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POTOMAC RIVER BASIN



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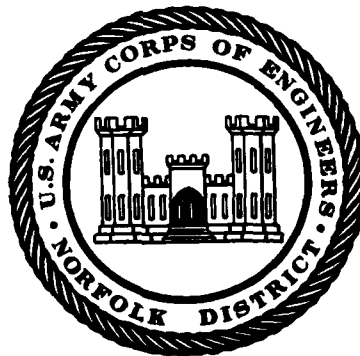
Name Of Dam: SOUTH RIVER NO. 3

Location: AUGUSTA COUNTY

Inventory Number: VA. 01510

LEVEL II

PHASE I INSPECTION REPORT
NATIONAL DAM SAFTY PROGRAM



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PREPARED BY
NORFOLK DISTRICT CORPS OF ENGINEERS
803 FRONT STREET
NORFOLK, VIRGINIA 23510

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MAY 1980

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20. Abstract

Pursuant to Public Law 92-367, Phase I Inspection Reports are prepared under guidance contained in the recommended guidelines for safety inspection of dams, published by 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 conditions 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.

Based upon the field conditions at the time of the field inspection and all available engineering data, the Phase I report addresses the hydraulic, hydrologic, geologic, geotechnic, and structural aspects of the dam. The engineering techniques employed give a reasonably accurate assessment of the conditions of the dam. It should be realized that certain engineering aspects cannot be fully analyzed during a Phase I inspection. Assessment and remedial measures in the report include the requirements of additional indepth study when necessary.

Phase I reports include project information of the dam and appurtenances, all existing engineering data, operational procedures, hydraulic/hydrologic data of the watershed, dam stability, visual inspection report and an assessment including required remedial measures.

NAME OF DAM: SOUTH RIVER #3
 LOCATION: AUGUSTA COUNTY, VIRGINIA
 INVENTORY NUMBER: VA 01510

⑥ **PHASE I INSPECTION REPORT
 NATIONAL DAM SAFETY PROGRAM**

South River #3 near S Dam
 (Inventory Number VA
 41510), Potomac River
 Basin, Augusta County,
 Virginia. Phase I
 Inspection Report.

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Unannounced Justification	<input type="checkbox"/>
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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 the Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

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

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the spillway design flood is based on the estimated "Probable Maximum Flood" for the region (flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the design flood should not be interpreted as necessarily posing a highly inadequate condition. The design flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

**PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM**

BRIEF ASSESSMENT OF DAM

Name of Dam: South River #3
State: Virginia
Location: Augusta County
USGS Quad Sheet: Vesuvius
Stream: Poor Creek
Date of Inspection: 16 April 1980

South River #3 Dam is an earthfill structure about 665 feet long and 47 feet high. The dam is owned by the Commonwealth of Virginia, Department of Corrections and maintained by the Headwater Soil and Water Conservation District. The dam is classified as an intermediate size with a significant hazard classification. The principal spillway is a concrete drop-inlet structure that discharges through a reinforced concrete pipe downstream of the dam. The emergency spillway is an earthen open channel cut in the right abutment. This reservoir is used for flood control and recreation and is located approximately one mile south of Greenville, Virginia at State Prison Camp #10.

Based on criteria established by the Department of the Army, Office of the Chief of Engineers (OCE), the Spillway Design Flood (SDF) is the 1/2 PMF. The spillways will pass 49 percent of the PMF without overtopping the dam. The SDF will overtop the dam by 0.1 feet with a peak average critical velocity of 3.5 feet per second and flow over the dam for a total of 0.5 hours. The spillways are rated as adequate.

The visual inspection revealed no apparent problems and there are no immediate needs for remedial measures. There is a regular maintenance operation program, but no warning system. It is recommended that a warning system be established and the maintenance items listed in Section 7.2 be accomplished as part of the regular maintenance program within the next 12 months.

Submitted By:

Original signed by
JAMES A. WALSH
JAMES A. WALSH, P. E.
Chief, Design Branch

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Douglas L. Haller
DOUGLAS L. HALLER
Colonel Corps of Engineers
District Engineer

Recommended By
Original signed by
JACK G. STARR

JACK G. STARR
Chief, Engineering Division

Date: AUG 1 1980



OVERALL VIEW OF DAM
16 APRIL 1980

SECTION 1

PROJECT INFORMATION

1.1 GENERAL:

1.1.1 Authority: Public Law 92-367, 8 August 1972, authorized the Secretary of the Army, through the Corps of Engineers to initiate a national program of safety inspections of dams throughout the United States. The Norfolk District has been assigned the responsibility of supervising the inspection of dams in the Commonwealth of Virginia.

1.1.2 Purpose of Inspection: The purpose is to conduct a Phase I inspection according to the Recommended Guidelines for Safety Inspection of Dams (Reference 1, Appendix V). The main responsibility is to expeditiously identify those dams which may be a potential hazard to human life or property.

1.2 Project Description:

1.2.1 Dam and Appurtenances: South River #3 Dam is an earthfill embankment structure about 665 feet long and 47 feet high. The crest of the dam is 16 feet wide with a crest elevation of 1655.5 ft. msl. A gravel road traverses the embankment from the State Prison Camp #10 to the pistol range in the emergency spillway. The upstream slope is 2.5 horizontal to 1 vertical (2.5H:1V) with a bench at elevation 1624.0. Riprap is placed on the embankment up to the bench elevation. The downstream slope is 2.5H:1V. The embankment has a core that is keyed into the foundation and has a toe drain with one 8-inch outlet pipe discharging into the stilling basin. Plan view and profiles are shown in Appendix I.

The principal spillway is a concrete drop-inlet that services a 24-inch reinforced concrete pipe passing through the dam at low level. The crest of the principal spillway is 1624.0 and the invert of the outlet pipe is 1612.0. A trash rack protects large debris from entering the intake structure. A 24-inch slide gate, with invert at elevation 1612.4, is provided to drawdown the reservoir from normal pool elevation.

The emergency spillway is an earthen open channel cut in the right abutment with the crest at elevation 1649.0. The emergency spillway is 100 feet wide with side slopes of (3H:1V).

1.2.2 Location: South River #3 Dam is located southeast of State Prison Camp No. 10 on Poor Creek, one mile south of Greenville, Virginia in Augusta County.

1.2.3 Size Classification: The dam is classified as an intermediate size structure because of height.

1.2.4 Hazard Classification: The dam is located upstream of one farm, state secondary Route 662, and Wallace Dam; therefore, a significant hazard classification is given for this structure according to guidelines contained in Section 2.1.2 of Reference 1, Appendix IV. The hazard classification used to categorize dams is a function of location only and has nothing to do with their stability or probability of failure.

1.2.5 Ownership: Commonwealth of Virginia, Department of Corrections

1.2.6 Purpose: Flood control and recreation

1.2.7 Design and Construction History: The dam was designed by the Soil and Conservation Service and constructed by Lester B. Frank. The dam was completed in 1958.

1.2.8 Normal Operational Procedures: The operation of the dam is automatic. The principal spillway is ungated; therefore, water rising above the crest of the drop-inlet is automatically passed downstream. Similarly, water is automatically passed through the emergency spillway in the event of an extreme flood which fills the flood storage space.

