

Mr. D. N. Morey
 Vice President - Farley Project
 Southern Nuclear Operating
 Company, Inc.
 Post Office Box 1295
 Birmingham, Alabama 35201-1295

July 2, 1999

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2 RE: REQUEST FOR
 ADDITIONAL INFORMATION — CATEGORY I COOLING WATER STORAGE
 POND DAM SAFETY AUDIT

Dear Mr. Morey:

On October 8, 1998, the Nuclear Regulatory Commission and the Federal Energy Regulatory Commission (FERC) conducted an audit of the Joseph M. Farley Nuclear Plant, Category I cooling water storage pond dam. Enclosed is a copy of FERC's final dam audit report. The audit concluded that there were no conditions found that should adversely affect the immediate safety and permanence of the dam and associated control facilities. However, pages 13 and 14 of FERC's report list the following four actions that you should take to ensure the continued safety of your cooling water storage pond dam:

1. Remove vegetation growing from various areas of the facility.
2. Eradicate fire ants on the dam crest.
3. Monitor possible seepage at the downstream toe of the dam (north of the relief drain).
4. Monitor concrete slabs at the relief drain system exit.

These actions are consistent with the Federal Guidelines for Dam Safety (1979) and the Dam Safety Program Act defined in the Water Resources Act of 1996. Within 120 days of the date of this letter, please send me a written response describing what actions you will take. I discussed this request with Mark Ajluni on June 30, 1999, and we mutually established this response date. You do not need to respond to other FERC findings and follow-up actions contained in the report. Please call me at (301) 415-1423 if you need to revise the date.

Sincerely,
 Original signed by:
 L. Mark Padovan, Project Manager, Section 1
 Project Directorate II
 Division of Licensing Project Management
 Office of Nuclear Reactor Regulation

9907070371 990702
 PDR ADOCK 05000348
 P PDR

Docket Nos. 50-348 and 50-364

Enclosure: Operation Inspection Report

cc w/encl: See next page

NRC FILE CENTER COPY

DFol

DISTRIBUTION: OGC DRom PD II-1 R/F
 Docket File SBlack PSkinner, RII
 PUBLIC ACRS HBerkow

DOCUMENT NAME: G:\PDii-1\Farley\dam insp results rai.wpd

To receive a copy of this document, indicate in the box: "C" = Copy without enclosures
 "E" = Copy with enclosures "N" = No copy

OFFICE	PDII-1/PM	E	PDII-1/LA	E	PDII-1/SC
NAME	MPadovan <i>MP</i>		CHawes <i>CMH</i>		REmch <i>RE</i>
DATE	7/1/99		6/30/99		7/1/99

OFFICIAL RECORD COPY



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

July 2, 1999

Mr. D. N. Morey
Vice President - Farley Project
Southern Nuclear Operating
Company, Inc.
Post Office Box 1295
Birmingham, Alabama 35201-1295

SUBJECT: JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2 RE: REQUEST FOR
ADDITIONAL INFORMATION — CATEGORY I COOLING WATER STORAGE
POND DAM SAFETY AUDIT

Dear Mr. Morey:

On October 8, 1998, the Nuclear Regulatory Commission and the Federal Energy Regulatory Commission (FERC) conducted an audit of the Joseph M. Farley Nuclear Plant, Category I cooling water storage pond dam. Enclosed is a copy of FERC's final dam audit report. The audit concluded that there were no conditions found that should adversely affect the immediate safety and permanence of the dam and associated control facilities. However, pages 13 and 14 of FERC's report list the following four actions that you should take to ensure the continued safety of your cooling water storage pond dam:

1. Remove vegetation growing from various areas of the facility.
2. Eradicate fire ants on the dam crest.
3. Monitor possible seepage at the downstream toe of the dam (north of the relief drain).
4. Monitor concrete slabs at the relief drain system exit.

These actions are consistent with the Federal Guidelines for Dam Safety (1973) and the Dam Safety Program Act defined in the Water Resources Act of 1996. Within 120 days of the date of this letter, please send me a written response describing what actions you will take. I discussed this request with Mark Ajluni on June 30, 1999, and we mutually established this response date. You do not need to respond to other FERC findings and follow-up actions contained in the report. Please call me at (301) 415-1423 if you need to revise the date.

Sincerely,

L. Mark Padovan, Project Manager, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-348 and 50-364

Enclosure: Operation Inspection Report

cc w/encl: See next page

Joseph M. Farley Nuclear Plant

cc:

Mr. L. M. Stinson
General Manager -
Southern Nuclear Operating Company
Post Office Box 470
Ashford, Alabama 36312

Rebecca V. Badham
SAER Supervisor
Southern Nuclear Operating Company
P. O. Box 470
Ashford, Alabama 36312

Mr. Mark Ajluni, Licensing Manager
Southern Nuclear Operating Company
Post Office Box 1295
Birmingham, Alabama 35201-1295

Mr. M. Stanford Blanton
Balch and Bingham Law Firm
Post Office Box 306
1710 Sixth Avenue North
Birmingham, Alabama 35201

Mr. J. D. Woodard
Executive Vice President
Southern Nuclear Operating Company
Post Office Box 1295
Birmingham, Alabama 35201

State Health Officer
Alabama Department of Public Health
434 Monroe Street
Montgomery, Alabama 36130-1701

Chairman
Houston County Commission
Post Office Box 6406
Dothan, Alabama 36302

Resident Inspector
U.S. Nuclear Regulatory Commission
7388 N. State Highway 95
Columbia, Alabama 36319

OPERATION INSPECTION REPORT
for
THE NUCLEAR REGULATORY COMMISSION

Inspection by

THE FEDERAL ENERGY REGULATORY COMMISSION
Atlanta Regional Office

Date of inspection October 8, 1998

Dam (name) Farley Category I Cooling Water Storage Pond Dam

Location Farley Nuclear Station Houston Alabama
(Facility) (County) (State)

NRC Licensed Project Joseph M. Farley Nuclear Plant

Licensee Alabama Power Company

Features of the Dam and Impoundment Inspected Embankment and
associated structures

Inspected by Robert L. Bryant

Accompanied by Messrs. Daniel Rom, NRC-HQ; Bob Caldwell,
NRC-RI; Tom Johnson, NRC-Farley; Walter Simms, Robert Fucich,
Larry Dunlap, and Andy Patko, SNC

Weather Overcast, temperature approximately 70°F (21°C)

Summary

Based on a review of project design documents, maintenance and instrumentation records, discussions with NRC representatives and SNC employees, and observations made during the inspection, no conditions were found that should adversely affect the immediate safety and permanence of the project structures. However, observations made during the field inspection revealed problems relating to undesirable vegetation in the dam's upstream protective riprap (stone) and fire ant colonies in the dam's earthfill. These conditions could lead to significant safety problems if not corrected. A complete list of recommendations is included in the text of the report.

