UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

February 10, 2003

Mr. Dean Orbison
Engineering Manager
City and Borough of Sitka
Electric Department
105 Jarvis Street
Sitka, Alaska 99835

RE: Blue Lake Hydroelectric Project (FERC No. 2230)
Comments on Initial Consultation Document (ICD)
Request for Studies

Dear Mr. Orbison:

Please find enclosed ICD comments and study requests of the National Marine Fisheries Service for the Blue Lake Hydroelectric Project. The contact person for this project is Linda Shaw (907-586-7510).

Sincerely,

Jonathan M. Kurland
Assistant Regional Administrator
for Habitat Conservation

Enclosure
cc: Distribution List

National Marine Fisheries Service's Comments on the Initial Consultation Document for the Blue Lake Hydroelectric Project, FERC No. 2230

and

National Marine Fisheries Service Recommended Studies

February 10, 2003

BACKGROUND

The Blue Lake Hydroelectric Project (Project) is owned and operated by the City and Borough of Sitka (CBS). The Project was licensed by the Federal Energy Regulatory Commission (FERC) on April 4, 1958. The Project began commercial operations in July, 1961. The current license expires March 31, 2008. The re-licensing process has been initiated and an Initial Consultation Document (ICD) has been submitted by CBS to FERC.

Project description, elements, operation and history are discussed in the ICD (CBS, November 2002). The project is complex because water from the reservoir has many uses and users. Water may be used to generate electricity from 3 separate power plants. A tap on the lower penstock supplies water for the municipal water supply of Sitka. Water may also be supplied for bulk water export or other future uses at the pulp mill feeder unit (PMFU). The Alaska Department of Fish and Game (ADF&G) has filed an application with the Alaska Department of Natural Resources for an instream flow reservation in Sawmill Creek. The primary impact of this project has been the diversion of most of the water from Blue Lake to lower Sawmill Creek.

Sawmill Creek is a cataloged anadromous fish stream (#113-41-10210) that supports runs of pink, chum and coho salmon, steelhead trout and Dolly Varden char. King salmon, which are likely strays from the Medeveje Hatchery, have also been observed in Sawmill Creek (Wolfe, 2002).

NMFS INTEREST IN THIS PROCEEDING

The NMFS is responsible for protecting and managing a variety of marine animals, including Pacific salmon, groundfish, halibut, and marine mammals and their habitats under the Endangered Species Act (ESA)(16 U.S.C. §§ 1531 *et seq.)*, Federal Power Act (18 CFR § 10(j), the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (16 U.S.C. 1801 et seq.), Reorganization Plan Number 4 of 1970, and other laws.

Essential Fish Habitat

The 1996 amendments to the MSFCMA set forth a number of new mandates for NMFS, regional fishery management councils, and other federal agencies to identify and protect important marine and anadromous fish habitat. The Councils, with assistance from NMFS, are required to delineate "essential fish habitat" (EFH) for all managed species. Federal action agencies which fund, permit, or carry out activities that may adversely impact EFH, are required to consult with NMFS regarding the potential effects of their actions on EFH, and respond in writing to our recommendations. In addition, NMFS is required to comment on any state agency activities which would impact EFH. EFH species that are found in the project area include pink, chum and coho salmon. Steelhead trout are not an EFH

species because they are not covered by a North Pacific Fishery Management Council fishery management plan. King salmon found in Sawmill Creek are not thought to be a self-sustaining wild population and are likely strays from the Medeveje Hatchery. Therefore EFH for king salmon is not present in Sawmill Creek.

Endangered Species Act

The purpose of the ESA is to conserve endangered and threatened species and the ecosystems upon which they depend. To this end, the ESA provides for prohibitions on the "take" of endangered and threatened species. Section 7 of the ESA establishes a policy that all Federal agencies will seek to conserve listed species by utilizing their authorities to carry out conservation programs for such species. Furthermore, Federal agencies must ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species. When listed species may be affected by a Federal action, the Federal agency must consult with NMFS. No ESA listed salmonids are found in Sawmill Creek. Humpback whales (*Megaptera novaengliae*) and Steller sea lions (*Eumetopias jubatus*) could occur in the marine waters at the mouth of Sawmill Creek.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.) is the foundation of modern American environmental protection in the United States and its commonwealths, territories, and possessions. The implementing regulations for NEPA require that Federal action agencies must analyze the direct and indirect environmental effects and cumulative impacts of project alternatives and connected actions.