1.3 Pertinent Data:

1.3.1 Drainage Area: The dam controls a drainage area of 3.14 square miles.

1.3.2 Discharge at Dam Site: Maximum flood - 83 cfs, approximately 5 feet below the emergency spillway crest (1644) during the remnants of Hurricane Camille in 1969.

Pool level at top of dam

Principal Spillway	94 cfs
Emergency Spillway	4640 cfs

1.3.3 Dam and Reservoir Data: Pertinent data on the dam and reservoir are shown in the following table:

TABLE 1.1 DAM AND RESERVOIR DATA

Item	Elevation feet msl	Reservoir			Length miles
		Area, acres	Acre, feet	Capacity Watershed, inches	
Top of Dam	1655.5	83	1450	8.7	.871
Emergency Spill- way Crest	1649	62	1000	6.0	.833
Principal Spill- way Crest	1624	13	80	0.5	.227
Streambed at Down- stream Toe of Dam	1608.5+	--	--	--	--

SECTION 2

ENGINEERING DATA

2.1 Design: As-built drawings were provided by the U. S. Department of Agriculture, Soil Conservation Service. The drawings provide plans, elevations, sections, and details of the embankment and appurtenant structure. Also shown on the drawings are boring logs from test borings taken along the centerline of the embankment. The test boring logs show the foundation material to be silty clay with fine sand overlying limestone. The drawings shown anti-seepage devices along the outlet pipe and a toe drain.

2.2 Construction: No construction records were available through the SCS Office in Richmond. All records are on file and available through the SCS Office in Washington, D. C.

2.3 Evaluations: Based on the available information, an adequate representation of the dam geometrics can be assumed. However, there is no construction information. Therefore, there is insufficient information to evaluate the embankment stability.

SECTION 3

VISUAL INSPECTION

3.1 Findings:

3.1.1 General: The results of the 16 April 1980 inspection are recorded in Appendix III. At the time of the inspection, the weather was partly cloudy and windy. The temperature was 50° F and the ground conditions were moist. The pool elevation was about 1624.5 feet msl, normal pool elevation, and the tailwater was at approximately 1610.4 feet msl. There was flow through both the principal spillway and the toe drain outlet. The dam is annually inspected by SCS personnel. The latest available report is dated 27 April 1979 and no major problems were noted.

3.1.2 Embankment: The embankment is in good condition. A plan view and cross section are shown on the drawings provided on Plates I and II, Appendix I.

There are no signs of surface cracks, unusual movement, sloughing, or misalignment. However, there are numerous small animal burrows on both the upstream and downstream slopes as well as scattered miscellaneous debris. There are tire ruts (See Photo No. 2, Appendix II) on both upstream abutments and the upstream bench which contain standing water. There is a footpath on the downstream slope from the crest to the emergency spillway. There is minor erosion in the vicinity of the discharge pipe, where it exits the embankment.

Water is ponded in several areas on the road across the crest of the embankment.

A wet spot is located on the downstream right abutment at elevation 1618. (See Plate I, Appendix I and Photo No. 5, Appendix II). The water is clear and no definable seep can be found. The surrounding area, immediately downstream, is saturated.

A spring is located 72 feet from the downstream toe 54 feet right of the discharge pipe. (See Plate I, Appendix I). The flow is clear and no rate was measured.

The embankment has a toe drain with an 8-inch CMP drain pipe discharging into the stilling basin. Water from the pipe is clear and flowing at a rate of 1.7 gallons per minute.

3.1.3 Outlet Works: The concrete drop-inlet is in good condition. No cracking or spalling of the 24-inch outlet pipe is noticeable. The wheel and stem for the emergency gate are rusted. It is not known if the gate has ever been operated. The riprap on the right of the stilling basin has washed out. (See Photo No. 3 and 4, Appendix II).

3.1.4 Emergency Spillway: The emergency spillway is a cut through natural ground on the right of the dam. Both the approach and discharge channels are well vegetated. A gravel road traverses the control section.

Several small holes and a stack of hay are located just upstream of the gravel road. A pistol range is located in the discharge channel with fifteen targets and associated pistol stands. Large trees are located in the discharge channel of the spillway.

3.1.5 Instrumentation: There are a series of staff gages on the upstream left abutment measuring 30 feet above the principal spillway. There is no other instrumentation on the dam.

3.1.6 Reservoir Area: The reservoir area is gentle sloping highly wooded pasture land. There are no signs of reservoir slope failure or shoreline erosion.

3.1.7 Downstream Channel: The downstream channel slopes are gentle to mild with only a few large trees dotting the area. The land is primarily pasture land. Three wire fences cross the channel approximately 200 to 250 feet from the toe. (See Photo No. 4, Appendix II) There is some miscellaneous debris wedged against the fences. One farm, state secondary Route 662 and Wallace Dam are located in the downstream flood plain within a mile of the South River Dam #3.

3.2 Evaluation: Overall the dam appears in good condition. The inspection revealed certain preventive maintenance items which should be scheduled as part of an annual maintenance program. These are:

- a. The small animal burrows and tire ruts on the embankment, and the erosion in the vicinity of the discharge pipe, should be dressed with compacted fill and seeded.
- b. The footpath on the downstream slope should be seeded.
- c. The miscellaneous debris on the embankment should be removed.
- d. The road on the crest of the dam should be regraded and paved with crush stone.
- e. The wet spot in the downstream right abutment and spring in the downstream area should be monitored during periodic inspections.
- f. Additional riprap should be placed around the stilling basin.
- g. The holes in the emergency spillway should be dressed with compacted fill and seeded.
- h. The trees in the discharge channel of the emergency spillway should be cut to the ground.
- i. Bales of hay should be placed on the slope behind the targets to deter erosion from weapons fire.
- j. The debris should be removed from the fences crossing the downstream channel.

SECTION 4

OPERATIONAL PROCEDURES

4.1 Procedures: The normal storage pool is elevation 1624.0 which is the crest of the concrete principal spillway drop-inlet. The lake provides flood control storage and offers minimal recreation. Water passes automatically through the principal spillway as the water level in the reservoir rises above the principal spillway crest. Water will also pass automatically through the emergency spillway when the water level in the reservoir reaches elevation 1649.0. A 24-inch slide gate valve at low point in the drop-inlet is provided to drawdown the reservoir from normal pool.

4.2 Maintenance: A regular maintenance and inspection program is performed by the Headwater Soil and Water Conservation District. The maintenance includes liming, fertilizing, mowing embankment and spillway, seeding and mulching bare areas, and repairing gullies that occur in the dam and spillway areas. Additionally, the owner assists the district by occasionally mowing the dam for the hay.

4.3 Warning System: At present time there is no warning system or evacuation plan for South River #3 Dam.

4.4 Evaluation: The dam does not require an elaborate operational and maintenance procedure. Complete records of maintenance and inspections should be maintained for future reference. An emergency operation and warning plan should be developed. It is recommended that a formal emergency procedure be prepared and furnished to all operating personnel. This should include:

- a. How to operate the dam during an emergency.
- b. Who to notify, including public officials, in case evacuation from the downstream area is necessary.

SECTION 5

HYDRAULIC/HYDROLOGIC DATA

5.1 Design: None were available.

5.2 Hydrologic Records: None were available.

5.3 Flood Experience: The maximum flow observed flood reached approximately elevation 1644 or 5 feet below the emergency spillway crest during the remnants of Hurricane Camille in 1969.

