UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Alabama Power Company	)	
Martin Dam Project	)	P-349-150

COMMENTS ON PRELIMINARY APPLICATION DOCUMENT, STUDY REQUESTS, AND COMMENTS ON SCOPING DOCUMENT BY AMERICAN RIVERS AND ALABAMA RIVERS ALLIANCE

1 Introduction

On August 4, 2008, The Federal Energy Regulatory Commission (FERC or Commission) issued a Scoping Document (SD1) pursuant to the National Environmental Policy Act (NEPA) for the relicensing of Alabama Power Company's (APC) Martin Dam Project. Alabama Rivers Alliance and American Rivers respectfully submit these comments on FERC's Scoping Document and APC's Preliminary Application Document (PAD), which was filed with the Commission on June 5, 2008.

The Alabama Rivers Alliance (ARA) is a nonprofit conservation organization dedicated to the protection and restoration of waters in the state of Alabama. We are headquartered at 2027 Second Avenue North, Suite A, Birmingham, Alabama 35203. Alabama Rivers Alliance's mission is to unite the citizens of Alabama to protect clean, healthy waters. We represent more than 800 individuals and 60 grassroots groups.

American Rivers (AR) is a non-profit corporation whose headquarters are located at 1101 14th St. NW, Washington, DC 20005. Our Southeastern Regional Office is headquartered at 2231 Devine Street Suite 202, Columbia, SC 29205. AR is a national organization that stands up for healthy rivers so our communities can thrive. We believe that rivers are vital to our health, safety and quality of life. American Rivers mobilizes an extensive network of more than 65,000 members and activists located in every state across the county.

Both organizations are active participants in a number of other hydropower licensing proceedings in Alabama. We intend to participate fully in this process and file a Motion to Intervene after APC files its license application.

2 Comments on FERC's SD1

Given the size and scope of the project, we recommend that FERC prepare an Environmental Impact Statement (EIS). The 182.5-megawatt Martin Dam Project impounds 31 miles of river, creating a reservoir with 700 miles of shoreline and more than 1.6 million acre-feet of storage. The project's operations are the primary driver for flows in the mainstem Tallapoosa River downstream, causing significant daily flow fluctuations that can be seen at least as far downstream as Montgomery, Alabama.[1] The scope and significant impact of this project necessitates that the Commission prepare an EIS. If, however, the Commission deems that an EA is sufficient, we request that the Commission publish a draft EA and allow adequate time for public review and comment, consistent with 40 C.F.R. § 1501.4(e). Opportunity for public comment on both the draft and final EA documents is consistent with the Council on Environmental Quality's regulations, which provide "public scrutiny [is] essential to implementing NEPA." 40 C.F.R. 1500.1(b).

2.1 Geographical Scope of Project Effects

In our view, the Geographic Scope identified in section 4.1.2 of FERC's SD1 for the analysis of cumulative impacts is a good start, but not sufficiently inclusive. We strongly agree that the Tallapoosa River downstream of the Yates/Thurlow Development must be included in any analysis of *direct* effects of project operations, since the flows in that section of river are primarily driven by the operation of the Martin project. APC's PAD makes clear that flows below Yates/Thurlow are primarily driven by Martin: "APC operates the Yates/Thurlow Project as run of river projects that take advantage of peaking releases from Martin," and "[o]n many occasions, releases from Martin Dam are necessary to allow Thurlow powerhouse to meet [its minimum flow requirement of 1,200

[1] *See* USGS gauges 02419500 (Tallapoosa River at Milstead, AL) and 02419890 (Tallapoosa River near Montgomery, AL – Montgomery Water Works) at http://waterdata.usgs.gov/al/nwis/current/?type=flow

cfs]." PAD, p. 4-8. The project's operations involve significant daily flow fluctuations which can be seen at USGS stream gages as far downstream as Montgomery, Alabama. At a minimum, the Commission's analysis should consider the project's effect on fisheries and water resources for the entire 45-mile length of the unimpeded segment of the Tallapoosa River below Thurlow Dam. We recommend that all studies dealing with fisheries and water resources be expanded to address this geographic scope.