A project description, pertinent data sheet, project location map and site plan follow. A photograph location map precedes the photographs attached to the report.

Submitted


Robert L. Bryant, P.E.

Project Description

The Joseph M. Farley Nuclear Plant is located on the west bank of the Chattahoochee River in the southeast corner of Alabama. The plant is owned by Alabama Power Company, a division of The Southern Company, and is licensed by the Nuclear Regulatory Commission. The Farley Category I Cooling Water Storage Pond is the ultimate heat sink for the plant. The storage pond was built on the right bank of the Chattahoochee River by constructing a homogeneous earthen dam across a small valley. Embankment fill material was excavated from within the area of the proposed pond. During construction, pervious sands were removed from some areas of the dam's foundation and replaced with embankment fill material. The dam is founded on relatively impervious materials. The dam was constructed with a chimney drain downstream of its centerline. The main dam extends in a north-south direction along the east side of the pond. The dam curves and continues to the west. The western portion of the dam is also called the west dike. The water source for the pond is a river intake structure on the Chattahoochee River. The water is transported by pipeline to a discharge structure on the upstream side of the dam. Effluent from the pond is channeled to a spillway drop structure and then directed to a natural drainage channel for return to the Chattahoochee River.

The upstream slopes are protected by riprap (stone) in the areas potentially affected by wave action. The downstream slopes are protected by a well established grass cover. Pressure relief wells on the downstream side of the dam help control seepage.

TABLE 1

Pertinent Data

Dam:

Year Constructed 1976
Type Homogeneous earthfill
Length 3900 feet
Crest Elevation 195 feet
Crest Width 30 feet
Slopes:
 Main Dam:
 Upstream 4 (H):1 (V)
 Downstream 3 (H):1 (V)
 West Dike:
 Upstream 3.5 (H):1 (V)
 Downstream 2.5 (H):1 (V)
Spillway Type Uncontrolled

Reservoir:

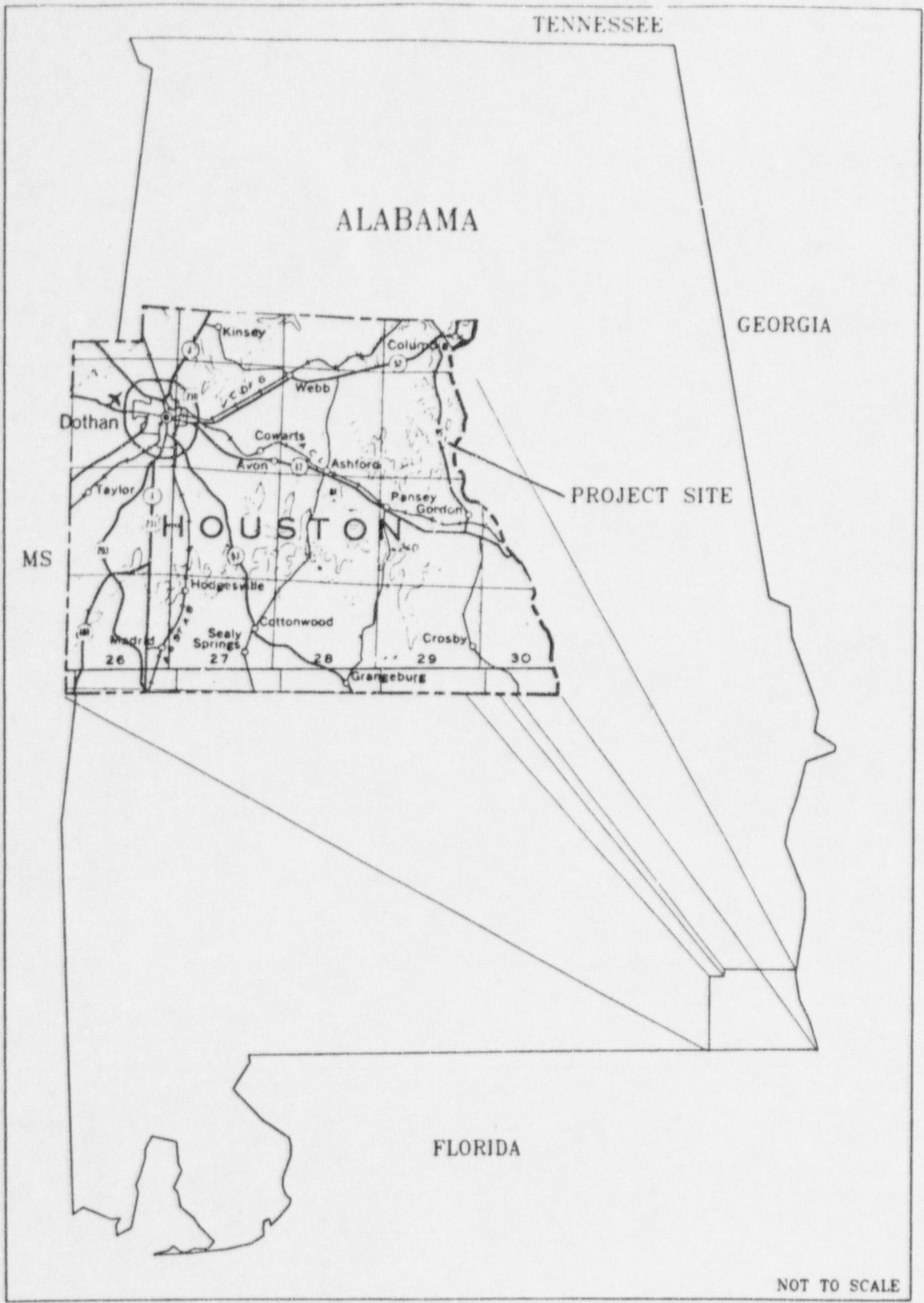
Drainage area 0.5 square miles
Normal pool elevation 185.0 feet
Surface area @ el. 184.0 ft. 95 acres
Volume:
 Below el. 161 feet 109 acre-feet
 Below el. 184 feet 1579 acre-feet
 Below el. 186 feet 1863 acre-feet
 Above el. 186 feet 811 acre-feet
 Maximum 2,674 acre-feet

