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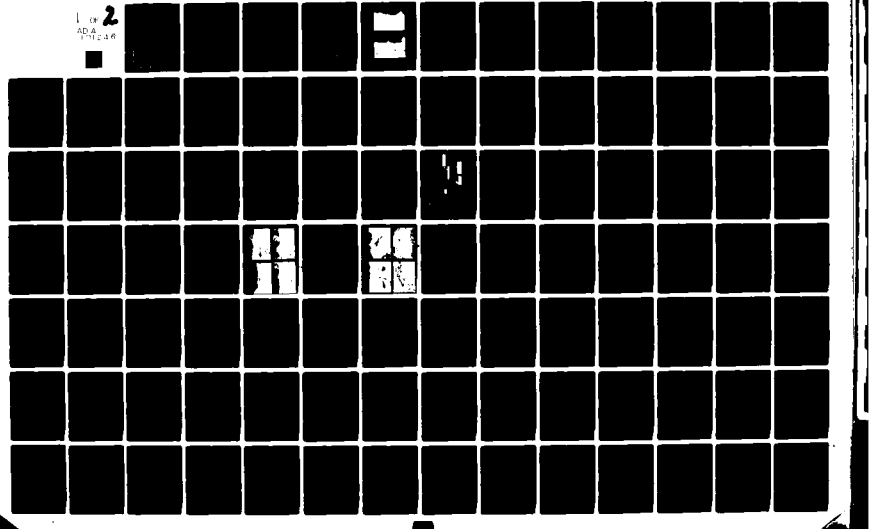

AD A101246

DELAWARE RIVER BASIN
BUSH KILL CREEK, PIKE COUNTY

PENNSYLVANIA

PICKERAL POND DAM

(NDI I.D. NO. PA-00755
PENNDER I.D. NO. 52-8)

~~PORTERS LAKE HUNTING AND~~
FISHING ASSOCIATION

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

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PREPARED FOR

DEPARTMENT OF THE ARMY
Baltimore District, Corps of Engineers
Baltimore, Maryland 21203

DACW 31-81-C-0015

PREPARED BY

GAI CONSULTANTS, INC.
570 BEATTY ROAD
MONROEVILLE, PENNSYLVANIA 15146

JUNE 1981

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PREFACE

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

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team.

It is important to note that the condition of 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 (greatest reasonably possible storm runoff) for the region, 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.

Breach analyses are performed, when necessary, to provide data to assess the potential for downstream damage and possible loss of life. The results are based on specific theoretical scenarios peculiar to the analysis of a particular dam and are not applicable to other related studies such as those conducted under the Federal Flood Insurance Program.

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PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

Pickeral Pond Dam: NDI I.D. No. PA-00755

Owner:	Porters Lake Hunting and Fishing Association
State Located:	Pennsylvania (PennDER I.D. No. 52-8)
County Located:	Pike
Stream:	Bush Kill Creek
Inspection Date:	12 October 1980
Inspection Team:	GAI Consultants, Inc. 570 Beatty Road Monroeville, Pennsylvania 15146

Based on a visual inspection, operational history, and available engineering data, the dam is considered to be in fair condition.

The size classification of the facility is intermediate and its hazard classification is considered to be high. In accordance with the recommended guidelines, the Spillway Design Flood (SDF) for the facility is the PMF (Probable Maximum Flood). Results of the hydrologic and hydraulic analysis indicate the facility will pass and/or store only about 40 percent of the PMF prior to embankment overtopping. A breach analysis indicates that failure under less than 1/2 PMF conditions could lead to increased downstream damage and potential for loss of life. Thus, based on screening criteria provided in the recommended guidelines, the spillway is considered to be seriously inadequate and the facility unsafe, non-emergency.

It is recommended that the owner immediately:

a. Develop a formal emergency warning system to notify downstream residents should hazardous embankment conditions develop. Included in the plan should be provisions for around-the-clock surveillance of the facility during periods of unusually heavy precipitation.

b. Retain the services of a registered professional engineer experienced in the hydrology and hydraulics of dams to further assess the adequacy of the spillway and prepare recommendations for remedial measures deemed necessary to make the facility hydraulically adequate.

c. Restore the operation of the outlet conduit at the upstream control mechanism and repair or replace its upstream and downstream headwalls.

Pickeral Pond Dam: NDI I.D. No. PA-00755

d. Repair concrete deterioration associated with the spillway overflow weir and right sidewall.

e. Clear all excess vegetation from the embankment crest and slopes on a regular routine basis in order to maintain an unobstructed view of the facility.

f. Develop formal manuals of operation and maintenance to ensure the future proper care of the facility.

GAI Consultants, Inc.

Bernard M. Mihalcin, P.E.

Date 5 June 1981

Approved by:

JAMES W. PECK
Colonel, Corps of Engineers
Commander and District Engineer

Date 19 JUNE 1981

COMMONWEALTH OF PENNSYLVANIA
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View from right abutment.

View from left abutment.

OVERVIEW PHOTOGRAPHS

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PHASE I INSPECTION REPORT
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PICKERAL POND DAM
NDI# PA-00755, PENNDER# 52-8

SECTION 1
GENERAL INFORMATION

1.0 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 inspection of dams throughout the United States.

1.1 Purpose.

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

1.2 Description of Project.

a. Dam and Appurtenances. Pickeral Pond Dam is 14-foot high earth embankment approximately 337 feet long, including spillway. The facility is constructed with an uncontrolled, rectangular shaped, two-stage, concrete spillway located at the left abutment. The spillway has an ogee-type crest and is 160 feet long. Drawdown capability is provided by a 24-inch diameter, concrete encased, steel pipe located in the embankment to the right of the spillway. Flows through the conduit are controlled at the inlet by means of a 24-inch diameter sluice gate that is manually operated from the upstream embankment face.

b. Location. Pickeral Pond Dam is located on Bush Kill Creek in Porter Township, Pike County, Pennsylvania. The reservoir is situated just off Pennsylvania Route 402, immediately adjacent to Porters Lake and less than three miles south of Pecks Pond. The dam and reservoir are contained within the Pecks Pond, Pennsylvania 7.5 minute U.S.G.S. topographic quadrangle (see Figure 1, Appendix E). The coordinates of the dam are N41° 15.1' and W75° 5.2'.

c. Size Classification. Intermediate (14 feet high, 2800 acre-feet storage capacity at top of dam).

d. Hazard Classification. High (see Section 3.1.e).

e. Ownership. Porters Lake Hunting and Fishing Association
SR Box 518
Dingmans Ferry, Pennsylvania 18328
Attn: Charles W. Miller
President

f. Purpose. Recreation.

g. Historical Data. Information contained in PennDER files indicates that Pickeral Pond predates the earliest available correspondence dated 1919. At that time, Pickeral Pond was reportedly impounded by a six foot high timber crib and stone fill structure. In 1925, the facility was replaced by a seven foot high concrete and stone fill structure. A small power plant was constructed as an appurtenance to the facility in 1928 and remained in operation until 1933. Remnants of the turbine sluiceway are still evident today downstream of the dam.

The present facility was constructed in 1950-51 immediately downstream of the concrete and stone fill structure. The facility was designed by Edward C. Hess of Stroudsburg, Pennsylvania, and was reportedly constructed by Litt Brothers, a local contractor. The facility has been inspected by state officials three times since its completion. Inspection reports dated 1951, 1956, and 1965 indicate the facility has been in generally good to excellent condition with no significant deficiencies cited.

The structure was apparently modified soon after its completion as state highway department officials became aware that the new facility could cause flooding along Pennsylvania Route 402 during minor storms. Normal pool level was subsequently lowered by means of notches cut through the spillway weir shown in Photograph 5.

Pickeral Pond Dam has been owned and operated throughout its entire history by the Porters Lake Hunting and Fishing Association.

1.3 Pertinent Data.

a. Drainage Area (square miles). 23.0.

b. Discharge at Dam Site.

Discharge Capacity of Outlet Conduit - Discharge curves are not available.

Discharge Capacity of Spillway at Maximum Pool = 7,740 cfs (see Appendix D, Sheet 10).

c. Elevations (feet above mean sea level). The following elevations were obtained through field measurements based on the elevation of normal pool at 1311.0 feet as indicated in Figure 1 (see Appendix D, Sheet 2).

Top of Dam	1317.7 (field). 1318.0 (design).
Maximum Design Pool	Not known.

Maximum Pool of Record	Not known.
Normal Pool	1311.0 (assumed datum).
Spillway Crest	1311.0 (lower stage). 1311.5 (upper stage).
Upstream Inlet Invert	1306.9 (design).
Downstream Outlet Invert	1306.5 (design). 1305.6 (field).
Downstream Embankment Toe	1303.7 (field).
Streambed at Dam Centerline	1305 (estimated).

d. Reservoir Length (feet).

Top of Dam	11000
Normal Pool	4500

e. Storage (acre-feet).

Top of Dam	2800
Normal Pool	360

f. Reservoir Surface (acres).

Top of Dam	624
Normal Pool	155

g. Dam.

Type	Earth.
Length	177 feet (excluding spillway).
Height	14 feet (field measured; embankment crest to downstream embankment toe).
Top Width	10 feet.
Upstream Slope	2-1/2H:1V (design). 2H:1V (field).
Downstream Slope	2H:1V (design). 2H:1V (field).
Zoning	Homogeneous earth fill with a concrete corewall along the embankment centerline (see Figure 3).
Impervious Core and Cutoff	Concrete corewall, 15-inches wide at the top and 36-inches wide at the base, reportedly extends a minimum of two feet into the rock foundation.

	Grout Curtain	None.
h.	Diversion Canal and Regulating Tunnels.	None.
i.	Spillway.	
	Type	Uncontrolled, rectangular shaped, two-stage, concrete spillway with an ogee-type weir located at the left abutment.
	Crest Elevation	1311.0 (lower stage). 1311.5 (upper stage).
	Crest Length	160 feet.
j.	Outlet Conduit.	
	Type	24-inch diameter, concrete encased, steel pipe located in the embankment to the right of the spillway.
	Length	65 feet (estimate).
	Closure and Regulating Facilities	Flows through the outlet conduit are controlled by means of a slide gate located at the inlet.
	Access	The gate control mechanism is accessible from the upstream embankment face when pool levels are at or below normal.

SECTION 2

ENGINEERING DATA

2.1 Design.

a. Design Data Availability and Sources. No formal design reports or calculations are available concerning any aspect of the facility. PennDER files contain several design drawings, the most sigificant of which has been included in Appendix E of this report (see Figure 3). These files also contain extensive correspondence dating back to 1919 along with dated photographs and three state inspection reports pertaining to the present facility. A state issued construction permit application report, dated 1950, contains brief discussions of the various design aspects of the present facility.

b. Design Features.

1. Embankment. Design features of the embankment are presented in Figure 3. As indicated, the embankment essentially comprises the right half of the structure and is 177 feet long and approximately 14 feet high. The embankment consists of homogeneous earthfill with a concrete corewall constructed along its centerline through its entire length. The corewall is 15 inches thick at the top with 1H:12V battered sides. It reportedly extends from 3.5 feet beneath the embankment crest into the foundation below the ground surface a minimum depth of two feet into solid rock. The design slopes were set at 2-1/2H:1V and 2H:1V for the upstream and downstream embankment slopes, respectively. However, both the upstream and downstream embankment slopes were field measured at 2H:1V. The upstream embankment face is protected with a 12-inch thick riprap layer. The design intended that embankment material be placed in six inch layers and thoroughly compacted with a 10-ton roller.

2. Appurtenant Structures.

a) Spillway. Design features of the spillway are presented in Figure 3. As indicated, the spillway comprises the left half of Pickeral Pond Dam. The spillway is a concrete-gravity type, ogee section, four feet high and six feet wide at the base, constructed on solid rock (see Photograph 5). A concrete sidewall abuts the right end of the spillway against the embankment while the left end of the spillway is tied into bedrock at the left abutment hillside.

b) Outlet Conduit. Design features of the outlet conduit are presented in Figure 3. As indicated, the outlet conduit is a 24-inch diameter, concrete encased, steel pipe located approximately 55 feet from the right abutment. The conduit was designed such that flows would be controlled at the inlet by means of a 24-inch diameter sluice gate.

c. Specific Design Data and Criteria. No specific design data or information relative to design procedures are available other than the general information contained in PennDER files.

2.2 Construction Records.

No formal construction records are available for this facility. PennDER files do contain various memoranda and correspondence that pertain to construction related activities. In addition, three of the available dated photographs were taken during construction and immediately upon completion of the project.

2.3 Operational Records.

No records of the day-to-day operation of the facility are available.

2.4 Other Investigations.

Other than three state inspections performed in 1951, 1956, and 1965, no formal investigations have been conducted on this facility subsequent to its construction.

2.5 Evaluation.

The available data are considered sufficient to make a reasonable Phase I evaluation of the facility.

SECTION 3

VISUAL INSPECTION

3.1 Observations.

a. General. The general appearance of the facility suggests the dam and its appurtenances are in fair condition.

b. Embankment. Observations made during the visual inspection indicate the embankment is in good condition. Heavy overgrowth covers the embankment crest and downstream face, indicative of a general lack of adequate maintenance (see Photographs 2, 3 and 4). Briars and low shrubs, along with at least six large trees (6 to 18 inches in diameter), characterize the vegetation. No evidence of sloughing, erosion, seepage through the downstream embankment face or excessive settlement was observed. Local ponding occurs in a low area located immediately downstream of the embankment. The primary source of the ponded water is the outlet conduit which, although supposedly sealed, leaks profusely at its discharge end (see Photograph 8). Observations suggest some seepage may emanate from along the downstream embankment toe and beyond; however, it does not appear to be significant.

c. Appurtenant Structures.

1. Spillway. The visual inspection revealed the spillway is in fair condition. General concrete deterioration characterizes the entire structure (see Photographs 5 and 6). The right sidewall, in particular, displays cracking, extensive spalling and efflorescence.

2. Outlet Conduit. The outlet conduit was not operated in the presence of the inspection team and is considered to be in poor condition. The gate control mechanism and concrete headwall at the inlet are dilapidated (see Photograph 7). The concrete headwall at the discharge end exhibits excessive concrete deterioration. Based strictly on its appearance, the control mechanism is likely inoperable. The non-functional gate has resulted in a fully flooded conduit that had to be closed off at the discharge end. A flat steel plate supported by steel angles has been placed across the discharge end of the conduit and acts as a seal. The top angle has broken free, resulting in leakage estimated at 30 to 40 gpm (see Photograph 8).

d. Reservoir Area. The general area surrounding the Pickeral Pond watershed consists of moderate, heavily forested slopes. The exception is a large swamp, known as Wolf Swamp, located to the immediate northeast of the pond. No evidence of slope distress was observed.

The 23-square mile Pickeral Pond watershed contains five substantial water impounding facilities (see Figure 2). These

include: 1) Blue Heron Lake Dam (PennDER I.D. No. 52-9); 2) Hemlock Dam (PennDER I.D. No. 52-71); 3) Lower Hemlock Dam (PennDER I.D. No. 52-117); 4) Pecks Pond Dam (PennDER I.D. No. 52-15); and Porters Lake Dam (PennDER I.D. No. 52-33). Statistics pertaining to each of these facilities are included in Appendix D (see Sheets 14 through 22).

e. Downstream Channel. Discharges from Pickeral Pond Dam are channeled into a heavily forested valley with moderate to steep confining slopes. The valley is strewn with both permanent and seasonal dwellings. Approximately one to three miles downstream of the embankment, several dwellings are located sufficiently near the stream as to possibly be affected by the floodwaters resulting from an embankment breach. It is estimated that as many as 15 to 20 persons could inhabit these structures at any given time, particularly on weekends and during the peak season. Consequently, the hazard classification is considered to be high.

3.2 Evaluation.

Based on visual observations, the condition of the facility is considered to be fair. Remedial measures should be implemented to: 1) repair the inlet and outlet portions of the outlet conduit; 2) remove excess vegetation from the embankment crest and slopes; and 3) repair the concrete deterioration associated with the spillway.

SECTION 4

OPERATIONAL PROCEDURES

4.1 Normal Operating Procedures.

Pickeral Pond Dam is essentially a self-regulating facility. That is, excess inflows are automatically discharged through the uncontrolled spillway and directed downstream. The outlet conduit has been partially sealed at its discharge end and is presently non-functional. No formal operations manual is available.

4.2 Maintenance of Dam.

The owner reportedly maintains the dam on an unscheduled, as-needed basis. Conditions observed by the inspection team indicate, however, that maintenance is minimal. No formal maintenance program has been established and no formal manuals are available.

4.3 Maintenance of Operating Facilities.

See Section 4.2 above.

4.4 Warning System.

No formal warning system is presently in effect.

4.5 Evaluation.

The general appearance of the facility suggests a lack of adequate maintenance. No formal maintenance or operations manuals are available, but, are recommended to ensure the future proper care and operation of the facility. In addition, formal warning system procedures should be incorporated into these manuals to provide for the protection of downstream residents should hazardous embankment conditions develop.

SECTION 5

HYDROLOGIC/HYDRAULIC EVALUATION

5.1 Design Data.

No formal design reports are available for this facility. According to information contained in PennDER files, the spillway at Pickeral Pond Dam was sized for a design discharge capacity of about 11,000 cfs. This was based on an uncontrolled, rectangular shaped, two-stage, concrete spillway with an ogee-type weir 171 feet long (coefficient of discharge C = 3.7). The capacity of the spillway, as determined by the analysis contained in this report and based on as-built and present day conditions, is approximately 7,700 cfs (see Appendix D, Sheets 6 through 10). The difference is due, in part, to the smaller as-built crest length and, in part, to the head losses attributable to the configuration of the approach channel and the odd angle at which the spillway is situated relative to the approach channel (see Figure 3, Appendix E). These head losses were apparently neglected in the design.

5.2 Experience Data.

Daily records of reservoir levels and/or spillway discharges are not available. The general appearance of the facility suggests adequate past performance.

5.3 Visual Observations.

On the date of inspection, no conditions were observed that would indicate the facility could not perform satisfactorily within the limits of its as-built capacity.

5.4 Method of Analysis.

The facility has been analyzed in accordance with the procedures and guidelines established by the U.S. Army, Corps of Engineers, Baltimore District, for Phase I hydrologic and hydraulic evaluations. The analysis has been performed utilizing a modified version of the HEC-1 program developed by the U.S. Army, Corps of Engineers, Hydrologic Engineering Center, Davis, California. Analytical capabilities of the program are briefly outlined in the preface contained in Appendix D.

5.5 Summary of Analysis.

a. Spillway Design Flood (SDF). In accordance with procedures and guidelines contained in the National Guidelines for Safety Inspection of Dams for Phase I Investigations, the Spillway

Design Flood (SDF) for Pickeral Pond Dam is the PMF (Probable Maximum Flood). This classification is based on the relative size of the dam (intermediate) and the potential hazard of dam failure to downstream developments (high).

b. Results of Analysis. Pickeral Pond Dam was evaluated under near normal operating conditions. That is, the reservoir was initially at the lower stage spillway crest elevation of 1311.0 feet, with the spillway weir discharging freely. The low flow notches cut in the spillway weir were not considered in this analysis (see Appendix D, Sheet 2, Note 1). The outlet conduit was assumed to be non-functional for the purpose of analysis, since the flow capacity of the conduit is not such that it would significantly increase the total discharge capabilities of the facility. The spillway consists of an uncontrolled, rectangular shaped, concrete channel, with discharges regulated by a two-stage, concrete, ogee-type weir.

Five upstream dams were included in the analysis to determine their effects on Pickeral Pond Dam. Pecks Pond Dam, Porters Lake Dam, and Blue Heron Lake Dam each discharge directly into Pickeral Pond, while Hemlock Lake Dam and Lower Hemlock Dam are located in series upstream of Blue Heron Lake Dam (see Figure 2). Each of these dams was evaluated under normal operating conditions. That is, the reservoirs were initially at normal pool, the spillways were assumed to be discharging freely, and, the outlet conduits were assumed to be closed. All pertinent engineering calculations relative to the evaluation of Pickeral Pond Dam, including those pertaining to the upstream facilities, are included in Appendix D.

Overtopping analysis (using the modified HEC-1 computer program) indicated that the discharge/storage capacity of Pickeral Pond Dam can accommodate only about 40 percent of the PMF prior to embankment overtopping. It was also found that Hemlock Dam, Lower Hemlock Dam, Blue Heron Lake Dam, Pecks Pond Dam, and Porters Lake Dam can accommodate about 60 percent, 67 percent, 4 percent, 4 percent, and 2 percent of the PMF, respectively, prior to embankment overtopping. Under PMF (SDF) conditions, the embankment at Pickeral Pond Dam was overtopped for more than 9.0 hours, by depths of up to 5.1 feet. Under 1/2-PMF conditions, the embankment was overtopped for nearly 7.0 hours, by depths of up to 1.1 feet (Appendix D, Summary Input/ Output Sheets, Sheets Q and R). Since the SDF for Pickeral Pond Dam is the PMF, it can be concluded that the dam has a high potential for overtopping, and thus, for breaching under floods of less than SDF magnitude.

Since Pickeral Pond Dam cannot safely pass a flood of at least 1/2 PMF magnitude, the possibility of embankment failure under floods of 1/2 PMF intensity or less was investigated (in accordance with Corps directive ETL-1110-2-234). Although the spillways at Blue Heron Lake Dam, Pecks Pond Dam, and Porters Lake Dam are not capable of safely passing the 1/2 PMF, the possibility of failure at these facilities was not considered.

Several possible alternative failure schemes were examined for Pickeral Pond Dam, since it is difficult, if not impossible, to determine exactly how or if a specific dam will fail. The major concern of the breaching analysis is with the impact of the various breach discharges on increasing downstream water surface elevations above those to be expected if breaching did not occur.

The modified HEC-1 computer program was used for the breaching analysis, with the assumption that the breaching of an earth dam would begin once the low area in the embankment crest was overtopped. Also, in routing the outflows downstream, the channel bed was assumed to be initially dry.

Five possible modes of failure were investigated. Two sets of breach geometry were evaluated for each of two failure times. The two breach sections chosen were considered to be the minimum and maximum probable failure sections. The two failure times (total time for each breach section to reach its final dimensions) under which the minimum and maximum sections were investigated were assumed to be a rapid time (0.5-hour) and a prolonged time (4.0 hours), so that a range of this most sensitive variable might be examined. In addition, an average possible set of breach conditions was analyzed, with a failure time of 1.0-hour (Appendix D, Sheet 24).

The peak breach outflows (resulting from 0.42 PMF conditions) at Pickeral Pond Dam ranged from 8,580 cfs for the minimum section-maximum fail time scheme to about 26,220 cfs for the maximum section-minimum fail time scheme. The peak outflow from the average breach scheme was about 15,300 cfs, compared to the non-breach 0.42 PMF peak outflow of approximately 8,250 cfs (Appendix D, Sheet 26).

Three potential damage centers were investigated in this analysis. At Section 1, about 1.1 miles downstream from Pickeral Pond Dam (see Figure 1), the outflows from the various breach models resulted in water levels ranging from 4.8 feet to 9.5 feet above the damage levels of the nearby dwellings, and 0.1-foot to 4.8 feet above the non-breach levels.

The maximum non-breach water level at Section 2, about 750 feet further downstream (see Figure 1), was approximately 2.0 feet above the damage level of the structures. However, the increases above the non-breach levels resulting from the various failure schemes ranged from 0.1-foot to 4.6 feet, and thus, were as much as 6.6 feet above the damage levels.

At Section 3, located about two miles downstream from the dam (Figure 1), the peak water surface elevations resulting from the breaches ranged up to 7.9 feet above the damage levels of the nearby structures, and up to 3.6 feet above the non-breach peak elevations (Appendix D, Sheet 27).

The consequences of dam failure can better be envisioned if not only the increase in the height of the floodwave is considered, but also the great increase in momentum of the larger and probably swifter moving volume of water. In addition, the possibility of a near instantaneous failure due to the collapse of the concrete corewall was not considered in this analysis, although such a failure is possible and would most likely result in higher downstream water surface elevations. Finally, it is noted that although the non-breach outflows resulted in the inundation of the dwellings nearest the stream at all three hazard centers, the increases in water levels due to the breaches were significant, and would most likely also cause flooding at other structures along these reaches (structures at higher elevations which were noted but not measured in the field inspection).

From this analysis, it is concluded that the failure of Pickeral Pond Dam is quite possible, and would most likely lead to increased property damage and possibly loss of life in the downstream regions.

5.6 Spillway Adequacy.

As presented previously, Pickeral Pond Dam can accommodate only about 40 percent of the PMF (SDF) prior to embankment overtopping. It has been shown that should an event of magnitude greater than this occur, the dam would be overtopped and could possibly fail, endangering downstream residences and increasing the potential for loss of life in the downstream regions. Therefore, the spillway is considered to be seriously inadequate.

