BLUE LAKE HYDROELECTRIC PROJECT
CITY OF SITKA, ALASKA
FERC No. 2230

INITIAL CONSULTATION DOCUMENT
For RELICENSING

INTRODUCTION

The City and Borough of Sitka, Alaska ("City", "Licensee") is beginning the process of relicensing the 7.5 megawatt (mw) Blue Lake hydroelectric project ("Project"), FERC No. 2230 near Sitka, Alaska. The City holds a fifty-year license (the "original license") from the Federal Energy Regulatory Commission (FERC) to operate the Project. The current license became effective on April 4, 1958, and expires on March 31, 2008. The FERC regulations require that the City submit an application for new license ("Application") no later than March 31, 2006, or two years prior to the existing license expiration. This document is the first in a series of information and decision documents the City is required to prepare and distribute during the relicensing process.

The exact name, business address and telephone number of the Licensee is:

City & Borough of Sitka
100 Lincoln Street
Sitka, Alaska
99835

The exact name, business address and contact numbers of the person authorized to act as agent for the Licensee is:

City & Borough of Sitka, Electric Department
Attn: Tim Barnum, Acting Utility Director
105 Jarvis Street
Sitka, Alaska 99835
Phone: 907-747-6633
Fax: 907-747-3208

All questions, comments, or correspondence related to this relicensing should be directed to the City of Sitka Electric Department. Changes in this contact information will be notified directly to parties on the mailing list, and through announcements in a local newspaper.

THE RELICENSING PROCESS.

Relicensing, as directed by FERC regulations under the Federal Power Act (FPA), is a five-year process which culminates in issuance of a "new" license. Prior to new license issuance, federal regulations require substantial study to update existing information on potentially affected environmental resources, and to evaluate the need for, or feasibility of modifications to the currently-licensed project layout or operating mode. The City intends to fully utilize this time period to conduct environmental, engineering and economic studies prior to submittal of the Application.

The FERC regulations require that relicensing proceed in three steps with respect to interactions with resource agencies, the Sitka Tribe of Alaska (Sitka Tribe), the public and Non-Governmental Organizations (NGO's), collectively referred to as the "stakeholders":

> **Stage 1. Initial Stage Consultation.** In this stage, the licensee prepares an Initial Consultation Document (ICD) intended to inform readers of the project features, affected resources and the relicensing process and schedule. The licensee holds a public meeting or meetings, facilitates a site visit, and solicits comments from reviewers. The licensee and resource agencies consult on study plans; final plan submittal marks the end of Stage I. (We hope to complete Stage I consultation by March 1, 2003, to assure a full season of field studies in 2003.)
>
> **Stage II. Conduct Studies, Draft License Application Preparation**. In this stage, the licensee conducts the studies approved during Stage I and distributes the Draft Application to the consulting parties, with a request for comment within 90 days. The licensee revises the Application relative to the comments received.
>
> **Stage III. License Application Submittal.** In this stage, the licensee submits the final Application to the FERC, with copies supplied to all parties previously consulted. The Final Application must be received by the FERC no less than 24 months prior to the Project License expiration, or, in this case, by March 31, 2006.

After Final Application submittal, the FERC conducts an independent analysis of the licensee's proposals, prepares draft and final environmental documents, and issues its Order Issuing New License, marking completion of the relicensing process.

Throughout the relicensing process, the licensee and stakeholders work closely to assure technical adequacy of studies and evaluation methods. Prior to issuance of the new license, the FERC regulations require that equal consideration be given to both the developmental (relating to project economic and other water management and use benefits) and the non-developmental (relating to environmental, cultural, aesthetic and recreational) aspects of the Project.

PURPOSE OF THIS ICD IN STAGE I CONSULTATION.

This ICD is required by the FERC, and is intended to provide the following information:

- Descriptions of the location, features and operation of the project, and pertinent project maps and design drawings;
- Environmental resources which might be affected by relicensing and any proposed protection, mitigation or enhancement measures for those effects, as known at the time of the ICD.
- Environmental and engineering studies which the licensee may perform, as known at the time of the ICD.
- The steps and schedule involved in the relicensing process;

The FERC regulations require that, soon after distribution of the ICD, the City hold a public meeting and site visit. The public meeting and site visit must be scheduled no less than 30 nor more than 60 days after distribution of the ICD. The cover letter for this ICD also requests public and stakeholder comment. The request is for oral comments at the time of the meeting/site visit, and for written comments to be delivered no more than 30 days after the public meeting/site visit.

These written and oral comments are very important to the City in the relicensing process. Comments received early in the process inform the City of issues which might accompany the relicensing, such as environmental resources which might be affected by the relicensing, economic factors in the community, or the rights and privileges of individuals whose property or lifestyle might be affected.

LICENSING PROCESS ALTERNATIVES.

Under a recent amendment of the FPA, licensees may elect to use the traditional licensing approach or the Alternative Licensing Procedure (ALP). Under the Traditional Approach, all activities and documents required under the National Environmental Policy Act (NEPA) are conducted by the FERC or their contractor after acceptance of the Application. This FERC action may take as long as two

years to complete. Under the ALP, the licensee may conduct NEPA Scoping (the public participation process to solicit comments on environmental issues) and may prepare a preliminary draft Environmental Assessment (EA) (first in a series of EA's) prior to submittal of the Application. This process may save as much as two years, but requires greater licensee time and effort prior to Application submittal. The City currently favors using the ALP, but has not formally notified the FERC of this position. The public and other stakeholders will be notified on Sitka's request to use the ALP if that is our decision and the FERC must consider all stakeholder comments on that decision prior to approval of the process.

SITKA'S RELICENSING GOALS.

The City's primary relicensing goal is to maintain low cost stable electrical rates, while exploring opportunities for additional environmental enhancements. The City of Sitka enjoys some of Alaska's lowest and most stable electrical rates due primarily to it's hydroelectric project generation base. The City recognizes it's role as steward for the project land and water resources and it's responsibility to the people of Sitka to assure clean, low-cost power. Our objective in relicensing is to achieve a balance among these values.

.

THE RELICENSING SCHEDULE.

Generally, the schedule is divided into pre-filing (licensee's activities prior to submittal of the final Application) and post-filing (FERC and licensee's activities after Application submittal). The pre-filing period is from October 1, 2002 to March 31, 2006. During this period, the City will consult with agencies, the Sitka Tribe, the public and NGO's to conduct studies, conduct the preliminary NEPA process phases (if the ALP is selected), negotiate recommendations and prepare the final Application.

Post-filing activities will extend from April 1, 2006 to issuance of a new license. During the post-filing period, the FERC may request additional information prior to preparation of its own NEPA documents and the Order Issuing New License.

An important phase of the relicensing process is Scoping. The FERC's NEPA regulations require that Scoping meetings be held after distribution of a Scoping Document. In this phase, preliminarily scheduled for fall, 2003 to take advantage of early study results, impact issues will be established and initial mitigation measures proposed and reviewed.

STAYING INVOLVED WITH THE PROCESS

The public and other stakeholders will be notified of meetings, documents and other milestones in the relicensing process through various formal and informal means. Under FERC regulations, all public meetings and site visits must be announced at least two weeks in advance in a local newspaper. Meeting minutes must be transcribed and made available to all interested parties. Draft and Final Applications from the City will be noticed by the FERC in the US Federal Register upon acceptance by that agency, with notes on the availability of the documents for review and comment.

In addition to the required notifications, the City may elect to maintain a project information system via web page, newsletters or other means of contact. Details of the information system, will be announced at the Public Meeting(s).

PROJECT DESCRIPTION

GENERAL

The Project is located approximately 5 miles east of the City of Sitka, Alaska on Sawmill Creek (formerly the Medvetcha River). The Project consists of ten major features: the dam; a submerged intake structure; a power conduit; three powerhouses; a switchyard and a primary and two secondary transmission lines (Figures 1 through 3).

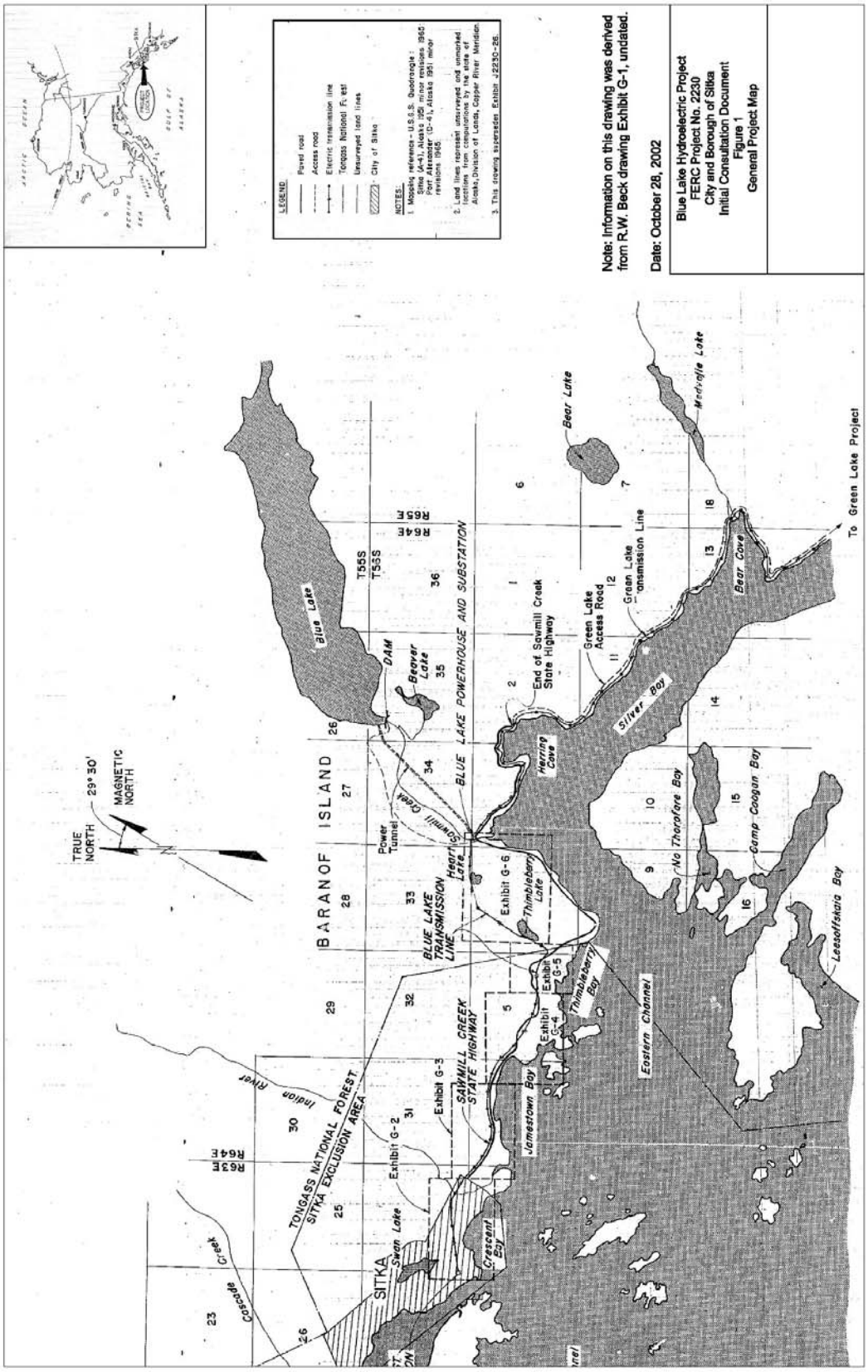
((Throughout this document, the Project features are discussed relative to their Stream Mile (SM), or the centerline distance on Sawmill Creek upstream from the Creek's mouth at tidewater, as determined from the project map. Reservoir and stream or roadway directions (left or right) are looking downstream or down-road. Elevations are referenced as heights in feet above or below mean low sea level, denoted by the term "El".))