Direct Effects

The CEQ regulations under 40 CFR 1508.8 (b) define direct effects as "effects, which are caused by the action and occur at the same time and place." Diversion of Blue Lake water flow associated with the dam construction and hydro power plants has resulted in an alteration of water flow to Sawmill Creek and is a "Direct Effect" of the proposed action. Introduction of cold Blue Lake water into Sawmill Creek may have reduced the water temperature in Sawmill Creek and would therefore also be a direct effect of the proposed action. Reduced stream temperatures may affect salmonid egg incubation, juvenile rearing and adult upstream migration, by creation of thermal barriers.

Indirect Effects

The CEQ regulations under 40 CFR 1508.8 (b) define indirect effects as effects "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Change to fish passage at the falls (stream mile 0.78) as a result of altered stream flows would also be an indirect effect. Any effects of the project to marine waters such as altering seasonal salinity patterns at the outlet of Sawmill Creek would be an indirect effect.

Cumulative Impacts

Cumulative impacts are those combined effects on quality of the human environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what Federal or non-Federal agency or person undertakes such other actions (40 CFR 1508.7, 1508.25(a), and 1508.25(c)). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Water usage for hydropower generation, the city water supply, a bottled water plant, bulk water export, and other industrial uses could result in a cumulative impact to anadromous fish populations due to a greatly altered flow regime. The applicant should provide a record of all past and projected permitting activity to assist the cumulative impacts analysis.

Connected Actions

Operation of the Blue Lake Dam, powerhouses and transmission lines are connected actions. The CEQ regulations require "connected actions" to be considered together in a single EIS. See 40 CFR §1508.25 (a)(1). "Connected Actions" are defined, as actions that: (i) automatically trigger other actions which may require environmental impact statements; (ii) cannot or will not proceed unless other actions are taken previously or simultaneously; (iii) are independent parts of a larger action and depend upon the larger action for their justification."

Federal Power Act (FPA)

Section 18 of the FPA

Section 18 of the FPA expressly grants to the Department of Commerce and the Department of the Interior (Departments) exclusive authority to prescribe fishways. Section 18 states that the Commission must require construction, maintenance, and operation by a licensee at its own expense of such

fishways as may be prescribed by the Secretary of Commerce or the Secretary of the Interior. Fishways prescribed under Section 18 by the Departments are mandatory upon the Commission. Within the Department of the Interior, the authority to prescribe fishways is delegated from the Secretary of the Interior to the FWS Regional Directors. Within the Department of Commerce, the authority to prescribe fishways is delegated to the NMFS Regional Administrators.

Section 10(j) of the FPA

Under Section 10(j) of the FPA, licenses for hydroelectric projects must include conditions to protect, mitigate damages to, and enhance fish and wildlife resources, including related spawning grounds and habitat. These conditions are to be based on recommendations received from federal and state fish and wildlife agencies. The Commission is required to include such recommendations unless it finds that they are inconsistent with Part I of the FPA or other applicable law, and that alternative conditions will adequately address fish and wildlife issues. Before rejecting an agency recommendation, the Commission and the agencies must attempt to resolve the inconsistency, giving due weight to the agencies' recommendations, expertise, and statutory authority. If the Commission does not adopt a 10(j) recommendation, in whole or in part, it must publish findings that adoption of the recommendation is inconsistent with the purposes and requirements of Part 1 of the FPA or other applicable provisions of law, and that conditions selected by the Commission adequately and equitably protect, mitigate damages to, and enhance fish and wildlife, including related spawning grounds and habitat.

Section 10(a)(1) of the FPA

Resources agencies may also recommend conditions under section 10(a)(1) of the FPA. However, the Commission may accept, modify, or reject those conditions under the comprehensive development standard of Section 10(a)(1) without attempting to resolve inconsistencies or making the findings required by section 10(j).

Authority to Recommend Studies During Relicensing

The Code of Federal Regulations (CFR) at 18 CFR 16.8(b)(4) direct interested resource agencies to provide a potential applicant with written comments. NMFS has identified studies that are necessary to assess the environmental and social consequences of the proposed relicensing. Under 18 CFR each interested resource agency and Indian tribe must provide a potential applicant with written comments:

i) Identifying its determination of necessary studies to be performed or information to be provided by the potential applicant;
ii) Identifying the basis for its determination;
iii) Discussing its understanding of the resource issues and its goals and objectives of these resources;
iv) Explaining why each study methodology recommended by it is more appropriate than other available methodology alternatives, including those identified by the potential applicant pursuant to paragraph (b) (1) (vi) of this section;

v) Documenting that the use of each study methodology recommended is a generally accepted practice; and
vi) Explaining how the studies and information requested will be useful to the agency or Indian tribe in furthering its resource goals and objectives.

