

Review of the Low Impact Hydropower Institute Application for Re-Certification

Tapoco Hydroelectric Project (FERC No.2169)



June 29, 2012 - Aluminum company Alcoa Inc. said it will sell its 351MW Tapoco Hydroelectric Project to Brookfield Renewable Energy Partners for \$600 million. Tapoco includes four hydroelectric power generating stations and dams on the Little Tennessee and Cheoah rivers in East Tennessee and western North Carolina. The deal also includes 86 miles of transmission line and about 14,500 acres, Alcoa said in a news release. The sale is subject to federal and state regulatory approval. This sale does not effect re-certification by LIHI because LIHI certifies the Project, not the owners

Prepared by Fred Ayer
July 17, 2012

Review of the Low Impact Hydropower Institute

Application for Re-Certification of the Tapoco Hydroelectric Project

NOTES: In preparing this report of my review of the Tapoco Project LIHI Re-Certification Application I have relied heavily on the excellent research done by Gabriela Goldfarb which includes her *October 27, 2005 Application Reviewer's Report* that was presented to the Board and made part of their decision to certify the Project for 8-years guided by Gabriela's recommendations.

I will present the information in my report in the following way: All items in red type are my updates, explanations, and recommendations that either concur or disagree with the Applicant's.

The text in blue is the Applicant's updated 2012 comments and responses to the original 2005 filing.

Introduction and Overview

This report reviews the application submitted by Alcoa Power Generating, Inc. ("APGI" or "Applicant") to the Low Impact Hydropower Institute ("LIHI") for Low Impact Hydropower Re-Certification of their Tapoco Project which is located in North Carolina and Tennessee.

As background, the Tapoco Hydroelectric Project (FERC No. 2169) was relicensed by the Federal Energy Regulatory Commission (FERC) by Order dated January 25, 2005. The new license is based largely on a comprehensive relicensing settlement agreement signed by a supermajority of the relicensing parties and filed with FERC on May 7, 2004. The Tapoco Project Relicensing Settlement Agreement (RSA) outlines protection, mitigation, and enhancement (PME) measures for the Project that address ecological resources as well as other beneficial uses of the Cheoah and Little Tennessee Rivers, including hydropower generation, watershed protection, endangered species enhancement, fish passage and recreational opportunities. The participants in the settlement negotiations included APGI, state and federal resource agencies, the Eastern Band of the Cherokee Indians, local governments, homeowner associations, and local and national non-governmental organizations (NGOs). The new FERC license became effective beginning March 1, 2005 and has a term of 40 years. APGI began implementing the new license immediately and is in compliance with the new license.

APGI's Compliance Manager is responsible for overall compliance with the FERC Project license and RSA. Additionally, all APGI personnel are responsible for understanding APGI's commitments and conducting all activities in compliance with the FERC license, RSA, 401 certifications, protocols, plans, agreements, and conservation easements. The Compliance Manager uses the following tools to ensure compliance:

- **Compliance database** – maintained and updated regularly; includes e-copies of all relevant agency correspondence, compliance filings, and FERC notices/approvals;
- **Compliance tracking table** – generated from database and used to track compliance on an ongoing basis; this table identifies required action(s), person(s) accountable, and due dates;
- **Monthly compliance calls** – the Compliance Manager and support staff meet monthly on the first Thursday of the month via conference call to review what near and long term actions are required to ensure ongoing compliance;

- **Compliance manual** – developed to help APGI staff understand and comply with the Project license, agreements, plans etc.; the manual is available electronically and in hard copy; the manual is updated regularly (every five years);
- **Annual compliance training** – the Compliance Manager organizes an annual training, which typically includes a presentation, a question/answer period, and follow-up; and
- **Information sharing on Project websites** – the Project website (www.alcoa.com/tapoco) provides resource management plans in electronic format, monitoring data, flow data, annual reports etc.

With this LIHI re-certification application, Alcoa wants to accelerate the expiration date of their current LIHI certificate for the Tapoco Project, LIHI Cert. No. 18. The LIHI certificate was issued for an 8-year term which expires on July 25, 2013. Assuming Tapoco is re-certified, they will be able to continue to offer their customers RECs from a project whose LIHI certification would not expire for eight years. In 2005, the Project was re-licensed for a 40-year term by the Federal Energy Regulatory Commission (FERC). The 2005 FERC license includes a comprehensive collaborative settlement agreement. LIHI's charge to the Application Reviewers is to conduct a review of the application focused solely on determining the answers to the following two questions:

1. *Has there been a material change in circumstances since the original certification was issued?* For purposes of recertification review, a "material change in circumstances" will mean one or both of the following:

(a) Non-compliance: Since receiving its last certification from LIHI, the certificate holder/applicant has not implemented, or has delayed implementing, or has done an inadequate job of implementing obligations at or near the facility that are of relevance to LIHI's criteria. These obligations could be in the form of terms and conditions of license(s), settlement agreements, resource agency recommendations or agreements, LIHI conditions of certification including annual notifications, agreements with local municipalities or other third parties or similar relevant obligations; or

(b) New or renewed issues of concern that are relevant to LIHI's criteria: Since receiving its last certification from LIHI, either new issues of concern and relevance to LIHI's criteria have emerged that did not exist or were not made known to LIHI at the time of certification, or there continues to be ongoing problems with previously known issues that appeared to LIHI to be resolved or on the road to resolution at the time of certification but in fact are not resolved, and are ongoing at the time of the re-certification application. If a new license, settlement agreement, prescription, biological opinion or other similar regulatory decision has been made since the original recertification, these documents will be evaluated to determine if new or renewed issues have been raised.

2. *Have any of LIHI's criteria, or the Board's interpretation of one or more criterion, changed in meaningful ways since the original certification that are applicable to the circumstances of the facility seeking re-certification?*

Project Description

The Tapoco project consists of four powerhouses and four dams in eastern Tennessee and western North Carolina totaling 350 megawatts (MW) of electric generation capacity, which power Alcoa Tennessee Operations near Knoxville. The project is located on the Little Tennessee and Cheoah Rivers and is owned and operated by APGI.

The four developments that make up the Tapoco Project include:

Santeetlah Development consisting of: (1) 1,054-foot-high and 216-foot-high concrete arch dam; (2) 25,176 foot long tunnel/pipeline; (3) 2,881-acre reservoir; (4) powerhouse with two generating units, with the total installed capacity of 49.2 MW; and (5) 750-foot-long 161 kV transmission line.

Cheoah Development consisting of: (1) 750-foot-long and 229-foot high curved concrete gravity dam; (2) 644-acre reservoir; (3) powerhouse with 4 vertical Francis turbine units directly connected to generators and 1-independent Francis turbine unit added in 1949; and (4) 118-MW total installed capacity.

Calderwood Development consisting of: (1) 916-foot-long and 230-foot-high concrete arch dam; (2) 570-acre reservoir; (3) 2,050-foot-long tunnel; and (4) powerhouse with 3 Francis turbine units, which are being upgraded to a total installed capacity of 140.4 MW.

Chilhowee Development consisting of: (1) 1,483-foot-long and 88.5-foot-high concrete gravity dam; (2) 1,734-acre reservoir; and (3) powerhouse with 3 Kaplan turbine units with a total installed capacity of 52.2 MW

The total area within the FERC Project Boundary is approximately 8,300 acres (5,800 acres of water and 2,500 acres of land). The new license is anticipated to add about 147 acres of land within the Project Boundary. The Tapoco Project extends along the Little Tennessee River from about river mile marker 33 located approximately 3,000 feet downstream of Chilhowee Dam to just above river mile marker 60, a little more than a half-mile downstream of the Tennessee Valley Authority's (TVA) Fontana Dam. Chilhowee, Calderwood and Cheoah developments and Santeetlah Powerhouse are located on the Little Tennessee River. Santeetlah Dam and Reservoir are located on the Cheoah River, a tributary to the Little Tennessee River. Santeetlah Dam is located approximately 9.3 miles upstream of the confluence of the two rivers, which is located just downstream of Cheoah Powerhouse. The Project Boundary also encompasses much of the Cheoah River corridor downstream of the Santeetlah Dam.

Project and site characteristics. The project boundary includes approximately 5,800 acres of water and 2,650 acres of land. According to the applicant a 200-foot zone extending around the project's impoundments (including lands not owned by APGI, and excluding lands along the Cheoah River) totals 3,304 acres. Part of the project occupies federal lands within the Nantahala National Forest. As noted above, three of the four developments comprising the project are located along the Little Tennessee River. The fourth, Santeetlah, consists of a dam on the Cheoah River (a tributary to the Little Tennessee River) that diverts water to a powerhouse on the Little Tennessee River. The four developments are operated as daily peaking facilities that are integrated components of the Tennessee Valley Authority (TVA) system. As noted in the project's FERC license:

TVA schedules the Tapoco power station generators based on its planned schedule for operating the Fontana Dam which is 7.5 miles upstream of the Cheoah development, with consideration for the Santeetlah Reservoir operating guide curve. TVA forecasts Fontana Dam operations and provides APGI with a flow/generation schedule for the next day at

6:00 pm each day. APCI adheres to the flow and operation schedule provided by TVA.

Highlights of the FERC License Provisions. The project's new license includes a number of requirements intended primarily to restore, protect, and enhance natural resources and improve public access and recreation. The applicant must comply with license requirements to:

- 1) Operate the Santeetlah development to ensure minimum flows to the formerly dewatered bypass section of the Cheoah River below the development, maintain surface elevations to benefit aquatic resources, and provide high flow events to benefit downstream aquatic resources and whitewater recreation, among other operational changes.
- 2) Release continuous minimum flows from Calderwood dam to protect and restore aquatic resources in the previously dewatered bypass reach of the Little Tennessee River, and minimize drawdowns from the Chilhowee Reservoir.
- 3) Protect natural resources and recreation through conservation easements, land transfers, and other enforceable measures.
- 4) Upgrade existing and construct or fund additional recreational infrastructure and amenities, and expand recreation access to certain project lands.
- 5) Fund up to \$10,000 of fish passage measures for the Chilhowee development in the form of seasonal trapping and relocation of threatened and endangered fish species, and implement a study to evaluate the presence and status of additional migrating riverine and diadromous fish species as the basis for possible future fishway requirements at the development.
- 6) Fund or undertake a series activities to monitor and research natural resources affected by the project, promote threatened and endangered species recovery, and implement outreach and environmental education.
- 7) Consult periodically with stakeholders to assess water reallocation and flows for whitewater recreation in the Cheoah River.

Highlights of Additional Settlement Agreement Provisions. The Settlement Agreement goes beyond the FERC license requirements in reflecting the parties' agreement to carry out a number of other actions relating to protection, restoration, and enhancement of natural resources or recreation. The Settlement Agreement stipulates that the applicant will:

- 1) Establish of two funds, one in Tennessee and one in North Carolina, to underwrite natural resource enhancement and stewardship activities. The applicant is to endow and annually augment the funds under the terms of both the FERC license and Settlement Agreement. The applicant will pay \$4 million and \$1.074 million to the Tennessee and North Carolina funds, respectively, over the license period.
- 2) Fund recreational enhancements at the four impoundments. The applicant's financial contribution will be \$4.6 million over the license period (state and federal agencies must contribute additional funding).
- 3) Convey permanent and term conservation easements and purchase options to land conservancies and public agencies, and also impose restrictive covenants, in order to protect natural resources and public recreation access on project lands. These changes in land ownership and use restrictions, affecting roughly 10,000 acres, will permanently establish contiguous areas of land in conservation management because of the project's central location relative to two National Forests, two Wilderness areas, and Great Smoky Mountain National Park.

- 4) Provide a total of \$400,000 over the license period (to be matched by the State of Tennessee) for recreational fish stocking at Calderwood Reservoir.
- 5) Implement a protocol to guide the consideration, feasibility, and funding of additional high flow events to benefit whitewater recreation in the Cheoah River, beyond those required by the FERC license primarily to benefit fish and wildlife.

A list of the 22 signatories to the Settlement Agreement appears in the Applicant's LIHI application..

Memorandum of Understanding. The parties to the Settlement Agreement finalized the accord in May 2004. FERC issued its license for the project in January 2005. The signers of the Settlement Agreement developed an MOU to address inconsistencies between the FERC license and elements of the Settlement Agreement. The MOU reflects the signatories' agreement on common interpretations of the Settlement Agreement that would "preserve bargained-for benefits...without imposing unforeseen or unreasonable additional costs and burdens on the Licensee or any other Signatory."

The applicant is also requesting that the project's LIHI certification be extended by three years, based on its consistency with LIHI's watershed protection criteria D (i.e., a buffer zone dedicated for conservation purposes to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation extending 200 feet from the high water mark in an average water year around 50 - 100% of the impoundment, and for all of the undeveloped shoreline; or a fund that can achieve the equivalent). Natural resource agency staff confirmed that the applicant has implemented conservation easements required by the Settlement Agreement and license. In my opinion these easements, combined with implementation of the applicant's shoreline management plan, and establishment of the Tennessee and North Carolina funds, will provide protection that meets LIHI's watershed criteria. For this reason, if LIHI does certify the project, I also recommend that the Governing Board extend the applicant's certification by an additional three years.

Additional issues for LIHI Governing Board consideration. The Settlement Agreement and FERC license are broad in scope, with many elements to be executed over time. The applicant submitted its application for LIHI certification less than five months after FERC relicensed the project. This raises the general issue that the applicant's record of compliance is very short. For this reason, the LIHI Governing Board may wish to require that the applicant submit annual written compliance reports detailing consistency with provisions of the Settlement Agreement and FERC license. Submittal to LIHI of the applicant's annual compliance reports to FERC would accomplish this goal and not place an undue burden on the applicant.

The timing of the project's relicensing also raises a specific issue related to the formerly dewatered bypass reach of the Little Tennessee River below Calderwood Dam. This reach remains on the State of Tennessee's most recent Clean Water Act (CWA) section 303(d) list of impaired waters due to habitat loss, with the cause described as diversion of flow at the upstream impoundment. However, the state's CWA section 401 certification, also issued April 2005, states that the project will not violate state water quality laws if the applicant complies with the 401 certification's conditions, which include minimum flows to the bypass reach. Furthermore, in an October 19, 2005 letter to LIHI the directors of the Division of Water Pollution Control, Tennessee Department of Environment and Conservation, and the Division of Environmental Services, Tennessee Wildlife Resources Agency stated that they "agree that the Tapoco Project is appropriately protective of water quality in the bypass reach below Calderwood Dam." If the LIHI Governing Board has concerns about the bypass reach appearing on the CWA 303(d) list, it may wish to condition the project's continued LIHI certification on removal of the Calderwood development as the source of impairment of the bypass reach from the next iteration of the State of Tennessee's CWA 303(d) list.

General conclusions. The resource agency staff that I was able to communicate with and other stakeholders contacted in the course of this review, expressed the view that the post-Settlement Agreement/relicensing changes in facility operations and land management protect, restore, and enhance natural and recreation resources. Natural resource-related stakeholder contacted credited the applicant with acting in good faith throughout the negotiation of the Settlement Agreement and license and in their implementation of license and Settlement Agreement provisions to date. The Applicant received strong letters of support from five key resource agencies; The US Fish and Wildlife Service (USFWS), Tennessee Wildlife Resources Agency (TWRA), United States Forest Service, (USFS), North Carolina Division of Water Resources (NCDWR), and the Tennessee Department of Environment and Conservation Division of Water Resources. LIHI received no other comment letters.

Decision: I have determined Based on my review of information submitted by the applicant, my review of additional documentation, and my consultations with LIHI contractors, resource agency staff, and in accordance with the LIHI's Handbrook, I believe the Tapoco Hydroelectric Project meets all of the mandatory criteria to be certified. Therefore I approve the applicant's request to re-certify the Tapoco Hydroelectric Project for an eight-year term (with an effective date of March 20, 2012 and an expiration date of March 20, 2020).

Low Impact Certification Criteria

A. Flows

1) Is the Facility in Compliance with Resource Agency Recommendations issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations) for both the reach below the tailrace and all bypassed reaches?

YES.

