STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF SPORT FISH

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May 19, 2011

Ms. Kimberly Bose, Secretary
Federal Energy Regulatory Commission
888 First Street
Washington D.C. 20426

RE: "NOTICE OF DRAFT LICENSE APPLICATION AND PRELIMINARY DRAFT ENVIRONMENTAL ASSESSMENT (PDEA) AND REQUEST FOR PRELIMINARY TERMS AND CONDITIONS" Project No. 12495-001

SUBJECT: ADF&G Comments on DLA, PDEA and request for Terms and Conditions

Dear Ms. Bose:

Following are Alaska Department of Fish and Game (ADF&G) comments on the Draft License Application (DLA), Preliminary Draft Environmental Assessment (PDEA) and the Request for Preliminary Terms and Conditions. The use of italics identifies applicant statements in the DLA and PDEA filings, identifies statements of the applicant in previous filings as well as information from other sources. Information from other sources or previous documents is referenced in footnotes.

On February 11, 2011, Cascade Creek LLC filed, with the commission, a DLA and PDEA for a hydroelectric project to be located on Swan Lake in the Cascade Creek watershed near Petersburg, Alaska. On February 18, 2011, FERC published notice of receipt of the DLA and

PDEA and issued a request for comments on the DLA and PDEA as well as for Preliminary Terms and Conditions for this project. The Alaska Department of Fish and Game (ADF&G) have reviewed these documents and offers the following preliminary comments. In this document, ADF&G will provide comments and identify preliminary terms and conditions pursuant to §10(j) of the Federal Power Act. In addition, the following stipulations are also necessary to ensure that your project is consistent with the ACMP (6 AAC 80) and AS 16.05.841 and 16.05.871.

PROJECT DESCRIPTION

The proposed project is located in the Cascade Creek watershed which flows into Thomas Bay near Petersburg, Alaska. Water is proposed to be siphoned from Swan Lake, greatly reducing flows to Cascade Creek. Water will travel down a penstock and through a powerhouse, which will be located near tidewater, and will be released through a tailrace into Thomas Bay.

The proposed project will consist of the following: (1) a low-head weir on Swan Lake with a 3-foot-high, 50-foot-long crest gate and an intake siphon; (2) a 16,000-foot-long, 12 to 14-foot diameter unlined power conduit; (3) an 780-foot-long, 9-foot-diameter steel penstock from the power conduit to the powerhouse; (4) a 140-foot by 80-foot concrete and metal powerhouse containing three turbines with a capacity of 70 megawatts (MW); (5) an approximately 18.7-mile-long, 138-kV transmission line which will tie into an undetermined interconnection near Petersburg; and (6) appurtenant facilities. The estimated annual generation of the Cascade Creek project would be 205 gigawatt-hours. The project also lists a tailrace measuring 450 feet by 40 feet that runs from the powerhouse to tidewater in Thomas Bay.

GENERAL STATEMENT OF THE ALASKA DEPARTMENT OF FISH AND GAME

The Alaska Department of Fish and Game (ADF&G), is the state of Alaska's principal manager of fish and wildlife resources and their habitat. The ADF&G is mandated under state law to: "…manage, protect, maintain, improve, and extend the fish, game, and aquatic plant resources of the state in the interest of the economy and general well-being of the state…" (AS 16.05.020).

Among the ADF&G's various powers and duties are: "…to assist the United States Fish and Wildlife Service in the enforcement of federal laws and regulations pertaining to fish and game…" (AS 16.05.050), and protect fish habitat (AS 16.05.841 and AS 16.05.871).

Managing Alaska's fish and wildlife resources and protecting the habitat that sustains them are integral to the health of the state's economy. Collectively in 2009, commercial, sport, and subsistence fisheries generated over 1.4 billion dollars to the state's economy. Following the oil and gas industry, mining, tourism and the government sector, these fisheries represent a major source of income to the state's economy.