SECTION 6

EVALUATION OF STRUCTURAL INTEGRITY

6.1 Visual Observations.

a. Embankment. Based on visual observations, the structural condition of the embankment is considered to be good. The deficiencies encountered can be attributed, for the most part, to a lack of adequate maintenance. The overgrowth observed along the downstream embankment face is considered to be a significant deficiency requiring immediate remedial attention. The root systems of large trees may offer a course for possible piping through the embankment. Furthermore, the existence of trees on the slope which may uproot and topple is a potential threat to the overall stability of the slope. Excess vegetation also obscures clear view of the downstream toe which may become critical in the event of an embankment emergency.

b. Appurtenant Structures.

1. Spillway. The spillway is considered to be in fair condition. The concrete deterioration observed across the overflow weir and right sidewall should be repaired immediately and not allowed to advance to a stage where the stability of the structure would be threatened.

2. Outlet Conduit. The outlet conduit is presently inoperable and considered to be in poor condition. Restoration of the upstream control mechanism and concrete headwalls (upstream and downstream) should be undertaken immediately.

6.2 Design and Construction Techniques.

Little information is available that pertains to the methods of design and/or construction of the facility. Data contained in PennDER files indicates that the entire structure is founded on rock and that the embankment corewall and spillway are keyed several feet into the rock foundation.

6.3 Past Performance.

There are no records documenting any events during which the facility has not adequately functioned.

6.4 Seismic Stability.

The dam is located in Seismic Zone No. 1 and may be subject to minor earthquake induced dynamic forces. As the facility appears to be well constructed and sufficiently stable, it is believed that

it can withstand the expected minor dynamic forces; however, no calculations and/or investigations were performed to confirm this belief.

SECTION 7

ASSESSMENT AND RECOMMENDATIONS FOR REMEDIAL MEASURES

7.1 Dam Assessment.

a. Safety. The results of this investigation indicate the facility is in fair condition.

The size classification of the facility is intermediate and its hazard classification is considered to be high. In accordance with the recommended guidelines, the Spillway Design Flood (SDF) for the facility is the PMF (Probable Maximum Flood). Results of the hydrologic and hydraulic analysis indicate the facility will pass and/or store only about 40 percent of the PMF prior to embankment overtopping. A breach analysis indicates that failure under less than 1/2 PMF conditions could lead to increased downstream damage and potential for loss of life. Thus, based on screening criteria provided in the recommended guidelines, the spillway is considered to be seriously inadequate and the facility unsafe, non-emergency.

b. Adequacy of Information. The available data are considered sufficient to make a reasonable Phase I assessment of the facility.

c. Urgency. The recommendations listed below should be implemented immediately.

d. Necessity for Additional Investigations. An additional hydrologic/hydraulic investigation is currently deemed necessary to more accurately assess the adequacy of the spillway.

7.2 Recommendations/Remedial Measures.

It is recommended that the owner immediately:

a. Develop a formal emergency warning system to notify downstream residents should hazardous embankment conditions develop. Included in the plan should be provisions for around-the-clock surveillance of the facility during periods of unusually heavy precipitation.

b. Retain the services of a registered professional engineer experienced in the hydrology and hydraulics of dams to further assess the adequacy of the spillway and prepare recommendations for remedial measures deemed necessary to make the facility hydraulically adequate.

c. Restore the operation of the outlet conduit at the upstream control mechanism and repair or replace its upstream and downstream headwalls.

d. Repair concrete deterioration associated with the spillway overflow weir and right sidewall.

e. Clear all excess vegetation from the embankment crest and slopes on a regular routine basis in order to maintain an unobstructed view of the facility.

f. Develop formal manuals of operation and maintenance to ensure the future proper care of the facility.

APPENDIX A

VISUAL INSPECTION CHECKLIST AND FIELD SKETCHES

CHECK LIST
VISUAL INSPECTION
PHASE 1

NAME OF DAM Pickeral Pond Dam STATE Pennsylvania COUNTY Pike

NDI # PA — 00755 PENNDER # 52-8

TYPE OF DAM Earth and Rockfill SIZE Intermediate HAZARD CATEGORY High

DATE(S) INSPECTION 12 October 1980 WEATHER Overcast TEMPERATURE 55° @ Noon

POOL ELEVATION AT TIME OF INSPECTION 1309.2 feet M.S.L.

TAILWATER AT TIME OF INSPECTION N/A M.S.L.

INSPECTION PERSONNEL	OWNER REPRESENTATIVES	*OTHERS*
B.M. Mihalcin	None	
D.J. Spaeder		
D.L. Bonk		

RECORDED BY B.M. Mihalcin

EMBANKMENT

ITEM	OBSERVATIONS/REMARKS/RECOMMENDATIONS NDI# PA. 00755
SURFACE CRACKS	None observed. Entire dam is covered with rock.
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	Horizontal - Good. Vertical - See "Profile of Dam Crest from Field Survey," Appendix A.
RIPRAP FAILURES	None observed. Riprap is hard, durable sandstone. Individual pieces are somewhat elongated and flat, but well graded and interlocking.
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Good condition.

EMBANKMENT

ITEM	OBSERVATIONS/REMARKS/RECOMMENDATIONS NDI# PA - 00755
DAMP AREAS IRREGULAR VEGETATION (LUSH OR DEAD PLANTS)	Local ponding occurs in a low area located immediately beyond the downstream embankment toe. The primary source of the ponded water is the outlet conduit which, although supposedly sealed, leaks profusely at its discharge end. Some of the ponded water may be the result of minor seepage at or beyond the downstream embankment toe.
ANY NOTICEABLE SEEPAGE	None through downstream embankment. Observations suggest some seepage may emanate from along the downstream embankment toe and beyond; however, it does not appear to be significant.
STAFF GAGE AND RECORDER	None.
DRAINS	None observed.
VEGETATION	At least six (6) large trees (6 to 18 inches diameter) are rooted within the downstream embankment face and should be removed. Briars and low shrubs inhibit observation of the surface of the embankment structure.
MISCELLANEOUS	Bedrock is exposed throughout the area. Very little soil cover. Spillway and abutments are founded in rock. Dam appears to be an appurtenance to a natural lake.

OUTLET WORKS

ITEM	OBSERVATIONS/REMARKS/RECOMMENDATIONS NDI# PA- 00755
INTAKE STRUCTURE	Submerged, not observed.
OUTLET CONDUIT (CRACKING AND SPALLING OF CONCRETE SURFACES)	Not observed.
OUTLET STRUCTURE	Poor condition. Concrete headwall exhibits excessive concrete spalling, cracking and general deterioration. A flat steel plate supported by steel angles has been placed across the discharge end of the conduit in order to seal it. Top angle has broken free, resulting in a large leak (30 to 40 gpm) between the plate and conduit headwall.
OUTLET CHANNEL	Bedrock lined channel. Some ponding occurs immediately beyond the downstream embankment toe in a local low area.
GATE(S) AND OPERATIONAL EQUIPMENT	Dilapidated and inoperable gate control mechanism. Appears to be a steel framed slide gate set in a concrete channel. Frame is broken and concrete is cracked and dislodged.

EMERGENCY SPILLWAY

ITEM	OBSERVATIONS/REMARKS/RECOMMENDATIONS NDI# PA - 00755
TYPE AND CONDITION	Uncontrolled, rectangular shaped, concrete channel with an ogee-type weir located at the left abutment. Concrete weir and sidewalls in fair condition with severe spalling and general deterioration evident. Channel bottom is bedrock.
APPROACH CHANNEL	Bedrock lined channel. Partially obstructed by brush and small trees, particularly near the left abutment.
SPILLWAY CHANNEL AND SIDEWALLS	Left concrete sidewall is small and exists only to tie the concrete weir into the left abutment. Most of the left side of the spillway channel is cut in rock. Right concrete sidewall, abutting the embankment, is in fair condition with local spalling and cracking evident.
STILLING BASIN PLUNGE POOL	None. Spillway weir discharges into a bedrock lined channel.
DISCHARGE CHANNEL	Unobstructed, bedrock lined channel.
BRIDGE AND PIERS EMERGENCY GATES	None.

SERVICE SPILLWAY

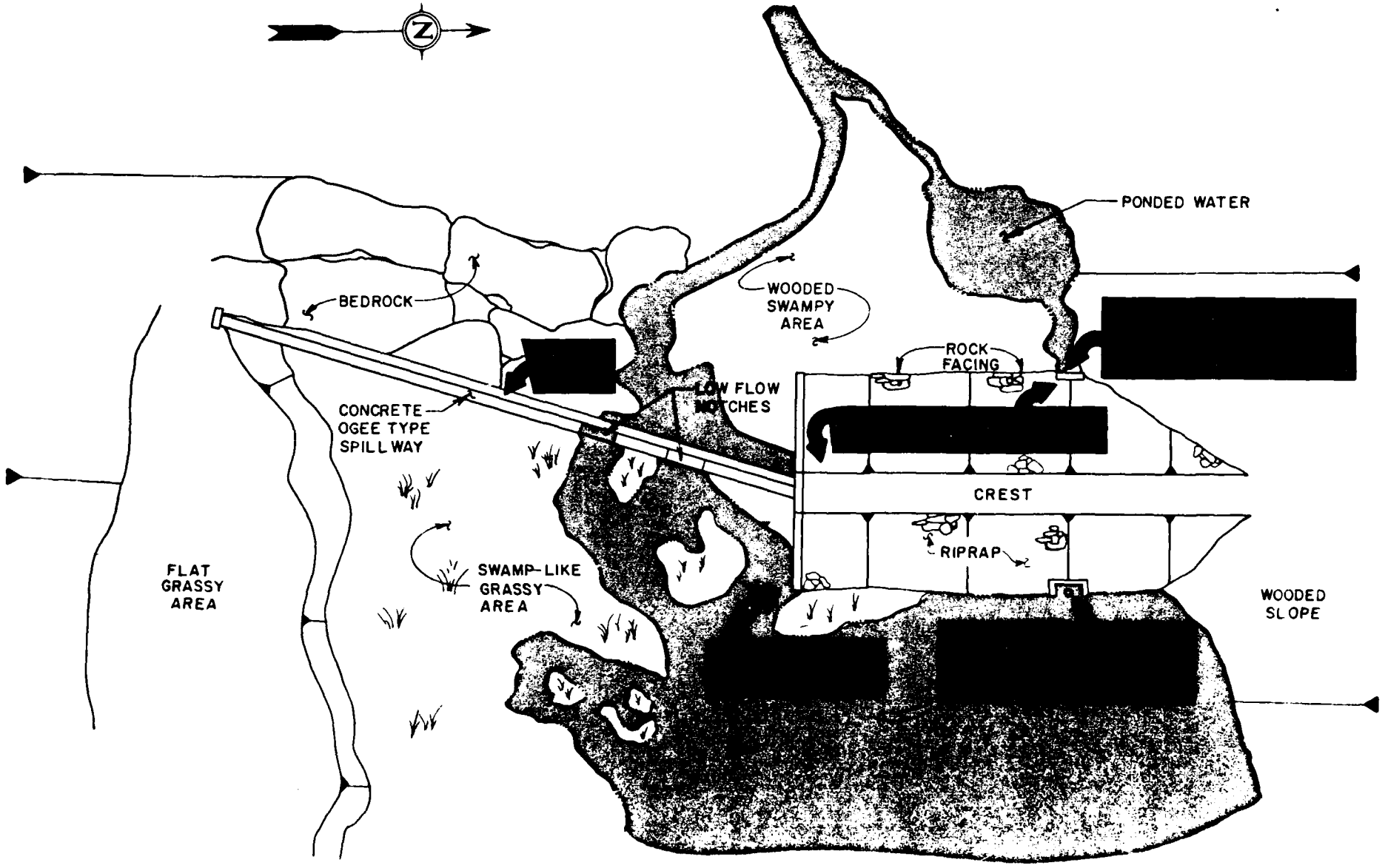
ITEM	OBSERVATIONS/REMARKS/RECOMMENDATIONS NDI# PA - 00755
TYPE AND CONDITION	N/A.
APPROACH CHANNEL	N/A.
OUTLET STRUCTURE	N/A.
DISCHARGE CHANNEL	N/A.

INSTRUMENTATION

ITEM	OBSERVATIONS/REMARKS/RECOMMENDATIONS NDI# PA - 00755
MONUMENTATION SURVEYS	None.
OBSERVATION WELLS	None.
WEIRS	None.
PIEZOMETERS	None.
OTHERS	None.

RESERVOIR AREA AND DOWNSTREAM CHANNEL

ITEM	OBSERVATIONS/REMARKS/RECOMMENDATIONS NDI# PA. 00755
SLOPES: RESERVOIR	Moderate slopes that are heavily forested. Bedrock exposed all around general area surrounding the reservoir. Very little soil cover.
SEDIMENTATION	Lake apparently floods an old swamp and is very shallow. Many tree stumps project above the water line. No evidence of actual sedimentation was observed.
DOWNSTREAM CHANNEL (OBSTRUCTIONS, DEBRIS, ETC.)	Rock falls located immediately downstream of embankment.
SLOPES: CHANNEL VALLEY	Gently sloped channel set in a heavily forested valley with moderate to steep confining slopes.
APPROXIMATE NUMBER OF HOMES AND POPULATION	Valley downstream of embankment is strewn with permanent and seasonal dwellings. It is estimated that as many as 15 to 20 persons could inhabit several dwellings situated near the stream about one to three miles downstream of the embankment.



PICKERAL POND DAM

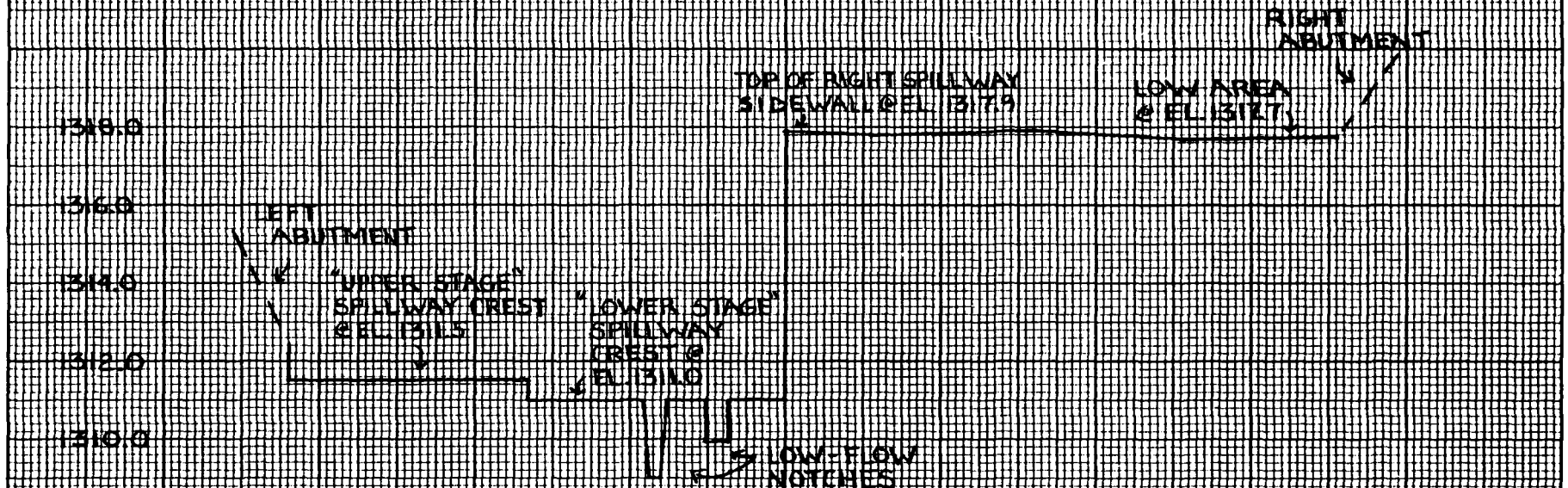
GENERAL PLAN-FIELD INSPECTION NOTES

K·E 20 X 20 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

NDI # PA- 00755

PICKERAL POND DAM

PROFILE OF DAM CREST
FROM FIELD SURVEY



SCALE:
VERTICAL: 1 IN. = 2 FT.
HORIZONTAL: 1 IN. = 50 FT.

SUBJECT PICKERAL POND DAM
BY JDS DATE 5-9-81 SHEET NO. OF
CHKD. BY DLB DATE 5-11-81 PROJECT NO. 80-238-755

APPENDIX B

ENGINEERING DATA CHECKLIST

CHECK LIST
ENGINEERING DATA
PHASE I

NAME OF DAM Pickeral Pond Dam

ITEM	REMARKS	NDI# PA - 00755
PERSONS INTERVIEWED AND TITLE	Porters Lake Hunting and Fishing Association Charles W. Miller - President Walter Whittaker - caretaker (full-time resident)	
REGIONAL VICINITY MAP	See Figure 1, Appendix E.	
CONSTRUCTION HISTORY	Constructed in 1950-51. Designed by Edward C. Hess of Stroudsburg, PA. Notches cut in spillway weir shortly after completion to lower pool level and prevent frequent flooding of Pennsylvania Route 402.	
AVAILABLE DRAWINGS	None from owner. Design drawing (several revisions) contained in PennDER files (see Figure 3, Appendix E).	
TYPICAL DAM SECTIONS	See Figure 3, Appendix E.	
OUTLETS: PLAN DETAILS DISCHARGE RATINGS	See Figure 3, Appendix E.	

CHECK LIST
ENGINEERING DATA
PHASE I
(CONTINUED)

ITEM	REMARKS	NDI# PA - 00755
SPILLWAY: PLAN SECTION DETAILS	See Figure 3, Appendix E.	
OPERATING EQUIP- MENT PLANS AND DETAILS	See Figure 3, Appendix E.	
DESIGN REPORTS	None available.	
GEOLOGY REPORTS	None available.	
DESIGN COMPUTATIONS: HYDROLOGY AND HYDRAULICS STABILITY ANALYSES SEEPAGE ANALYSES	None available.	
MATERIAL INVESTIGATIONS: BORING RECORDS LABORATORY TESTING FIELD TESTING	None available.	

CHECK LIST
ENGINEERING DATA
PHASE I
(CONTINUED)

ITEM	REMARKS	NDI# PA - 00755
BORROW SOURCES	Not known.	
POST CONSTRUCTION DAM SURVEYS	None.	
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None.	
HIGH POOL RECORDS	No formal records are available.	
MONITORING SYSTEMS	None.	
MODIFICATIONS	Cut notches in spillway shortly after completion of construction (1951).	

CHECK LIST
ENGINEERING DATA
PHASE I
(CONTINUED)

ITEM	REMARKS	NDI# PA - 00755
PRIOR ACCIDENTS OR FAILURES	None.	
MAINTENANCE: RECORDS MANUAL	No records or manual are available.	
OPERATION: RECORDS MANUAL	No records or manual are available.	
OPERATIONAL PROCEDURES	Self-regulating.	
WARNING SYSTEM AND/OR COMMUNICATION FACILITIES	None.	
MISCELLANEOUS	Two construction photographs showing cutoff trenches founded in bedrock from PennDER files. Also one photograph of completed structure (1951).	

GAI CONSULTANTS, INC.

CHECK LIST
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

NDI ID # PA-00755
PENNDER ID # 52-8

SIZE OF DRAINAGE AREA: 4.9 square miles (local); 23.0 square miles (total).

ELEVATION TOP NORMAL POOL: 1311.0 STORAGE CAPACITY: 360 acre-feet

ELEVATION TOP FLOOD CONTROL POOL: - STORAGE CAPACITY: -

ELEVATION MAXIMUM DESIGN POOL: - STORAGE CAPACITY: -

ELEVATION TOP DAM: 1317.7 (field) STORAGE CAPACITY: 2,800 acre-feet

SPILLWAY DATA

CREST ELEVATION: 1311.0 feet (lower stage); 1311.5 feet (upper stage).

TYPE: Uncontrolled, rectangular, concrete channel with ogee-type weir.

CREST LENGTH: 160 feet.

CHANNEL LENGTH: N/A.

SPILLOVER LOCATION: Left abutment.

NUMBER AND TYPE OF GATES: None.

OUTLET WORKS

TYPE: 24-inch diameter, concrete encased steel pipe.

LOCATION: Right of spillway.

ENTRANCE INVERTS: 1306.9 (design).

EXIT INVERTS: 1306.5 (design); 1305.6 (field).

EMERGENCY DRAWDOWN FACILITIES: Slide gate at inlet.

HYDROMETEOROLOGICAL GAGES

TYPE: None.

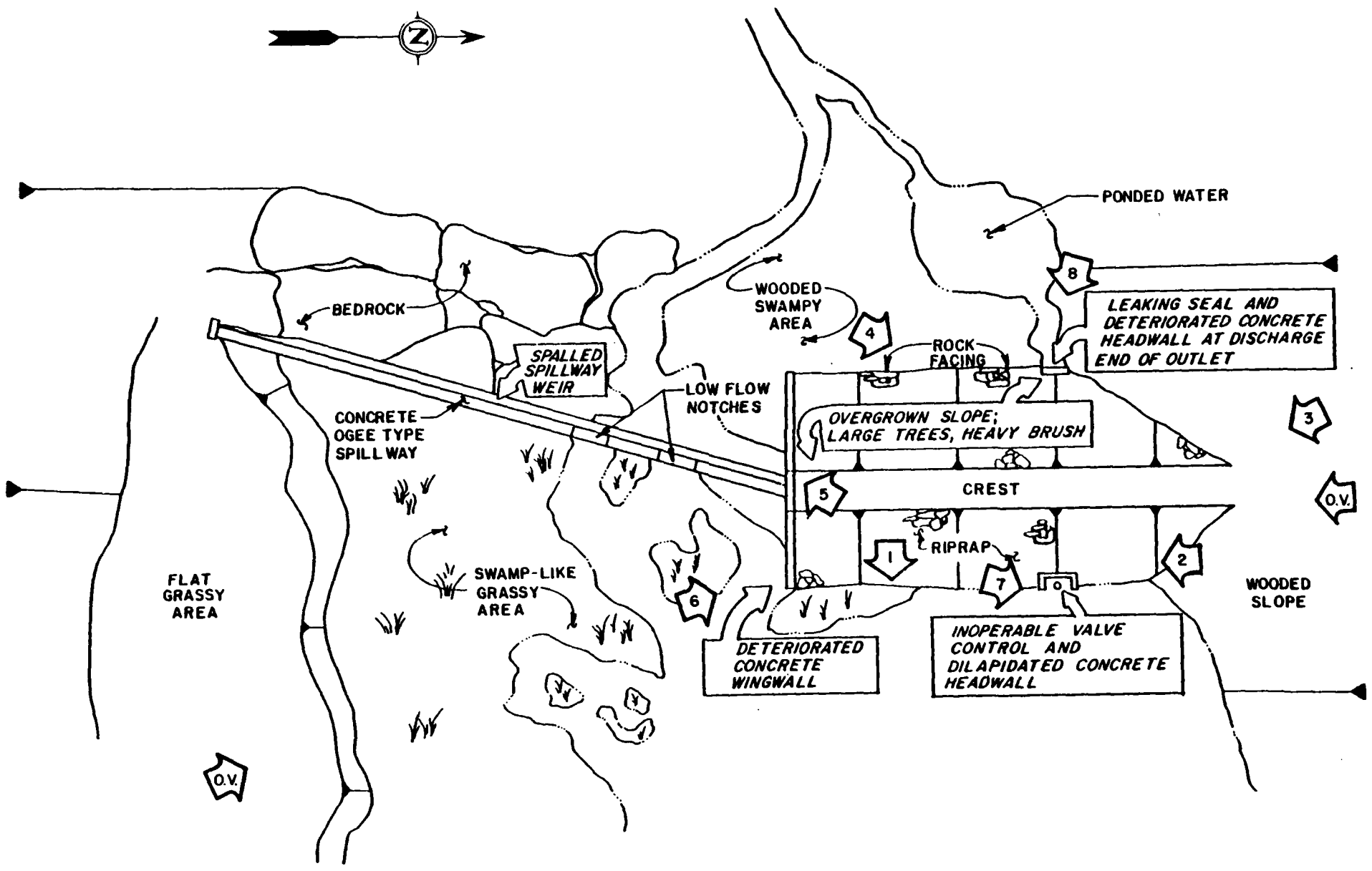
LOCATION: -

RECORDS: -

MAXIMUM NON-DAMAGING DISCHARGE: Not known.

APPENDIX C

PHOTOGRAPHS



PICKERAL POND DAM
PHOTOGRAPH KEY MAP

PHOTOGRAPH 1 View of Pickeral Pond as seen from the upstream embankment face.

PHOTOGRAPH 2 View of the rock covered upstream embankment face as seen from the right abutment.

PHOTOGRAPH 3 View of the overgrown downstream embankment face as seen from a position along the right abutment about 50 feet downstream of the embankment.

PHOTOGRAPH 4 View of the downstream embankment face as seen from a position about 40 feet downstream of the embankment between the spillway and outlet conduit.