Under the terms of the project's FERC license and Settlement Agreement, the applicant is required to operate the Santeetlah development in North Carolina to ensure minimum flows to the formerly dewatered bypass section of the Cheoah River below the development, maintain surface elevations to benefit aquatic resources and recreational amenities, and provide high flow events to benefit downstream aquatic resources and whitewater recreation, among other operational changes. The applicant is also required to release continuous minimum flows from Calderwood dam in Tennessee to protect and restore aquatic resources in the formerly dewatered bypass reach of the Little Tennessee River, and minimize drawdowns from the Chilhowee Reservoir (also in Tennessee). Resource agency staff of the respective states said that to the best of their knowledge the applicant is complying with all flow and related operating requirements, which had a September 1, 2005 deadline.

With respect to the required minimum flows to the bypass reach below Calderwood dam, resource agencies set the flow levels to create stream temperatures that match the cool water fishery that is believed to have existed prior to hydropower development in the watershed. The mandated flows are smaller than what are believed to be historic flows. However, as a result of the basin's hydro development, flows greater than the mandated levels would create conditions for a cold water fishery, which would run counter to the resource agencies' management objectives. Tennessee Department of Environment and Conservation (TDEC) staff commented that the Tapoco Project has the effect of dampening potentially greater adverse effects of the Tennessee Valley Authority's upstream Fontana Dam. Absent the Tapoco Project, the Fontana Dam would be releasing widely fluctuating and very cold tailwaters.

Applicant's 2012 update - Historically there have been two bypassed river reaches at the Tapoco Project – the Cheoah River Bypass reach and the Calderwood Bypass reach. The RSA includes agreements to restore flows to both of these bypassed reaches. The details of these agreements are summarized below. The Resource Agencies did not recommend any flow conditions for the Cheoah and Chilhowee tailwaters.

Cheoah River Bypass Reach - In order to enhance, maintain, and protect fish and wildlife habitat and biological integrity and water quality in the Cheoah River bypass reach, APGI began releasing aquatic base flows from Santeetlah Dam September 1, 2005 in the magnitude and for the duration described in Table 1. APGI determines the aquatic base flow for each month by calculating the average daily inflow (ADI) value for the three preceding months. APGI calculates the ADI using its recorded measures of daily change in reservoir elevation and total discharge (generation flows, instream flow releases, high flow events, and flood discharge flows). If the ADI is greater than the historic 25th percentile average flow for that month (Table 2), APGI releases flows according to Tier A and if the ADI is less than or equal to the historic 25th percentile average flow for that month, APGI releases flows according to Tier B. Flow data is recorded and posted on APGI's Project website at http://www.alcoa.com/tapoco/en/info_page/santeetlah.asp.

Table 1: Aquatic Base Flows

Month	Tier A Flowrate (cfs)	Tier B Flowrate (cfs)
January	50	50
February	100	90
March	100	90
April	100	90
May	90	80
June	60	60
July	60	50
August	50	40
September	50	40
October	50	40
November	50	40
December	60	50

Table 2: Historic 25th Percentile Average Flows
Based on 31-year Period of Record (1971-2001)

Month	Threshold Flow (cfs)
Jan	256
Feb	446
Mar	484
Apr	615
May	617
Jun	526
Jul	403
Aug	289
Sep	208
Oct	141
Nov	116
Dec	148

Table 3: High Flow Events – 5-year Repeating Schedule

Month	Year 1		Year 2		Year 3		Year 4		Year 5		Magnitude (cfs) ³		
	# Events	Total Days Per Month	# Events	Total Days Per Month	# Events	Total Days Per Month	# Events	Total Days Per Month	# Events	Total Days Per Month	Day 1	Day 2	Day 3
January													
February	1	2	1	2	1	2	1	2	1	2	1000	Var ¹	
March	1	3	1	3	1	3	1	3	1	3	1000	600 ²	300
April	2	5	3	6	2	5	2	5	3	6	1000	850	300
May	2	4	2	4	3	6	3	6	3	6	1000	850	
June	1	2	1	2					1	2	1000	850	
July					1	2					1000	850	
August							1	1			1000		
September	1	1			1	1					1000		

October	1	1	1	1	1	1	1000
November	1	1	1	1	1	1	1000
December							
Total Per Year:	10	19	10	19	10	19	
1 600 cfs from hour 15 to hour 19, 400 cfs from hour 20 to hour 34; 200 cfs from hour 35 to hour 47; 100 cfs for hour 48							
2 600 cfs from hour 16 to hour 36; 300 cfs from hour 37 to hour 48							
3 12:00 a.m. (midnight) shall be the starting point for determining the appropriate time for initiating and changing flow releases							

Table 4: High Flow Events (2005-2011)

<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>
September 17 October 1 November 2	February 8-9 March 21-23 April 1-2 April 8-9 April 15-16 May 6-7 May 27-28 June 3-4 October 1 November 1	February 7-8 March 17-19 April 14-15 April 21-23 May 5-6 May 19-20 May 26-27 July 7-8 September 1 November 3	February 16-17 March 15-17 April 5-7 April 19-20 May 3-4 May 10-11 May 17-18 August 17 October 4 November 1
<u>2009</u>	<u>2010</u>	<u>2011</u>	
February 21-22 March 14-16 April 4-5 April 18-19 April 25-26 May 9-10 May 16-17 May 30-31 June 20-21 November 7	February 20-21 March 20-22 April 10-12 April 24-25 May 8-9 May 22-23 June 26-27 September 18 October 2 November 6	February 19-20 March 19-21 April 2-3 April 9-10 April 16-17 May 14-15 May 21-22 June 18-19 October 1 November 5	

APGI began releasing aquatic base flows and periodic high flows from Santeetlah Dam beginning September 1, 2005 according to Tables 1-3. Table 4 shows the dates that APGI released high flows from Santeetlah Dam from 2005 through 2011. The USGS gage at Bearpen Gap (Gage No. 0351706800) is used to measure flows released from the Santeetlah Dam into the Cheoah River and monitor compliance with the requirements outlined in the RSA. APGI funds the operation of the Bearpen Gap flow gage. APGI uses the calibrated manual staff gage below Santeetlah Dam at the Joyce Kilmer Bridge for visual confirmation of Cheoah River flows. In accordance with the RSA, APGI reviews the results from the aquatic base flows and periodic high flow events from Santeetlah Dam with the Resource Agencies at the annual Cheoah River flow planning meeting each October. There have been no instances of non-compliance with the flow regime. In letters dated February 21, 2012, February 27, 2012, and February 29, 2012, the USFWS, USFS, and NCDENR respectively, indicated that the restored flows in the Cheoah River are supporting agency restoration goals.

Calderwood Bypass Reach of Little Tennessee River

On March 1, 2005 APGI began releasing minimum instream flows in the Calderwood Bypass reach of the Little Tennessee River according to the repeating 10-year schedule shown in Table 5. The minimum flow regime varies annually in both discharge and timing (i.e. adjustments in flows will be made on the first Tuesday of the month, no later than 12:00 p.m., so as to not always occur at the end of one month and beginning of another). APGI uses

the gate position and headpond elevation to determine the magnitude of the flow release. APGI releases water from the base of the gate, down approximately six feet from normal full pond elevation of 1087.8 feet USGS datum.

APGI makes the determination to release minimum instream flows in the Calderwood Bypass according to Scenario A, B or C for each calendar year, so long as the required frequency of each of these scenarios is met within each ten-year period.

Table 5: Calderwood Bypass Instream Flows

Scenario	A	B	C
January	45	50	55
February	40	50	60
March	35	50	65
April	20	40	60
May	30	40	50
June	25	30	35
July	30	30	30
August	20	25	30
September	25	25	25
October	35	30	25
November	45	40	25
December	40	40	40
Average Annual Flow	32.5 cfs	37.5 cfs	41.5 cfs
Frequency	3/10 years	5/10 years	2/10 years

In order to reduce the potential for thermal impacts on stream biota, during the normally hot and dry months of July – September, APGI considers the flows in Table 5 for each month as target flows. APGI operates within a limited flow band around the flow values due to the variation in headpond elevations during normal operation and the small magnitude of some of the required flows. APGI may exceed target flows if water is released upstream or inflows exceed the turbine capacity of the Calderwood Powerhouse or as necessary to pass trash at the dam.

In releasing the target flows into the Calderwood Bypass reach consistent with Table 5, APGI must ensure that the released flows are no greater than 50 cfs above the target flows, except as provided in the previous paragraph, and no lower than 5 cfs below the target flows.

APGI may temporarily reduce instream flows in the Calderwood Bypass for the purpose of safely crossing the Little Tennessee River to utilize the Goat Creek access route to construct, reconstruct, inspect, maintain or perform related activities with respect to the Calderwood transmission lines. In accordance with the Project license and applicable conditions, APGI has on several occasions reduced flow in the Calderwood Bypass to access the Calderwood transmission lines. In each case, APGI has provided the required 15 days prior notice to the appropriate Resource Agencies and FERC and has maintained 20 cfs in the Calderwood Bypass during the entire period that transmission line work was performed.

APGI began releasing minimum instream flows into the Calderwood Bypass on March 1, 2005. APGI has operated in compliance with the flow regime from 2005 through the present. Flow data is recorded and posted on APGI's Project website at http://www.alcoa.com/tapoco/en/info_page/calderwood.asp.

DWR was the lead agency representing the NCDWR during the relicensing and settlement process for the Tapoco hydroelectric project. NCDWR our focus was on the Santeetlah facility

and the associated bypassed reach of the Cheoah River, since the other facilities covered by this license are located in Tennessee.

Studies were conducted during relicensing to evaluate the effect of flows in the Cheoah River bypassed reach on aquatic habitat and whitewater recreation. NCDWR staff were active participants in study design, data collection, review of results, development of recommendations, and negotiation of the relicensing settlement agreement. The Secretary of NCDENR signed the settlement agreement on behalf of our Department.

Although The resource agencies did not recommend any flow conditions for the Cheoah and Chilhowee tailwaters, the FERC license incorporated most of the conditions that had been agreed to by the parties to the RSA. According to the USFWS "... the RSA and License returned seasonally variable flow regimes to a 9.1-mile reach of the Cheoah River and a 1-mile reach of the lower Little Tennessee River, which had been bypassed by project operations."

YES

PASS

B. Water Quality

1) Is the Facility either:

- a) In Compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the Facility after December 31, 1986? Or**
- b) In Compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?**

YES

Officials of TDEC and the North Carolina Department of Environment and Natural Resources (NCDENR) confirmed that to the best of their knowledge, the applicant is in compliance with all requirements of the respective states' Clean Water Act Section 401 water quality certifications. The certifications included requirements that are discussed in the flows, fish passage and protection, watershed protection, and recreation sections of this application review.

Pursuant to §401 of the Federal Clean Water Act, the State of Tennessee certified on April 29, 2004 and the State of North Carolina certified on November 8, 2004 that the Tapoco Project will not violate applicable water quality standards provided it conforms with the approved plans, specifications, and other information submitted.

The North Carolina certification includes 14 conditions, 11 of which mirror the RSA. The remaining three conditions are in addition to, although not inconsistent with, the RSA. These conditions require: (1) APGI to report consumptive withdrawal of water from Santeetlah Reservoir; (2) conduct all activities in a manner consistent with state water quality standards and any other state and federal law; and (3) provide that the certification does not grant or affirm any property rights, license, or privilege in any water or any right of use in any water. In addition to the agency letters in Attachment 5 confirming compliance, Table 6 summarizes the status of APGI's compliance with each of the conditions.

Table 6: Conditions of the North Carolina §401 Water Quality Certificate

Condition No.	Status
1. Release aquatic base flows from Santeetlah Dam	In Compliance, See Section A.1
2. Provide high flow events into the Cheoah River	In Compliance, See Section A.1
3. Convene an annual planning meeting in early October of each year to discuss Cheoah River flows	In Compliance, See Section A.1
4. Beginning in October 2010, in conjunction with the annual meeting in Condition No. 3, consult with the USFWS, USFS, NCDENR, NCWRC, EBCI, and Graham County regarding possibility of providing an additional high flow event on a trial basis	In Compliance, APGI held this meeting on October 5, 2010. See Attachment 3.
5. If inflow is not adequate to provide high flow releases and maintain required reservoir levels while maintaining instream flows, make equitable reductions in reservoir levels and high flow releases as outlined in Condition No. 5	In Compliance, Implementation of the Low Inflow Protocol has not been necessary to date.
6. Continue funding the USGS Bearpen Gap gage; install/maintain a calibrated staff gage or equivalent at the Joyce Kilmer Bridge; and make available the calculated release to the Cheoah River at Santeetlah Dam on an hourly basis via the Internet	In Compliance, See Section A.1
7. Prior to the gate modifications and automation in Condition No. 8, release a continuous base flow of approximately 50 cfs through an existing Tainter gate at Santeetlah Dam and provide high flow events with consideration of factors outlined in Condition No. 7	In Compliance, Completed March 2005 – July 2007
8. Add "piggy back" gates to, and automate, either two or three of the existing Tainter gates on Santeetlah Dam to accommodate release of the aquatic base flow and high flow events	In Compliance, Completed July 2007
9. Operate Santeetlah Reservoir according to the operating rules outlined in Condition No. 9, except when operating under the Low Inflow Protocol	In Compliance, See Section 1
10. Monitor the elevation of Santeetlah Reservoir on an hourly basis and make that data available via the Internet	In Compliance, See Section 1

Condition No.	Status
11. During emergencies and for planned Project maintenance or inspection activities, APGI may vary from the reservoir operating curve, vary flows below the required aquatic base flows or lake levels, or vary from the high flow release schedule, with notification to NCDENR, NCWRC, USFS, and USFWS as outlined in Condition No. 11	In Compliance, No variations have been necessary to date.
12. Identify and report in writing existing and proposed consumptive uses (defined as $\geq 100,000$ gallons per day) to DWQ and NC Division of Water Resources	In Compliance, See Section B.2. There are no consumptive uses at Santeetlah.
13. Conduct activities in a manner consistent with State water quality standards and any other appropriate requirements of State law and federal law	In Compliance, See Section B and Letters in Attachment 5
14. Certification does not grant or affirm any property right, license or privilege in any waters or any right of use in any waters and Certification does not authorize any person to interfere with riparian rights, littoral rights or water use rights of any other person	N/A

The Tennessee certification contains 21 conditions, 16 of which mirror the RSA. The remaining five conditions are in addition to, but are not inconsistent with, the RSA. These conditions require: (1) conformance of approved plans, specifications, agreements, data and other information submitted in support of APGI's application; (2) prohibit the release of pollutants in flowing water from construction or maintenance activities associated with the Project; (3) require that Project-related work be carried out in such a manner as will prevent violations of water quality criteria rules; (4) bar any petroleum products or other chemical pollutants from entering state waters; and (5) make the terms and conditions of the certification applicable to any contractors. In addition to the agency letters in Attachment 5 confirming compliance, Table 7 summarizes the status of APGI's compliance with each of the conditions.

Table 7: Conditions of the Tennessee §401 Water Quality Certificate

Condition No.	Status
1. Operate Project in conformance with approved plans, specifications, agreements, data and other information submitted in support of the Certification Application and the limitations, requirements, and conditions of the Certification	In Compliance, See Attachment 2
2. Establish/maintain Tallassee Fund and provide annual funding to the Tallassee Fund	In Compliance, See Section D.2
3. Develop/operate/maintain fish passage program	In Compliance, See Section C.6
4. Release instream flows in the Calderwood Bypass reach of the Little Tennessee River	In Compliance, See Section A.1
5. During the months of July-September, consider flows outlined in Condition No. 4 as target flows and operate within a limited flow band around the flow values	In Compliance, See Section A.1

Condition No.	Status
6. Ensure that the released flows into the Calderwood Bypass reach are no greater than 50 cfs above the target flows outlined in Condition No. 4, except as provided in Condition No. 5, and no lower than 5 cfs below the target flows; file a plan and schedule for FERC approval for gate modifications/complete gate modifications	In Compliance, See Section A.1
7. Use the gate position and headpond elevation to determine the magnitude of the flow release and release water from the base of the gate	In Compliance, See Section A.1
8. Record flow data electronically, using the control system at Calderwood Dam, and make the calculated hourly Calderwood Bypass flow release data available electronically via the Internet	In Compliance, See Section A.1
9. Operate Calderwood Reservoir with no seasonal drawdown and maximum drawdowns of 6 feet from normal full pool elevation	In Compliance, See Section 1
10. Operate Chilhowee Reservoir with no seasonal drawdown and maximum drawdowns of 5 feet from normal full pool elevation	In Compliance, See Section 1
11. May modify instream flow releases required in Condition Nos. 4-8 and the reservoir drawdowns required in Condition Nos. 10 and 11 on a temporary basis as outlined in Condition No. 11	In Compliance, See Section A.1
12. Develop and file with FERC a sampling plan to periodically sample benthic macroinvertebrates in the Chilhowee tailwater	In Compliance, APGI filed the Chilhowee Development Benthic Macroinvertebrate Study Plan in February 2007. FERC approved the plan in May 2007. The first sampling was conducted in 2007 and a study report was filed with FERC in 2008. Additional sampling is not required until 2019.
13. In the event that issues related to FERC jurisdiction over Tapoco Project lands lying within the Great Smoky Mountains National Park (GSMNP) boundary are resolved, grant and convey a permanent conservation easement (the "Bulge Easement") to TNC on a tract south of US Highway 129, known as "The Bulge" and grant to TNC the option to purchase the remaining fee simple interest underlying the Bulge Lands (the "Bulge Option")	In Compliance, Complete – 2005.
14. Grant and convey a permanent conservation easement on APGI non-Project lands to TNC that creates 200 feet of protection on the shorelines of Chilhowee and Calderwood reservoirs	In Compliance, See Section D.2.

