

AD-A065 638

D'APPOLONIA CONSULTING ENGINEERS PITTSBURGH PA
NATIONAL DAM INSPECTION PROGRAM. YELLOW CREEK STATE PARK DAM (N--ETC(U)
SEP 78

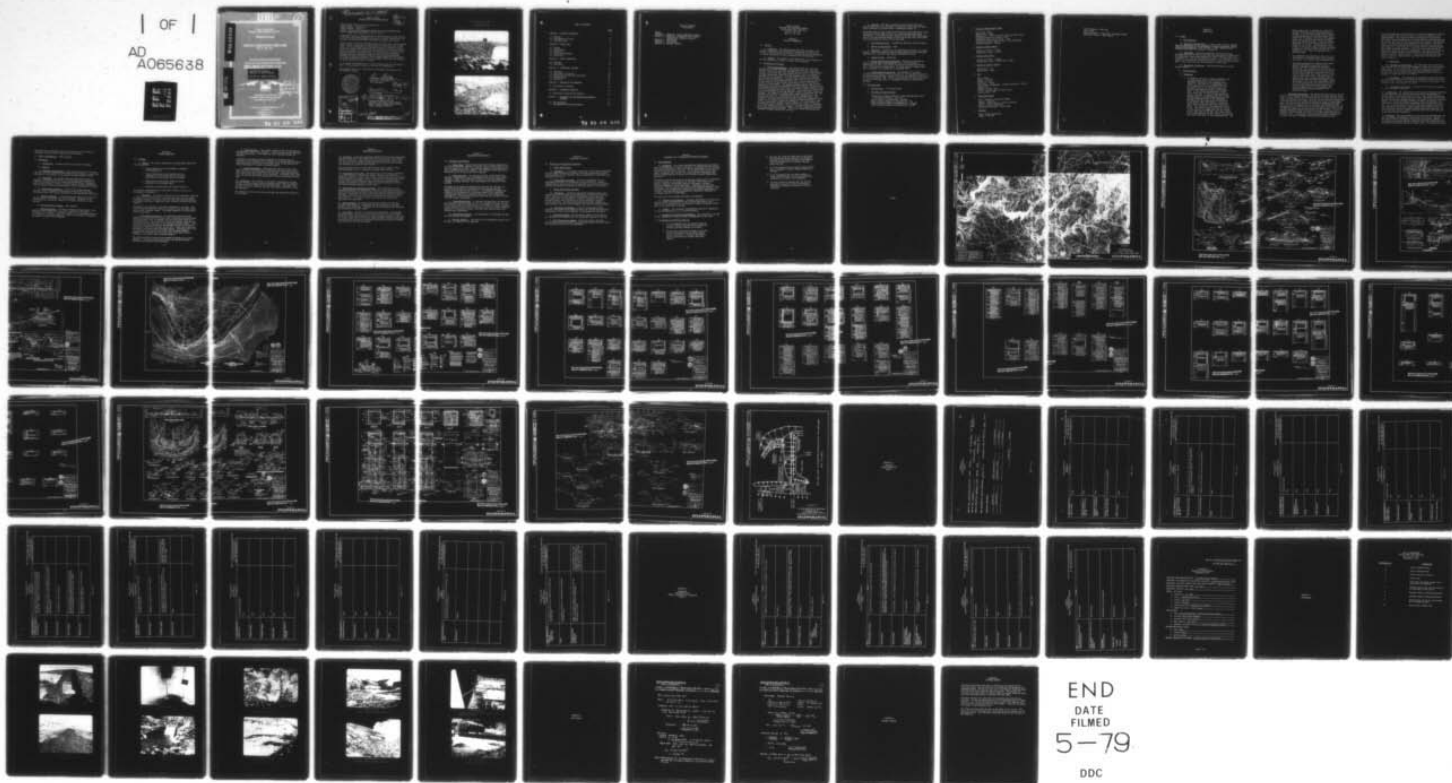
F/G 13/2

DACW31-78-C-0049

UNCLASSIFIED

NL

| OF |
AD
A065638



END
DATE
FILMED
5-79
DDC

AD A0 65638

DDC FILE COPY

OHIO RIVER BASIN
YELLOW CREEK, INDIANA COUNTY

PENNSYLVANIA

YELLOW CREEK STATE PARK DAM

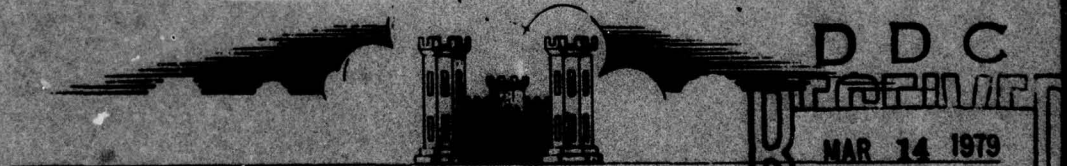
NDI I.D. NO: 282

PHASE I INSPECTION REPORT NATIONAL DAM INSPECTION PROGRAM

ORIGINAL CONTAINS COLOR PLATES; ALL DDC
REPRODUCTIONS WILL BE IN BLACK AND WHITE.

Distribution Unlimited
Approved for Public Release

Contract No. DACW31-78-C-0049



PREPARED FOR

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

BY

D'APPOLONIA CONSULTING ENGINEERS
10 DUFF ROAD
PITTSBURGH, PA. 15235
SEPTEMBER 1978

79 03 08 04

(15) ACW31-78-C-449

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM

(12)
76p.

NAME OF DAM: Yellow Creek State Park Dam
STATE LOCATED: Pennsylvania
COUNTY LOCATED: Indiana
STREAM: Yellow Creek, secondary tributary of the Conemaugh River
DATE OF INSPECTION: (September 2 and 8, 1978)

ASSESSMENT: Based on the evaluation of the conditions as they existed on the dates of inspection and as revealed by visual observations, the condition of Yellow Creek State Park Dam is assessed to be good.

Severe erosion of rock was observed along the right wall of the spillway outlet channel, resulting in undermining of the spillway wall foundations. It is recommended that the eroded areas be repaired to avoid structural damage to the walls that may result due to further erosion. Minor rock slides were observed on the right bank of the outlet works discharge channel. The right bank of the outlet works discharge channel should be periodically observed and necessary maintenance performed to prevent blockage of the discharge channel by rock slides. It is also recommended that the outlet conduit sluice gate be repaired to permit adequate seating of the gate.

It is further recommended that a formal warning system be developed to alert the downstream residents in the event of emergencies.

The spillway capacity is classified to be adequate according to the recommended criteria.



Lawrence D. Andersen

Lawrence D. Andersen, P.E.
Vice President

(11 Sep 78)

G. K. Withers

1 Dec 78

G. K. WITHERS
Colonel, Corps of Engineers
District Engineer

© National Dam Inspection Program
Yellow Creek State Park Dam
(NDI-282), Ohio River Basin, Yellow
Creek, Indiana County, Pennsylvania.
Phase I Inspection Report.

ACCESSION FOR	
WTR	White Section <input checked="" type="checkbox"/>
GRS	Griff Section <input type="checkbox"/>
UNRECORDED	<input type="checkbox"/>
JUSTIFICATION	
BY	
DISTRIBUTION/AVAILABILITY CODE	
COPIES	AVAIL. CODE/ST. SYMBOL
A	

411 001

ORIGINAL CONTAINS COLOR PLATES: ALL DDC
REPRODUCTIONS WILL BE IN BLACK AND WHITE.

YELLOW CREEK STATE PARK DAM
NDI I.D. NO. 282
SEPTEMBER 1, 1978



Upstream Face



Downstream Face

TABLE OF CONTENTS

	<u>PAGE</u>
SECTION 1 - PROJECT INFORMATION	1
1.1 General	1
1.2 Description of Project	1
1.3 Pertinent Data	2
SECTION 2 - DESIGN DATA	5
2.1 Design	5
2.2 Construction	7
2.3 Operation	7
2.4 Other Investigations	8
2.5 Evaluation	8
SECTION 3 - VISUAL INSPECTION	9
3.1 Findings	9
3.2 Evaluation	10
SECTION 4 - OPERATIONAL FEATURES	11
4.1 Procedure	11
4.2 Maintenance of the Dam	11
4.3 Maintenance of Operating Facilities	11
4.4 Warning System	11
4.5 Evaluation	11
SECTION 5 - HYDRAULICS AND HYDROLOGY	12
5.1 Evaluation of Features	12
SECTION 6 - STRUCTURAL STABILITY	13
6.1 Evaluation of Structural Stability	13
SECTION 7 - ASSESSMENT AND RECOMMENDATIONS/REMEDIAL MEASURES	14
7.1 Dam Assessment	14
7.2 Recommendations/Remedial Measures	14

TABLE OF CONTENTS
(Continued)

PLATES

- APPENDIX A - CHECKLIST, VISUAL INSPECTION, PHASE I
- APPENDIX B - CHECKLIST, ENGINEERING DATA, DESIGN,
CONSTRUCTION, OPERATION, PHASE I
- APPENDIX C - PHOTOGRAPHS
- APPENDIX D - CALCULATIONS
- APPENDIX E - REGIONAL GEOLOGY

PHASE I REPORT
NATIONAL DAM INSPECTION PROGRAM
YELLOW CREEK STATE PARK DAM
NDI I.D. NO. 282
DER I.D. NO. 32-74

SECTION 1
PROJECT INFORMATION

1.1 General

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

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

1.2 Description of Project

a. Dam and Appurtenances. The Yellow Creek State Park Dam consists of an earth embankment approximately 625 feet long with a maximum height of 62 feet from the downstream toe and a crest width of 25 feet. A 112-foot-wide open channel cut into the left abutment (looking downstream) constitutes the combined primary and emergency spillway for the reservoir. A 10-foot-wide broad-crested concrete weir across the spillway is located in line with the axis of the dam and at a level 25 feet below the dam crest. A notch approximately 40 feet wide and 16 inches deep in the concrete weir is the low flow section of the spillway. The unlined spillway channel terminates at a plunge pool about 250 feet downstream from the spillway control section. The spillway discharge channel joins the natural course of Yellow Creek 250 feet downstream from the plunge pool. The outlet works consist of a five-foot-diameter reinforced concrete conduit located near the right abutment. The conduit is equipped with trash rack devices on the upstream end and with a stilling basin at the discharge end. Flow through the conduit is controlled by sluice gates and regulatory valves located in the reinforced concrete control structure situated at mid-length of the conduit through the embankment. The outlet works also include a high-level intake structure located at a level 17 feet below the spillway crest elevation. The concrete control structure consists of two dry chambers and one wet chamber. The wet chamber includes the water stage recording equipment. This outlet system constitutes the emergency drawdown facility for the dam.

b. Location. The dam is located in Yellow Creek State Park approximately six miles southeast of Indiana in Cherry Hill and Brush Valley townships in Indiana County, Pennsylvania (Plate 1).

Downstream from the dam, Yellow Creek follows a narrow and steep valley and joins Two Lick Creek at Homer City approximately eight miles downstream. It is estimated that failure of the dam would cause large loss of life and property damage in the town of Homer City and further downstream along the course of Two Lick Creek.

c. Size Classification. Intermediate (based on 62-foot height).

d. Hazard Classification. High.

e. Ownership. Commonwealth of Pennsylvania (address: Mr. James Boswell, Chief of Operations, Pennsylvania Department of Environmental Resources, P.O. Box 2063, Harrisburg, Pennsylvania 17120).

f. Purpose of Dam. Recreation.

g. Design and Construction History. The dam was designed by Gannett Fleming Corddry and Carpenter, Inc., of Harrisburg, Pennsylvania in 1966. The dam was constructed by Harris and Brooks, Inc., of Riverdale, Maryland and S. J. Groves and Sons Company, Ann Arbor, Michigan, with completion in September 1969.

h. Normal Operating Procedure. The reservoir is normally maintained at Elevation 1278.75, the level of the low flow section of the uncontrolled spillway, leaving 26.25 feet of freeboard to the top of the dam at Elevation 1305. Inflow occurring when the lake level is at or above the spillway level is discharged through the uncontrolled spillway.

1.3 Pertinent Data

a. Drainage Area - 52.5 square miles

b. Discharge at Dam Site (cfs)

Maximum known flood at dam site - 6400 (maximum pool level
at Elevation 1285.02) - July 1977
Outlet conduit at maximum pool - Unknown
Gated spillway capacity at maximum pool - N/A
Ungated spillway capacity at maximum pool - 36,400
Total spillway capacity at maximum pool - 36,400

c. Elevation (USGS Datum) (feet)

Top of dam - 1305
Maximum pool - 1305
Normal pool - 1278.75 (spillway low flow crest level)
Upstream invert outlet works - 1247
Downstream invert outlet works - 1244
Streambed at center line of dam - 1240 (estimated)
Maximum tailwater - Unknown

d. Reservoir Length (feet)

Normal pool level - 16,500
Maximum pool level - 18,500

e. Storage (acre-feet)

Normal pool level - 13,800
Maximum pool level - 37,800 (top of dam)

f. Reservoir Surface (acres)

Normal pool - 710
Maximum pool - 1280

g. Dam

Type - Earth
Length - 625 feet
Height - 62 feet
Top width - 25 feet
Side slopes - Downstream: 2.0H:1V; Upstream: 2.5H:1V
Zoning - Yes
Impervious core - Yes
Cutoff - Cutoff trench to top of rock
Grout curtain - Yes

h. Regulating Outlet

Type - Five-foot reinforced conduit
Length - 250+ feet
Closure - Sluice gate at control structure
Access - Control structure
Regulating facilities - Sluice gate

i. Spillway

Type - Broad-crested weir
Length - 112 feet

Crest elevation - 1280 feet

Gate - None

Upstream channel - Trapezoidal riprapped channel

Downstream channel - Rock channel

SECTION 2 DESIGN DATA

2.1 Design

a. Data Available

(1) Hydrology and Hydraulics. A state report entitled, Report Upon the Application of the Department of Forests and Waters and the General State Authority, dated November 3, 1966, summarizes the available hydrologic and hydraulic information.

(2) Embankment. Available information consists of design drawings which also include boring logs and some hydrologic information. The embankment design report prepared by Gannett Fleming Corddry and Carpenter, Inc., was not available for review. They reported that their records for this dam were destroyed during the flood of Tropical Storm Agnes. These data were also not available in state files.

(3) Appurtenant Structures. Available information includes design drawings.

b. Design Features

(1) Embankment

- a. As designed, the dam is a zoned embankment with a cutoff trench on the center line of the embankment extending to the foundation rock (Plate 2). The zones of the embankment with select random fill on both sides of the core and random fill on the outside forming the upstream and downstream slopes of the embankment. A rock blanket approximately 10 feet thick covers both the upstream and downstream faces of the dam. A chimney drain and a filter blanket beneath the downstream slope forms the internal drainage system of the embankment. The impervious fill zone starts at the bottom of the cutoff trench and extends to Elevation 1285, which is five feet above the normal pool level. The top width of the impervious fill is 5 feet. The select random fill zone is located on both sides of the impervious fill and extends to the crest level of the dam. The select random fill is approximately 30 feet thick on the upstream side and 10 feet thick on the downstream side. The

select random fill is followed by random fill forming the downstream and upstream slopes of the dam. A 10-foot-thick chimney drain beneath the downstream slope is located between select random fill and random fill zones. The chimney drains into a three-foot-thick filter blanket under the downstream slope. The filter blanket discharges into a rock trench along the downstream toe of the dam. The design also incorporates a triple-line staged foundation grouting system which extends at least 60 feet into the foundation rock. Plate 3 illustrates this grouting scheme.