Projects that have the potential to impact fish passage or anadromous fish habitat may require a Title 16 permit. The Cascade Creek watershed provides habitat supporting rainbow trout and Dolly Varden char. Fish Resource Permit reports filed by Cascade Creek LLC's consultant, Oasis Environmental, for 2010 collections, also document capture of a coho smolt. The proposed project could affect upstream and downstream fish passage, spawning, incubation, and rearing habitat. Protection, improvement, and maintenance of fish habitat and production in these systems are essential to fishery production in the Cascade Creek watershed.

On February 1, 2011, Cascade Creek, LLC filed an application, with the Federal Energy Regulatory Commission (FERC), for a third Preliminary Permit (PP) pursuant to section 4(f) of the Federal Power Act (FPA), proposing to study the feasibility of the Cascade Creek Hydroelectric Project (Cascade Creek project) to be located on Cascade Creek, Swan Lake, and Falls Lake in the vicinity of Petersburg, Alaska. In the third PP application[1] (page 17, Exhibit 3 – Costs and Financing, (1) Estimated Costs and Financing, Environmental Consultation and Study Cost) Cascade Creek LLC stated: *"Based on review of planned work as a result of late stage consultation, the Applicant expects remaining environmental consultation, studies, and preparation of the final license application, to cost between $100,000 and $250,000."* This statement acknowledges that there is a great deal of environmental evaluation work which has

[1] Cascade Creek LLC Application for a third PP for Project 12495-002, dated February 1, 2011 and filed with FERC.

not been completed. The applicant cost estimates do not take into consideration any data gaps or deficiencies in study efforts which must be corrected and does not include ADF&G requested large game studies identified in the ADF&G comments on the third PP application, filed with FERC on May 13, 2011. Due to these issues, the cost estimates to complete environmental assessment work appear to be underestimated. Environmental evaluation work identified in the third PP application, when included with the missing or deficient wildlife and aquatic studies, will be at a greater cost than estimated. Extensive agency consultation on this project has been ongoing for several years. The reference to "*late stage consultation*" is confusing since study needs were identified early in the second PP term.

Due to the lack of baseline studies, as well as missing studies, ADF&G believes that the filing of this DLA and PDEA to be premature. Studies must include, in addition to other baseline data, seasonality information. Assuming the applicant is diligent in providing detailed study plans and field preparation activities, this will require studies in 2011and 2012. Wildlife studies could extend at least two years from their start date, perhaps into 2013 or 2014. Even if a request for additional information is issued by FERC, the time needed by the applicant to prepare, conduct and complete necessary studies will be lengthy and not in concert with a licensing process.

The proposed project footprint does not include any portion of Cascade Creek below Swan Lake. This project, as proposed, would have impacts on flow and habitat availability in the watershed. The entire affected watershed needs to be included within the project boundary, including Cascade Creek and Falls Lake below Swan Lake..

HYDROLOGY

ADF&G typically recommends five years of continuous streamflow data to adequately describe intra- and inter-variability in flows. Gaging at the earliest possible stage in a project is recommended by ADF&G. Gaging by the applicant did not begin until the final year of the second PP. As a result, the hydrologic data collected by the applicant is inadequate to sufficiently describe seasonal and long-term streamflow characteristics of the Cascade Creek watershed. The applicant has not shown due diligence to provide the requested hydrologic data.

See also: **ADF&G EVALUATION OF THE HYDROLOGIC REPORT, COMMENTS ON HYDROLOGIC STATEMENTS IN THE PDEA** later in this document.

Hydraulic Capacity

The applicant states that *"The project powerhouse has been designed to accommodate nearly 100% of the typical water year flow regime."* The applicant refers to instream flows as:"*if required"* throughout the DLA. Instream flow requirements will be difficult to develop due to incomplete aquatic resources data and will account for the level of refinement and variability of the data provided.

SPECIFIC COMMENTS

EXHIBIT A – PROJECT DESCRIPTION

1.0 INTRODUCTION

"A 138-kilovolt (kV)

transmission line, comprised of overland and undersea cable, would extend approximately 18.7 miles from the powerhouse to an interconnection point near Petersburg."