Location: Latitude 31.2225, Longitude 85.1117

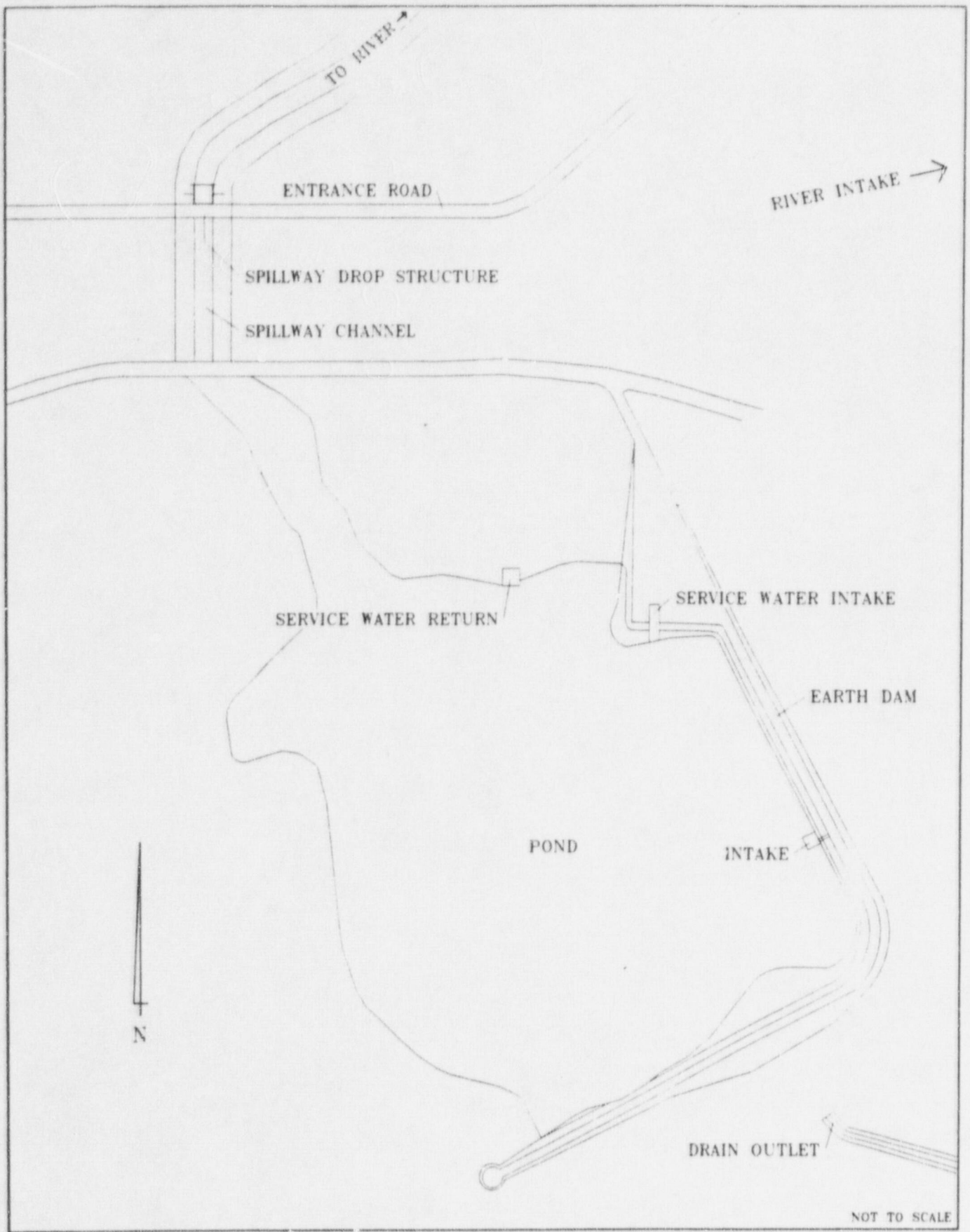
NATDAM Number: AL83101

Hazard Potential: Low

NOTE: All elevations are mean sea level.



FARLEY STORAGE POND
PROJECT LOCATION MAP



FARLEY STORAGE POND
SITE PLAN

A. Safety of the Project.

1. Dams, Dikes, and Appurtenant Structures. The inspection team walked the crest and downstream toe of the dam, the abutments, drain outlet, associated structures, and all accessible areas of the spillway. No conditions were observed that should adversely affect the immediate safety and permanence of the project structures.

a. Storage Pond Dam. The dam was inspected by walking the crest and toe. Areas of interest were more closely examined on both the upstream and downstream slopes. The upstream slope (Photographs 1, 3, 4, and 7) was stabilized with stone (riprap) to protect the earth dam from erosion due to wave action. The stone appeared to be in good condition, with no indication of weathering. No abnormalities in the upstream slope such as sliding, sloughing, or subsidence were observed. A considerable amount of vegetative growth was observed in the riprap (Photographs 1 and 4). This vegetation should be treated to prohibit growth and removed as necessary.

The crest and roadway along the top of the dam (Photograph 3) appeared to be in good condition, with no indication of cracking, sliding, settlement, or erosion. Several fire ant mounds were observed near the crest. These should be eradicated.

The downstream slope appeared to be in good condition (Photographs 2 and 11). The slope is protected by a well established grass cover. Some areas along the toe of the slope near the north end of the dam (Photograph 11) supported vegetation typical of that found in wet areas. The licensee's biennial inspection on June 10, 1998, was made after a period of dry weather

and found the area to be wet. This indicates the presence of seepage through the dam. The area should be kept under observation during routine inspections. Any change in the condition of the areas should be noted.