APC's PAD further points out that APC also operates its Tallapoosa reservoirs (of which Martin has the most storage capacity) to "maintain a flow of 4,640 cfs at Montgomery, Alabama as part of the Alabama-Coosa-Tallapoosa (ACT) River Basin system-wide requirements. Because APC also operates its reservoirs on the Coosa River (FERC project no. P-2146) to meet the flow targets specified in this agreement, APC has operational control over nearly all of the flows in the Alabama River basin upstream of Montgomery, AL. Because flow releases from the Tallapoosa system may directly impact flow releases and project operations within the Coosa system (and vice-versa), we recommend that FERC extend its cumulative impacts analysis of fisheries and water resources to the Coosa River basin and, to the greatest possible extent, coordinate the relicensing of the Martin Dam Project with its ongoing licensing of the Coosa River project to ensure that both licensing decisions are ultimately, consistent with the requirement in section 10(a) of the Federal Power Act (FPA), 16 U.S.C. § 803(a), that any license be "best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of waterpower development, for the adequate protection, mitigation, and enhancement of fish and wildlife […] and for other beneficial public uses."

2.2 Alternatives to be Addressed in FERC's Environmental Analysis

The discussion of alternatives to the proposed action is the "heart" of the environmental document. 40 C.F.R. § 1502.14; *see also* 42 U.S.C. § 4332(c)(iii). The environmental document should "present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision-maker and the public." *Id.* The

Commission must "[r]igorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated." *Id*. It must also "[d]evote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits." *Id.* As lead agency under NEPA, the Commission must "*[r]igorously explore and objectively evaluate all reasonable alternatives*…" and possible environmental measures before approving the license application. *Id.* (emphasis added).

FERC's Scoping Document identifies only one action alternative (Staff's modification of the proposed action) in addition to APC's proposed action and the no-action alternative. While we expect that the study results will help the Commission and other stakeholders to develop and analyze a range of reasonable alternatives to the proposed action, we recommend that the commission consider the alternative below in addition to the alternatives proposed in the Scoping Document.

2.2.1 Recommended Alternative: Modify existing peaking operations

Modifications to the natural hydrograph caused by peaking or load-following operations at hydropower dams often have significant adverse impacts to the downstream ecosystem. FERC should consider an action alternative in which the operations of Martin dam are modified from a peaking/storage facility to a "run-of-reservoir" facility where the instantaneous inflow into the project reservoir is roughly equivalent to the outflow. Run-of-reservoir operations typically have fewer adverse impacts on water quality, erosion, and aquatic ecosystems than peaking/storage operations. While many social and economic changes would result from this proposed alternative, the ecological, aesthetic, and environmental benefits would be considerable. Run-of-reservoir operations would lead to more stable lake levels, enhance recreational opportunities within the project boundary and on the Tallapoosa River below Thurlow Dam, and improve fish production.

These benefits would likely occur even if Martin were operated in a modified run-of-river or run-of-reservoir mode that allowed slight modifications to accommodate flood control requirements and downstream minimum flow requirements. FERC's analysis of

this alternative should consider both scenarios. This alternative is also consistent with and supportive of the stakeholder comments identified in section 4.4.2.1 of APC's PAD expressing interest in higher and more stable lake levels, including changes that would result in a higher winter pool elevation at Lake Martin or in extending the length of time during which the project is held at its summer pool elevation.

In its analysis of this alternative, we recommend that FERC consider the effects of the proposed operational changes on downstream flows; erosion and sedimentation in the project area and in the free-flowing section of the Tallapoosa downstream; impacts and benefits to fish and wildlife habitat within the project boundary and within the free-flowing section of the Tallapoosa River below Thurlow Dam. It should also consider APC's ability to meet flow targets and flood control requirements.

3 Comments on APC's PAD

We appreciate APC's willingness to consult with stakeholders in advance of filing its PAD and NOI, and for seeking stakeholder input into its study plans. While this is not a requirement of FERC's integrated licensing process, it is our experience that advance stakeholder involvement is one of the components of a successful hydropower relicensing, and APC deserves credit for its initial efforts in this area. It is our sincere hope that APC continues to work collaboratively with all interested parties to ensure that issues that have been identified during that process as well as in this scoping and study plan development process are fully considered and resolved. In particular, we stress the need for high-quality studies which can fill all gaps in existing information so that the environmental analysis and the subsequent final license decision will be supported by substantial evidence. We also stress the need for inclusive dialogue with all stakeholders as proposed license conditions are being developed.

While there is a great deal of useful information in the PAD, we are concerned that there are also several remaining gaps. Some of these gaps can be addressed through existing information that was not included in the PAD. Others can be addressed in the study phase, either through APC's proposed studies with the recommended improvements below, or through additional studies as proposed in these comments. In the

following sections, we will outline information that is missing from the PAD and propose improvements to APCs proposed study plan.

4 Requests for Additional Information

In the following section, we address information gaps in the PAD that can be filled with existing information that was not included in the PAD. For convenience, the subheadings of our information requests correspond to the numbering of existing sections in the PAD where we believe that additional information is needed.