1

2

3

4

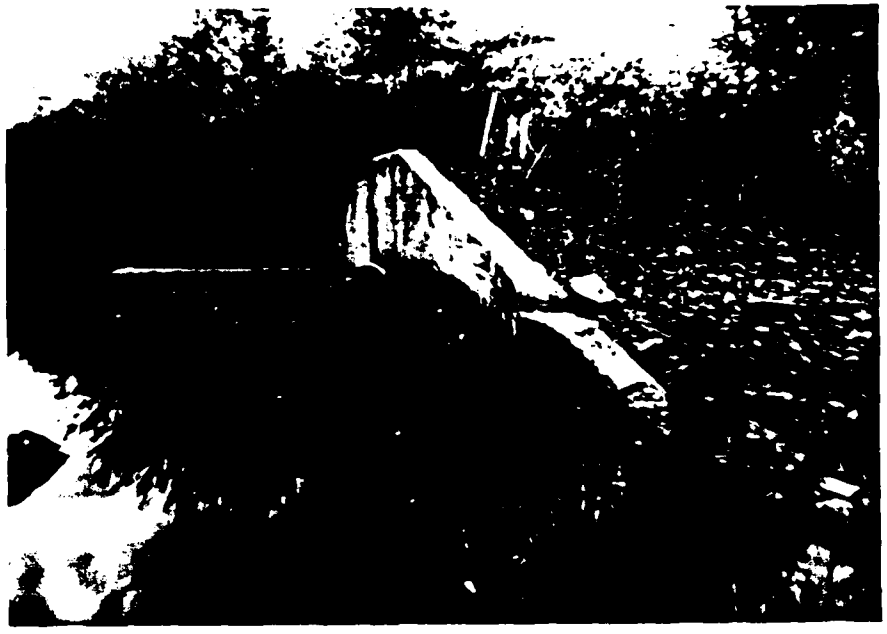
PHOTOGRAPH 5 View of the spillway weir looking toward the left abutment.

PHOTOGRAPH 6 View of the deteriorated right spillway sidewall.

PHOTOGRAPH 7 View of the dilapidated outlet conduit control mechanism and upstream headwall.

PHOTOGRAPH 8 View of the partially sealed outlet conduit discharge and deteriorated concrete headwall.

5



6

7

8

APPENDIX D

HYDROLOGIC AND HYDRAULIC ANALYSES

PREFACE

The modified HEC-1 program is capable of performing two basic types of hydrologic analyses: 1) the evaluation of the overtopping potential of the dam; and 2) the estimation of the downstream hydrologic-hydraulic consequences resulting from assumed structural failures of the dam. Briefly, the computational procedures typically used in the dam overtopping analysis are as follows:

a. Development of an inflow hydrograph(s) to the reservoir.

b. Routing of the inflow hydrograph(s) through the reservoir to determine if the event(s) analyzed would overtop the dam.

c. Routing of the outflow hydrograph(s) from the reservoir to desired downstream locations. The results provide the peak discharge(s), time(s) of occurrence the peak discharge(s), and the maximum stage(s) of each routed hydrograph at the downstream end of each reach.

The evaluation of the hydrologic-hydraulic consequences resulting from an assumed structural failure (breach) of the dam is typically performed as shown below.

a. Development of an inflow hydrograph(s) to the reservoir.

b. Routing of the inflow hydrograph(s) through the reservoir.

c. Development of a failure hydrograph(s) based on specified breach criteria and normal reservoir outflow.

d. Routing of the failure hydrograph(s) to desired downstream locations. The results provide estimates of the peak discharge(s), time(s) to peak and maximum water surface elevation(s) of failure hydrograph(s) for each location.

HYDROLOGY AND HYDRAULIC ANALYSIS
DATA BASE

NAME OF DAM: PICKERAL POND DAM

PROBABLE MAXIMUM PRECIPITATION (PMP) = 21.5 INCHES/24 HOURS (1)

STATION	1	2	3
STATION DESCRIPTION	HEMLOCK LAKE DAM	LOWER HEMLOCK DAM	BLUE HERON LAKE DAM
DRAINAGE AREA (SQUARE MILES)	1.1	0.1	5.0
CUMULATIVE DRAINAGE AREA (SQUARE MILES)	-	1.2	6.2
ADJUSTMENT OF PMF FOR DRAINAGE AREA LOCATION (%) (1)	ZONE 1	ZONE 1	ZONE 1
6 HOURS	101	101	101
12 HOURS	114	114	114
24 HOURS	124	124	124
48 HOURS	133	133	133
72 HOURS	-	-	-
SNYDER HYDROGRAPH PARAMETERS			
ZONE (2)	1	1	1
C_p (3)	0.45	0.45	0.45
C_t (3)	1.23	1.23	1.23
L (MILES) (4)	-	-	4.5
L_{ca} (MILES) (4)	-	-	2.4
L' (MILES) (4)	0.66	0.31	-
t_p (MILES) (5)	0.96	0.61	2.51
SPILLWAY DATA			
CREST LENGTH (FEET)	47	43.5	24/38 (6)
FREEBOARD (FEET)	3.0	3.3	1.5/1.1 (6)

(1) HYDROMETEOROLOGICAL REPORT 33, U.S. ARMY CORPS OF ENGINEERS, 1956.

(2) HYDROLOGIC ZONE DEFINED BY CORPS OF ENGINEERS, BALTIMORE DISTRICT, FOR DETERMINATION OF SNYDER COEFFICIENTS (C_p AND C_t).

(3) SNYDER COEFFICIENTS

(4) L = LENGTH OF LONGEST WATERCOURSE FROM DAM TO BASIN DIVIDE
L_{ca} = LENGTH OF LONGEST WATERCOURSE FROM DAM TO POINT OPPOSITE BASIN CENTROID.
L' = LENGTH OF LONGEST WATERCOURSE FROM RESERVOIR INLET TO DRAINAGE DIVIDE.

(5) $t_p = C_t (L \cdot L_{ca})^{0.3}$ or $t_p = C_t (L')^{0.6}$

(6) SERVICE/EMERGENCY.

HYDROLOGY AND HYDRAULIC ANALYSIS
DATA BASE

NAME OF DAM: PICKERAL POND DAM

PROBABLE MAXIMUM PRECIPITATION (PMP) = 21.5 INCHES/24 HOURS (1)

STATION	4	5	6
STATION DESCRIPTION	PORTERS LAKE DAM	PECKS POND DAM	PICKERAL POND DAM
DRAINAGE AREA (SQUARE MILES)	2.7	9.2	4.9
CUMULATIVE DRAINAGE AREA (SQUARE MILES)	-	-	23.0
ADJUSTMENT OF PMF FOR DRAINAGE AREA LOCATION (%) (1)	ZONE 1	ZONE 1	ZONE 1
6 HOURS	101	101	101
12 HOURS	114	114	114
24 HOURS	124	124	124
48 HOURS	133	133	133
72 HOURS	-	-	-
SNYDER HYDROGRAPH PARAMETERS			
ZONE (2)	1	1	1
C_p (3)	0.45	0.45	0.45
C_t (3)	1.23	1.23	1.23
L (MILES) (4)	4.6	-	3.2
L_{ca} (MILES) (4)	1.8	-	1.8
L' (MILES) (4)	-	2.6	-
t_p (MILES) (5)	2.32	2.18	2.08
SPILLWAY DATA			
CREST LENGTH (FEET)	6.4	30	83/77 (6)
FREEBOARD (FEET)	1.5	2.3	6.7/6.2 (6)

(1) HYDROMETEOROLOGICAL REPORT 33, U.S. CORPS OF ENGINEERS, 1956.
(2) HYDROLOGIC ZONE DEFINED BY CORPS OF ENGINEERS, BALTIMORE DISTRICT, FOR DETERMINATION OF SNYDER COEFFICIENTS (C_p AND C_t).
(3) SNYDER COEFFICIENTS
(4) L = LENGTH OF LONGEST WATERCOURSE FROM DAM TO BASIN DIVIDE
L_{ca} = LENGTH OF LONGEST WATERCOURSE FROM DAM TO POINT OPPOSITE BASIN CENTROID.
L' = LENGTH OF LONGEST WATERCOURSE FROM RESERVOIR INLET TO DRAINAGE DIVIDE.
(5) $t_p = C_t (L \cdot L_{ca})^{0.3}$ or $t_p = C_t (L')^{0.6}$
(6) SERVICE/EMERGENCY

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-13-81 PROJ. NO. 80-238-755

CHKD. BY DLB DATE 4-28-81 SHEET NO. 1 OF 27

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DAM STATISTICS

HEIGHT OF DAM = 14 FT (FIELD MEASURED) – TOP OF DAM TO DOWNSTREAM EMBANKMENT TOE; "TOP OF DAM" HERE AND ON ALL SUBSEQUENT CALCULATION SHEETS REFERS TO THE MINIMUM ELEVATION ALONG THE EMBANKMENT CREST.)

NORMAL POOL STORAGE CAPACITY = 362 AC-FT (HEC-1)

MAXIMUM POOL STORAGE CAPACITY = 3796 AC-FT (HEC-1)
(@ TOP OF DAM)

DRAINAGE AREA:

SUB-AREA (SEE FIG. 1)	LOCAL D.A. (SQ. MI.)	CUMULATIVE D.A. (SQ. MI.)
HEMLOCK LAKE	1.1	—
LOWER HEMLOCK LAKE	0.1	1.2
BLUE HERON LAKE	5.0	6.2
PORTERS LAKE	2.7	—
PECKS POND	9.2	—
PICKERAL POND	4.9	23.0

(PLANIMETERED ON USGS TOPO QUADS: PECKS POND, TWELVEMILE POND, AND PROMISED LAND, PA)

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-13-81 PROJ. NO. 80-238-755

CHKD. BY DLB DATE 4-28-81 SHEET NO. 2 OF 27

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ELEVATIONS:

TOP OF DAM (DESIGN)		= 1318.0	(FIG. 3; SEE NOTE 1)
TOP OF DAM (FIELD)		= 1317.7	
NORMAL POOL		= 1311.0	(SEE NOTE 1)
SPILLWAY CREST:	LOWER STAGE	= 1311.0	(FIELD SURVEY)
	UPPER STAGE	= 1311.5	(FIELD SURVEY)
	LOW FLOW NOTCH	= 1309.2	(FIELD SURVEY; SEE NOTE 1)
UPSTREAM INLET INVERT (DESIGN)		= 1306.9	(FIG. 3; SEE NOTE 1)
DOWNSTREAM OUTLET INVERT (DESIGN)		= 1306.5	(FIG. 3; SEE NOTE 1)
DOWNSTREAM OUTLET INVERT (FIELD)		= 1305.6	
DOWNSTREAM EMBANKMENT TOE (FIELD)		= 1303.7	
STREAMBED @ DAM CENTERLINE		= 1305	(EST.; FIG. 3, SEE NOTE 1)

NOTE 1: THE DESIGN DRAWINGS ARE BASED ON A NORMAL POOL OR SPILLWAY CREST (LOWER STAGE) ELEVATION OF 92.5. HOWEVER, THE USGS TOPO QUAD FOR PECKS POND, PA, INDICATES THAT THE NORMAL POOL ELEVATION IS 1311. THEREFORE, IT WILL BE ASSUMED THAT THE SPILLWAY CREST (LOWER STAGE) IS AT ELEVATION 1311.0, AND 1218.5 FT (OR 1311.0 − 92.5) WILL BE ADDED TO THE ELEVATIONS GIVEN ON THE DESIGN DRAWINGS. IT IS NOTED THAT THERE ARE TWO LOW-FLOW NOTCHES CUT IN THE SPILLWAY WEIR FOR THE PURPOSE OF PROVIDING A NORMAL POOL ELEVATION SOMEWHAT LOWER THAN THE ORIGINAL NORMAL POOL (LOWER STAGE SPILLWAY CREST, ASSUMED AT EL. 1311.0). HOWEVER, SINCE THE FLOW CAPACITY OF THESE NOTCHES IS SMALL IN COMPARISON TO THAT OF THE SPILLWAY WEIR, THEIR EFFECTS HAVE BEEN NEGLECTED IN THIS ANALYSIS, AND NORMAL POOL IS ASSUMED TO BE AT THE ELEVATION OF THE "LOWER STAGE SPILLWAY CREST." IT IS ALSO NOTED THAT THE ELEVATIONS USED IN THIS ANALYSIS ARE CONSIDERED ESTIMATES, AND ARE NOT NECESSARILY ACCURATE.

DAM CLASSIFICATION

DAM SIZE:	INTERMEDIATE	(REF 1, TABLE 1)
HAZARD CLASSIFICATION:	HIGH	(FIELD OBSERVATION)
REQUIRED SDF:	PMF	(REF 1, TABLE 3)

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-13-81 PROJ. NO. 80-238-755

CHKD. BY DLB DATE 4-28-81 SHEET NO. 3 OF 27

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HYDROGRAPH PARAMETERS

$C_p = 0.45$
$C_t = 1.23$

(SUPPLIED BY C.O.E., ZONE 1, DELAWARE RIVER BASIN)

SUB-AREA (SEE FIG. 1)	L ① (MI)	L_{CA} ② (MI)	L' ③ (MI)	$t_p = C_t (L \cdot L_{CA})^{0.3}$ ④ (HRS)	$t_p = C_t (L')^{0.6}$ ③ (HRS)
HEMLOCK LAKE	—	—	0.66	—	0.96
LOWER HEMLOCK LAKE	—	—	0.31	—	0.61
BLUE HERON LAKE	4.5	2.4	—	2.51	—
POTTERS LAKE	4.6	1.8	—	2.32	—
PECKS POND	—	—	2.6	—	2.18
PICKERAL POND	3.2	1.8	—	2.08	—

① L = LENGTH OF LONGEST WATERCOURSE.

② L_{CA} = LENGTH OF LONGEST WATERCOURSE FROM DAM TO A POINT OPPOSITE BASIN CENTROID.

③ L' = LENGTH OF LONGEST WATERCOURSE FROM RESERVOIR INLET TO BASIN DIVIDE; USED IN ESTIMATION OF t_p WHEN RESERVOIR LENGTH > L_{CA} (AS PER C.O.E., BALTIMORE DISTRICT; STREAM LENGTHS MEASURED ON USGS TOPO QUADS — PECKS POND, TWELVEMILE POND, AND PROMISED LAND, PA).

④ FROM REF. 2.

(NOTE: HYDROGRAPH VARIABLES USED HERE ARE DEFINED IN REF 2, IN SECTION ENTITLED "SNYDER SYNTHETIC UNIT HYDROGRAPH.")

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-13-81 PROJ. NO. 80-238-755

CHKD. BY DLB DATE 4-28-81 SHEET NO. 4 OF 27

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RESERVOIR STORAGE CAPACITY

RESERVOIR SURFACE AREAS:

- SURFACE AREA (S.A.) @ NORMAL POOL (EL. 1311.0) = 155 ACRES

- S.A @ EL. 1320 = 785 ACRES
- S.A. @ EL. 1340 = 1280 ACRES

(PLANIMETERED ON USGS TOPO QUADS - PECKS POND, AND TWELVEMILE POND, PA; PLANIMETERED ONLY AS FAR UPSTREAM AS THE PORTERS LAKE WATERSHED BOUNDARY - SEE PORTERS LAKE ANALYSIS (SHEETS 19-21) AND NOTE 6 (SHEET 20).)

- S.A. @ TOP OF DAM (EL. 1317.7) = 624 ACRES
(BY LINEAR INTERPOLATION)

THE "ZERO-STORAGE" ELEVATION IS ASSUMED TO BE AT EL. 1304, APPROXIMATELY THE SAME ELEVATION AS THE DOWNSTREAM TOE OF THE DAM. THE ACTUAL ELEVATION OF THE BOTTOM OF THE RESERVOIR IS UNKNOWN, AND THUS THE VALUE OF 1304 IS USED, SINCE THIS IS THE MAXIMUM LIMIT TO WHICH A POTENTIAL BREACH COULD OCCUR. (THE NORMAL POOL STORAGE CAPACITY COMPRISES ONLY A SMALL PERCENTAGE OF THE MAXIMUM POOL STORAGE CAPACITY.)

ELEVATION - STORAGE RELATIONSHIP:

THE ELEVATION-STORAGE RELATIONSHIP IS COMPUTED INTERNALLY IN THE HEC-1 PROGRAM, BY USE OF THE CONIC METHOD, BASED ON THE GIVEN RESERVOIR SURFACE AREA AND ELEVATION DATA (SEE SUMMARY INPUT/OUTPUT SHEETS).

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-13-81 PROJ. NO. 80-238-755

CHKD. BY DLB DATE 4-28-81 SHEET NO. 5 OF 27

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PMP CALCULATIONS

- APPROXIMATE RAINFALL INDEX = 21.5 INCHES
  (CORRESPONDING TO A DURATION OF 24 HOURS AND A DRAINAGE AREA OF 200 SQUARE MILES.)
  (REF. 3, FIG. 1)

- DEPTH-AREA-DURATION ZONE 1 (REF 3, FIG. 1)

- DATA CORRESPONDING TO A 23-SQUARE MILE DRAINAGE AREA:

DURATION (HRS)	PERCENT OF INDEX RAINFALL
6	101
12	114
24	124
48	133

(REF. 3, FIG. 2)

HOP BROOK FACTOR (ADJUSTMENT FOR BASIN SHAPE AND FOR THE LESSER LIKELIHOOD OF A SEVERE STORM CENTERING OVER A SMALL BASIN) FOR A DRAINAGE AREA OF 23 SQUARE MILES IS 0.827.

(HEC-1)

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-14-81 PROJ. NO. 80-238-255

CHKD. BY DLB DATE 4-28-81 SHEET NO. 6 OF 27

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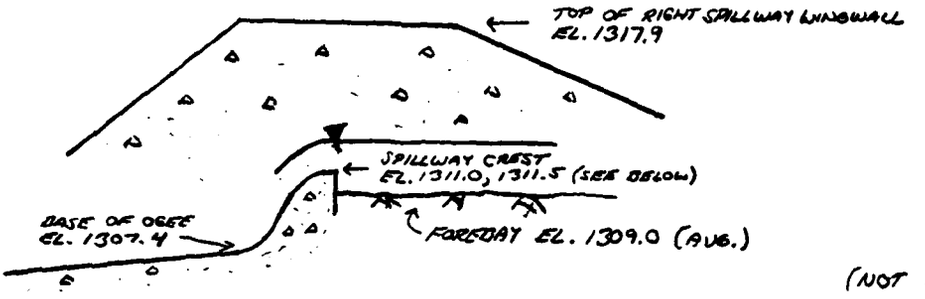
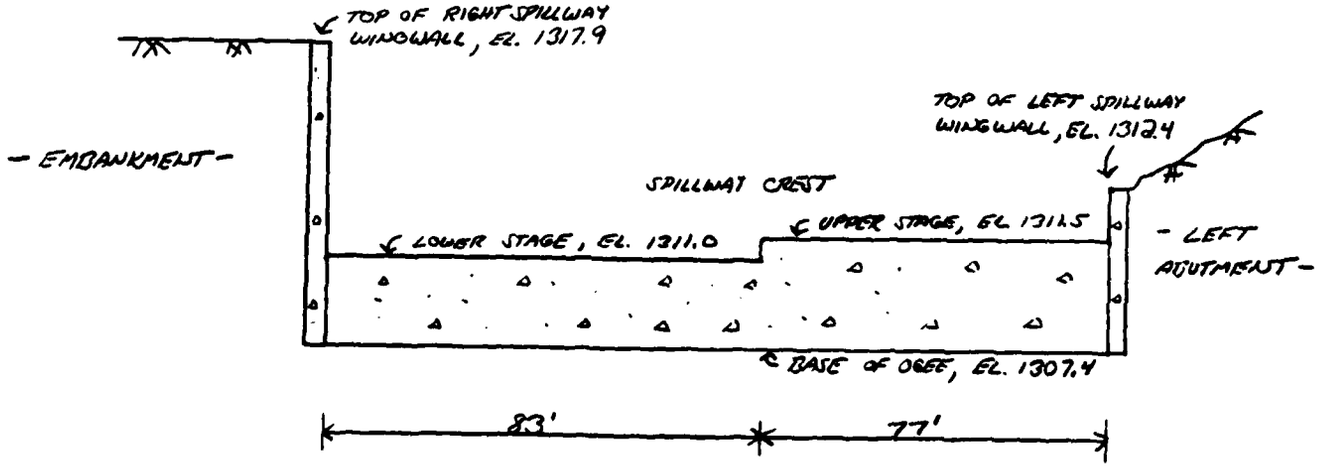
SPILLWAY CAPACITY

PROFILE:



(NOT TO SCALE)

CROSS-SECTION: - LOOKING UPSTREAM -



(NOT TO SCALE)

- SKETCHES BASED ON FIELD SURVEY AND DESIGN DRAWINGS.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-14-81 PROJ. NO. 80-238-755

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THE SPILLWAY CONSISTS OF AN UNCONTROLLED RECTANGULAR-SHAPED CONCRETE CHANNEL, WITH DISCHARGES REGULATED BY A TWO-STAGE CONCRETE OGEE-TYPE WEIR, AS SHOWN ON SHEET 6 (SEE NOTES 1 & 2). DISCHARGE OVER THE WEIR CAN BE ESTIMATED BY THE EQUATION

$$Q = CLH^{3/2} \qquad \text{(REF 4, p. 373)}$$

WHERE Q = DISCHARGE, IN CFS,
C = COEFFICIENT OF DISCHARGE,
L = LENGTH OF WEIR CREST,
H = TOTAL HEAD ON CREST, IN FT.

THE DESIGN HEAD, H_o, IS ASSUMED TO BE 6.9 FT (ABOVE THE LOWER STAGE), OR TO THE TOP OF THE RIGHT SPILLWAY WINGWALL. IT IS ASSUMED THAT THE RELATIONSHIPS IN REF. 4, pp. 372-382, CAN BE APPLIED TO THIS OGEE-LIKE WEIR. FOR AN AVERAGE FOREBAY DEPTH OF ABOUT 20 FT,

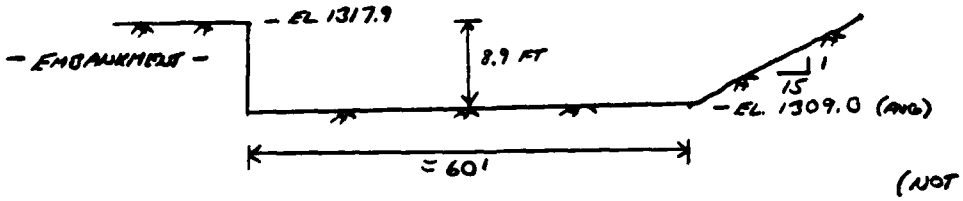
$$\frac{P}{H_o} = \frac{20}{6.9} = 0.29$$

$$\therefore C_o = 3.68 \qquad \text{(REF 4, FIG. 249, p. 378)}$$

APPROACH CHANNEL LOSSES @ DESIGN HEAD DISCHARGE:

- APPROXIMATION OF AVERAGE CROSS-SECTION OF APPROACH CHANNEL:
(FROM FIELD NOTES AND FIG. 3)

(LOOKING UPSTREAM)



(NOT TO SCALE)

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-14-81 PROJ. NO. 80-238-755

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APPROACH CHANNEL LENGTH (AVG) = 90 FT (FIG 3)

AT ELEV. 1317.9 (ASSUMED DESIGN HEAD),

$$\text{FLOW AREA} = (8.9)(60) + \left(\tfrac{1}{2}\right)(8.9)(8.9)(15)$$
$$= 1128 \text{ FT}^2$$

INITIAL ESTIMATE OF DISCHARGE: (SEE NOTE 2)

$$Q = CLH^{3/2}$$
$$= (3.68)(83)(6.9)^{3/2} + (3.68)(77)(6.4)^{3/2}$$
$$= 10{,}124 \text{ CFS}$$

AVERAGE VELOCITY IN APPROACH CHANNEL:

$$V_A = Q/A = \frac{10{,}124}{1128} = 9.0 \text{ FT/SEC}$$

AVERAGE APPROACH VELOCITY HEAD:

$$h_A = \frac{V_A^2}{2g} = \frac{(9.0)^2}{64.4} = 1.26 \text{ FT}$$

ASSUMING THAT THE APPROACH CHANNEL ENTRANCE LOSS = $0.1\, h_A$ (REF 4, p. 379)

h_e = ENTRANCE LOSS = $(0.1)(1.26) = 0.13$ FT.

APPROACH CHANNEL FRICTION LOSS, h_F:

$$h_F = \left[\frac{V_a n}{(1.486) R^{2/3}}\right]^2 \times L_c$$ (REF 4, p. 379)

NOTE 2: THE SPILLWAY CAPACITY IS ESTIMATED BASED ON THE ASSUMPTION THAT THE LOW FLOW NOTCHES IN THE WEIR CAN BE NEGLECTED, AND THAT THE TREES AND BRUSH ARE CLEARED FROM THE LEFT-SIDE PORTION OF THE APPROACH CHANNEL (SEE PHOTO 5).

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WHERE L_c = LENGTH OF APPROACH CHANNEL = 90 FT (AVG),
n = MANNING'S ROUGHNESS COEFFICIENT = 0.050
(TREES AND BRUSH REMOVED)
R = HYDRAULIC RADIUS = FLOW AREA / WETTED PERIMETER.