The water intake pipe and concrete wall along the top of the dam (Photograph 7) were straight and well aligned. Misalignment of these structures can be indicators of shifting or movement in the supporting earth dam. The water intake pipe is a potential source of leaks that could cause erosion of the upstream slope of the earth dam. Ideally, the pipe should be relocated to eliminate this potential hazard. Since the pipe is installed along the top of the dam, it should be inspected for leaks on a regular basis (no less than weekly). The concrete wall protects the intake pipe from traffic on the crest of the dam and would serve to redirect flow into the reservoir from any pipe leak. Previous inspections expressed concern over loss or deterioration of joint material at construction joints in the wall. The joints in the wall are inspected and repaired in accordance with routine inspection and maintenance procedures. Drains at the base of the wall allow rainfall runoff from the crest of the dam to pass through the wall and into the reservoir.

b. Spillway Structure. The spillway structure (Photographs 12 and 13) is a reinforced concrete, uncontrolled, three bay, drop type structure located northwest of the pond under the main entrance road to the Farley Nuclear Plant. The structure has relief wells equipped with flap valves in the floor to relieve hydrostatic pressure. The spillway channel connecting the pond to the drop structure is a large excavated ditch with grass lined,

sloping sides. The invert to the channel is at elevation 186 feet. Since normal pool elevation is 185 feet, the spillway is used infrequently and is normally dry. Water levels in the pond are maintained by controlling the volume of water released into the pond at the intake structure. The spillway was last used after heavy rains in February 1986. The spillway channel extends past the spillway structure into a natural drainage area. Any flow from the spillway would pass into a creek and subsequently into the Chattahoochee River approximately 2 miles from the spillway structure. No sign of cracking or displacement was observed in the concrete spillway structure. The steel sheet pile walls on either side of the spillway structure also appeared to be stable and in good condition. No misalignment or bulging of the sheet pile walls was observed. The steel sheet pile walls had a surface layer of corrosion, but did not appear to have significant loss of material due to corrosion. Inspection of the spillway structure is included in the service water storage pond dam biennial inspection. The latest biennial inspection was conducted on June 10, 1998, and found the structure to be in very good condition.

c. Other Structures. Other structures observed during the course of the inspection included the pond fill discharge (Photographs 5 and 6), the service water intake, the service water return, and the river intake (Photograph 14). No conditions were observed during the inspection that would indicate the need for remedial action, although some routine maintenance such as painting of the steel walkway and handrails at the pond fill discharge was needed.

d. Reservoir. Portions of the reservoir shoreline were observed from the dam and abutments. No indications of active shoreline erosion or accumulations of floating trash or debris were observed.

2. Instrumentation. Project instrumentation includes 19 surface monuments, 60 observation wells (Photograph 3), and 25 relief wells (Photographs 8 and 9). Water levels in the pond are monitored electronically and remotely monitored. Monuments are located along the crest of the dam to monitor horizontal and vertical movement. Photograph 3 shows typical protective barriers for protection of observation wells and survey reference points. Observation wells are located along the crest of the dam and on selected downstream slope sections. Relief wells are located in the area downstream of the downstream toe and are connected to a pipe collection system typically 6 to 8 feet (2 to 3 m) below the ground surface.

Instrumentation data for the observation wells and monument surveys was provided in tabular and graphical formats. Monument surveys are made annually to measure horizontal and vertical movement. Observation well and relief well readings are made quarterly. A review of the instrumentation data revealed no anomalies or unusual trends. The data indicate that conditions are stable. Instrumentation and monitoring at this site appear to be adequate for the project size and complexity. No additional instrumentation appears necessary.

3. Hazard Potential Classification. The storage pond dam is classified as having a "Low" hazard potential in accordance with Federal Energy Regulatory Commission criteria. The storage

pond dam is located about 4,000 feet (1,200 m) west of the Chattahoochee River. Natural drainage features in the topography between the dam and the river would convey flow from any dam break directly to the river. No structures are located along the route of flow from the dam to the river. The licensee checked building permits in the area and found that no permits have been issued in the past 6 years. Failure of the storage pond dam would have little impact on water levels in the river, certainly not significant enough to upgrade the hazard potential classification.

4. Consultant's Safety Inspection Report. An independent consultant's safety inspection has not been required for this facility. Based on the small size of the project, the "Low" hazard potential classification, excellent condition of the dam, and the existing operation and maintenance program, inspection by an independent consultant does not appear to be necessary.

5. Licensee's Inspection Program. The following table summarizes the licensee's inspection program:

Inspection	Frequency	By	Date
Dam	Daily	FNP	-
Water Level/Temperature	Daily	FNP	-
Observation/Relief Wells	Quarterly	APC	07/20/98
Horizontal/Vertical Movement	Annually	APC	04/21/98
Spillway Channel/Structure	Biennially	FNP	06/11/98
Sediment Survey	Biennially	APC	03/20/98
Dam	Biennially	APC/SCS	06/10/98
Seepage Test	5-Year	FNP	10/19/98
Spillway Channel, Post Storm	Pond Level 187+	FNP	02/11/86

FNP - Farley Nuclear Plant
APC - Alabama Power Company
SCS - Southern Company Services

The inspection schedule appears to be appropriate for detection of potential problems at a project of this size and complexity.

B. Operation and Maintenance.

1. Dams, Dikes, and Appurtenant Structures. The upstream riprap appeared to be in good condition. The riprap appeared to be stable, provided complete coverage, and showed no deterioration or weathering. There was a considerable amount of undesirable vegetative growth in the riprap (Photographs 1 and 3) and near the waterline. Several fire ant mounds were found along the crest of the dam. Eradication of these pests should be included in the maintenance program. The downstream slope has a well established grass cover, but was in need of mowing. Regular mowing inhibits growth of undesirable trees and shrubs and makes detection of any animal burrows easier.

2. Spillway Gates and Standby Power. The project has no spillway gates. The spillway is an uncontrolled, reinforced concrete drop structure (Photographs 12 and 13). The flow passes from the pond, through the spillway channel, the drop spillway structure, the exit spillway channel, into a natural drainage channel, and eventually into the Chattahoochee River. The invert to the spillway channel is 1 foot above the pond's normal pool elevation and is therefore used only on rare occasions such as an extremely heavy rainfall event that results in higher than normal pond levels. The last such event occurred in 1986.

3. Power Plants. There is no hydroelectric power plant at this site. The pond is used to provide emergency cooling water for the nuclear power plant.

4. Reservoir. Areas of the reservoir observed during this inspection appear to be clean and free of debris. No indications of erosion were observed. Operation and maintenance of the reservoir appear to be in accordance with good engineering practice. Water levels in the pond are maintained by pumping water from the river intake structure on the Chattahoochee River. Sedimentation in the pond is monitored by the licensee.