5.4 Flood Potential: The 1/2 PMF and PMF were developed and routed through the reservoir by use of the HEC-IDB computer program (Reference 2, Appendix IV) and appropriate unit hydrograph, precipitation and storage-outflow data. Clark's Tc and R coefficients for the local drainage area were estimated from basin characteristics. The rainfall applied to the developed unit hydrograph was obtained from the U. S. Weather Bureau Publication (Reference 3, Appendix IV).

5.5 Reservoir Regulation: Pertinent dam and reservoir data are shown in Table 1.1.

Water passes automatically through the principal and emergency spillways as the reservoir rises above their respective crests.

The storage curve was developed from areas obtained from a U. S. Geological Survey Quadrangle Map. Rating curves were developed for the principal spillway, emergency spillway, and the non-overflow section of the dam. In routing hydrographs through the reservoir, it was assumed that the initial pool level was at elevation 1624.0. Flow through the principal and emergency spillway was included in the routings.

5.6 Overtopping Potential: The probable rise in the reservoir and other pertinent information on reservoir performance is shown in the following table:

Table 5.1 RESERVOIR PERFORMANCE

Item	Normal Flow	1/2 PMF	PMF 1/
Peak flow, c.f.s.			
Inflow	3	7201	14402
Outflow	3	4918	14192
Maximum elevation ft., msl	1624.0	1655.6	1657.7
Emergency Spillway (crest el. 1649.0)			
Depth of flow, ft	-	6.6	8.7
Duration, hrs	-	16	18
Velocity, fps 2/	-	11.5	13.3
Non-overflow section (el. 1655.5)			
Depth of flow, ft.	-	.1	2.2
Duration, hrs	-	.5	4.5
Velocity, fps 2/	-	3.5	6.8
Tailwater elevation ft., msl	1611+	-	-

1/ The PMF is an estimate of flood discharges that may be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region.

2/ Critical velocity.

5.7 Reservoir Emptying Potential: A 24-inch slide gate outlet at elevation 1612.4 on the drop-inlet intake structure is available for dewatering the reservoir. The outlet will permit withdrawal of about 50 cfs with the reservoir at normal pool and essentially dewater the reservoir in less than 2 days. This is equivalent to an approximate drawdown rate of 8 feet per day based on the hydraulic height measured from normal pool divided by the time to dewater the reservoir.

5.8 Evaluation: Based on the size (intermediate) and hazard classification (significant), the recommended Spillway Design Flood is 1/2 PMF to the PMF. Because of the risk involved, the 1/2 PMF has been selected as the SDF. The spillways will pass 49 percent of the PMF without overtopping the dam. The SDF will overtop the dam by 0.1 feet with a peak average critical velocity of 3.5 feet per second and flow over the dam for a total of 0.5 hours.

Conclusions pertain to present day conditions. The effect of future development on the hydrology has not been considered.

SECTION 6

DAM STABILITY

6.1 Foundation and Abutment: Test boring logs on the design drawings indicate the foundation materials to be silty clays with fine sand overlying limestone. (See Plate 3, Appendix I). The dam is located within the valley and ridge physiographic province consisting of undulating hills of low topographic relief. Limestone outcrops in the area strike perpendicular to the dam axis with a rear vertical dip. The rock is thin bedded, fine grained, and has calcite stringers. The foundation material is generally impervious but bedding planes enhance seepage. As noted in the visual inspection there is a wet spot on the downstream right abutment and a spring downstream of the toe. Based on the drawings, the dam is keyed into bedrock and has a toe drain. Overall the foundation is considered stable.

6.2 EMBANKMENT:

6.2.1 Material: There is no information available on the nature of the embankment materials other than that the borrow was taken from within the reservoir area below elevation 1624 feet msl. The area soils are low plastic silts and clays. The drawings indicate that the embankment is homogeneous.

6.2.2 Stability: There are no available stability calculations. The dam is 47 feet high and 16 feet wide. A gravel road traverses the crest of the dam. The slopes are 2.5H:1V. The dam is subject to sudden drawdown because the approximate reservoir drawdown rate of 8 feet per day exceeds the critical rate of 0.5 feet per day for earth dams. The existing pool is at normal pool. The dam has not experienced the maximum control storage pool which is at the elevation of the emergency spillway.

According to the guidelines presented in Design of Small Dams, U.S. Department of the Interior, Bureau of Reclamation for small homogenous dams, with a stable foundation, subjected to a drawdown and composed of low plastic fines (CL, ML), the recommended slopes are 3.5H:1V upstream and 2.5H:1V downstream. The recommended width is 20 feet. Based on these guidelines the dam has an adequate downstream slope, but inadequate upstream slope and width.

6.2.3 Seismic Stability: The dam is located in Seismic Zone 2. Therefore, according to the Recommended Guidelines for Safety Inspection of Dams, the dam is considered to have no hazard from earthquakes provided static stability conditions are satisfactory and conventional safety margins exist.

6.3 Evaluation: There is insufficient information to adequately evaluate the stability of the dam. Also, based on the visual inspection, the foundation is considered sound. Based on the Bureau of Reclamation Guidelines, the upstream slope and the width are inadequate. However, the structure is an engineered embankment constructed under SCS supervision. The dam is regularly maintained and inspected. The visual inspection revealed no apparent instability. Overtopping is not considered a problem because flows are shallow, lasting only 0.5 hours, and the velocity is less than 6 fps, the effective eroding velocity for a vegetated earth embankment. A stability analysis is not required because the embankment is a known engineered dam, is regularly maintained and inspected, and the visual inspection revealed no apparent problems.