- b. The embankment was designed to have a 2.5 to 1 (horizontal to vertical) slope on the upstream face and a 2 to 1 slope on the downstream face.
- c. The boring locations for foundation and borrow material exploration are shown in Plate 4. Plates 5 through 10 include the available boring logs. The subsurface profile along the axis of the dam consists of silty clays five to 10 feet thick along the valley walls and silty fine to medium sand and to gravel up to 50 feet thick at the valley floor. The overburden is underlain by fine- to medium-grained, thin to medium bedded sandstone with interbedded shales, siltstones, clays, and thin carbonaceous units. It is reported that the rock units at the site belong to the Pennsylvanian Age between the Lower Kittanning coal of the Allegheny Group and the Homewood Sandstone Member of the Pottsville Group.

c. Appurtenant Structures. The appurtenant structures of the dam consist of the combined emergency and primary spillways and the outlet works. An open channel 112 feet wide cut into the left abutment constitutes the spillway of the dam. The crest of the spillway is capped with a 10-foot-wide concrete overflow section which forms a broad-crested weir. The crest of the spillway is located at Elevation 1280, which leaves 25 feet of freeboard to the top of the dam (Elevation 1305). A rectangular notch 33 feet wide and 16 inches deep at the middle of the spillway weir forms the low flow section of the spillway. The unlined spillway discharge channel narrows from a width of 112 feet at the hydraulic control section to 72 feet at 215 feet downstream from the spillway crest. The spillway channel discharges into a plunge pool 40 feet by 40 feet as designed excavated into foundation rock.

The outlet works for the dam consist of a five-foot-diameter reinforced concrete conduit and a concrete control structure located near the right abutment. The conduit entrance is equipped with trash racks. The outlet conduit terminates at a stilling basin at the downstream toe of the dam. The concrete control structure is located at the upstream side of the dam crest at about midlength of the conduit. The control structure includes manually operated sluice gates and the regulatory valve controls. A wet well in the concrete control structure includes water stage recording equipment. The outlet works also include the high level intake for low flow augmentation. The concrete conduit was placed in a trench excavated into foundation rock and incorporates cutoff collars for seepage control. Outlet works details are shown in Plates 11 and 12. Plan, profile, and sections of the spillway are shown in Plate 13.

d. Design Data

(1) Hydrology and Hydraulics. The 1966 state report indicates that the spillway for the dam was designed to pass the maximum probable flood (PMF). It is reported that the PMF was based on 27.1 inches of precipitation in six hours, which resulted in a maximum inflow of 61,670 cubic feet per second (cfs) and a maximum outflow through the spillway of 42,000 cfs with no freeboard.

(2) Embankment. The embankment as designed was apparently based on the geology and soils report prepared by Gannett Fleming Corddry and Carpenter, Inc. However, as noted above, the data on the design of the embankment were not available for review.

(3) Appurtenant Structures. No design calculations are available for the appurtenant structures.

2.2 Construction. The construction of the dam was apparently conducted in accordance with the drawings and specifications as prepared by Gannett Fleming Corddry and Carpenter, Inc. Very limited information was available on the construction of the dam. The state files included several construction progress reports. Mr. Albert C. Hooke, a principal designer of the dam with Gannett Fleming Corddry and Carpenter, was contacted to obtain additional information on the construction of the dam. To his recollection, there were some design changes made during the construction of the dam. These changes were recorded on the as-built drawings prepared by Gannett Fleming Corddry and Carpenter. He understands the as-built drawings were lost after they were delivered to the General State Authority.

2.3 Operation. The superintendent of the state park reported that the lake is normally maintained at the spillway crest level. Therefore, the normal inflow is discharged through the uncontrolled spillway. It is reported that during low flow conditions the flow in Yellow Creek is maintained by discharge through the outlet works. The 1966 state report

indicates that a continuous flow of not less than 7.8 cfs shall be maintained in Yellow Creek immediately below the dam.

2.4 Other Investigations. None reported.

2.5 Evaluation

a. Availability. Available data were provided by PennDER.

b. Adequacy

(1) Hydrology and Hydraulics. The reported results of the hydrologic and hydraulic analysis are considered to be adequate to assess the conformity of the analysis to the current spillway design criteria.

(2) Embankment. As inferred from the design drawings and as reported in the 1966 state report, the design generally followed the currently accepted practice for subsurface investigation, laboratory testing, and analysis. However, as noted before, detailed information, such as engineer reports or calculations, were not available for review.

(3) Appurtenant Structures. Review of the design drawings indicates that as designed no significant design deficiencies exist that should affect the overall performance of the appurtenant structures.

c. Operating Records. It was reported that operating records for the dam consist of periodic lake level readings. Operation of the sluice gates and regulatory valves in the control structure is also recorded.

d. Post-Construction Changes. None reported.

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

SECTION 3 VISUAL INSPECTION

3.1 Findings

a. General. The on-site inspection of Yellow Creek State Park Dam consisted of:

1. Visual inspection of the embankment, abutments, and embankment toe.
2. Visual examination of the spillway and its components, the downstream end of the outlet pipe and the outlet works control structure.
3. Observation of the factors affecting runoff potential of the drainage basin.
4. Evaluation of downstream area hazard potential.

The specific observations are illustrated in Plate 14 and in the photographs in Appendix C.

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

In general, the condition of the dam is considered to be good. Only one wet area was observed, located on a bench on the left side of the outlet works discharge channel. No seepage appeared to be associated with this wet area.

c. Appurtenant Structures. The appurtenant structures were examined for deterioration or other signs of distress and obstructions that would limit flow. In general, the structures were found to be in good condition. Severe erosion of rock was observed along the concrete walls on the right side of the spillway discharge channel. Some sections of the wall foundations were exposed by three to four feet. This erosion reportedly occurred in July 1977. Minor rock slides were observed in the outlet works discharge channel. The appearance of the cut along the right side of the outlet works discharge channel suggested the potential for rock slides that could result in the blockage of the outlet works discharge channel.

The concrete control structure was examined and found to be in good condition. The outlet conduit sluice gate was operated by park personnel and observed to be functional.

d. Reservoir Area. A map review indicates that the watershed is predominantly covered with woodlands. A minor portion of the watershed has been strip mined. A few homes are also scattered through the watershed.

A review of the regional geology (Appendix E) indicates that the shorelines of the reservoir are not likely to be susceptible to massive landslides which would affect the storage volume of the reservoir or cause overtopping of the dam by displaced water.

e. Downstream Channel. Downstream from the dam, Yellow Creek flows through a narrow and steep valley and joins Black Lick Creek in Homer City, eight miles downstream from the dam. Upstream from Homer City, the Yellow Creek Valley is not inhabited. The stream flows under Route 954 and the Penn-Central Railroad five miles downstream from the dam.

3.2 Evaluation. The condition of the dam is considered to be good. However, the rock erosion along the spillway walls should be repaired to avoid structural damage to the retaining walls. The outlet pipe was half-full due to the flow from the sluice gate; therefore, it was not inspected.

The operation of the outlet pipe sluice gate was observed and found to be functional.

SECTION 4 OPERATIONAL FEATURES

4.1 Procedure. State park personnel reported that the only operational feature of the dam is the augmentation of flow in Yellow Creek during low flow conditions. Under normal operating conditions, inflow into the reservoir is discharged through the uncontrolled primary spillway. The spillway has no operational features.

The operational feature of the dam which may affect safety is the outlet pipe gate if it is necessary to lower the reservoir.

4.2 Maintenance of the Dam. The maintenance of the dam is considered to be satisfactory. The spillway channel should be periodically inspected, especially after large flows, to assess the extent of erosion and the repairs to be made, if any. The rock cut along the right side of the outlet works discharge channel should also be periodically observed and necessary measures taken to prevent blockage of the outlet works discharge channel by rock slides.

4.3 Maintenance of Operating Facilities. The maintenance of the operating facilities is considered to be fair. State park personnel reported that the bottom sill of the outlet conduit sluice gate has been displaced. Therefore, the sluice gate could not be completely closed. The inside of the control structure was observed and found to be in good condition. The outlet conduit sluice gate was operated and observed to be functional.

4.4 Warning System. No formal warning system exists for the dam. The park superintendent, responsible for the operation of the dam, resides in the park area. Telephone and radio communication facilities are available at the park office.

4.5 Evaluation. The dam is satisfactorily maintained. The spillway discharge channel should be periodically inspected and the necessary maintenance should be undertaken to prevent erosion problems. The rock cut on the right side of the outlet works discharge channel should also be periodically observed and necessary maintenance performed to prevent rock slides into the outlet channel.

SECTION 5
HYDRAULICS AND HYDROLOGY

5.1 Evaluation of Features

a. Design Data. Yellow Creek State Park Dam has a watershed of 52.5 square miles and impounds a reservoir with a surface area of 740 acres at normal pool level. The combined emergency and primary spillway is located on the left abutment. The capacity of the spillway is determined to be 36,400 cfs with no freeboard.

b. Experience Data. As previously stated, Yellow Creek State Park Dam is classified as an "intermediate" dam in the "high" hazard category. Under the recommended criteria for evaluating emergency spillway discharge capacity, such impoundments are required to pass the PMF.

According to the hydrology and hydraulic analysis for the dam, the spillway was designed in conformance with the current spillway design criteria (see Section 2.1(d).1). An independent analysis was conducted of the adequacy of the spillway based on the simplified procedure developed by the Baltimore District, Corps of Engineers (Appendix D). This analysis also indicated that the spillway can pass full PMF without overtopping.

c. Visual Observations. On the date of inspection, no conditions were observed that would indicate that the emergency spillway for the dam could not function satisfactorily in the event of a flood. However, it was observed that the flow of 6400 cfs in July 1977 caused extensive erosion of the spillway channel, including some undercutting of the spillway wall foundations.

d. Overtopping Potential. As stated above, the spillway can pass full PMF without overtopping.

e. Spillway Adequacy. According to the recommended criteria, the spillway is classified to be adequate.

SECTION 6 STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

(1) Embankment. As discussed in Section 3, the field observations did not reveal any signs of distress that would significantly affect the performance of the structure, and no unsatisfactory conditions were reported in the past.

(2) Appurtenant Structures. Structural performance of the appurtenant structures is considered to be satisfactory. However, undercutting of the spillway wall foundations due to erosion should be repaired or monitored to assure the continued stability of the wall.

b. Design and Construction Data

(1) Embankment. The dam was apparently designed based on the evaluation of the subsurface conditions and the results of laboratory tests. However, as noted before, the engineer's report and the calculations were not available for review. Review of the design drawings suggests that the design of the dam followed currently accepted practice. The design incorporated such basic elements as cutoff trench, zoning of the embankment, and internal drainage system.

(2) Appurtenant Structures. Review of the design drawings indicates that there are no apparent structural deficiencies that would significantly affect the performance of the appurtenant structures.

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

d. Post-Construction Changes. There have been no reported post-construction modifications to the original design that would affect the structural stability of the embankment.

SECTION 7
ASSESSMENT AND RECOMMENDATIONS/REMEDIAL MEASURES

7.1 Dam Assessment

a. Assessment. The visual observations indicate that the Yellow Creek State Park Dam is in good condition. No conditions were observed that would significantly affect the overall performance of the structure and none were reported in the past. To the extent that can be determined, it appears that the dam was constructed with reasonable care and the design generally followed the currently accepted engineering practices.

The erosion problems observed in the spillway channel are not considered to pose a threat to the integrity of the dam at the present time. However, necessary maintenance should be performed to prevent structural damage to the spillway walls. Similarly, the wet area observed on the left side of the outlet works discharge channel is also considered to be insignificant relative to the overall performance of the dam. This area should be periodically observed to determine if a seepage condition is developing.

The capacity of the spillway was found to be adequate.

b. Adequacy of Information. Available information in conjunction with the visual observations and the previous experience of the inspectors are considered to be sufficient to make a reasonable assessment of the conditions of the dam.

c. Urgency. The following recommendations should be implemented as soon as practicable or on a continuing basis.

d. Necessity for Further Investigation. The condition of the dam is not considered to require further investigation at this time.

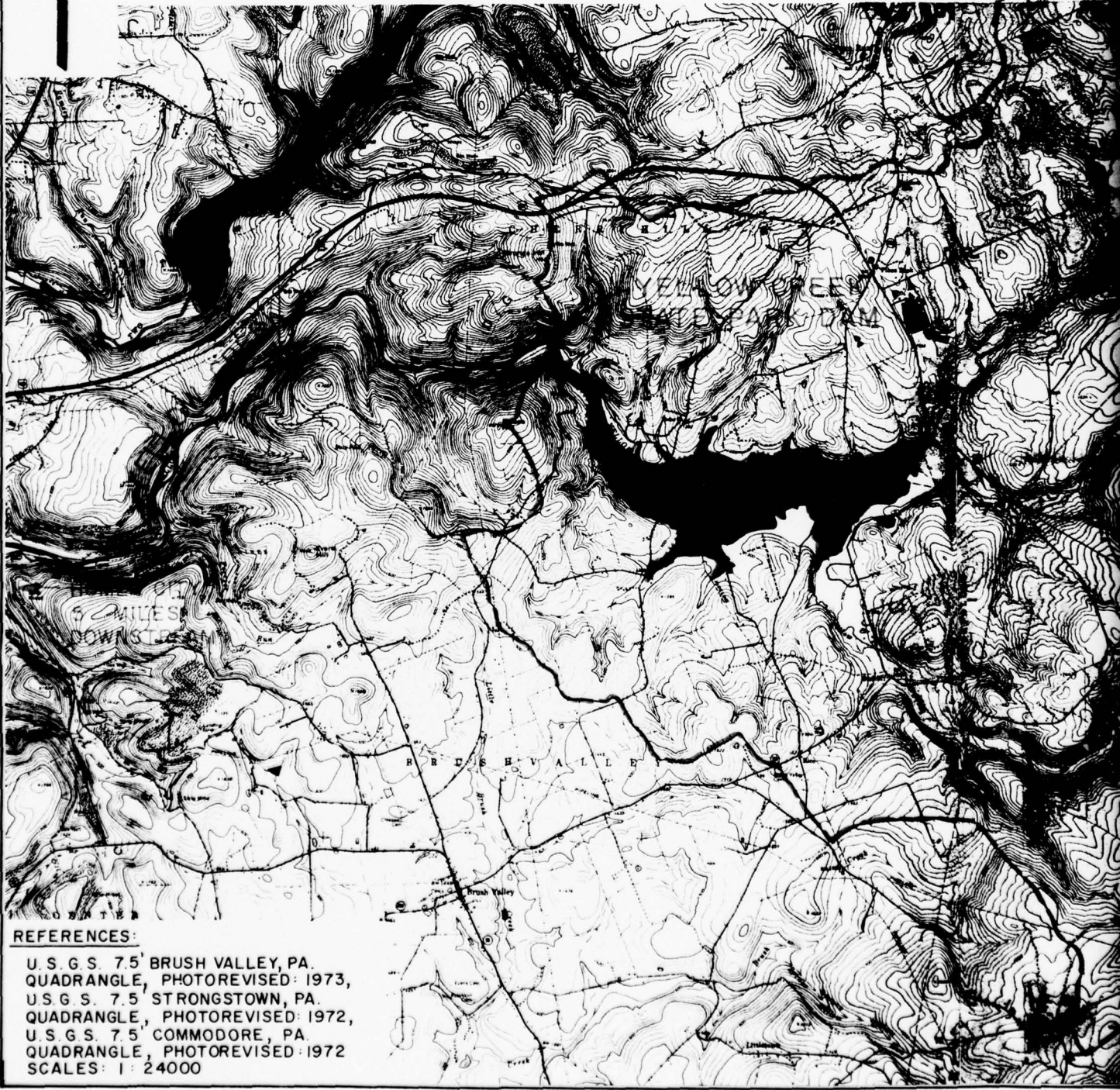
7.2 Recommendations/Remedial Measures

1. It is recommended that the erosion along the spillway channel walls should be repaired to prevent structural damage to the walls.
2. The wet area located on the bench on the left side of the outlet works discharge channel should be monitored. Necessary maintenance should be performed if seepage conditions develop.

3. The rock cut along the right side of the outlet works discharge channel should be periodically observed and necessary maintenance performed to avoid rock slides into the channel that may block the flow.
4. It is recommended that the outlet conduit sluice gate be repaired to permit adequate seating of the gate.
5. It is recommended that the owner develop a formal warning system to alert the downstream residents in the event of an emergency.
6. The owner should be advised that the dam and appurtenant structures should be inspected regularly and necessary maintenance should be performed.