Section 4.3.3 – Powerhouse

On p. 4-3 of the PAD, APC states that it "has no operating experience with discharges less than best gate on all units (minimum hydraulic capacity)." Because of the unknown consequences, operating points lower than best gate cannot be used for long periods of discharge." This information is not sufficient to describe the full range of operational capabilities at the Martin powerhouse. It does not appear that APC is unable to undertake studies or testing that would allow it to gain "operating experience," only that it has not done so to date. We request that APC provide a complete description of the operational capabilities of each of the four turbines as designed and their ability to operate at a full range of discharges, including those discharges that are outside of APCs operating experience. We request that APC conduct any necessary tests or modeling that will allow it to gain "operating experience with discharges less than best gate on all units."

Section 4.4.6 – Summary of Generation and Outflow Records

This section does not include outflow records for the project; rather it merely offers an extremely brief, qualitative description of how Martin's operations fit into APC's Tallapoosa River system. We request that APC provide hourly flow information from Martin, Yates, and Thurlow Dams, as well as inflows into the Martin reservoir, so that these data can be independently analyzed and used to assess any proposed operational changes. We request raw data, not summary data. In the case that hourly information is not available, we request that APC provide flow information in the most detailed time increment for which it is available. We recommend that this information be

provided in Excel, CSV, Access, or other format that can readily be imported into a spreadsheet or database.

We also request that APC provide more detailed information about the project's actual generation. Ten years of average monthly generation is not sufficient. Rather, APC should provide generation statistics for each month for every year for which such statistics exist from the date that the project's existing license was issued until the present. Such information will assist stakeholders in understanding how APC operates its project during different water year conditions and will help parties to assess the relative effects of proposed operational changes. We recommend that this information be provided in Excel, CSV, Access, or other format that can readily be imported into a spreadsheet or database.

We request that APC provide a flow exceedance curve which shows the daily pattern of discharge under the existing and the proposed license. In other words, how often does the project operate at minimum capacity, maximum capacity, and other increments between minimum and maximum?

Section 4.4.7 – Delivery of Water for Non-Power Uses

Each of the water withdrawals in this section are described in terms of "projected" average use. We request that APC clarify this projection to outline both the methodology and assumptions on which these projections are based, and the time scale for which this projection applies. In other words, does APC anticipate that the volume of any these withdrawals may increase or decrease at any point over the 30-50 year term of any new license? If so (or if not), what is the basis for this assumption? We also request that APC disclose the process and set of criteria that are used as the basis for issuing water withdrawal permits.

Section 5.1.2 – Existing Erosion

A 2004 order amending APC's license for the Yates and Thurlow Developments (P-2407) requires that APC conduct monitoring to determine the effects of flows on downstream bank erosion on the Tallapoosa below Thurlow Dam:

> "(E) Within 6 months of the issuance of this order amending license, the licensee shall develop a plan, in consultation with the U.S. Fish and Wildlife Service, Alabama Department of Environmental Management, and Alabama Department of Conservation and Natural Resources, to monitor the effects of the new project flow regime on downstream bank erosion for 2 years."

106 FERC 62,014. We request that APC provide all monitoring data, analysis, and other information collected pursuant to this monitoring requirement.

Section 5.2.8 – Federally Approved Water Quality Standards

In this section, APC describes the status of the NPDES permits that it has obtained for the ten existing discharge points at the Martin powerhouse. Additional information about these and other NPDES permits is needed so that the EA might properly analyze the cumulative impacts of the Martin project on water quality within the project area. We request that APC provide the status of all NPDES permits that involve discharges into the project area. This information should articulate 1) to whom each permit has been issued; 2) what discharge(s) each permit regulates; 3) the requirements of these permits; 4) the date when each permit was or is scheduled to be issued and the date when it is scheduled to be reissued; and 5) a description of any compliance issues for each permit.

Section 5.2.3.1 – Flow Statistics

Article 404 of Alabama Power's license for the Yates and Thurlow Developments (P-2407) requires that APC:

> "[F]ile with the Commission for approval, a final streamflow gaging plan which includes: (1) *establishment of a gaging system to measure hourly flows within 0.5 miles downstream from Thurlow Dam in the Tallapoosa River*; and (2) a provision for reporting daily calculations of minimum flows including all input values (runoff into Yates and Thurlow impoundments, scheduled flow releases from Martin Dam, storage, etc.)."