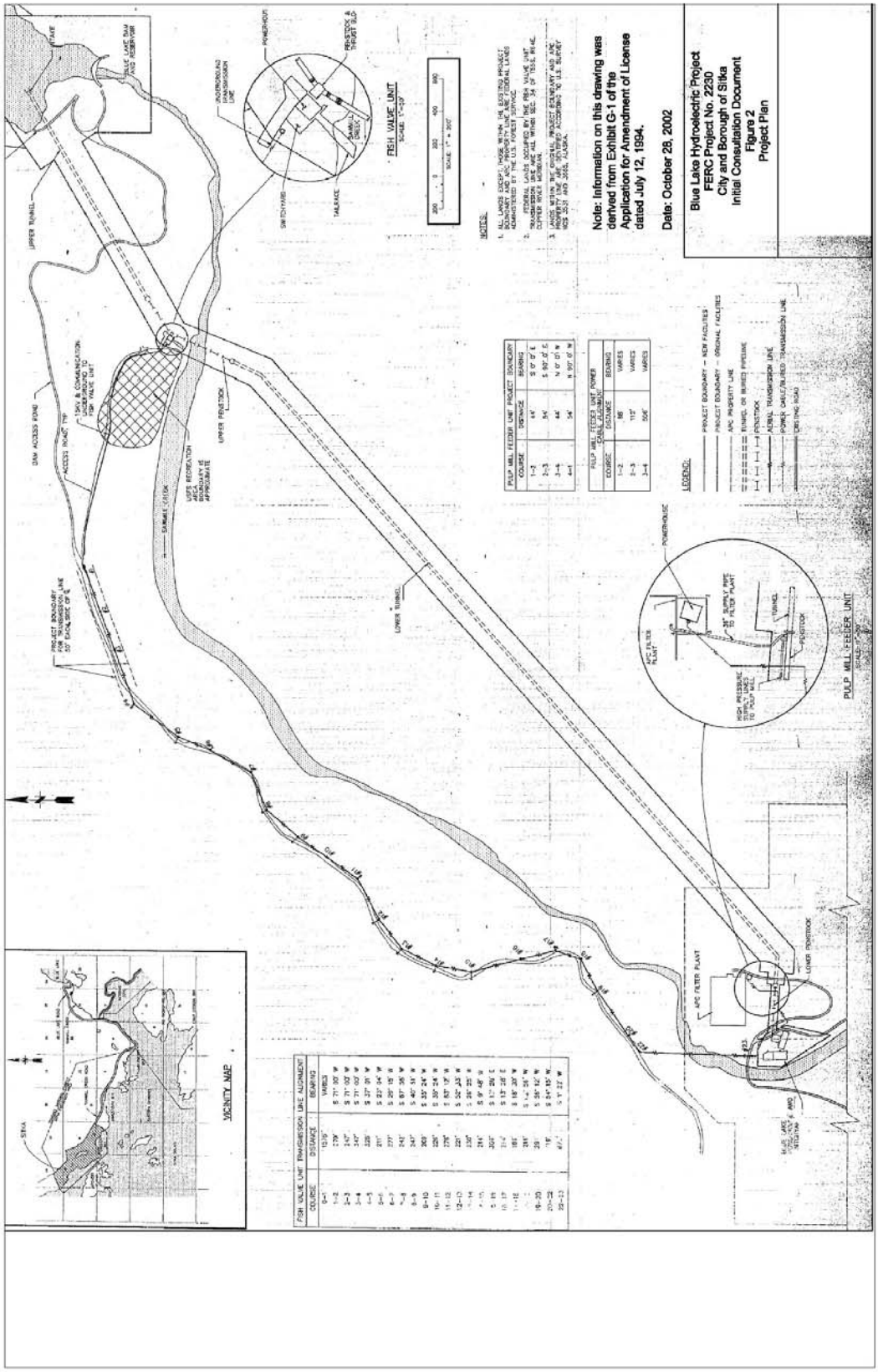
PROJECT FEATURES.

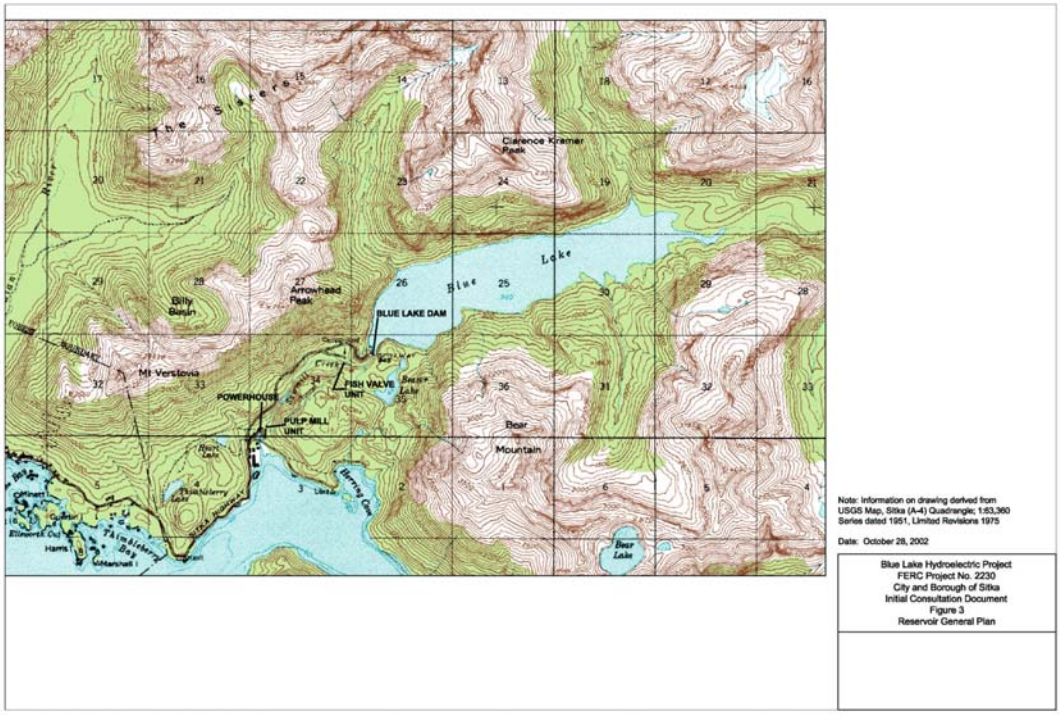
Names of project features are in bold type on first reference in this section to introduce project terminology which will be used throughout this document. Detailed design drawings of the major project structures are in the Appendix.

Dam

Located at SM 2.7 on Sawmill Creek, the concrete arch **dam** is 211 feet high with a base width of 25 ft and a crest width of 256 ft. The 140 ft wide **spillway** at El 342 is centrally located in the dam, and is sized to transport 14,000 cubic feet per second (cfs). A **release valve,** installed at the base of the dam, is used to release


LEGEND
Paved road
Access road
Electric transmission line
Tongass National Forest
Unsurveyed land lines
City of Sitka
NOTES:
1. Mapping reference - U.S.G.S. Quadrangle: Sitka (A-4), Alaska 1951 minor revisions 1960; Port Alexander (D-4), Alaska 1951 minor revisions 1966.
2. Land lines represent unsurveyed and unmarked locations from computations by the state of Alaska, Division of Lands, Copper River Meridian.
3. This drawing supersedes Exhibit J-2230-26.
Note: Information on this drawing was derived from R.W. Beck drawing Exhibit G-1, undated.
Date: October 28, 2002
Blue Lake Hydroelectric Project
FERC Project No. 2230
City and Borough of Sitka
Initial Consultation Document
Figure 1
General Project Map
TRUE NORTH
MAGNETIC NORTH
29° 30'
BARANOF ISLAND
TONGASS NATIONAL FOREST
SITKA EXCLUSION AREA
Blue Lake
Beaver Lake
DAM
Power Tunnel
Sawmill Creek
Hearth Lake
BLUE LAKE POWERHOUSE AND SUBSTATION
BLUE LAKE TRANSMISSION LINE
SAWMILL CREEK STATE HIGHWAY
End of Sawmill Creek State Highway
Green Lake Access Road
Green Lake Transmission Line
Bear Lake
Medvejie Lake
Bear Cove
Silver Bay
Herring Cove
Thimbleberry Lake
Thimbleberry Bay
Jamestown Bay
Crescent Bay
Swan Lake
SITKA
Indian River
Cascade Creek
Eastern Channel
No Therefore Bay
Camp Coogan Bay
Leesoffskaia Bay
To Green Lake Project
Exhibit G-1
Exhibit G-2
Exhibit G-3
Exhibit G-4
Exhibit G-5
Exhibit G-6


Blue Lake Hydroelectric Project
FERC Project No. 2230
City and Borough of Sitka
Initial Consultation Document
Figure 2
Project Plan
Date: October 28, 2002
Note: Information on this drawing was derived from Exhibit G-1 of the Application for Amendment of License dated July 12, 1994.
FISH VALVE UNIT
PULP MILL FEEDER UNIT
VICINITY MAP
LEGEND:
NOTES:
SITKA
BLUE LAKE DAM AND RESERVOIR
UPPER TUNNEL
DAM ACCESS ROAD
SWITCHYARD
TAILRACE
POWERHOUSE
LOWER PENSTOCK
LOWER TUNNEL
APC FILTER PLANT
SARAHE CREEK
PROJECT BOUNDARY FOR TRANSMISSION LINE 50' EACH SIDE OF ℄


Clarence Kramer Peak
Blue Lake
Arrowhead Peak
Billy Basin
BLUE LAKE DAM
Mt Verstovia
POWERHOUSE
FISH VALVE UNIT
PULP MILL UNIT
Bear Mountain
Bear Lake
Note: Information on drawing derived from USGS Map, Sitka (A-4) Quadrangle; 1:63,360 Series dated 1951, Limited Revisions 1975
Date: October 28, 2002
Blue Lake Hydroelectric Project
FERC Project No. 2230
City and Borough of Sitka
Initial Consultation Document
Figure 3
Reservoir General Plan

water when the reservoir is below the spillway elevation. The valve capacity is 800 cfs. A natural **plunge pool** is located downstream of the dam, to dissipate energy from the spillway discharge.

Reservoir.

A **reservoir**, known as **Blue Lake Reservoir**, was created when the dam raised the natural Blue Lake water surface from El 208 to El 342 and increased the lake surface area from 490 to 1,225 surface acres. Blue Lake is 3.25 mi long and 0.625 mi in average width. The deepest point is at El minus 126 at a depth of 468 feet below the lake surface at spill elevation. The reservoir has gross storage capacity of 145,200 acre/feet (af) and usable storage of 102,200 af at spill level. A submerged concrete **intake structure** is located approximately 400 feet north of the dam at El 210.

Power Conduit.

A 7,110 ft. long **power conduit** extending from the intake structure to the Blue Lake powerhouse branches to provide water to the various powerhouses and other facilities described below.

The power conduit consists of an **upper tunnel** with an unlined, 11.5 ft. diameter modified horseshoe cross-section extending 1,500 feet from the intake structure to the **upper penstock** on the right side of Sawmill Creek. The upper penstock, an 84 in. diameter, 460 ft. long, steel pipe crosses the stream supported on concrete piers and enters the **lower tunnel** on the left side of Sawmill Creek. The 4,650 ft. lower tunnel has an unlined, 10 ft. diameter modified horseshoe cross-section and extends to the **lower penstock**.

The lower penstock, an 84 in. diameter, 500 ft. long, steel pipe, has two taps immediately below the lower tunnel portal. A 36" tap supplies water to the Pulp Mill Feeder Unit and an 24" tap supplies water to the Sawmill Cove Industrial Park (SCIP), site of the former Alaska Pulp Company (APC) mill. Approximately 90 feet below these two pipes is a 20 in. tap (the "**water supply tap**") leading into the adjacent water treatment plant for municipal water supply. Approximately 50 feet below this tap is an 84 in. butterfly valve which allows shutdown of the main powerhouse and dewatering of the turbines while maintaining water to the Industrial Park and the Water Treatment Plant.

Project Powerhouses.

The project consists of three generating units, including the Blue Lake, Fish Valve Unit and Pulp Mill Feeder Unit powerhouses. The Blue Lake powerhouse is the primary generating unit, and the other two units provide additional generation capacity, as described in detail below.

Blue Lake Powerhouse

The **Blue Lake Powerhouse** is the primary Project generating unit. It is located on the left bank of Sawmill Creek at SM 0.15 and is a 35 ft. X 70 ft. steel superstructure, precast concrete foundation structure housing two horizontal shaft Francis **turbines** each rated at 3000 kilowatt (kW) with provision for future installation of a third unit. The turbines discharge water into the approximately 150 ft long **tailrace** which carries water from the turbines to Sawmill Creek.

The **Blue Lake Switchyard**, located adjacent to the powerhouse, receives generation energy from the Blue Lake powerhouse, the Fish Valve Unit and the Pulp Mill Feeder Unit (described below). The switchyard includes 12.47/4.16 kV and 4 .16/69 kV transformers, with associated bus-work and disconnect switches. Power from the Green Lake Project, FERC No. 2818, another hydroelectric facility owned by the City of Sitka, is also transmitted to the Blue Lake switchyard at 69 kV.

By FERC Order Amending License dated September 6, 1991, the Project was modified to include two additional generating units. These were:

Fish Valve Unit(FVU)

The **FVU**, located at SM 1.14, generates power from flows released for instream purposes through a valve located about 1900 ft. downstream of the dam. It is housed in a concrete powerhouse located approximately 175 feet below the upstream end of the upper penstock on the right side of the stream. A 36 in. diameter wye branch on the upper penstock supplies water to the FVU. An automatic bypass valve opens when the Fish Valve Unit is tripped off-line to maintain the required flow of 50 cfs in the stream at all times. A single Francis turbine spins a generator rated at 670 kW.

Pulp Mill Feeder Unit (PMFU)

The **PMFU** generates power from the water supply to the former Alaska Pulp Corporation (APC) filter plant. Since closure of the APC plant in 1993, the PMFU uses releases for bulk water export and other future uses. The PMFU consists of a 36 in. tee connected to the existing pulp mill feeder pipe and a 36 inch diameter,

24 ft. long penstock from the tee to the generating unit. The single horizontal, Francis turbine spins a generator rated at 870 kW.

The regular PMFU operation was discontinued in 1993 because of shutdown of the APC mill. The unit is periodically "exercised" or operated to assure working order.

Transmission Lines

Primary Transmission Line.

A 69 kV **primary transmission line** extends 5 miles from the Blue Lake Switchyard to the Jarvis Street and Marine Street substations in Sitka. The line consists of both H-frame and single pole, wood structures. The transmission line right of way occupies 27 acres of land. This land is administered by the U.S. Forest Service, the State of Alaska along the Sawmill Creek Highway right of way and private land owners.

Pulp Mill Feeder Unit Transmission Line.