5. Records. Design/construction/as-built drawings and operation records are maintained by APC at the site. APC also maintains instrumentation records and other design documents in its Birmingham, Alabama office. Design/construction records are also maintained at the NRC-HQ offices in Washington, D. C.

6. Emergency Action Plan. The storage pond dam is considered a "Low" hazard potential dam. An emergency action plan does not appear necessary and has not been requested.

The pond provides a separate, emergency 30-day supply of water to the nuclear power plant to permit safe shutdown of the nuclear reactor units in the event of an emergency. In the event of a dam failure, procedures in the Final Safety Analysis Report (FSAR), will apply. Paragraph 9.2.5.2. of the FSAR states: ". . . the need to shut down is indicated by the storage pond level. An alarm will sound in the control room when the pond is lowered to elevation 184 feet 4 inches. Under two-unit operation, this will allow 90 minutes to evaluate the situation and shut down if required." High water levels in the pond will also trigger an alarm. The service water system is reviewed as part of license training every two years.

C. Environmental, Public Use, and Safety.

1. Public Safety Plan. No public access is allowed on the site, therefore a public safety plan is not required.

2. Need for Action. None.

3. Environmental and Public Use Inspection. An environmental and public use inspection is not required, since the public is denied access to the pond. However, no environmental or safety problems were observed during the inspection. The Farley Nuclear Plant area is fenced and access road gates are manned by security forces. Existing personnel safety devices appear adequate and are properly maintained. No additional actions to protect life and property were recommended as a result of the inspection.

D. Matters of Commission Interest.

1. Additions, Betterments, Leases, Retirements, or Needed Extensions. Not Applicable.

2. Requiring Commission Action. Not Applicable.

3. Project Compliance. Not Applicable.

E. Findings and Followup Actions. The inspection team observed no conditions that should adversely affect the immediate safety of the project; however, several conditions were observed that could lead to safety problems if left uncorrected. A meeting was held at the site on the afternoon of October 8, 1998, and the following observations and recommendations were discussed with NRC and APC representatives:

- o A considerable amount of undesirable vegetation was found growing in the riprap on the upstream slope of the dam. The vegetation should be eliminated by either physical or chemical means. Environmentally

safe chemical defoliants are available for this purpose.

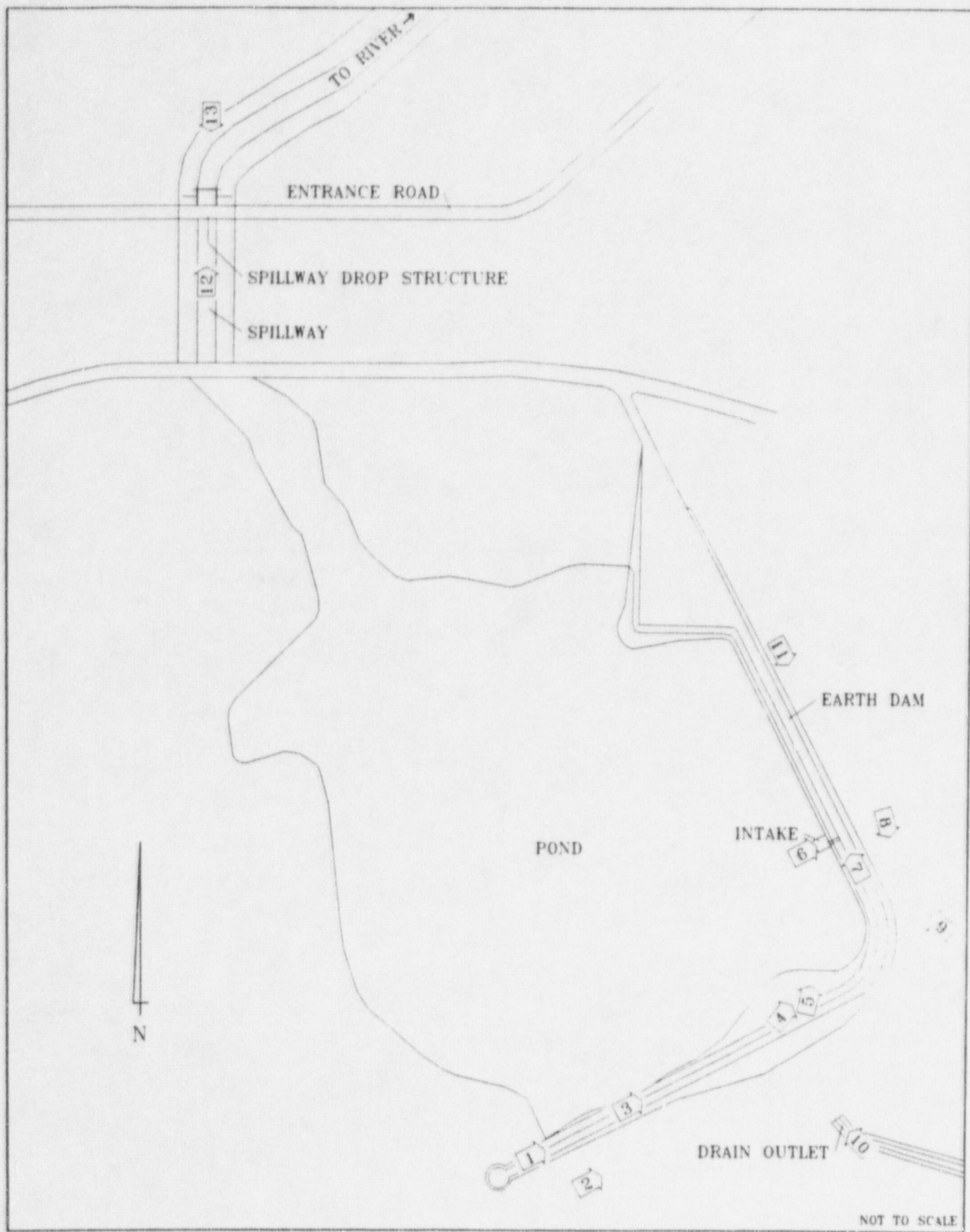
- o Several fire ant mounds were observed along the crest of the dam. These pests have been known to dig tunnels as deep as 4 feet and lateral foraging burrows as long as 8 feet. Eradication of these pests should be a part of the regular maintenance and inspection program.
- o The flat area at the downstream toe of the dam north of the relief drain system was wet and supported vegetation indicating the continuous presence of water. This is a probable seepage zone and should be monitored during regular maintenance and inspection.
- o The concrete slabs at the exit for the relief drain system appear to have shifted and some have broken edges. While this condition is not critical to the safety of the project, the conditions should be monitored.