Condition No.	Status
15. In the event that issues related to FERC jurisdiction over Tapoco Project lands lying within GSMNP boundary are resolved, grant and convey a permanent conservation easement ("Corridor Easement") to TNC for non-Project lands within a corridor adjacent to the Calderwood Bypass and grant to TNC the option to purchase the remaining fee simple interest underlying the Corridor Lands (the "Corridor Option")	In Compliance, See Section D.2
16. So long as the fee interest in the Corridor Lands is owned by APCI or TNC, cooperate with TWRA in maintaining public access to the Corridor Lands and the property covered by the Shoreline Easement (called the "Tennessee Riparian Lands Easement" in the RSA)	In Compliance, Ongoing
17. In the event that issues related to FERC jurisdiction over Tapoco Project lands lying within GSMNP boundary are resolved, grant and convey a conservation easement (the "Term Conservation Easement") to TNC over all remaining APCI-owned non-Project lands in Tennessee in the vicinity of the Project and grant to TNC a permanent right of first refusal to purchase some or all of the remaining APCI Lands	In Compliance, See Section D.2
18. Do not carry out construction or maintenance activities in flowing waters associated with Project operation that are likely to release pollutant; separate grading, excavation or fill activities from the water column	In Compliance, Ongoing
19. Carry out all work in such a manner as will prevent violations of water quality criteria	In Compliance, Ongoing
20. Take appropriate steps to ensure that petroleum products or other chemical pollutants are prevented from entering waters of the State; immediately report/take measures to prevent the pollution of waters of the State for all spills	In Compliance, Ongoing
21. Convey all terms and conditions of the Certification to contractors	In Compliance, Ongoing

2) Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?

YES

The bypass reach of the Little Tennessee River below Calderwood Dam is included on the State of Tennessee's 2004 Clean Water Act Section 303(d) list of impaired waters.¹

If YES, go to B3.

¹ Tennessee Department of Environment and Conservation. 2005. Final Version Year 2004 303(d) List. <<http://www.state.tn.us/environment/wpc/publications/#303d04>> (Accessed September 22, 2005).

3) If the answer to question B.2 is yes, has there been a determination that the Facility is not a cause of that violation?

YES

Water quality at the Project is generally good. No Project waters located in North Carolina are listed as impaired by NCDWQ on the 2010 North Carolina 303(d) list. The West Buffalo Creek arm of Santeetlah Reservoir was previously listed as impaired on the 2004 North Carolina 303(d) list due to nutrients as a direct result of nutrient laden discharges from upstream trout farms. In its most recent Little Tennessee River Basin Water Quality Plan (NCDWQ 2007), NCDWQ reported that the four trout farms located on the West Buffalo Creek arm of Santeetlah Reservoir were fully decommissioned by March 2004 due to an award of \$1.25 million from the Clean Water Management Trust Fund that supported the buyout of the four trout farms. According to the most recent Little Tennessee River Basin Water Quality Plan (NCDWQ 2007), NCDWQ conducted a special study in 2005 of West Buffalo Creek and the West Buffalo Creek arm of Santeetlah Reservoir to document changes or improvements to the water quality of Buffalo Creek following the dismantling of the trout farms. Results from that study indicated that the nutrient reduction strategy was effective, however, an insufficient number of samples were available for NCDWQ to assign a use support rating to this segment.

Additionally, the most recent 303(d) list for Tennessee (2010) lists the segment of the Little Tennessee River below Calderwood Dam as impaired (Category 4c for impairment not caused by pollutant) due to habitat loss from flow alteration as flow is diverted around this section of the river (reference: http://www.tn.gov/environment/wpc/publications/pdf/2010_303d_final.pdf).

To alleviate impacts of the diversion of water from the Little Tennessee River below Calderwood Dam, on March 1, 2005 APGI began releasing minimum instream flows in the Calderwood Bypass reach of the Little Tennessee River according to the repeating 10-year schedule shown in Table 5 (see discussion in Section A above). In its §401 certificate, the state of Tennessee certified that the operation of the Tapoco Project, in conformance with approved plans and specifications, will not violate applicable water quality standards.

APGI is in compliance with both the NC and TN §401 water quality certificates. In accordance with the NC 401 certificate, APGI filed a letter dated April 25, 2005 with FERC which reported that there are no existing or planned consumptive uses at Santeetlah Reservoir of at least 100,000 gallons per day. By letter dated May 23, 2005, FERC acknowledged that APGI had fulfilled this requirement of the §401/FERC license.

B.3 If the answer to question B.2 is yes, has there been a determination that the Facility does not cause, or contribute to, the violation?

Yes, Pass, Go to C

In a §401 Water Quality Certificate issued April 29, 2004, the Tennessee Department of Environment and Conservation (TDEC), Division of Water Pollution Control, certified that the operation of the Tapoco Project, in conformance with approved plans and specifications, will not violate applicable water quality standards. Furthermore, in a letter dated March 8, 2012 the TDEC Division of Water Resources affirmed that APGI continues to operate the Tapoco Project in compliance with the Water Quality Certificate and therefore, is appropriately protective of water quality in the bypass reach below Calderwood Dam (see Attachment 5).

If Yes go to C.

The Applicant received a letter dated March 8, 2012 (see Appendix A) from the Tennessee Department of Environment and Conservation, Division of water Resources' Daniel C. Egar, Manager. Mr. Egar states that he represented his Division "...in the FERC Relicensing of the two Tapoco projects. The Division issued a section 401 Water Quality Certification on April 29, 2004 that specified terms and conditions under which operation of the project would not cause violations of state water quality. To my knowledge, the project has continued to operate in compliance with the Water Quality Certification. Therefore, I believe that the Tapoco Project is appropriately protective of water quality in the bypass reach below Calderwood Dam."

In a letter dated February 29, 2012 the NCDWR provided the following response to the Applicant regarding recertification of the Tapoco project. "Studies were conducted during relicensing to evaluate the effect of flows in the Cheoah River bypassed reach on aquatic habitat and whitewater recreation. NCDWR staff were active participants in study design, data collection, review of results, development of recommendations, and negotiation of the relicensing settlement agreement."

YES

PASS

C. Fish Passage and Protection

- 1) **Is the Facility in Compliance with *Mandatory Fish Passage Prescriptions* for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?**

YES

The prescribed fish passage device and its proposed uses are described in this excerpt from the following February 21, 2012 USFWS letter to applicant:

"The Fish and Wildlife Service filed a §18 fishway prescription that addressed the

passage needs of four endangered and threatened fishes at the Chilhowee Development. The objective of the fishway prescription is to maintain the long-term genetic diversity of the populations of yellowfin madtom, smoky madtom, duskytail darter, and spotfin chub at Abrams Creek and Citico Creek, tributaries to the Little Tennessee River that are separated by the Chilhowee Dam and reservoir. The fishway consists of a program to capture and move individuals of these species between these streams each generation."

Consistent with a FERC license article reflecting U.S. Fish and Wildlife Service (FWS) requirements, on August 31, 2005 the applicant submitted a study plan for evaluating the presence and status of diadromous fish (specifically American eel, *Anguilla rostrata*; see below regarding requirements for riverine fish). The plan is to include initial monitoring within 5 years of the effective license date and additional monitoring in years 10 and 20 of the license. If populations are detected at the base of Chilhowee Dam, FWS may require additional fishways, except that FWS may not require structural fishways prior to year 20 of the license.

If YES, go to C5.

5) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of *Riverine* fish?

YES

Consistent with requirements of the FERC license, on August 31, 2005 the applicant filed with FERC a plan for fish passage at the Chilhowee development for four target threatened or endangered fish species: the Spotfin chub (*Erimonax monachus*), Yellowfin madtom (*Noturus flavipinnis*), Smoky madtom (*Noturus baileyi*) and Duskytail darter (*Etheostoma percnurum*). FWS required the seasonal trapping and relocation of these targeted fish species between three tributaries to the Little Tennessee River. Prior to construction of the mainstem Little Tennessee River dams, there were no physical barriers to the movement of these species between the tributaries. The applicant is to consult annually with FWS to determine the quantities of fish to be relocated, and to carry out sampling and other activities. FWS's goal is to achieve genetic mixing between the sub-populations of the four fish species. The applicant is required to provide \$10,000 in funding annually to implement the plan. According to FWS staff, the applicant is prepared to disburse the funds, but the resource management agencies have not yet established a fiscal agent to receive them.

Together with the requirement for the diadromous fish study described under criterion C1, above, FERC included in the project license the FWS requirement that the applicant submit by April 30, 2006 a study plan to evaluate the presence and status of other riverine fish species in the vicinity of the Chilhowee Dam tailrace, including but not limited to Lake sturgeon (*Acipenser fulvescens*), Black buffalo (*Ictiobus niger*), Smallmouth buffalo (*Ictiobus bubalus*), Sauger (*Sander canadense*), and River redhorse (*Moxostoma carinatum*). The plan must include initial monitoring within five years of the effective license date and additional monitoring in

years 10 and 20 of the license. If populations of these species are detected at the base of Chilhowee Dam, FWS may require additional fishways, but no structural fishways will be required prior to year 20 of the license.

If YES, go to C6.

6) Is the Facility in Compliance with Resource Agency Recommendations for Riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?

NOT APPLICABLE

Applicant's Update 2012

C.1 Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?

Yes, Go to C5

C.5 Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of Riverine fish

Yes, Go to C6

C.6 Is the Facility in Compliance with Resource Agency Recommendations for Riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?

In a letter to the Applicant the USFWS offered the following: "I would like to confirm that the Licensee is in compliance with all requirements (flows to bypass reach, high flow releases, License articles). Further, we regularly recognize the good work of APGI, especially with research and restoration under the Tallassee Fund and Cheoah River Fund, information sharing, and comprehensive land conservation, as examples for other projects to follow. I support the recertification of the Tapoco Hydroelectric Project by LIHI's as Low Impact."

The USFWS filed a Prescription for Fishways for the Tapoco Project with FERC, which is appended to the FERC license as Appendix D. The Prescription specifically discusses a fishway for the Chilhowee Development.

Per the USFWS Prescription, fish passage entails annual funding by APGI for trapping and relocation of certain numbers of each target fish species (turquoise shiner (spotfin chub), yellowfin madtom, smoky madtom, and duskytail darter), each season. Actual numbers of each species are determined annually in consultation with the U.S. Fish and Wildlife Service. Annual funding is used first to accomplish the primary fish passage objective of moving a certain number of each of the target fish species between Abrams Creek and Citico Creek, and between Abrams Creek and the Tellico River. Funding is used secondarily to conduct associated sampling, marking

and genetics testing to help demonstrate that the USFWS's goal of genetic mixing between the sub-populations of the four fish species is being met. Funding can also be used to trap and transport fish between the Tellico River and Citico Creek, to the extent that such efforts may also enhance the overall genetic health of the Abrams Creek populations. These details were included in a Fish Passage Translocation Plan that was prepared in consultation with the USFWS and filed with FERC on August 31, 2005. FERC modified and approved the Plan on August 22, 2006. In accordance with the approved Plan, APGI submits a summary report of the previous year's fish translocation effectiveness studies along with the proposed studies and schedule for the upcoming year, as discussed at the annual meeting, by March 15 of each year. APGI provides the USFWS with the opportunity to comment on the report before it is filed with the FERC.

Table 8 summarizes the total number of each fish species released in the Tellico River and Abrams Creek annually since the implementation Fish Passage Translocation Plan.

Table 8: Summary of Annual Fish Reintroductions

	Spotfin Chub		Smoky Madtom		Yellowfin Madtom		Duskytail Darter (now known as Citico Darter)	
	Tellico River	Abrams Creek	Tellico River	Abrams Creek	Tellico River	Abrams Creek	Tellico River	Abrams Creek
2006	3,017		148	8	84	8	490	
2007	1,460		277		419		510	
2008	2,400		603		300		375	
2009	2,524	204	351	100	413	100	365	
2010	698		201	48	96	49	292	98

The USFWS Prescription also requires APGI to develop and file with FERC a plan for evaluating the presence and status of important potamodromous and diadromous fishes (including but not limited to American eel (*Anguilla rostrata*), Lake sturgeon (*Acipenser fulvescens*), Black buffalo (*Ictiobus niger*), Smallmouth buffalo (*Ictiobus bubalus*), Sauger (*Sander canadense*), and River herring (*Moxostoma carinatum*) in the upper end of Tellico Reservoir in the vicinity of the Chilhowee Dam tailwater. The plan was developed in consultation with the Resource Agencies (USFWS, USFS, TDEC, TWRA, and NPS) and filed with FERC on August 31, 2005. FERC approved the plan on July 20, 2006. In accordance with the approved Plan, APGI conducted initial monitoring within five years of the effective date of the FERC license (in 2009), with additional monitoring to be conducted in year 10 (2014) and year 20 (2024) of the FERC license. The USFWS will use the data collected under the fish monitoring plan to determine the need for additional fishways at the Chilhowee Development (in consultation with the USFS, NPS, TDEC, and TWRA). The need for additional fishways for the targeted potamodromous and diadromous fish species will be determined by the USFWS when certain conditions of populations or congregations occur. The presence of significant populations of the target fish species at Chilhowee Dam will be a condition precedent to the requirement of additional fishways.

No additional structural fishway will be required by the USFWS under any circumstances for the passage of the target fish species before year 20 of the FERC license. Subject to this limitation, the

Secretary of the Department of Interior reserves the right to require fishways at the Tapoco Project.

The Tapoco Project is in compliance with the USFWS Section 18 Prescription. In a letter dated February 21, 2012, the USFWS states that APGI is helping to ensure adequate fish passage around Project dams for native species through the implementation of the prescribed fishway. In a letter dated February 20, 2021, TWRA also supports APGI's implementation of the Fish Passage Translocation Plan and annual fish reintroductions

Not Applicable

If NOT APPLICABLE, go to D

PASS

D. Watershed Protection

- 1) Is there a buffer zone dedicated for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation) extending 200 feet from the high water mark in an average water year around 50 - 100% of the impoundment, and for all of the undeveloped shoreline?**
- 2) Has the facility owner/operator established an approved watershed enhancement fund that: 1) could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1., and 2) has the agreement of appropriate stakeholders and state and federal resource agencies?**

Table 9 shows that there are 3,304 acres within 200-ft of the four Project reservoirs. A portion of these lands are APGI lands protected by term and permanent conservation easements (discussed below under D.2). A much larger portion of these riparian lands are federal lands within the National Forest or National Park Service system. In total, 67% of the riparian lands are protected by conservation easements and/or federal ownership.

Table 9: Riparian Areas Dedicated for Conservation Purposes

Impoundment	Total Acreage 200 ft Buffer (acres)	APGI Lands in Conservation Easement (approx. %)	National Forest / Park, Other Public Ownership (approx. %)	Total Acres in Conservation Ownership (approx. %)
Santeetlah Reservoir	1,756	~2%	~76%	78%
Cheoah Reservoir	505	~42%	~30%	72%
Calderwood Reservoir	412	~30%	~11%	41%

Chilhowee Reservoir	631	~23%	~22%	43%
Total	3,304	~16%	~51%	67%

D.2 Has the Facility owner/operator established an approved watershed enhancement fund that: 1) could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1, and 2) has the agreement of appropriate stakeholders and state and federal resource agencies?