66 FERC 62,068 at p. 19 (emphasis added). APC submitted this plan on August 1, 1994, and FERC approved the plan on February 23, 1995. Despite these requirements of APC's license, the PAD states that "the closest (gauges) to Lake Martin include Gage No. 02414715, located approximately five mi upstream of Lake Martin at Horseshoe Bend,

and Gage No. 02419500, located downstream of Lake Martin near Milstead Alabama," further noting that the Milstead gauge does not record flow in cfs, but rather gage height. We request that APC provide all flow/gaging information collected pursuant to this license article. We also request that APC provide any and all other available flow/gaging information which describes or measures inflows into and outflows from the Martin reservoir. We request that this information be provided in Excel, CSV, Access, or other format that can readily be imported into a spreadsheet or database. We request raw, not summary, data.

We further note that the USGS previously operated a gauge at Tallassee Alabama (USGS Gage No. 02418500), but the gage appears to have ceased operation. The gage recorded flow discharge information in cfs from October 1, 1928 until September 30, 2007, and can be accessed at http://waterdata.usgs.gov/al/nwis/uv/?site_no=02418500. A letter from the U.S. Fish and Wildlife Service (FWS) to APC dated March 8, 1995 suggests that APC relied on this gauge to calibrate its gages at Thurlow Dam. "Comments of US Fish/Wildlife Service on AL Power Co's modified stream flow gaging plan under Art 404 of Yates & Thrulow Proj-2407 et al.," FERC Accession No. 19950322-0103.

Section 5.3 – Fish and Aquatic Resources

APC's license for the Yates/Thurlow project requires APC to conduct monitoring to assess the effects of flows in the Tallapoosa below Thurlow dam on fisheries and aquatic resources. Article 406 of the license provides:

> "Within 180 days of license issuance, the Licensee shall file with the Commission, for approval, a plan to monitor macroinvertebrate and fish populations 5 and 10 years (years 1997 and 2002) after initiation of the minimum flow releases in the Tallapoosa River downstream of the Thurlow Project."

66 FERC 62,068. This license article was later modified in a 2004 license amendment in 2004, extending the monitoring period:

> "(D) The licensee shall extend the biological monitoring study previously approved for the years 1997 and 2002 to include sampling in the years 2007

> and 2012. The monitoring shall be conducted as done in 2002, to properly define the effects of the new project outflow on the downstream aquatic resources.

106 FERC 62,014. We request that APC provide all monitoring data, analysis, and other information collected pursuant to these monitoring requirements.

5 Study requests and Comments on Proposed Studies

In this section, we have folded our study requests into our comments on APC's proposed studies using FERC's criteria for study requests, and we request that the Commission consider each of our recommendations as comment on APC's proposal and a study request in its own right. We commend APC for its collaborative approach to developing these studies with stakeholder groups, and we hope that our comments and recommendations will prove useful as APC further refines and improves its study plan.

5.1 Evaluation of Minimum Flows (Corresponds to APC's Study proposal 3)

5.1.1 Study Description and Objectives

Operation of the Martin Project in a peaking mode results in impacts downstream of the project area in the tailrace and the riverine stretch below Thurlow Dam. We would like to understand the relationship of the project operations and the potential impacts of hydro-peaking on aquatic fauna and aquatic habitat in the Martin tailrace area and in the Tallapoosa River below Thurlow Dam. AR and ARA would like to explore possibilities for flexibility in Martin Dam operations that could enhance downstream areas; in the Martin Tailrace, Yates Reservoir, Thurlow Reservoir, and the Tallapoosa River.

5.1.2 Study Area

APC's proposed study area includes: Martin Reservoir and its tributaries, and Martin Tailrace. Because operations at Martin Dam dramatically alter conditions on the free-flowing river section downstream of Thurlow Dam we recommend expanding the study area to include Yates Reservoir, Thurlow Reservoir, and the Tallapoosa River below Thurlow. The downstream section of this study should, at minimum, extend to the USGS Gauging station at Milstead (USGS gage 02419500).

5.1.3 Resource Management Goals

We support ADCNR and USFWS to explore flexibility in regards to project operations (peaking) and to work with APC to develop strategies to offset downstream impacts to fisheries resources associated with peaking operations.

5.1.4 Relevant Public Interest

There is significant public interest in fisheries resources in the Martin Tailrace, Yates Reservoir, Thurlow Reservoir, and the Tallapoosa River below Thurlow Dam to the Milsted gauging station.

5.1.5 Existing Information

Several sources of information exist that can be used to describe current operations at Martin. There is however, insufficient information in the PAD describing how operations at Martin impact conditions below the Thurlow Dam downstream to the Milsted gauging station (USGS 02419500). APC may also have existing information available pursuant to license requirements for the Yates and Thurlow project. This information was not included in the PAD (please see our request for this information above).