PLATES

DRAWN BY	c/b	CHECKED BY	JCE	10-10-73	DRAWING NUMBER	78	1-B199



REFERENCES:

U.S.G.S. 7.5' BRUSH VALLEY, PA.
 QUADRANGLE, PHOTOREVISED: 1973,
 U.S.G.S. 7.5' STRONGSTOWN, PA.
 QUADRANGLE, PHOTOREVISED: 1972,
 U.S.G.S. 7.5' COMMODORE, PA.
 QUADRANGLE, PHOTOREVISED: 1972
 SCALES: 1:24000

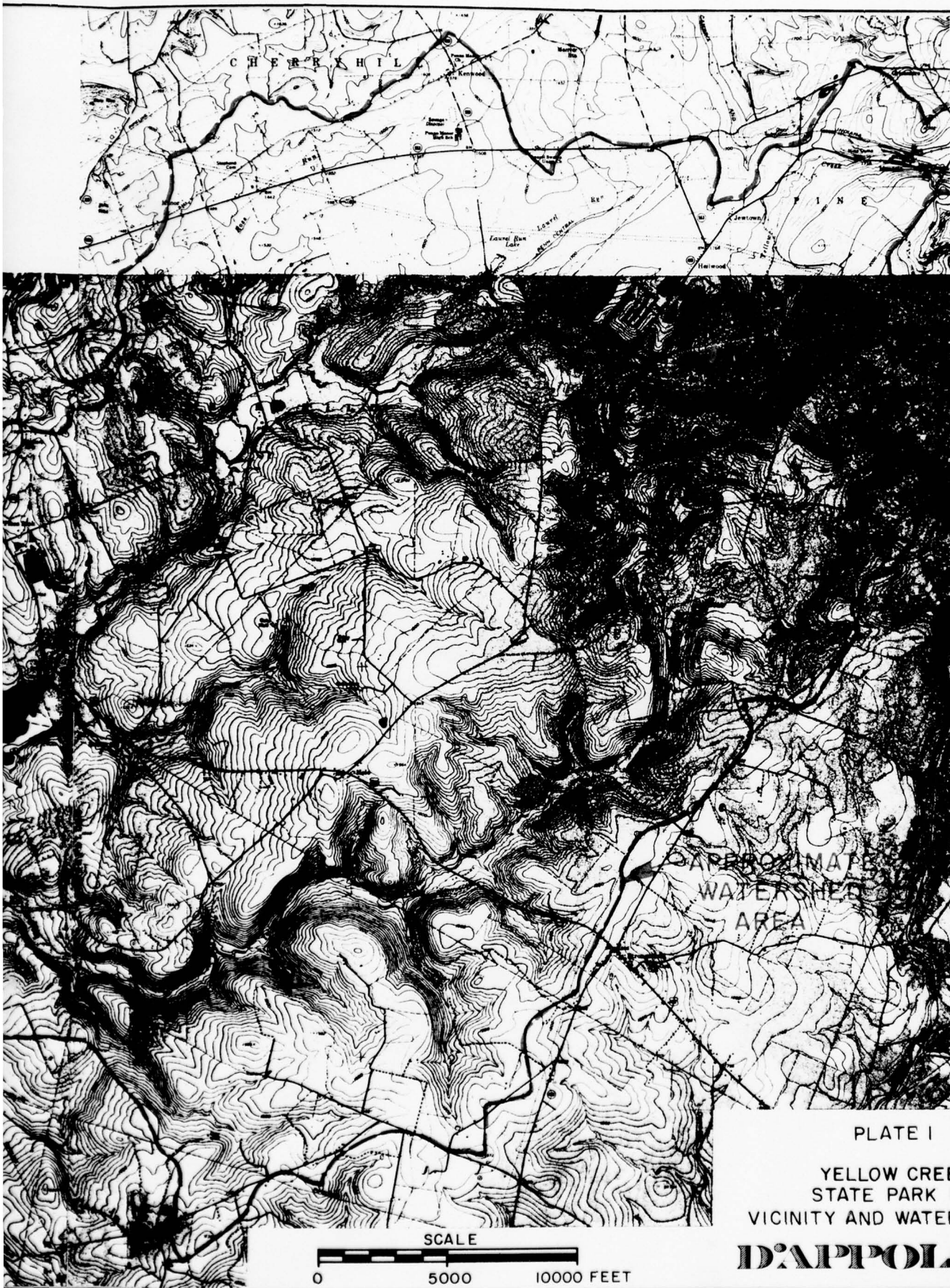
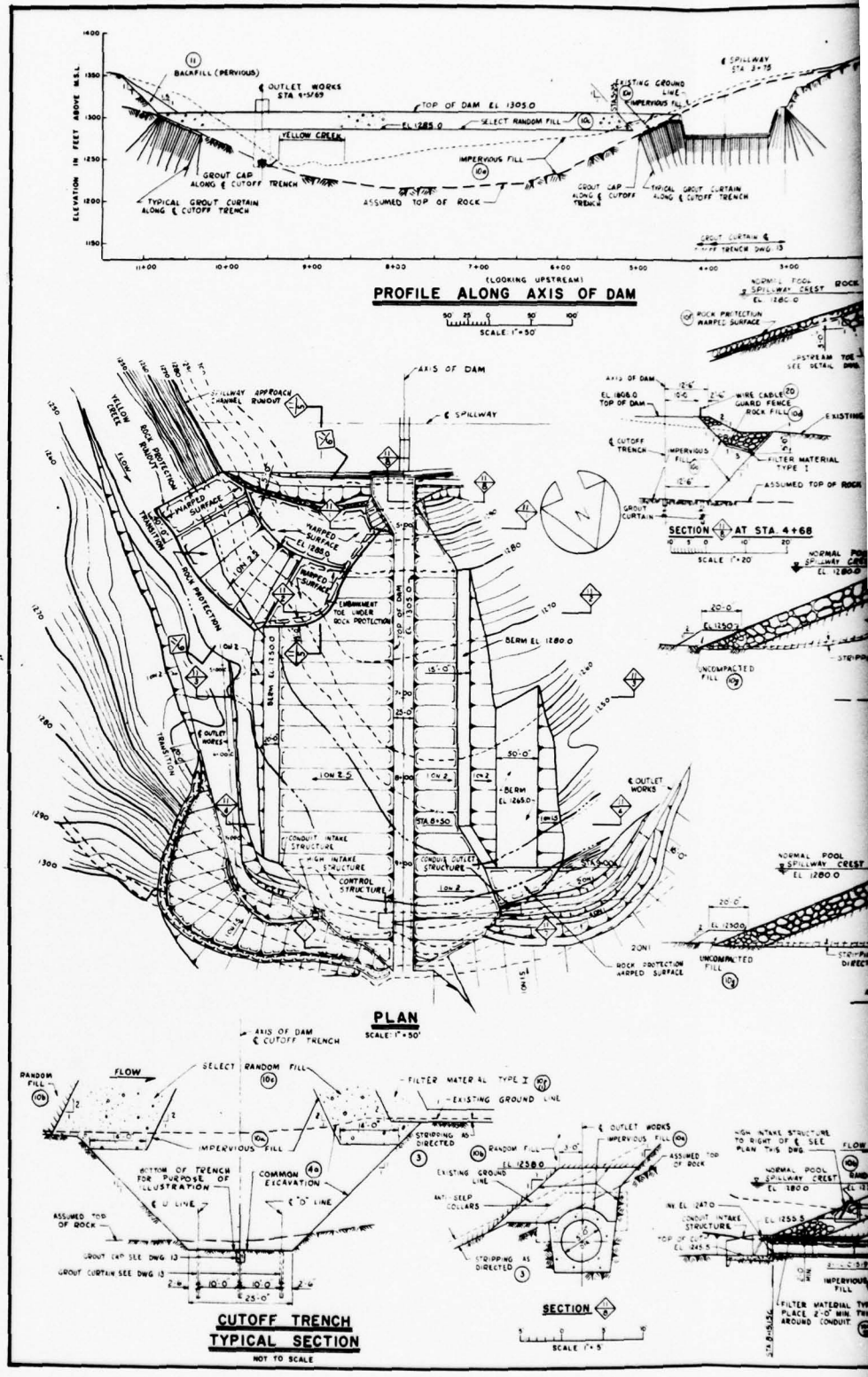
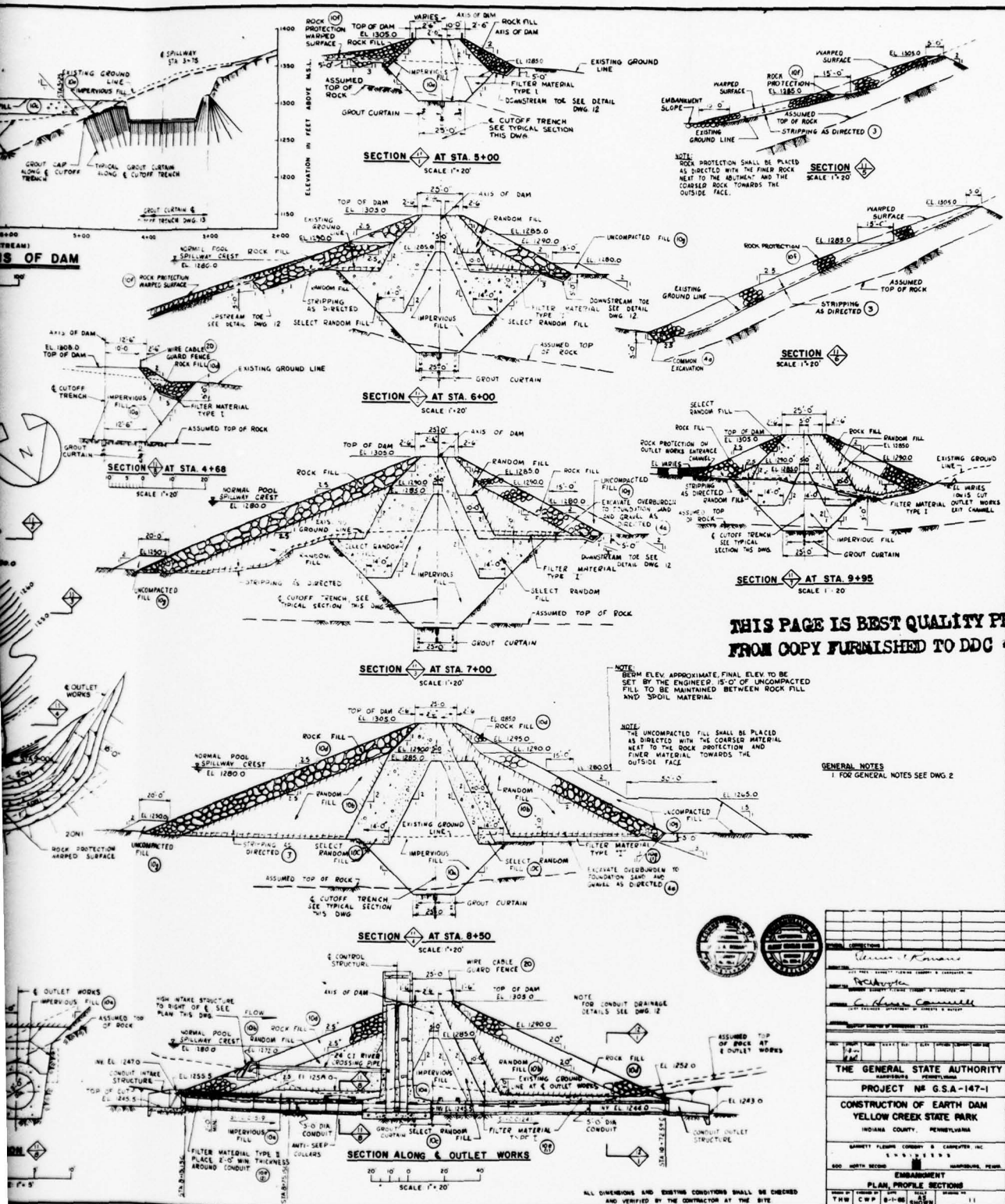


PLATE I
YELLOW CREEK
STATE PARK DAM
VICINITY AND WATERSHED MAP
D'APOLONIA

DRAWN BY 1rs
 CHECKED BY 1st
 9-5-78 APPROVED BY SHP
 10-15-78 DRAWING NUMBER 14-B192



THIS PAGE IS BEST QUALITY PRACTICABLE
 FROM COPY FURNISHED TO DDG

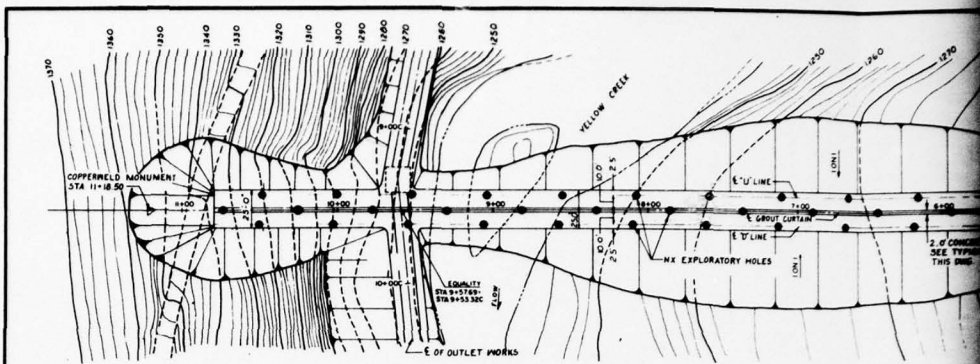


THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

PLATE 2

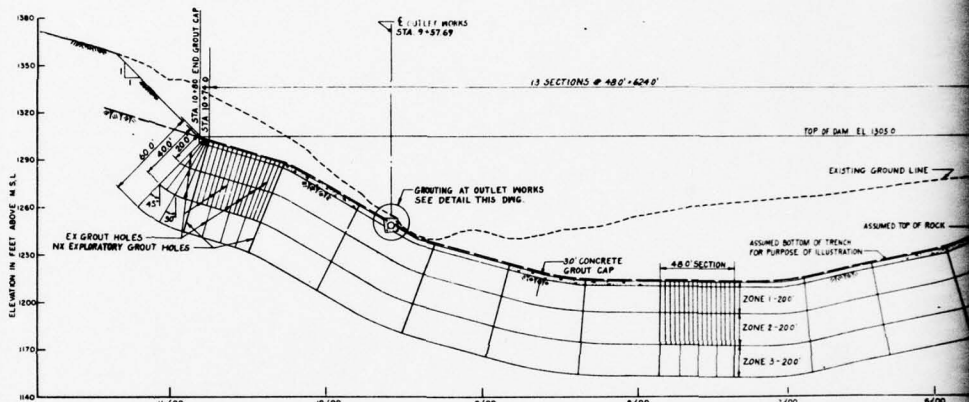
D'APPOLONIA

DRAWN BY 1rs
 CHECKED BY BE
 9-5-78 APPROVED BY JHP
 DRAWING NUMBER 70-114-B190
 10-10-78

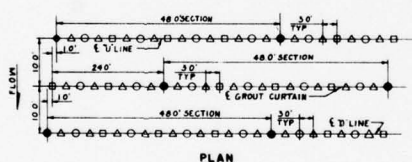


THIS PAGE IS BEST QUALITY PRACTICABLE
 FROM COPY FURNISHED TO DDG

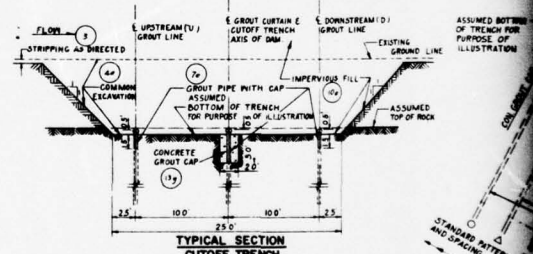
PLAN
 SCALE 1"=30'



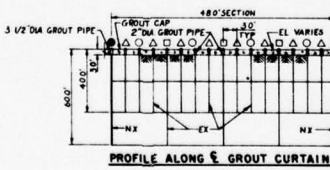
PROFILE ALONG GROUT CURTAIN
 SCALE 1"=30'