Yes, Pass, Go to E

The RSA included many commitments aimed at protecting the resources of the Little Tennessee River Basin including land protection, over \$6 million payments to watershed trust funds over the life of the project license, and a Shoreline Management Plan. As of January 2012 \$1,186,040 has been paid to trust funds.

Land Protection

In addition to the 7,839 acres owned within the Project boundary, APGI owns and manages approximately 12,725 acres of non-Project land. On August 30, 2005 APGI granted to The Nature Conservancy, at no cost, permanent conservation easements covering approximately 5,900 acres and term conservation easements on an additional 3,975 acres of this non-Project acreage for reconveyance to a federal or state agency (see APGI Lands Maps on pages 30-31). The primary purpose of these conservation easements is to retain land and water areas predominantly in their natural, scenic, open or wooded condition or as suitable habitat for fish, plants or wildlife and preserve the historical, architectural, archaeological, or cultural aspects of the properties. The total number of acres protected through the conservation easements is approximately 11,000 acres. About 800 acres of the total are riparian (Project and non-Project) areas along the Project reservoirs.

Trust Funds

APGI also established two funds for natural resource stewardship and Project mitigation activities. The beneficiaries North Carolina Resource Management and Enhancement Fund (North Carolina Fund) include the North Carolina Wildlife Resources Commission, North Carolina Department of Environment and Natural Resources, U. S. Forest Service, Eastern Band of Cherokee Indians, and U. S. Fish and Wildlife Service. The North Carolina Fund must be used within the scope of subject matter of the Fish and Wildlife Coordination Act, the Endangered Species Act, and Section 10 of the Federal Power Act including but not limited to 1) monitoring of biotic and abiotic parameters, 2) addition of large woody debris, and gravel and vegetation management in the Cheoah River below Santeetlah Dam, and 3) for other natural resource stewardship activities, including, but not limited to, a) threatened and endangered species recovery efforts, b) control of exotic species and environmental outreach and c) education directly related to those Cheoah River and Little Tennessee River basin resources affected by ongoing Project operations, in particular the Santeetlah and Cheoah developments, and the portion of the Calderwood Development in North Carolina. Projects funded by the North Carolina Fund to date include:

- Population genetics of the Appalachian elktoe mussel;
- Restoration ecology of fishes in regulated rivers;
- Virginia spiraea monitoring and management;
- Captive culture and reintroduction of priority fishes and mussels;
- Yellow Creek invasives eradication;
- Propagation and reintroduction of the Wounded darter; and
- Cheoah River gravel augmentation.

Additional details of the North Carolina Fund's activities can be found at http://www.alcoa.com/tapoco/en/info_page/nc_fund_board.asp.

APGI made an initial payment of \$100,000 (escalated in accordance with the RSA) in 2005 and has made annual deposits of \$25,000 (escalated in accordance with the RSA). Table 10 shows the annual payments

made to the North Carolina Fund to date. Annual payments will continue for the duration of the FERC license except for the final three years of the project license term. Monies in the fund shall be held and managed by an entity unanimously agreed to by the beneficiary entities listed above and APGI.

Table 10: North Carolina Fund Annual Payments 2005 - 2012

Month/Year	Payment (\$)
Initial payment (2005)	\$102,080
January 2006	\$26,201
January 2007	\$27,011
January 2008	\$27,710
January 2009	\$28,395
January 2010	\$28,554
January 2011	\$28,891
January 2012	\$29,613
Total to Date	\$298,455

APGI also established the Tallassee Fund, which is managed by the USFWS, USFS, Great Smoky Mountains National Park, Tennessee Department of Environment and Conservation, Tennessee Wildlife Resources Agency, the Eastern Band of the Cherokee Indians, The Nature Conservancy of Tennessee, the National Parks Conservation Association, the Tennessee Clean Water Network, and American Rivers for 1) threatened and endangered species recovery efforts, 2) ecosystem enhancements and restoration, 3) management and control of exotic species, and 4) environmental outreach and education directly related to the Tapoco Project and non-Project lands in Tennessee currently owned by APGI to mitigate the continuing environmental impacts associated with the Project's operations. Projects funded by the Tallassee Fund to date include:

- Protecting a threatened watershed by acquiring baseline aquatic species data;
- Protecting a threatened watershed by inventorying and acquiring baseline monitoring data on the newly acquired Great Smoky Mountains National Park lands;
- Recovery status of 2 federally protected extirpated fish species in Abrams Creek, Great Smoky Mountains National Park;
- Re-establishment of Blotchside logperch into Tellico River and Citico Creek;
- Propagating and reintroduction of Hellbender into the Little Tennessee River Watershed;
- Exotic species removal in the southwestern portion of Great Smoky Mountains National Park;
- Targeted algal species inventory and water chemistry of lower Abrams in the Great Smoky Mountains National Park;
- Exotic invasive plant species removal in the Lower Abrams Creek Watershed of the Great Smoky Mountains National Park;
- Inventory of snails;
- Assessment of exotic hogs;
- Treatment of eastern Hemlock stands;
- Intensive control of wild hogs;
- Identify and improve fire-dominated bird habitat;
- Documentary to promote diverse aquatic species at Citico Creek;
- Roost ecology of Eastern small-footed bats; and
- Utilizing Cherokee heritage, tradition, and Cherokee syllabary.

APGI made an initial deposit of \$100,000 (escalated in accordance with the RSA) in 2005 and has made annual deposits of \$100,000 (escalated in accordance with the RSA). Table 11 shows the annual payments made to the Tallassee Fund to date. Annual payments will continue for the duration of the FERC license.

Monies in the Fund shall be held and managed by an entity unanimously agreed to by the beneficiary agencies listed above and APGI.

Table 11: Tallassee Fund Annual Payments 2005 - 2012

Month/Year	Payment (\$)
Initial payment (2005)	\$102,080
January 2006	\$104,806
January 2007	\$108,044
January 2008	\$110,842
January 2009	\$113,580
January 2010	\$114,216
January 2011	\$115,564
January 2012	\$118,453
Total to Date	\$887,585

Shoreline Management Plan

APGI filed a Shoreline Management Plan (SMP) for the Project with FERC on October 1, 2004. By order dated March 31, 2006, FERC approved the SMP with minor modifications. In accordance with the FERC order, APGI distributed an SMP addendum in June 2006 that revised APGI's Shoreline Stewardship Policy, Specifications for Private Recreation Use Facilities, and Subdivision Access Approval, Multi-use Facility Permitting, and Industrial Approval Procedures, which are included in the SMP as appendices. (Reference http://www.alcoa.com/tapoco/en/info_page/shoreline_management.asp)

APGI prepared the Shoreline Management Plan in consultation with North Carolina Department of Environment and Natural Resources, North Carolina Wildlife Resources Commission, North Carolina State Historic Preservation Office, U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Indian Affairs, Great Smoky Mountains National Park, Eastern Band of Cherokee Indians, Cross Creek Property Owners Association, Friends of Lake Santeetlah, Town of Lake Santeetlah, Town of Robbinsville, Graham County, Sierra Club, American Rivers, Tennessee Clean Water Network, The Nature Conservancy, Tennessee Department of Environment and Conservation, Tennessee Wildlife Resources Agency, Tennessee Historic Commission and the Tennessee State Historic Preservation Office.

Upon FERC's request for Comments, motions to intervene and protests on the Shoreline Management Plan, several key Resource Agencies, U.S Department of Interior, U.S Forest Service, and North Carolina Wildlife Resources Commission, filed letters of support for the SMP.

The U.S. Department of Interior stated "We are pleased with the balance of shoreline uses afforded by the SMP and its shoreline classification and are encouraged that the primarily undeveloped characteristics of the Project developments will be retained for the benefit of fish and wildlife and their habitats as well as fish-and-wildlife-based recreation for the American public...We have worked with APGI and other parties and believe that the SMP adequately protects, enhances, and mitigates the ongoing and future impacts of the Project."

The NCWRC stated "The NCWRC was actively involved in the development of the shoreline management plan submitted by Alcoa Power Generating Inc. (APGI). We strongly support the shoreline management plan as written. We very much appreciate APGI's commitment to the protection of fish and wildlife resources and habitats in the project area."

State and federal resource agency staff confirmed that APGI had met its commitments under the Settlement Agreement to provide a buffer zone on or in proximity to the shoreline of each impoundment on APGI lands, except for areas in the immediate vicinity of project facilities (dams, powerhouses, transmission facilities, etc.). The table below presents the acreage contained in a 200-foot buffer surrounding each impoundment and the

approximate percentages of that area contained either in an APCI conservation easement or conservation ownership

Impoundment	Total Acreage 200 Foot Buffer	APCI Lands in Conservation Easement (approx. %)	National Forest/Park, Other Public Ownership (approx. %)	Total Acres in Conservation Ownership (approx. %)
Santeetlah	1,756	~2%	~76%	~78%
Cheoah	505	~42%	~30%	~72%
Calderwood	412	~30%	~11%	~41%
Chilhowee	631	~23%	~22%	~43%
Total	3,304	~16%	~51%	~67%

Source: APCI

In many areas, the APCI easement does not begin at the shoreline, but slightly landward. However, where there is a “gap” between the shoreline and easement, the area is covered by a license-required Shoreline Management Plan (SMP). The Department of the Interior (DOI), the Forest Service, and the North Carolina Wildlife Resources Commission submitted letters to FERC supporting the Shoreline Management Plan in June 2005. The DOI letter stated that under the plan “the primarily undeveloped characteristics of the Project developments will be retained for the benefit of fish and wildlife and their habitats as well as fish-and-wildlife-based recreation for the American public.” Attachment D to this report provides a map illustrating for Santeetlah Reservoir the extent of the 200-foot buffer, the APCI easement, and public ownership.

The Settlement Agreement provides watershed protection far beyond a 200-foot buffer through land conveyances. The land conveyances involve permanent and term conservation easements and purchase options granted by the applicant to land conservancies and public agencies, as well as imposition of restrictive covenants, in order to protect natural resources and public recreation access. These changes in land ownership and use restrictions, affecting roughly 10,000 acres, will permanently establish a large contiguous area of land in conservation management because of the project’s central location relative to two adjacent National Forests and Wilderness areas (Cherokee and Nantahala National Forests, Citico Creek Wilderness and Joyce Kilmer-Slickrock Creek Wilderness), another nearby National Forest (Pisgah), and the Great Smoky Mountains National Park.

Finally, under the Settlement Agreement the applicant will, over the life of the project license, contribute more than \$6 million to two funds to pay for project mitigation activities and natural resource stewardship in the project’s vicinity (\$4 million to the Tallassee Fund [Tennessee] and \$1.074 million to the North Carolina Resource Management and Enhancement Fund). The funds’ boards are comprised of representatives of the state and federal resource agencies, the Eastern Band of Cherokee Indians and, for the Tennessee fund, a number of nongovernmental organizations. The applicant is ready to make its initial payments to these funds, but is awaiting the public agencies’ formation of a fiscal entity to receive them.

Taken together, the APCI easements, federal land in conservation ownership, Shoreline Management Plan, and establishment of the Tennessee and North Carolina funds appear to more than satisfy LIHI’s watershed criteria.

The applicant is also requesting that the project’s LIHI certification be extended by three years, based on its consistency with LIHI’s watershed protection criteria D (i.e., a buffer zone dedicated for conservation purposes to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation extending 200 feet from the high water mark in an average water year around 50 - 100% of the impoundment, and for all of the undeveloped shoreline; or a fund that can achieve the equivalent). Natural resource agency staff confirmed that the applicant has implemented conservation easements required by the Settlement Agreement and license. In my opinion, these easements, combined with implementation of the applicant’s shoreline

management plan and establishment of the Tennessee and North Carolina funds, will provide protection that meets LIHI's watershed criteria. For this reason, if the Governing Board does certify the project, I recommend that the Governing Board extend the applicant's certification by an additional three years.

If YES, go to E

PASS

E. Threatened and Endangered Species Protection

1) Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?

YES

The License and Relicensing Settlement Agreement (RSA) addresses the needs of many rare, threatened, and endangered species that occur in or adjacent to the project area.

SPECIES	TAXA	STATUS
Appalachian elktoe	Mussel	Endangered
Spotfin chub	Fish	Threatened
Duskytail darter	Fish	Endangered
Yellowfin madtom	Fish	Threatened
Smoky madtom	Fish	Endangered
Indiana bat	Mammal	Endangered
Virginia spiraea	Plant	Threatened

There are 7 federally listed threatened or endangered species and 3 additional federal species of concern; all of these are included on the list of more than two dozen state-listed imperiled or threatened species found within the project boundary. The federally listed species are the primary focus of the resource management agencies, and these are the Appalachian elktoe (freshwater mussel), Virginia spiraea (shrub), Indiana bat, and the four fish species discussed above in section C5 regarding fish passage: Spotfin chub, Yellowfin madtom, Smoky madtom, and Duskytail darter.

If YES, go to E2.

2) If a recovery plan has been adopted for the threatened or endangered species pursuant to Section 4(f) of the Endangered Species Act or similar state provision, is the Facility in Compliance with all recommendations in the plan relevant to the Facility?

According to FWS there were some specific objectives in the recovery plans for the federal species noted above that were relevant to the project and guided FWS in its development of recommendations for the FERC license and the Settlement Agreement. However, the recovery plans did not specifically name the project. FWS reports that the applicant is, at present, in compliance with the threatened and endangered species-related provisions of the license and Settlement Agreement and therefore with any recovery plan recommendations reflected in those documents.

There was no evidence of state recovery planning provisions for state listed species either in conversation with wildlife officials or in relicensing or Settlement Agreement documents. State officials stated that several elements of the license and Settlement Agreement would benefit state listed species (in particular, that the projects to be underwritten by the respective state funds were expected to include projects to benefit special status species). State officials are satisfied with the applicant's compliance to date with the license and Settlement Agreement with respect to these provisions.

If YES, go to E3.

3) If the Facility has received authority to incidentally Take a listed species through: (i) Having a relevant agency complete consultation pursuant to ESA Section 7 resulting in a biological opinion, a habitat recovery plan, and/or (if needed) an incidental Take statement; (ii) Obtaining an incidental Take permit pursuant to ESA Section 10; or (iii) For species listed by a state and not by the federal government, obtaining authority pursuant to similar state procedures; is the Facility in Compliance with conditions pursuant to that authority?

NOT APPLICABLE

If NOT APPLICABLE, go to E5.

5) If E.2. and E.3. are not applicable, has the Applicant demonstrated that the Facility and Facility operations do not negatively affect listed species?

In documents filed with FERC in connection with the relicensing of the project, FWS found that the project would not be likely to adversely affect the Appalachian elktoe, Virginia spiraea, Indiana bat, Spotfin chub, Yellowfin madtom, Smoky madtom, and Duskytail darter, and would have no effect on two other species, the red-cockaded woodpecker and bald eagle, found in the vicinity of the project. There was no information relevant to state listed species.

The USFWS filed a “Biological Assessment for the Tapoco Settlement Agreement” with FERC (this Assessment is appended to the RSA). This Assessment concluded that none of the activities described in the RSA (e.g., Project operations, recreational enhancements etc.) are anticipated to have adverse effects on rare, threatened, or endangered (RTE) species. In some cases, the activities described in the RSA would have a beneficial effect.

Background

During studies conducted for the Project relicensing, 23 rare, threatened, and endangered species were located within the Project boundary: 12 were animal species (3 birds, 3 salamanders, 3 mammals, 2 fish, and 1 lizard) and 11 were plant species (5 herbaceous flowering species, 2 trees, 2 ferns, 1 moss, and 1 hornwort) as listed in Table 12. All of the species listed in Table 12 warrant formal protection under state or federal statutes. The Indiana bat and Appalachian elktoe are federally listed as “Endangered” and the Virginia spiraea is federally listed as “Threatened.” The bald eagle was delisted under the federal Endangered Species Act (ESA) by the USFWS in 2007, however, the species remains of special concern and is listed by the State of Tennessee as “Deemed in Need of Management” and as “Threatened” by the State of North Carolina. Although the peregrine falcon was removed from federal listing, it remains state listed in both North Carolina and Tennessee. Additionally, the Junaluska salamander, historically known to inhabit the upper reaches of the Cheoah River just below Santeetlah Dam, and the Southern Appalachian woodrat are listed as “Federal Species of Concern”. All other species are listed at the state level.