SPECIES DESCRIPTION AND STATUS

Chinook/King Salmon

Wolfe (2002) found two king salmon in Sawmill Creek in the fall of 2001. Wolfe states that "It is generally believed that the Sawmill Creek king salmon do not spawn in the stream, but are strays from other nearby streams or fish hatcheries. Origin of these king salmon stocks will be an objective of the City's continued fisheries studies in Sawmill Creek."

Coho/Silver Salmon

Sawmill Creek is cataloged for coho salmon by the ADF&G anadromous waters catalog (USGS Quadrangle Sitka, A-4, #113-41-10210). Wolfe (2002) counted coho at the index site and in the stream surveys. Coho have also been observed by U.S. Forest Service staff above the falls at stream mile (SM) 0.78 and juvenile coho have been documented by ADF&G staff up to the base of Blue Lake dam. Coho salmon spawn later in the fall than other species, and Wolfe (2002) also speculated that for Sawmill Creek they may prefer upstream spawning locations.

Chum/Dog Salmon

Sawmill Creek is cataloged for chum salmon by the ADF&G anadromous waters catalog (USGS Quadrangle Sitka A-4, #113-41-10210). Wolfe (2002) found both an early and late run. Chum were observed spawning in the index area. Areas upstream of the index area were not evaluated for spawning due to inaccessibility.

Pink/Humpback Salmon

Sawmill Creek is cataloged for pink salmon by the ADF&G anadromous waters catalog (USGS Quadrangle Sitka A-4, #113-41-10210). Wolfe (2002) found that pink salmon spawn earlier and further down Sawmill Creek than the other salmon species. Pink salmon observed in 2002 suggests that the larger run for the Sawmill Creek is the "even year" run (ICP, 2002).

Steelhead Trout

Sawmill Creek is cataloged for steelhead trout by the ADF&G anadromous waters catalog (USGS Quadrangle Sitka A-4, #113-41-10210). Steelhead trout surveys are planned for the spring of 2002 (Wolfe, 2002).

NMFS RESOURCE GOALS AND OBJECTIVES

Resource Goals

1. Protect, conserve, enhance and recover native anadromous salmonids and their habitats by providing access to historic habitats and by restoring fully functioning habitat conditions.

2. Identify and implement measures to protect, mitigate or minimize direct, indirect, and cumulative impacts to, and enhance native anadromous salmonid resources, including related spawning, rearing, and migration habitats and adjoining riparian habitats.

Resource Objectives

1. ***Flows*** **-** Obtain guaranteed minimum water flow from Blue Lake into Sawmill Creek to the benefit of native anadromous salmonids and their habitats. This includes providing a range or schedule of flows necessary to: a) optimize suitable habitat; b) stabilize flows during spawning and incubation of ingravel life stages; c) facilitate the efficient migration of spawning adults, safe and timely emigration of smolts, and movement of rearing juveniles between feeding and sheltering areas; d) ensure redd placement in viable areas; and e) facilitate channel forming processes, riparian habitat protection and maintenance/movement of forage communities.

2. ***Water Quality*** **-** Modify project structures or operations necessary to mitigate direct, indirect, or cumulative water temperature and quality impacts associated with project structures and operations or enhance water temperature and quality conditions in salmonid habitat.

3. ***Fish Passage*** **-** Provide access to historic spawning, rearing and migration habitats necessary for salmonids to complete their life cycles and utilize seasonal habitats. This includes modifications to project facilities and operations necessary to ensure the safe, timely and efficient passage of upstream migrating adults, downstream passage of emigrating juveniles and passage necessary for juveniles to seasonally disperse and access habitat to feed and find shelter.

PROJECT IMPACTS ON ANADROMOUS SALMONIDS

Sawmill Creek contains wild populations of 3 species of Pacific salmon (coho, chum and pink) found in Alaska and steelhead trout (Wolfe, 2002). The relative productivity of the Sawmill Creek Watershed for salmon production was not documented prior to initiation of the hydroelectric project. Licensing requirements for hydropower projects were less stringent in 1950's and 1960's than they are today. The project may have impacted salmon production in Sawmill Creek and Blue Lake. Project impacts as they are related to the resource objectives are listed below.

Flows (Resource Objective 1)

Diversion of Blue Lake outflow to the Fish Valve Unit (FVU) and Blue Lake Powerhouses has created an overall flow reduction in Sawmill Creek . There is no instream flow requirement for the portion of Sawmill Creek from the base of the dam to the FVU. An instream flow requirement of 50 cfs from May to November is required by the original license. In 1977, license amendments provided that, from December through April, the 50 cfs could be further reduced to specified levels ranging from 22 to 37 cfs, if the lake elevation dropped below certain critical levels (ICP 2002).