5.1.6 Nexus to Project

We concur with APC that a clear nexus exists between project operations and conditions in the Martin Tailrace as well as in the Tallapoosa River downstream of Thurlow Dam. Neither Yates Reservoir nor Thurlow Reservoir has the storage capacity to capture peaking releases from Martin. Therefore, the operations of the Martin Project largely regulate the allocation, timing, levels and distribution of water flows in the Tallapoosa River.

5.1.7 Study Methodology

APC proposes a methodology to evaluate minimum flows downstream of Martin Dam that includes three parts: 1) review of project operations; 2) review existing environmental data for the Tallapoosa River downstream of Thurlow Dam; and 3) perform limited field surveys in the Martin Dam tailrace as needed to evaluate habitat

potential for unionids. We request that APC specifically describe the methodology to be used in studying macro invertebrate and fish habitat availability, mussel, snail, and crayfish distribution, water quality, and other studies relevant to downstream flows in the Martin tailrace and downstream of the Thurlow Dam to the Milsted gauging station. We also recommend the licensee incorporate one or more peer reviewed methodologies for evaluating flows into their downstream flow study plan. This is common practice in other FERC relicensings. Several methodologies have been developed and widely used include, but are not limited to:

- Index of Biotic Integrity (IBI)
- Target Fish Community Assessment Method
- Biological Response to Flow Correlation Method
- Two-Dimensional Hydraulic Models
- Enhanced Stream Water Quality Model

5.1.8 Level of Effort and Cost

We request that APC specifically describe the methodology it will use in the evaluation of minimum flows downstream of Martin Dam. This methodology is consistent with accepted methods studying/evaluating downstream flows for hydropower relicensing projects. The methodology that is implicit in the existing study proposal may well be acceptable, but we cannot evaluate its quality since the proposal does not identify the methodology to be used. If so, our request will result in minimal change to APC's projected cost. If, however, APC chooses to use a methodology that is different from the one it does not identify in its study plan, the costs of the study might differ.

5.2 Erosion and Sedimentation (Corresponds to APC's study proposal 10)

5.2.1 Goals and Objectives

To understand the correlation between Maritn Project operations and shoreline eriosion and sedimentation in areas of Lake Martin, to understand peaking project impacts to bank erosion downstream of Thurlow Dam, and to quantify how the Martin

Dam interrupts bedload and suspended sediment transport to the Tallapoosa River downstream of the project.

5.2.2 Relevant Public Interest

Biodiversity within the Tallapoosa River is dependent on normal river functions which include bedload and suspended sediment transport. Certain bedload sediments provide critical habitat for mussels as well as essiantial spawning and rearing habitat for several species of substrate spawning river fishes.

5.2.3 Background and Existing Information

We are not aware of any sediment transport information in the Tallapoosa River downstream of the Martin Project.

5.2.4 Project Nexus

The existence of the Martin Project dramatically alters natural river functions including sediment transport downstream of the project in the Tallapoosa River. All sediment transport from the mainstem Tallapoosa River and upstream Tallapoosa tributaries including reservoir tributaries are intercepted and prevented from moving to the Tallapoosa River downstream of Thurlow Dam. Hydro-peaking operations at Martin directly impact conditions including bank erosion in the Tallapoosa River downstream.

5.2.5 Study Area

The study area should include the Martin project boundary, reservoir tributaries and the Tallapoosa River below Thurlow Dam to the USGS gauging station near Milsted.

5.2.6 Methodology

Accepted scientific methods to determine Martin Project impacts on Martin Lake, Martin Tailrace, Yates Reservoir, Thurlow Reservoir, and the Tallapoosa River downstream of Thurlow Dam may include but are not limited to:

Sediment Supply

Sediment dynamics exert important controls on channel morphology and texture that affect habitat quantity and quality for aquatic and riparian species. Aquatic habitat attributes such as spawning gravel availability and the amount of fine sediment in the channel bed are determined by the size distribution and rate of sediment input and by the capacity of stream channels to store and transport sediment. Sediment transport and storage characteristics control the average time required for sediment of various sizes to be routed through the channel network, influencing the sensitivity of channels to disturbances

Sediment Transport and Channel Condition

A coarse-level analysis of channel morphology is commonly conducted for hydroelectric project relicensings to examine historical changes and identify locations for intensive study. Coarse-level analyses utilize historical aerial photographs, digital elevation models (DEM), digital orthophotography, and previous studies on channel geomorphology. A coarse-level analysis typically involves assessment of channel confinement, channel slope, channel sinuosity, sediment source area, presence of alluvial sediment (gravel bars), potential hillslope sediment source areas, and the distribution of side channels.