APGI filed the Tapoco Project Endangered Species Management Plan (ESMP) with FERC on August 30, 2007. On March 4, 2008 FERC issued an Order Modifying and Approving the ESMP. The revisions requested by FERC were made and a revised ESMP was filed with FERC on September 4, 2008. FERC approved the revised ESMP on April 14, 2009.

Table 12: Federally or State Listed Rare, Threatened, and Endangered Species Located in 1999 within the Tapoco Project Boundary

Species	Family	Rank and Listing	Habitat Requirements
Animal Species			
Peregrine Falcon (<i>Falco peregrinus</i>)	Bird	Very rare and critically imperiled; endangered (NC and TN)	Nests are usually situated over lakes, marshes, swamps, rivers, as well as over coniferous and riparian forests adjacent to the nesting habitat
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Bird	Delisted in 2007; deemed in need of management (TN); threatened (NC)	Near seacoasts, rivers, and large lakes breeding in tall trees or on cliffs
Osprey (<i>Pandion haliaetus</i>)	Bird	Very rare and imperiled; threatened (TN)	Rivers, lakes, coasts
Hellbender (<i>Cryptobranchus alleganiensis</i>)	Salamander	Rare and uncommon (NC and TN); deemed in need of management (TN); species of special concern (NC)	Clear, fast-flowing streams and rivers with rocky bottoms; adjacent terrestrial habitat
Blackbelly Salamander (<i>Desmognathus quadramaculatus</i>)	Salamander	Very rare and imperiled; deemed in need of management (TN)	Sizable swift and boulder-strewn mountain streams, at elevations of 1,600-5,000 feet
Junaluska Salamander (<i>Eurycea Junaluska</i>)	Salamander	Federal species of concern; extremely rare and critically imperiled; deemed in need of management (TN); imperiled species of special concern (NC)	Lower elevations of the Appalachian Mountains under logs and rocks along streams

Species	Family	Rank and Listing	Habitat Requirements
River Otter (<i>Lutra Canadensis</i>)	Mammal	Rare and uncommon; threatened (TN)	Streams, lakes, ponds, swamps, marshes, estuaries
Southern Appalachian Woodrat (<i>Neotoma floridana</i> ssp. <i>haematoreia</i>)	Mammal	Federal Species of Concern; extremely rare and imperiled; deemed in need of management (TN); imperiled species of concern (NC)	Rock strewn sites, usually mountaintops and valley sides
Meadow Jumping Mouse (<i>Zapus hudsonius</i>)	Mammal	Widespread, abundant, and apparently secure; deemed in need of management (TN); rare or uncommon watch species (NC)	Open grassy fields; abundant in thick vegetation near ponds, streams, and marshes in woodland areas
Indiana Bat (<i>Myotis sodalis</i>) ¹	Mammal	Federally listed as Endangered; endangered (TN and NC)	During the summer, roost and forage in floodplain and riparian forests. Trees normally used as primary roosts are dead and have a diameter at breast height greater than 12 inches. During the winter, roost sites are in caves or mines that maintain temperatures between 37°F and 43°F.
Smoky Dace (<i>Clinostomus funduloides</i> ssp.)	Fish	Extremely rare and critically imperiled; deemed in need of management (TN); imperiled; special concern (NC)	Sand and rock-bottomed pools and backwaters of clear, cool, swift shallow streams of small to medium size
Tuckaseegee Darter (<i>Etheostoma blennioides</i> ssp. <i>gutselli</i>)	Fish	Widespread, abundant, and apparently secure; endangered (TN)	Swift riffle areas with boulder, bedrock, or coarse cobble substrates in small to moderate rivers
Green Anole (<i>Anolis carolinensis</i>)	Lizard	Rare and uncommon; deemed in need of management (TN)	This species is arboreal, selecting moist habitats with trees, shrubs, and vine tangles; also found on man-made structures such as fences, homes, bridges
Appalachian Elktoe (<i>Alasmodonta raveneliana</i>) ¹	Mussel	Federally listed as Endangered; endangered (TN and NC)	Native to streams and rivers of the southern Appalachian region. Most often found in riffles, runs, and shallow flowing pools with stable, relatively silt-free, coarse sand and gravel substrate associated with cobble, boulders, and/or bedrock. Known to be endemic only to the upper Tennessee River system.
Plant Species			
Climbing Fumitory (<i>Adlumia fungosa</i>)	Herbaceous	Very rare and imperiled; threatened (TN); imperiled; significantly rare (NC)	Woods, moist coves, and rock outcrops
White-leaved Leatherflower (<i>Clematis glaucophylla</i>)	Herbaceous	Extremely rare and critically imperiled; threatened proposed endangered (TN); candidate species (NC)	Moist woods and along streams

Species	Family	Rank and Listing	Habitat Requirements
Branching Whitlow Grass (<i>Draba ramosissima</i>)	Herbaceous	Very rare and imperiled; species of special concern (TN); imperiled and significantly rare (NC)	Dry mountain woodlands, over limestone
Buffalo Clover (<i>Trifolium reflexum</i>)	Herbaceous	Rare and uncommon; species of special concern (TN); critically imperiled; watch species (NC)	Open woods and clearings
Eastern Turkey beard (<i>Xerophyllum asphodeloides</i>)	Herbaceous	Rare and uncommon; threatened (TN); threatened watch species (NC)	Pine barrens, dry oak-hickory forest with a strong pine component
Carolina-star Moss (<i>Plagiomnium carolinianum</i>)	Moss	Extremely rare and critically imperiled; species of special concern (TN); imperiled candidate species (NC)	Moist, granitic rock (or humus-covered rock), especially on cliff ledges near streams or waterfalls
Chalk Maple (<i>Acer saccharum</i>)	Tree	Very rare and imperiled; uncommon species (TN)	Rocky woods, along the banks of streams, rocky gorges, in moist soil; often at the base of rocky bluffs
Butternut (<i>Juglans cinerea</i>)	Tree	Federal Species of Concern; very rare and imperiled and threatened (TN); imperiled and rare (NC)	Moist, rich soils; will also grow on drier, rocky limestone soils
American Pillwort (<i>Pilularia americana</i>)	Fern	Extremely rare and critically imperiled; species of special concern (TN)	Edges of ponds, reservoirs (in draw down zones), vernal pools, pools on granitic outcrops
Dwarf Bristle Fern (<i>Trichomanes petersii</i>)	Fern	Very rare and imperiled; threatened (TN); critically imperiled threatened (NC)	Cliffs and overhanging ledges or sometimes epiphytic on the bases of tree trunks; also in moist ravines, or on the faces of sandstone, igneous or metamorphic boulders; ledges overhanging streams
<i>Megaceros aenigmaticus</i>	Hornwort	Extremely rare and critical; uncommon (TN); imperiled candidate species (NC)	Rocks along small, fast-flowing mountain streams and the spray zones around waterfalls and cascades; mature forest canopy and moist conditions
Virginia Spiraea (<i>Spiraea virginiana</i>) ¹	Shrub	Federally listed as Threatened; endangered (TN and NC)	Disturbed areas along rivers and streams. Flood scouring is essential since it inhibits competition. Also found along slow changing, dependable riparian areas.

¹Although these species were not located within the Project Boundary during the 1999 Inventory referenced above, they are included in this table based upon studies conducted during the relicensing of the Tapoco Project and after the 1999 Inventory.

The following is a discussion of Project effects on the federally listed rare, threatened or endangered (RTE) species known to occur or potentially occurring at the Tapoco Project and the measures that APGI is implementing to protect and enhance these species in accordance with the ESMP, FERC license, and RSA.

Appalachian Elktoe

The Appalachian elktoe is an endangered rare freshwater mussel known to occur in the Cheoah River. The Cheoah River from Santeetlah Dam to the confluence with the Little Tennessee River was designated as

critical habitat for this species in 2002. Modifications to the flow regime of the Cheoah River as part of the Relicensing Settlement Agreement were designed with this species under consideration. In August 1996, the USFWS approved and published an Appalachian Elktoe Recovery Plan. The immediate goal of the recovery plan is to maintain the only known surviving populations of the species and to protect its remaining habitat from present and foreseeable threats. The intermediate goal of the plan is to restore and maintain the species throughout a significant portion of its historic range and to downlist the species from endangered to threatened status.

More recently, the USFWS designated critical habitat for the Appalachian elktoe under the Endangered Species Act (ESA) (Federal Register, Vol. 67, No. 188: September 27, 2002). A portion of the Tapoco Project, the Cheoah River from the Santeetlah Dam downstream to its confluence with the Little Tennessee River (9.1 miles), is designated as critical habitat for the Appalachian elktoe. The basis for the designation was that the Cheoah River is currently occupied by the species and provides the physical and biological habitat elements necessary for the life cycle needs of the species.

Under the new FERC license there are no operational changes or Project modifications that are likely to conflict with the USFWS's management of the Appalachian elktoe. In fact, the Cheoah River aquatic base flow regime and disturbance flow regime (see discussion of Section A above), which is based on the concept of restoring more natural-like flow conditions to the Cheoah River, is expected to increase the amount of available useable habitat for the elktoe and provide significant increases in habitat for adult and juvenile mottled sculpin, a known elktoe fish host.

In addition, APGI developed the ESMP which identifies measures to assist in the protection and enhancement of Appalachian elktoe at the Project. In consultation with the Resource Agencies, APGI coordinated with the Resource Agencies to monitor the Cheoah River elktoe populations in 2009. APGI is currently finalizing a report summarizing the results of the monitoring that will be filed with FERC by June 1, 2012. In accordance with the ESMP, APGI will continue monitoring the elktoe every second and fifth year (i.e., 2014, 2016, 2019, 2021, 2024, 2026, 2029, 2031, 2034, 2036, 2039, 2041, and 2044) for the term of the FERC license or until the elktoe has been delisted, whichever is sooner, and file a report with FERC after each survey year.

APGI and the North Carolina Fund Board are also implementing the Cheoah River Bypassed Reach Gravel Enhancement Plan which is also expected to benefit the elktoe through gravel introductions in the Cheoah River that would generally occur every other year and monitoring to determine the effectiveness of the gravel augmentation. The Plan was filed with FERC on August 31, 2005 and approved by FERC on August 11, 2006. Gravel introductions occurred in 2008 and 2010, and a third introduction is expected to occur in 2012.

Additionally, the ESMP identifies measures to be undertaken if APGI identifies the need to implement or permit ground-disturbing activities within the riverbed (e.g., instream vegetation removal or gage placement) or construct or permit the construction of Project-related facilities on lands within the Project boundary (e.g., recreation facilities). These measures would assist in the protection and enhancement of Virginia spiraea at the Project. Specific measures to improve Appalachian elktoe habitat in the Cheoah River may also be periodically undertaken by the Resource Agencies or through the auspices of the North Carolina Fund Board (discussed in Section D.2).

Indiana Bat

The Indiana bat is listed as endangered by the USFWS that is known to occur within the region of the Project but was not located within the Project Boundary. In March 1999, the USFWS issued a second Indiana bat revised recovery plan (Agency Draft Indiana Bat (*Myotis soldalis*) Revised Recovery Plan). The short-term

recovery objective of the plan is to halt and reverse the continued decline of the Indiana bat. In the long-term, the USFWS hopes to delist the species. The purpose of the revised recovery plan is four-fold: 1) to update the recovery plan with information on the life history and ecology of the Indiana bat gathered since 1983; 2) to highlight the continued and accelerated decline of the species; 3) to continue site protection and monitoring efforts at hibernacula; and 4) to focus new recovery efforts towards research to determine the factor(s) causing population declines.

The habitat of most concern for the Indiana bat at the Project is potential roost trees. While it is unknown whether there are any roost trees located around Santeetlah Reservoir or the Cheoah River, none of the operational and non-operational resource enhancement measures described in the RSA would be expected to adversely impact any trees of a size that is likely to be used by the Indiana bat. In addition, APGI developed the ESMP which identifies measures to be undertaken if APGI identifies the need to remove or cut a tree(s) with a diameter of 12 inches or greater located on Tapoco Project lands or modify a Project dam or other industrial structure within the Tapoco Project boundary which may provide habitat for the bats. The measures would ensure protection of the Indiana bat and its habitat at the Tapoco Project.

Virginia Spiraea

The Virginia spiraea is a federally listed endangered plant species that is known to inhabit the banks of the Cheoah River downstream of Santeetlah Dam. In November 1992, the USFWS approved and published a management recovery plan for the Virginia spiraea. The recovery objective is to delist the species. To be considered for delisting, certain recovery criteria must be met. Delisting will be considered when 1) three stable populations are permanently protected in each drainage where populations are currently known; 2) stable populations are established on protected sites in each drainage where documented vouchers have been collected; 3) potential habitat in the states with present or past collections has been searched for additional populations; and 4) representatives of each genotype are cultivated in a permanent collection. The USFWS recovery strategy for the Virginia spiraea is sequential: preserve, understand, extend knowledge, manage, and monitor.

APGI's operation of the Project as described in the RSA will support the recovery of the Virginia spiraea. Periodic spill events combined with disturbance flows in the Cheoah River (discussed in Section A above) are anticipated to benefit the plant by reducing shading and competition from other plants and by promoting asexual propagation.

In addition, APGI developed the ESMP which identifies measures to assist in the protection and enhancement of Virginia spiraea at the Project. In consultation with the Resource Agencies, APGI prepared and filed a Virginia spiraea status report with FERC on May 13, 2011 based on the monitoring and management measures funded by the North Carolina Fund Board discussed in Section D.2. In accordance with the ESMP, APGI will prepare and file a Virginia spiraea status report every five years after 2011. APGI is also working in cooperation with the North Carolina Department of Transportation (NCDOT) to exchange location information and protect Virginia spiraea populations within the 20 to 30 foot right-of-way (ROW) easement from the centerline of US Highway 129 and Project boundary. Additionally, the ESMP identifies measures to be undertaken if APGI identifies the need to remove vegetation along the Cheoah River corridor, construct or permit the construction of recreational facilities, and/or convey lands along the Cheoah River corridor. These measures would assist in the protection and enhancement of Virginia spiraea at the Project.

Fish

APGI continues to support ongoing and future fish reintroduction efforts in Abrams Creek, a tributary to Chilhowee Reservoir. As described in Section C.6, APGI developed a Fish Passage Translocation Plan cooperatively with the USFWS to translocate four identified rare, threatened and endangered (RTE) fish species to Abrams Creek from Citico Creek and the Tellico River that was modified and approved by FERC on August 22, 2006. The goals of the Plan also include enhancement of the overall genetic health of the Abrams Creek, Citico Creek, and Tellico River fish populations, and the genetic mixing between the sub-populations of the four target fish species.

APGI's fish reintroduction efforts are currently targeting: 1) the turquoise shiner (spotfin chub), federally listed as threatened by the USFWS (September 9, 1977) and considered threatened in North Carolina and endangered in Tennessee; 2) the yellowfin madtom, federally listed as threatened (September 9, 1977) and considered endangered in Tennessee; 3) the smoky madtom, federally listed as an endangered species on October 26, 1984 and listed as endangered by the State of Tennessee; and 4) the duskytail darter, listed as endangered by the USFWS on April 27, 1993 and listed as endangered by the State of Tennessee. Concurrent with the smoky madtom listing, the USFWS also designated Citico Creek from the Cherokee National Forest boundary at upper Citico Creek bridge on Mountain Settlement Road upstream to the confluence of Citico Creek with Barkcamp Branch as critical habitat.

Generally, these four RTE species are considered as "possibly occurring" in Project waters. The spotfin chub is considered as "possibly occurring" in a portion of Abrams Creek that lies within the Project. The only other habitat within the Project that may be suitable to support the spotfin chub is the Cheoah River downstream of Santeetlah Dam. Since the yellowfin madtom, duskytail darter, and smoky madtom are known to occur in the free-flowing portion of Abrams Creek outside the Project boundary, these species may also exist in the short stretch of free-flowing Abrams Creek that is within the Project boundary.