SECTION 7

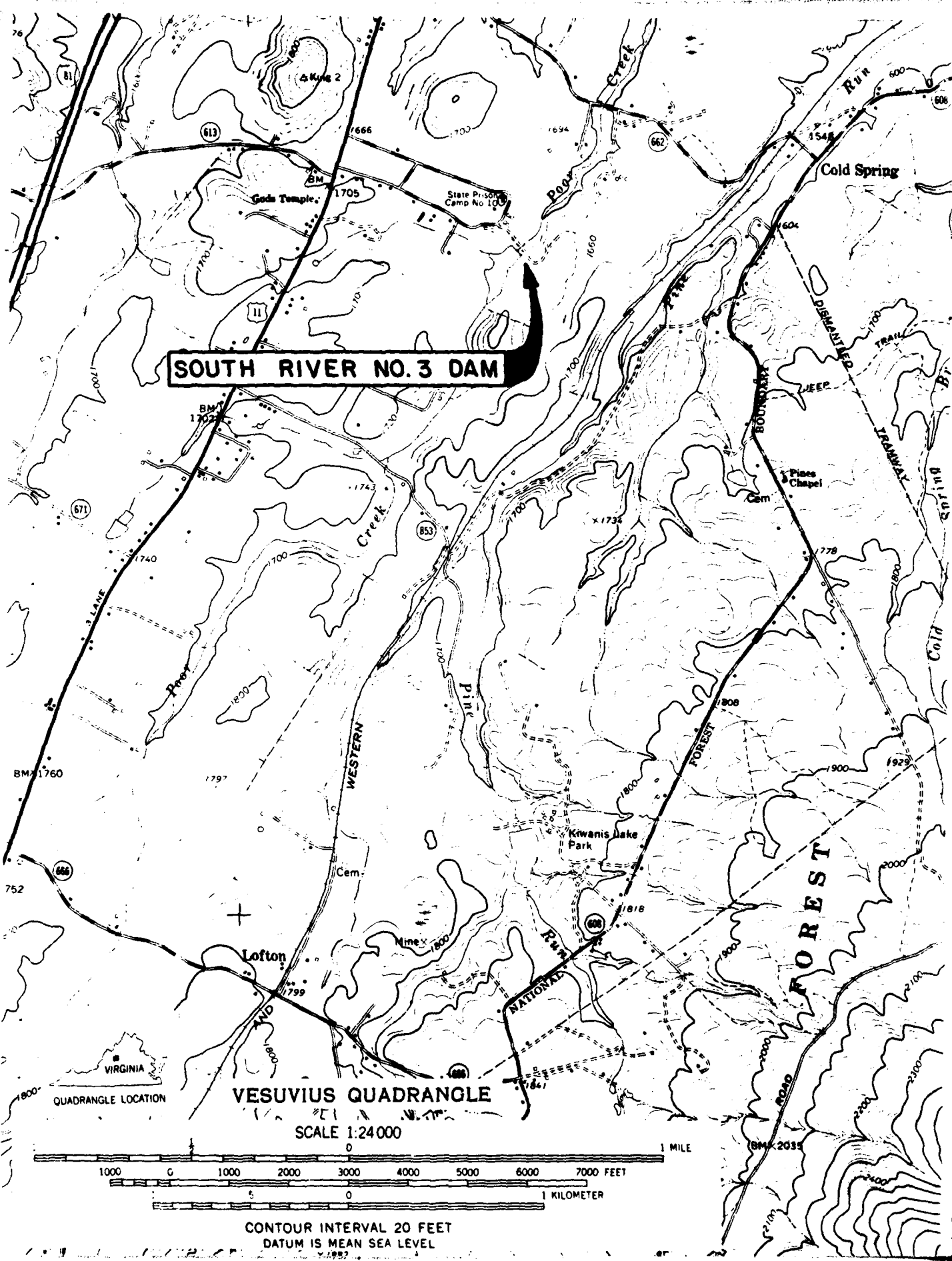
ASSESSMENT/REMEDIAL MEASURES

7.1 Dam Assessment: The available engineering data is insufficient to evaluate the embankment stability. The visual inspection revealed no findings that proved the dam to be unsound. There is a regular maintenance operations program. However, there is no emergency operations and warning plan. Overall the dam is in good condition and there is no immediate need for remedial measures. Based on criteria established by the Department of the Army, Office of the Chief of Engineers (OCE), the Spillway Design Flood (SDF) is the 1/2 PMF. The spillways will pass 49 percent of the PMF without overtopping the dam. The spillways are, therefore, rated as adequate. Flows overtopping the dam during SDF are not considered detrimental to the embankment. A stability check of the dam is not required.

7.2 Recommended Remedial Measures: It is recommended that the regular maintenance operation program be documented for future reference. A formal emergency procedure should be prepared and furnished to all operating personnel. This should include how to operate the dam during an emergency, and who to notify including public officials, in case evacuation from the downstream area is necessary. Also, the inspection revealed the following maintenance items that should be scheduled by the owner during a regular maintenance period within the next 12 months:

- a. The small animal burrows and tire ruts on the embankment, and the erosion in the vicinity of the discharge pipe, should be dressed with compacted fill and seeded.
- b. The footpath on the downstream slope should be seeded.
- c. The miscellaneous debris on the embankment should be removed.
- d. The road on the crest of the dam should be regraded and paved with crush stone.
- e. The wet spot in the downstream right abutment and spring in the downstream area should be monitored during periodic inspections.
- f. Additional riprap should be placed around the stilling basin.
- g. The holes in the emergency spillway should be dressed with compacted fill and seeded.
- h. The trees in the discharge channel of the emergency spillway should be cut to the ground.
- i. Bales of hay should be placed on the slope behind the targets to deter erosion from weapons fire.
- j. The debris should be removed from the fences crossing the downstream channel.

