



ALABAMA POWER COMPANY

BIRMINGHAM, ALABAMA

MARTIN HYDROELECTRIC PROJECT

FERC NO. 349

STUDY PLAN 10 – EROSION AND SEDIMENTATION

NOVEMBER 2008

Prepared by:



**ALABAMA POWER COMPANY
BIRMINGHAM, ALABAMA**

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TABLE OF CONTENTS

1.0	GOALS AND OBJECTIVES OF STUDY.....	1
2.0	RELEVANT RESOURCE MANAGEMENT GOALS	1
3.0	BACKGROUND AND EXISTING INFORMATION	1
4.0	PROJECT NEXUS	2
5.0	STUDY AREA AND STUDY SITES.....	2
6.0	PROPOSED METHODOLOGY	2
6.1	Erosion Hotspot Data Collection and Analysis	2
6.2	Sedimentation Area Data Collection and Analysis.....	2
7.0	CONSISTENCY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE	3
8.0	PRODUCTS.....	3
9.0	SCHEDULE.....	3
10.0	LEVEL OF EFFORT AND COST	3
11.0	REFERENCES	3

STUDY PLAN 10 – EROSION AND SEDIMENTATION

1.0 GOALS AND OBJECTIVES OF STUDY

The consulting stakeholders identified shoreline erosion and sedimentation in areas of Lake Martin as two issues that they are concerned about. They would like Alabama Power Company (APC) to collect additional information on erosion areas within the lake or tailrace that are related to project operation and to collect information on the amount of sedimentation that is occurring in the upper portion of the of the lake near Irwin Shoals and in the mouths of tributaries of Lake Martin. Additionally, the agencies would like to understand if nuisance aquatic vegetation is becoming a problem in these areas of sedimentation. Stakeholders have also identified “tributary headcutting” during winter drawdown as an issue to review.

2.0 RELEVANT RESOURCE MANAGEMENT GOALS

The consulting agencies regulate recreational fishing and water quality resources on Lake Martin. As part of that responsibility, they would like to limit project related shoreline erosion and its impacts on water quality; to identify areas of sedimentation; to identify areas that currently have or could potentially have nuisance aquatic vegetation; and to identify ways to reduce adverse impacts related to project operation on these issues.

3.0 BACKGROUND AND EXISTING INFORMATION

Project operations related to lake level fluctuations can result in areas of the shoreline that exhibit erosion within the lakebed. However, much of the erosion that occurs around the lake appears to be associated with construction and development adjacent to the Martin project boundary. APC currently employs several contractors for Lake Martin, who typically inspect new development sites and note any excessive amounts of shoreline erosion occurring as a result of land development. These contractors are also aware of “hotspot” erosion sites on the lake below the full pool elevation. APC also has an Aquatic Vegetation control group that periodically inspects Lake Martin for nuisance aquatic vegetation and treats infested areas accordingly. These sites often occur in areas where excessive sedimentation has accumulated. With regard to sediment accumulation amounts and rates, there are no known sources that can describe this aspect of the issue. However, LIDAR information and flyover photography are available for the project at winter pool. This information may be helpful in identifying areas of sedimentation around the project.

4.0 PROJECT NEXUS

Erosion “hotspot” sites related to existing project lake level fluctuation can periodically occur along the lake shoreline or in the immediate tailrace below the project dam as a result of peaking flow operations. Erosion materials often deposit along the lake (upstream river channel and tributary mouths) and can create areas that are prone to the establishment of nuisance aquatic vegetation.

5.0 STUDY AREA AND STUDY SITES

Erosion “hotspot sites” are typically limited to the area between the full pool elevation to the lowest level of the winter drawdown on Lake Martin and the immediate Tailrace downstream of Martin Dam. Sediment accumulation areas typically occur in the upstream areas of the lake and in the mouth of tributaries of the lake. The study area will be focused on these erosion “hotspot” areas and sediment accumulation areas. The presence or absence of nuisance aquatic vegetation will be documented in these areas. Tributary headcutting will be examined on selected streams that drain into the lake to determine the significance of this issue.