Power from the PMFU is transmitted over a 470 ft. long, underground transmission line to the Blue Lake Powerhouse and connected to the main generation bus.

Fish Valve Unit Transmission Line.

Power from the FVU is transmitted over a 7,700 ft. long transmission line to the Blue Lake switchyard where it is transformed to 4.16 kV and connected to the main generation bus. The first 1,400 feet of the transmission line through the U.S. Forest Service Sawmill Creek recreation area is underground. The remaining portion is overhead.

Access Roads.

The **dam access road** is the USFS road No. 5755 and extends 2.19 miles to the dam from Sawmill Creek Road. Just downstream of the FVU, a **footbridge bridge** crosses Sawmill Creek at SM 1.10. Access to the Blue Lake powerhouse and the PMFU is along a licensee owned road connected to Sawmill Creek Road at mile 5.5; access to the FVU is via USFS road No. 5755. At SM 0.25, the **Blue Lake Powerhouse bridge** crosses Sawmill Creek just upstream of the Blue Lake powerhouse.

PROJECT LANDS

The existing facilities of the Blue Lake Project occupy 812 acres of U.S. lands administered by the Forest Service.

The project lies within U.S. Geological Survey Sitka A-4 and A-5 Quadrangle maps, within the land descriptions presented in Table 1.

Table 1. Land Descriptions of Blue Lake Project Features.

Project Features	Map Locations
Dam, Spillway and Intake Structure	Section 35 of T55S, R64E, Copper River Meridian.
Power Conduit	Sections 34 and 35 of T55S, R64E, Copper River Meridian.
Fish Valve Unit	Section 34 of T55S, R64E, Copper River Meridian.
Pulp Mill Feeder Unit	Section 34 of T55S, R64E, Copper River Meridian.
Blue Lake Powerhouse	Section 34 of T55S, R64E, Copper River Meridian.
Primary Transmission Line	Section 33 & 34 of T55S, R64E, Copper River Meridian; Section 4, 5 and 6 of T56S, R64E, Copper River Meridian; Section 1 of T56S, R63E, Copper River Meridian; Section 35 & 36 of T55S, R63E, Copper River Meridian.

PROJECT HISTORY AND OPERATION

PROJECT HISTORY

The Federal Power Commission (FPC) Order issuing the original license is dated April 4, 1958. Construction began April 30, 1958 and commercial operation commenced July 23, 1961. In 1979, to meet increased electrical demands, the City obtained a license for the Green Lake project (FERC No. 2818), which was constructed in 1982 in the Vodopod River basin approximately 8 miles to the southeast of the Blue Lake project. The Blue Lake and Green Lake Projects operate conjunctively to supply the City's electrical needs.

The original Blue Lake license remains in effect, but with several amendments addressing various additions and upgrades to the original project design and/or operation. The following amendments are described relative to their provisions and respective issuance order dates:

- Due to increased loads and several dry years, an order amending the license to allow the current instream flow releases was issued on September 7, 1977, as described in subsequent sections;

- The construction of the Green Lake project necessitated upgrading of the Blue Lake transmission line capacity from 34.5 kV to 69 kV. The order amending the license for this change is dated June 12, 1980;

- An order was issued on November 15, 1983 to allow the 20" municipal water tap on the penstock.

- An amendment was ordered on September 6, 1991 to increase the Project nameplate capacity from 6000 kW to 7500 kW with the addition of the Fish Valve Unit and the Pulp Mill Feeder Unit.

PROJECT OPERATION.

Project Role in Sitka's Electrical System

The Blue Lake Project is operated in conjunction with the Green Lake Project to meet the City's electric demand ("load"). The Blue Lake powerhouse is the control center for Sitka's entire electric system and is manned around the clock. Generally, the Blue Lake Project is operated as a "base-load" resource, that is, at a pre-set generation output. The Green Lake Project is used for "load-following" or at a continually changing generation output to meet the shifting load in addition to Blue Lake generation. Generation is also allocated between the Blue Lake and Green Lake Projects to manage storage levels in the reservoirs. Back-up generation for the hydroelectric system is supplied by four diesel powered electric generators totaling 11.9 mw nameplate capacity.

Blue Lake reservoir levels are determined by two major factors: 1) reservoir inflow, resulting from precipitation and/or snowmelt, and 2) water releases for hydroelectric generation, spill, instream flow needs, municipal water use and water sales. Hydroelectric generation is the largest of these releases, and has the greatest effect on Blue Lake reservoir levels.

Reservoir inflow is highest in summer and fall due to snowmelt and rainfall. During mid-winter, inflow decreases because precipitation is stored as snowpack. Sitka's electrical loads vary during the year due primarily to energy needs for heating. Demand is highest in winter and lowest in summer (Figure 4).

Because electrical load is lowest in summer and early fall, when inflow is highest, reservoir levels generally rise during this period. During winter, increased loads and reduced inflow cause the reservoir level to fall. Often, in early fall during the highest period of precipitation, reservoir levels exceed the height of the dam and water is "spilled" over the spillway at EL 342. Spilling in particularly wet years may last for several months. The reservoir is operated to maintain the highest possible level to maximize generation unless lower levels are desired for maintenance operations. Typically the lowest normal operational level is about El 280.

Project Operation Criteria

The Project is operated according to conditions in the Original FPC License and certain license Amendments (described above) which specify Sawmill Creek streamflows. In addition, the City controls Blue Lake reservoir elevations on a monthly basis to assure adequate storage (in conjunction with the Green Lake Project), flood protection capacity, and maintenance access to the dam and intake, as required.

The City is required, under provisions or the Original license, to release flows for instream purposes ("instream flows") at the FVU, which generates power from these releases. From May through November, the minimum instream flow requirement is 50 (cfs), regardless of reservoir elevation. The license Amendment of 1977 provided that, from December through April, the 50 cfs flow could be reduced if the lake elevation dropped below certain critical levels (Table 2).

Table 2. Sawmill Creek minimum Instream Flow requirements allowed at various Blue Lake levels (FERC Order dated September 7, 1977).

Month	Lake Surface Elevation (feet)	Minimum Flow (cfs)
December	336	37
January	324	22
February	311	22
March	295	22
April	274	22

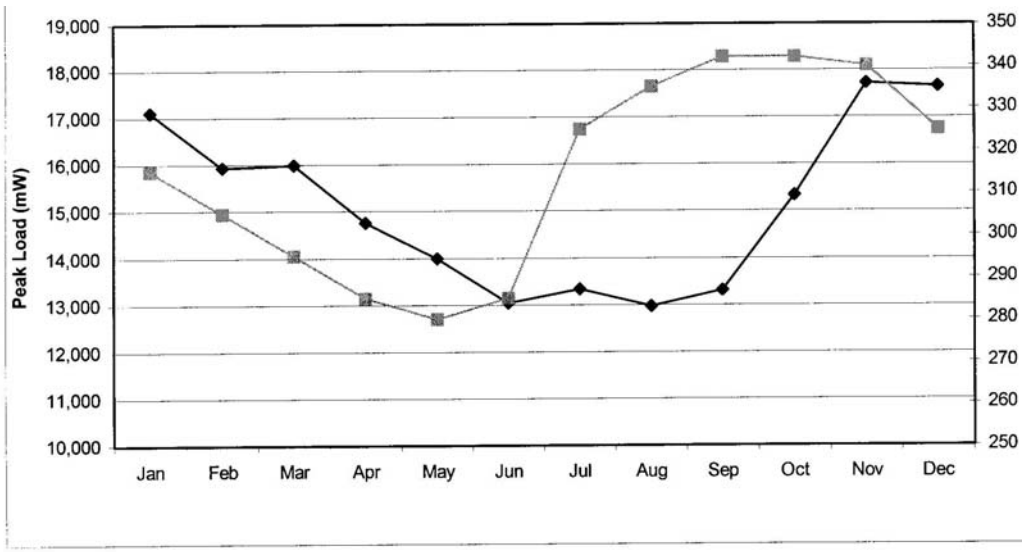


Figure 4. Typical Monthly Peak Loads and Reservoir Elevations, Blue Lake Project.

An automatic bypass valve opens when the FVU is not operating to maintain the required flow of 50 cfs in the stream. The reservoir release valve is used to maintain flow in the stream when the power conduit is out of service.

In addition to hydroelectric generation and instream flows, water is also released from Blue Lake reservoir to serve commercial interests, including bottled water and bulk water export operations located at or near the SCIP. The water rights for these operations, held by the City, require that withdrawals for these commercial purposes cease when reservoir elevations fall below the elevations listed in Table 2. This is to assure priority for instream flow releases.

Pulp Mill Feeder Unit operation.

The PMFU was installed to generate power from process water for the APC mill. The mill was closed in 1993 and has since been dismantled. Currently, the PMFU is operated periodically to maintain working order. This unit will be used to deliver water for bulk export and other potential uses.

SAWMILL CREEK HYDROLOGY.

Prior to construction of the Blue Lake Project, Sawmill Creek streamflow was characterized by large seasonal variations with high flows due to the Basin's heavy rainfall and snowmelt, and low flows due to cold periods when the Basin's water was stored as snow and ice. Since the impoundment, flows below the dam have become more stable because of storage of peak flows and minimum releases which prevent extreme low flows during droughts or very cold periods.

Streamflow data applicable to the Project has been gathered in a variety of locations over the years at the stations and timeframes described below:

The US Geological Survey (USGS) "Original" Gage.

This gage, USGS gage No. 15088000, Sawmill Creek near Sitka, Alaska, was installed in 1921 near the mouth of Sawmill Creek. It was retired upon completion of Blue Lake Dam. Data from this gage generally characterized Sawmill Creek streamflow prior to impoundment. The gage had a 29-year period of record that included water years 1921 and 1922, and 1929 to 1957. Median (the flow exceeded 50% of the time) flow at this gage was 390 cfs for the period of record. Extreme (highest or lowest among hourly recordings) low flow during this period was 9.1 cfs, and extreme high flow was 7,100 cfs.

Average monthly flows at this gage location ranged from 160 to about 800 cfs for the period of record.(Figures 5 and 6). As shown in the figure, flows were low in the winter, when much of the drainage basin was frozen. High flows occurred between May and September, due to snowmelt runoff and during October and November due to rain events. Streamflow variation was greatest in fall because of effects of individual storms or weather patterns. Average high flows rarely exceed 1100 cfs, and average low flows were often below 100 cfs.

Maximum daily flows from this period, however, ranged as high as 5,500 cfs, and minimum low flows fell to as low as 11 cfs. (Table 3). These extremes indicate the effects of heavy storms, cold periods and droughts, without the regulating effects of the reservoir.

Table 3. Maximum and Minimum Average Daily Flows in Sawmill Creek, by Month, for 29-year Period of Record. Original USGS Gage 15088000.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Max	2,270	2,410	1,250	1,050	1,640	1,780	2,170	4,940	4,980	5,500	4,430	3,770
Min	24	16	11	14	57	308	311	200	71	84	46	34

"New" USGS Gage, or "Lower Staff Gage".

In May 2001 the USGS installed a new gage on Sawmill Creek just downstream of the Blue Lake Powerhouse access bridge, approximately 400 feet from mean high tidewater. The USGS has assigned the original gage number, 15088000, to this new gage location. This gage is currently referred to as the "**Lower Staff Gage**" to distinguish it from the Upper Staff Gage described next. Continuous streamflows have been recorded at this gage by the USGS since May 17, 2001, but are not presented here because they are considered provisional by USGS pending a longer period of gage operation.

Upper Staff Gage.

A staff gage was installed on the footbridge near the FVU in 1995 for the stream gaging plan. Under this plan and subsequent orders, this gage is required to be read once every seven days. The Upper Staff Gage readings depict recent Sawmill Creek streamflow in the reaches between the FVU and the Blue Lake powerhouse.