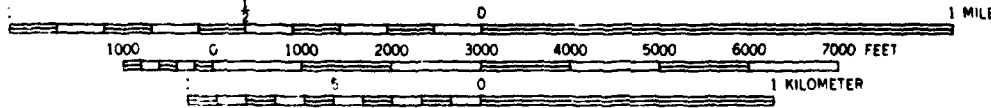
APPENDIX I
MAPS AND DRAWINGS



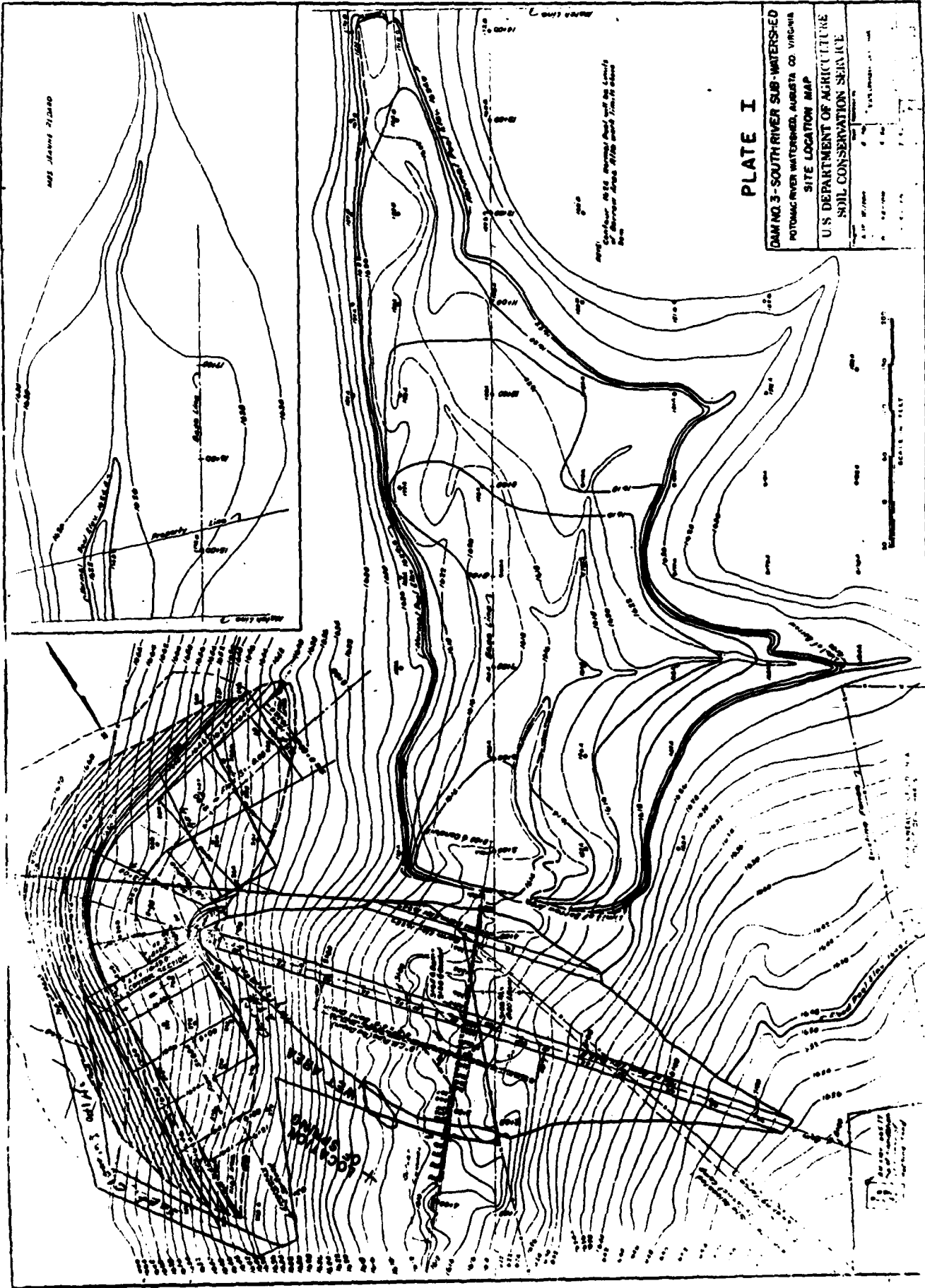
SOUTH RIVER NO. 3 DAM

VESUVIUS QUADRANGLE

SCALE 1:24 000



CONTOUR INTERVAL 20 FEET
 DATUM IS MEAN SEA LEVEL



MRS. JAMES ZIMMER

Contour 2000, 2500, 3000, 3500, 4000, 4500, 5000, 5500, 6000, 6500, 7000, 7500, 8000, 8500, 9000, 9500, 10000

PLATE I

DAM NO. 3 - SOUTH RIVER SUB-WATERSHED
POTOMAC RIVER WATERSHED, AUGUSTA CO. VIRGINIA
SITE LOCATION MAP
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Scale	1" = 1000'
Projection	Universal Transverse Mercator
Zone	18N
Grid	18N 18W
Sheet	18N 18W
Section	18N 18W
Block	18N 18W
Sheet	18N 18W
Section	18N 18W
Block	18N 18W

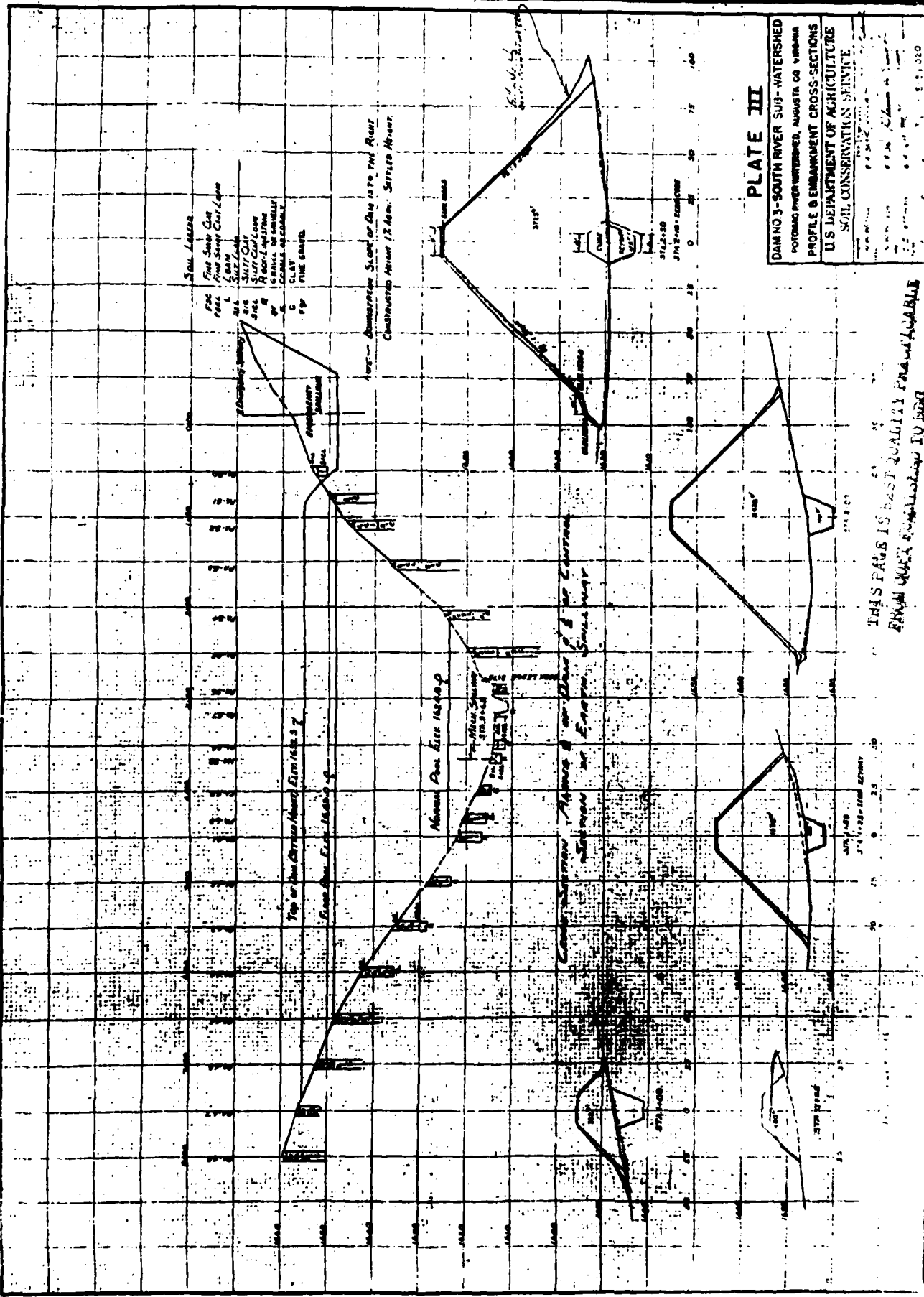


PLATE III

DAM NO. 3-SOUTH RIVER SUJ-WATERSHED
 POTOMAC RIVER WATERSHED, AUGUSTA CO. VIRGINIA
 PROFILE & EMBANKMENT CROSS SECTIONS
 U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