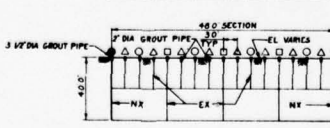
PLAN



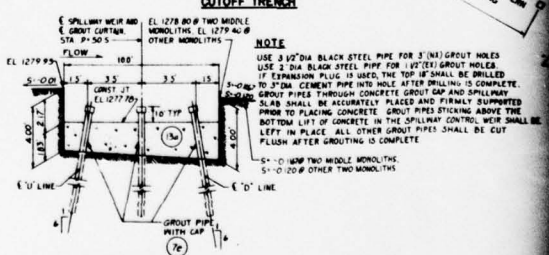
TYPICAL SECTION
 CUTOFF TRENCH



PROFILE ALONG GROUT CURTAIN



PROFILE ALONG E OF "U" AND "D" LINES

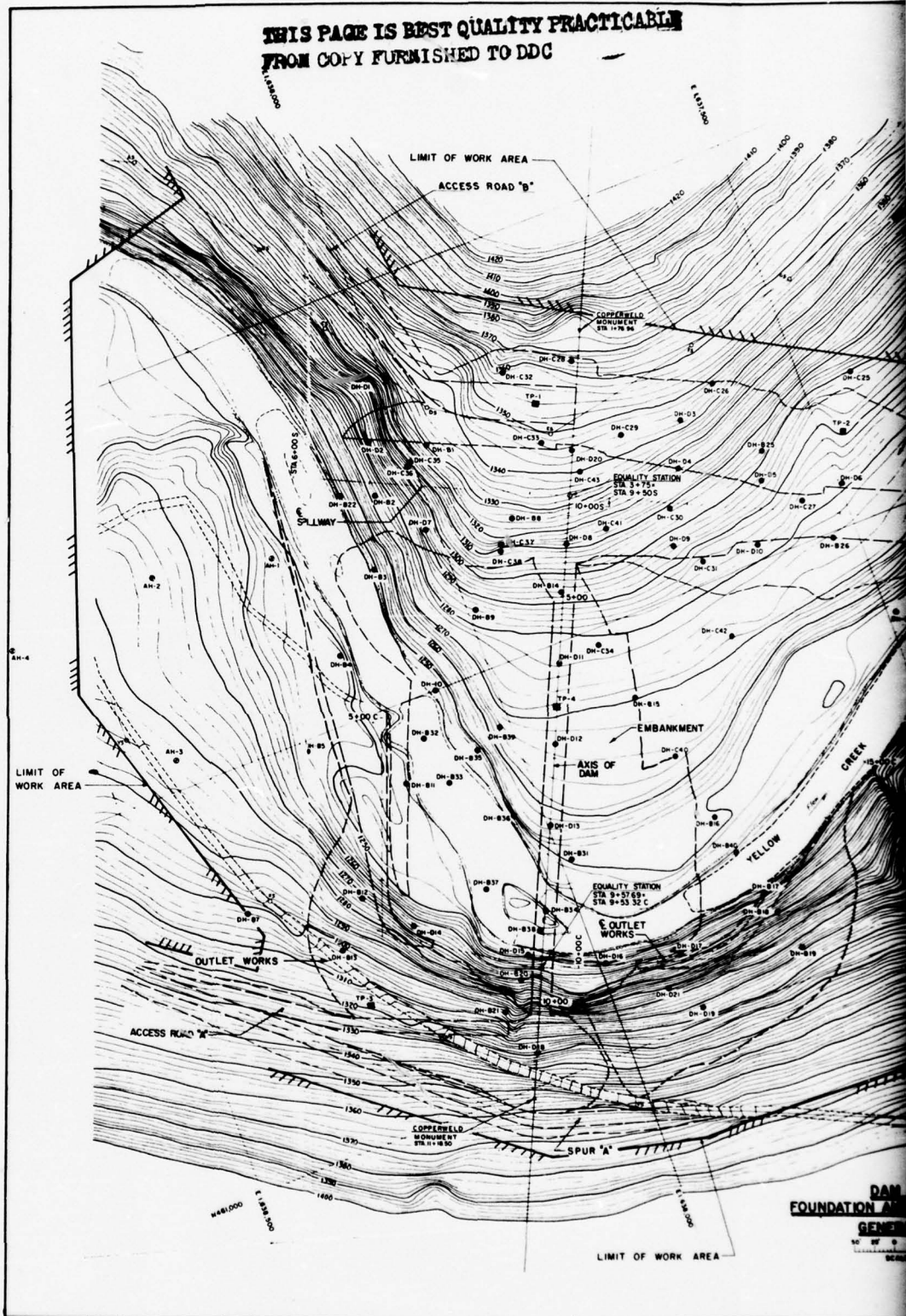


TYPICAL SECTION
 SPILLWAY CONTROL WEIR

GRouting DETAILS
 NOT TO SCALE

DRAWN BY
9-5-78
CHECKED BY
10-10-78
APPROVED BY
10-10-78
DRAWING NUMBER
76-114-B188

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC



DAM
FOUNDATION
GENERAL

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

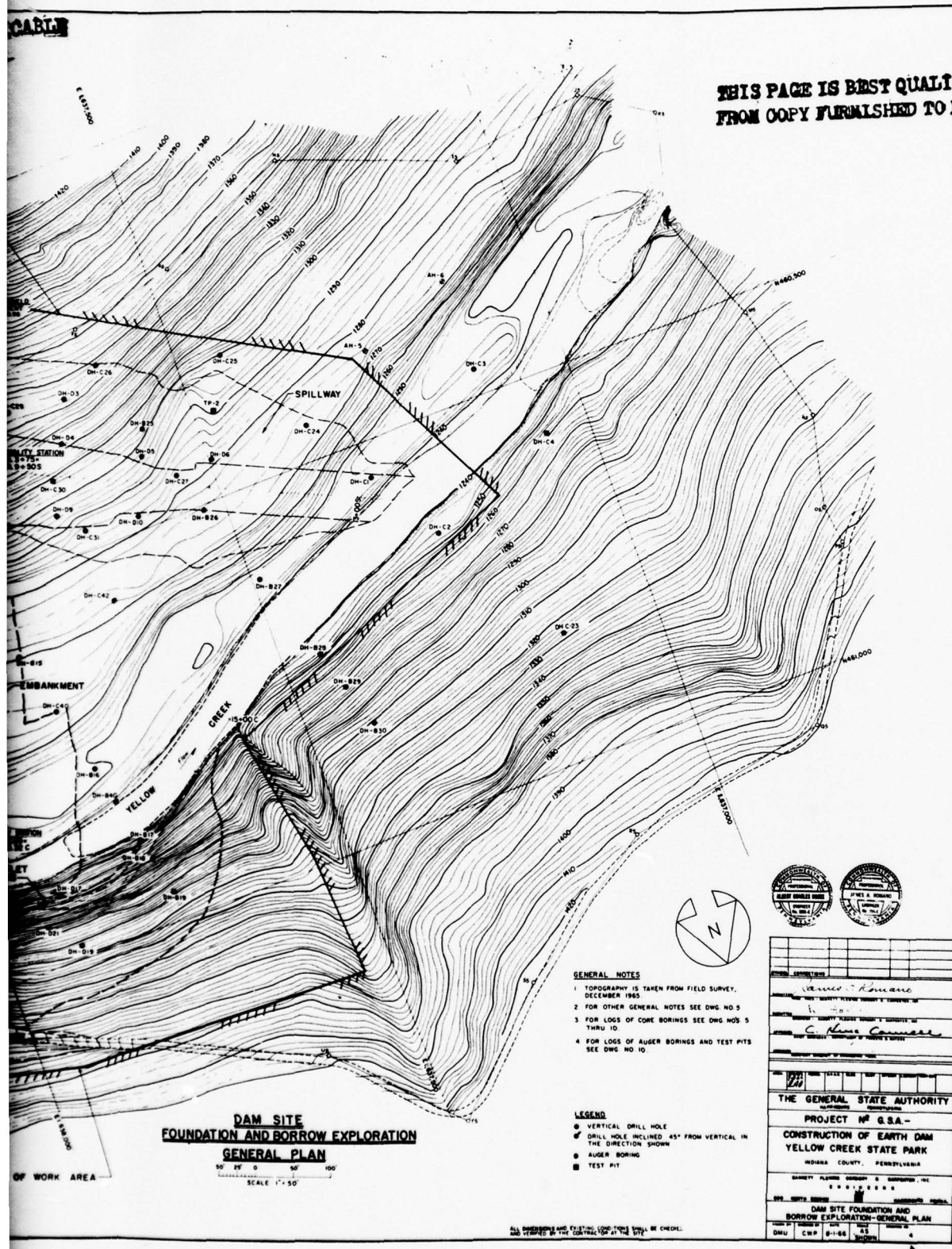
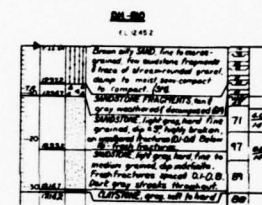
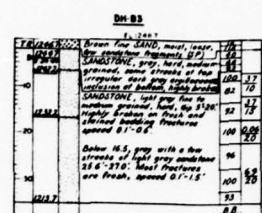


PLATE 4

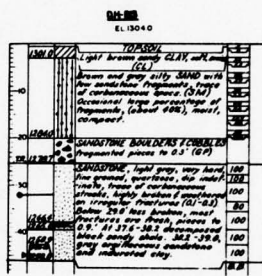
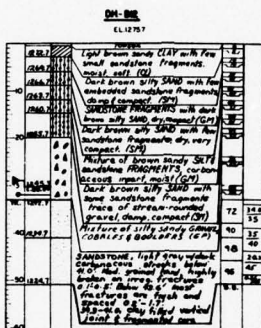
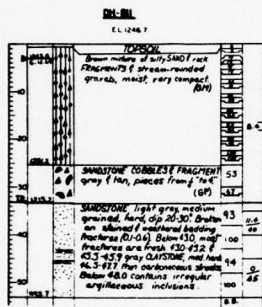
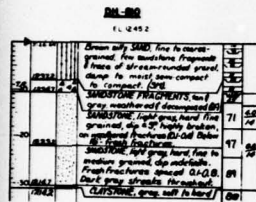
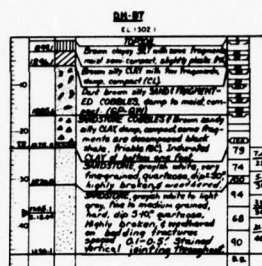
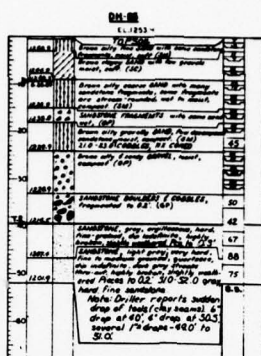
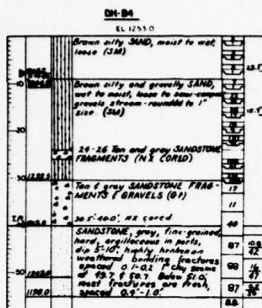
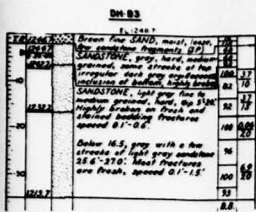
D'APPOLONIA

2

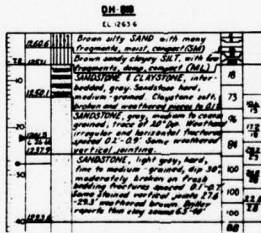
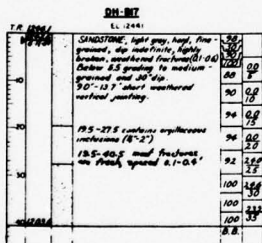
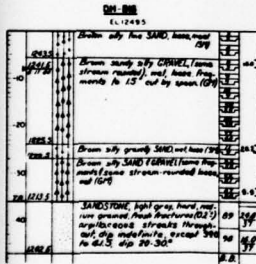


CH 2885		CL 2885	
10	25.5	From study box SAGE, same as 159	10
15	25.5	From study box CORREL, same as 159 (same result), but from 1st study to 15" and by spec. 159	15
20	25.5	From study box SAGE and from 159	20
25	25.5	From study box SAGE (same result) and from 159	25
30	25.5	SAGESTONE, light gray, hard and smooth, from 159	30
35	25.5	From study box SAGE (same result) and from 159	35
40	25.5	SAGESTONE, light gray, hard and smooth, from 159	40
45	25.5	From study box SAGE (same result) and from 159	45
50	25.5	SAGESTONE, light gray, hard and smooth, from 159	50
55	25.5	From study box SAGE (same result) and from 159	55
60	25.5	SAGESTONE, light gray, hard and smooth, from 159	60
65	25.5	From study box SAGE (same result) and from 159	65
70	25.5	SAGESTONE, light gray, hard and smooth, from 159	70
75	25.5	From study box SAGE (same result) and from 159	75
80	25.5	SAGESTONE, light gray, hard and smooth, from 159	80
85	25.5	From study box SAGE (same result) and from 159	85
90	25.5	SAGESTONE, light gray, hard and smooth, from 159	90
95	25.5	From study box SAGE (same result) and from 159	95
100	25.5	SAGESTONE, light gray, hard and smooth, from 159	100

DEPTH		STRAKE	DESCRIPTION	TEMPERATURE		WIND	WAVE	SEA	VISIBILITY	MOON	CLOUDS	REMARKS
FEET	METERS			°F	°C							
			PERIOD									
			Dark gray sandy MTL with 10% - 20% gravel. No gravel at surface.	11	11							% Water Content
			Dark, heavy homogeneous mass of (silt) clay.	12	12							Slown pace of 1000' thermometer falling
			(silt) clay.	13	13							
			(silt) clay.	14	14							
			(silt) clay.	15	15							
			(silt) clay.	16	16							
			(silt) clay.	17	17							
			(silt) clay.	18	18							
			(silt) clay.	19	19							
			(silt) clay.	20	20							
			(silt) clay.	21	21							
			(silt) clay.	22	22							
			(silt) clay.	23	23							
			(silt) clay.	24	24							
			(silt) clay.	25	25							
			(silt) clay.	26	26							
			(silt) clay.	27	27							
			(silt) clay.	28	28							
			(silt) clay.	29	29							
			(silt) clay.	30	30							
			(silt) clay.	31	31							
			(silt) clay.	32	32							
			(silt) clay.	33	33							
			(silt) clay.	34	34							
			(silt) clay.	35	35							
			(silt) clay.	36	36							
			(silt) clay.	37	37							
			(silt) clay.	38	38							
			(silt) clay.	39	39							
			(silt) clay.	40	40							
			(silt) clay.	41	41							
			(silt) clay.	42	42							
			(silt) clay.	43	43							
			(silt) clay.	44	44							
			(silt) clay.	45	45							
			(silt) clay.	46	46							
			(silt) clay.	47	47							
			(silt) clay.	48	48							
			(silt) clay.	49	49							
			(silt) clay.	50	50							
			(silt) clay.	51	51							
			(silt) clay.	52	52							
			(silt) clay.	53	53							
			(silt) clay.	54	54							
			(silt) clay.	55	55							
			(silt) clay.	56	56							