Streamflow records from the Upper Staff Gage between 1996 and 2001 show that with-project flows in the reach below the FVU are less variable than before impoundment (Figures 7 through 9). As described in the Project Operation section, the FERC Project license requires a continuous minimum release of 50 cfs from

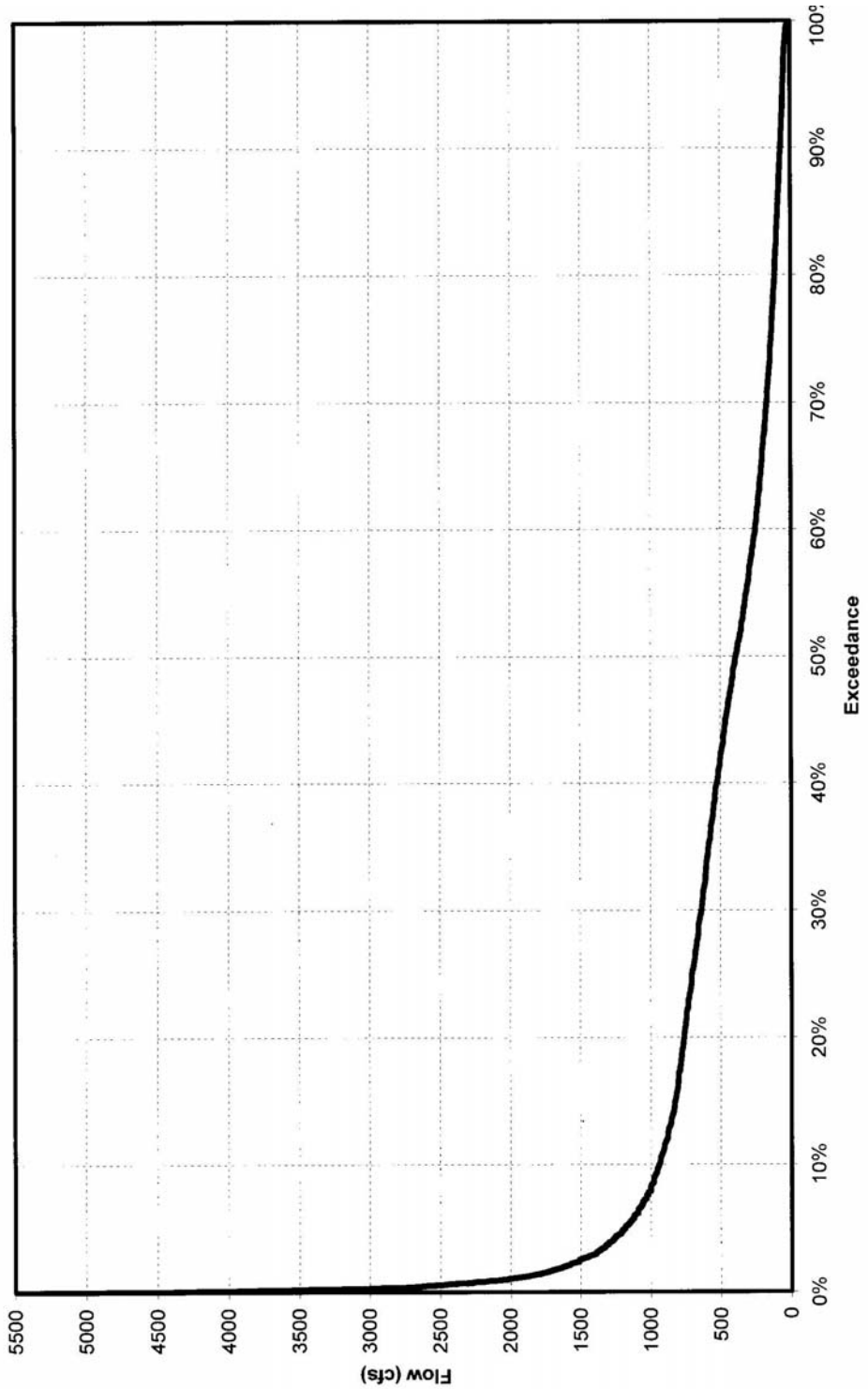


Figure 5. Exceedence Graph for Original USGS Gage, Sawmill Creek Near Sitka, Alaska.

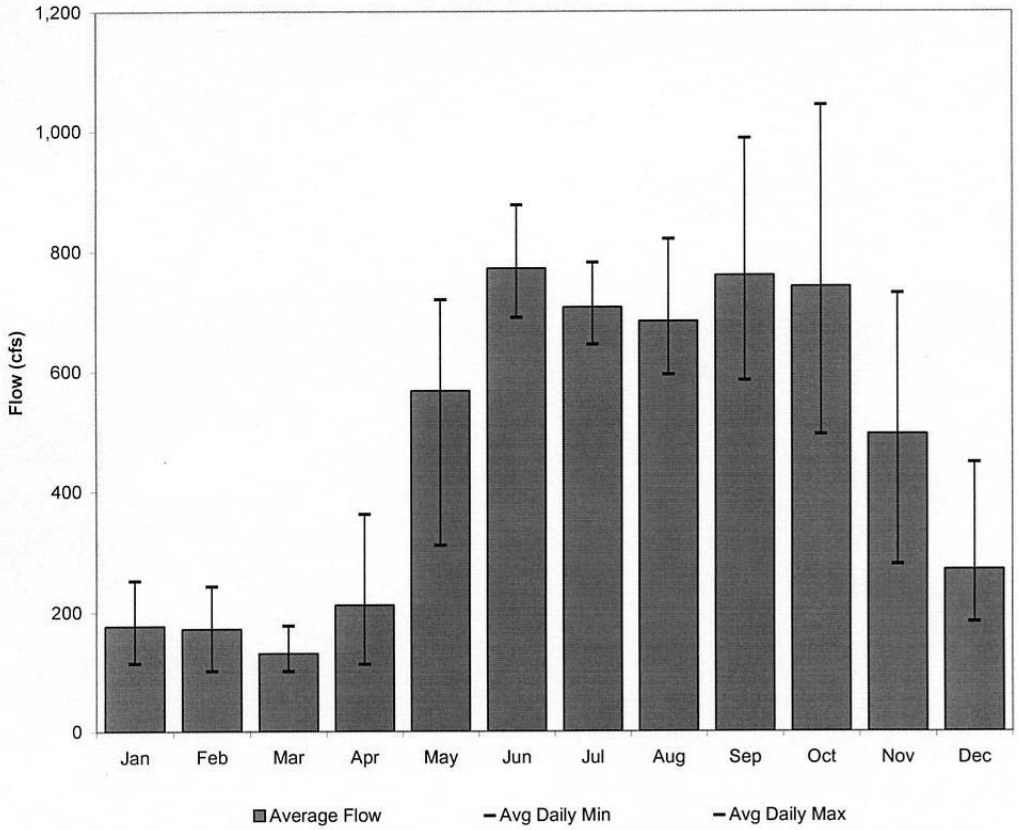


Figure 6. Average, average minimum, and average maximum streamflow, Original USGS Gage, Sawmill Creek near Sitka, Alaska.

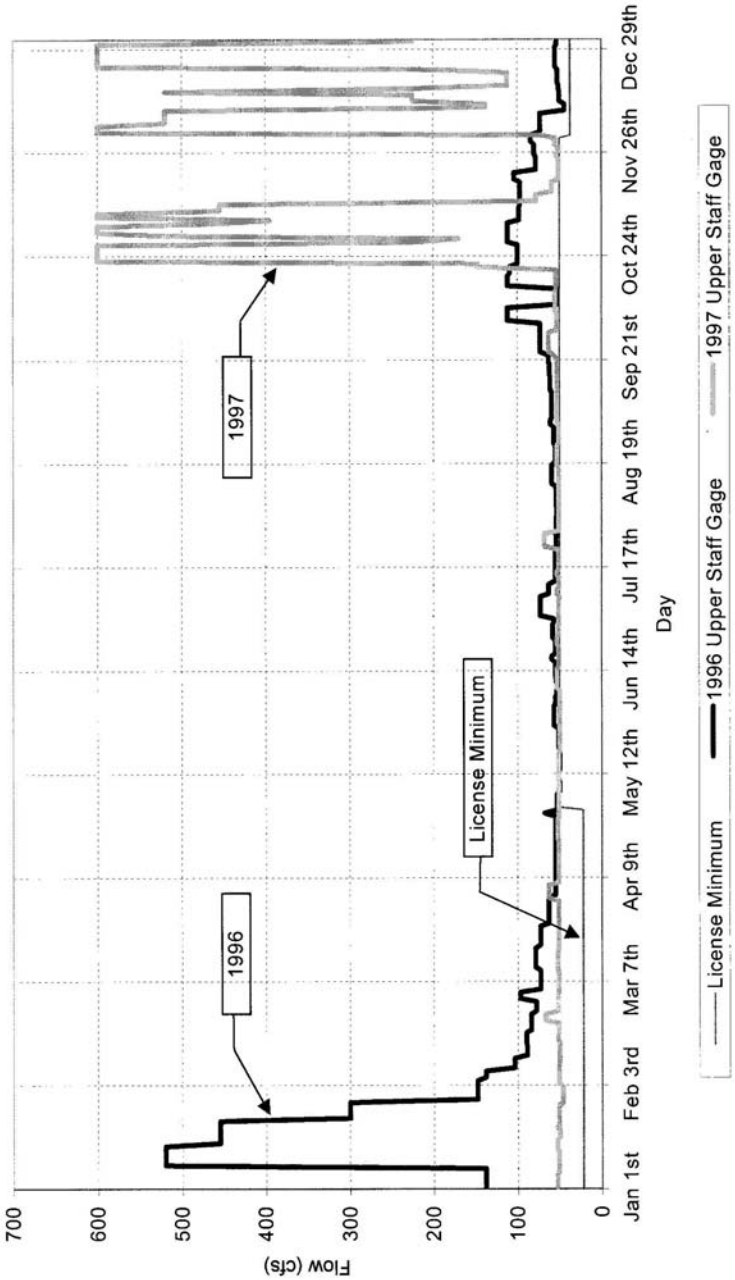


Figure 7. Sawmill Creek flows, 1996 and 1997, based on Upper Staff Gage weekly readings.

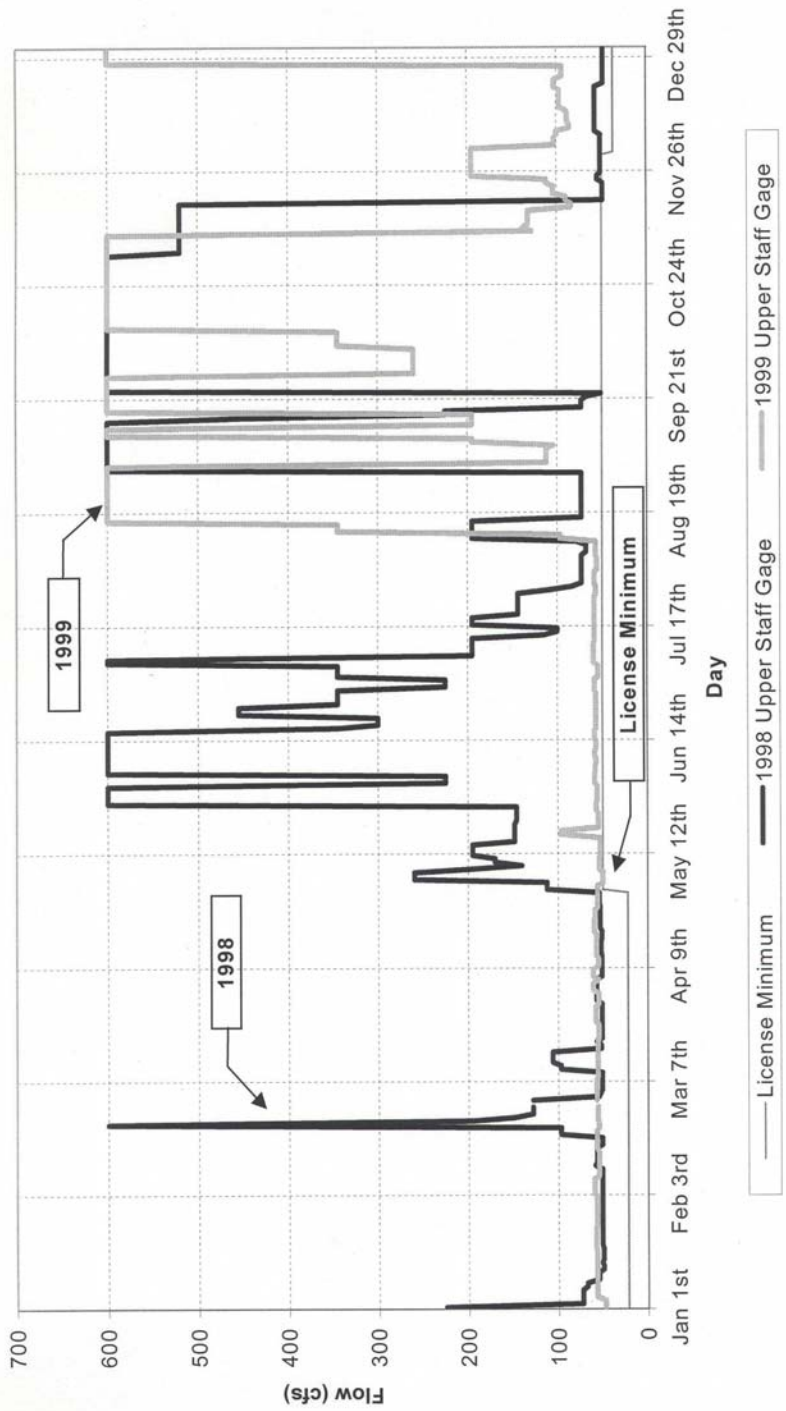


Figure 8. Sawmill Creek flows, 1998 and 1999, based on Upper Staff Gage weekly readings.