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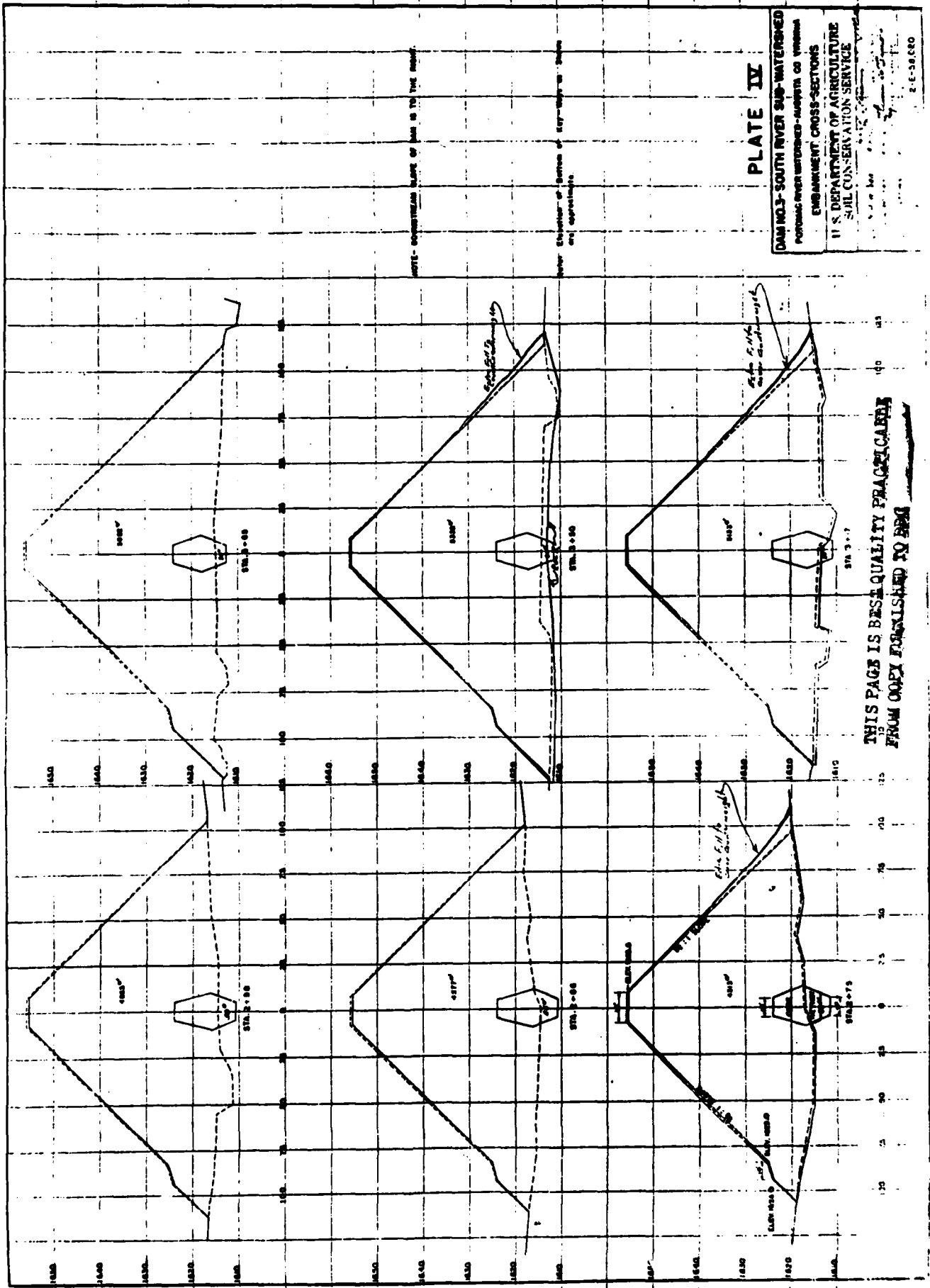


PLATE IV
 DAM NO. 3 - SOUTH RIVER SUB-WATERSHED
 EMBANKMENT CROSS-SECTIONS
 U. S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

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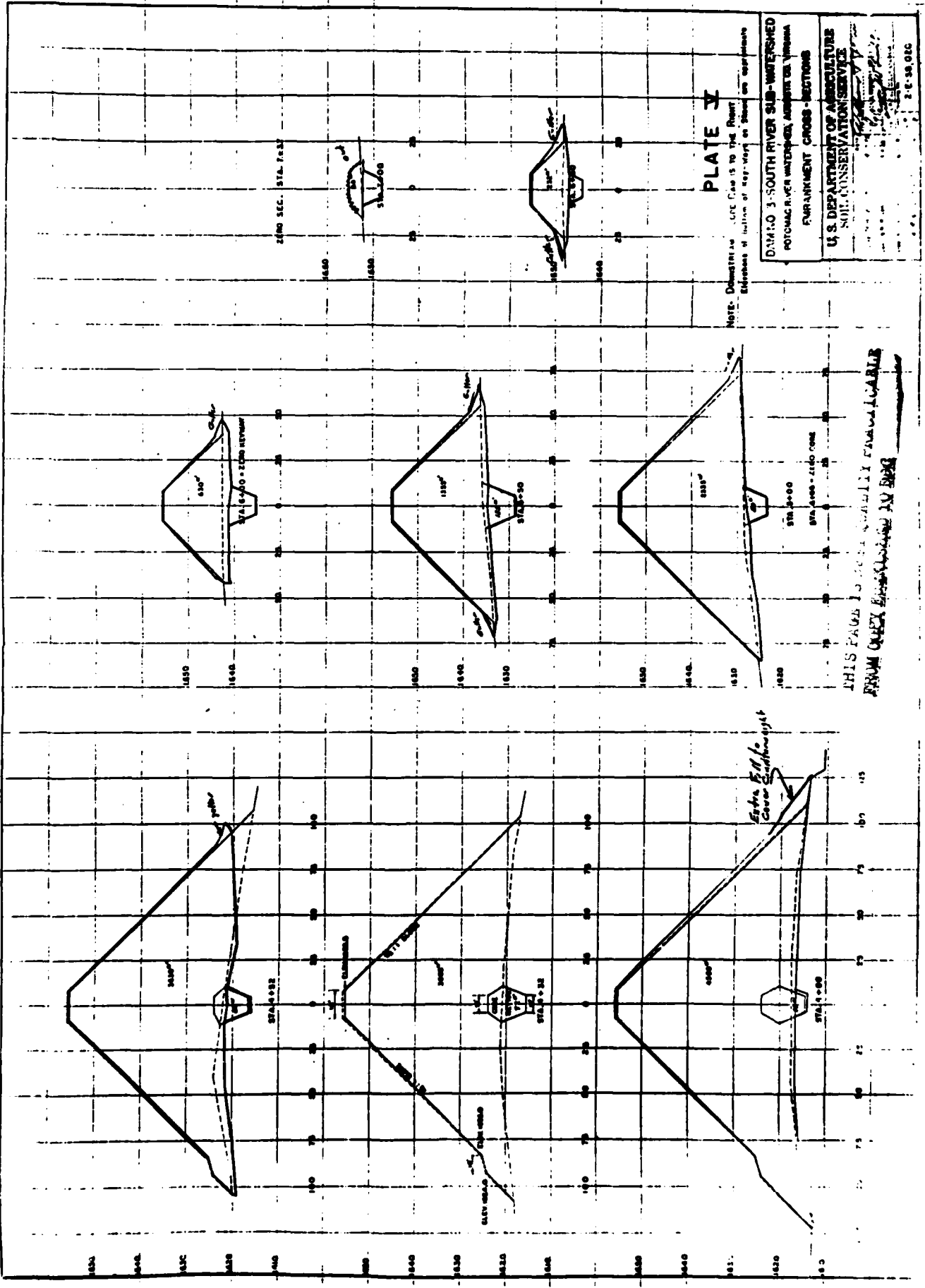


PLATE V

NOTE: DEMONSTRATE USE CAN BE THE RESULT OF EVIDENCE OF SECTION AT 1575+00 OR SHOW ON APPROPRIATE

DRAINAGE SOUTH RIVER SUB-WATERSHED
 POTOMAC RIVER WATERSHED, ANNEAPOLIS, MARYLAND
 FURNISHMENT CROSS-SECTIONS
 U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE
 WASHINGTON, D.C.