P_w = WETTED PERIMETER = $8.9 + 60 + (15.0)(8.9) = 203$ FT

$R = A/P = \frac{1128}{203} = 5.6$ FT

$h_F = \left[\frac{(9.0)(0.050)}{(1.486)(5.6)^{2/3}}\right]^2 \times 90 = 0.83$ FT

∴ TOTAL APPROACH LOSS = $h_E + h_F$
$= 0.13 + 0.83 = 0.96$ FT

ACTUAL EFFECTIVE HEAD = $6.9 - 0.96 = 5.94$ FT

$\frac{P}{H_o} = \frac{2}{5.94} = 0.34$; ∴ $C_o = 3.72$

SPILLWAY CAPACITY @ DESIGN HEAD = $3.72\left[(83)(5.94)^{3/2} + (77)(5.44)^{3/2}\right] = 8104$ CFS

FOR HEADS OTHER THAN DESIGN HEAD, THE APPROACH CHANNEL LOSSES WILL BE ASSUMED TO BE PROPORTIONAL TO THE LOSSES AT DESIGN HEAD:

$$h_L = \left(\frac{0.96}{6.9}\right) H$$

WHERE h_L = TOTAL APPROACH CHANNEL LOSS, IN FT,
AND H = RESERVOIR ELEVATION − 1311.0 FT.

EFFECTS OF HEAD OTHER THAN DESIGN HEAD:

AS THE HEAD ON THE WEIR BECOMES SMALL, DISCHARGE IS REDUCED DISPROPORTIONATELY, DUE TO THE ROUGHNESS AND THE CONTRACT

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PRESSURE BETWEEN THE WATER AND THE WEIR SURFACE. THUS, THE DISCHARGE COEFFICIENT (C) TAKES ON A LOWER VALUE THAN THAT OF DESIGN HEAD. THE OPPOSITE TREND OCCURS FOR HEADS GREATER THAN THAT OF DESIGN. THEREFORE, THE DESIGN DISCHARGE COEFFICIENT WILL BE MODIFIED APPROPRIATELY, ACCORDING TO FIG. 250, REF. 4.

FINALLY, IT WAS ASSUMED THAT THERE WAS NO TAILWATER INTERFERENCE AT THE WEIR.

SPILLWAY RATING CURVE: (SEE NOTE 2, SHEET 8)

	RESERVOIR ELEVATION (FT)	H (FT)	h_L ① (FT)	He ② (FT)	H_e/H_o ③	C/C_o ④	C ⑤	Q ⑥ (CFS)
	1311.0	0	—	—	—	—	—	0
	1311.5	0.5	0.07	0.43	0.07	0.81	3.01	70
	1312.0	1.0	0.14	0.86	0.14	0.84	3.12	260
	1313.0	2.0	0.28	1.72	0.29	0.88	3.27	950
	1314.0	3.0	0.42	2.58	0.43	0.91	3.39	1950
	1315.0	4.0	0.56	3.44	0.58	0.94	3.50	3210
	1316.0	5.0	0.70	4.30	0.72	0.96	3.57	4680
	1317.0	6.0	0.83	5.17	0.87	0.98	3.65	6400
(TOP OF DAM)	1317.7	6.7	0.93	5.77	0.97	1.00	3.72	7740
(TOP OF UNDERWALL)	1317.9	6.9	0.96	5.94	1.00	1.00	3.72	8100
	1318.5	7.5	1.04	6.46	1.09	1.01	3.76	9340
	1319.0	8.0	1.11	6.89	1.16	1.02	3.79	10,400
	1320.0	9.0	1.25	7.75	1.30	1.04	3.87	12,750
	1321.0	10.0	1.39	8.61	1.45	1.05	3.91	15,150
	1322.0	11.0	1.53	9.47	1.59	1.07	3.98	17,860
	1323.0	12.0	1.67	10.33	1.74	1.07	3.98	20,410
	1324.0	13.0	1.81	11.19	1.88	1.07	3.98	23,080
	1325.0	14.0	1.95	12.05	2.03	1.07	3.98	25,850

① $h_L = \left(\frac{0.96}{6.9}\right) H$ (SEE SHEET 9)

② $He = H - h_L$

③ $H_o = 5.94$

④ FROM REF 4, FIG. 250, p. 378.

⑤ $C_o = 3.72$; $C = 3.72 \times C/C_o$

⑥ $Q = C\left[(83)(He)^{3/2} + (77)(He - 0.5)^{3/2}\right]$; ROUNDED TO NEAREST 10 CFS

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-15-81 PROJ. NO. 80-238-755

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EMBANKMENT RATING TABLE

ASSUME THAT THE EMBANKMENT BEHAVES ESSENTIALLY AS A BROAD-CRESTED WEIR WHEN OVERTOPPING OCCURS. THUS, THE DISCHARGE CAN BE ESTIMATED BY THE RELATIONSHIP

$$Q = CLH^{3/2} \qquad \text{(REF 5, p. 5-23)}$$

WHERE Q = DISCHARGE OVER EMBANKMENT, IN CFS,
L = LENGTH OF EMBANKMENT OVERTOPPED, IN FT,
H = HEAD, IN FT; IN THIS CASE IT IS THE AVERAGE "FLOW AREA WEIGHTED HEAD" ABOVE THE TOP OF THE DAM; AND
C = COEFFICIENT OF DISCHARGE, DEPENDENT UPON THE HEAD AND THE WEIR BREADTH.

LENGTH OF EMBANKMENT INUNDATED VS. RESERVOIR ELEVATION:

RESERVOIR ELEVATION (FT)	EMBANKMENT LENGTH (FT)
1317.7	0
1317.8	75
1317.9	180
1318.2	180
1318.5	185
1319.0	190
1320.0	195
1321.0	225
1322.0	255
1323.0	285
1324.0	315
1325.0	345

(FROM FIELD SURVEY AND USGS TOPO QUAD - PECKS POND, PA, AND FIG. 3)

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

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ASSUME THAT INCREMENTAL DISCHARGES OVER THE EMBANKMENT FOR SUCCESSIVE RESERVOIR ELEVATIONS ARE APPROXIMATELY TRAPEZOIDAL IN CROSS-SECTIONAL FLOW AREA. THEN ANY INCREMENTAL AREA OF FLOW CAN BE ESTIMATED AS $H_i [(L_1+L_2)/2]$, WHERE L_1 = LENGTH OF EMBANKMENT OVERTOPPED AT HIGHER ELEVATION, L_2 = LENGTH AT LOWER ELEVATION, H_i = DIFFERENCE IN ELEVATIONS. THUS, THE TOTAL AVERAGE "FLOW AREA WEIGHTED HEAD" CAN BE ESTIMATED AS

H_w = (TOTAL FLOW AREA / L_1).

EMBANKMENT RATING TABLE:

RESERVOIR ELEVATION (FT)	L_1 (FT)	L_2 (FT)	INCREMENTAL HEAD, H_i (FT)	INCREMENTAL FLOW AREA, A_i (FT²) ①	TOTAL FLOW AREA, A_T (FT²)	WEIGHTED HEAD, H_w (FT) ②	H_w/l ③	C ④	Q (CFS) ⑤
1317.7	0	—	—	—	—	—	—	—	0
1317.8	75	0	0.1	4	4	0.05	0.005	2.90	0
1317.9	180	75	0.1	13	17	0.09	0.01	2.93	10
1318.2	180	180	0.3	54	71	0.39	0.04	3.01	130
1318.5	185	180	0.3	55	126	0.68	0.06	3.03	310
1319.0	190	185	0.5	94	220	1.2	0.11	3.04	760
1320.0	195	190	1.0	193	413	2.1	0.20	3.07	1820
1321.0	225	195	1.0	210	623	2.8	0.27	3.09	3260
1322.0	255	225	1.0	240	863	3.4	0.32	3.09	4940
1323.0	285	255	1.0	270	1133	4.0	0.38	3.09	7050
1324.0	315	285	1.0	300	1433	4.5	0.43	3.09	9290
1325.0	345	315	1.0	330	1763	5.1	0.49	3.09	12,280

① $A_i = H_i [(L_1+L_2)/2]$

② $H_w = A_T / L_1$

③ l = BREADTH OF CREST = 10.5 FT (FIELD MEASURED)

④ $C = P(H, l)$; FROM REF. 12, FIG. 24.

⑤ $Q = CL_1 H_w^{3/2}$ (ROUNDED TO NEAREST 10 CFS)

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PICKERAL POND DAM

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TOTAL FACILITY RATING TABLE

$Q_{TOTAL} = Q_{SPILLWAY} + Q_{EMBANKMENT}$

	RESERVOIR ELEVATION (FT)	① $Q_{SPILLWAY}$ (CFS)	② $Q_{EMBANKMENT}$ (CFS)	Q_{TOTAL} (CFS)
(NORMAL POOL)	1311.0	0	—	0
	1311.5	70	—	70
	1312.0	260	—	260
	1313.0	950	—	950
	1314.0	1950	—	1950
	1315.0	3210	—	3210
	1316.0	4680	—	4680
	1317.0	6400	—	6400
(TOP OF DAM)	1317.7	7740	0	7740
	1317.9	8100	10	8110
	1318.2	8720 *	130	8850
	1318.5	9340	310	9650
	1319.0	10,400	760	11,160
	1320.0	12,750	1820	14,570
	1321.0	15,150	3260	18,410
	1322.0	17,860	4940	22,800
	1323.0	20,410	7050	27,460
	1324.0	23,080	9290	32,370
	1325.0	25,850	12,280	38,130

* - BY LINEAR INTERPOLATION.

① FROM SHEET 10.
② FROM SHEET 12.

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PICKERAL POND DAM

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UPSTREAM DAMS

1) HEMLOCK LAKE DAM:

- DAM STATISTICS:
  - HEIGHT OF DAM = 14 FT (SEE NOTE 3)
  - ELEVATION OF NORMAL POOL = 1439.0 "
  - ELEVATION OF TOP OF DAM = 1442.0 "
- PMP DATA - SEE SHEET 5.
- RESERVOIR STORAGE CAPACITY: (SEE NOTE 3)

ELEV (FT)	STORAGE (AC-FT)
1438.0	0
(NORMAL POOL) 1439.0	918
1440.0	1044
1460.0	4594

- SPILLWAY / EMBANKMENT RATING TABLES:

THE SPILLWAY RATING TABLE AND EMBANKMENT RATING TABLE ARE COMPUTED INTERNALLY IN THE HEC-1 PROGRAM, BASED ON THE WEIR EQUATION (SHEETS 7, 11) AND ON THE FOLLOWING INPUT DATA: (SEE NOTE 3)

SPILLWAY: $C = 3.3$; $L = 47$ FT; CREST @ EL. 1439.0.
EMBANKMENT: $C = 2.6$; $L = 450$ FT; CREST @ EL. 1442.0.

NOTE 3: OBTAINED FROM PHASE I INSPECTION REPORT, NATIONAL DAM INSPECTION PROGRAM - HEMLOCK LAKE DAM, NDI-PA 00399, PA DER 52-71, PREPARED BY O'BRIEN AND GERE, MAY, 1979.

SUBJECT DAM SAFETY INSPECTION
PICKEREL POND DAM

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2) LOWER HEMLOCK DAM:

- DAM STATISTICS:

  - HEIGHT OF DAM = 15 FT (SEE NOTE 4)
  - ELEVATION OF NORMAL POOL = 1432.0 "
  - ELEVATION OF TOP OF DAM = 1435.3 "

- PMP DATA - SEE SHEET 5.

- RESERVOIR STORAGE CAPACITY:

  THE ELEVATION-STORAGE RELATIONSHIP IS COMPUTED INTERNALLY IN THE HEC-1 PROGRAM, BASED ON THE FOLLOWING DATA: (SEE NOTE 4)

ELEV. (FT)	SURFACE AREA (ACRES)
1392.1	0
1432.0	23.1
1440.0	39.7

- FACILITY RATING TABLE: (SEE NOTE 4)

ELEV. (FT)	OUTFLOW (CFS)		ELEV. (FT)	OUTFLOW (CFS)
1432.0	0		1435.0	877
1432.5	60	(TOP OF DAM)	1435.3	1012
1433.0	169		1436.0	1441
1433.5	310		1436.5	1896
1434.0	477		1437.0	2471
1434.5	667		1438.0	3992

NOTE 4: OBTAINED FROM PHASE I INSPECTION REPORT, NATIONAL DAM INSPECTION PROGRAM - LOWER HEMLOCK DAM, NDI-PA 00756, PA DER NO. 52-117, PREPARED BY BERGER ASSOCIATES, INC., JUNE 1980.

SUBJECT DAM SAFETY INSPECTION
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3) BLUE HERON LAKE DAM:

- DAM STATISTICS:

  - HEIGHT OF DAM = 11 FT (FIELD MEASURED)
  - ELEVATION OF NORMAL POOL = 1337.0 (USGS TOPO - PECKS POND, PA)
  - ELEVATION OF TOP OF DAM = 1338.5 (FIELD MEASURED)

- PMP DATA: SEE SHEET 5.

- RESERVOIR STORAGE CAPACITY:

  S.A. @ NORMAL POOL = 90 ACRES
  S.A. @ EL. 1340 = 110 ACRES
  S.A. @ EL. 1360 = 380 ACRES
  (PLANIMETERED ON USGS TOPO QUAD - PECKS POND, PA)

  S.A. @ TOP OF DAM (EL. 1338.5) = 100 ACRES
  (BY LINEAR INTERPOLATION)

  VOLUME AT NORMAL POOL = 65×10^6 GALLONS
  = 200 AC-FT (SEE NOTE 5)

  VOLUME AT NORMAL POOL = $\frac{1}{3} HA$ = 200 AC-FT (CONIC METHOD)

  WHERE H = MAXIMUM RESERVOIR DEPTH @ NORMAL POOL,
  A = SURFACE AREA @ NORMAL POOL = 90 ACRES

  $\therefore H = \frac{(3)(200)}{(90)} = 6.7$ FT

  $\therefore$ ZERO STORAGE ASSUMED AT 1337.0 - 6.7 = 1330.3

NOTE 5: OBTAINED FROM "DAMS, RESERVOIRS, AND NATURAL LAKES", WATER RESOURCES BULLETIN NO. 5, COMMONWEALTH OF PENNSYLVANIA, DEPARTMENT OF FORESTS AND WATER, HARRISBURG, PA, 1970. (BLUE HERON LAKE DAM IS REFERRED TO AS DORYS DAM, PA DER NO. 52-9, IN THIS PUBLICATION.)

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

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BLUE HERON LAKE DAM:

THE ELEVATION-STORAGE RELATIONSHIP IS COMPUTED INTERNALLY IN THE HEC-1 PROGRAM, BASED ON THE SURFACE AREA-ELEVATION DATA GIVEN ON SHEET 16. ALTHOUGH THE MINIMUM RESERVOIR ELEVATION DOES NOT NECESSARILY OCCUR AT EL. 1330.3, THIS VALUE MUST BE USED IN THE HEC-1 INPUT IN ORDER TO MAINTAIN A NORMAL POOL STORAGE OF 200 AC-FT.

SPILLWAY CAPACITY:

THE "SERVICE SPILLWAY" CONSISTS OF A CONCRETE OGEE-TYPE WEIR, WITH AN EFFECTIVE CREST LENGTH OF 24 FT, AND A FREEBOARD OF 1.5 FT TO THE TOP OF THE DAM (THE FLASHBOARDS, IN PLACE ON THE DATE OF INSPECTION, WERE ASSUMED TO BE REMOVED IN THIS ANALYSIS.)

THE "EMERGENCY SPILLWAY" ALSO CONSISTS OF A CONCRETE OGEE-TYPE WEIR, WITH AN EFFECTIVE CREST LENGTH OF 38 FT, AND A FREEBOARD OF 1.1 FT TO THE TOP OF THE DAM (i.e. CREST IS AT 1338.5 - 1.1 = 1337.4).

DISCHARGE OVER EACH WEIR IS ESTIMATED BY THE WEIR EQUATION

$$Q = CLH^{3/2}$$ (SEE SHEET 7).

THE DISCHARGE COEFFICIENT (C) IS ASSUMED TO BE ON THE ORDER OF 3.6 (REF 4). THE TOTAL RATING TABLE FOR THE COMBINED OUTFLOWS OF THE SERVICE AND EMERGENCY SPILLWAYS IS PROVIDED ON SHEET 18.

SUBJECT DAM SAFETY INSPECTION
PISKERAL POND DAM

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BLUE HERON LAKE DAM:

TOTAL SPILLWAY RATING TABLE:

	ELEVATION (FT)	H_S ① (FT)	H_E ② (FT)	Q_{TOTAL} ③ (CFS)
(NORMAL POOL)	1337.0	0	–	0
	1337.4	0.4	0	20
	1338.0	1.0	0.6	150
(TOP OF DAM)	1338.5	1.5	1.1	320
	1339.0	2.0	1.6	520
	1340.0	3.0	2.6	1020
	1341.0	4.0	3.6	1630
	1342.0	5.0	4.6	2320
	1343.0	6.0	5.6	3080
	1344.0	7.0	6.6	3920
	1345.0	8.0	7.6	4820

① H_S = RESERVOIR ELEVATION − 1337.0

② H_E = RESERVOIR ELEVATION − 1337.4

③ $Q = C\left[L_S H_S^{3/2} + L_E H_E^{3/2}\right] = 3.6\left[(24)H_S^{3/2} + (38)H_E^{3/2}\right]$

(ROUNDED TO NEAREST 10 CFS)

EMBANKMENT RATING TABLE:

DISCHARGE OVER THE EMBANKMENT WILL BE COMPUTED INTERNALLY IN THE HEC-1 PROGRAM, WITH THE ASSUMPTION THAT CRITICAL DEPTH OCCURS ON THE CREST, AND WITH THE CREST PROFILE REPRESENTED BY A SERIES OF TRAPEZOIDS.

INPUT DATA:

CREST LENGTH:	90	500	500 (ASSUMED)
AT OR BELOW ELEVATION:	1338.5	1340.0	1345.0

(BASED ON FIELD NOTES AND USGS TOPO - PECKS POND, PA)

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DDS DATE 4-16-81 PROJ. NO. 80-238-755

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4) PORTERS LAKE DAM:

- DAM STATISTICS:

  - HEIGHT OF DAM = 4 FT (FIELD MEASURED)
  - NORMAL POOL ELEVATION = 1315.0 (USGS TOPO - PECKS POND, PA)
  - ELEVATION OF TOP OF DAM = 1316.5 (FIELD SURVEY)

- PMP DATA: SEE SHEET 5.

- RESERVOIR STORAGE CAPACITY:

  S.A. @ NORMAL POOL (EL. 1315.0) = 235 ACRES
  S.A. @ EL. 1320 = 310 ACRES
  S.A. @ EL. 1340 = 570 ACRES (PLANIMETERED ON USGS TOPO QUADS - PECKS POND AND TWELVEMILE POND, PA)

  S.A. @ TOP OF DAM (EL. 1316.5) = 258 ACRES (BY LINEAR INTERPOLATION)

  VOLUME @ NORMAL POOL = 623×10^6 GALLONS
  = 1900 AC-FT (SEE NOTE 5, SHEET 16)

  VOLUME @ NORMAL POOL = $\frac{1}{3}HA$ = 1900 AC-FT (CONIC METHOD)

  WHERE H = MAXIMUM DEPTH OF RESERVOIR @ NORMAL POOL,
  A = SURFACE AREA @ NORMAL POOL = 235 ACRES.

  $\therefore H = \frac{(3)(1900)}{(235)} = 24.3$ FT

  $\therefore$ ZERO STORAGE ASSUMED AT 1315.0 - 24.3 = 1290.7 FT.

THE ELEVATION - STORAGE RELATIONSHIP IS COMPUTED INTERNALLY IN THE HEC-1 PROGRAM, BASED ON THE ABOVE DATA. (SEE SUMMARY INPUT / OUTPUT SHEETS.)

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-17-81 PROJ. NO. 80-238-755

CHKD. BY DLB DATE 4-28-81 SHEET NO. 20 OF 27

gai CONSULTANTS, INC.
Engineers • Geologists • Planners
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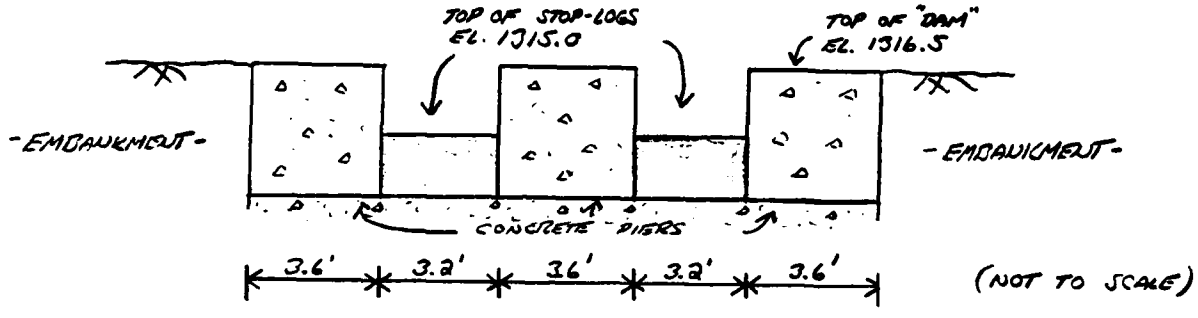
PORTERS LAKE DAM:

SPILLWAY CAPACITY:

THE "SPILLWAY" AT PORTERS LAKE DAM CONSISTS OF WOODEN STOP-LOGS SET BETWEEN CONCRETE PIERS AT THE OUTLET OF WHAT IS ESSENTIALLY A NATURAL LAKE (SEE SKETCH BELOW):



(NOT TO SCALE)

-BASED ON FIELD MEASUREMENTS.

THE SPILLWAY RATING TABLE IS COMPUTED INTERNALLY IN THE HEC-1 PROGRAM, BASED ON THE WEIR EQUATION (SHEET 7), AND ON THE FOLLOWING INPUT DATA:

- $L_{TOTAL} = 3.2 + 3.2 = 6.4$ FT
- ASSUME C IS ON THE ORDER OF 3.3 (SHARP-CRESTED WEIR, REF 5)
- CREST @ EL. 1315.0 (ASSUME STOP-LOGS KEPT IN PLACE)

NOTE 6: ALTHOUGH THERE WOULD MOST LIKELY BE TAILWATER EFFECTS FROM PICKERAL POND IMMEDIATELY DOWNSTREAM, AND POSSIBLY COMPLETE SUBMERGENCE OF THE DAM UNDER PMF-MAGNITUDE FLOWS, THESE EFFECTS WILL BE NEGLECTED HERE, A CONSERVATIVE ASSUMPTION WITH RESPECT TO THE PICKERAL POND DAM ANALYSIS.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 4-17-81 PROJ. NO. 80-238-755
CHKD. BY DLB DATE 4-28-81 SHEET NO. 21 OF 27

GAI CONSULTANTS, INC.
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PORTERS LAKE DAM:

- EMBANKMENT RATING TABLE:

DISCHARGE OVER THE EMBANKMENT WILL BE COMPUTED INTERNALLY IN THE HEC-1 PROGRAM, BASED ON THE ASSUMPTION THAT CRITICAL DEPTH OCCURS ON THE CREST, AND WITH THE CREST PROFILE REPRESENTED BY A SERIES OF TRAPEZOIDS. (SEE NOTE 6, SHEET 20)

INPUT DATA:

CREST LENGTH :	80	1400	1400 (ASSUMED)
AT OR BELOW ELEVATION:	1316.5	1320.0	1325.0

(BASED ON FIELD NOTES AND USGS TOPO - PECKS POND AND TWELVEMILE POND, PA)

5) PECKS POND DAM

- DAM STATISTICS:

- HEIGHT OF DAM = 7 FT (SEE NOTE 7)
- ELEVATION OF NORMAL POOL = 1360.0 "
- ELEVATION OF TOP OF DAM = 1362.3 "
- PMP DATA: SEE SHEET 5.