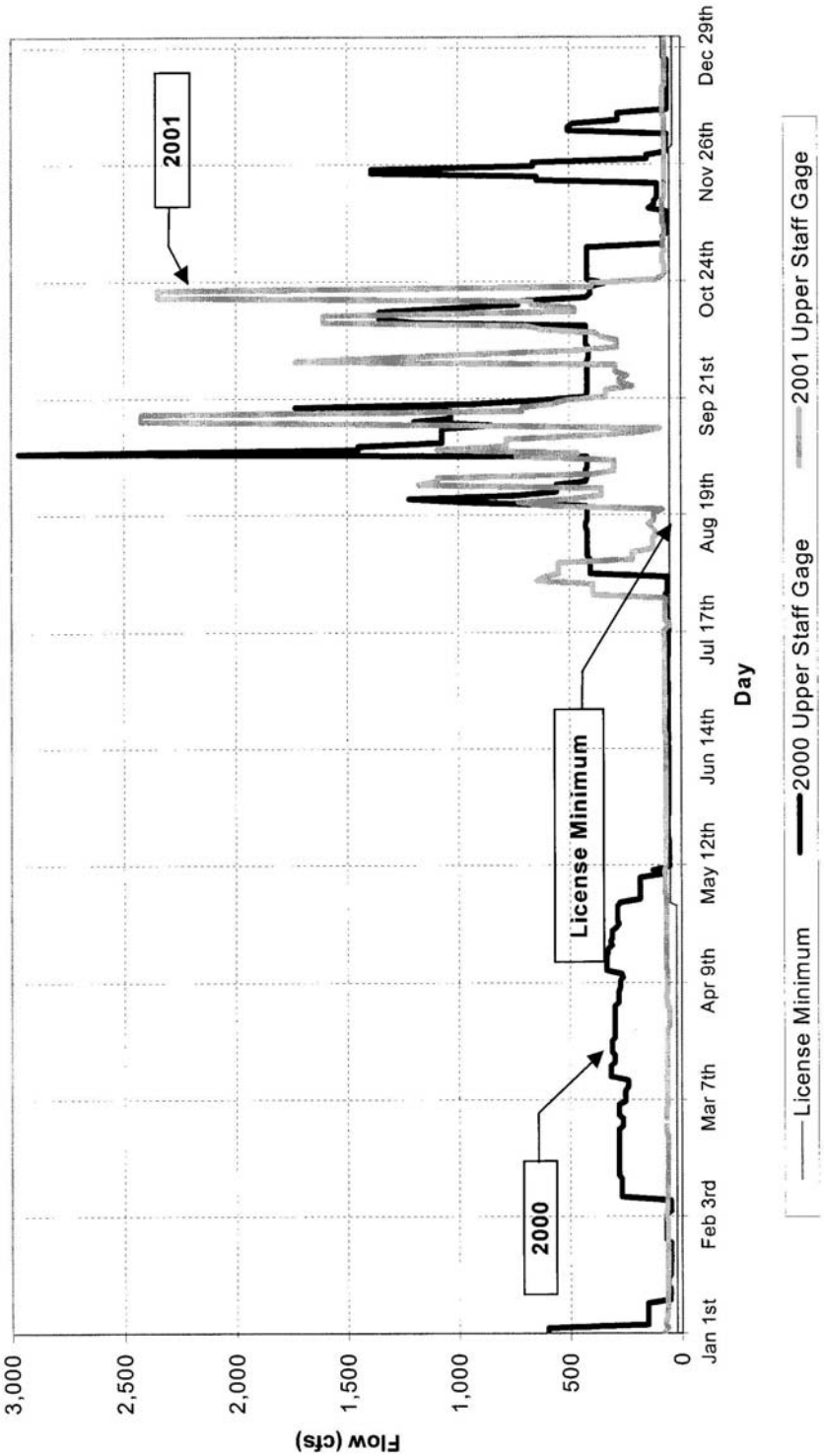


Figure 9. Sawmill Creek flows, 2000 and 2001, based on Upper Staff Gage weekly readings.

the FVU Powerhouse into Sawmill Creek. From January through April, however, the minimum release may be lowered from 50 cfs to 22 cfs when the surface elevation of Blue Lake reservoir falls below specified levels. The high flow events, which are well above the minimum flow requirements, reflect periods of spill at Blue Lake Dam. During these spill events, flow data from the Upper Staff Gage represents the total of the spill and the FVU releases.

AFFECTED ENVIRONMENT

GENERAL DESCRIPTION OF THE LOCALE

The following general description covers the area in the vicinity of Sitka and the Blue Lake project. In this document, we refer to two primary sub-areas of the project area: the **Blue Lake basin** ("Basin"), or the Basin area at or above the Blue Lake dam, and the **Sawmill Creek canyon**, or that area that drains into Sawmill Creek. As described in the Affected Environment section below, topography, vegetation and other natural resources vary between these two areas.

Physiography.

The topography in the vicinity of Sitka is rugged, rising from the sea to about 4,000 feet within 1.5 miles of the shoreline. Blue Lake lies in a narrow, U-shaped, glacially formed valley. The Sawmill Creek canyon is a steep, rugged, generally inaccessible valley formed primarily by stream erosional processes. Sawmill Creek is accessible by road only at the area near the US Forest Service campground at SM 1.14. From here, the stream enters the first of two steep-sided canyons. Except at the campground and at the bridge at SM 0.25, access to the canyon is difficult and often dangerous.

Climate.

Sitka's climate is classified as Coastal Maritime (marine), characterized by moderate temperatures, relatively high precipitation, and little seasonal variation The local weather pattern is shaped by three main factors: a pressure system that results in an almost year-round southerly flow of air; proximity to the ocean and consequent exposure to warm, moisture-laden air masses; and the rugged mountainous terrain of Baranof Island.

In 83 years of record, Sitka's warmest average monthly temperature, 67.3F, was recorded in August, 1927. The summer temperatures average around 60F and average monthly winter temperatures are seldom below freezing. The coldest average monthly temperature, 8.1F, was recorded in January, 1969. The summers

are considered cool, and by comparison to inland areas, the winters are considered warm.

Annual average precipitation in the Sitka area is 96.9 inches, approximately the same as the average for all of southeast Alaska. In an average year, there are 200 days with some form of precipitation. Precipitation increases with an increase in elevation. While no precipitation records are kept in the upper Basin regions, it is expected that rain and snowfall are significantly greater here than at sea level. Heaviest precipitation occurs during the fall and winter months, when the Pacific storms have their greatest frequency of movement into Gulf of Alaska and Sitka area. Precipitation occurs mostly as rain. Snowfall has very high water content, and averages 50 inches annually. The wettest month on record is October, with an extreme of 30.84 inches; the driest month on record is February, with an extreme of 0.43 inch.

Vegetative cover.

Vegetation in the Blue Lake basin is primarily Sitka spruce/western hemlock forest. Understory is composed of blueberry, huckleberry, devil's club, other forbes and mosses. There are no endangered plant species in the basin.

Population

The population of Sitka is currently estimated at about 8700. Sitka's population has been relatively stable for the past 9 years, owing largely to the 1993 closure of the APC pulp mill which had been the major local employer since it's construction in 1960. Sitka's economy now depends on commercial and sport fishing, tourism, government and local businesses.

Recreation on Sawmill Creek is limited by difficult access to the canyon areas. Nonetheless, Sawmill Creek is a popular sport fishing area, primarily for migratory steelhead trout and, to a lesser extent, salmon.

Recreation on Blue Lake is minimized by difficult and often dangerous terrain, and the fact that access to the Blue Lake watershed is limited by the City because of its use as part of Sitka's drinking water supply. The aesthetics of the basin are outstanding; indeed all of the Baranof range and the greater Sitka area are characterized by impressive vistas, mountain backdrops and lush forests and understory.

Land development.

No significant land development has taken place in the vicinity of the Blue Lake Dam, access road, tunnel and penstock since initial project construction. Development has occurred at the downstream end of Sawmill Creek, where the Blue Lake power plant, Sawmill Cove Industrial Park, and the City water treatment plant are located.

FISH, WILDLIFE and BOTANICAL RESOURCES.

Fisheries Resources

Potentially-Affected Fisheries Resources.

Blue Lake.

Blue Lake is a deep, cold and relatively clear (except following high rains or runoff) lake. The lake surface fluctuates due to precipitation and Project operations, with resultant variations in the lengths of the several tributaries which feed the lake. The major incurrent tributary is named Blue Lake Creek. On maps produced since impoundment of the Blue Lake dam, this tributary has been unnamed.

While there have been no recent (less than five years old) fisheries or aquatic resource studies done in Blue Lake, it is known from anecdotal evidence (primarily reports from sport fishers) and a 1994 report (Aram Der Hovanisian, 1994) that the lake is home to a significant population of rainbow trout (*Oncorhynchus mykiss*). It is not known whether rainbow trout were native to Blue Lake, but it is known that both resident rainbow and migratory rainbow (steelhead trout) inhabit Sawmill Creek.

Alaska Department of Fish and Game (ADF&G) records show that in 1938 and 1939 Blue Lake was stocked with rainbow trout of unknown stock and with 5000 anadromous rainbow (steelhead trout) of Sashin lake, AK, stock. In 1976, another 8,800 rainbow were stocked in the lake. No other fish species are currently known to inhabit Blue Lake.

Sawmill Creek.

Sawmill Creek is a generally clear, cold-water Alaskan stream which fluctuates according to operations of the Blue Lake hydroelectric project. Below the fish-valve unit, Sawmill Creek flows at slightly above 50 cubic feet per second (cfs) except when the project is spilling or during releases to create flood storage

headroom. The 0.4 mi. long reach from the base of the dam to the fish-valve unit is dewatered except when the project is spilling or during releases.

As part of fisheries studies conducted by a City of Sitka contractor in 2001 and 2002, Sawmill Creek reaches were named for easier orientation (Table 2). These reaches are also shown on Figure 2. All locations in the study report (Wolfe, 2002) were relative to Stream Miles (SM) upstream of mean low tidewater.

Table 2. Sawmill Creek Stream Reach numbering, from bridge near lower powerhouse upstream to base of Blue Lake Project dam.

Stream Reach and Location (Name)	Identifying Stream Characteristics
Reach 1.	Blue Lake Powerhouse Bridge (SM .27) upstream to top of **Index Area** (SM .48)
Reach 2.	Inlet of Index area pool to **Pulp Mill Outflow** (SM .58)
Reach 3.	From top of Pulp Mill Outflow pool to base of **Falls** (SM 0.78)
Reach 4.	From top of Falls to **Slo**t (SM 1.03)
Reach 5.	From Slot to fish valve unit (SM 1.10)
Reach 6.	From fish valve unit to base of Project dam (SM 2.31)

(The "**Index Area**" is a large pool just upstream of the bridge from which it is easy to observe incoming salmon and steelhead timing and abundance. The **Pulp Mill Outflow** is the point at which the PMFU discharges into Sawmill Creek. The "**Falls**" is a steep cascade or series of cascades estimated at nearly 20 feet in height. The "**Slot**" is a very narrow chute (less than 15 feet wide) which greatly constricts Sawmill Creek flow.)

In the summer and fall, 2001 surveys, Wolfe found the following fish species in lower Sawmill Creek:

Common Name	**Scientific Name**
Pink Salmon	*Oncorhynchus gorbuscha*;
Chum salmon	*O. keta;*

Coho Salmon	*O. kisutch; and*
King salmon	*O. tshawytscha.*

These salmon species were found at all observation locations below the Falls at SM 0.78. No salmon of any species or life stage was observed upstream of the Falls at SM 0.78. Generally, pink salmon were more abundant in August and early September, chum salmon in mid-to late September and coho salmon in September and October. King salmon were not numerous, probably because their numbers had peaked prior to the early September study initiation date. (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.)

During further surveys which began in spring, 2002, Wolfe has added Steelhead trout (*Oncorhynchus mykiss*) to the Sawmill Creek species list. His steelhead observations were limited, as were all earlier salmonid observations, to the area below the Cascade at SM 0.78.

Preliminary data from 2002 observations indicate that Sawmill Creek pink salmon are "even year" fish, that is, larger populations escape to the river in even numbered years than in odd years. Because of this annual variation, it will be necessary to document several run years to accurately determine the size of the pink salmon populations.

There is also evidence that not all fish which run up Sawmill Creek are fish of Sawmill Creek origin. Again, further studies through the relicensing period will seek to determine both run strength and origin of the various fish species.

The Alaska "Fish Catalogue" (ADF&G 1993 a and b) notes the presence of five species of anadromous salmonids (trout and salmon) as well as rainbow trout (*O. mykiss*) and Dolly Varden char (*Salvelinus malma*) in Sawmill Creek. The Atlas states that all anadromous fish species are to be found from tidewater to the base of Blue Lake dam.

Sport fishing in the Blue Lake basin is an important local activity. Anglers access Blue Lake via boats to catch the lake's resident rainbow trout. Bank anglers fish for steelhead in Sawmill Creek with moderate success.

Fisheries Studies.

The City expects to conduct, through a qualified and approved contractor, baseline surveys of fish populations, their habitats and general life histories in both Blue Lake and Sawmill Creek over the relicensing period. Study plans for these surveys will be developed in consultation with Alaska state and federal resource agencies, including ADF&G, National Marine Fisheries Service (NMFS) and the US Fish and Wildlife Service (FWS).

Blue Lake. Blue Lake surveys may include, but not limited to:

- Lake tributary surveys during spring to determine rainbow trout spawning periodicity;
- Population surveys of Blue Lake to determine species present and relative abundance:
- Benthic surveys to help determine the food source and bottom composition and structure of the lake.

Sawmill Creek. Sawmill Creek fisheries studies may include:

- Foot surveys and various capture techniques to determine overall species composition and life history;
- Instream habitat surveys to determine effects of flow regime on fish habitat;
- Invertebrate studies to determine resident and juvenile fish food source and overall benthic diversity;
- Water quality surveys to determine the production potential of the stream, and to serve as monitoring base of any future construction activities.
- Detailed studies of the hydraulic properties of the Falls at SM 0.78 to better determine its potential as a barrier to upstream fish migration.

Wildlife Resources.

Potentially-Affected Wildlife Resources.