PRACTICABLE



THIS PAGE IS BEST QUALITY PRACTICABLE FROM COPY FURNISHED TO DDC



GENERAL NOTES

1. DRILL HOLES (DL-83) WERE ACCOMPLISHED BY DRIVE BORING PROCEDURE USING A 2.0 IN. x 11 IN. 1000 LB. FOR DISTURBED SAMPLES OBTAINED BY A 300 LB. HAMMER FALLING 40 IN. A SHOT BY THE TESTER FOR UNDISTURBED SAMPLES. TWO SETS OF SAMPLES, IN EACH BORER, WERE OBTAINED WITH THE DRILLING COLUMN.
2. THE BORINGS INCLUDED IN THESE DRAWINGS ARE THOSE IN OR NEAR THE IMMEDIATE AREA OF THE WORK OTHER BORINGS ARE NOT SHOWN UNLESS THEY ARE NEARLY ADJACENT TO THE BORING LOCATION INFORMATION LOSS AND LABORATORY DATA OF BORINGS ARE AVAILABLE FOR REVIEW.
3. LATER BORINGS, SUCH AS DL-84, ARE IN ACCORDANCE WITH THE BORING WATER LEVEL, SHOWN ON THE LOGS REPRESENTS THE LEVEL AT WHICH WATER WAS STABILIZED IN THE HOLE PRIOR TO REMOVAL OF CASING. IT IS NOT NECESSARILY THE LEVEL AT WHICH WATER WAS ENCOUNTERED IN THE DRILLING OPERATION.
4. DESCRIPTION OF SOILS GIVEN ON THE LOGS IS BASED ON EXAMINATION OF QUANTITY AND SIZE AND PRESENCE OF BOULDER HAS BEEN NOTED ON THE LOGS WHEN THERE ARE BOULDERS IN THE BORING OPERATION WITHIN THE BORING COLUMN. IT SHOULD BE NOTED, HOWEVER, THAT IN SOME CASES, BOULDERS ARE NOTED ON THE LOGS, BUT IN OTHER CASES, THEY ARE NOT. THIS IS BECAUSE THE BOULDER HAS BEEN REFLECTED IN THE LOGS OF THE DRILL HOLES WHEN REFERENCE TO BORINGS AS REQUIRED IN THE RIGHT HAND COLUMN OF THE LOGS IS CORRELATED WITH CASES TO BE DUE TO A CORRECTION OF SMALL BOULDER.
5. WATER CONTENTS SHOWN IN RIGHT HAND COLUMN OF LOGS ARE BASED ON THE WATER CONTENTS OF SOILS IN OR NEAR THE IMMEDIATE AREA OF THE WORK OTHER BORINGS ARE NOT SHOWN UNLESS THEY ARE NEARLY ADJACENT TO THE BORING LOCATION INFORMATION LOSS AND LABORATORY DATA OF BORINGS ARE AVAILABLE FOR REVIEW.
6. FOR LOCATION OF DRILL HOLES SEE DWS & DWS-1. FOR LOCATION OF TEST PIT, SEE DWS-1. FOR LOCATION OF BORING, SEE DWS-1.
7. TEST PIT, TEST PIT, MACHINE DUG.
8. FOR LOCATION OF DRILL HOLES SEE DWS & DWS-1. FOR LOCATION OF TEST PIT, SEE DWS-1. FOR LOCATION OF BORING, SEE DWS-1.
9. DRILL HOLES DL-81 TO DL-84 WERE ACCOMPLISHED MAY 7, 1964 TO JUNE 16, 1964.
10. DRILL HOLES DL-85 TO DL-87 WERE ACCOMPLISHED DEC. 1, 1964 TO JAN. 1, 1965.
11. DRILL HOLES DL-88 TO DL-94 WERE ACCOMPLISHED JAN. 1, 1965 TO FEB. 1, 1965.

GENERAL STATE AUTHORITY

PROJECT NO. G.S.A.-147-1

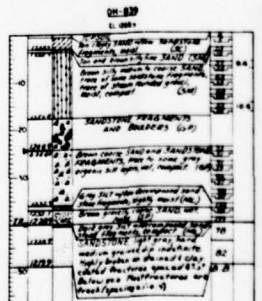
CONSTRUCTION OF EARTH DAM YELLOW CREEK STATE PARK INDIANA COUNTY, PENNSYLVANIA

DAM SITE FOUNDATION EXPLORATION LOGS OF CORE BORINGS-SHEET NO. 1

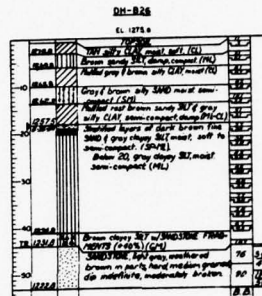
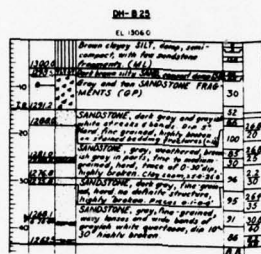
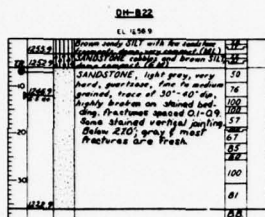
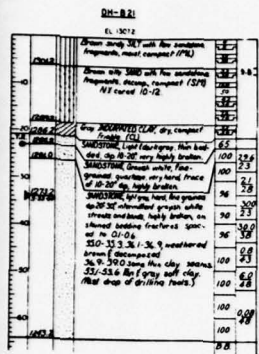
DATE: JAN 14 1965

BY: J.D. B-1-68

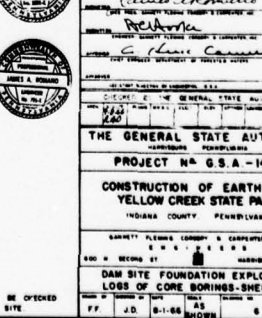
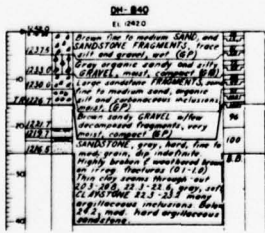
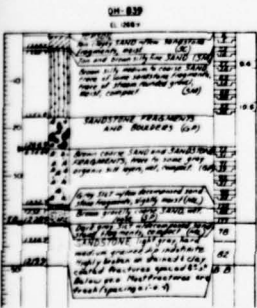
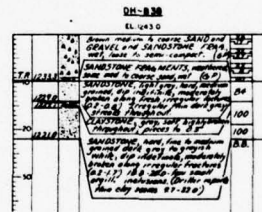
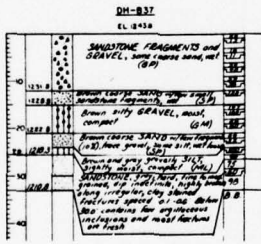
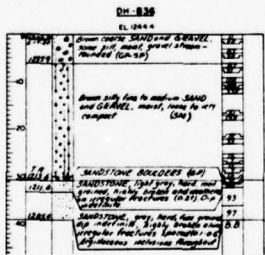
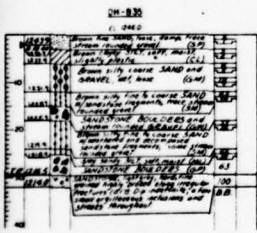
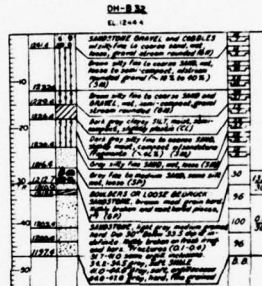
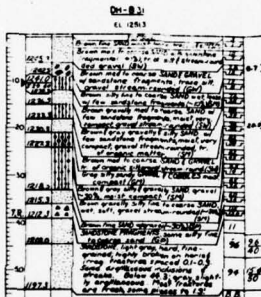
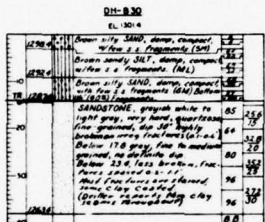
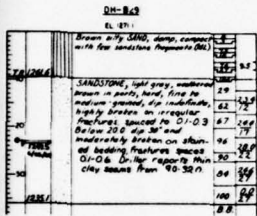
PP: J.D. B-1-68



THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC



THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC



GENERAL NOTES
1. FOR LOCATION OF DRILL HOLES SEE DWG 4
2. FOR LEGEND, SYMBOLS AND OTHER GENERAL NOTES SEE DWG 5



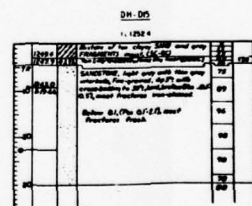
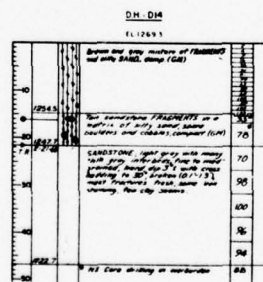
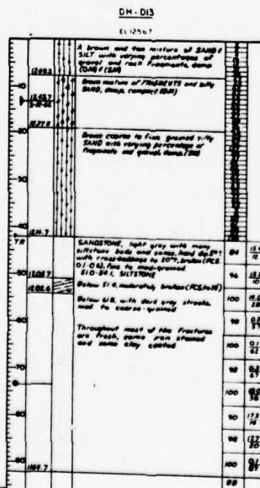
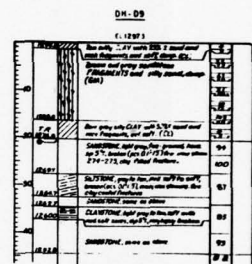
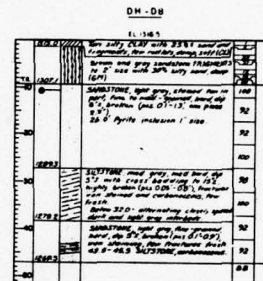
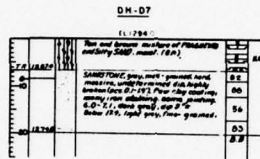
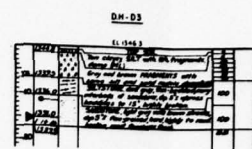
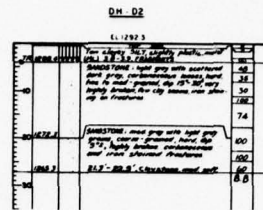
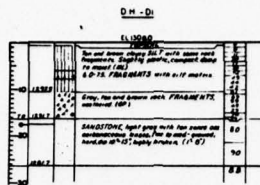
THE GENERAL STATE AUTHORITY
INDIANA COUNTY, PENNSYLVANIA
PROJECT NO. G.S.A.-147-1
CONSTRUCTION OF EARTH DAM
YELLOW CREEK STATE PARK
INDIANA COUNTY, PENNSYLVANIA
SARNEY, FLEMING COMPANY & COMPANY, INC.
ENGINEERS
DAM SITE FOUNDATION EXPLORATION
LOSS OF CORE BORINGS-SHEET NO. 3
DATE OF ISSUE: 10-1-66
BY: J.D. B-1-66
CHECKED BY: J.D. B-1-66
APPROVED BY: J.D. B-1-66

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDG



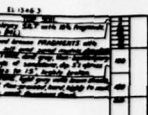


THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDG

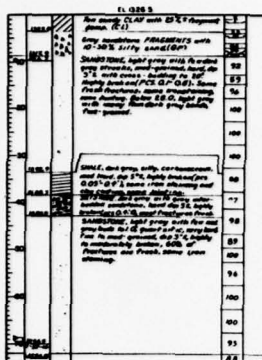


THIS PAGE IS BEST QUALITY PRACTICABLE
 FROM COPY FURNISHED TO DDC

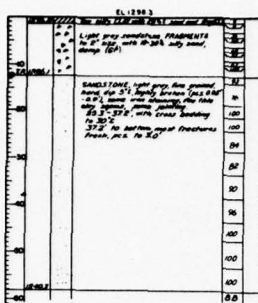
DN-03



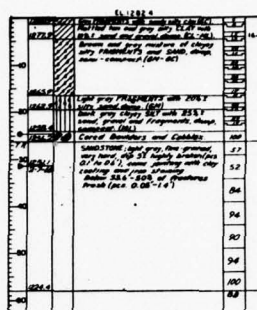
DN-04



DN-05

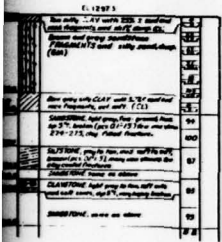


DN-06

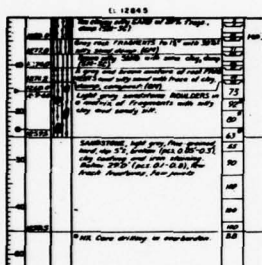


THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DGC

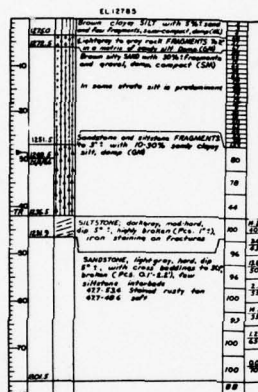
DN-07



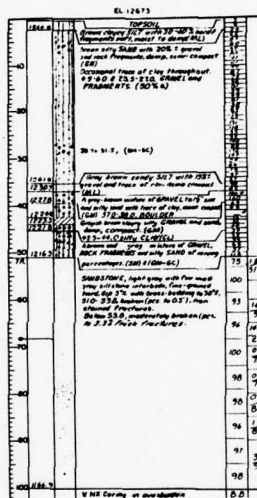
DN-08



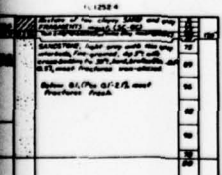
DN-09



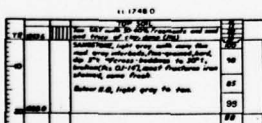
DN-10



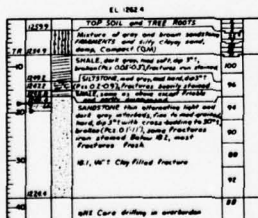
DN-11



DN-12



DN-13



GENERAL NOTES

1. FOR LOCATION OF DRILL HOLES SEE DWG. 4
2. FOR LEGEND, SYMBOLS AND OTHER GENERAL NOTES SEE DWG. 5

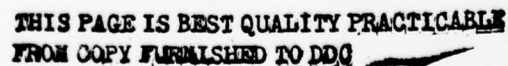


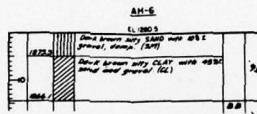
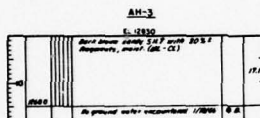
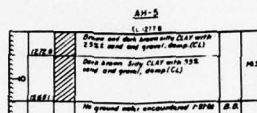
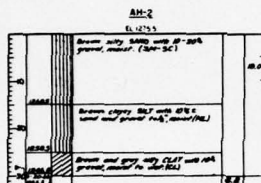
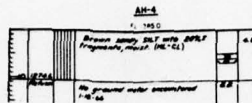
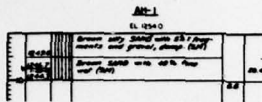
CORRECTIONS	
DATE	BY
CHECKED BY THE GENERAL STATE AUTHORITY	
THE GENERAL STATE AUTHORITY	
PROJECT No. G.S.A. -147-1	
CONSTRUCTION OF EARTH DAM	
YELLOW CREEK STATE PARK	
INDIANA COUNTY, PENNSYLVANIA	
DAM SITE FOUNDATION EXPLORATION	
LOSS OF CORE BORINGS-SHEET NOS	
DATE OF PREPARED BY	DATE OF REVIEW BY
J.D. B.H. 8-1-58	B

PLATE 9

D'APPOLONIA

DRAWN BY

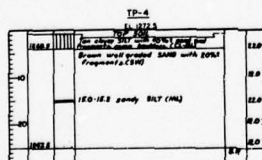
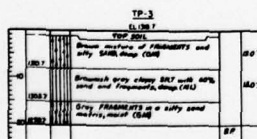




THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDG

GENERAL NOTES:

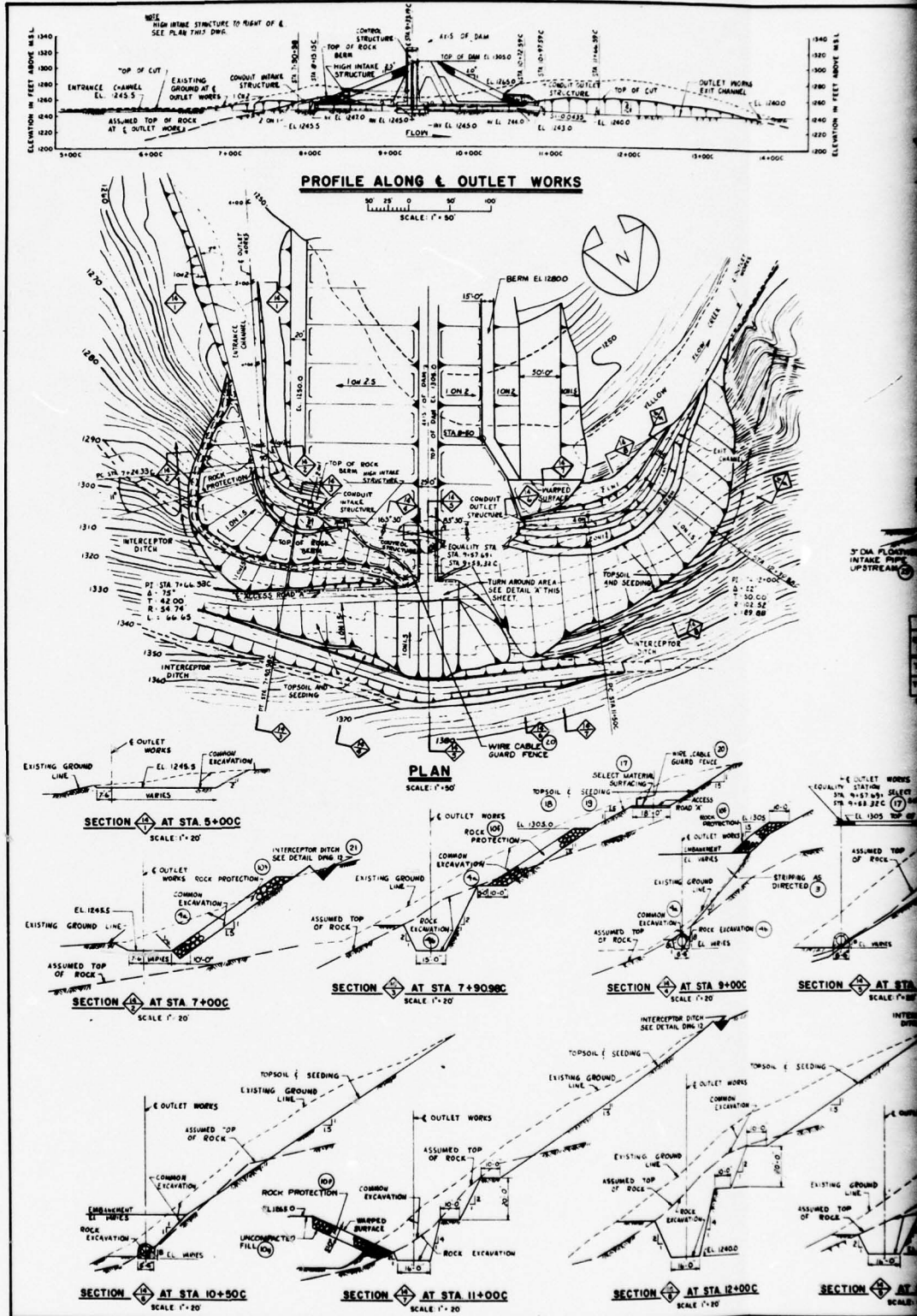
1. FOR LOCATION OF DRILL HOLES, AUGER HOLES AND TEST PITS SEE DWG. 4.
2. FOR LEGEND, SYMBOLS AND OTHER GENERAL NOTES SEE DWG. 5.



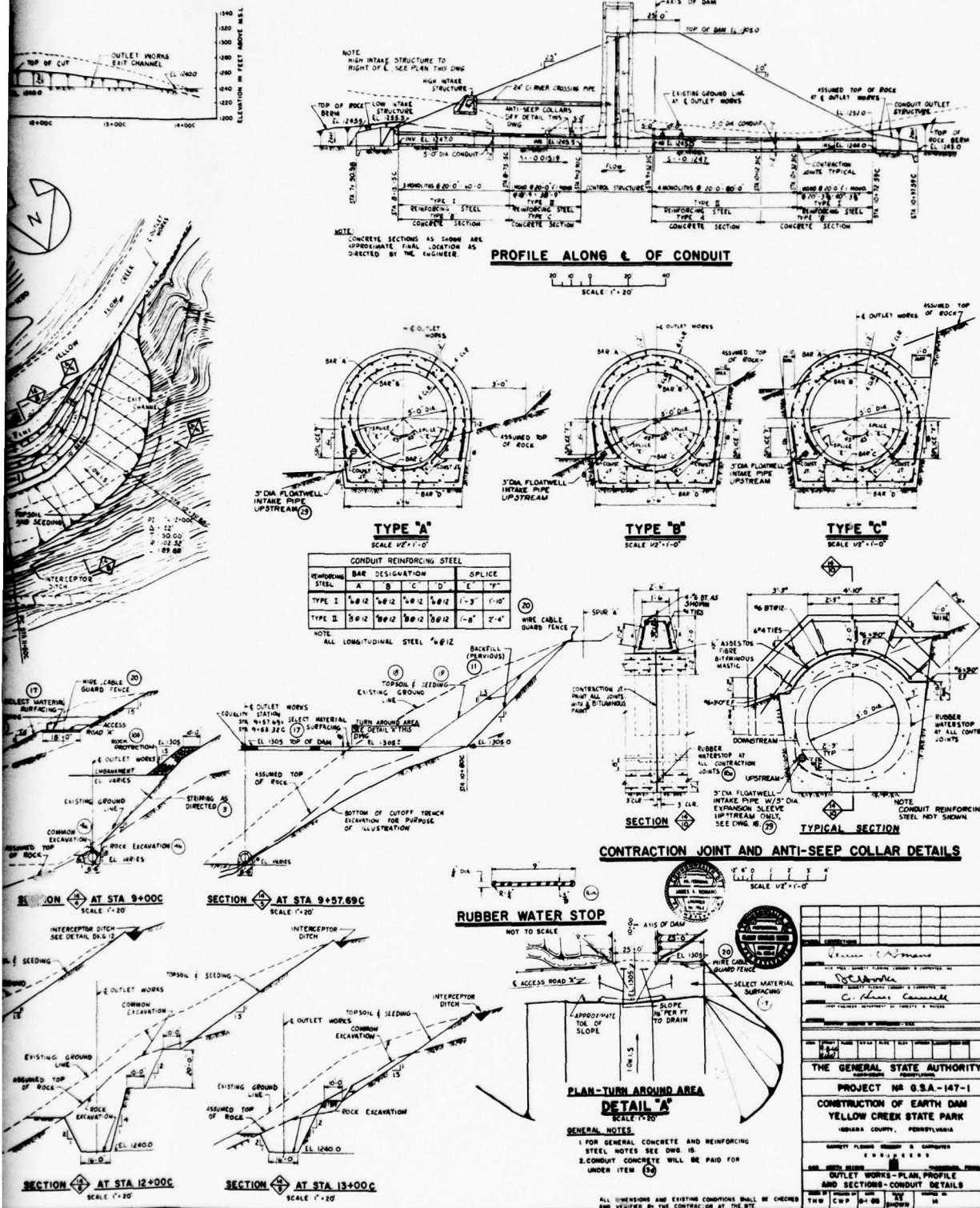
APPROVAL	
DESIGNED BY	<i>James L. P. ...</i>
CHECKED BY	<i>Detmold</i>
APPROVED BY	<i>C. H. ...</i>
CHECKED BY THE GENERAL STATE AUTHORITY	
THE GENERAL STATE AUTHORITY	
PROJECT N ^o G.S.A.-147-1	
CONSTRUCTION OF EARTH DAM	
YELLOW CREEK STATE PARK	
INDIANA COUNTY, PENNSYLVANIA	
ENGINEER: FLEMING CORRY & COMPANY, INC.	
800 N. SECOND ST. HARRISBURG, PENN.	
DATE: 1-1-58	
DRAWN BY: J.D.	
CHECKED BY: J.D.	

ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE

DRAWN BY 115
 9-5-78
 CHECKED BY 115
 10-5-78
 APPROVED BY 115
 10-5-78
 DRAWING 78-14-B191
 NUMBER



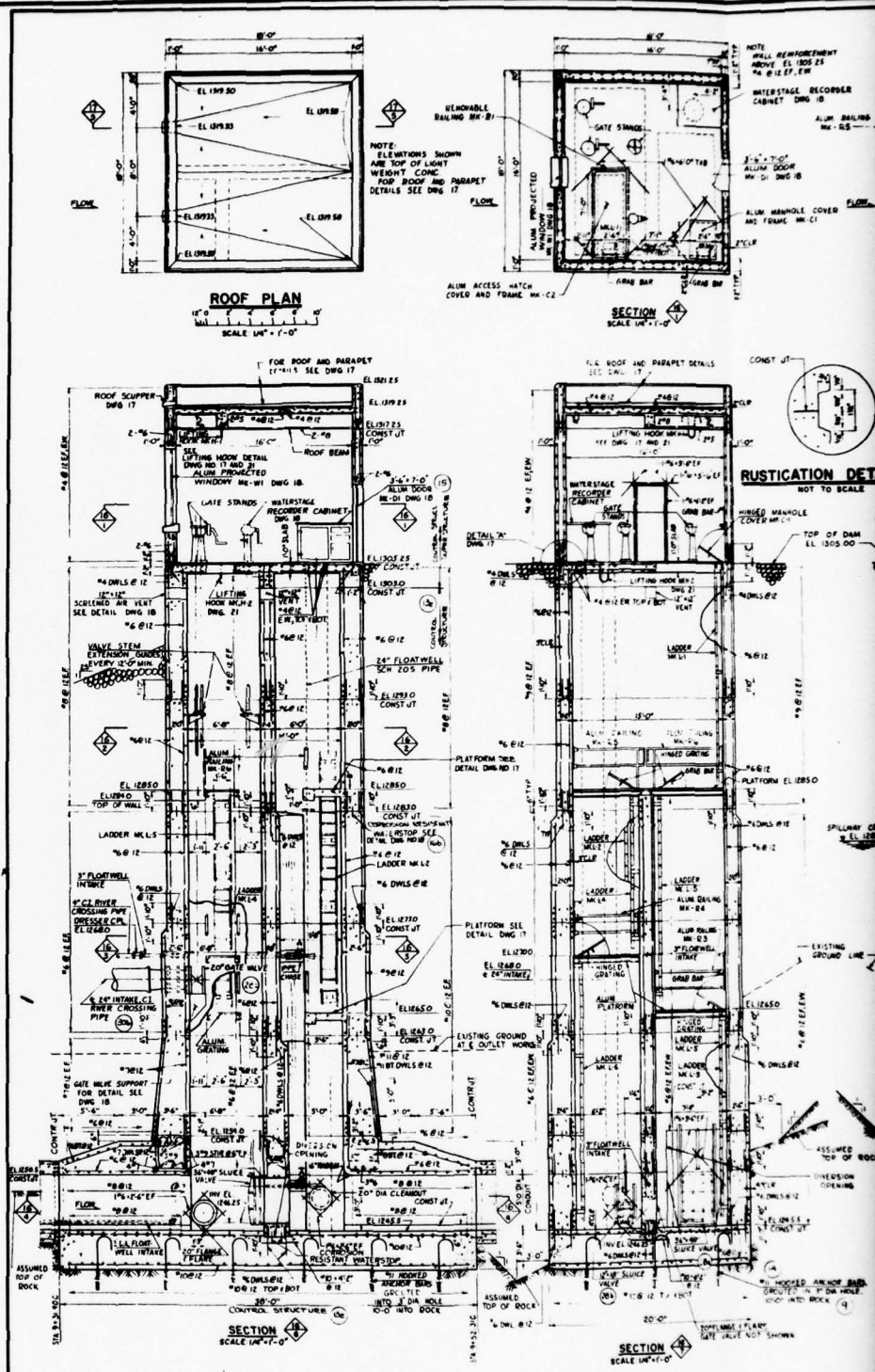
THIS PAGE IS BEST QUALITY PRACTICABLE
 FROM COPY FURNISHED TO DDC



THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC

PLATE II
D'APPOLONIA

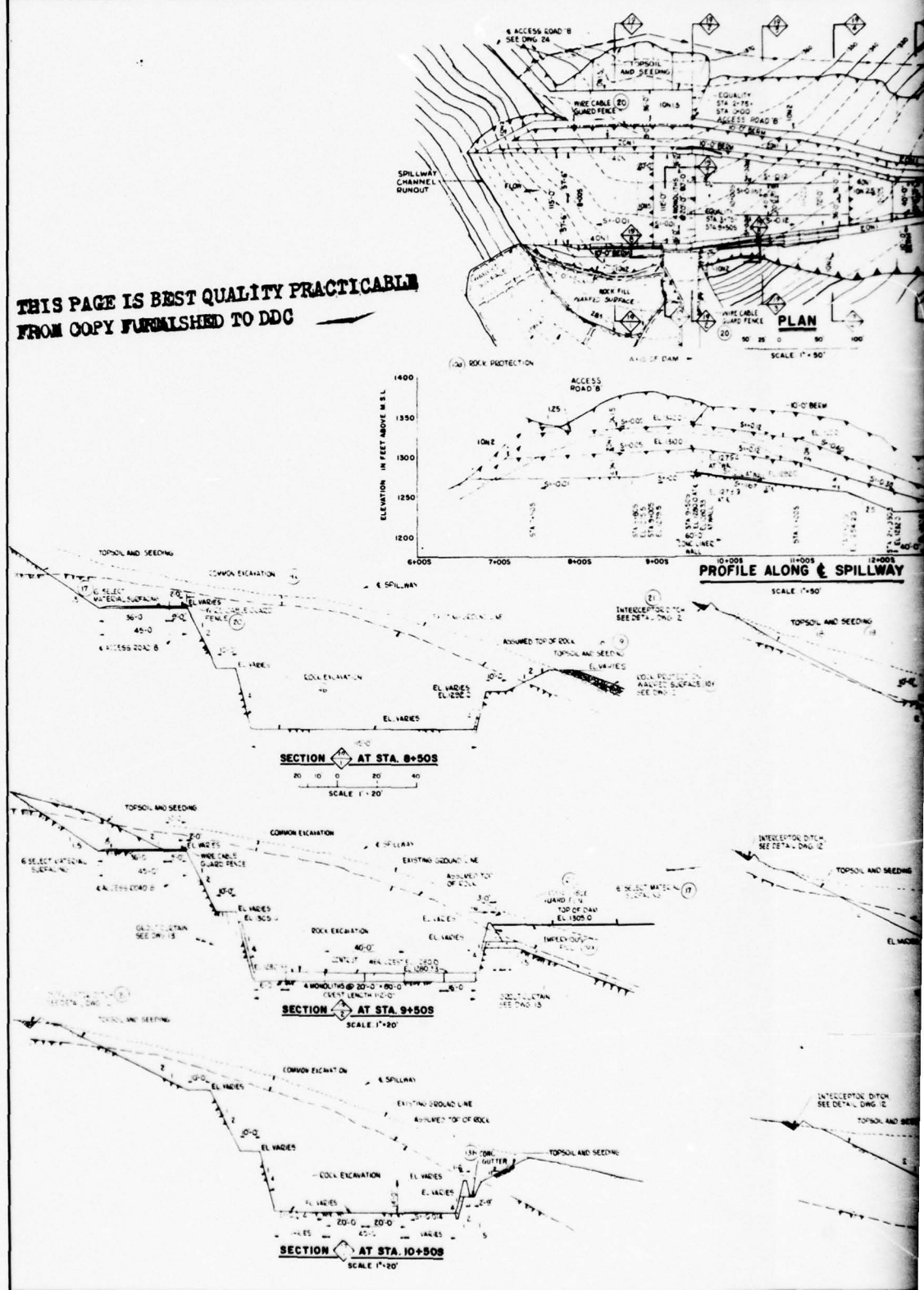
DRAWN BY **IRS** CHECKED BY **13C** 10-1-78 DRAWING 78-14-B189
 BY **9-5-78** APPROVED BY **SHD** 10-10-78 NUMBER