Characterization of Channel Morphology and Bed Surface Texture

Surveys at intensive study sites commonly involve measuring a longitudinal profile of the channel bed along the thalweg and water surface, sediment facies mapping, three or more cross-sections extending onto the floodplain and to the adjacent hillslope toes where feasible, pebble counts conducted at cross-sections to estimate channel roughness and calibrate facies mapping estimates, coarse particle embeddedness and estimation or measurement of armoring ratio, and bulk sampling of surface and subsurface material located in mobile sediment patches.

Bedload Transport

Bedload transport creates and modifies bedform topography, controls sediment storage, affects surface texture through selective transport and abrasion, influences channel migration, and directly influences aquatic habitat. The flux rate of coarse material is an important component of sediment mass balance within a regulated reach. Higher bedload transport capacity can lead to greater potential geomorphic impacts of reduced coarse sediment supply. Bedload transport is typically modeled and calibrated with field studies at intensive study sites to estimate surface-based dimensionless Shield stress, critical discharges to mobilize the channel bed, coarse (> 2 mm) bedload transport capacity, and bedload grain size distributions. Model input parameters commonly include channel cross-section data, water surface slope, grain size (channel roughness) data of either the channel surface substrate or the bedload supply, and annual flow duration curves of the current and reference flow regimes. Model output parameters commonly include Shields stress versus discharge rating curves, average annual coarse bedload transport capacity, and grain size distributions of either the bedload supply or channel surface (depending on whether the input parameter was surface or bedload supply grain size). Long-term synthetic hydrologic flow records representing current and reference conditions may be used to generate flow duration curves for modeling bedload transport capacity.

Fine Sediment Transport

In regulated reaches with abundant supply of fine sediment, decreased peak flow magnitude and/or frequency may increase fine sediment accumulation in pools and in gravel interstices, affecting the quality of stream habitat for fish and other aquatic species. Fine sediment (< 2 mm) accumulation in project-affected reaches (e.g., bypass reaches) can be evaluated by: (1)Bulk sediment samples from the bed surface and subsurface to determine fine sediment concentration; and (2) V* (proportion of residual pool volume occupied by mobile fine sediment) or equivalent techniques for estimating fine sediment deposition in pools.

Distribution of Side Channels

Project effects on LWD loading, sediment supply, active channel storage, and peak flows may reduce connectivity to side channels, as well as their extent and stability. Reduced peak flow magnitude and/or frequency may also impact the functionality of side channels by reducing access to flow. Methods for evaluating project effects on the distribution, frequency, and length of side channels includes analysis of an aerial photographic time series and field inventories of side channels during low flow. Field inventories may include evaluation of mechanisms of side channel formation (e.g., LWD, channel and/or valley morphologic controls, or sediment deposition), vegetation age on the island bars or terraces between the side channel and main channel, stability of the side channels, and connectivity with the main channel. At the inlet and outlet controls (minimum elevation for surface water from the main channel to connect with the side channel) of the side channels, differential leveling may be used to survey the local water surface and thalweg elevations of the main and side channels to assess topographic controls on surface water flow connectivity with the main channel. Cross-sections and channel roughness data at side channel inlets can also be surveyed as input parameters for water surface modeling aimed at estimating stage-discharge thresholds for surface flow connectivity

Sediment Storage

Channel sediment storage can be altered by sediment trapping in project impoundments, flow regulation, alterations to LWD volume, anthropogenic increases in erosion rates, and other natural events that affect sediment supply and transport. The dynamics of within-reach channel sediment storage, however, is often difficult to assess due to limited historical information, spatial and temporal variability in sediment storage, and uncertainties in sediment activity level and residence time. Changes in stored sediment volume in project-affected reaches may be quantified using several approaches, including reoccupying historical channel cross sections, repeated surveying of channel topography to determine volumetric changes through time, and by assessing the relative activity and response times of sediment in storage based on reservoir theory.

Sediment Budget

A sediment budget is a useful approach to integrating each of the previously discussed areas of potential hydrogeomorphic effects (hydrology, sediment supply, sediment transport, and sediment storage) into a sediment mass balance perspective that provides a framework for interpreting changes in fluvial geomorphology caused by hydroelectric projects and other land uses. Sediment budgets may be constructed at various scales and to varying levels of detail; ranging from those that incorporate detailed long-term field measurements of sediment supply, transport, and storage processes in a channel reach; to rapid sediment budgets that describe geomorphic processes and rates throughout a drainage basin using the best available information. The methods used to develop a sediment budget depend on the specific goals and objectives of the study, and most of approaches described in previous sections are directly applicable.

5.2.7 Level of Effort and Cost

It is difficult to predict cost differences between APC's proposed study plan and the scientifically accepted study methods listed in section 1.6. APC may in fact be proposing an adequate study plan in which case the change in cost would be minimal. However, expanding the geographic scope of the study may result in increased effort and cost. The vague description of the study plan and methodology make it impossible to determine additional or reduced costs.