Generally, the Blue Lake basin is not considered a major area for wildlife production or utilization, in comparison to other areas in Southeast or greater Alaska. Wildlife resources are described in this document in three categories: 1) large mammals, 2) small mammals 3) birds. Only three species of large mammals are known to inhabit the Blue Lake basin, including:

Common Name	Scientific Name
Brown bear	*Ursus arctos*
Mountain goat	*Oreamnos americanus*
Sitka black-tailed deer	*Odocoileus hemionus sitkensis*

A variety of small mammal species inhabit Baranof Island and may be found in the Blue Lake basin, including the following:

Common Name	Scientific Name
River otter	*Lutra canadensis*
Pine marten	*Martes americana*
Beaver	*Castor canadensis*
Mink	*Mustela vison*
Red squirrel	*Tamiasciurus hudsonicus*
Keen's mouse	*Peromiscus keeni*
Common shrew	*Sorex cinereus*
Tundra vole	*Microtus oeconomus*
Short-tailed weasel	*Mustela erminea*
Little brown bat	*Myotis lucifigus*

Birds known or expected to occur in the Sawmill Creek basin are:

Common Name	Scientific Name
Bald eagle	*Haliaeetus leucocephalus*
Dipper (Water ouzel)	*Cinclus mexicanus*
American merganser	*Mergus merganser americanus*

Willow ptarmigan	*Lagopus lagopus*
Rock ptarmigan	*Lagopus mutus*
Mallard	*Anas platyrhynchos*
Harlequin Duck	*Histrionicus histrionicus*
Northern goshawk	*Accipiter gentilis*
Marbled murrelet.	*Brachyramphus marmoratus*
Belted kingfisher	*Megaceyrle alcyon*
Raven	*Corvus corax*
Spruce Hen	*Canachites canadensis*

During annual migrations, several waterfowl species use Blue Lake as a resting place, including trumpeter swan, tundra swan, pintail, green-wing teal, hooded merganser, northern shoveler, redhead and lesser and greater scaup, among other less abundant waterfowl species.

Although Baranof Island offers habitat for numerous songbird species, no significant songbird populations are known to use the Blue Lake basin year-round.

The Blue Lake basin is used as a hunting destination, primarily for deer and mountain goats. Most hunting occurs in the upper basin, above Blue Lake because of an Alaska state prohibition against big game hunting within ¼ mile of a road, which eliminates most hunting in the accessible areas of Sawmill Creek canyon. North of Blue Lake where the mountain slopes approach blue lake, there is well defined winter range for goats offering nearby cliffs for escape cover. Blue Lake is used as boat access to hunting areas for these goats and for deer.

The Blue Lake basin is not known for its small mammal or bird hunting opportunities, although there is probably some ptarmigan hunting, either directed or secondary to deer and goat hunting. There is likely some duck hunting on Blue Lake, although recreation on Blue Lake is discouraged, although not prohibited, by the City.

There is some trapping for marten, mink and river otter throughout the Blue Lake basin, but little is known of specific trapping sites or takes.

Wildlife Studies.

The City expects to conduct wildlife surveys during the relicensing period. All wildlife-related study plans will be developed in association with Alaska state and federal resource agencies, including ADF&G and the FWS. Typically, wildlife surveys include:

- Ground surveys to determine large mammal habitat utilization and food habits;
- Small mammal trapping, to determine distribution and relative abundance of small mammals; and
- General visual and trapping observations of birds.

Botanical Resources.

Potentially-Affected Botanical resources.

The primary vegetative cover of the Blue Lake basin is mixed Sitka spruce and western hemlock forest with some mountain hemlock in the higher elevations. The wet areas in the lower parts of the basin are vegetated with yellow and red alder. Understory throughout the Basin consists primarily of devils' club, blueberry and huckleberry. In the higher elevations there are limited area of dryas forbe tundra. At the upper end of Blue Lake are sedges and grass flats, but the sedges are not well developed because of the recent inundation due to the impoundment of the lake by Blue Lake dam. Yellow cedar is found, though not common, in the mid-elevation forest, and there are limited bog-fen areas in the low-gradient areas of the Basin. In the bog-fen areas, overstory is beach pine.

There is no active logging in the Blue Lake basin, and the current Forest Plan does not forecast logging in the planning term. The Plan lists no sensitive plant species, and there are no listed endangered plants in the Basin. Although there are no designated wetlands in the Basin, it is expected that such areas, as defined by regulations enacted after licensing, do exist.

Botanical Studies.

The licensee intends to conduct baseline surveys for potentially-affected botanical resources, according to study plans approved by USFS, ADF&G and perhaps other agencies. Typically, baseline plant surveys include:

- Aerial inventories of vegetative type, primarily from existing imagery;
- Foot surveys, to ground-truth the aerial inventories;
- A Preliminary Jurisdictional Determination (PJD), to determine location, type, function and extent of wetlands, uplands, and Waters of the US in the Project area;
- Sensitive Plant surveys, if deemed necessary in consultation.

GEOLOGIC AND SOIL RESOURCES.

Potentially Affected Geologic and Soil Resources.

The Blue Lake basin is generally characterized by steep slopes and evidence of recent erosional processes primarily related to glacial retreat within the past 10,000 years.

Baranof Island in the Project area consists of a core of Cretaceous granitic rocks, primarily quartz diorite, which have been intruded into metamorphosed sedimentary rocks on the east and west sides of the island. These sedimentary rocks include graywacke, phyllite, argillite, and meta-conglomerate. Geologic history of the area is complex, with alternate periods of sediment accumulation followed by or concurrent to igneous intrusions, and subsequent folding or metamorphism. Quality of the rock in the Blue Lake dam area has been characterized as high in recent FERC dam safety inspection reports.

Southeast Alaska is a zone of high seismicity. The Project area is in an active tectonic belt associated with plate boundaries along the Pacific rim. Similar boundaries as far south as northern California are responsible for significant volcanism and associated seismic activity. Three major faults form the southwest, northeast, and southeast sides of Baranof Island. The Chichigof-Sitka Fault traverses the island on a northwest southeast trend near Sitka and passes through Silver Bay within a mile of the Blue Lake dam.

The Blue Lake basin is not rich in extractable mineral deposits, and there is no evidence of recent mining either in the basin or in the greater area of western Baranof Island.

The soils in the basin are considered thin and of poor general quality, because of extreme rainfall, high gradient slopes and leaching. Soil stability is poor in many areas of the Basin, resulting in road failures and small landslides.

Geology and Soils Studies.

At this time the City does not envision further geologic or soils studies, based on availability of existing data from dam safety inspections, and the fact that there have been no changes in the area due to earthquakes, road building or other major construction. If, through the relicensing process, it is decided that major construction is necessary (unlikely at this time), or if a natural event changes the geologic or soils baseline, the City will determine through consultation which studies might be necessary.

CULTURAL RESOURCES.

Potentially Affected Cultural Resources.

Before issuance of a new license, the FERC will require compliance with Section 106 of the Historic Preservation Act of 1966 (HPA). The Act requires federal agencies to protect or mitigate for the loss of archaeological, historical or cultural properties that are listed or eligible for listing on the National Register of Historic Places (National Register). In the case of the Blue Lake project, there might be two potentially-eligible types of sites: 1) Project elements such as powerhouses, penstocks or buildings and 2) archaeologic or historic sites.

It is generally believed that no project features themselves are of sufficient age or character to be eligible for listing on the National Register.

Preliminary inquiries of the Alaska Department of Natural Resources, State Historic Preservation Office (SHPO), US Forest Service (USFS) and the Sitka Tribe have indicated that there are no currently-known Historic or Archaeological sites or resources within the project area. The area of Baranof Island occupied by the project is within the original range of the Sitka Tribe, who inhabited primarily the coastal zones of the area. The Sitka Tribe may have utilized the Medvetcha River basin for various subsistence and spiritual purposes, but because of the steep slopes, heavy vegetative cover and difficult access, probably did not occupy the area for either permanent or temporary housing.

Experience in other developments in Southeast Alaska has shown that tribes often left culturally modified trees (CMT's, trees with blazes or marks indicating bark gathering) and had questing sites or areas in which tribe members sought visions which might offer insights into the future.

Cultural Resources Studies.

The City intends to conduct, using a qualified and approved contractor, an inventory of cultural resources sufficient to document the following:

- Eligibility of any project feature for listing the National Registry of Historic Places (it is generally thought that no project feature is currently eligible);
- Existence of cultural resources within areas currently occupied by project features, or in areas which might be affected by future project use such as road clearing, logging or other ground clearing.

These surveys will be in two stages: Stage I survey would be less-intensive reconnaissance surveys designed to define the direct and indirect impact area of the project and the potential of the areas for containing sites. The more intensive Stage II surveys would follow in those areas identified in the stage I surveys as having a reasonable likelihood of containing sites.

The scope of all survey work will be determined in consultation with the SHPO the USFS and the Sitka Tribe.

WATER QUANTITY AND QUALITY.

Water Quantity.

Existing Water Uses and Quantity

The waters of Blue Lake and Sawmill Creek are important to the City and Borough of Sitka both for their use in generating electricity and for use as potable water supply. Blue Lake is the City's primary water source, supplying 4 million to 8 million gallons of water per day (mgd) through the treatment plant located alongside the lower penstock. The secondary City water supply is provided from Indian River which runs through the southeast portion of Sitka.

Blue Lake water is also used, under agreements with the City, to supply a bottled water plant located at the SCIP, owned and operated by Sitka Beverage Company. Finally, a bulk water export operation, Global Water Company, holds rights from the City to export bulk water from the Blue Lake basin via a dock in Silver Bay.

Drawdown of Blue Lake is controlled by various operational rules related to the FERC license and amendments or to the City's operational criteria. As described in the Project Hydrology Section, above, maximum drawdown in most cases, is to El 280, or about 60 feet below the spillway elevation.

The monthly streamflow regime in Sawmill Creek is described in more detail in the Project Operation section, but is generally determined by project operations in three separate stream segments: 1) from the dam face to the fish valve unit; 2) from the fish valve unit to the project tailrace, and 3) from the project tailrace to tidewater. Streamflows in these three areas are governed by various conditions of the original project license and subsequent amendments (Table 3).

Table 3. Sawmill Creek streamflow requirements and governing conditions in various stream reaches.

Stream Reach	Streamflow Requirement	Governing Condition
From dam face to Fish Valve Unit.	0 cfs except when project is spilling or releasing.	Original License.
From Fish Valve Unit to Project Tailrace.	50 cfs except when project is spilling or releasing. See Project Operation Section.	Original License and Amendments.
From Project Tailrace to Tidewater.	Unrestricted. (50 cfs by default)	None.

Water Use and Quantity Studies.

No studies of water use and quantity are planned. The City will be required to present all relevant lake level and volume and streamflow data in the Application material, and it is to the City's benefit to evaluate all possible ways in which available project water might be used on relicensing. The City will track all events regarding water rights and uses from the Blue Lake basin, in consultation with the Alaska Department of Natural Resources (ADNR) and will report on the status of those rights and uses as they affect the relicensing as changes occur.

Water Quality.

Existing Blue Lake and Sawmill Creek Water Quality

While no extensive water quality studies have been performed in the Basin, the City routinely monitors quality of Blue Lake water at the City's water supply tap. Water from this location is monitored continuously for turbidity and on a daily basis for pH and temperature. Less frequently, the City monitors concentrations of lead and copper and fecal coliform bacteria.

Quality of Blue Lake water, as monitored by the City, is quite high. The water is neutral or slightly acid, unbuffered by carbonate salts or other sources of alkalinity, cold, and quite clear. Because of the lack of industry and human habitation in the basin, there is little potential for input of fecal coliform bacteria, industrial chemicals or by-products, or development-related runoff products such as sediment, fertilizers or petroleum residues. Some glacially-produced sediment enters Blue Lake from a small lake (known as Glacier Lake) high in the Basin. Sediment concentrations below Blue Lake have remained consistently low, to the extent that no filtration is required to meet drinking water standards.

Although no routine water quality surveys are conducted in Sawmill Creek, it is expected that its water quality is similar to that at the water supply tap. Only runoff from Beaver Lake might cause differences in water quality between waters emanating from Blue Lake and those in the middle reaches of Sawmill Creek.

Water Quality Studies.

Water quality studies for relicensing generally focus on characterization of the temperature, dissolved oxygen, dissolved solids and clarity (turbidity) of waters affected by the project or which may be affected if the project operation is changed. These water quality parameters are measured either continuously or periodically (seasonally, daily or weekly), using modern equipment capable of high accuracy and reliability.

The City intends to conduct water quality surveys of both Blue Lake and Sawmill Creek water, but will determine the exact sampling methods, locations and frequency through the consultation process. Water quality study plans will be reviewed by Alaska state and federal resource agencies, including Alaska Department of Environmental Conservation (ADEC), the agency responsible for water quality standard compliance.

PROJECT ALTERNATIVE(S).

The FERC regulations require that the ICD present any alternative project designs or operations as they may be known at the time of submittal. The City has begun the process of evaluating alternative operations and designs, and will intensify efforts in this area as we receive input from the stakeholders.

The only alternative design which has been considered would involve raising the dam height to increase storage capacity. The generation, economic and environmental consequences of this change would be complex, and will be discussed in detail during the relicensing process.

REFERENCES

Aram Der Hovanisian, John. 1994. Stock assessment of rainbow trout in a southeast Alaska impoundment. Master's thesis, University of Alaska, Fairbanks. 164 pp.

ADF&G. 1993a. Catalog of Waters Specified as Important for the Spawning, Rearing, or Migration of Anadromous Fishes. ADF&G Habitat and Restoration Division, Anchorage, AK.