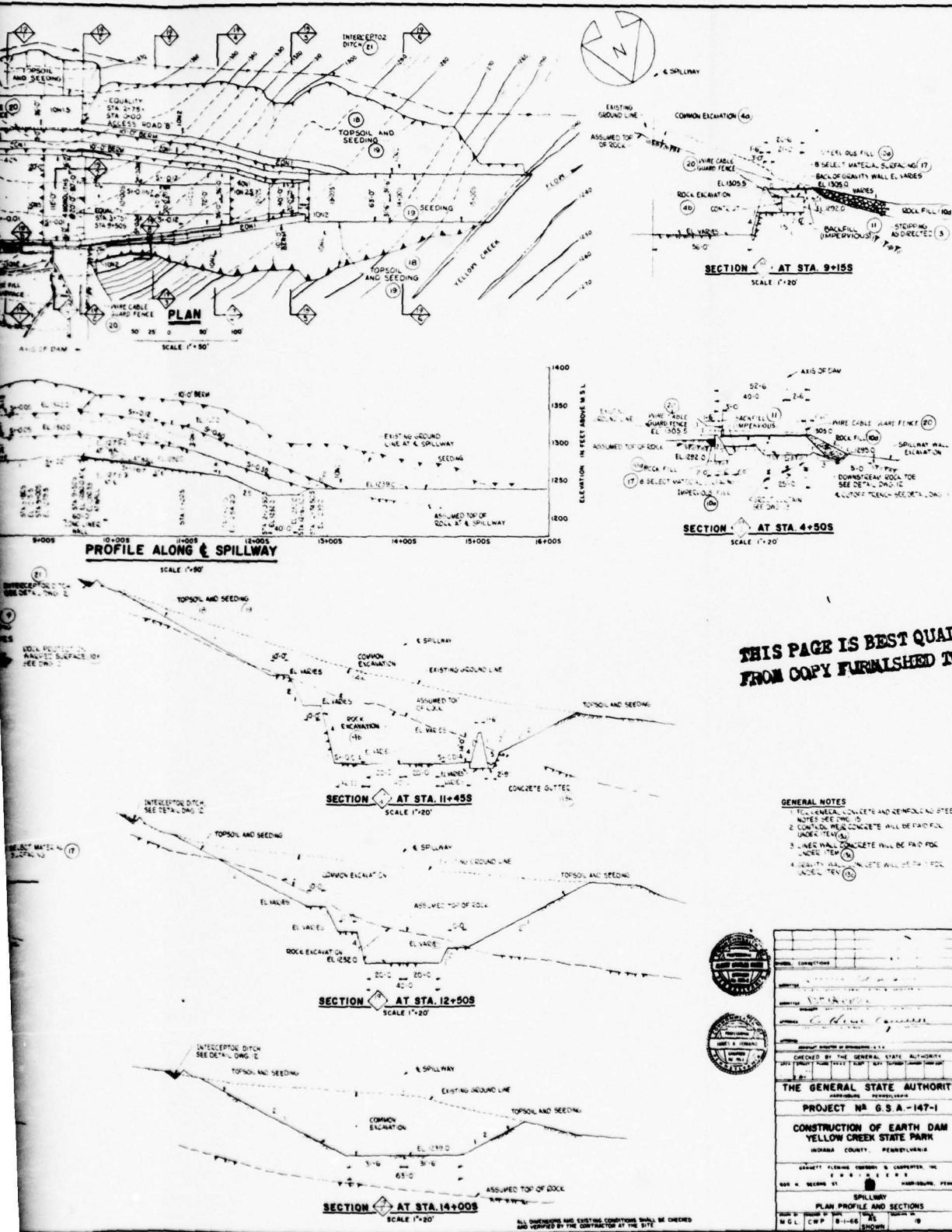


THIS PAGE IS BEST QUALITY PRACTICABLE
 FROM COPY FURNISHED TO DDC

DRAWN BY	TR	CHECKED BY	10-9-78	DRAWING NUMBER	10-10-78

THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDC



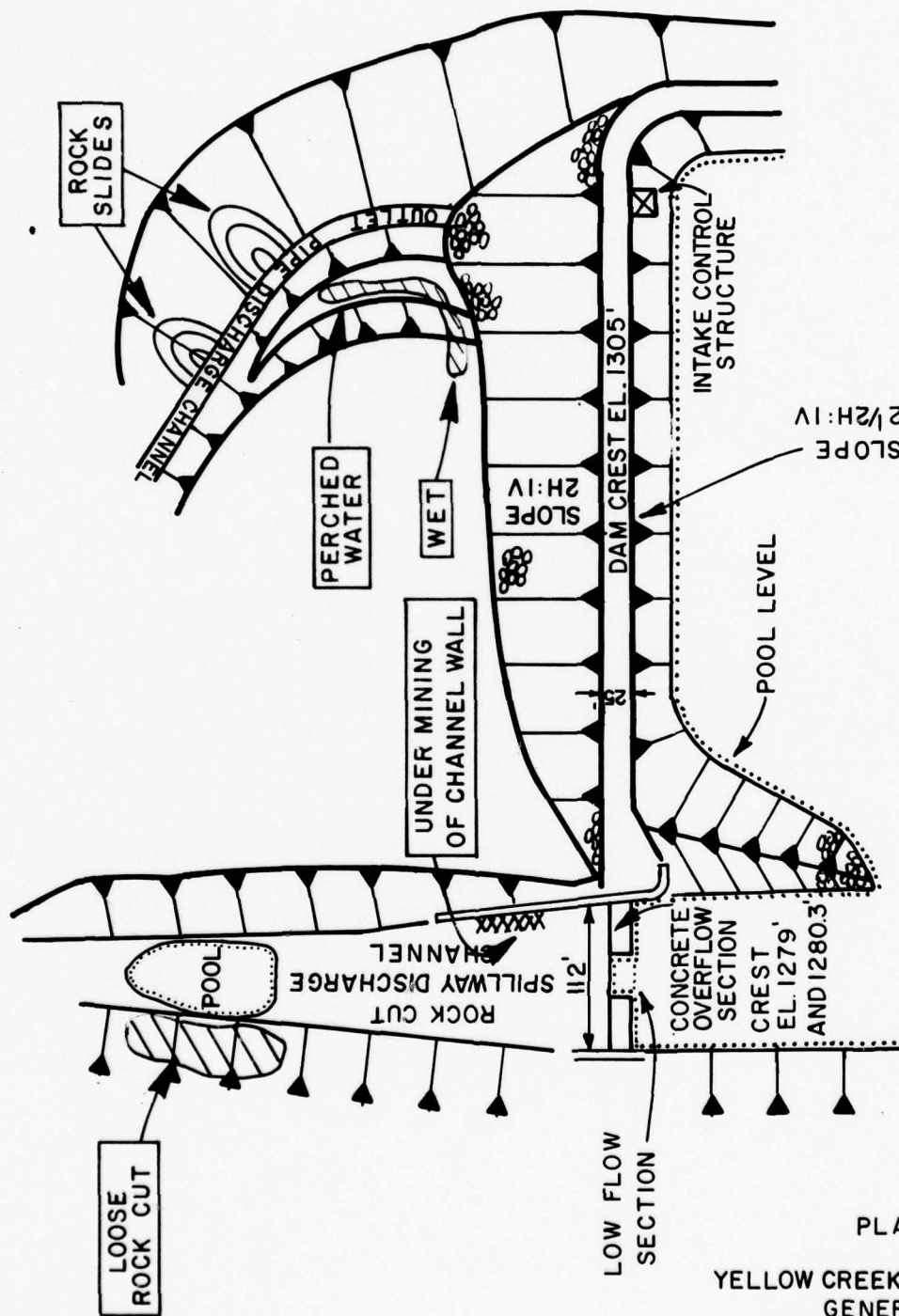


**THIS PAGE IS BEST QUALITY PRACTICABLE
FROM COPY FURNISHED TO DDG**

- GENERAL NOTES**
1. ALL GENERAL CONCRETE AND REINFORCING STEEL NOTES SEE D.M.C. 2.
 2. CONTROL MEAS CONCRETE SHALL BE PAID FOR UNDER ITEM (M).
 3. UNDER MEAS CONCRETE SHALL BE PAID FOR UNDER ITEM (M).
 4. HEALTHY WALL CONCRETE SHALL BE PAID FOR UNDER ITEM (M).

CHECKED BY THE GENERAL STATE AUTHORITY DATE: 10/1/55	
THE GENERAL STATE AUTHORITY PROJECT NO. G.S.A.-147-1 CONSTRUCTION OF EARTH DAM YELLOW CREEK STATE PARK INDIANA COUNTY, PENNSYLVANIA	
EXHIBIT: EARTH DAM, SPILLWAY, PLAN, PROFILE AND SECTIONS SHEET NO. 1 OF 1 DATE: 10/1/55	

DRAWN BY	Trs	CHECKED BY	BE	10-10-73	DRAWING NUMBER	714-A30
9-8-78	APPROVED BY	TR				



POOL LEVEL DATE OF INSPECTION: ELEVATION 1279.15' (From depth gauge)

NOT TO SCALE

PLATE 14

YELLOW CREEK STATE PARK DAM
GENERAL PLAN
FIELD INSPECTION NOTES
FIELD INSPECTION DATE: 9-1-78

D'APPOLONIA

APPENDIX A
CHECKLIST
VISUAL INSPECTION
PHASE I

CHECKLIST
VISUAL INSPECTION
PHASE I

NAME OF DAM Yellow Creek State Park COUNTY Indiana STATE Pennsylvania ID# NDI 282
 TYPE OF DAM Earthfill HAZARD CATEGORY High DER 32-74
 DATE(S) INSPECTION September 2, 1978 WEATHER Sunny TEMPERATURE 80's
 POOL ELEVATION AT TIME OF INSPECTION 1279.15 M.S.L. TAILWATER AT TIME OF INSPECTION 1245+ M.S.L.

INSPECTION PERSONNEL:

<u>Bilgin Erel</u>	<u>Review Inspection by:</u>	<u>Elio D'Appolonia</u>
<u>Wah-Tak Chan</u>	<u>(September 8, 1978)</u>	<u>L. D. Andersen</u>
<u> </u>	<u> </u>	<u>J. H. Poellot</u>

Bilgin Erel RECORDER

VISUAL INSPECTION
PHASE I
EMBANKMENT

NAME OF DAM Yellow Creek State Park Dam

ID# NDI 282, DER 32-74

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	None	
SLOUCHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	None	
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	No perceivable misalignment	
RIPRAP FAILURES	None	

VISUAL INSPECTION
PHASE I
EMBANKMENT
OBSERVATIONS

NAME OF DAM Yellow Creek State Park Dam
ID# NDI 282, DER 32-74

VISUAL EXAMINATION OF	REMARKS OR RECOMMENDATIONS
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	No signs of distress or seepage.
ANY NOTICEABLE SEEPAGE	A wet area located on the left side of the outlet conduit of the discharge channel. See Plate 4 for location.
STAFF GAGE AND RECORDER	Located in the outlet works control structure.
DRAINS	None

VISUAL INSPECTION
PHASE I
CONCRETE/MASONRY DAMS

NAME OF DAM Yellow Creek State Park Dam
ID# NDI 282, DER 32-74

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
ANY NOTICEABLE SEEPAGE	(Earth-fill dam) N/A	
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	N/A	
DRAINS	N/A	
WATER PASSAGES	N/A	
FOUNDATION	N/A	

VISUAL INSPECTION

PHASE I

CONCRETE/MASONRY DAMS

NAME OF DAM Yellow Creek State Park Dam

ID# NDI 282, DER 32-74

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	(Earth-fill dam) N/A	
STRUCTURAL CRACKING	N/A	
VERTICAL AND HORIZONTAL ALIGNMENT	N/A	
MONOLITH JOINTS	N/A	
CONSTRUCTION JOINTS STAFF GAGE OF RECORDER:	N/A	

VISUAL INSPECTION
PHASE 1
OUTLET WORKS

NAME OF DAM Yellow Creek State Park Dam
ID# NDI 282, DER 32-74

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	Five-foot-diameter reinforced concrete conduit. The conduit was half full due to flow from the sluice gate. Therefore, it was not inspected.	
INTAKE STRUCTURE	Submerged, not visible. Two chambers of the concrete control structure were observed and found to be in good condition.	
OUTLET STRUCTURE	Stilling basin, good condition.	
OUTLET CHANNEL	The outlet channel is partially blocked by rock slides located approximately 100 feet downstream from the discharge end of the outlet conduit.	
EMERGENCY GATE	The sluice gate was operated by state personnel and observed to be functional.	

VISUAL INSPECTION
PHASE 1
UNGATED SPILLWAY

NAME OF DAM Yellow Creek State Park Dam
ID# NDI 282, DER 32-74

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE WEIR	Ten-foot-wide concrete broad-crested weir. In good condition.	
APPROACH CHANNEL	Submerged, appears to be free of debris.	
DISCHARGE CHANNEL	Rock erosion along the right spillway wall. In segments, rock eroded three to four feet below the foundation level of the walls.	It is reported that the spillway discharge channel severely eroded during the July 1977 flood.
BRIDGE AND PIERS	None	

VISUAL INSPECTION
PHASE I
GATED SPILLWAY

NAME OF DAM Yellow Creek State Park Dam
ID# NDI 282, DER 32-74

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	(No gated spillway) N/A	
APPROACH CHANNEL	N/A	
DISCHARGE CHANNEL	N/A	
BRIDGE PIERS	N/A	
GATES AND OPERATION EQUIPMENT	N/A	

VISUAL INSPECTION
PHASE I
INSTRUMENTATION

NAME OF DAM Yellow Creek State Park Dam

ID# NDI 282, DER 32-74

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

VISUAL INSPECTION
PHASE I
RESERVOIR

NAME OF DAM Yellow Creek State Park Dam

ID# NDI 282, DER 32-74

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Steep in the vicinity of the dam and gentle along the rest of the reservoir.	
SEDIMENTATION	Unknown	

VISUAL INSPECTION
PHASE I
DOWNSTREAM CHANNEL

NAME OF DAM Yellow Creek State Park Dam

ID# NDI 282, DER 32-74

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	No apparent obstructions immediately downstream from the dam.	
SLOPES	No apparent instability (immediately downstream from the dam).	
APPROXIMATE NUMBER OF HOMES AND POPULATION	Homer City (first community downstream from the dam) is located eight miles downstream. Population: 2,500	It is estimated that a significant portion of this community would be affected in the event of a flood due to failure of the dam.

APPENDIX B
CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Yellow Creek State Park Dam
ID# NDI 282, DER 32-74

ITEM	REMARKS
AS-BUILT DRAWINGS	A complete set of design drawings is available in state files.
REGIONAL VICINITY MAP	See Plate 1.
CONSTRUCTION HISTORY	Designed by Gannett Fleming Corddry and Carpenter, Inc., of Harrisburg, Pennsylvania in 1966. The construction of the dam was completed in 1969.
TYPICAL SECTIONS OF DAM	See Plate 3.
OUTLETS - PLAN - DETAILS - CONSTRAINTS - DISCHARGE RATINGS	See Plates 11 and 12.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Yellow Creek State Park Dam
ID# NDI 282, DER 32-74

ITEM	REMARKS
RAINFALL/RESERVOIR RECORDS	Reservoir levels are recorded by the state and by USGS.
DESIGN REPORTS	Not available. A state report, <u>Report Upon the Application of the Department of Forests and Waters and the General State Authority</u> , dated November 1966, summarizes the design features of the dam.
GEOLOGY REPORTS	Not available. Some information is provided in the 1966 state report.
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	Not available.
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	Boring logs are included in the design drawings. No other information is available.

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Yellow Creek State Park Dam
ID# NDI 282, DER 32-74

ITEM	REMARKS
POST CONSTRUCTION SURVEYS OF DAM	None reported.
BORROW SOURCES	See Plate 4.
MONITORING SYSTEMS	None
MODIFICATIONS	None reported.
HIGH POOL RECORDS	Elevation 1285.2 feet on June 23, 1972 (USGS Water Data Report PA-76-3)

CHECKLIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION
PHASE I

NAME OF DAM Yellow Creek State Park Dam
 ID# NDI 282, DER 32-74

ITEM	REMARKS
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None reported.
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None reported.
MAINTENANCE OPERATION RECORDS	Maintained by state personnel.
SPILLWAY PLAN SECTIONS DETAILS	See Plate 13.
OPERATING EQUIPMENT PLANS AND DETAILS	See Plate 12.