NOTE 7: OBTAINED FROM PHASE I INSPECTION REPORT, NATIONAL DAM INSPECTION PROGRAM - PECKS POND DAM, NDI No. PA-00754, PENN DER I.D. No. 52-15, PREPARED BY GAI CONSULTANTS, INC., JANUARY 1981.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DTS DATE 4-17-81 PROJ. NO. 80-238-755

CHKD. BY DLS DATE 4-28-81 SHEET NO. 22 OF 27

gai CONSULTANTS, INC.
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PECKS POND DAM

- RESERVOIR STORAGE CAPACITY:

THE ELEVATION-STORAGE RELATIONSHIP IS COMPUTED INTERNALLY IN THE HEC-1 PROGRAM, BASED ON THE FOLLOWING DATA: (SEE NOTE 7)

	ELEV. (FT)	SURFACE AREA (ACRES)
	1351.1	0
	1359.2	300
(NORMAL POOL)	1360.0	420
(TOP OF DAM)	1362.3	491
	1380.0	1040

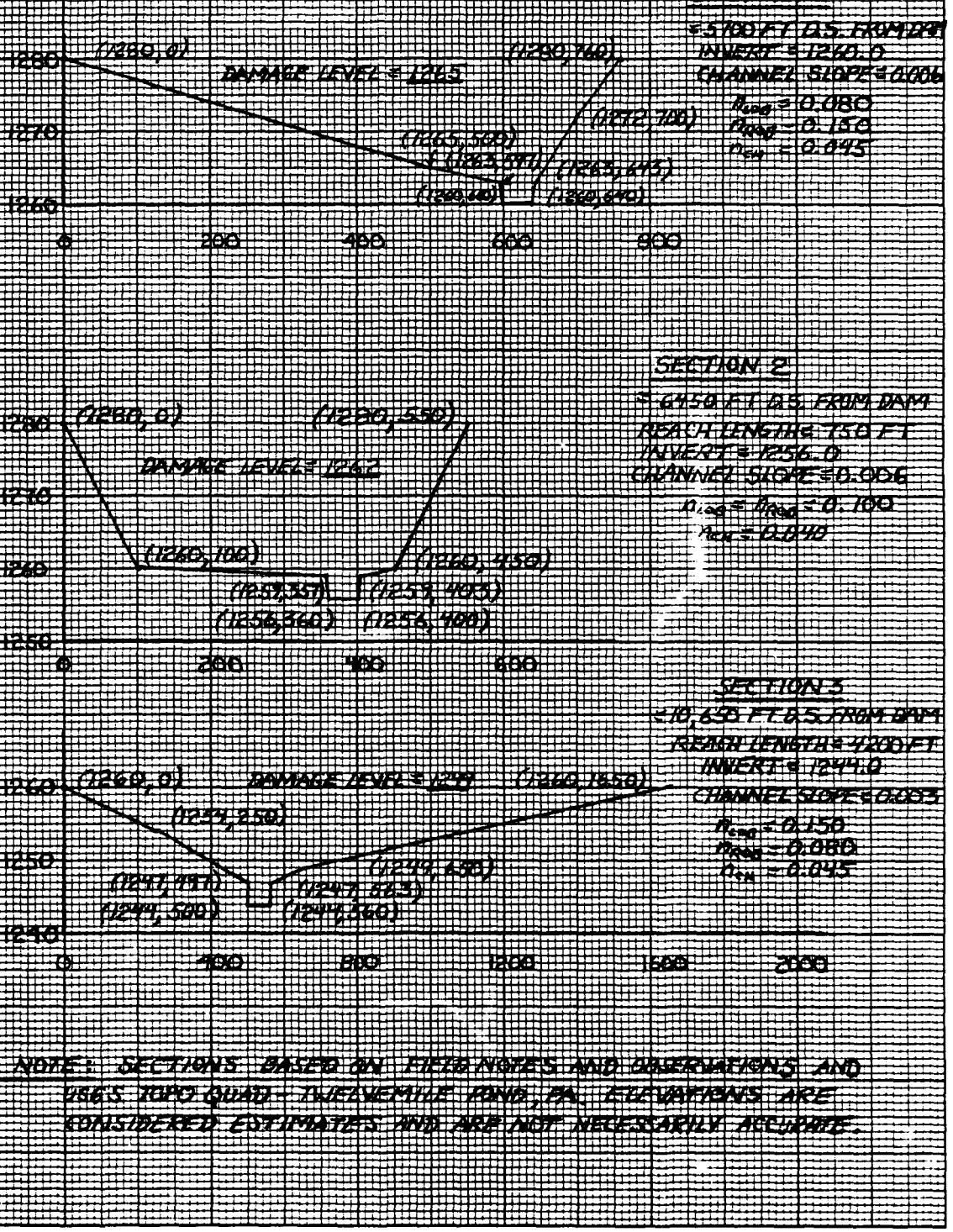
- FACILITY RATING TABLE: (SEE NOTE 7)

	ELEV (FT)	OUTFLOW (CFS)	ELEV (FT)	OUTFLOW (CFS)
	1360.0	0	1362.6	590
	1360.5	30	1362.7	710
	1361.0	100	1363.0	1200
	1361.5	200	1363.5	2290
	1362.0	320	1364.0	3810
(TOP OF DAM)	1362.3	420	1365.0	7650
	1362.4	460	1366.0	12,410
	1362.5	530	1367.0	18,130

46 1242
K&E 20 X 20 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

PICKERAL POND DAM

DOWNSTREAM ROUTING SECTIONS



NOTE: SECTIONS BASED ON FIELD NOTES AND OBSERVATIONS AND USGS TOPO QUAD - TWELVEMILE POND, PA. ELEVATIONS ARE CONSIDERED ESTIMATES AND ARE NOT NECESSARILY ACCURATE.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY TDS DATE 5-1-81 PROJ. NO. 80-238-755

CHKD. BY DLB DATE 5-4-81 SHEET NO. 24 OF 27

GAI CONSULTANTS, INC.
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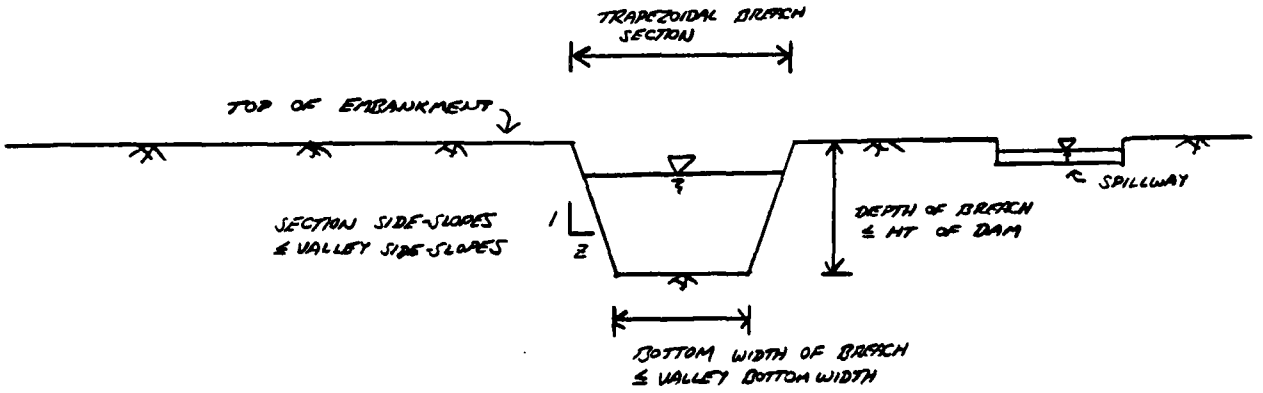
BREACH ASSUMPTIONS

TYPICAL BREACH SECTION:



HEC-1 DAM BREACHING ANALYSIS INPUT:

(BREACHING ASSUMED TO COMMENCE WHEN RESERVOIR LEVEL REACHES ELEVATION OF LOW AREA ALONG EMBANKMENT CREST)

PLAN	BREACH BOTTOM WIDTH (FT)	MAX. BREACH DEPTH (FT)	SECTION SIDE-SLOPES	BREACH TIME (HRS)
① MIN. BREACH SECTION MIN. FAIL TIME	0	14	1H:1V	0.5
② MAX. BREACH SECTION MIN. FAIL TIME	100	14	2.5:1	0.5
③ MIN. BREACH SECTION MAX. FAIL TIME	0	14	1:1	4.0
④ MAX. BREACH SECTION MAX. FAIL TIME	100	14	2.5:1	4.0
⑤ AVERAGE POSSIBLE CONDITIONS	40	14	1:1	1.0

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY _____ DATE _____ PROJ. NO. 80-238-755

CHKD. BY DLB DATE 5-4-81 SHEET NO. 25 OF 27

CONSULTANTS, INC.
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THE BREACH ASSUMPTIONS LISTED ON THE PRECEDING SHEET ARE BASED ON THE SUGGESTED RANGES PROVIDED BY THE C.O.E. (BALTIMORE DISTRICT), AND ON THE PHYSICAL CONSTRAINTS OF THE DAM AND SURROUNDING TERRAIN:

- DEPTH OF BREACH OPENING = 14 FT (HEIGHT OF DAM – SEE SHEET 1)
- LENGTH OF BREACHABLE EMBANKMENT = 175 FT (FIELD MEASURED)
- VALLEY BOTTOM WIDTH = 250 – 300 FT (FIELD OBSERVATION; INCLUDES SPILLWAY)
- VALLEY SIDE-SLOPES ADJACENT TO DAM:
  - RT. ABUTMENT: = 7H : 1V (FIG. 3)
  - LT. ABUTMENT: = 5H : 1V "

SUBJECT DAM SAFETY INSPECTION — PICKERAL POND DAM

BY JJS DATE 5-5-81 PROJ. NO. 80-238-755

CHKD. BY DLB DATE 5-11-81 SHEET NO. 26 OF 27

JCI CONSULTANTS, INC.
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HEC-1 DAM BREACHING ANALYSIS OUTPUT SUMMARY:

RESERVOIR DATA: (UNDER 0.42 PMF CONDITIONS)

PLAN*	VARIABLE BREACH BOTTOM WIDTH (FT)	ACTUAL MAX. FLOW DURING FAIL TIME (CFS)	CORRESPONDING TIME OF PEAK (HRS)	INTERPOLATED OR HEC-1 ROUTED MAX. FLOW DURING FAIL TIME (CFS)	CORRESPONDING TIME OF PEAK (HRS)	ACTUAL PEAK FLOW THROUGH DAM (CFS)	CORRESPONDING TIME OF PEAK (HRS)	TIME OF INITIAL BREACH (HRS)
①	0	9713	45.50	9713	45.50	9713	45.50	45.00
②	100	26,220	45.50	26,220	45.50	26,220	45.50	45.00
③	0	8579	48.58	8579	48.58	8579	48.50	45.00
④	100	15,274	48.67	15,274	48.67	15,274	48.67	45.00
⑤	40	15,300	46.00	15,300	46.00	15,300	46.00	45.00

* - SEE SHEET 24.

(THE NON-BREACH 0.42 PMF PEAK OUTFLOW ≈ 8253 CFS)

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 5-5-81 PROJ. NO. 80-238-255

CHKD. BY DLG DATE 5-11-81 SHEET NO. 27 OF 27

CONSULTANTS, INC.
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DOWNSTREAM ROUTING DATA:

(UNDER 0.42 PMF BASE FLOW CONDITIONS)

PLAN *	PEAK FLOW (CFS)	CORRESPONDING WATER SURFACE ELEVATION (FT)	WATER SURFACE ELEVATION W/O BREACH (FT)	ELEVATION DIFFERENCE (FT)	ESTIMATED DAMAGE ELEVATION (FT)
OUTPUT @ SECTION 1:					
①	9593	1270.3	1269.7	+0.6	
②	22,882	1274.5	1269.7	+4.8	
③	8577	1269.8	1269.7	+0.1	1265
④	15,225	1272.4	1269.7	+2.7	
⑤	14,412	1272.1	1269.7	+2.4	
OUTPUT @ SECTION 2:					
①	9595	1264.5	1264.0	+0.5	
②	22,894	1268.6	1264.0	+4.6	
③	8576	1264.1	1264.0	+0.1	1262
④	15,226	1266.4	1264.0	+2.4	
⑤	14,414	1266.2	1264.0	+2.2	
OUTPUT @ SECTION 3:					
①	9481	1253.8	1253.3	+0.5	
②	20,916	1256.9	1253.3	+3.6	
③	8568	1253.5	1253.3	+0.2	1249
④	15,070	1255.5	1253.3	+2.2	
⑤	13,796	1255.2	1253.3	+1.9	

* - SEE SHEET 24.

DAM SAFETY INSPECTION
PICKERAL POND DAM ** OVERTOPPING ANALYSIS ** (U.S. DAMS INCLUDED)
10-MINUTE TIME STEP AND 48-HOUR STORM DURATION

JOB SPECIFICATION

NO	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
300	0	10	0	0	0	0	0	0	0

JOPER	NWT	LKOPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 3 LRTIO= 1

RTIOS= .40 .50 1.00

OVERTOPPING ANALYSIS

****

SUB-AREA RUNOFF COMPUTATION

LOCAL INFLOW= PECKS POND

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

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	9.20	0.00	23.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	101.00	114.00	124.00	133.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .827

INITIAL & CONSTANT RAINFALL LOSSES AS PER C.O.E.

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= 2.19 CP= .45 NTA= 0

BASE FLOW PARAMETERS AS PER C.O.E.

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

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC=13.60 AND R=20.83 INTERVALS

UNIT HYDROGRAPH100 END-OF-PERIOD ORDINATES, LAG= 2.19 HOURS, CP= .45 VOL= .99

24.	89.	184.	297.	424.	561.	708.	851.	978.	1044.
1166.	1225.	1255.	1244.	1196.	1140.	1087.	1036.	987.	941.
897.	855.	815.	776.	740.	705.	672.	641.	611.	582.
555.	529.	504.	480.	458.	436.	416.	396.	378.	360.
343.	327.	312.	297.	283.	270.	257.	245.	234.	223.
212.	202.	193.	184.	175.	167.	159.	152.	145.	138.
131.	125.	119.	114.	108.	103.	98.	94.	89.	85.
81.	77.	74.	70.	67.	64.	61.	58.	55.	53.
50.	48.	46.	44.	42.	40.	38.	36.	34.	33.
31.	30.	28.	27.	26.	24.	23.	22.	21.	20.

	RAIN	EXCS	LOSS	COMP Q
SUM	23.66	21.26	2.40	704359.
	(601.)(	540.)(	61.)(19945.23)	

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY DJS DATE 5-12-81 PROJ. NO. 80-238-755
CHKD. BY DLG DATE 5-13-81 SHEET NO. 4 OF 22

SUMMARY INPUT/OUTPUT SHEETS

CONSULTANTS, INC.
Engineers • Geologists • Planners
Environmental Specialists

SUBJECT: DAM SAFETY INSPECTION
PICKERAL POND DAM

BY: DJJ DATE: 5-11-81 PROJ. NO. 80-238-755

CHKD. BY: DLB DATE: 5-13-81 SHEET NO. 13 OF 22

GAI CONSULTANTS, INC.
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Environmental Specialists

LOCAL INFLOW-
PECKS POND.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	6401.	4953.	1915.	937.	281233.
CMS	181.	140.	54.	27.	7964.
INCHES		5.01	7.75	7.90	7.90
MM		127.19	196.75	200.63	200.63
AC-FT		2456.	3799.	3874.	3874.
THOUS CU M		3029.	4686.	4778.	4778.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8001.	6191.	2394.	1172.	351541.
CMS	227.	175.	68.	33.	9955.
INCHES		6.26	9.68	9.87	9.87
MM		158.99	245.94	250.79	250.79
AC-FT		3070.	4749.	4842.	4842.
THOUS CU M		3787.	5857.	5973.	5973.

PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	16002.	12381.	4788.	2344.	703082.
CMS	453.	351.	136.	66.	19909.
INCHES		12.52	19.37	19.75	19.75
MM		317.99	491.89	501.58	501.58
AC-FT		6140.	9497.	9684.	9684.
THOUS CU M		7573.	11715.	11945.	11945.

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

HYDROGRAPH ROUTING

ROUTE THROUGH PECKS POND DAM

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

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	1097.	-1

STAGE	1360.00	1360.50	1361.00	1361.50	1362.00	1362.30	1362.40	1362.50	1362.60
	1363.00	1363.50	1364.00	1365.00	1366.00	1367.00			
FLOW	0.00	30.00	100.00	200.00	320.00	420.00	460.00	530.00	590.00
	1200.00	2290.00	3810.00	7650.00	12410.00	18130.00			

SURFACE AREA=	0.	300.	420.	491.	1040.
CAPACITY=	0.	810.	1097.	2143.	15392.
ELEVATION=	1351.	1359.	1360.	1362.	1380.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1360.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1362.3	0.0	0.0	0.

PECKS POND - OUTFLOW.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4217.	3540.	1157.	586.	166919.
CMS	119.	100.	33.	16.	4727.
INCHES		3.58	4.68	4.69	4.69
MM		90.92	118.82	119.08	119.08
AC-FT		1755.	2294.	2299.	2299.
THOUS CU M		2165.	2830.	2836.	2836.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9816.	4839.	1603.	771.	231224.
CMS	169.	137.	45.	22.	6548.
INCHES		4.89	6.48	6.49	6.49
MM		124.27	164.63	164.96	164.96
AC-FT		2399.	3179.	3185.	3185.
THOUS CU M		2960.	3921.	3929.	3929.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	33852.	11130.	3877.	1864.	559271.
CMS	381.	315.	110.	53.	15837.
INCHES		11.25	15.68	15.71	15.71
MM		285.85	398.33	398.99	398.99
AC-FT		5519.	7691.	7703.	7703.
THOUS CU M		6808.	9487.	9502.	9502.

PMF

****

SUB-AREA RUNOFF COMPUTATION

LOCAL INFLOW= HEMLOCK LAKE

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

HYDROGRAPH DATA

IHTOG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	1.10	0.00	23.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	101.00	114.00	124.00	133.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .827

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= .96 CP= .45 NTA= 0

RECESSION DATA

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

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 6.03 AND R= 9.29 INTERVALS

UNIT HYDROGRAPH 53 END-OF-PERIOD ORDINATES, LAG= .97 HOURS, CP= .45 VOL= 1.00

21.	77.	156.	239.	302.	332.	319.	287.	258.	231.
208.	187.	167.	150.	135.	121.	109.	98.	88.	79.
71.	64.	57.	51.	46.	41.	37.	33.	30.	27.
24.	22.	19.	17.	16.	14.	13.	11.	10.	9.
8.	7.	7.	6.	5.	5.	4.	4.	3.	3.
3.	3.	2.							

SUBJECT DAM SAFETY INSPECTION
PICKEREL POND DAM
BY JDS DATE 5-12-81 PROJ. NO. 80-238-755
CHKD. BY RAG DATE 5-13-81 SHEET NO. 5 OF 22

GEI CONSULTANTS, INC.
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SUBJECT DAM SAFETY INSPECTION
PICKEREL POND DAM
BY DGB DATE 5-12-81 PROJ. NO. 80-238-755
CHKD. BY DGB DATE 5-13-81 SHEET NO. 12 OF 22

Engineers • Geologists • Planners
Environmental Specialists

GEI CONSULTANTS, INC.

HEMLOCK LAKE - INFLOW.

0.40PMF

PERIOD	RAIN	EXCS	LOSS	COMP Q
SUM	23.66	21.26	2.40	89969.
	(601.)(	540.)(	61.)(	2547.64)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1192.	725.	245.	120.	35976.
CMS	34.	21.	7.	3.	1019.
INCHES		6.13	8.27	8.45	8.45
MM		155.72	210.14	214.66	214.66
AC-FT		359.	485.	496.	496.
THOUS CU M		443.	598.	611.	611.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1489.	906.	306.	150.	44970.
CMS	42.	26.	9.	4.	1273.
INCHES		7.66	10.34	10.56	10.56
MM		194.65	262.67	268.32	268.32
AC-FT		449.	606.	619.	619.
THOUS CU M		554.	748.	764.	764.

PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2979.	1812.	611.	300.	89940.
CMS	84.	51.	17.	8.	2547.
INCHES		15.33	20.68	21.13	21.13
MM		389.30	525.35	536.64	536.64
AC-FT		899.	1213.	1239.	1239.
THOUS CU M		1109.	1496.	1528.	1528.

****

HYDROGRAPH ROUTING

ROUTE THROUGH HEMLOCK LAKE DAM

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

ROUTING DATA

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

	NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
	1	0	0	0.000	0.000	0.000	-1439.	0

CAPACITY=	0.	918.	1044.	4594.
ELEVATIONS=	1428.	1439.	1440.	1460.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1439.0	47.0	3.3	1.5	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1442.0	2.6	1.5	450.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY DSS DATE 5-12-81 PROJ. NO. 80-238-755
CHKD. BY DLB DATE 5-13-81 SHEET NO. 6 OF 22

GEI CONSULTANTS, INC.
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HEMLOCK LAKE - OUTFLOW.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	427.	383.	156.	75.	22631.
CMS	12.	11.	4.	2.	641.
INCHES		3.24	5.29	5.32	5.32
MM		82.32	134.31	135.03	135.03
AC-FT		190.	310.	312.	312.
THOUS CU M		234.	382.	384.	384.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	555.	494.	201.	97.	29106.
CMS	16.	14.	6.	3.	824.
INCHES		4.18	6.80	6.84	6.84
MM		106.18	172.67	173.66	173.66
AC-FT		245.	399.	401.	401.
THOUS CU M		302.	492.	495.	495.

PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1791.	1242.	460.	222.	66669.
CMS	51.	35.	13.	6.	1888.
INCHES		10.51	15.56	15.66	15.66
MM		266.83	395.18	397.79	397.79
AC-FT		616.	912.	918.	918.
THOUS CU M		760.	1125.	1133.	1133.

****

SUB-AREA RUNOFF COMPUTATION

LOCAL INFLOW- LOWER HEMLOCK LAKE

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

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	.10	0.00	23.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	101.00	114.00	124.00	133.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .827

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOR	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= .61 CP= .45 NTA= 0

RECESSION DATA

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

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 3.71 AND R= 5.97 INTERVALS

UNIT HYDROGRAPH 34 END-OF-PERIOD ORDINATES, LAG= .61 HOURS, CP= .45 VOL= 1.00

6.	22.	39.	46.	42.	36.	30.	26.	22.	18.
16.	13.	11.	9.	8.	7.	6.	5.	4.	3.
3.	2.	2.	2.	1.	1.	1.	1.	1.	1.
1.	0.	0.	0.						

	MAIN	EXCS	LOSS	CUMP Q
SUM	23.66	21.26	2.40	8200.
	(601.)(	540.)(	61.)(	232.20)

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY DJS DATE 5-12-81 PROJ. NO. 80-238-755
CHKD. BY DLG DATE 5-13-81 SHEET NO. 5 OF 22

UCI CONSULTANTS, INC.
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LOCAL INFLOW-
LOWER
HEMLOCK
LAKE.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	137.	70.	22.	11.	3284.
CMS	4.	2.	1.	0.	93.
INCHES		6.51	8.30	8.49	8.49
MM		165.27	210.74	215.66	215.56
AC-FT		35.	44.	45.	45.
THOUS CU M		43.	55.	56.	56.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	171.	87.	28.	14.	4105.
CMS	5.	2.	1.	0.	116.
INCHES		8.13	10.37	10.61	10.61
MM		206.59	263.43	269.45	269.45
AC-FT		43.	55.	57.	57.
THOUS CU M		53.	68.	70.	70.

PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	342.	175.	56.	27.	8211.
CMS	10.	5.	2.	1.	233.
INCHES		16.27	20.74	21.22	21.22
MM		413.17	526.86	538.89	538.89
AC-FT		87.	111.	113.	113.
THOUS CU M		107.	136.	140.	140.

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COMBINE HYDROGRAPHS

COMBINE HEMLOCK LAKE DAM OUTFLOW W/ LOWER HEMLOCK LAKE INFLOW

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

SUM OF HEMLOCK
LAKE DAM
OUTFLOW AND
LOWER HEMLOCK
LAKE LOCAL
INFLOW.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	456.	414.	179.	96.	25915.
CMS	13.	12.	5.	2.	734.
INCHES		3.21	5.54	5.58	5.58
MM		81.48	140.68	141.74	141.74
AC-FT		205.	384.	357.	357.
THOUS CU M		253.	437.	440.	440.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	593.	534.	229.	111.	33211.
CMS	17.	15.	6.	3.	940.
INCHES		4.14	7.10	7.15	7.15
MM		105.07	180.23	181.65	181.65
AC-FT		265.	454.	457.	457.
THOUS CU M		326.	560.	564.	564.

PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1924.	1348.	516.	250.	74880.
CMS	54.	38.	15.	7.	2120.
INCHES		10.45	15.99	16.12	16.12
MM		265.35	406.13	409.65	409.55
AC-FT		668.	1023.	1031.	1031.
THOUS CU M		824.	1262.	1272.	1272.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY JJC DATE 5/28/81 PROJ. NO. 80-238-755
CHKD. BY DLG DATE 5-13-81 SHEET NO. 6 OF 22

GJ CONSULTANTS, INC.
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HYDROGRAPH ROUTING

ROUTE TOTAL HYDROGRAPH THROUGH LOWER HEMLOCK LAKE DAM

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

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1432.	-1

STAGE	1432.00	1432.50	1433.00	1433.50	1434.00	1434.50	1435.00	1435.30	1436.00
	1437.00	1438.00							
FLOW	0.00	60.00	169.00	310.00	477.00	667.00	877.00	1012.00	1441.00
	2471.00	3992.00							
SURFACE AREA=	0.	23.	40.						
CAPACITY=	0.	307.	555.						
ELEVATION=	1392.	1432.	1440.						

CHEL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1432.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1435.3	0.0	0.0	0.

LOWER HEMLOCK DAM - OUTFLOW.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	438.	402.	162.	78.	23517.
CMS	12.	11.	5.	2.	666.
INCHES		3.11	5.03	5.06	5.06
MM		79.12	127.81	128.63	128.63
AC-FT		199.	322.	324.	324.
THOUS CU M		246.	397.	400.	400.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	571.	519.	210.	101.	30431.
CMS	16.	15.	6.	3.	862.
INCHES		4.03	6.51	6.55	6.55
MM		102.26	165.36	166.44	166.44
AC-FT		258.	416.	419.	419.
THOUS CU M		318.	514.	517.	517.

PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1846.	1319.	498.	237.	70972.
CMS	52.	37.	14.	7.	2010.
INCHES		10.22	15.18	15.28	15.28
MM		259.65	385.57	388.18	388.18
AC-FT		656.	971.	978.	978.
THOUS CU M		809.	1198.	1206.	1206.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY JJS DATE 5-12-81 PROJ. NO. 80-238-755
CHKD. BY JLG DATE 5-13-81 SHEET NO. 4 OF 22

GJ CONSULTANTS, INC.
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SUB-AREA RUNOFF COMPUTATION

LOCAL INFLOW- BLUE HERON LAKE

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

HYDROGRAPH DATA

INTDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	5.00	0.00	23.00	4.60	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	101.00	114.00	124.00	133.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .027

LOSS DATA

LKOPT	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= 2.51 CP= .45 RTA= 0

RECESSION DATA

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

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC=15.57 AND R=23.00 INTERVALS

UNIT HYDROGRAPH 100 END-OF-PERIOD ORDINATES, LAG= 2.52 HOURS, CP= .45 VOL= .98

9.	35.	72.	116.	166.	221.	279.	340.	400.	454.
500.	538.	568.	589.	598.	591.	571.	548.	525.	503.
483.	463.	444.	426.	408.	391.	375.	360.	345.	331.
317.	304.	291.	279.	268.	257.	246.	236.	227.	217.
208.	200.	191.	184.	176.	169.	162.	155.	149.	143.
137.	131.	126.	121.	116.	111.	106.	102.	98.	94.
90.	86.	83.	79.	76.	73.	70.	67.	64.	62.
59.	57.	54.	52.	50.	48.	46.	44.	42.	40.
39.	37.	36.	34.	33.	31.	30.	29.	28.	27.
25.	24.	23.	22.	22.	21.	20.	19.	18.	17.

	RAIN	EXCS	LOSS	COMP Q
SUM	23.66	21.26	2.40	371113.
	(601.)(	540.)(	61.)(	10508.75)

LOCAL INFLOW - BLUE HERON LAKE DAM.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3221.	2561.	1009.	494.	148106.
CMS	91.	73.	29.	14.	4194.
INCHES		4.76	7.51	7.65	7.65
MM		121.01	190.71	194.41	194.41
AC-FT		1270.	2001.	2040.	2040.
THOUS CU M		1566.	2468.	2516.	2516.

0.50 PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4026.	3201.	1261.	617.	185132.
CMS	114.	91.	36.	17.	5242.
INCHES		5.96	9.39	9.57	9.57
MM		151.26	238.39	243.02	243.02
AC-FT		1587.	2501.	2550.	2550.
THOUS CU M		1938.	3086.	3145.	3145.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY RTS DATE 5/12-81 PROJ. NO. 80-238-755
CHKD. BY DLB DATE 5-13-81 SHEET NO. 7 OF 22

UEI CONSULTANTS, INC.
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	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8082.	6402.	2522.	1236.	370264.
CMS	228.	181.	71.	35.	10489.
INCHES		11.91	18.77	19.14	19.14
MM		302.53	476.78	486.03	486.03
AC-FT		3179.	5003.	5100.	5100.
THOUS CU M		3916.	6171.	6291.	6291.

PMF

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COMBINE HYDROGRAPHS

COMBINE BLUE HERON LAKE INFLOW W/ LOWER HEMLOCK LAKE DAM OUTFLOW

ISTAO	ICOMP	ICON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
RHLD	2	0	0	0	0	1	0	0

SUM OF BLUE HERON LAKE LOCAL INFLOW AND LOWER HEMLOCK LAKE OUTFLOW.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3600.	2933.	1171.	572.	171623.
CMS	102.	83.	33.	16.	4860.
INCHES		4.40	7.03	7.15	7.15
MM		111.77	178.54	181.68	181.68
AC-FT		1484.	2323.	2364.	2364.
THOUS CU M		1794.	2865.	2916.	2916.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4524.	3486.	1471.	719.	215563.
CMS	128.	104.	42.	20.	6104.
INCHES		5.53	8.83	8.98	8.98
MM		140.48	224.25	228.19	228.19
AC-FT		1828.	2918.	2969.	2969.
THOUS CU M		2255.	3599.	3662.	3662.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9744.	7691.	3012.	1471.	441236.
CMS	276.	218.	85.	42.	12494.
INCHES		11.94	18.88	18.39	18.39
MM		293.10	459.12	467.09	467.09
AC-FT		3814.	5974.	6078.	6078.
THOUS CU M		4704.	7369.	7497.	7497.

PMF

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HYDROGRAPH ROUTING

ROUTE TOTAL HYDROGRAPH THROUGH BLUE HERON LAKE DAM

ISTAO	ICOMP	ICON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
RHLD	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

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

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1337.	-1

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY RSS DATE 5-20-81 PROJ. NO. 80-238-755
CHKD. BY RAB DATE 5-13-81 SHEET NO. 7 OF 22

GJ CONSULTANTS, INC.
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STAGE	1337.00	1337.50	1338.00	1338.50	1339.00	1340.00	1341.00	1342.00	1343.00
	1345.00								
FLOW	0.00	20.00	150.00	320.00	520.00	1020.00	1630.00	2320.00	3080.00
	4020.00								
SURFACE AREA=	0.	90.	100.	110.	380.				
CAPACITY=	0.	201.	343.	501.	5131.				
ELEVATION=	1336.	1337.	1339.	1340.	1360.				

CREL	SPWID	COOW	EXPW	ELEVL	COOL	CAREA	EXPL
1337.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COOD	EXPD	DAMWID
1338.5	0.0	0.0	0.

CREST LENGTH AT OR BELOW ELEVATION	90.	800.	900.
	1338.5	1340.0	1345.0

BLUE HERON LAKE
DAM OUTFLOW.

0.40 PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3325.	2083.	1071.	516.	154941.
CMS	100.	59.	30.	15.	4387.
INCHES		4.33	6.41	6.46	6.46
MM		109.88	163.31	164.02	164.02
AC-FT		1430.	2125.	2134.	2134.
THOUS CU M		1764.	2621.	2632.	2632.

0.50 PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4449.	3042.	1367.	659.	197667.
CMS	126.	103.	39.	19.	5597.
INCHES		5.46	8.20	8.24	8.24
MM		138.80	208.34	209.25	209.25
AC-FT		1806.	2711.	2723.	2723.
THOUS CU M		2228.	3344.	3358.	3358.

PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	9619.	7647.	2890.	1397.	419156.
CMS	272.	217.	82.	40.	11869.
INCHES		11.47	17.34	17.47	17.47
MM		291.41	440.56	443.72	443.72
AC-FT		3792.	5732.	5773.	5773.
THOUS CU M		4677.	7071.	7122.	7122.

SUB-AREA RUNOFF COMPUTATION

LOCAL INFLOW- PORTERS LAKE

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

HYDROGRAPH DATA

INTDG	IHNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	2.70	0.00	23.00	0.00	0.000	0	1	0

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY RKT DATE 5-12-81 PROJ. NO. 80-238-755
CHKD. BY DLG DATE 5-13-81 SHEET NO. 6 OF 22

GEI CONSULTANTS, INC.
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PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	31.56	101.00	114.00	126.00	133.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .827

LOSS DATA

LKOPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOR	STRTL	CRSTL	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= 2.32 CP= .45 NTA= 0

RECESSION DATA
STRTQ= -1.50 QRCSN= -.05 RTIOR= 2.00
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC=14.46 AND R=22.01 INTERVALS

UNIT HYDROGRAPH 100 END-OF-PERIOD ORDINATES, LAG= 2.32 HOURS, CP= .45 VOL= .99

6.	23.	47.	76.	108.	143.	181.	219.	255.	285.
310.	330.	343.	349.	344.	330.	315.	301.	288.	275.
263.	251.	240.	229.	219.	210.	200.	191.	183.	175.
167.	160.	152.	146.	139.	133.	127.	121.	116.	111.
106.	101.	97.	92.	88.	84.	81.	77.	74.	70.
67.	64.	61.	59.	56.	54.	51.	49.	47.	45.
43.	41.	39.	37.	36.	34.	33.	31.	30.	28.
27.	26.	25.	24.	23.	22.	21.	20.	19.	18.
17.	16.	16.	15.	14.	14.	13.	13.	12.	11.
11.	10.	10.	10.	9.	9.	8.	8.	8.	7.

	RAIN	EXCS	LOSS	CUMP 0
SUM	23.66	21.26	2.40	204257.
	(601.)(540.)(61.)(5783.9))			

LOCAL INFLOW-
PORTERS LAKE.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1820.	1425.	555.	272.	81548.
CMS	52.	40.	16.	8.	2309.
INCHES		4.91	7.65	7.80	7.80
MM		124.68	194.41	198.21	198.21
AC-FT		707.	1102.	1123.	1123.
THOUS CU M		871.	1359.	1385.	1385.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2275.	1781.	694.	340.	101925.
CMS	64.	50.	20.	10.	2886.
INCHES		6.14	9.57	9.75	9.75
MM		155.86	243.01	247.76	247.76
AC-FT		883.	1377.	1404.	1404.
THOUS CU M		1089.	1698.	1732.	1732.

PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4549.	3562.	1388.	679.	203850.
CMS	129.	101.	39.	19.	5772.
INCHES		12.27	19.13	19.51	19.51
MM		311.71	486.01	495.53	495.53
AC-FT		1766.	2754.	2808.	2808.
THOUS CU M		2179.	3397.	3463.	3463.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY RJS DATE 5-4-81 PROJ. NO. 80-238-755
CHKD. BY DKG DATE 5-13-81 SHEET NO. 4 OF 22

GJ CONSULTANTS, INC.
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HYDROGRAPH ROUTING

ROUTE THROUGH PORTERS LAKE DAM

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
PLD	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	1	0	0	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1315.	0

SURFACE AREA=	0.	235.	258.	310.	570.
CAPACITY=	0.	1904.	2273.	3246.	11935.
ELEVATION=	1291.	1315.	1317.	1320.	1340.

CNEL	SPWID	COQW	EXPW	ELEVL	CAREA	EXPL
1315.0	0.4	3.3	1.5	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1316.5	3.0	1.5	0.

CREST LENGTH	80.	1400.	1400.
AT OR BELOW ELEVATION	1316.5	1320.0	1325.0

PORTERS LAKE - OUTFLOW.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1034.	879.	265.	127.	30120.
CMS	29.	25.	7.	4.	1879.
INCHES		3.03	3.65	3.65	3.65
MM		76.89	92.62	92.66	92.66
AC-FT		436.	525.	525.	525.
THOUS CU M		537.	647.	648.	648.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1536.	1267.	393.	189.	56684.
CMS	43.	36.	11.	5.	1605.
INCHES		4.36	5.42	5.42	5.42
MM		110.85	137.73	137.79	137.79
AC-FT		628.	780.	781.	781.
THOUS CU M		775.	963.	963.	963.

PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4037.	3213.	1058.	508.	152452.
CMS	114.	91.	30.	14.	4317.
INCHES		11.07	14.58	14.59	14.59
MM		281.14	370.43	370.59	370.59
AC-FT		1593.	2099.	2100.	2100.
THOUS CU M		1965.	2589.	2590.	2590.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY JJS DATE 5-13-81 PROJ. NO. 80-238-755
CHKD. BY RLG DATE 5-13-81 SHEET NO. 11 OF 22

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****

SUB-AREA RUNOFF COMPUTATION

LOCAL INFLOW= PICKERAL POND

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

HYDROGRAPH DATA

INTDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	4.90	0.00	23.00	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	21.50	101.00	114.00	124.00	133.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .827

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= 2.00 CP= .45 NTA= 0

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

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC=13.12 AND R=19.69 INTERVALS

UNIT HYDROGRAPH 100 END-OF-PERIOD ORDINATES, LAG= 2.09 HOURS, CP= .45 VOL= .99

14.	53.	109.	176.	251.	332.	417.	499.	569.	625.
668.	696.	704.	686.	652.	620.	589.	560.	532.	506.
481.	457.	434.	413.	392.	373.	354.	337.	320.	304.
289.	275.	261.	248.	236.	224.	213.	203.	193.	183.
174.	165.	157.	149.	142.	135.	128.	122.	116.	110.
105.	100.	95.	90.	85.	81.	77.	73.	70.	66.
63.	60.	57.	54.	51.	49.	46.	44.	42.	40.
38.	36.	34.	33.	31.	29.	28.	27.	25.	24.
23.	22.	21.	20.	19.	18.	17.	16.	15.	14.
14.	13.	12.	12.	11.	11.	10.	10.	9.	9.

	RAIN	EXCS	LOSS	COMP Q
SUM	23.66	21.26	2.40	379088.
	(601.1)(540.)(61.)(10732.3)			

LOCAL INFLOW - PICKERAL POND

0.40 PMF

	PEAK	6-HR	24-HR	72-HR	TOTAL VOL.
CFS	3513.	2688.	1031.	505.	151354.
CMS	99.	76.	29.	14.	4286.
INCHES		5.10	7.83	7.98	7.98
MM		129.59	198.79	202.73	202.73
AC-FT		1333.	2044.	2085.	2085.
THOUS CU M		1644.	2522.	2572.	2572.

0.50 PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	4392.	3359.	1288.	631.	189193.
CMS	124.	95.	36.	18.	5357.
INCHES		6.38	9.78	9.98	9.98
MM		161.99	248.49	253.41	253.41
AC-FT		1666.	2555.	2606.	2606.
THOUS CU M		2055.	3152.	3214.	3214.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY JTS DATE 5-13-81 PROJ. NO. 80-238-755
CHKD. BY DLG DATE 5-13-81 SHEET NO. 11 OF 22

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	8783.	8719.	2877.	1261.	378385.
CMS	249.	190.	73.	36.	10715.
INCHES		12.76	19.57	19.95	19.95
MM		323.98	496.99	506.83	506.83
AC-FT		3332.	5111.	5212.	5212.
THOUS CU M		4110.	6304.	6429.	6429.

PMF

****

COMBINE HYDROGRAPHS

COMBINE PICKERAL POND INFLOW W/ ROUTED OUTFLOWS FROM UPSTREAM DAMS

	ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
PIPD		4	0	0	0	0	1	0	0

SUM OF LOCAL INFLOW TO PICKERAL POND AND OUTFLOW FROM PORTERS LAKE, BLUE HERON LAKE, AND PECKS POND.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	10872.	9233.	3523.	1704.	511334.
CMS	308.	261.	100.	48.	14479.
INCHES		3.73	5.70	5.74	5.74
MM		94.85	144.78	145.91	145.91
AC-FT		4578.	6988.	7043.	7043.
THOUS CU M		5647.	8620.	8688.	8688.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	14877.	12391.	4691.	2249.	674767.
CMS	421.	351.	132.	64.	19107.
INCHES		5.01	7.52	7.58	7.58
MM		127.30	191.12	192.55	192.55
AC-FT		6144.	9225.	9294.	9294.
THOUS CU M		7579.	11379.	11464.	11464.

0.50 PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	34664.	28139.	10402.	5031.	1509265.
CMS	982.	797.	295.	142.	42738.
INCHES		11.38	16.83	16.96	16.96
MM		289.07	427.46	430.69	430.69
AC-FT		13953.	20833.	20789.	20789.
THOUS CU M		17211.	25450.	25643.	25643.

PMF

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HYDROGRAPH ROUTING

ROUTE TOTAL HYDROGRAPH THROUGH PICKERAL POND DAM

	ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
	PIPD	1	0	0	0	0	1	0	0

ROUTING DATA

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

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1311.	-1

STAGE	1311.00	1311.50	1312.00	1313.00	1314.00	1315.00	1316.00	1317.00	1317.70
	1318.20	1318.50	1319.00	1320.00	1321.00	1322.00	1323.00	1324.00	1325.00
FLOW	0.00	70.00	260.00	950.00	1950.00	3210.00	4680.00	6400.00	7740.00
	8850.00	9650.00	11160.00	14570.00	18410.00	22800.00	27460.00	32370.00	38130.00

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SURFACE AREA=	0.	155.	624.	785.	1280.
CAPACITY=	0.	362.	2796.	4413.	24862.
ELEVATION=	1304.	1311.	1318.	1320.	1340.

CHEL	SPWID	COOL	EXPW	ELEVL	COOL	CAREA	EXPL
1311.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COOD	EXPD	DAMWID
1317.7	0.0	0.0	0.

CREST LENGTH AT OR BELOW ELEVATION	100. 1300.0	100. 1320.0

} ARTIFICIAL VALUES REQUIRED DUE TO THE PROGRAM AND THE SPECIFIC INPUT DATA; WILL HAVE NO EFFECT ON FACILITY RATING CURVE.

PICKERAL POND DAM OUTFLOW.

0.40PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	7746.	7270.	2524.	1216.	364702.
CMS	219.	206.	71.	34.	10327.
INCHES		2.94	4.08	4.10	4.10
MM		74.69	103.72	104.07	104.07
AC-FT		3605.	5007.	5023.	5023.
THOUS CU M		4447.	6176.	6196.	6196.

0.50PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	10653.	9742.	3403.	1638.	491508.
CMS	302.	276.	96.	46.	13918.
INCHES		3.94	5.50	5.52	5.52
MM		100.08	139.82	140.26	140.26
AC-FT		4831.	6749.	6770.	6770.
THOUS CU M		5958.	8325.	8351.	8351.

PMF

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	26520.	23469.	8334.	4012.	1203640.
CMS	751.	665.	236.	114.	34083.
INCHES		9.49	13.48	13.52	13.52
MM		241.10	342.47	343.47	343.47
AC-FT		11638.	16531.	16579.	16579.
THOUS CU M		14355.	20390.	20450.	20450.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY JSS DATE 5-13-81 PROJ. NO. 80-238-755
CHKD. BY JLB DATE 5-13-81 SHEET NO. 12 OF 22

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SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY JJS DATE 5-13-81 PROJ. NO. 80-238-755
CHKD. BY DGB DATE 5-13-81 SHEET NO. 2 OF 22

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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)

ROUTING SUMMARY.

OPERATION	STATION	AREA	PLAN	RATIO APPLIED TO FLOWS RATIO 1 .40	RATIO 2 .50	RATIO 3 1.00
HYDROGRAPH AT	PEPD	9.20 (23.83)	1	6401. (181.25)(	8001. 226.57)(	16002. 453.14)(
ROUTED TO	PEPD	9.20 (23.83)	1	4217. (119.41)(	5816. 164.69)(	13452. 380.92)(
HYDROGRAPH AT	HLD	1.10 (2.85)	1	1192. (33.74)(	1489. 42.18)(	2979. 84.35)(
ROUTED TO	HLD	1.10 (2.85)	1	427. (12.08)(	555. 15.72)(	1791. 50.72)(
HYDROGRAPH AT	LHLD	.10 (.26)	1	137. (3.87)(	171. 4.84)(	342. 9.68)(
2 COMBINED	LHLD	1.20 (3.11)	1	456. (12.92)(	593. 16.80)(	1924. 54.49)(
ROUTED TO	LHLD	1.20 (3.11)	1	438. (12.40)(	571. 16.18)(	1846. 52.29)(
HYDROGRAPH AT	BHLD	5.00 (12.95)	1	3221. (91.21)(	4026. 114.01)(	8052. 228.02)(
2 COMBINED	BHLD	6.20 (16.06)	1	3600. (101.95)(	4524. 128.10)(	9744. 275.91)(
ROUTED TO	BHLD	6.20 (16.06)	1	3525. (99.81)(	4445. 125.86)(	9619. 272.37)(
HYDROGRAPH AT	PLD	2.70 (6.99)	1	1820. (51.53)(	2275. 64.41)(	4549. 128.83)(
ROUTED TO	PLD	2.70 (6.99)	1	1034. (29.28)(	1536. 43.49)(	4037. 114.32)(
HYDROGRAPH AT	PIPD	4.90 (12.69)	1	3513. (99.49)(	4392. 124.36)(	8783. 248.72)(
4 COMBINED	PIPD	23.00 (59.57)	1	10872. (307.87)(	14877. 421.28)(	34664. 981.59)(
ROUTED TO	PIPD	23.00 (59.57)	1	7746. (219.34)(	10653. 301.65)(	26520. 750.97)(

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY JJS DATE 5-12-81 PROJ. NO. 80-238-755
CHKD. BY JLG DATE 5-13-81 SHEET NO. 2 OF 22

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PECKS POND DAM; OVERTOPS @ ≈ 0.04PMF

HEMLOCK LAKE DAM; OVERTOPS @ ≈ 0.60PMF

LOWER HEMLOCK DAM; OVERTOPS @ ≈ 0.67PMF

SUMMARY OF DAM SAFETY ANALYSIS

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1360.00	1360.00	1362.30
STORAGE	1091.	1091.	2143.
OUTFLOW	0.	0.	420.

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
.40	1364.11	1.81	3072.	4217.	9.33	44.50	0.00
.50	1364.52	2.22	3298.	5816.	9.83	44.00	0.00
1.00	1366.10	3.80	4246.	13452.	12.00	43.50	0.00

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1439.00	1439.00	1442.00
STORAGE	918.	918.	1399.
OUTFLOW	0.	0.	806.

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
.40	1440.96	0.00	1215.	427.	0.00	43.50	0.00
.50	1441.34	0.00	1282.	555.	0.00	43.50	0.00
1.00	1442.70	.70	1523.	1791.	8.00	42.67	0.00

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1432.00	1432.00	1435.30
STORAGE	307.	307.	394.
OUTFLOW	0.	0.	1012.

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
.40	1433.88	0.00	354.	438.	0.00	44.00	0.00
.50	1434.25	0.00	364.	571.	0.00	43.83	0.00
1.00	1436.45	1.15	429.	1846.	4.17	43.00	0.00

SUBJECT DAM SAFETY INSPECTION — PICKERAL POND DAM

BY RTS DATE 5/13-81 PROJ. NO. 80-238-755

CHKD. BY RLG DATE 5/13-81 SHEET NO. R OF 22

UNITED SCIENCE CONSULTANTS, INC.
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BLUE HERON LAKE DAM; OVERTOPS @ = 0.09 PMF

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1337.00	1337.00	1338.50
STORAGE	201.	201.	343.
OUTFLOW	0.	0.	320.

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
.40	1340.39	1.89	545.	3525.	12.00	42.83	0.00
.50	1340.67	2.17	576.	4445.	12.83	42.83	0.00
1.00	1341.94	3.44	732.	9619.	16.17	42.83	0.00

PORTERS LAKE DAM; OVERTOPS @ = 0.02 PMF

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1315.00	1315.00	1316.50
STORAGE	1904.	1904.	2273.
OUTFLOW	0.	0.	39.

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
.40	1317.66	1.16	2583.	1034.	8.83	45.17	0.00
.50	1317.91	1.41	2651.	1536.	9.33	44.50	0.00
1.00	1318.69	2.19	2874.	4037.	11.50	43.33	0.00

PICKERAL POND DAM (OVERTOPS @ = 0.40 PMF)

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1311.00	1311.00	1317.70
STORAGE	362.	362.	2796.
OUTFLOW	0.	0.	7740.

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
.40	1317.70	.00	2798.	7746.	.33	46.50	0.00
.50	1318.83	1.13	3546.	10653.	6.67	46.17	0.00
1.00	1322.80	5.10	6696.	26520.	9.00	45.00	0.00

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SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY JSS DATE 5-13-81 PROJ. NO. 80-238-755
CHKD. BY DLB DATE 5-13-81 SHEET NO. 5 OF 22

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DAM SAFETY INSPECTION
PICKERAL POND DAM ** BREACHING ANALYSIS ** (U.S. DAMS INCLUDED)
10-MINUTE TIME STEP AND 48-HOUR STORM DURATION

JOB SPECIFICATION

NU	NHR	NMIN	IDAY	IHR	IMIN	METHC	IPLT	IPRT	NSTAN
300	0	10	0	0	0	0	0	0	0
			JOPER	NWT	LROPT	TRACE			
			5	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 6 NRTIOS 1 LRTIOS 1

RTIOS= .42

BREACHING ANALYSIS
(INPUT SAME AS FOR OVERTOPPING ANALYSIS, WITH THE ADDITION OF THE BREACH CRITERIA GIVEN HERE.)
- UNDER 0.42 PMF CONDITIONS.

PLAN

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HYDROGRAPH ROUTING

ROUTE TOTAL HYDROGRAPH THROUGH PICKERAL POND DAM

DAM DATA

TOPEL	COOD	EXPD	DAMWID
1317.7	0.0	0.0	0.