THIS PAGE IS FOR THE PROPERTY OF THE U.S. ARMY
 FROM GEX 1575+00 TO 1600+00

Extra Fill to
 Cover Sandstone

2-1-58 010

APPENDIX II

PHOTOGRAPHS



PHOTO #1 DAM AND RESERVOIR



PHOTO #2 UPSTREAM FACE OF DAM



PHOTO #3 PRINCIPAL SPILLWAY DISCHARGE

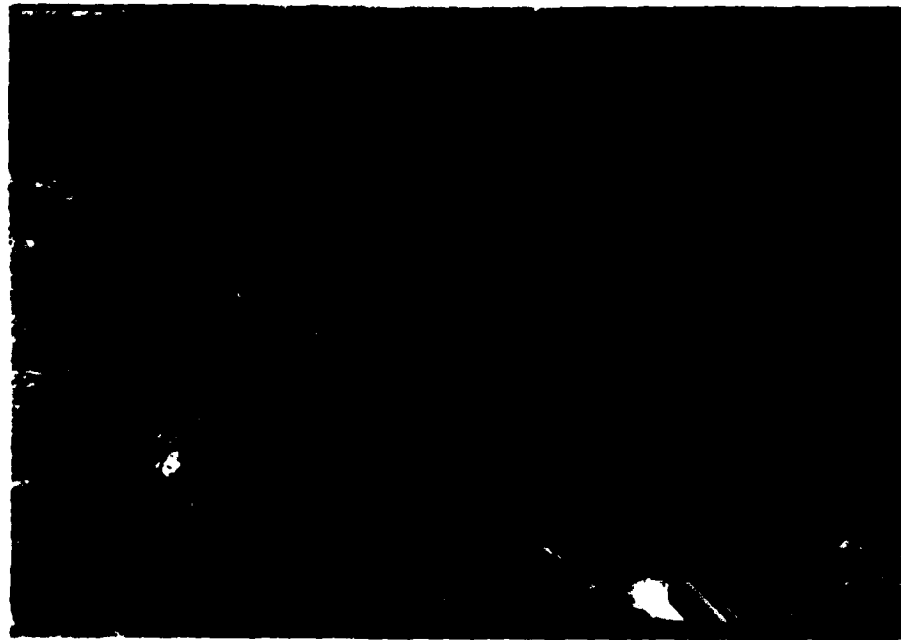


PHOTO #4 PRINCIPAL SPILLWAY
DISCHARGE CHANNEL

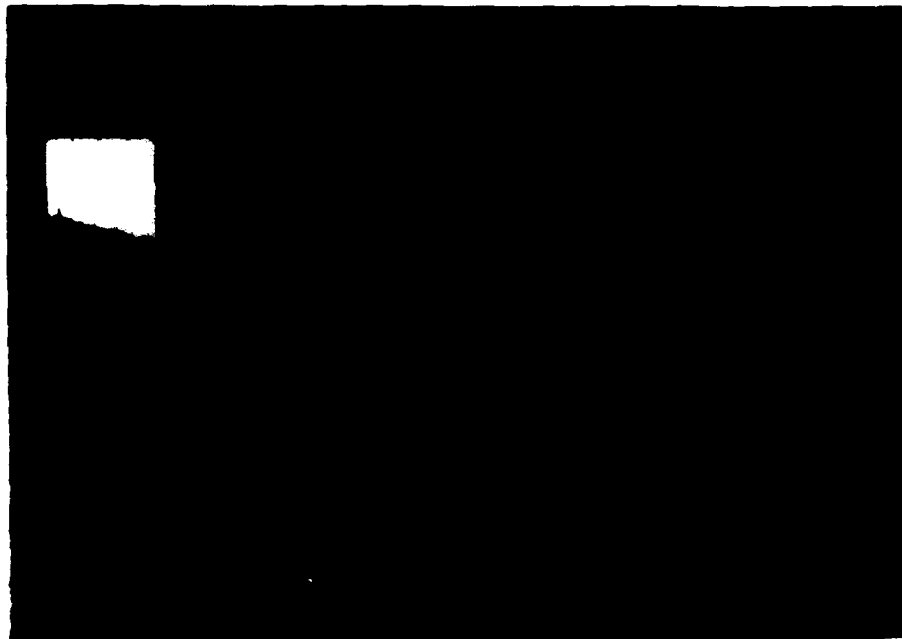


PHOTO *5 EXTENSIVE WET SOGGY AREA AT
AND BEYOND DOWNSTREAM TOE

APPENDIX III
FIELD OBSERVATIONS

Check list
Visual Inspection
Phase I

Name Dam: South River #3 County: Augusta State: VA Coordinaters: Lat 37°59.4'
Long 79°09.0'

Date Inspection: 16 Apr 80 Weather: Partly Temperature: 50°F
cloudy & windy

Pool Elevation at Time of Inspection: 1624 ft. MSL Tailwater at Time of Inspection: 1610.4 ft. MSL

Inspection Personnel:

Bo Taran, COE	Len Jones, COE	Leon Musselwhite, SWCB
Jim Robinson, COE	Dan Davis, COE	Dave Bushman, SWCB
Dave Pezza, COE		

Davis Recorder

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	There are no surface cracks. Ground conditions are moist.	None.
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	There are no creep, sloughing, or bearing capacity problems.	None.
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	There are numerous small animal burrows on both the upstream and downstream slopes. Tire ruts are located on both upstream abutments and the upstream bench. Water is ponded in the ruts on the upstream bench saturating the embankment. A footpath begins on the crest at about station 2+00 and cuts down the downstream slope to the Emergency Spillway. There is miscellaneous debris on the face of the dam. There is minor erosion in the vicinity of the discharge pipe, where it exits the embankment.	The small animal burrows and tire ruts should be dressed with compacted fill and vegetated. The foot path should be vegetated. The miscellaneous debris should be removed. The erosion in the vicinity of the discharge pipe should be dressed with compacted fill and vegetated.
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	There is no deviation from the alignment on the drawings. No settlement is noticeable. The crest of the dam serves as a gravel road. Water is ponded on the road in several places.	The road should be regraded and paved with four to six inches of crushed stone.
RIPRAP FAILURES	The upstream slope is protected by a river run cobble riprap to elevation 1624 feet. The riprap is clear of vegetation and shows no signs of failure. There is no other riprap on the dam proper.	None.

EMBANKMENT

FOUNDATION

There is no noticeable sliding or settlement. Limestone outcrops in the area strike perpendicular to the dam axis, dip is near vertical. The limestone is thin bedded, fine grained, and has calcite stringers. The foundation material is generally impervious but bedding planes enhance seepage.

None.

ANY NOTICEABLE SEEPAGE

A spring is located 72 feet downstream of the toe, 54 feet right of the discharge pipe. The flow is clear, rate not measured. A wet area is located on the downstream right abutment at elevation 1618.2. The water is clear, and no definable seep can be found. The surrounding area immediately downstream is saturated.

The spring and wet area should be monitored during periodic inspections.