6.0 PROPOSED METHODOLOGY

6.1 Erosion Hotspot Data Collection and Analysis

Erosion hotspot areas on Martin Lake or in the Martin Dam tailrace identified by stakeholders or APC contractors will be investigated during low water elevations in the fall through spring. Each identified site will be examined to determine the cause of erosion – project operation, land disturbance (development), and/or both causes combined. The Data sheet for this field evaluation is attached to this Study Plan. Tributary headcutting will be investigated during the winter draw down on at least two of the larger tributaries of the lake to determine if headcutting is potentially a source of erosion impact. Once each erosion site has been evaluated, a draft report of the field surveys will be prepared and issued to Martin Issue Group (MIG) 2 for their review and comment. Comments received from MIG-2 will be incorporated or addressed in the final report.

6.2 Sedimentation Area Data Collection and Analysis

The identification of sedimentation areas will be performed through examination of the LIDAR and lake photography available for the project. This will be accompanied by field observations to verify sedimentation areas. Each of these areas will be surveyed for nuisance aquatic vegetation and APC records for treatment of these areas will be reviewed. A summary of surveys and recommendations will be prepared and issued to the MIG-2 group for review and comment. Comments received from the MIG-2 will be incorporated or addressed, as applicable, in the final report.

7.0 CONSISTENCY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

The planned study methods discussed above are consistent with typical erosion and sedimentation investigations. These methods have been discussed and generally accepted by the federal and state agencies and other interested stakeholders during relicensing meetings in 2007 and 2008.

8.0 PRODUCTS

Once this study is complete, a draft report including maps (both electronic and hard copy) of erosion spots on Lake Martin and Martin Dam tailrace and a draft report of sedimentation areas will be distributed to the MIG 2 for review and comment. Upon review and discussion, Final reports will be filed with the Martin License Application.

9.0 SCHEDULE

This schedule is draft and APC intends to develop a formal schedule with MIG 2 members upon final FERC approval of the study.

APC files Final Study Plan	November 2008
Anticipated FERC Approval	May 2009
MIG 2 Consultation	July 2009 – December 2010
Field Surveys	September 2009 - January 2010
Draft Reports	April 2010
Final Reports	December 2010

10.0 LEVEL OF EFFORT AND COST

APC estimates the cost of consulting on development of the study plan, collecting and reviewing existing information, and reporting is approximately \$150,000.

11.0 REFERENCES

Alabama Power Company (APC). 2005. Coosa/Warrior Projects: Erosion Repair and Monitoring Plan. Alabama Power Company, Birmingham, AL.

MARTIN HYDROPOWER RELICENSING
EROSION & BANK STABILITY STUDY

Water Body: _____ Date: _____

Field Personnel: _____ Photo No.: _____

1. Erosion Area Location:

ID: _____ Lat: _____ Long: _____ Time: _____

2. Potential Cause:

- Project operations (water level fluctuations)
- Natural factor independent of operations (e.g., seasonal flooding, riverine processes, etc.)
- Land use (e.g., farming, ranching, mining, development, etc.)
- Anthropogenic (Foot/bike paths, vehicle traffic, waves from boats, etc.)
- Other: _____

3. Position in Landscape:

- | | |
|---|---|
| <input type="checkbox"/> Levee/Embankment | <input type="checkbox"/> Main Channel/Main Body of Lake |
| <input type="checkbox"/> Steep bank | <input type="checkbox"/> Cove |
| <input type="checkbox"/> Floodplain Terrace | <input type="checkbox"/> Other: _____ |

4. Physical Properties:

Length: _____ Slope: Steep (> 20%)
Width: _____ Moderate (8% to 20%)
Shape: _____ Gentle (< 8%)

5. Erosion Processes:

- Direct scour from river or tributary flows
- Piping
- Slumping due to scoured toe of bank
- Gully or rill erosion from overland flows towards lake
- Other: _____

6. Adjacent Land Use / Vegetable Cover:

- | | |
|---|---|
| <input type="checkbox"/> Agricultural | <input type="checkbox"/> Unvegetated |
| <input type="checkbox"/> Undeveloped, Grassy | <input type="checkbox"/> Early successional vegetation |
| <input type="checkbox"/> Undeveloped, Wooded | <input type="checkbox"/> Exposed roots or root undercutting |
| <input type="checkbox"/> Road Crossing/Bridge | <input type="checkbox"/> Leaning or fallen trees |
| <input type="checkbox"/> Roadway, Gravel | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Roadway, Paved | |
| <input type="checkbox"/> Park | |
| <input type="checkbox"/> Other: _____ | |

7. Hydrologic Impact Information (Erosion area affected during or by):

- Extreme Floods
- Above normal high water level
- Within range of normal water level fluctuations

8. Description of Exposed Soils:

9. General Comments:

_____ (Provide additional comments on back of sheet)