ADF&G. 1993b. Atlas to the Catalog of Waters Specified as Important for the Spawning, Rearing or Migration of Anadromous Fishes. ADF&G Habitat and Restoration Division, Anchorage AK.

City and Borough of Sitka, Alaska, 1990. Application for Amendment of License for the Blue Lake Hydroelectric Project, FERC No. 2230. Prepared by R.W. Beck and Associates.

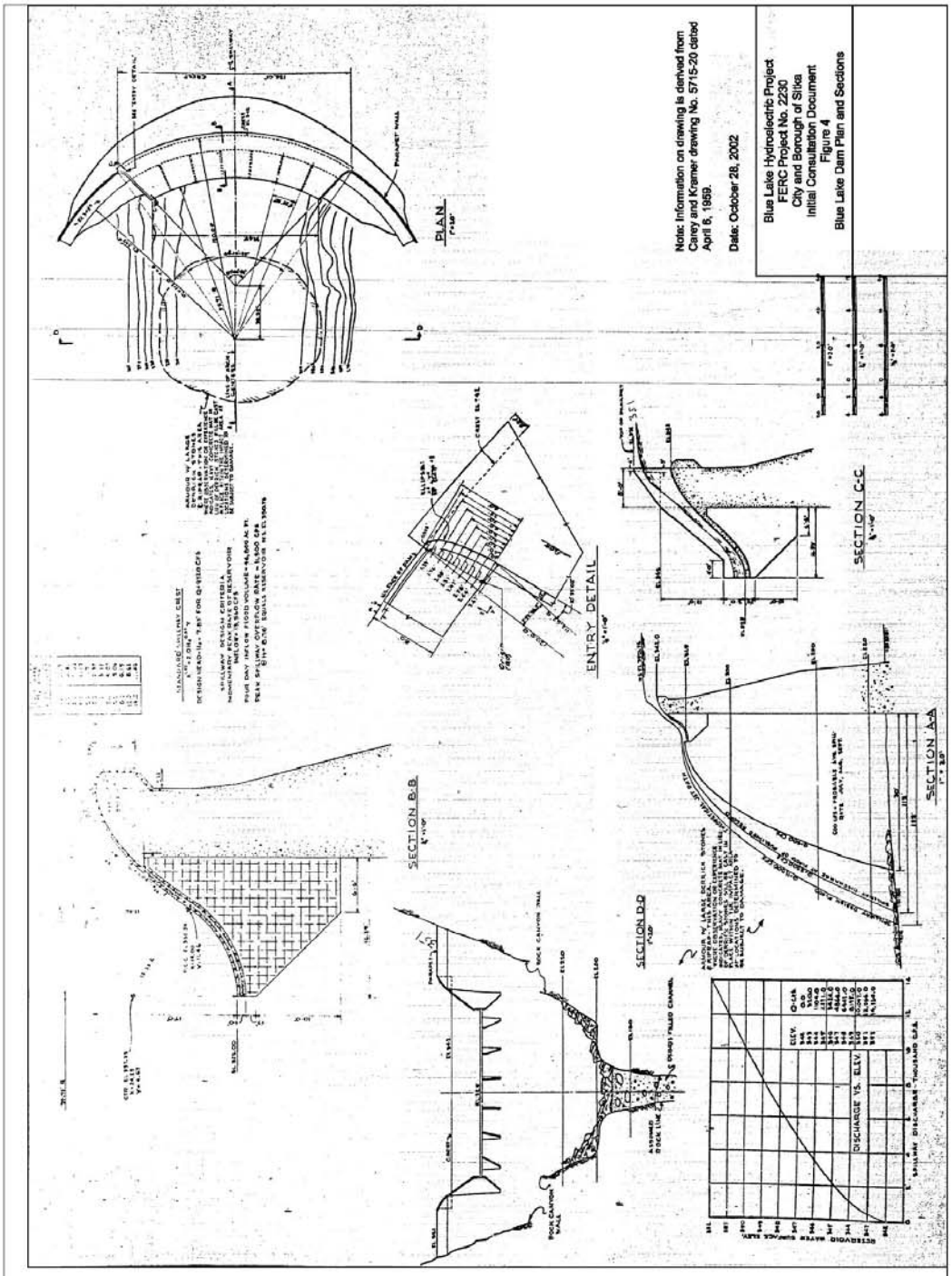
Wolfe, Karl, 2002. Fisheries Survey Annual Report, Sawmill Creek, 2001. Blue Lake Project, Federal Energy Regulatory Commission (FERC) No. 2230. Available at City and Borough of Sitka Electric department.

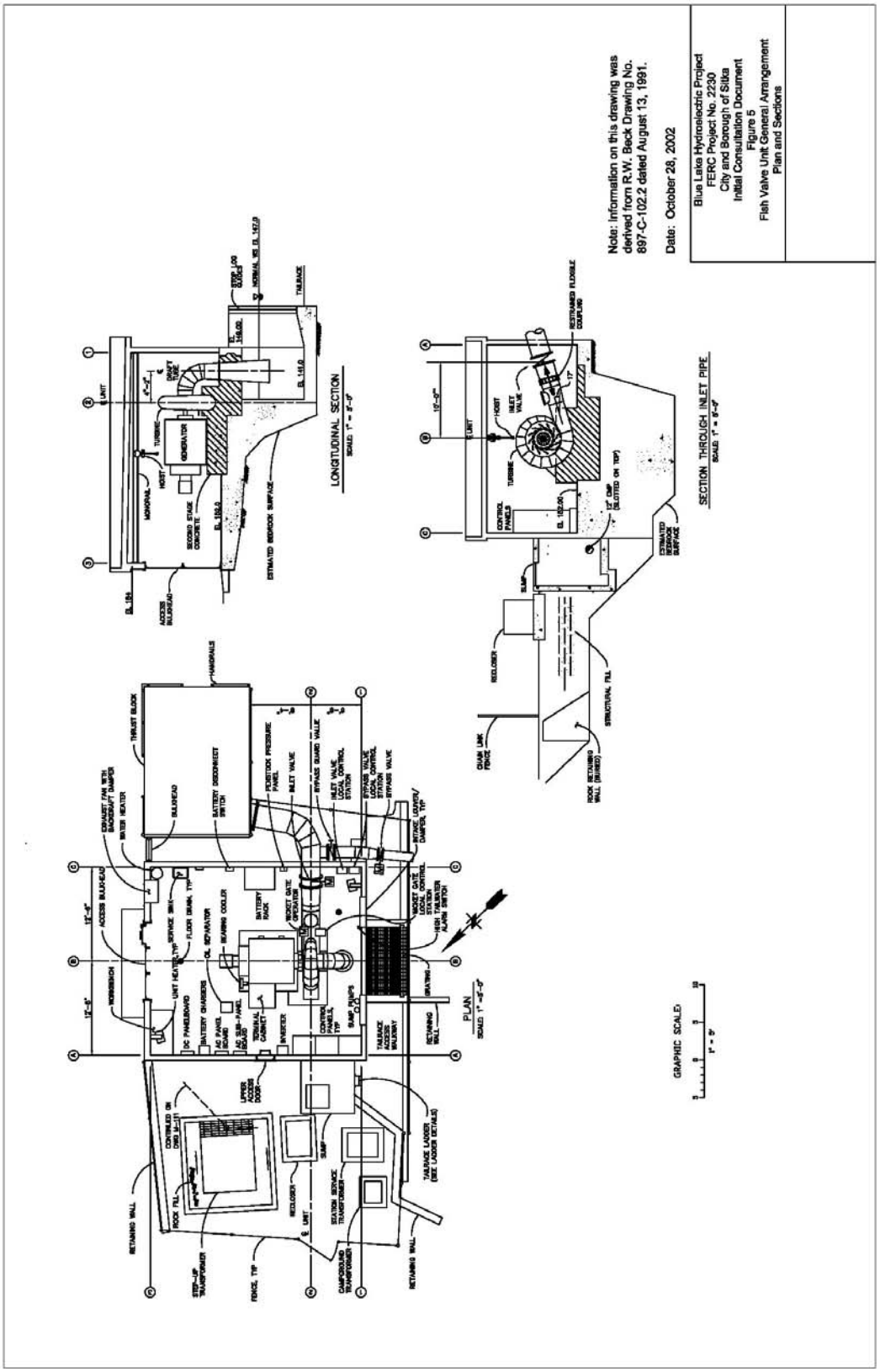
GLOSSARY OF ACRONYMS

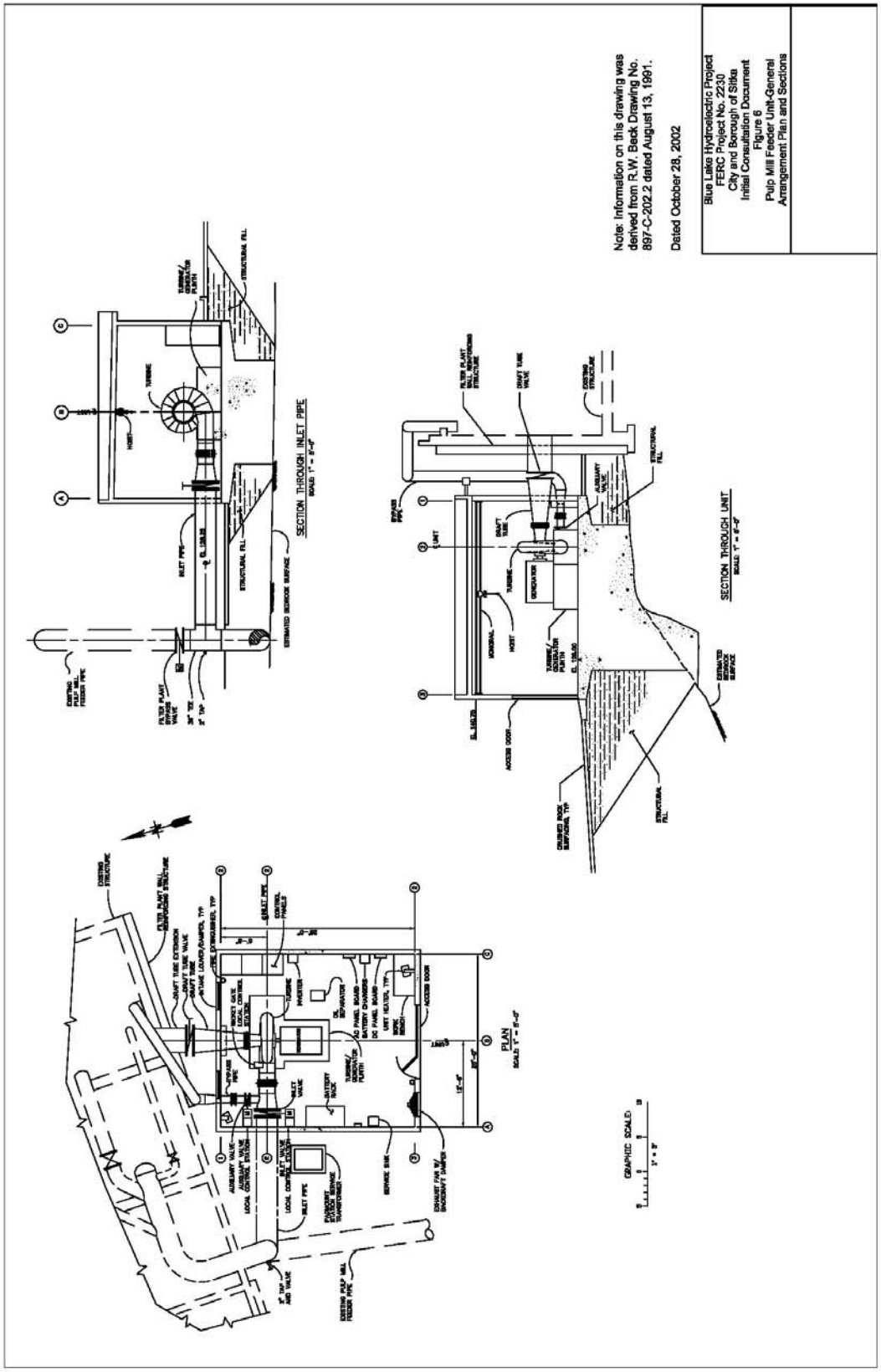
ADEC	**Alaska Department of Environmental Conservation**
ADF&G	**Alaska Department of Fish and Game**
ADNR	**Alaska Department of Natural Resources**
af	**Acre foot or feet**
ALP	**Alternative Licensing Process**
APC	**Alaska Pulp Company**
Cfs	**Cubic foot or feet per second**
CMT	**Culturally-Modified tree**
EA	**Environmental Assessment**
FERC	**Federal Energy Regulatory Commission**
FPA	**Federal Power Act**
FVU	**Fish Valve Unit**
FWS	**United States Fish and Wildlife Service**
HPA	**Historic Preservation Act**
ICD	**Initial Consultation Document**
kW	**Kilowatt**
mgd	**Million gallons per day**
mw	**Megawatt**
NEPA	**National Environmental Policy Act**
NGO	**Non-governmental Organization**
NMFS	**National Marine Fisheries Service**
PJD	**Preliminary Jurisdictional Determination**
PMFU	**Pulp Mill Feeder Unit**
SCIP	**Sawmill Cove Industrial Park**
SHPO	**State Historic Preservation Officer**
SM	**Stream Mile**
USFS	**United States Forest Service**
USGS	**United States Geological Survey**