Following the inspection, Mr. Dan Rom, of NRC, was advised that the water supply pipe along the top of the dam is a potential source of leakage that could cause erosion of the earth dam. If the pipe cannot be relocated, it should be inspected for leaks at intervals no greater than one week.

cc: D2SI, Deputy Director

RLB/rlb:aca

filename: L:\BRYANT\nrcfarle.o98



FARLEY STORAGE POND
PHOTOGRAPH LOCATION MAP



Photograph 1

10/08/98

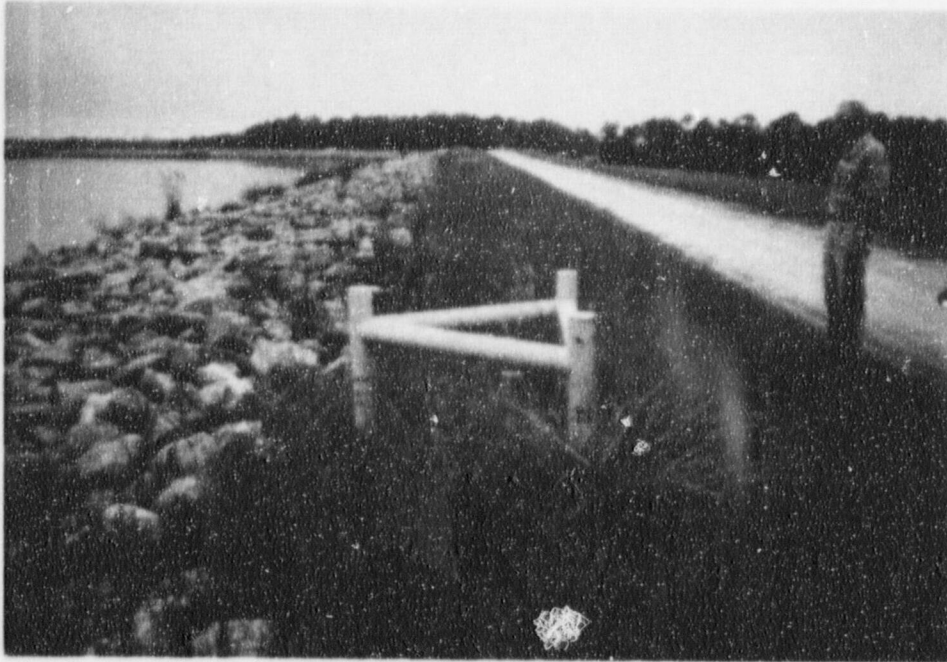
Upstream slope of the dam as seen from near the right (southwest) abutment. Note the undesirable vegetation in the riprap (stone) along the slope.



Photograph 2

10/08/98

Downstream slope of the earth dam as seen from near the right abutment. Note the well established grass cover.



Photograph 3

10/08/98

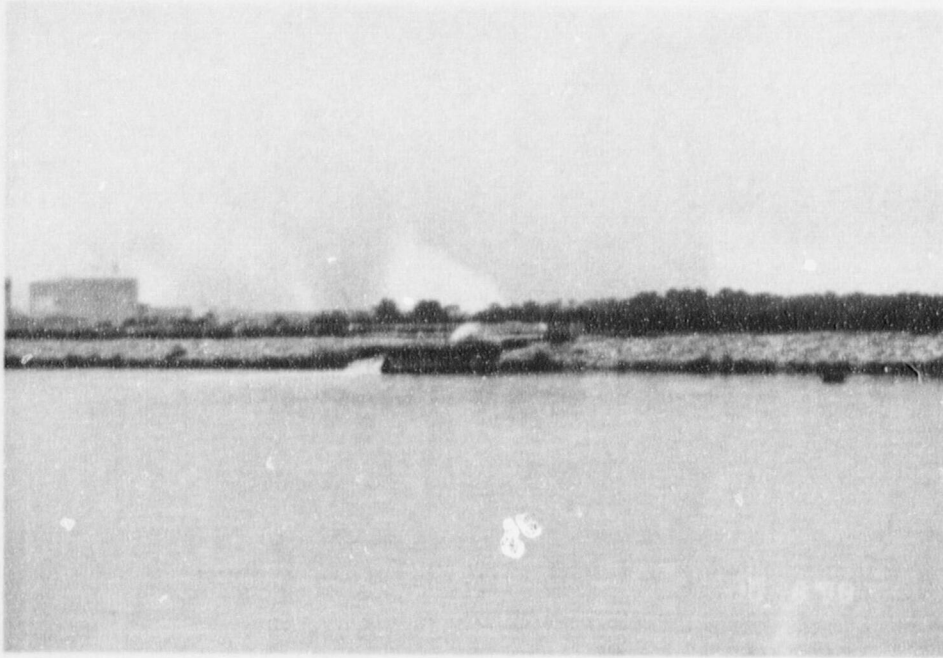
Observation well No. 7. The barrier around the well is typical of all of the wells.