The habitat for all life stages of the salmonid freshwater life cycle may have been significantly impacted by flow alteration. Spawning habitat may have been reduced due to periods of insufficient or no water in historic spawning areas. Rearing habitat for juveniles may have been reduced or eliminated in some areas due to lack of water. Stream productivity may also have been impacted. Nutrients that historically came from the lake are no longer entering the stream food web. These nutrients helped fuel primary and secondary production in the stream.

Water Quality (Resource Objective 2)

A primary impact to water quality in Sawmill Creek may be a significant reduction in temperature from the introduction of colder water drawn from the intake of Blue Lake. Reduced temperatures may have a significant impact on salmonid spawning. A large temperature decrease could prevent or delay adult sexual maturation. A thermal barrier may also develop that prevents upstream migration. This could result in failure to spawn or spawning later than normal. The later spawning would cause later egg and alevin maturation resulting in fry emergence too late to match the preferred emergence. The reduced water temperatures could further delay egg and alevin maturation in the gravel resulting in greater separation from the preferred emergence window. Colder water temperatures may also impact the benthic productivity of Sawmill Creek, thus reducing food availability for rearing juvenile salmonids.

Fish Passage (Resource Objective 3)

The alteration of Blue Lake out flow by the Project may have impacted fish passage in Sawmill Creek. Adults may be attracted to the outflow of the Blue Lake Powerhouse. Holding in this area would delay

their migration upstream to spawn. Delayed spawning would cause later egg and alevin maturation resulting in fry emergence too late to match the preferred emergence window. Fish passage above the falls at stream mile 0.78 might also be impacted by reduced flows. The ability of some fish to utilize historic spawning habitat may also be reduced.

COMMENTS ON ICD

The ICD should provide the following information:

1) A historical review of ADF&G stream survey/escapement data for Sawmill Creek salmonids. All previous information on fish numbers and species in the Sawmill Creek drainage should be assimilated into the historical review.

2) A historical review to determine if information exists on the extent of anadromous presence in Sawmill Creek above the falls at mile 0.78 and in Blue Lake, prior to construction of the dam.

3) A summary of the 1988 ADF&G instream flow analysis and any other historical analyses of instream flow studies. Attach studies as appendices.

4) A summary of current and reserved water uses for the watershed, including the power generation, municipal water supply, bulk export, and ADF&G water right reservations. Outline the quantities of water used/reserved on a seasonal basis.

5) Indicate how often the minimum instream flow levels shown in Table 2, page 14 have been implemented since they were adopted in 1977.

RECOMMENDED STUDIES

Flows (Resource Objective 1)

Studies under this resource objective will establish existing conditions and should include analysis of Project impacts on hydrology as well as instream flow related habitat modeling (instream flow studies). The results of these studies combined with the other recommended studies will help determine if and/or what levels of increased flows will produce improved fish habitat.

Hydrology

Construct hydrographs of the natural flow regimes of both Sawmill Creek and discharge through the Blue Lake powerhouse using as many years of continuous flow data as are available, tabulated as mean

daily, mean monthly and mean annual flows using cubic feet per second as units. Include monthly flow duration curves, in 5 percent increments, presented in both graphical and tabular format.

Utilize models such as those used by the US Geological Survey, Physical Habitat Simulation Software (PHABSIM)[1], to characterize the water budget for actual hydrology for multiple climatic year-type scenarios. This should be done for the entire period of record. Flow data will need to be calibrated or normalized according to water year type. Flows encompassing a variety of scenarios should be modeled.

Stratify the stream flow and precipitation records into water year types. For different climatic water year classes, describe timing, magnitude, and duration of peak flows, high flows, and low flows. Perform simulations to help interpret Project effects on the magnitude, duration, and timing of flow. The PHABSIM program should be run for both actual (historic) and natural (synthesized unimpaired) flows. A combination of graphs and tables showing daily flow characteristics for each water year type (e.g. wet, average, dry) is a valuable product, besides the raw data output. Enhance models to simulate multiple drought years.

Instream Flow Studies

Instream flow studies should be conducted using Instream Flow Incremental Methodology (IFIM)[2] modeling. Study components for physical habitat study include:

1. Review all available historic Sawmill Creek flow records for the watershed prior to and after dam construction. Create historic database for use in hydrology analyses.
2. Measure existing instream flows to add to existing data base. Flows should be measured using the existing stream gauges.