The USFWS has published recovery plans for all four species. Generally, the goal of the recovery plans is to restore viable populations of each species to a significant portion of its historic range and remove each species from the federal endangered species list. Additionally, the goal of the Smoky Madtom Recovery Plan is to restore four viable populations of the smoky madtom and to protect the species and its habitat to such a degree that the species no longer qualifies for protection under the Endangered Species Act.

APGI's fish reintroduction efforts support the overall goal of the recovery plans. Additionally, APGI's recent change in operation of Santeetlah Dam to provide aquatic base flows and high flow events in the Cheoah River might provide habitat enhancement for the spotfin chub, if indeed it still exists there. Overall, the Project is considered to have no impacts on these species and the Relicensing Settlement Agreement and Fish Passage Translocation Plan will benefit these species. Tapoco has also developed the ESMP that identifies measures to be undertaken if APGI identifies the need to implement or permit ground-disturbing activities within the Tapoco Project boundary in the vicinity of the Citico Creek, Abrams Creek, and Tellico River population areas for these species. These measures would help protect and enhance populations of spotfin chub, yellowfin madtom, smoky madtom, and duskytail darter and their habitat at the Tapoco Project, to the extent they exist in the Project.

The License and RSA addresses the needs of many rare, threatened, and endangered species that occur in or adjacent to the project area.

The USFWS states that "The Settlement Agreement adequately balances the flow needs to attain the aquatic and riparian restoration objectives while maintaining the ongoing use of the reservoir inflow for hydroelectric production.

These restored flows provide adequate protection and enhancement of the native biological diversity,

including rare species (Appalachian elktoe, Virginia spiraea, Junaluska salamander, spotfin chub) and recreationally important species (smallmouth bass, rock bass). Scheduled high flows are proving compatible with aquatic biodiversity while providing recreational opportunities.

If YES, go to F.

**YES
PASS**

F. Cultural Resource Protection

1) If FERC-regulated, is the Facility in Compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?

YES

Cultural resources at the Tapoco Project consist of the project's civil works, and archaeological sites that date from both Indian tribal habitation and early European settlement periods. Many of the latter two are found along the shoreline or submerged beneath the reservoirs. A programmatic agreement for the management of historic properties is in place, with federal, state, and tribal agencies and historic preservation offices as signatories. The applicant is preparing a Historic Properties Management Plan, required by the FERC license, that is due March 1, 2006.

The Eastern Band of Cherokee Indians (EBCI) Tribal Historic Preservation Officer expressed the concern that the applicant had not consulted with EBCI at a level corresponding to its status as a sovereign government in the course of the overall relicensing and Settlement Agreement processes. He did report a very positive meeting with the applicant's representatives in May 2005 in connection with the applicant's requirement to develop an Historic Properties Management Plan. However, he expressed concern that he had had no further contact from the applicant related to development of the plan, which is due by March 1, 2006.

Staff of both the Tennessee Historical Commission and the North Carolina State Historic Preservation Office confirmed that to their knowledge the applicant has complied to date with all license requirements related to cultural resources. Information is pending from the Forest Service (the federal agency most involved in cultural resource issues connected with the project) and will be provided at the LIHI Governing Board meeting.

During the first year of the new FERC license (March 1, 2005 through February 28, 2006) APGI worked in consultation with the North Carolina State Historic Preservation Office, the Tennessee State Historic Preservation Office, the Eastern Band of Cherokee Indians Tribal Historic Preservation Office, the Bureau of Indian Affairs, the U.S. Forest Service and the Great Smoky Mountains National Park to develop a Tapoco Historic Properties Management Plan (HPMP). The HPMP was filed with FERC on February 28, 2006 and approved on June 21, 2006.

The HPMP requires APGI to consult with the NCSHPO, TNSHPO, EBCI THPO, BIA, USFS, and GSMNP if APGI proposes any ground-disturbing work within the Project Area of Potential Effect (APE) that may impact an

existing significant archaeological site or is located within a high- or moderate-probability area. Additionally, the HPMP also requires APGI to give 45-day prior notice to the NCSHPO or TNSHPO (whichever applies) and the EBCI THPO if APGI plans to do work at the Project's historic structures that may diminish the integrity of location, design, setting, materials, workmanship, feeling, or association of the structures. Since implementation of the HPMP, APGI has conducted the following consultations:

- By letter dated July 10, 2006, APGI consulted with the TNSHPO, EBCI THPO, BIA, USFS, and GSMNP on ground-disturbing work for the Tellico Lake Utility Crossing below Chilhowee Dam.
- By letter dated August 7, 2006, APGI consulted with the NCSHPO, TNSHPO, EBCI THPO, BIA, USFS, and GSMNP on ground-disturbing work for the installation of fencing around the Project's four developments.
- By letter dated July 16, 2007, APGI consulted with the NCSHPO, EBCI THPO, and BIA on ground-disturbing work for a Tennessee Valley Authority transmission line easement request.
- By letter dated September 18, 2007, APGI consulted with the NCSHPO, EBCI SHPO, BIA, USFS, and GSMNP on a conveyance of Project lands.
- APGI conducted extensive consultation with the TNSHPO, EBCI THPO, BIA, USFS, THC, and GSMNP in 2008 regarding the impact of an extended 20 to 25-ft drawdown of Chilhowee Reservoir to facilitate the repair/reconstruction of a portion of the left embankment of Chilhowee Dam on historic properties within the Project's APE.
- By letter dated April 2, 2008, APGI consulted with the NCSHPO and EBCI THPO on the Cheoah Unit Nos. 1-4 upgrades.
- By letter dated July 15, 2008, APGI consulted with the TNSHPO, THC, EBCI THPO, BIA, USFS, and GSMNP about ground-disturbing work necessary to install a new transformer at the Calderwood Service Center.
- By letter dated September 12, 2008, APGI provided the THC, TNSHPO, EBCI THPO, BIA, USFS, and GSMNP with a copy of the report of the monitoring activities for the ground-disturbing work to install a new transformer at the Calderwood Service Center.
- By email and letter dated January 14, 2011, APGI consulted with the TNSHPO and EBCI THPO about replacing two original equipment gantry cranes and the original handrails located on top of Calderwood Dam at the Calderwood Development with a guardrail/handrail system and plan to photo-document the existing gantry cranes and railing facilities prior to their removal and replacement.
- By email dated May 9, 2011, APGI consulted with the NCSHPO, EBCI THPO, USFS, and USFWS about ground-disturbing work necessary to provide additional storage space and overflow parking in the vicinity of the intersection of US Highway 129 and Meadow Branch Road to support the ongoing upgrades at the Cheoah development.

Additionally, the HPMP requires APGI to implement several site specific mitigation strategies and investigations. Since implementation of the HPMP, APGI has implemented the following measures under the HPMP:

- In October 2006, June 2007, October 2007, April 2008, October 2008, April 2009, October 2009, October 2010, April 2011, and October 2011, APGI personnel inspected identified National Register of Historic Places (NRHP) eligible and potentially eligible sites at Santeetlah, Calderwood, and Chilhowee reservoirs to document any changes in the shoreline, signs of use or looting, and any other unusual activity or changes. Additionally, APGI had a professional archaeologist inspect NRHP eligible and potentially eligible sites on April 12, 2010 within the project boundary on Chilhowee, Calderwood, and Santeetlah reservoirs. During the survey, evidence of adverse effects was discovered at two sites. Immediately following the inspection APGI removed evidence of recreational use at both sites and posted additional "No Trespassing" signs. APGI also patched a cracked concrete slab at one of the sites.
- After consulting with the NCSHPO, TNSHPO, and EBCI THPO (email dated June 26, 2006), APGI in late 2006 posted signs to discourage artifact collection at each of the Project's recreation access areas.
- On June 25, 2007 APGI met with representatives of the NCSHPO, EBCI THPO, BIA, USFS and Legacy Research Associates in the field to discuss shoreline stabilization at

two archaeological sites on Santeetlah Reservoir and at one archeological site on Calderwood Reservoir.

- By email dated December 20, 2007, APCI distributed site stabilization plans for Site 31GH445. In January 2008, APCI initiated shoreline stabilization work at Site 31GH445.
- APCI scheduled a conference call with the TNSHPO, EBCI THPO, and GSMNP on August 20, 2008 to discuss the Phase II testing Scope of Work for Site 40BT8. By letter dated August 20, 2008, APCI distributed a revised Scope of Work for review. The Scope of Work was subsequently finalized and the field work was completed during the week of August 25, 2008. APCI completed Phase II testing at site 40BT8 in 2009 and distributed a final report on May 18, 2010 to the TNSHPO, EBCI THPO, and GSMNP for review.
- In January 2009 APCI completed the archaeological survey work at Site 40BT8, as required by FERC's December 2008 Memorandum of Agreement with the TNSHPO, to address the potential impacts of the Chilhowee Reservoir extended drawdown. APCI provided the survey report to state and federal agencies in February 2009.
- On February 18-20, 2011, APCI had a professional archaeologist to conduct a subsurface investigation when Santeetlah Reservoir was drawn down 8 feet below the full-pool elevation. This work documented that within the drawdown at the site there is no evidence that intact cultural features or horizons are present and no further mitigation work was recommended within the drawdown of this site.

Additionally, although not required by the HPMP, APCI undertook several additional measures to protect cultural resources at the Tapoco Project. APCI stabilized approximately 360 linear feet of shoreline at Site 40MR687 (potentially eligible for the NRHP on Chilhowee Reservoir) to prevent further shoreline erosion at the site. On August 1, 2009, APCI donated artifacts and records gathered from the four Project reservoirs to the Frank H. McClung Museum at the University of Tennessee Knoxville, including all cultural material recovered from archaeological investigations conducted at the Project by APCI between 2001 and 2008. APCI also donated curation fees to help underwrite the purchase of storage cases for the materials and supply the necessary manpower to prepare the artifacts and records to be added to the museum's collections.

YES

If YES, go to G.

PASS

G. Recreation

1) If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?

The Applicant has met and continues to comply with terms of the Settlement Agreement and FERC License conditions and therefore Passes this criterion (see below).

YES

Under the terms of the Settlement Agreement and license, the applicant will pay nearly \$1.6 million to upgrade existing and add new recreation facilities at the four reservoirs and along the

Cheoah River. The applicant will also contribute \$85,000 annually to operation and maintenance of recreation related facilities, including \$10,000 per year to pay for recreational fish stocking in Calderwood Reservoir. The applicant hosted the first annual recreation planning meeting in July, as required, to prioritize 2005 and 2006 investments.

The applicant is also required to generate high flow events suitable for whitewater recreation as part of mandated flow releases according to an approved schedule. The first two events occurred September 17 and October 1. (It is notable that whitewater recreation interests were not satisfied with the Settlement Agreement and were not signatories because of their desire for additional high flow events. Resource agency staff contacted in the course of this review said that high flow events were intended to first benefit fish and wildlife, with whitewater recreation accommodated to the degree that the events, based on the best scientific information available to the agencies, would not adversely affect fish and wildlife.)

Resource agency staff report that the applicant has complied with all recreation related requirements to date, except that disbursement of funds to the relevant public agencies has not yet occurred because the resource agencies have not yet established a fiscal agent to receive the funds.

The Tapoco Project currently provides 43 recreation access areas, including recently constructed access areas in accordance with the RSA, which provide opportunities for picnicking, camping, boating/paddling, swimming, fishing, and hiking (see Tables 13-17). APGI provides access to these recreation opportunities at no cost to the public. Tapoco operates and maintains, solely or in cooperation with state and/or federal resource agencies, 24 of these areas, while the others are managed by the U.S. Forest Service (USFS), Tennessee Valley Authority (TVA), North Carolina Wildlife Resource Commission (NCWRC), or North Carolina Department of Transportation (NCDOT).

Consistent with the RSA APGI has paid over \$1.4 million from 2005 through 2010 to upgrade recreational facilities at the four reservoirs and along the Cheoah River. APGI has also contributed \$423,633 from 2005 through 2010 for the operation and maintenance of recreation related facilities (see Table 18).

APGI also generates high flow events for whitewater recreation as part of its FERC license.



Massey Branch Accessible Fishing Pier – Santeetlah Reservoir

Table 13: Santeetlah Reservoir Multi-Use Recreation & Access Facilities Available for Public Use

Site	Type	Fee	Ramp	Lane	Parking	Boat Temporary Tie-up Docks	Campsites
Santeetlah Dam Overlook	Access				10		
Cheoah Point Boat Access	Boat Launch Ramp		1	1	38	1	
Cheoah Point Campground	Camping	Yes			26		26
Cheoah Point Day Use Area	Swimming, Picnicking, Access				33		
East Buffalo Branch Campsites	Camping						9
Ted Jordan Wayside Area	Access (visual only)				10		
Massey Branch Wayside Picnic Area	Picnicking				10		
Massey Branch Wayside Camping	Camping				1		1
Massey Branch Boat Access Area	Boat Launch Ramp		1	1	15	1	
Snowbird Picnic Area	Picnicking				5		
Long Hungry Road Camping	Camping						6
Santeetlah Road Wayside	Access (visual only)				6		
Rattler Ford Group Camp	Camping	Yes					16

Site	Type	Fee	Ramp	Lane	Park- ing	Boat Temporary Tie- up Docks	Campsites
Horse Cove Campground	Camping	Yes					18
Joyce Kilmer Trailhead Parking	Access				25		
Avey Branch Boat Access	Boat Launch Ramp		1	1	35		
Atooga Branch Camping Area	Camping						2
Santeetlah Reservoir Dispersed Campsites	Camping						53
FACILITY TOTAL	18	3	3	3	214	2	131

Table 14: Cheoah River Multi-Use Recreation and Access Facilities Available for Public Use

Site	Type	Fee	Ramp	Lane	Park- ing	Boat Temporary Tie- up Docks	Campsites
Boater Put-in/Take-out Facilities	Non-motorized Boat Put-in/Take-out Ramps		2	1	25		
FACILITY TOTAL	1		2	1	25		

Table 15: Cheoah Reservoir Multi-Use Recreation and Access Facilities Available for Public Use

Site	Type	Fee	Ramp	Lane	Park- ing	Boat Temporary Tie- up Docks	Campsites
Panel Branch Boat Access Area	Boat Launch Ramp		1	1	25		
Lewellyn Branch Boat Access Area (relocation of Panel Branch Boat Access Area)	Boat Launch Ramp, Fishing Pier		1	1	14	1	
Farley Branch Boat Access Area	Boat Launch Ramp		1	1	8	1	
NC Highway 28 Wayside Pull-offs	Access (visual only)				7		
Twenty-Mile Creek Lake Access Area	Launch (unimproved), Access		1	1	4		1
Cheoah Dam Overlook	Access (visual only)				16		
Canoe Portage	Canoe Portage Trail (including take-out, put-in)						
FACILITY TOTAL	7		4	4	74	2	1

Table 16: Calderwood Reservoir Multi-Use Recreation and Access Facilities Available for Public Use

Site	Type	Fee	Ramp	Lane	Parking	Boat Temporary Tie-up Docks	Campsites
Magazine Branch Boat Access and Picnic Area	Boat Launch Ramp (one of which is unimproved), Picnicking		2	2	15	1	5
Slickrock Creek Boat-in Campsite	Launch (unimproved), Camping		1	1			1
Cheoah Powerhouse Tailrace Fishing Access	Fishing, Access				15		
Slickrock Creek Trailhead Parking	Access				16		
U.S. Highway 129 Pull-offs	Picnicking				12		
Calderwood Overlook	Access (visual only)				6		
Primitive Campsites	Primitive Campsites						5
Canoe/Kayak Take-out	Canoe Portage (including take-out, put-in)						
FACILITY TOTAL	8		3	2	64	1	11

Table 17: Chilhowee Reservoir Multi-Use Recreation and Access Facilities Available for Public Use

Site	Type	Fee	Ramp	Lane	Parking	Boat Temporary Tie-up Docks	Campsites
Calderwood Village Day Use Area	Picnicking					1	
Tab Cat Boat Access Area	Boat Launch Ramp		1	1	11		
Gravel Pile Boat Access Area	Boat Launch Ramp, Picnicking, Accessible Fishing Piers		1	1	11		
Abrams Creek Bridge Pull-off Access Area	Launch (unimproved), Access		1	1			
Happy Valley Boat Access Area	Boat Launch Ramp		1	1	6	1	
Chigger Beach Boat-in Access Area	Launch (unimproved)		1	1			
U.S. Highway 129 Pull-off Day-Use Areas	Access, Bank Fishing, and Picnicking				6		
Pear Tree Boat Access and Camping Area	Boat Launch Ramp, Camping		1	1	20		10
Canoe Portage	Canoe Portage (including take-out, put-in, and parking)						
FACILITY TOTAL	9		6	6	54	2	10

In addition to continuing to operate and manage existing public access recreation areas, APGI agreed, in the RSA, to add new public recreation facilities and upgrade existing facilities at the access areas. Specifically, APGI made recreational funding commitments for facility enhancements and upgrades to the USFS, NCWRC, and TWRA. APGI has consulted with the USFS, the NCWRC, and TWRA on an annual basis to prioritize recreational enhancements to be implemented for the following year based on funding availability and other relevant considerations. APGI also provides annual funding to support operations and maintenance costs for recreational facilities and related purposes. Additionally, APGI contributes annually, on a cost-share basis, to TWRA for recreational fish stocking in Calderwood Reservoir. Table 18 summarizes the funding provided by APGI from 2006 through 2010 for all recreation facility enhancements and upgrades. In accordance with its FERC license, APGI filed a Recreation Plan with FERC on February 28, 2006, which was supplemented on June 23, 2006. FERC approved the Plan on August 9, 2006. Table 19 summarizes the current status of the recreation facility enhancements and upgrades outlined in the Recreation Plan.