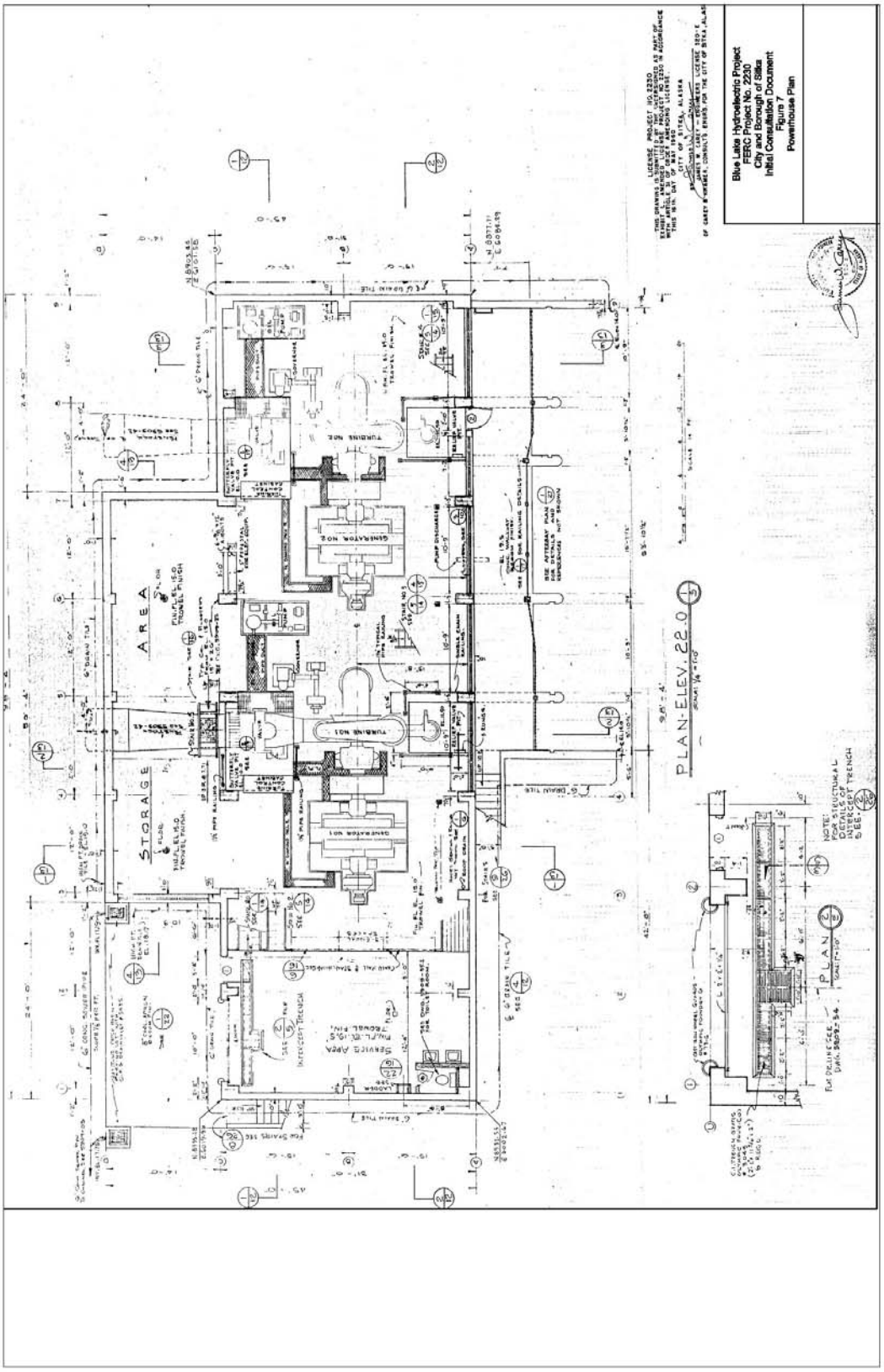
APPENDIX

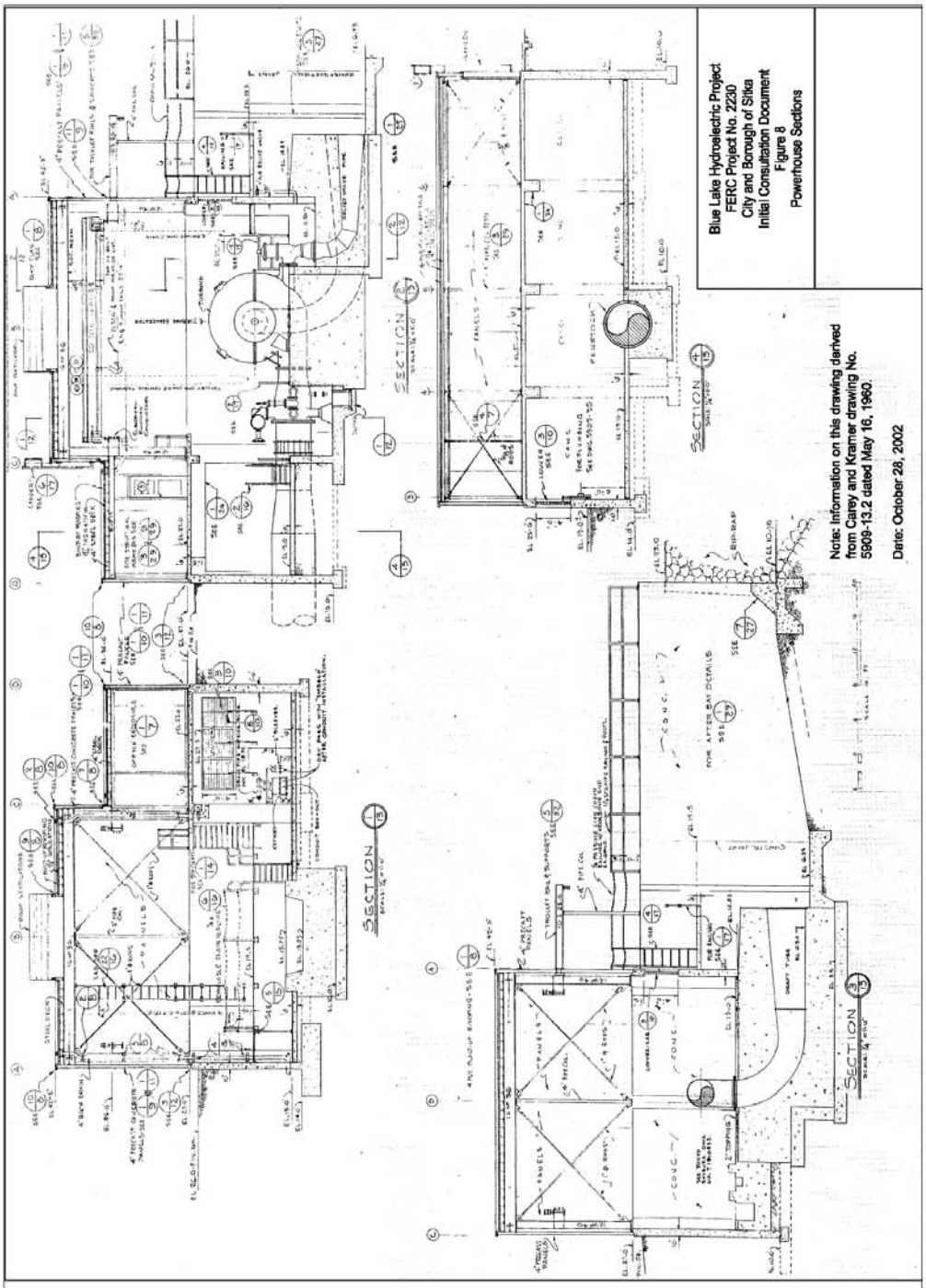
Blue Lake Project Design Drawings
(Not all drawings represent exact as-built dimensions or locations)


PLAN
ENTRY DETAIL
SECTION C-C
SECTION B-B
SECTION D-D
SECTION A-A
DISCHARGE VS. ELEV
Note: Information on drawing is derived from Carey and Kramer drawing No. 5715-20 dated April 6, 1959.
Date: October 28, 2002
Blue Lake Hydroelectric Project
FERC Project No. 2230
City and Borough of Sitka
Initial Consultation Document
Figure 4
Blue Lake Dam Plan and Sections


Note: Information on this drawing was derived from R.W. Beck Drawing No. 897-C-102.2 dated August 13, 1991.
Date: October 28, 2002
Blue Lake Hydroelectric Project
FERC Project No. 2230
City and Borough of Sitka
Initial Consultation Document
Figure 5
Fish Valve Unit General Arrangement
Plan and Sections
LONGITUDINAL SECTION
SCALE: 1" = 5'-0"
SECTION THROUGH INLET PIPE
SCALE: 1" = 5'-0"
PLAN
SCALE: 1" = 5'-0"
GRAPHIC SCALE:
1" = 5'


Note: Information on this drawing was derived from R.W. Beck Drawing No. 897-C-202.2 dated August 13, 1991.
Dated October 28, 2002
Blue Lake Hydroelectric Project
FERC Project No. 2230
City and Borough of Sitka
Initial Consultation Document
Figure 6
Pulp Mill Feeder Unit-General Arrangement Plan and Sections
SECTION THROUGH INLET PIPE
SECTION THROUGH UNIT
PLAN
GRAPHIC SCALE


Blue Lake Hydroelectric Project
FERC Project No. 2230
City and Borough of Sitka
Initial Consultation Document
Figure 7
Powerhouse Plan
PLAN-ELEV. 22.0
PLAN
STORAGE
AREA
TURBINE NO.2
TURBINE NO.1
GENERATOR NO.2
GENERATOR NO.1
SERVICE AREA


SECTION
SECTION
SECTION
SECTION
Blue Lake Hydroelectric Project
FERC Project No. 2230
City and Borough of Sitka
Initial Consultation Document
Figure 8
Powerhouse Sections
Note: Information on this drawing derived from Carey and Kramer drawing No. 5909-13.2 dated May 16, 1960.
Date: October 28, 2002

MAILING LIST

Clayton Hawkes
Alaska Department of Fish and Game
Habitat and Restoration Division
P.O. Box 240020
Douglas, Alaska 99824-0020

Alaska Dept. Of Fish & Game
Att: Christopher Estes
Sport Fish Division
333 Raspberry Road
Anchorage, AK 99518-1599

Jason Mouw
Alaska Department of Fish and Game
Division of Sport Fish/RTS
P.O. Box 240020
Douglas, Alaska 99824-0020

Phil Mooney, Habitat Biologist
Alaska Department of Fish and Game
Habitat and Restoration Division
304 Lake Street, Room 103
Sitka, Alaska 99835-7563

Alaska Department of Natural Resources,
Division of Water
Att: John Dunker
400 W. Willoughby
Juneau, AK 99801-1724

Sitka Tribe of Alaska
Att: Lisa Gassman
P.O. Box 1001
Sitka, AK 99835

U.S. Geological Survey
Attn: Bruce Bigelow
P.O. Box 1568
Juneau, AK 99801

Carol Goularte
US Forest Service
Sitka Ranger District
204 Siginaka Way
Sitka, AK 99835

Kevin Brownlee
Alaska Department of Fish and Game
Division of Sport Fish/RTS
P.O. Box 240020
Douglas, Alaska 99824-0020

Bob Chadwick
Alaska Department of Fish and Game
Division of Sport Fish
304 Lake Street, Room 103
Sitka, Alaska 99835-7563

Jack Whitman, Area Wildlife Biologist
Alaska Department of Fish and Game
Division of Wildlife Conservation
304 Lake Street
Room 103, Sitka, Alaska 99835-7563

US Fish and Wildlife Service
Attn: Richard Enriques
3000 Vintage Blvd., Suite 201
Juneau, Alaska, 99801.

Alaska Department of Environmental Conservation
Att: Jim Powell
410 Willoughby Ave
Juneau, AK 99835

Division of Governmental Coordination
Att: Lorraine Marshall
240 Main Street, Suite 500
Juneau, AK 99811-0030

National Marine Fisheries Service
Att: Linda Shaw, Habitat Biologist
P.O. Box 21668
Juneau, AK 99802-1668

Mike Johnson
US Forest Service
Sitka Ranger District
204 Siginaka Way
Sitka, AK 99835

Lorraine Thomas
Tongass National Forest
8465 Old Dairy Road
Juneau, AK 99801-8041

Margaret Beilharz
Blue River Ranger District
P.O. Box 199
Blue River, OR 97413

Roger Birk,
US Forest Service
Alaska Region (R-10)
PO Box 21628
Juneau, AK 99802-1628

City and Borough of Sitka
Attn: Marlene Campbell
100 Lincoln St.
Sitka, Alaska, 99835

Bill Keller
Unit Coordinator, US Army Corps of Engineers
PO Box 6898
Elmendorf AFB, AK, 99506

State Historic Preservation Officer
Att: Judith Bittner
3601 C St., Ste. 1278
Anchorage, AK 99503

Federal Energy Regulatory Commission
Portland Regional Office
Att: Harry Hall
101 S.W. Main St., Suite 905
Portland, OR 97204

Federal Energy Regulatory Commission
Attn: Nick Jayjack
Office of Energy Projects
888 First St., NE
Washington D.C. 2042