CREST LENGTH	100.	100.
AT DH BELOW ELEVATION	1500.0	1520.0

DAM BREACH DATA

BRWID	Z	ELBR	TFAIL	WSEL	FAILEL
0.	1.00	1304.00	.50	1311.00	1317.70

STATION PIPD , PLAN 1, RATIO 1

BEGIN DAM FAILURE AT 45.00 HOURS

PEAK OUTFLOW IS 9713. AT TIME 45.50 HOURS

②

DAM BREACH DATA

BRWID	Z	ELBR	TFAIL	WSEL	FAILEL
100.	2.50	1304.00	.50	1311.00	1317.70

STATION PIPD , PLAN 2, RATIO 1

BEGIN DAM FAILURE AT 45.00 HOURS

PEAK OUTFLOW IS 26220. AT TIME 45.50 HOURS

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 5-13-81 PROJ. NO. 80-238-755

CHKD. BY DLB DATE 5-13-81 SHEET NO. 7 OF 22

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PLAN

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                DAM BREACH DATA
          Z      ELBM    TFAIL    HSEL FAILEL
BRWID     1.00   1304.00  4.00  1311.00 1317.70
 0.

          STATION  PIPD , PLAN 3, RATIO 1

BEGIN DAM FAILURE AT 45.00 HOURS

PEAK OUTFLOW IS     8579. AT TIME  48.50 HOURS
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                DAM BREACH DATA
          S      ELBM    TFAIL    HSEL FAILEL
BRWID     2.50   1304.00  4.00  1311.00 1317.70
180.

          STATION  PIPD , PLAN 4, RATIO 1

BEGIN DAM FAILURE AT 45.00 HOURS

PEAK OUTFLOW IS    15274. AT TIME  48.67 HOURS
```

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                DAM BREACH DATA
          S      ELBM    TFAIL    HSEL FAILEL
BRWID     1.00   1304.00  1.00  1311.00 1317.70
40.

          STATION  PIPD , PLAN 5, RATIO 1

BEGIN DAM FAILURE AT 45.00 HOURS

PEAK OUTFLOW IS    15300. AT TIME  46.00 HOURS
```

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY JDS DATE 5-13-81 PROJ. NO. 80-238-755

CHKD. BY PLB DATE 5-13-81 SHEET NO. 4 OF 22

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THE DAM BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF .010 HOURS DURING BREACH FORMATION.
DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF .167 HOURS.
THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.
INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

PLAN ②

TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	-	COMPUTED BREACH HYDROGRAPH (CFS)	=	ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-FT)
45.000	0.000	7776.		7776.		0.	0.	0.
45.010	.010	7975.		7830.		145.	145.	0.
45.020	.020	8173.		7919.		254.	399.	0.
45.029	.029	8372.		8032.		340.	739.	1.
45.039	.039	8571.		8165.		405.	1144.	1.
45.049	.049	8769.		8316.		454.	1598.	1.
45.059	.059	8968.		8482.		486.	2084.	2.
45.069	.069	9167.		8663.		503.	2587.	2.
45.078	.078	9365.		8858.		507.	3093.	3.
45.088	.088	9564.		9067.		497.	3591.	3.
45.098	.098	9763.		9288.		475.	4065.	3.
45.108	.108	9961.		9521.		440.	4506.	4.
45.118	.118	10160.		9766.		394.	4900.	4.
45.127	.127	10359.		10022.		337.	5237.	4.
45.137	.137	10557.		10289.		268.	5505.	4.
45.147	.147	10756.		10567.		189.	5694.	5.
45.157	.157	10955.		10855.		100.	5794.	5.
45.167	.167	11153.		11153.		0.	5794.	5.
45.176	.176	11533.		11462.		72.	5866.	5.
45.186	.186	11913.		11780.		133.	5999.	5.
45.196	.196	12293.		12107.		185.	6184.	5.
45.206	.206	12673.		12445.		228.	6413.	5.
45.216	.216	13053.		12791.		262.	6674.	5.
45.225	.225	13433.		13146.		286.	6961.	6.
45.235	.235	13813.		13511.		302.	7263.	6.
45.245	.245	14193.		13884.		309.	7571.	6.
45.255	.255	14573.		14266.		307.	7878.	6.
45.265	.265	14952.		14656.		296.	8174.	7.
45.275	.275	15332.		15055.		278.	8452.	7.
45.284	.284	15712.		15461.		251.	8703.	7.
45.294	.294	16092.		15876.		216.	8919.	7.
45.304	.304	16472.		16298.		174.	9093.	7.
45.314	.314	16852.		16729.		124.	9217.	8.
45.324	.324	17232.		17166.		66.	9282.	8.
45.333	.333	17612.		17612.		0.	9282.	8.
45.343	.343	18118.		18065.		53.	9335.	8.
45.353	.353	18625.		18525.		100.	9435.	8.
45.363	.363	19131.		18992.		139.	9574.	8.
45.373	.373	19637.		19467.		170.	9744.	8.
45.382	.382	20144.		19948.		195.	9939.	8.
45.392	.392	20650.		20437.		213.	10153.	8.
45.402	.402	21156.		20931.		225.	10378.	8.
45.412	.412	21663.		21433.		230.	10607.	9.
45.422	.422	22169.		21941.		228.	10836.	9.
45.431	.431	22675.		22455.		220.	11056.	9.
45.441	.441	23182.		22975.		206.	11262.	9.
45.451	.451	23688.		23502.		186.	11449.	9.
45.461	.461	24194.		24034.		160.	11609.	9.
45.471	.471	24701.		24572.		128.	11737.	10.
45.480	.480	25207.		25116.		91.	11828.	10.
45.490	.490	25713.		25665.		48.	11877.	10.
45.500	.500	26220.		26220.		0.	11877.	10.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 5-13-81 PROJ. NO. 80-238-755

CHKD. BY DLB DATE 5-13-81 SHEET NO. V OF VII

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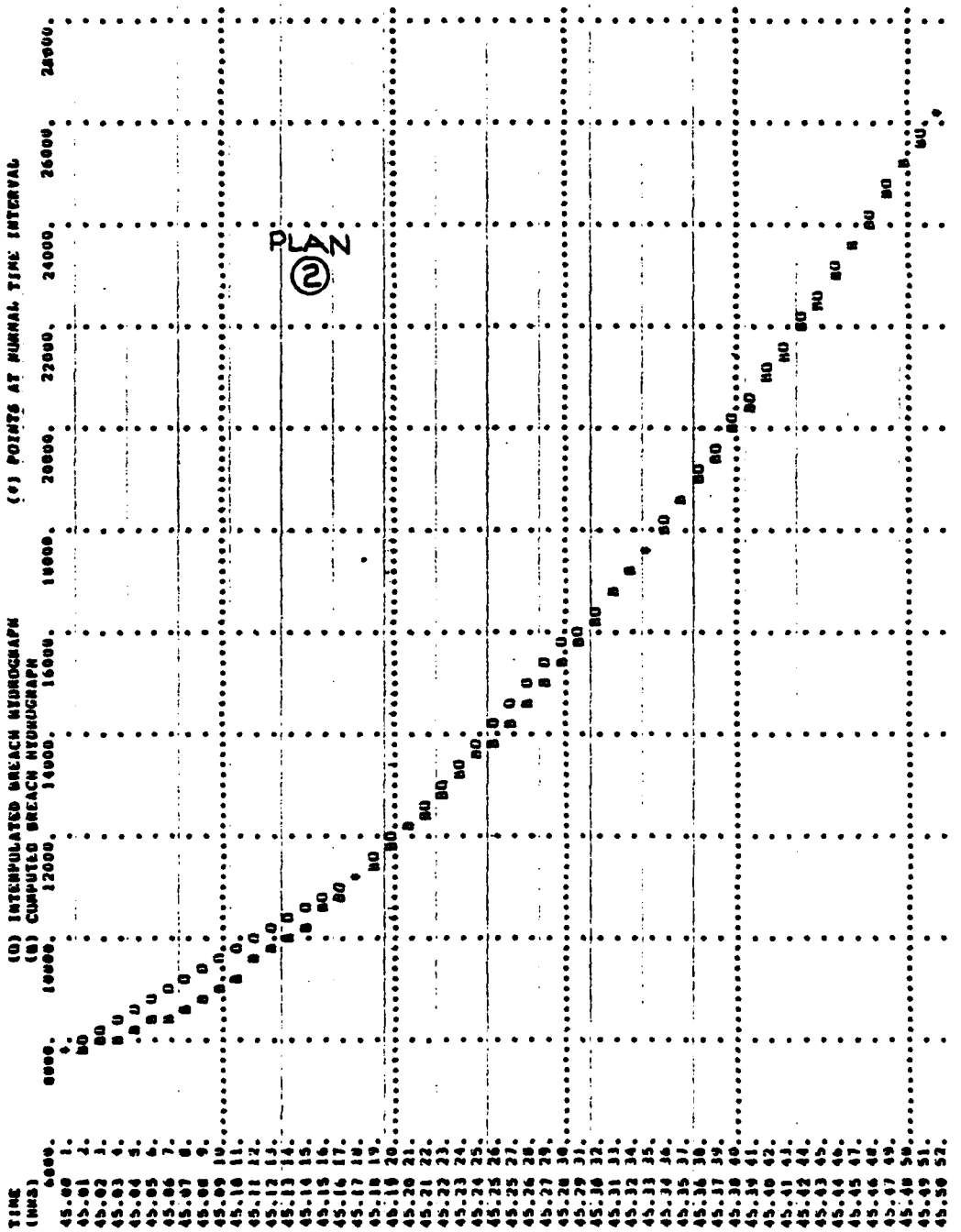

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 5-13-81 PROJ. NO. 80-238-755

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THE DAM BREACH HYDROGRAPH WAS DEVELOPED USING A TIME INTERVAL OF .021 HOURS DURING BREACH FORMATION.
DOWNSTREAM CALCULATIONS WILL USE A TIME INTERVAL OF .167 HOURS.
THIS TABLE COMPARES THE HYDROGRAPH FOR DOWNSTREAM CALCULATIONS WITH THE COMPUTED BREACH HYDROGRAPH.
INTERMEDIATE FLOWS ARE INTERPOLATED FROM END-OF-PERIOD VALUES.

PLAN ⑤

TIME (HOURS)	TIME FROM BEGINNING OF BREACH (HOURS)	INTERPOLATED BREACH HYDROGRAPH (CFS)	- COMPUTED BREACH HYDROGRAPH (CFS)	= ERROR (CFS)	ACCUMULATED ERROR (CFS)	ACCUMULATED ERROR (AC-FT)
45.000	0.000	7775.	7775.	0.	0.	0.
45.021	.021	7845.	7810.	35.	35.	0.
45.042	.042	7915.	7860.	55.	90.	0.
45.063	.063	7985.	7920.	65.	155.	0.
45.083	.083	8054.	7989.	65.	220.	0.
45.104	.104	8124.	8066.	59.	279.	0.
45.125	.125	8194.	8149.	45.	324.	1.
45.146	.146	8264.	8239.	26.	350.	1.
45.167	.167	8334.	8334.	0.	350.	1.
45.188	.188	8452.	8435.	17.	367.	1.
45.208	.208	8570.	8541.	29.	395.	1.
45.229	.229	8687.	8652.	35.	431.	1.
45.250	.250	8805.	8768.	37.	468.	1.
45.271	.271	8923.	8889.	35.	503.	1.
45.292	.292	9041.	9014.	27.	530.	1.
45.313	.313	9159.	9143.	16.	546.	1.
45.333	.333	9277.	9277.	0.	546.	1.
45.354	.354	9428.	9415.	13.	559.	1.
45.375	.375	9579.	9556.	23.	582.	1.
45.396	.396	9730.	9702.	28.	610.	1.
45.417	.417	9881.	9851.	30.	640.	1.
45.438	.437	10033.	10005.	28.	668.	1.
45.458	.458	10184.	10162.	22.	690.	1.
45.479	.479	10335.	10322.	13.	703.	1.
45.500	.500	10486.	10486.	0.	703.	1.
45.521	.521	10665.	10653.	11.	714.	1.
45.542	.542	10843.	10824.	19.	733.	1.
45.563	.562	11022.	10998.	24.	757.	1.
45.583	.583	11201.	11175.	25.	783.	1.
45.604	.604	11379.	11356.	24.	806.	1.
45.625	.625	11558.	11539.	19.	825.	1.
45.646	.646	11737.	11726.	11.	836.	1.
45.667	.667	11915.	11915.	0.	836.	1.
45.688	.687	12110.	12100.	10.	845.	1.
45.708	.708	12320.	12301.	18.	862.	1.
45.729	.729	12522.	12502.	20.	882.	2.
45.750	.750	12724.	12703.	21.	903.	2.
45.771	.771	12926.	12906.	20.	923.	2.
45.792	.792	13128.	13113.	15.	938.	2.
45.813	.812	13330.	13321.	9.	947.	2.
45.833	.833	13532.	13532.	0.	947.	2.
45.854	.854	13753.	13745.	8.	955.	2.
45.875	.875	13974.	13961.	13.	968.	2.
45.896	.896	14195.	14178.	17.	985.	2.
45.917	.917	14416.	14399.	18.	1002.	2.
45.938	.937	14637.	14621.	16.	1019.	2.
45.958	.958	14856.	14845.	12.	1031.	2.
45.979	.979	15077.	15045.	7.	1039.	2.
46.000	1.000	(15300.)	(15300.)	0.	1039.	2.

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY DJS DATE 5-13-81 PROJ. NO. 80-238-755

CHKD. BY DLO DATE 5-13-81 SHEET NO. X OF XX

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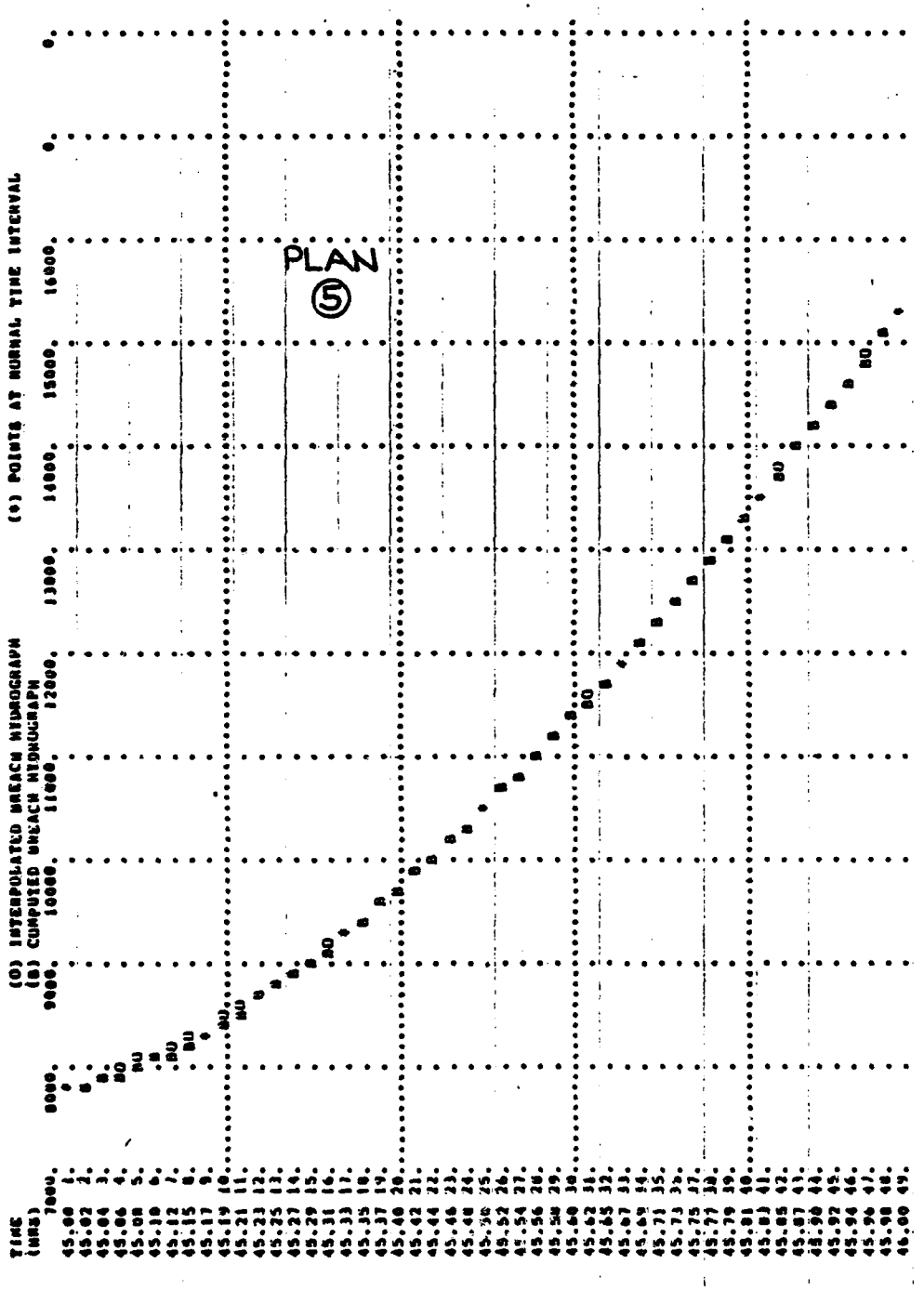

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY RTS DATE 5-13-81 PROJ. NO. 80-238-755
CHKD. BY DLG DATE 5-13-81 SHEET NO. Y OF ZZ

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HYDROGRAPH ROUTING

ROUTE FROM DAM TO SECTION 1: 5700 FT D.S. FROM DAM

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
SEC 1	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

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

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

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELMVI	ELMAX	RLNTH	SEL
.0800	.0450	.1500	1260.0	1280.0	5700.	.00600

CROSS SECTION COURDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1280.00 500.00 1265.00 597.00 1263.00 600.00 1260.00 640.00 1260.00
643.00 1263.00 700.00 1272.00 760.00 1280.00

STORAGE	0.00	5.65	11.60	17.92	29.42	48.81	74.56	106.07	143.33
	235.10	289.61	349.90	416.10	488.22	566.27	650.23	740.11	835.91
OUTFLOW	0.00	111.24	352.29	696.17	1194.51	1914.51	2910.77	4199.55	5809.71
	10106.12	12846.06	16010.72	19628.14	23726.23	28329.13	33460.44	39143.25	45400.16
STAGE	1260.00	1261.05	1262.11	1263.16	1264.21	1265.26	1266.32	1267.37	1268.42
	1270.53	1271.58	1272.63	1273.68	1274.74	1275.79	1276.84	1277.89	1278.95
FLOW	0.00	111.24	352.29	696.17	1194.51	1914.51	2910.77	4199.55	5809.71
	10106.12	12846.06	16010.72	19628.14	23726.23	28329.13	33460.44	39143.25	45400.16

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

HYDROGRAPH ROUTING

ROUTE FROM SECTION 1 TO SECTION 2: 6450 FT D.S. FROM DAM

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
SEC2	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

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

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

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY JJS DATE 5-13-81 PROJ. NO. 80-238-755
CHKD. BY DLG DATE 5-12-81 SHEET NO. 12 OF 22

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NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.1000	.0400	.1000	1256.0	1280.0	750.	.00600

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1280.00 100.00 1260.00 357.00 1259.00 360.00 1256.00 400.00 1256.00
403.00 1259.00 450.00 1260.00 550.00 1280.00

STORAGE	0.00	.90	1.85	4.48	12.07	20.05	28.30	36.83	45.63
	64.06	73.69	83.59	93.76	104.21	114.94	125.94	137.21	148.76
OUTFLOW	0.00	169.47	536.81	1139.40	2513.03	4598.72	7277.09	10499.59	14237.39
	23189.55	28382.11	34043.09	40168.25	46754.85	53801.29	61306.92	69271.79	77696.59
STAGE	1256.00	1257.26	1258.53	1259.79	1261.05	1262.32	1263.58	1264.84	1266.11
	1268.63	1269.89	1271.16	1272.42	1273.68	1274.95	1276.21	1277.47	1278.74
FLOW	0.00	169.47	536.81	1139.40	2513.03	4598.72	7277.09	10499.59	14237.39
	23189.55	28382.11	34043.09	40168.25	46754.85	53801.29	61306.92	69271.79	77696.59

****

HYDROGRAPH ROUTING

ROUTE FROM SECTION 2 TO SECTION 3; 10650 FT D.S. FROM DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPNT	INAME	ISTAGE	IAUTO
SEC3	1	0	0	0	0	1	0	0

ALL PLANS HAVE SAME ROUTING DATA

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

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

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.1500	.0450	.0800	1244.0	1260.0	4200.	.00300

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC
0.00 1260.00 250.00 1254.00 497.00 1247.00 500.00 1244.00 560.00 1244.00
563.00 1247.00 650.00 1249.00 1650.00 1260.00

STORAGE	0.00	4.94	10.02	15.23	21.08	31.49	47.29	70.30	101.94
	191.09	248.61	314.76	389.81	473.93	567.11	669.35	780.66	901.04
OUTFLOW	0.00	81.49	258.18	506.73	826.50	1247.01	1794.60	2496.53	3424.25
	6140.13	8003.82	10250.54	12904.63	16014.49	19612.27	23729.05	28394.95	33639.26
STAGE	1244.00	1244.84	1245.68	1246.53	1247.37	1248.21	1249.05	1249.89	1250.74
	1252.42	1253.26	1254.11	1254.95	1255.79	1256.63	1257.47	1258.32	1259.16
FLOW	0.00	81.49	258.18	506.73	826.50	1247.01	1794.60	2496.53	3424.25
	6140.13	8003.82	10250.54	12904.63	16014.49	19612.27	23729.05	28394.95	33639.26

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY DES DATE 5-13-81 PROJ. NO. 80-238-755
CHKD. BY DLG DATE 5-13-81 SHEET NO. 44 OF 77

GJ CONSULTANTS, INC.
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BREACH ANALYSIS SUMMARY (0.42PMF)

PECKS POND DAM

SUMMARY OF DAM SAFETY ANALYSIS

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1360.00	1360.00	1362.30
STORAGE	1097.	1097.	2143.
OUTFLOW	0.	0.	420.

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
.42	1364.19	1.89	3119.	4551.	9.33	44.33	0.00

HEMLOCK LAKE DAM

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1439.00	1439.00	1442.00
STORAGE	918.	918.	1399.
OUTFLOW	0.	0.	804.

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
.42	1441.04	0.00	1220.	452.	0.00	43.50	0.00

LOWER HEMLOCK LAKE DAM

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1432.00	1432.00	1435.30
STORAGE	307.	307.	394.
OUTFLOW	0.	0.	1012.

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
.42	1433.96	0.00	356.	463.	0.00	44.00	0.00

BLUE HERON LAKE DAM

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1337.00	1337.00	1338.50
STORAGE	201.	201.	343.
OUTFLOW	0.	0.	320.

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
.42	1340.45	1.95	551.	3709.	12.17	42.83	0.00

PORTERS LAKE DAM

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1315.00	1315.00	1316.50
STORAGE	1904.	1904.	2273.
OUTFLOW	0.	0.	39.

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
.42	1317.72	1.22	2598.	1133.	9.00	45.00	0.00

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM
BY JJS DATE 5-17-81 PROJ. NO. 80-238-755
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PICKERAL POND DAM.

PLAN (1).....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1311.00	1311.00	1317.70
STORAGE	362.	362.	2796.
OUTFLOW	0.	0.	7740.

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
.42	1317.83	.13	2077.	9713.	1.83	45.50	45.00

PLAN (2).....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1311.00	1311.00	1317.70
STORAGE	362.	362.	2796.
OUTFLOW	0.	0.	7740.

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
.42	1317.75	.05	2026.	26220.	.44	45.50	45.00

PLAN (3).....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1311.00	1311.00	1317.70
STORAGE	362.	362.	2796.
OUTFLOW	0.	0.	7740.

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
.42	1317.95	.25	2955.	8579.	3.00	48.58	45.00

PLAN (4).....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1311.00	1311.00	1317.70
STORAGE	362.	362.	2796.
OUTFLOW	0.	0.	7740.

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
.42	1317.85	.15	2092.	15274.	1.58	48.67	45.00

PLAN (5).....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1311.00	1311.00	1317.70
STORAGE	362.	362.	2796.
OUTFLOW	0.	0.	7740.

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
.42	1317.80	.10	2060.	15300.	.96	46.00	45.00

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PICKERAL POND DAM

BY JDS DATE 5-13-81 PROJ. NO. 80-238-755

CHKD. BY DHG DATE 5-13-81 SHEET NO. 5C OF 22

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PLAN (6)..... (NON-BREACH)

	ELEVATION	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
	STORAGE	1311.00	1311.00	1317.70
	OUTFLOW	362.	362.	2796.
		0.	0.	7740.