5.3 Water Quality, Water Use, Water Balance, and Water Withdrawals (corresponds to APC's study proposal 11)

5.3.1 Study Description and Objectives

Several issues have been identified concerning water quality, water quantity, and water that relate to the Martin Project. An objective of American Rivers and The Alabama River Alliance is to learn about the correlation between Lake Martin water storage, Yates and Thurlow water storage, R.L. Harris water releases, water withdrawals, hydroelectric operations at all four projects (Martin, Yates, Thurlow, and R.L. Harris) and ecological and navigational flow requirements in the Tallapoosa and Alabama Rivers. It is important to understand the range of operational conditions at APC's projects

within the Tallapoosa River Basin and Thurlow and the effect that these operations have throughout the project area and the river basin as a whole.

To fully understand the impact of any new license proposal, one must understand how the project's proposed operations would contrast with the results of alternative operating proposals. The simplest way to accomplish this goal is to simulate the operation of the project over a long period of hydrologic history, taking into account other water withdrawals and returns in the basin. We recommend that APC create an open, transparent water balance model that all participants can use to evaluate multiple alternative operational scenarios.

Such a model would facilitate collaborative resolution of issues related to flows, lake levels, and project releases. This model would allow a thorough examination of lake elevations in the Martin development, as well as flows at multiple points in the river over a long period of history. From these data, summary statistics could be generated that allow participants to understand the dynamics of the Tallapoosa system and the impact of the Martin Project's operations on this system.

To facilitate this model and the understanding of the full range of operational possibilities, we also request that APC conduct any necessary tests or modeling that will allow stakeholders to understand APC's ability to operate the project at a full range of discharges, including those discharges that are outside of APCs operating experience.

5.3.2 Relevant Resource Management Goals

Recent drought has severely stressed water resources in the Tallapoosa Basin. Operations at the Martin project to a large extent regulates the allocation, timing, levels and distribution of flows downstream in the Tallapoosa River and significantly contributes to minimum ecological and navigational flow requirements in the Alabama River below the confluence with the Coosa River. As drought and population increases put further pressure on the basin, it is critical to understand APC's management of this water resource in the context of its management of the basin.

5.3.3 Background and Existing Information

Citizens Groups, existing water quality data, records of operation, existing gauging, flow, release, and generation data, information about water withdrawals in the project area.

5.3.4 Project Nexus

There is a clear nexus between the operations of the Martin Project and the balance of water throughout the Tallapoosa and Alabama River Basins. Martin's reservoir provides the bulk of the system's storage capacity, and the project's operations affect water availability for current and future withdrawals and ecological and navigational flow requirements in the Tallapoosa River Basin. It is imperative to understand the relationship between the Martin Project, water scarcity, and competing demands on these resources when determining how to manage this valuable public resource. The project's existence and operations have a direct impact on water quality, influencing water temperature, dissolved oxygen concentrations, nutrient cycling, and turbidity.

5.3.5 Study Area

In order to understand the nexus between project operations, water scarcity, and competing interests including current and future water withdrawals and downstream flow requirements it is import expand the study area outside of the project boundary. The study area should include Lake Martin, APC-owned lands within the Project Boundary, Lake Martin tributaries, as well as areas downstream in the Tallapoosa and Alabama Rivers.

5.3.6 Proposed Methodology

APC's proposed draft study plan does not offer a specific explanation of how data will be collected and analyzed. It is therefore impossible to comment on the adequacy of the proposed methodology or whether the study is consistent with generally accepted scientific practice. In order to understand the correlation between hydroelectric operations at Martin and water quantity and water quality demands and constraints in the

basin it is necessary to conduct a comprehensive study that expands the geographic scope of study to include areas outside of the project boundary. Many relevant scientifically accepted water quality, water quantity, and water balance methodologies are available. We recommend that APC and FERC consider the water balance model that was used in the Roanoke Rapids relicensing (and which was later adapted for the licensing of the Smith Mountain Project) as a model for this study.

5.3.7 Level of Effort and Cost

It is difficult to predict the difference in effort and cost between the licensee's proposed study and a study with a specific methodology. If the licensee is in fact proposing an adequate study it would result in a minimal change to the predicted effort and cost. However, expanding the geographic scope of the study may result in increased effort and cost. APC's vague description of its study plan and methodology make it difficult for us to estimate additional or reduced costs.