In addition to recreation facility enhancements and upgrades, APGI collected recreation use data at the Tapoco Project to support the development of its most recent Licensed Hydropower Development Recreation Report (FERC Form 80). Required by FERC, the FERC Form 80 provides data on recreational resources at hydropower projects. On March 30, 2009, APGI filed with FERC a revised FERC Form 80 along with a supplemental report describing the methodologies for collecting the recreation use data.

Table 18: Recreation Facilities Funding 2005-2010

Year	Recreational Enhancements (Capital Funding)	Operations and Maintenance (O&M) of Existing Recreation Facilities
2005	\$55,000	
2006	\$83,000	\$85,000
2007	\$167,530	\$87,735
2008	\$384,077	\$64,898
2009	\$611,500	\$93,000
2010	\$117,355	\$93,000
2005-2010 Total	\$1,418,462	\$423,633

Table 19: Summary of Status of Recreation Facility Enhancements and Upgrades

New and/or Upgraded Recreation Facilities	Primary Agency Responsible	Location Sited?	Construction Begun?	Anticipated Beginning of Construction	Anticipated Completion of Construction
Santeetlah Reservoir					
Massey Branch Boat Launch	USFS / NCWRC	Yes	No	Uncertain	By March 2020
Cheoah Point Boat Access	NCWRC / USFS	COMPLETE	COMPLETE	COMPLETE	COMPLETE
Cheoah Point Campground	USFS	COMPLETE	COMPLETE	COMPLETE	COMPLETE
USFS Dispersed Campsites	USFS	COMPLETE	COMPLETE	COMPLETE	COMPLETE
Avey Branch Boat Launch	USFS / NCWRC	Yes	No	Uncertain	By March 2020
Bank Fishing Areas	APGI / USFS	COMPLETE	COMPLETE	COMPLETE	COMPLETE

Cheoah River					
US 129 Access Areas and Additional Parking	USFS	Yes	No	Uncertain	By March 2020
Cheoah River Trail	USFS	No	No	Uncertain	By March 2020
Shoreline Fishing Facility	NCWRC / USFS	Yes	No	Uncertain	By March 2020
Boater Put-in/Take-out Facilities	USFS	COMPLETE	COMPLETE	COMPLETE	COMPLETE
Cheoah Reservoir					
Canoe Portage	APGI	COMPLETE	COMPLETE	COMPLETE	COMPLETE
Bank Fishing Facilities	APGI	COMPLETE	COMPLETE	COMPLETE	COMPLETE
Panel Branch Boat Access Relocation to Lewellyn Branch	NCWRC	COMPLETE	COMPLETE	COMPLETE	COMPLETE
Calderwood Reservoir					
Primitive Campsites	APGI / USFS	COMPLETE	COMPLETE	COMPLETE	COMPLETE
Canoe/Kayak Take-out	APGI	COMPLETE	COMPLETE	COMPLETE	COMPLETE
Fish Delivery Chute	APGI	COMPLETE	COMPLETE	COMPLETE	COMPLETE
Chilhowee Reservoir					
Canoe Portage	APGI	COMPLETE	COMPLETE	COMPLETE	COMPLETE
Accessible Fishing Piers	TWRA	COMPLETE	COMPLETE	COMPLETE	COMPLETE
US 129 Day-use Areas	APGI / TWRA	COMPLETE	COMPLETE	COMPLETE	COMPLETE

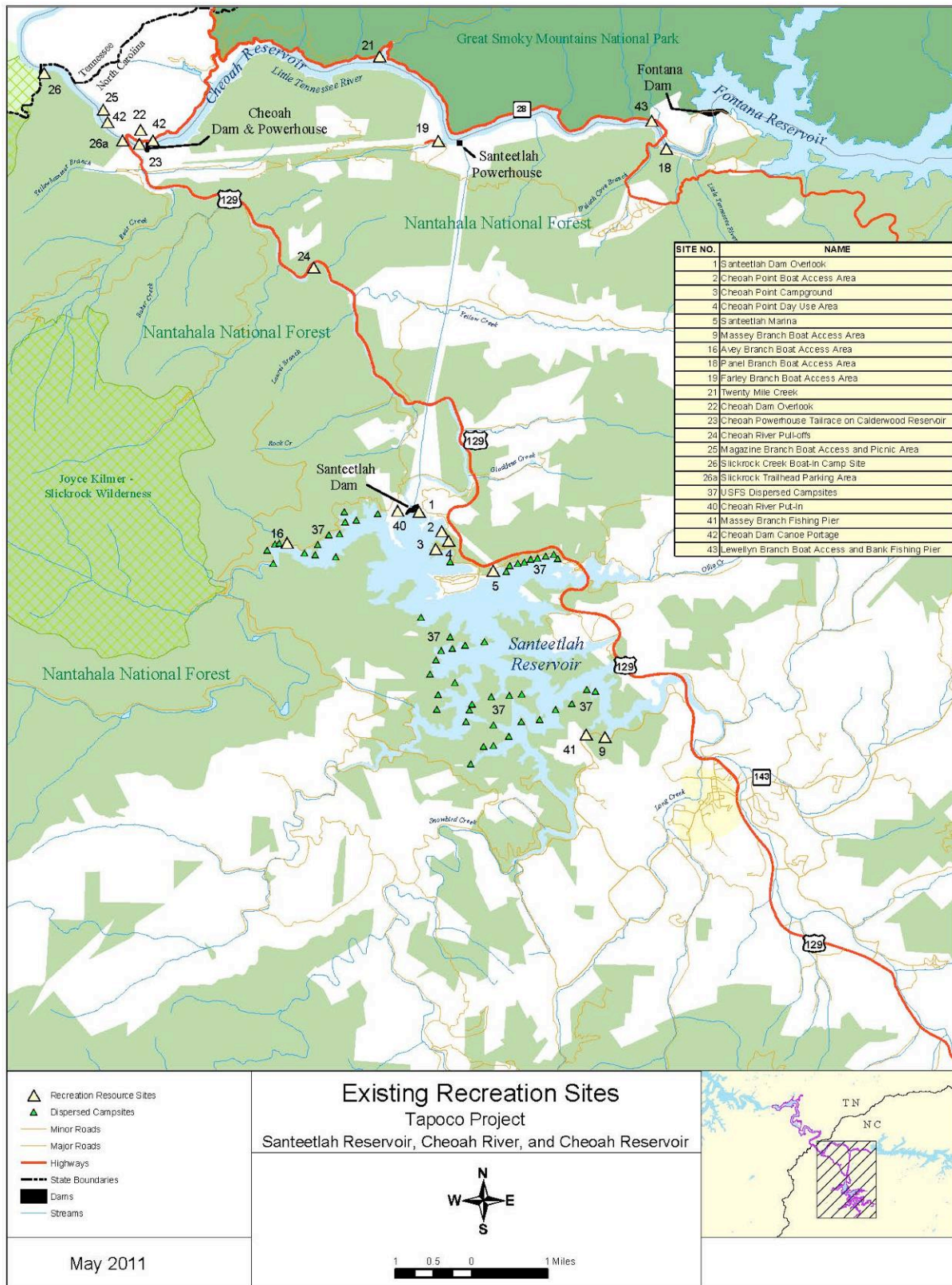
Calderwood Dam Portage Trail (upstream of dam)



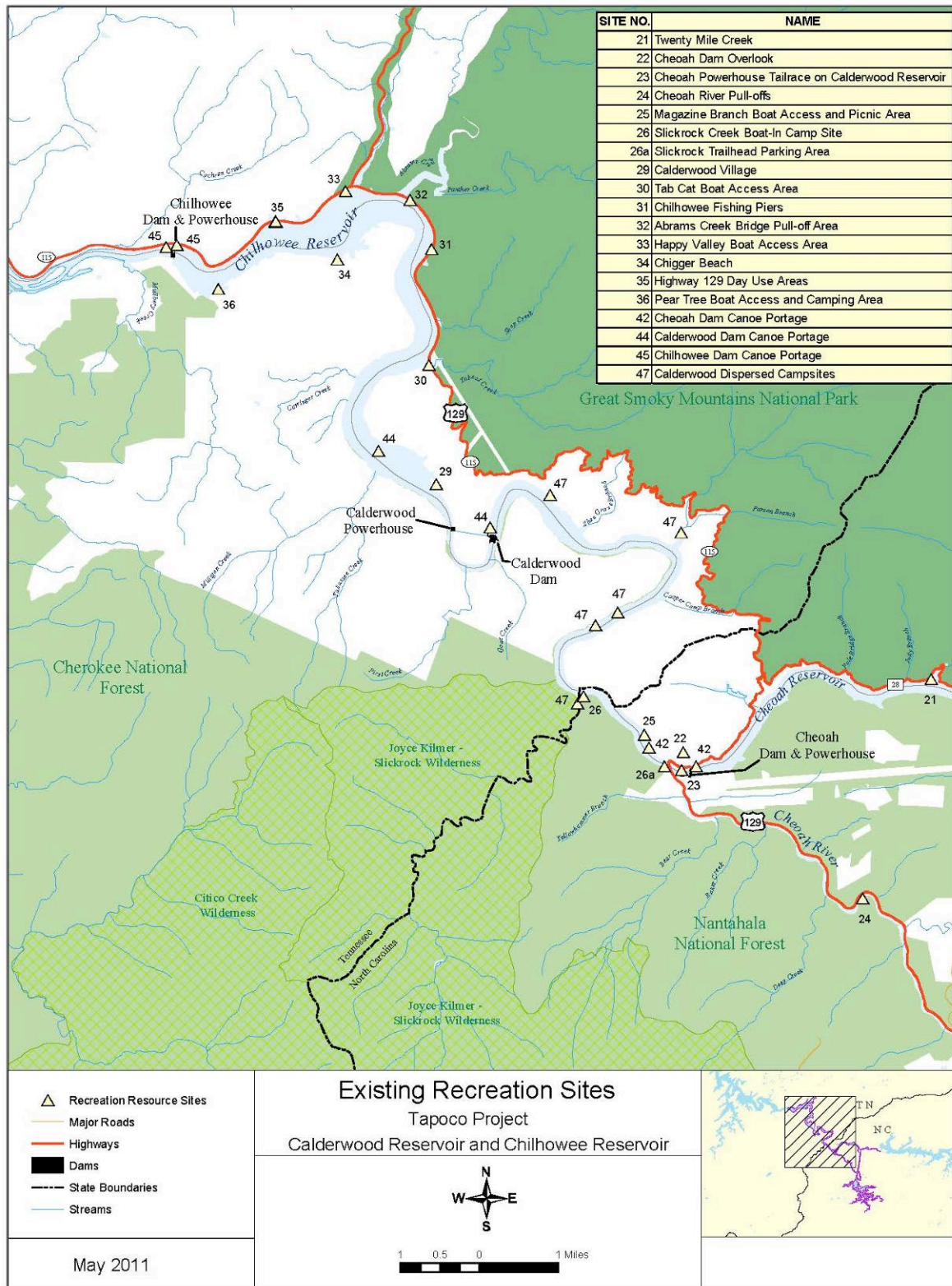
Primitive Campsite at Calderwood Reservoir



Map of Recreation Sites at Santeetlah Reservoir, Cheoah River, Cheoah Reservoir



Map of Recreation Sites at Calderwood Reservoir and Chilhowee Reservoir



H.3 Does the Facility allow access to the reservoir and downstream reaches without fees or charges?

YES

The applicant provides access to its recreation facilities at no cost to the public.

Section H – Facilities Recommended for Removal

H.1 Is there a Resource Agency Recommendation for removal of the dam associated with the Facility?

NO

None of the local, state, or federal resource agencies have formally requested that any of the four Project developments be removed.

If NO, PASS

PASS

FACILITY IS LOW IMPACT

RECORD OF CONTACTS

Date of Conversation: September 20, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Renee Hoyos, Tennessee Clean Water Network
Telephone/email: 865/522-7007
Areas of Expertise: Water quality and quantity, habitat

Ms. Hoyos explained that since the signing of the settlement agreement Tennessee Clean Water Network had not been tracking compliance with the Settlement Agreement (SA) or license. While she wasn't aware of any compliance violations, she recommended speaking with Andrew Fahlund of American Rivers.

Date of Conversation: September 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Dan Eagar, Division of Water Pollution Control, Tennessee Dept. of Environment & Conservation
Telephone/email: 615/532-0708; dan.eagar@state.tn.us
Areas of Expertise: Water quality

Mr. Eagar reported that TDEC had not put together a tracking list of compliance requirements for the 401 certification in response to my question on this matter. He suggested contacting the Nature Conservancy and National Parks Conservation Association regarding land conveyance and recreational requirements, respectively. He reported that the Tallassee Fund is in the process of being established; APCI is ready to write the check as soon as the institution is ready to receive funds. Mr. Eagar said that so far as he knew, flow restoration to the Little Tennessee River bypass reach below Calderwood Dam had started, but referred me to David McKinney in the regional office of the Tennessee Wildlife Resources Agency for confirmation. He believes APCI is operating in good faith, and has seen regular reporting from them on operational matters, such as variances for maintenance. With regards to the issue of the 303(d) listing of the Little Tennessee River below Calderwood Dam for impairment due to hydro development, I asked if he believed the restoration of flows warranted the reach's removal from the 303(d) list. He referred me to Greg Denton, TDEC's 303(d) list coordinator for discussion. However, he did say that there is no established basis for assessing whether the level of restored flows is adequate to justify delisting. Resource agencies agreed to the newly mandated flows as part of the overall Settlement Agreement, and set the required levels to create stream temperatures that match the cool water fishery that is believed to have existed prior to hydropower development in the watershed. The mandated flows are smaller than what are believed to be historic flows. However, as a result of the basin's hydro development, increasing flows would create conditions for a cold water fishery, which would be counter to the resource agencies' management objectives. At the same time, he commented that the Tapoco Project has the effect of dampening potentially greater adverse effects of the Tennessee Valley Authority's upstream Fontana Dam. Absent the Tapoco Project, the Fontana Dam would be releasing widely fluctuating and very cold tailwaters.

Update via email sent March 8, 2012: “The Division issued a section 401 Water Quality Certification on April 29, 2004 that specified terms and conditions under which operation of the project would not cause violations of state water quality standards. To my knowledge, the project has continued to operate in compliance with the Water Quality Certification. Therefore, I believe that the Tapoco Project is appropriately protective of water quality in the bypass reach below Calderwood Dam.”

Date of Conversation: September 26, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: John Dorney, 401 Certification Coordinator, Water Quality Division, North Carolina Department of Environment and Natural Resources
Telephone/email: 919/733-1786; john.dorney@ncmail.net
Areas of Expertise: Water quality

Mr. Dorney could only report that his database reflected no record of any compliance violations with the 401 certification for the Tapoco project.