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
.42	1317.96	.26	2959.	8253.	3.50	46.50	0.00

PLAN (1) STATION SEC1

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	9593.	1270.3	46.33

PLAN (2) STATION SEC1

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	22882.	1274.5	45.83

SECTION 1

PLAN (3) STATION SEC1

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	8577.	1269.8	48.83

PLAN (4) STATION SEC1

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	15225.	1272.4	49.00

PLAN (5) STATION SEC1

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	14412.	1272.1	46.33

PLAN (6) STATION SEC1 (NON-BREACH)

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	8238.	1269.7	46.67

SUBJECT DAM SAFETY INSPECTION
PICKERAL POND DAM

BY JDSI DATE 5/3-81 PROJ. NO. 80-238-755

CHKD. BY DLG DATE 5/3-81 SHEET NO. 222 OF 222

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Environmental Specialists

PLAN (1) STATION SEC2

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	9595.	1264.5	46.33

PLAN (2) STATION SEC2

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	22894.	1268.6	45.83

PLAN (3) STATION SEC2

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	8576.	1264.1	48.83

PLAN (4) STATION SEC2

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	15226.	1266.4	49.00

PLAN (5) STATION SEC2

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	14414.	1266.2	46.33

PLAN (6) STATION SEC2
(NON-BREACH)

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	8237.	1264.0	46.83

SECTION 2

SECTION 3

PLAN (1) STATION SEC3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	9481.	1253.8	46.83

PLAN (2) STATION SEC3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	20916.	1256.9	46.33

PLAN (3) STATION SEC3

RATIO	FLOW,CFS	STAGE,FT	HOURS
.42	8568.	1253.5	49.00

PLAN (4) STATION SEC3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	15076.	1255.5	49.17

PLAN (5) STATION SEC3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	13796.	1255.2	46.83

PLAN (6) STATION SEC3
(NON-BREACH)

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
.42	8209.	1253.3	47.17

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APPENDIX E

FIGURES

LIST OF FIGURES

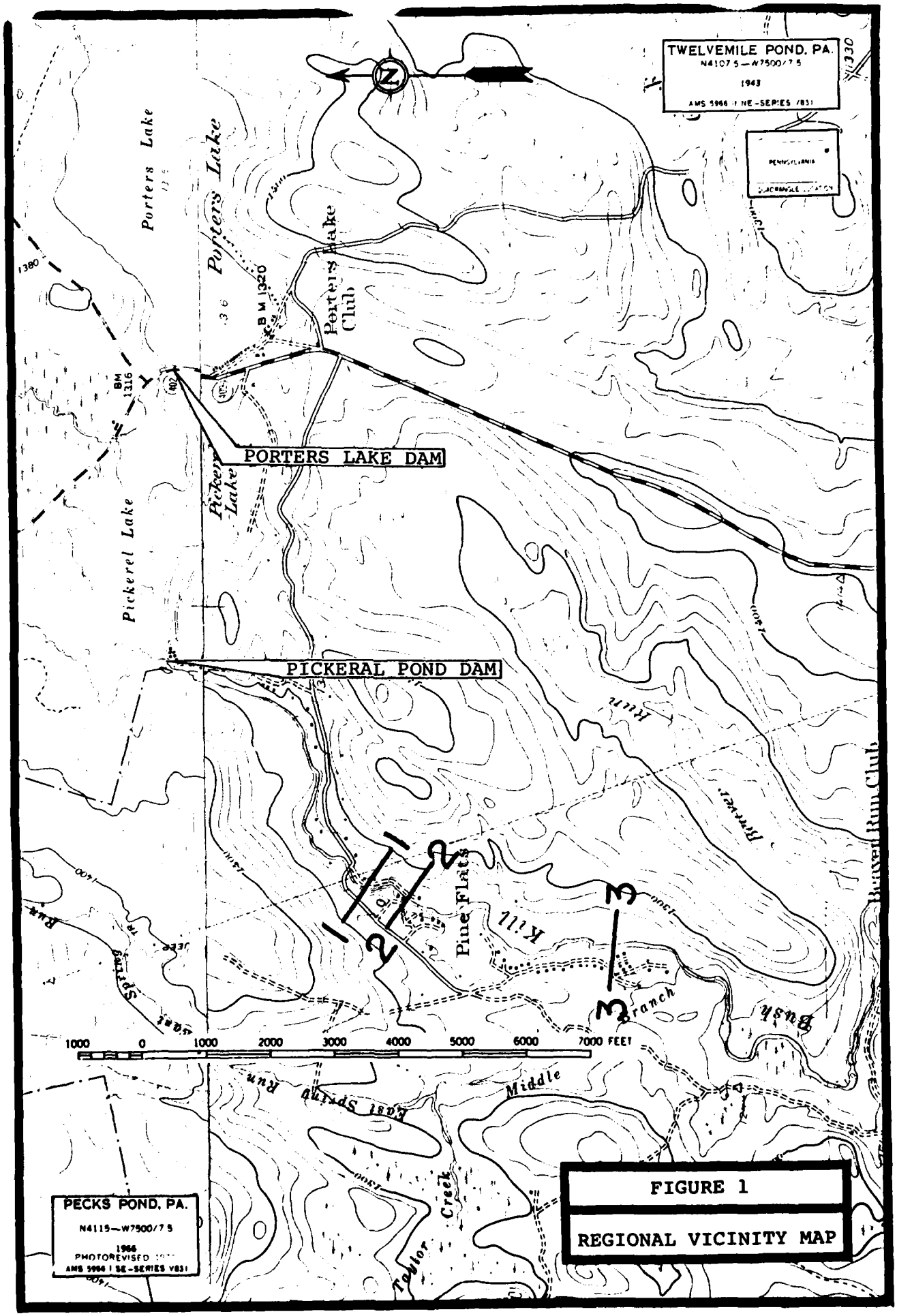


FIGURE 1

REGIONAL VICINITY MAP

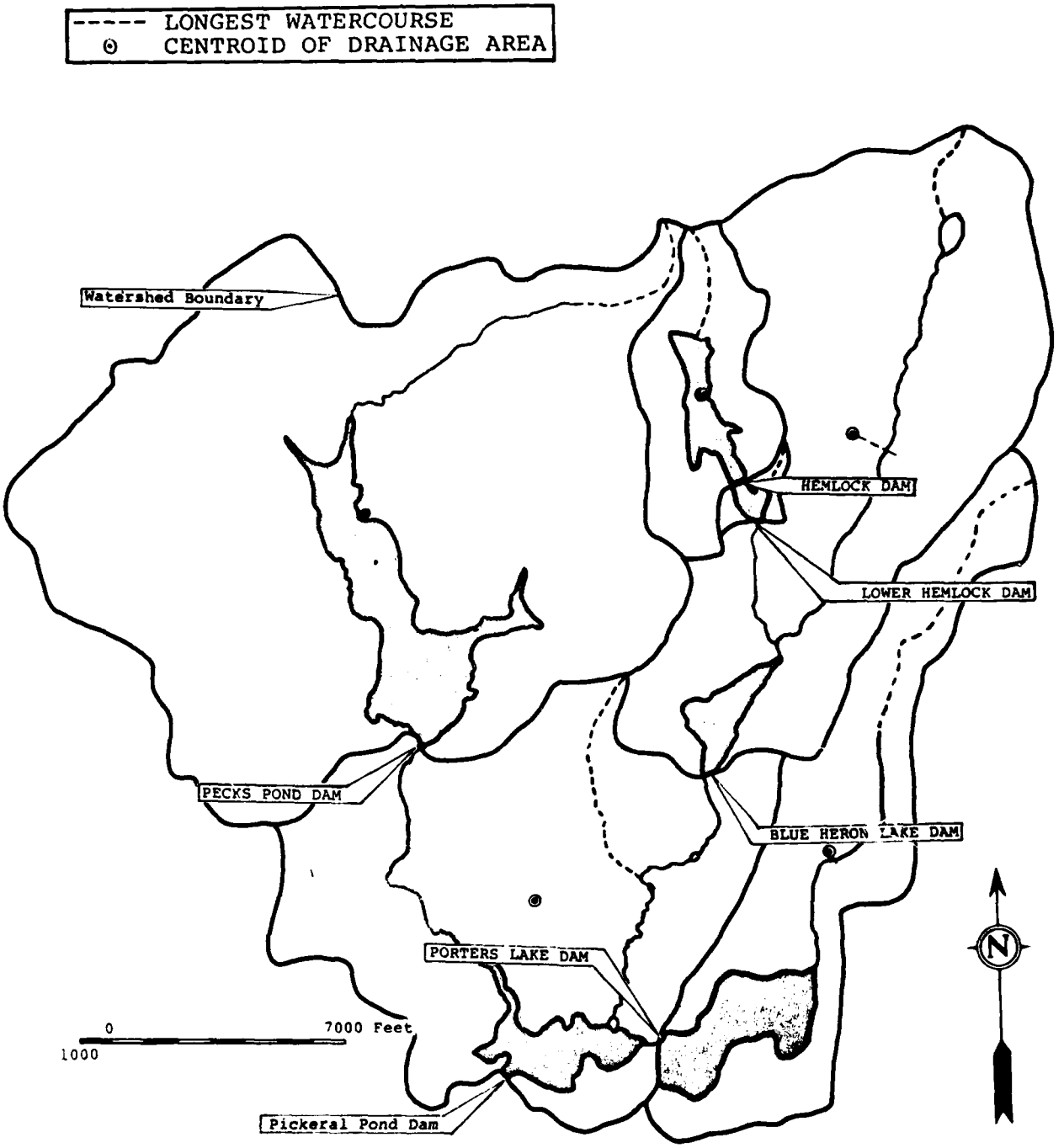
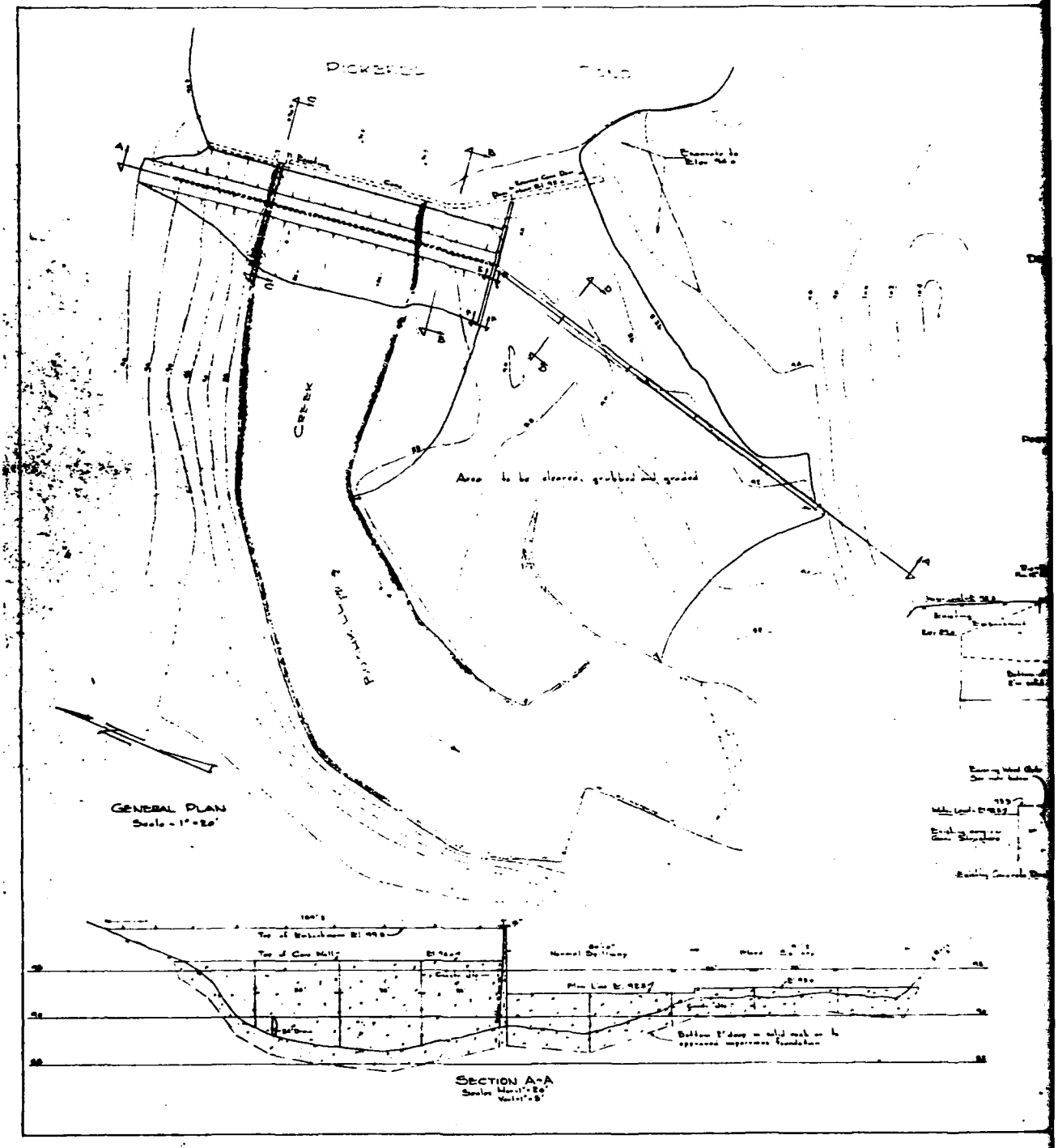


FIGURE 2

WATERSHED BOUNDARY MAP


GENERAL PLAN
SECTION A-A

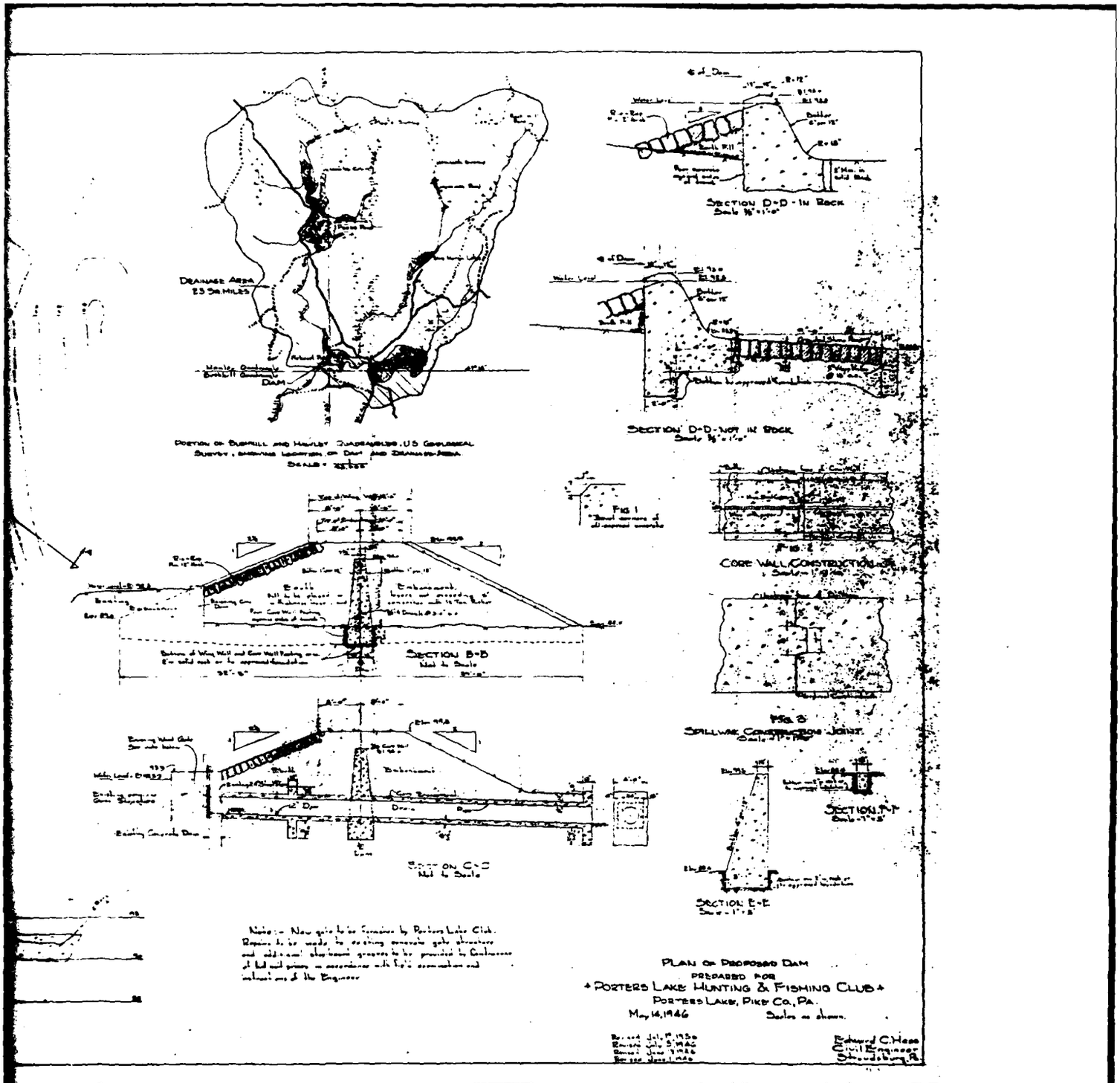


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FIGURE 3

APPENDIX F

GEOLOGY

Geology

Pickeral Pond Dam is located in the glaciated Low Plateaus section of the Appalachian Plateaus physiographic province of eastern Pennsylvania. In this area, the Appalachian Plateaus province is characterized topographically by flat-topped, hummocky hills formed as a result of glaciation and subsequent stream dissection of nearly flat-lying strata. The Devonian age sedimentary rock strata in Pike County regionally strike N35°E and dip gently to the northwest. The Delaware River is the major drainage basin in the area. Major tributary streams intersect the Delaware River at right angles; whereas, smaller streams display a slightly more random tributary pattern. Both major and minor tributary stream systems are joint controlled and exhibit modified rectangular and trellis-type drainage patterns.

Structurally, the area containing Pike County lies on the south flank of a broad, asymmetrical synclinorium that plunges to the southwest. Superimposed on this broad structural basin are numerous anticlinal and synclinal folds characterized by planar limbs and narrow hinges. Due to prior glaciation, low relief and surficial soil cover, fold axes are difficult to trace.

The sedimentary rock sequences in the vicinity of the dam and reservoir are probably members of the Susquehanna Group of Upper Devonian age (see Geology Map). The sedimentological changes observed in the Catskill Formation indicate that the rate of sedimentation exceeded the rate of basin subsidence, resulting in a facies change from marine to non-marine strata. On the accompanying geology map the delineation between the Middle and Upper Devonian age sedimentary rock sequences represents the Allegheny Front which separates the Valley and Ridge physiographic province from the Appalachian Plateaus physiographic province.

Approximately half of Pike County, including the dam site, is covered by a blanket of Wisconsin age (most recent) glacial drift which, based on the degree of weathering, was probably deposited during the Woodfordian stage. Valley bottoms are typically covered by recent alluvium and Woodfordian outwash of variable thickness, but typically less than 10 feet. These deposits are characteristically unconsolidated stratified sand and gravel, usually with more gravel than sand and some small boulders. The direction of the Wisconsin ice advance was from the northeast over the Catskill Mountains and from the north over the Appalachian Plateau. The terminal moraine resulting from the southern most advance of the Wisconsin ice sheet in this area is located in the southern portion of Monroe County, which borders Pike County to the South.

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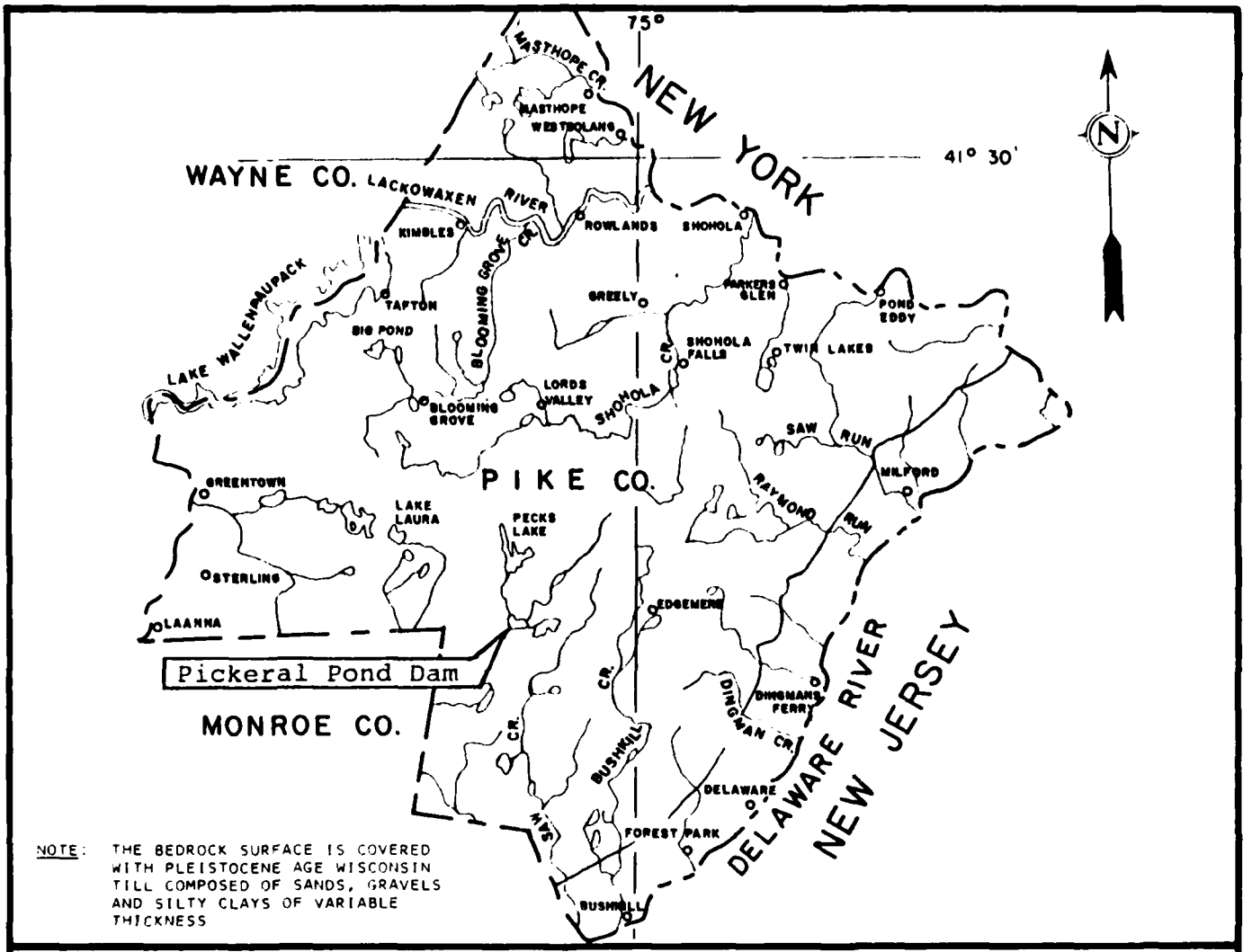

NOTE: THE BEDROCK SURFACE IS COVERED WITH PLEISTOCENE AGE WISCONSIN TILL COMPOSED OF SANDS, GRAVELS AND SILTY CLAYS OF VARIABLE THICKNESS

LEGEND

UPPER DEVONIAN

SUSQUEHANNA GROUP

Catskill Formation - *Shohola Member interbedded 5- to 55-foot thick units of greenish-gray, red and purple red very fine to medium-grained sandstone and sandy shale and lesser medium-gray to medium-dark-gray siltstone and shale. Sandstones are predominantly low-rank greywackes. Beds are thin to very thick, most have simple or planar sets of small- to medium-scale, generally low-angle cross stratification. Contacts with shale units are abruptly disconformable to gradational. Sandstones are poorly sloped, beds are thinly laminated and well cleaved. Mud cracks, convolute bedding, and sole marks are present near contacts with sandstone units. Member is more than 2,000 feet thick. Lower contact is gradational and is placed at top of highest red bed of the underlying Analomink. Analomink Red Shale Member, medium-grayish-red silty, micaceous, finely laminated well-cleaved shale containing thin beds of brownish-gray arkosic siltstone and silty very fine grained sandstone. Unit in the "first wall" going up section in Upper Pike County; member is about 100 feet thick. Lower contact is gradational and is placed at the base of lowest red bed. Delaware River Flags Member, grayish-green, micaceous, laminated sandstone and lesser interbedded shale. Beds range from a few inches to as much as 4 feet thick. Sandstones are low-rank greywackes and contain no marine fossils. Member is about 300 feet thick. Lower contact is gradational.*

MIDDLE DEVONIAN

HAMILTON GROUP

Mahantango Formation - *Upper member medium-dark-gray, fairly coarse grained, thin-bedded siltstone and silty shale; member in about 700 feet thick and is separated from lower member by the "Honesdale Reef," a calcareous siltstone biostrome containing abundant horn corals. The Centerfield is about 21 feet thick, lower member, virtually same lithology as upper member. Unit is about 1,100 feet thick. Lower contact is gradational.*

Marcellus Shale - *Dark-gray, evenly laminated, silty clay shale and clayey silt shale. Unit commonly contains very hard limy concretions and is well cleaved; bedding is generally obscured. Member is about 75-feet thick. Lower contact is gradational.*

SCALE

0 6 12 18 MILES

REFERENCE:
GEOLOGIC MAP OF NORTHEASTERN PENNSYLVANIA. COMPILED BY GEO. W. STOSE AND O.A. LJUNGSTEDT COMMONWEALTH OF PENNSYLVANIA DEPT. OF INTERNAL AFFAIRS DATED 1932, SCALE 1" = 6 MILES.

GEOLOGY MAP

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