Photograph 4

01/24/95

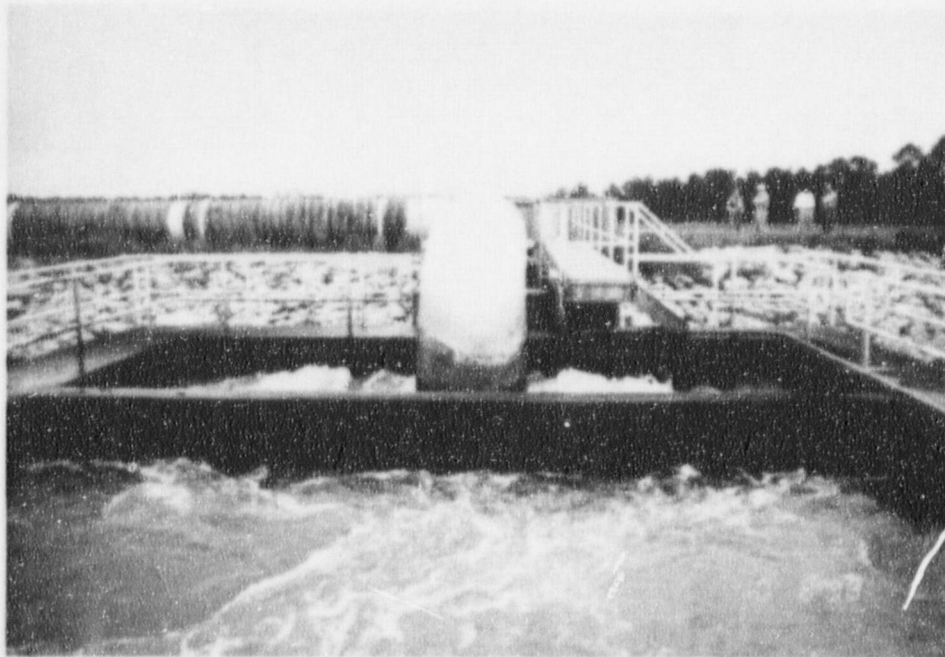
View of the upstream slope near the center of the dam. Note the vegetation in the riprap.



Photograph 5

10/08/98

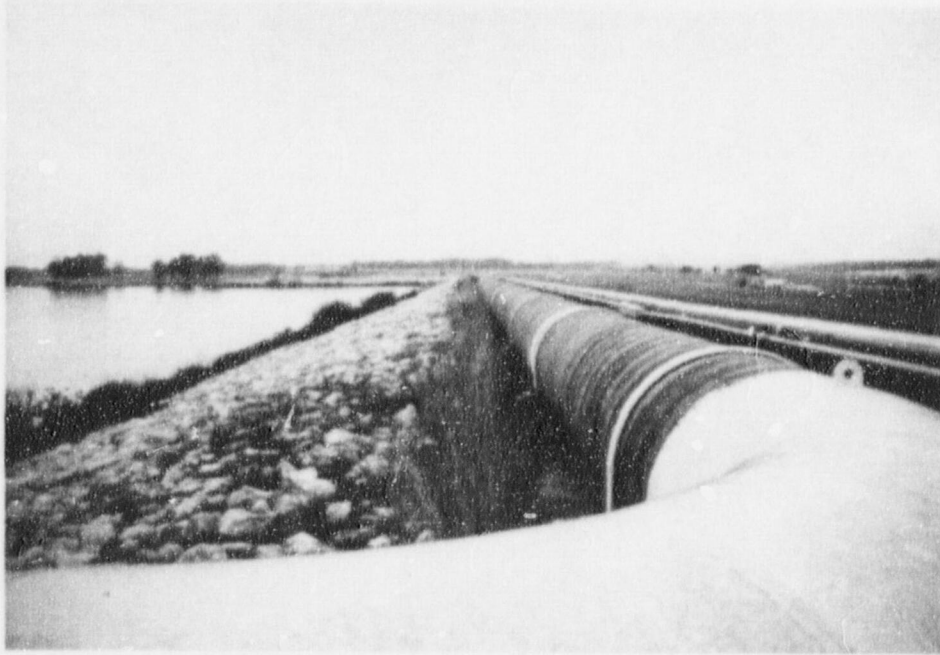
View of the pond fill discharge structure as seen from the top of the dam on the south side of the pond.



Photograph 6

10/08/98

View of the pond fill discharge structure as seen from the walkway on the pond side of the structure.



Photograph 7

10/08/98

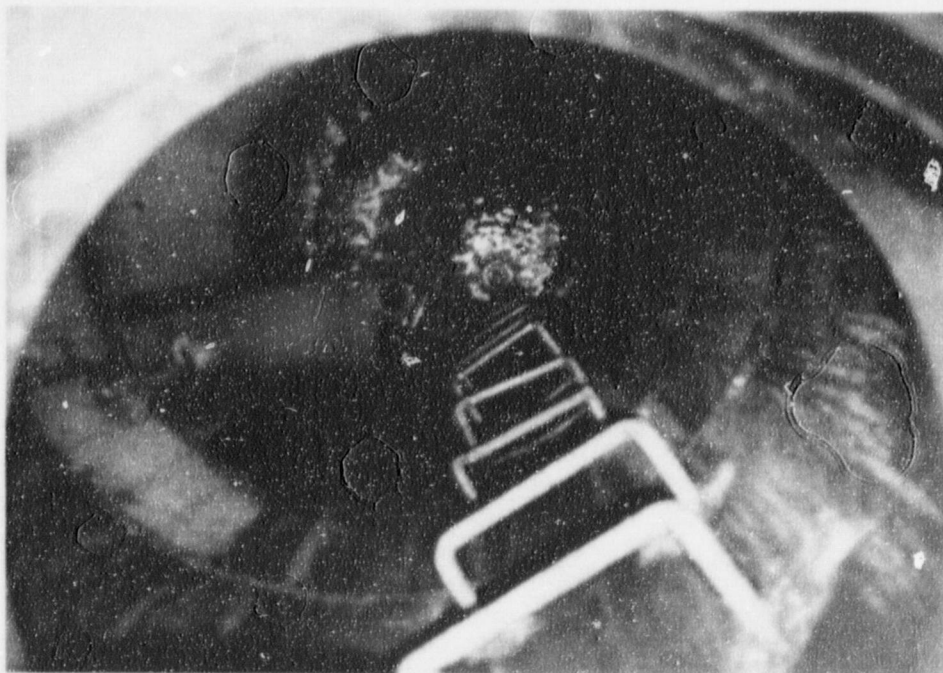
Pipeline to the pond fill discharge structure looking toward the left (north) abutment. Note the undesirable vegetation in the riprap.



Photograph 8

10/08/98

Manhole for pressure relief well No. 15. The flag warns mower operators of the location of the manhole.



Photograph 9

10/08/93

Inside of relief well No. 15. Effluent from the well flows into a horizontal pipe which connects to an underground collection system.