DRAINS

One 8-inch CMP toe drain outlet is located 2 feet right of the discharge pipe and extends 7.5 feet from the headwall. Water from the pipe is clear and flowing at a rate of 1.7 gallons per minute. A small animal barrier is across the opening of the pipe.

None.

MATERIALS

Area soils are silty clays and silty clays with fine sand. Borrow was taken from the reservoir area.

None.

VEGETATION

The embankment is lightly vegetated with Fesque and Kentucky 31.

None.

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CRACKING AND SPALLING OF CONCRETE SURFACES IN OUTLET CONDUIT	The 24" reinforced concrete pipe and craddle appear in good condition.	None.
INTAKE STRUCTURE	The concrete drop-inlet appears to be working efficiently.	None.
OUTLET STRUCTURE	A 24-inch reinforced concrete pipe discharges into a ripraped stilling basin. Water is flowing 9 inches deep in the pipe.	None.
OUTLET CHANNEL	The stilling basin is approximately 20 feet wide and extended 25 feet below the discharge pipe. The ripraps on the right side of the basin has washed into the channel. Some of the adjoining slope has washed into the channel also. Several animal burrows are located around the stilling basin. A sewage drain from the prison located nearby discharges into the channel about 20' below the basin.	Additional ripraps should be placed around the basin to protect the slopes and form an efficient stilling basin pool.
EMERGENCY GATE	The stem and wheel for the emergency gate are located on the riser and appeared rusted. It is not known if the gate has ever been operated.	None.

EMERGENCY SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATION
CONTROL SECTION	<p>The control section has a good grass cover. A gravel road traverses the crest of the dam and passes through the control section near the discharge channel. Several small holes are located in the area along with a stack of rolled hay. The side slopes are well vegetated except for a few sparse areas.</p>	<p>The holes should be back-filled and the sparsely vegetated areas seeded.</p>
APPROACH CHANNEL	<p>The approach channel is well vegetated with no apparent problems.</p>	<p>None.</p>
DISCHARGE CHANNEL	<p>A target range with 15 pistol stands and targets are located downstream of the gravel road that passes through the control section. Large trees are located in the downstream end of the channel. The right slope is partially defaced due to weapons fire penetrating through the targets.</p>	<p>The trees should be cut to the ground. Bales of hay should be placed on the right slope to deter erosion from weapons fire.</p>

INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATION
MONUMENTATION/SURVEYS	There are no known monuments in the area.	None.
OBSERVATION WELLS	There are no wells.	None.
WEIRS	There are no weirs.	None.
PIEZOMETERS	There are no piezometers.	None.
STAFFGAGES	There are a series of staff gages on the upstream left abutment measuring 30 feet above the principal spillway.	None.

RESERVOIR

VISUAL EXAMINATION

OBSERVATIONS

REMARKS OR RECOMMENDATIONS

The reservoir area contains mild sloping pasture lands. Few trees grow near the water's edge. No debris can be seen around the reservoir.

SLOPES

None.

SEDIMENTATION

The inspection team is unable to determine if there is a sedimentation problem.

None.

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Three wire fences cross the channel about 200-250 feet downstream from the outlet pipes. Some debris is wedged against the fence.	The fences may dam water causing the downstream toe to become saturated. Debris should be removed after heavy rains (flows) and during the regular mainte- nance program.
SLOPES	The channel slopes are gentle to mild with only a few large trees dotting the area. The land is primarily pasture land with little to no potential debris accumulation.	None.
APPROXIMATE NO. OF HOMES AND POPULATION	One farm, state secondary Route 662, and Wallace Dam are located in the downstream flood plain. A dam failure could endanger the lives of the people who live in this area.	None.

APPENDIX IV
PAST INSPECTION REPORT

HEADWATERS SOIL & WATER CONSERVATION DISTRICT
O&M INSPECTION REPORT ON
PL 534/566 FLOOD CONTROL DAMS

WATERSHED SOUTH RIVER DAM NO. 3 DATE 4/27/71
 LANDOWNER (S) STATE OF VIRGINIA LOCATION POOR CREEK
 ANNUAL TRI ANNUAL _____ OTHER _____

TRI ANNUAL USE ONLY

SCHEDULE:
 A. MOWING _____ DATE _____
 B. SOIL SAMPLING - 1. DAM FACE DIS _____ 2. DAM BACK U/S _____
 3. SPILLWAY _____ 4. BORROW _____
 SOILS REPORT: ATTACHED _____ ACTION _____

	GENERAL	VEGETATION	DRAINAGE	EROSION	DEB-OBSERV	OTHER
ACCESS ROAD (S) 1	E	E	E	E	E	
EMERGENCY SPILLWAY 2	E	E	E	E	See Note	
TOP ROAD (YN) 3	E	E	E	E	E	
DAM FACE DIS 4	E	E	E	E	E	
DAM BACK U/S 5	E	E	E	E	E	
BERMS 6	E	E	E	E	E	
BORROW 7	None					
LAKE 8	E	SHORELINE E	INLET E	W/DAMAGE E	E	

OTHER :

A SLOPE STABILITY -	E	H GATES & VALVES -	Did Not T.I.
B TOE DRAINS -	E	I OVERFLOW INLET -	E
C GUTTERS & ABUTS -	E	J OUTLET PIPE -	E
D SEEPAGE -	E	K STILLING BASIN -	E
E RISER -	E	L CHANNEL -	E
F TRASH RACK -	E	M PHOTOGRAPHS -	-
G STAND PIPE -	E	N OTHER -	-

KEY: E-EXCELLENT ; G-GOOD ; F-FAIR ; P-POOR ; IM-IMMEDIATE ACTION

FINDINGS: The cover on this dam in Key 31, Tucson area is in very good. There is no erosion. The spillway is being used for a practice firing range. No work is being done. The concrete weir, trash rack and outlet pipe appear to be in good shape. The area below the dry slope is stable with one crevasse. It is stable. The two drains are functioning. The land owner can be commended for their excellent care of this area.

RECOMMENDATIONS: 1. The dam either moved or approved when it is dry. 2. It is suggested that stream-bales be placed in the impact area behind the targets to reduce erosion. 3. Stone will be applied to road across to of dam. 4. The station point of the firing range be removed after each firing.

INSPECTION TEAM
William E. Lucas, Jr.
Wayne M. Hayes
E. John Taylor
John Smith

AGENCY
H.S.E. R.C.D.
SCS
H.S. DUC 17
K. S. C. C.

LANDOWNER: C.C. Shuff - Supt.

APPENDIX V

REFERENCES

APPENDIX V

REFERENCES

1. Recommended Guidelines for Safety Inspection of Dams, Office of the Chief of Engineers, Department of the Army, Washington, D. C.
2. HEC-1DB Flood Hydrograph Package, (Hydrologic Engineering Center, U. S. Army Corps of Engineers, September 1978.)
3. "Probable Maximum Precipitation Estimates, United States East of the 105th Meridian," Hydrometeorological Report No. 51, (U. S. Weather Bureau, June 1978).
4. "Rainfall Frequency Atlas of the United States", Technical Paper No. 40, (U.S. Weather Bureau, May 1961).
5. Earth Dams and Reservoirs, Technical Release No. 60, June 1976, U. S. Department of Agriculture, Soil Conservation Service, Engineering Division.