Water Quality (Resource Objective 2)

The primary water quality parameter of concern is water temperature. The licensee should develop a water quality model to compare water quality impacts under various potential relicensing scenarios. Thermographs should be placed in Sawmill Creek at the outlet of the FVU, at the base of the falls and above and below the powerhouse outlet to continuously record water temperature. Thermographs should be backed up with extra data loggers, and calibrated to ensure consistency among recorders. Temperature units needed for Sawmill Creek salmon and steelhead eggs to hatch and emerge should be determined. Stream temperature regimes and emergence timing for each species under existing, proposed and theoretical reservoir operations (i.e. stage increase of reservoir, surface water release)

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[1]See http://www.mesc.usgs.gov/products/software

[2]See /www.mesc.usgs.gov/products/software/software.asp

should be developed. This modeling exercise will determine if fish populations are being impacted by temperature changes. If impacts are determined, the modeling will help determine what needs to be done to alleviate impacts.

Fish Passage (Resource Objective 3)

Fish passage barriers are the result of conditions in the stream channel, which impede the migration of fish. The effect of stream flows (high or low) and/or temperatures may be responsible for creating barrier conditions. In the Project area, barriers related to Project operations and facilities may occur in Sawmill Creek as a result of reduced flows and/or temperatures. All feasible options to obtain anadromous fish passage to upstream habitat should be investigated, including the effects of reduced flow to the waterfall at stream mile 0.78. The results of these studies combined with the other studies will help determine if fish passage can be improved and what needs to be done to realize those improvements.

Fish Passage

In order to evaluate how changes in stream flow resulting from Project operations may have affected habitat for fish in the Project affected area, analyses should be included in the physical habitat simulation modeling study (PHABSIM). Velocities and depths of flow-responsive habitats may have been altered by flow reductions due to Project operations. This may have resulted in habitat types, such as riffles, becoming sufficiently shallow to create a barrier to fish passage. Therefore, access to spawning, rearing, or cover habitat may have been lost. To evaluate these potential effects, NMFS recommends use of the U.S. Forest Service (USFS) Fish and Aquatic Stream Habitat Survey (Tier 4) protocol for the Alaska Region (USFS, 2001) to map and index habitat types in Project reaches including identification of spawning, nursery and rearing areas. Based on Project operations and natural base flow hydrology, the potential for barriers to fish passage should be assessed. Yearly hydrographs and exceedance curves should be used to evaluate the likely occurrence, seasonality and duration of flow-related passage barriers. The waterfall at SM 0.78 should be evaluated relative to variable flows to determine the current and potential role it plays as a fish barrier. NMFS recommends the Powers and Orsborn (1985) methodology for assessment of the waterfall as a fish passage barrier.

Native Anadromous Salmonids - Surveys and Status

To determine the relevance of fish passage needs in Sawmill Creek, the fish surveys already begun by the project (Wolfe, 2002) should be continued and expanded as follows:

Juvenile sampling:

Junvenile fish have been observed by ADF&G personnel to the base of the dam. Further documentation of juvenile fish distribution in Sawmill Creek should be pursued. More than one sampling method should be used to reduce gear bias, however at the least the trapping of juveniles with

baited minnow traps should be used. Trapping should be coordinated with the ADF&G Division of Sport Fish office in Stika to obtain a scientific collection permit and ensure that adverse effects of trapping are minimized.

Adult sampling:

Adult salmon and steelhead should be counted annually for several years using ADF&G methods for standardization and indexing of peak survey counts.

A preliminary assessment needs to be developed that displays existing and potential fish presence and distribtion, run timing, limiting factors and potential mitigation measures. This assessment should provide a detailed discussion on how coho, pink, and chum salmon would use Sawmill Creek if passage due to low flows/temperature were not a concern. Effects would be assessed based on the identified impacts in terms of the amount and types of habitat available and the extent to which passage barriers affect their use.

LITERATURE CITED

City and Borough of Sitka, Electric Department. Initial Consultation Document for Relicensing of the Blue Lake Hydroelectric Project, FERC No. 2230. Novemeber 2002.

Powers, P.D. and J.F. Orsborn. 1985. Analysis of barriers to upstream fish migration; an investigation of the physical and biological conditions affecting fish passage success at culverts and waterfalls. Bonneville Power Administration, Project No. 82-14.

USFS Region 10. 2001. Fish 2090.21 - Aquatic Ecosystem Management Handbook, Fish and Aquatic Stream Habitat Survey.

Wolfe, K. 2002. Fisheries Survey Annual Report, Sawmill Creek, 2001. Blue Lake Project, Federal Energy Regulatory Commission (FERC) No. 2230. City and Borough of Sitka, Licensee.

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