Photograph 10

10/08/98

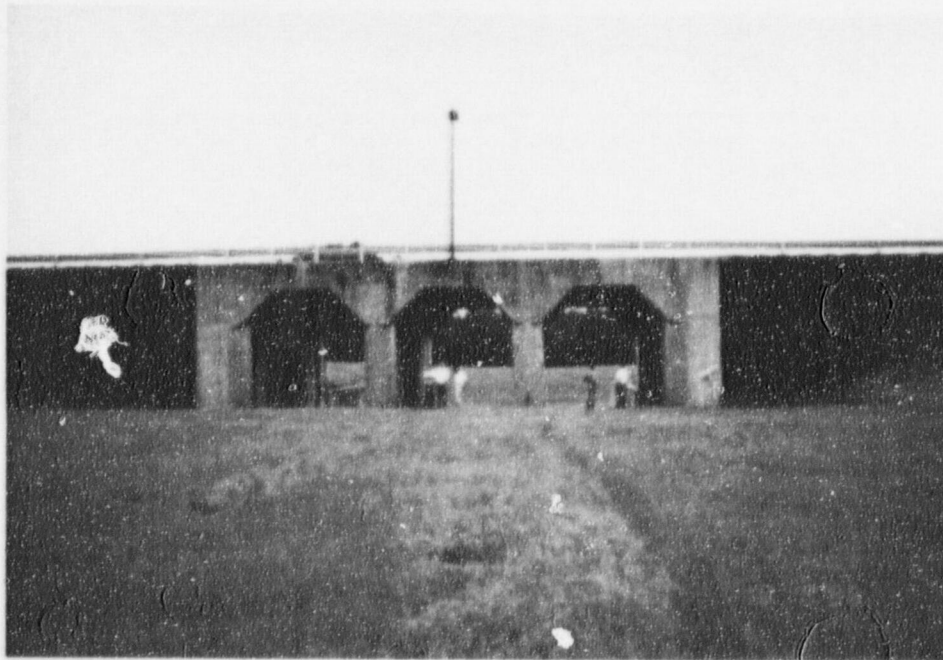
Outlet for the relief well collection system.



Photograph 11

10/08/98

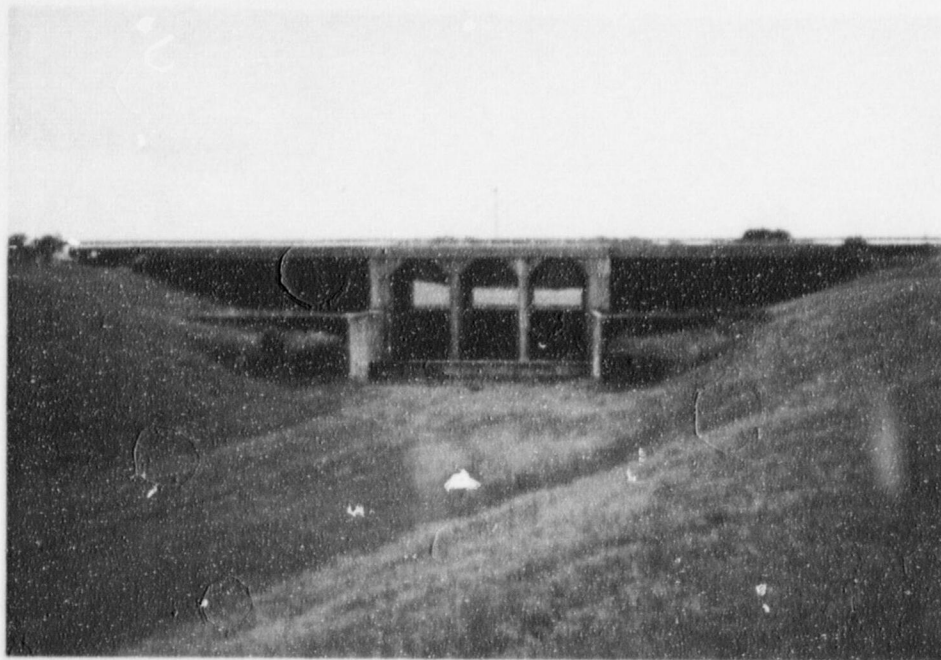
View of the downstream slope of the dam from near the left (north) abutment. Note the well established grass cover.



Photograph 12

10/08/98

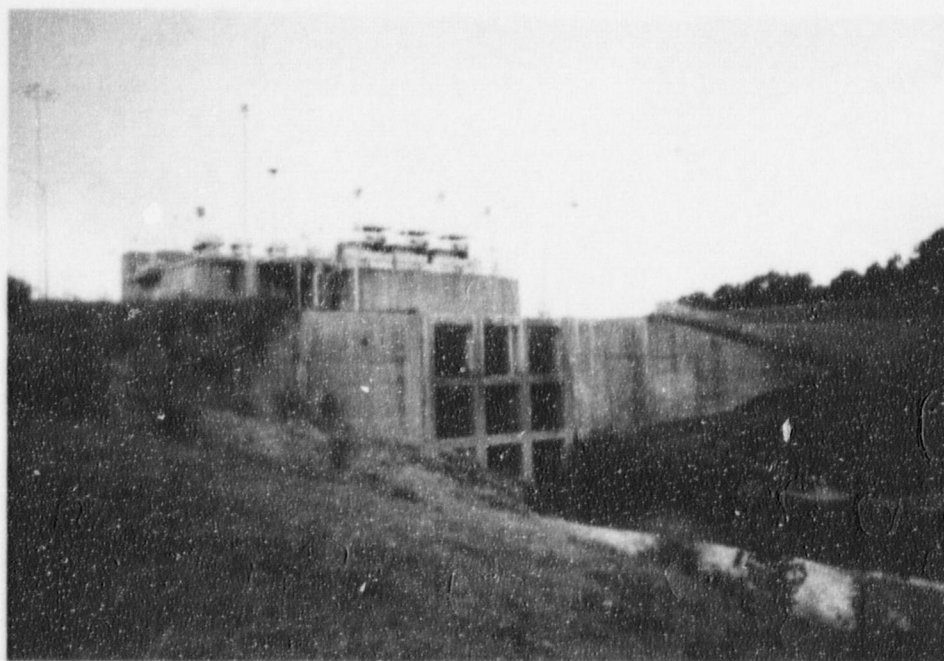
Upstream side of the spillway drop structure. Note the steel sheet pile walls.



Photograph 13

10/08/98

Downstream side of the spillway drop structure. Note the steel sheet pile walls along the roadway and at the structure wingwalls.



Photograph 14

10/08/98

River intake structure located on the Chattahoochee River.