NAME OF DAM Yellow Creek State Park Dam

ID# NDI 282, DER 32-74

CHECKLIST
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 52 square miles, wooded

ELEVATION; TOP NORMAL POOL AND STORAGE CAPACITY: 1380 acre-feet at El. 1280

ELEVATION; TOP FLOOD CONTROL POOL AND STORAGE CAPACITY: Same as above

ELEVATION; MAXIMUM DESIGN POOL: El. 1305

ELEVATION; TOP DAM: El. 1305

CREST: (Spillway)

- a. Elevation El. 1280
- b. Type Broad-crested weir
- c. Width 112 feet
- d. Length 10 feet
- e. Location Spillover Adjacent to spillway
- f. Number and Type of Gates None

OUTLET WORKS:

- a. Type Five-foot-diameter reinforced concrete conduit
- b. Location Near right abutment
- c. Entrance Inverts El. 1247.5
- d. Exit Inverts El. 1244.0
- e. Emergency Draindown Facilities Five-foot-diameter conduit

HYDROMETEOROLOGICAL GAGES:

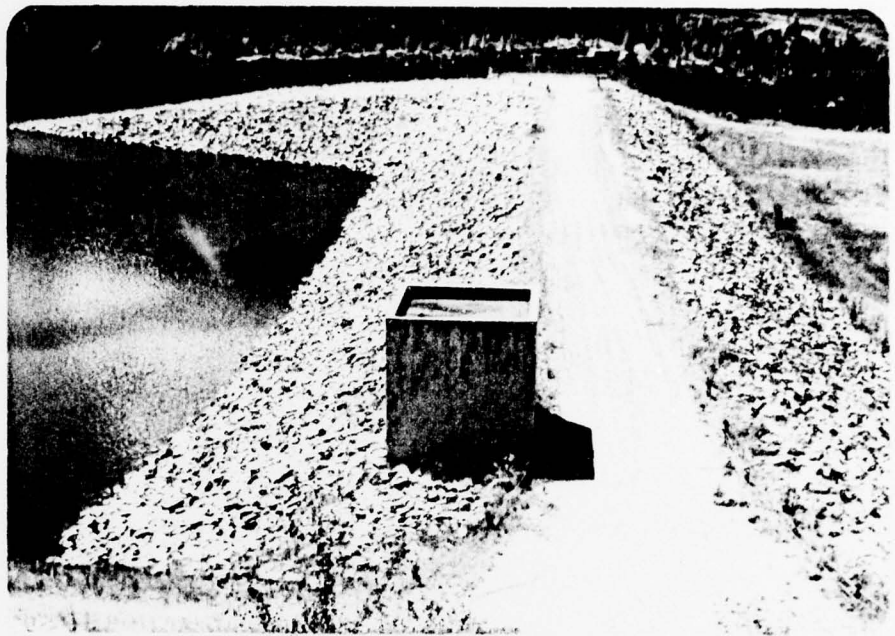
- a. Type None
- b. Location None
- c. Records None

MAXIMUM NONDAMAGING DISCHARGE: Spillway capacity (36,400 cfs)

APPENDIX C
PHOTOGRAPHS

LIST OF PHOTOGRAPHS
YELLOW CREEK STATE PARK DAM
NDI I.D. NO. 282
SEPTEMBER 1, 1978

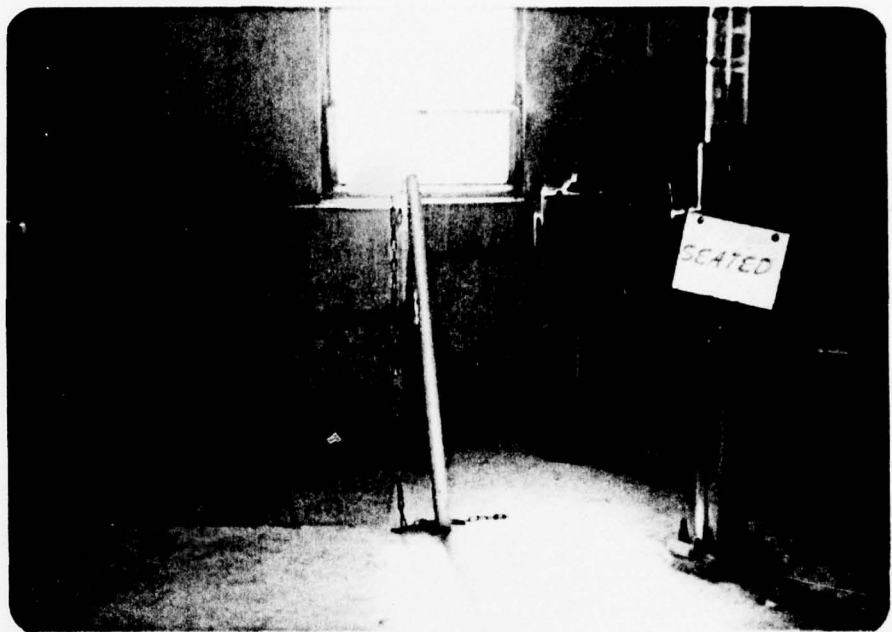
<u>PHOTOGRAPH NO.</u>	<u>DESCRIPTION</u>
1	Crest (looking south).
2	Crest (looking north).
3	Outlet pipe gate controls.
4	Outlet pipe.
5	Outlet pipe discharge channel (note rock slide into channel).
6	Spillway crest (note low flow section in the middle of the crest).
7	Spillway channel (looking downstream).
8	Spillway channel (looking upstream).
9	Erosion along the toe of the spillway wall (looking upstream).
10	Yellow Creek at Homer City.



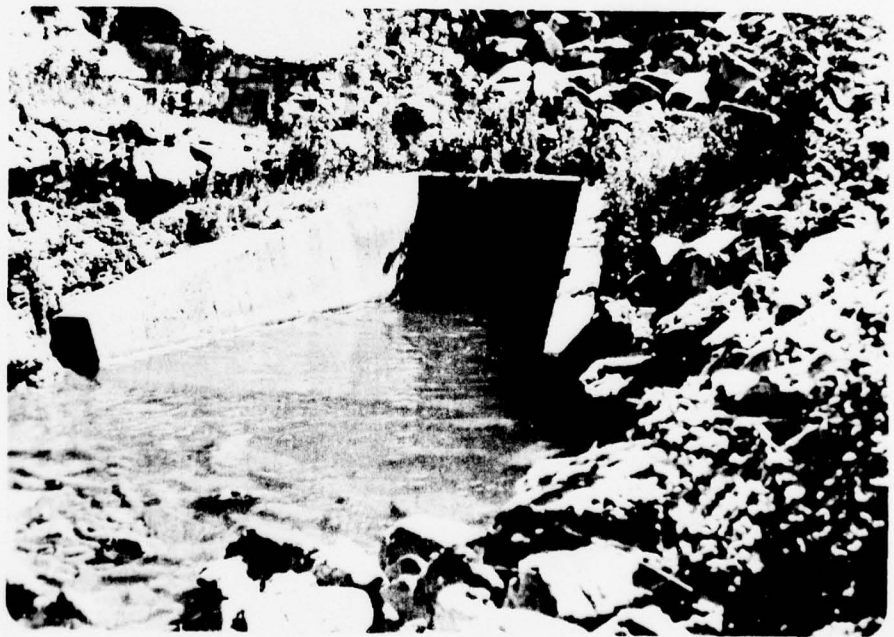
Photograph No. 1
Crest (looking south).



Photograph No. 2
Crest (looking north).



Photograph No. 3
Outlet pipe gate controls.



Photograph No. 4
Outlet pipe.



Photograph No. 5

Outlet pipe discharge channel (note
rock slide into channel).



Photograph No. 6

Spillway crest (note low flow section
in the middle of the crest).



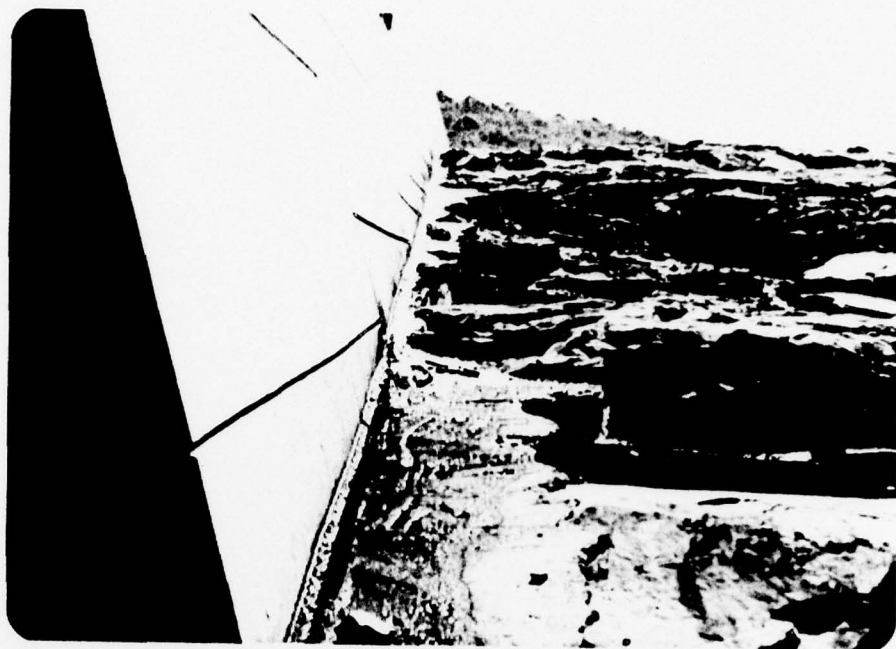
Photograph No. 7

Spillway channel (looking downstream).



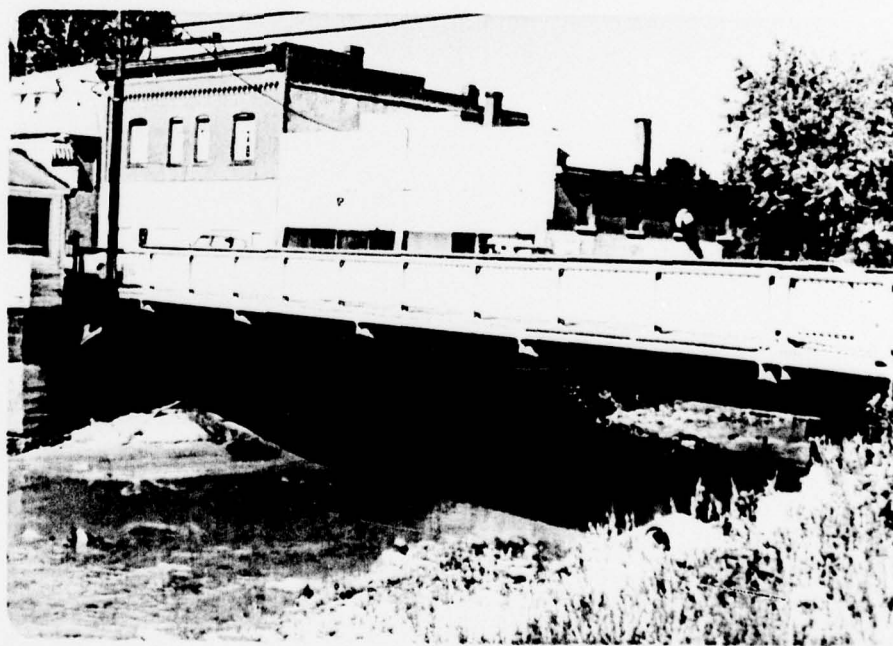
Photograph No. 8

Spillway channel (looking upstream).



Photograph No. 9

Erosion along the toe of the spillway wall
(looking upstream).



Photograph No. 10

Yellow Creek at Homer City.

APPENDIX D
CALCULATIONS

INDIANAPOLIS

CONSULTING ENGINEERS, INC

By WTC Date 9-18-78 Subject YELLOW CREEK LAKE DAM Sheet No. 1 of 2
Chkd. By MMB Date 9/29/78 HYDROLOGY & HYDRAULIC Proj. No. 78-114-30

DAM: YELLOW CREEK LAKE DAM

BASIN: OHIO RIVER BASIN, KISKIMINETAS RIVER, YELLOW CREEK
@ INDIANA, PA

WATERSHED AREA $A = 52.5$ SQ. MILE (Bf 1)

ACCORDING TO HYDROLOGICAL CHARTS PROVIDED BY
COE BALTIMORE DIST.

P M F PEAK INFLOW $q = 880$ cfs/SQ. MILE

$$Q = q A = \boxed{46200 \text{ cfs}}$$

$$26" \text{ RUN OFF} = \frac{26}{12} \times 52.5 \times 640$$

$$= \boxed{72,800 \text{ ac-ft}}$$

SPILLWAY

CONCRETE OVERFLOW WEIR

LENGTH = 112 FT

$$= 40' @ \text{ELEV } 1279 + 72' @ \text{ELEV } 1280.33$$

16" cutout, original design 1280.

TOP OF DAM 1305, FOR ALL PRACTICAL PURPOSES, USE
 $CH = 25'$

$$Q_s = (2.6)(112)(25)^{1.5}$$
$$= 36400 \text{ cfs}$$

REF (1) "WATER RESOURCES DATA FOR PENNSYLVANIA WATER YEAR 1976" VOLUME 3
OHIO RIVER AND ST LAWRENCE RIVER BASINS, USGS WATER-DATA REPORT
PA-76-3

DAIPIPOLONIA

CONSULTING ENGINEERS, INC.

By WTC Date 9-18-78 Subject YELLOW CREEK LAKE DAM Sheet No. 2 of 2
 Chkd. By MG Date 9/29/78 HYDROLOGY & HYDRAULIC Proj. No. 78-114-30

SURCHARGE STORAGE VOLUME

EL	Vol, ac-ft (Ref 1)
1285.02 FT (June 23, 1972)	18470 (MAX Recorded High)
1282.41 FT (Feb 17, 1976)	15970
1280 (NORMAL POOL)	13800 (LAKE AREA = 860 ac-ft)

APPROXIMATE STORAGE PER FOOT

$$= \frac{18470 - 15970}{1285.02 - 1282.41} = \frac{2500}{2.61} = 958 \text{ ac-ft/ft}$$

$$\boxed{\text{Say } 960 \text{ ac-ft/ft}}$$

FOR $\Delta H = 25 \text{ FT}$ Vol_{estimate} = 25×960

$$= 24000 \text{ ac-ft}$$

$$\boxed{\text{Say } V = 24000 \text{ ac-ft}}$$

ESTIMATED PERCENT OF PMF

$$= \left(\frac{36400}{46200} + \frac{24000}{72800} \right) 100\%$$

$$= (0.79 + 0.33) 100\%$$

$$= 112\%$$

$$\boxed{\text{Say } 100\% \text{ PMF}}$$

ESTIMATE MAX PEAK FLOW in June 23, 1972 (Record High)

$$Q_s = (2.6)(112)(502)^{1.5} = 3275 \text{ cfs} \quad \boxed{\text{Say } 3300 \text{ cfs}}$$

↑
(1285.02 - 1280)

APPENDIX E
REGIONAL GEOLOGY

APPENDIX E REGIONAL GEOLOGY

The Yellow Creek State Park Dam is situated on rock strata of the Pottsville Group, and the reservoir is on strata of the Allegheny and Conemaugh Groups. The dam is just east of the Chestnut Ridge Anticline with the Brush Valley Syncline east of the site. The rock in the vicinity of the dam consist of medium bedded to massive sandstone seams with thin interbedded shale, claystone, and coal seams.

The Upper Freeport coal seam crops on the slopes above the dam and reservoir. It has not been mined as of 1977, although there is a small entryway. The coal seams below the Upper Freeport coal seam are thin and are high in sulfur and therefore not minable. There are no minable coal seams in the Allegheny Group.

The slopes are steep near the dam, on the order of two to one. Rock falls could occur, although large slides should not be expected in the sandstone strata. The slopes are relatively gentle in the vicinity of the reservoir.