Date of Conversation: September 26, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: David McKinney, Director, Division of Environmental Services, Tennessee Wildlife Resources Agency
Telephone/email: 423/581-7037; dave.mckinney@state.tn.us
Areas of Expertise: Habitat

Mr. McKinney believes that APCI is committed to fulfilling its commitments under the Tapoco Settlement Agreement and FERC license, and is satisfied that the company is meeting its ongoing obligations to date. He offered as examples the company’s reporting on modifications to dam gates for releasing bypass flows below Calderwood Dam, payment of negotiated fees for fish stocking, and readiness to make the initial \$100,000 payment to endow the Tallassee fund called for in the Settlement Agreement. Regarding the issue of whether the flow releases to the bypass reach of the Little Tennessee River below Calderwood Dam are adequate to justify removal of the reach from the state’s 303(d) list, he noted that the management goal was to improve the remnant communities of the cool water fishery that existed historically in the Little Tennessee River. Full restoration could not be accomplished absent removal of all hydro development in the basin (i.e., all Tennessee Valley Authority dams). The flows mandated in the Settlement Agreement/License were calibrated to the needs of a cool water fishery. Higher flows would create a cold water fishery suitable for stocking trout. However, in addition to placing a high value on partially restoring the historic habitat values to the reach, the resource agencies do not want to encourage a recreational trout fishery in the area because it is a major wildlife corridor that is already subject to poaching pressure. They believe that encouraging increased public usage could exacerbate the poaching problem. In response to my query about whether he would be willing to write a letter specifically endorsing the flows as appropriately protective of

fish and wildlife resources, he said he would be willing to do so in conjunction with Paul Davis, Director of Water Pollution for the Tennessee Department of Environment and Conservation. Mr. McKinney stressed the importance of the land conveyance elements of the SA/license to achieving regional conservation goals because the APGI lands link the Great Smoky Mountains National Park to the north, the Pisgah and Nantahala National Forests to the east and the Cherokee National Forest to the south. He confirmed that transfer of easements had just been completed. He said his agency had not compiled a list to track compliance with the SA/license.

Update via email sent February 20, 2012: TWRA has a positive and cooperative working relationship with APGI. TWRA meets with APGI about twice annually, at a minimum, to discuss the implementation of the Project's Recreation Plan (July) and to discuss the work of the Tallassee Fund Board (November). TWRA and APGI meet at other times throughout the year, as necessary. In the years since the issuance of the new Project license (2005) APGI has consistently and without fail met its obligations in the RSA and Project license. We are not aware of any instance of non-compliance and have no concerns regarding license implementation and compliance. In closing, I would like to reiterate TWRA's support of APGI's recertification application..."

Date of Conversation: September 27, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Dwayne Stutzman, Outdoor Recreation Planner, Div. Parks and Recreation, NCDENR
Telephone/email: 828-296-4500
Areas of Expertise: Recreation

Mr. Stutzman discussed the recreation improvements sought in the licensing/Settlement Agreement process. He stated that he was satisfied to date with the applicant's compliance.

June 15, 2012 – Phoned and left voice messages. No returns

Date of Conversation: September 28, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Greg Denton, Manager, Planning and Standards, Div. Water Pollution Control, TN Dept. Env. and Conservation (TDEC)
Telephone/email: 615-532-0699
Areas of Expertise: Water Quality, CWA 303(d) List

Mr. Denton said that it was not possible to know at this time whether the habitat improvements that are anticipated to result from the restoration of minimum flows to the bypassed reach below Calderwood dam would be sufficient to remove the reach from the state's 303(d) list. He expressed his view that the requirement to meet state water quality standards is not waived by virtue of compliance with a state Clean Water Act section 401 certification.

June 27, 2012 – left phone messages. No response.

Date of Conversation: September 28, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Chris Goudreau, NC Wildlife Resources Commission
Telephone/email: 828-652-4360 ext. 223
Areas of Expertise: Tapoco Natural Resource Issues Generally

Mr. Goudreau confirmed that all deadlines to date had been met (bypass flows, high flow event, 200 foot buffer, land conveyances), or would soon be met (recreational amenities funding), except for fund establishment, which was delayed due to resource agencies' delay in setting up fiscal agent. He underscored positive working developed with relationship with Alcoa through the Settlement Agreement process.

Update: July 10, 2012 --- Caught up with Chris and he confirmed what I had heard from others associated with the Project. He was not aware of any compliance issues, and believed ALCOA has met all deadlines to date and had been met (bypass flows, high flow event, 200 foot buffer, land conveyances). He reinforced earlier statement concerning the positive working relationship with the staff and contractors. He supports re-certification. He hopes the new owners would do as well as ALCOA has done in the first certification term.

Date of Conversation: September 28, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Ray Johns, U.S. Forest Service
Telephone/email: 828-257-4859
Areas of Expertise: Real Estate Specialist

Mr. Johns stated that Alcoa had complied with everything in the Settlement Agreement to date; conservation easements and other conveyances signed, minimum and high flows released. Administrative barriers on the part of the resource agencies prevented timely receipt of recreational and trust funds, but should be resolved soon.

Date of Conversation: September 29, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Paul Trianofsky, The Nature Conservancy
Telephone/email: 423-571-2562
Areas of Expertise: Land Conveyances

Mr. Trianofsky said that APGI is living up to its obligations, only lag is due to federal agencies in terms of resolving boundary and title issues.

Date of Conversation: September 29, 2005
Application Reviewer: Gabriela Goldfarb, Consultant

Person Contacted: Mark Cantrell, US Fish and Wildlife Service
Telephone/email: 828-258-3939 ext 227
Areas of Expertise: Fish and Wildlife, Endangered Species

UPDATE (June 7, 2012) – I spoke with Mark who reconfirmed how well the Tapoco Project's protection and mitigation plans were being implemented and said that the Applicant had gone above and beyond in their efforts to meet all conditions. He was pleased at the progress of the fish passage (Trap and Truck) and the translocation plan. Overall very satisfied.

Update (February 21, 2012) – Excerpts from letter from Mark to Applicant: "The Fish and Wildlife Service maintains a continued high level of participation at the Project, attending meetings, engaging in shoreline and flow consultations, and monitoring the response of biota to the improvements under the RSA and License terms.

I would like to confirm that the Licensee is in compliance with all requirements (flows to bypass reach, high flow releases, License articles). Further, we regularly recognize the good work of APGI, especially with research and restoration under the Tallassee Fund and Cheoah River Fund, information sharing, and comprehensive land conservation, as examples for other projects to follow. I support the recertification of the Tapoco Hydroelectric Project by LIHI's as Low Impact."

Date of Conversation: October 6, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Steve Reed, NCDENR, Div. Water Resources
Telephone/email: 919-715-5425
Areas of Expertise: Overall Point Person on Tapoco for NC

Confirmed that in general, applicant is in compliance with all requirements (flows to bypass reach, high flow releases). Discussed issue of annual meetings to evaluate flows; not really adaptive management, because there are sideboards to how much water can be spilled. Said that North Carolina fund will really be the Cheoah River Resource Management & Enhancement Fund, because that is where funds will be targeted (i.e., the nine mile reach below Santeetlah dam). Focus of activities there to be monitoring, addressing habitat fragmentation, reintroduction/enhancement of listed species, gravel reintroduction. Mentioned that in terms of tribal interests, Chilhowee dam area in TN is of greatest interest.

Update (February 12, 2012) Letter from Steve Reed's Supervisor, Jim Mead: NCDWR continues to be very involved in the implementation of the license and RSA terms and conditions. Our staff participates in annual meetings to review the effectiveness of the preceding high flow release events and to plan the upcoming high flow release schedule. NCDWR is also one of the five agencies represented on the Cheoah Fund Board. This board reviews project proposals for funding by the Cheoah River Fund, oversees contracts, and tracks the progress of the work undertaken. The current chair of the board is from NCDWR and this is the second time our staff has served in this capacity. We are pleased to say that APGI continues to be an active

and committed partner in the implementation of the RSA as well as complying with the requirements of the FERC license.

Date of Conversation: September 26, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Andrew Fahlund,
Telephone/email: afahlund@americanrivers.org
Areas of Expertise: Hydro Relicensing

Mr. Fahlund stated his sense that the applicant is being proactive and acting in good faith, and that the resource agencies are paying attention although the applicant is driving implementation.

Date of Conversation: October 25, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Mark Cantrell
Telephone/email: Mark_A_Cantrell@fws.gov
Areas of Expertise: Fish and Wildlife, Endangered Species

In response to an emailed question about whether there were endangered species recovery plan recommendations that apply to the project, Mr. Cantrell wrote that there are some specific objectives in the recovery plans that apply to the Tapoco Project, and guided the development of FWS recommendations, although his sense was that the project was not named in the plans.

Date of Conversation: October 25, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Joe Garrison, Review and Compliance, Tennessee Historical Commission
Telephone/email: 615-532-1550 x 103
Areas of Expertise: Cultural Resources

Mr. Garrison stated that the applicant was very responsive and had followed through on all commitments to date. He referred me to his counterparts with the Eastern Band of the Cherokee Indians, the North Carolina State Historic Preservation Office, and the person he said was the remaining federal point person on cultural resources for Tapoco, Rodney Snedeker at the Daniel Boone National Forest.

Date of Conversation: October 25, 2005
Application Reviewer: Gabriela Goldfarb, Consultant

Person Contacted: Russell Townsend, Tribal Historic Preservation Office, Eastern
Band of Cherokee Indians (EBCI)
Telephone/email: 828-488-0237
Areas of Expertise: Cultural Resources

Mr. Townsend expressed disappointment with the applicant's treatment of EBCI as a narrow stakeholder group rather than a sovereign; consultation was not timely or frequent enough in the pre-Settlement Agreement/licensing phase. In May 2005 he had one very good meeting with the applicant's consultant regarding cultural resources, but he has not been contacted since and the Historical Properties Management Plan required under the license is due March 1, 2006.

Date of Conversation: October 26-27, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Bob Smet, Tony Plizga, APGI
Telephone/email:
Areas of Expertise: Tapoco Project

In email exchanges and telephone conversations, Mr. Smet and Mr. Plizga clarified the situation of project conservation easements as they relate to the LIHI watershed protection criteria. Mr. Plizga provided a map illustrating the fact that in many areas the buffer established by the applicant starts some feet landward of the shoreline. Mr. Smet clarified that the "gap" between the easement and the shoreline is covered by an approved Shoreline Management Plan required by the license.

Date of Conversation: October 27, 2005
Application Reviewer: Gabriela Goldfarb, Consultant
Person Contacted: Renee Gledhill-Early, North Carolina State Historic Preservation
Office
Telephone/email: 919-733-4763
Areas of Expertise: Cultural Resources

Ms. Gledhill-Early confirmed that her office had signed the programmatic agreement on cultural resources and was working on a Historic Properties Management Plan with the applicant. She gave them "a gold star" for compliance with their requirements.

Appendix D

Tapoco Fish Passage Prescription

DEPARTMENT OF THE INTERIOR SECTION 18 FISHWAY PRESCRIPTION

The United States Department of the Interior hereby submits its Prescription for Fishways for the Tapoco Project, pursuant to section 18 of the Federal Power Act, as amended. The Department is submitting this Decision Document to the Federal Energy Regulatory Commission, and will supplement this filing with its Administrative Record.

Statutory Authority

Section 18 of the Federal Power Act, 16 USC § 811, states in part:

"The Commission shall require the construction, maintenance, and operation by a licensee..., such fishways as may be prescribed by the Secretary of Commerce or the Secretary of Interior."

Section 1701(b) of the National Energy Policy Act of 1992, P.L. 102-486, Title XVII, § 1701(b), 106 Stat. 3008, states:

"The items which may constitute a 'fishway' under section 18 [16 USC § 811] for the safe and timely upstream and downstream passage of fish shall be limited to physical structures, facilities, or devices necessary to maintain all life stages of such fish, and project operations and measures related to such structures, facilities, or devices that are necessary to ensure the effectiveness of such structures, facilities, or devices for such fish."

The Prescription for Fishways herein are issued under authority to the Southeast Regional Director from the Secretary of the Interior; the Assistant Secretary for Fish, Wildlife and Parks; and the Director of the U.S. Fish and Wildlife Service pursuant to section 18 of the Federal Power Act.

Part I. Prescription of a Fishway for the Chilhowee Development

A. General Terms and Conditions for Fishways

To ensure the immediate and timely contribution of any fishway to the Upper Tennessee River fish restoration effort, the following measures are included and shall be incorporated by the APGI (Licensee) to ensure the effectiveness of the fishway pursuant to section 1701(b) of the 1992 National Energy Policy Act (P.L. 102-0486, Title XVII, 106 Stat. 3008).

a) A fishway shall be developed, operated and maintained to provide effective

(safe, timely, convenient) passage for Spotfin Chub (*Erimonax (Cyprinella) monachusj*, Yellowfin Madtom (*Noturus flavipinnisj*, Smoky Madtom (*Noturus baileyi*), and Duskytail Darter (*Etheostoma percnurum*) between Citico Creek and Abrams Creek, and between Tellico River and Abrams Creek.

b) The populations to be passed are those occurring at tributaries to the Little Tennessee River, including Abrams Creek (trib. at LT RM 37), Citico Creek (trib. at LT RM 31.8) and Tellico River (trib. at LT RM 19.2). The population of spotfin chubs at the Little Tennessee River (>LT RM 88.5) is also a source for augmentation of the populations.

c) The design population to be "passed" between each of the three designated rivers for each target species is:

<u>Target Species</u>	<u>Fishway Exchange</u>
Spotfin Chub	100 per generation
Yellowfin Madtom	1 effective genome/generation
Smoky Madtom	1 effective genome/generation
Duskytail Darter	1 effective genome/generation

At this time, the best information available for rate of exchange indicates that naturally a few individuals per decade moved successfully between these populations. Movement of individuals probably comprised young-of-year dispersal movements during fall and winter, therefore translocations scheduled during this same time frame (August - May) would most closely mimic natural dispersal.

Exhibit B

SUMMARY OF GENERATING CAPACITY OF TAPOCO PROJECT DEVELOPMENTS

Note: the notation “Attachment 3” pertains to the APGI document from which this chart was excerpted.

Attachment 3 - Distribution of Generation Capacity By Project and Unit

Units	Original Nameplate Capacity	Capacity Under Previous FERC License (MW)	Capacity Under 2005 FERC License (MW)	Estimated Modernization Date
Santeelah 1	20.0	24.6	23.5	2013
Santeelah 2	20.0	24.6	23.5	2014
Total Santeelah	40.0	49.2	47.0	
Cheoah 1	22.0	22.0	27.5	2014
Cheoah 2	22.0	22.0	27.5	2015
Cheoah 3	22.0	22.0	27.5	2007
Cheoah 4	22.0	22.0	27.5	2007
Cheoah 5	30.0	30.0	34.7	2019
Total Cheoah	118.0	118.0	144.7	
Calderwood 1	39.0	46.8	46.8	May-06
Calderwood 2	39.0	46.8	46.8	July-02
Calderwood 3	39.0	46.8	46.8	August-05
Total Calderwood	117.0	140.4	140.4	
Chilhowee 1	17.0	17.4	16.0	2011
Chilhowee 2	17.0	17.4	16.0	2012
Chilhowee 3	17.0	17.4	16.0	2013
Total Chilhowee	51.0	52.2	48.0	
Total Tapoco	326.0	359.8	380.1	

Exhibit C

SIGNATORIES TO THE TAPOCO SETTLEMENT AGREEMENT

American Rivers
APGI, Tapoco Division
Blount County
City of Alcoa
City of Maryville
Cross Creek Property Owners Association
Friends of Lake Santeetlah
Graham County
National Park Service
National Parks Conservation Association
NC Department of Environment and Natural Resources
NC Wildlife Resources Commission
The Nature Conservancy of TN
TN Clean Water Network
TN Department of Environment and Conservation
TN Wildlife Resources Agency
Town of Lake Santeetlah
Town of Robbinsville
US Bureau of Indian Affairs
US Fish and Wildlife Service
US Forest Service
Western NC Alliance

Exhibit D

SANTEETLAH RESERVOIR SHORELINE PROTECTION