5.4 Recreation (corresponds to APC's Study Plan 14)

5.4.1 Goals and Objectives

A recreation plan for the Martin Project should include a description of the project and existing facilities, an analysis of current and future estimates, and proposals for future recreation facility development and enhancement. Because flow based recreation in the Tallapoosa River downstream of Thurlow Dam is dependent on releases at Martin, a recreation plan should also include an assessment of downstream recreational use including economic benefits associated with flow based recreation (boating, fishing, wading), safety hazards associated with current peaking operations, and current and future recreational use (flow based boating, fishing, wading).

5.4.2 Relevant Resource Management Goals

FERC requires that each licensee prepare and implement a recreation plan. This plan should include all aspects of the proposed recreation plan and include an assessment of flow based recreation in the Tallapoosa River below Thurlow Dam to the USGS river gage at Milsted (02419500)

5.4.3 Background and Existing Information

The licensee has identified several sources of existing information that will be valuable in completing this study plan.

5.4.4 Project Nexus

Operation of the Martin facility clearly effects flow based recreation downstream of Thurlow Dam. Current hydro-peaking operations may enhance, degrade, or present safety hazards to flow-based recreational users in the Tallapoosa River downstream of Thurlow Dam.

5.4.5 Study Area

The study area should focus on the Martin Project but include the Tallapoosa River downstream of the Thurlow Dam to the USGS river gage at Milstead (02419500).

5.4.6 Proposed Methodology

Scientifically accepted approaches for designing a recreation study may include but are not limited to the following methods:

Inventory studies

Inventory studies primarily provide descriptive information about recreation resources, use, and users in a project area. Although one type of study examines future recreation demand, these studies generally focus on existing recreation resources and use, while avoiding evaluative information that describes what “should” occur. The output from these studies are broadly equivalent to the recreation section of an “affected environment” chapter of an agency NEPA document such as an Environmental Assessment (EA) or Environmental Impact Statement (EIS). Specific types of inventory studies include:

- facility inventories,
- access inventories,
- existing use inventories,
- use trends and future demand,
- trip and user characteristics, and

- regional recreation context.

Impact/evaluation

These are the studies that assess how a hydroelectric project has affected (or could affect) recreation or how recreation may be affecting other resources. This has more evaluative information and comprises the alternatives/impacts analysis components of a typical NEPA document. Specific types of impact/evaluation studies common during relicensing include:

- flows and recreation,
- reservoir levels and recreation,
- facility need assessments,
- use conflicts,
- recreation capacity assessments, and
- recreation economic studies.

Integrating inventory and impact information

Integration of information from inventory and impacts studies forms the basis for developing and evaluating alternatives in a plan regarding management actions that might be taken to meet needs or address problems.

Ultimately, the objective is a list of potential management measures (actions) and a description of how they might change recreation opportunities and quality. These could include cost estimates, implementation constraints, effects of creating new opportunities, and discussion of trade-offs from taking actions that enhance one opportunity but may diminish another. These are typically organized along the lines of:

- facility improvement options,
- reservoir level/flow regime changes,
- education program options,
- regulation options, and
- use limit options.

Evaluating use trends and future demands

Information about potential future recreation use (e.g., demand) is also relevant in relicensing. Future use is sometimes estimated by summarizing current use and applying national or regional recreation trend information (e.g., the National Survey on Recreation and the Environment; the Outdoor Industry Association survey on human-powered outdoor activities, state-by-state trend information usually developed in mandated Statewide Comprehensive Outdoor Recreation Plans or SCORPs).

However, this method may not be viable for river reaches that do not have current use (due to a lack of flows or access), or for predicting use of reaches or reservoirs whose characteristics will be modified by new hydropower development or operations. Efforts to estimate this demand generally require professional judgment and/or demand "experiments," in addition to a review of trend information, but may also include analysis of survey responses to questions about future use (recognizing that intentions are not always good predictors of behavior).

5.4.7 Level of Effort and Cost

6 Conclusion

We appreciate the opportunity to submit these comments, and look forward to collaborating with FERC staff, APC, and other stakeholders during the relicensing of this project.

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Respectfully Submitted,

/s/ Cindy Lowry

Cindy Lowry
Executive Director
Alabama Rivers Alliance
2027 2nd Ave N, Suite A
Birmingham, AL 35203
205-322-6395
clowry@alabamarivers.org

/s/ Matt Rice

Matt Rice
Associate Director Southeast Conservation
American Rivers
2231 Devine Street, Suite 202
Columbia, SC 29205
803-771-7206
mrice@americanrivers.org

/s/ John Seebach

John Seebach
Director, Hydropower Reform Initiative
American Rivers
1101 14th St. NW, Suite 1400
Washington, DC 20005
202-347-7550 ext. 3055
jseebach@americanrivers.org

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