- Petersburg Municipal Power and Light (PMPL) commented with FERC on interconnection issues in comments on the Scoping Document 2 (SD-2)[2] and on the applicant's application for a third PP[3]. The Southeast Alaska Power Authority (SEAPA) also filed statements regarding no ability to allow for interconnection with their transmission grid with FERC in a Motion to Intervene, on the applicant's application for a third PP.[4] There are no alternatives listed by the applicant.
- The PMPL statements referenced also state that existing utility corridors are fully utilized and that would be problems with transmission lines crossing airport property. This

[2] PMPL Comments on SD-2 for FERC Project No. 12495-002, dated November 18, 2010 and filed with FERC.
[3] PMPL Motion to Intervene, RE: Application for a third PP, Project No. 12495-002, dated April 14, 2011 and filed with FERC.
[4] SEAPA Motion to Intervene, RE: Application for a third PP, Project No. 12495-002, dated March 18, 2011, 2011 and filed with FERC.

application lacks identification of alternate transmission corridors and associated environmental studies.

- Cascade Creek LLC's Application for a third PP, states: "*Applicant is not proposing to construct new interconnect facilities and/or substations at the point of interconnection. Applicant anticipates working through existing system upgrade requirements prior to and during interconnection discussions, which will occur post-licensing."* The availability of interconnection to either PMPL's power dispersion grid or the SEAPA intertie would seem to require new substations, utility corridors and a different project footprint. These all will require additional environmental review.

2.0 PROJECT STRUCTURES

2.1 Proposed facilities

2.1.1 Intake Structures

"The submerged lake siphon inlet, equipped with intake screens, would be placed at an approximate depth of 40-ft."

The use of approximate is not appropriate. Engineering should have been completed to identify a more precise depth.

"A 58-ft-long, 49-ft-wide, and 25-ft-high underground gatehouse would be constructed near the shore of Swan Lake and would house the vacuum pump, vacuum receiver tank, and valve system to control water flow to the power conduit. A 26-ft by 26-ft by 98-ft deep concrete lined vertical shaft below the gatehouse would house the vertical portion of the 10-ft diameter siphon piping and siphon shutoff valve."

- Construction of these two features will require removal of approximately 5100 cubic yards of material. More information is needed on the final disposition of this material and how this material be stockpiled and then removed from the Swan Lake area?
- Because the proposed gatehouse structure will be a minimum of 123 feet in depth, more information is needed to determine groundwater levels and permeation of the soils. Also information is needed on any pumping during excavation including settling basins, if used, and pump water discharges.

2.1.2 Outlet Control Structure

"An outlet control structure would consist of a very small, low-head weir approximately 6-ft-high above the lowest elevation of the lake outlet."

- The use of *"approximately"* is not appropriate. Applicant needs to adequately define the structure.
- If a six foot high structure with a three foot high crest gate is installed at a level three foot above the existing lake sill height, how will this project handle hundred year flood events without the level of Swan Lake establishing a high water mark above the current high water mark?
- There is no information provided on the construction type/design or materials to be used in this "weir" or how construction will be accomplished in this remote area. These are factors in evaluating potential impacts to both Swan Lake and Cascade Creek.
- How will the structure be anchored to the lake sill and the adjacent natural features?

"The weir would serve several purposes: minimize outflow leakage through the shallow substrata, provide for minimum in-stream flow contribution if required; facilitate lake level management by adding the ability to store or release water as necessary in drought or flood conditions to help maintain the desired lake level; and allow or emergency overflow discharge to the stream outlet of Swan Lake."

More detailed information is needed on the applicants proposal to *"minimize outflow leakage"* Instream flow requirements will be evaluated and assessed.

2.1.3 Power Conduit

Elevations are supplied for several points described in this section. However, there is no reference to datum used. If Mean Sea Level (MSL) is used it should be stated.

2.1.4 Powerhouse

"The powerhouse, located at tidewater on Thomas Bay, would consist of a concrete and metal building, approximately 140-ft-long by 80-ft-wide, embanked by rock fill on the east side. Its foundation would be cast-in-place concrete, founded on bedrock. The superstructure would be

reinforced pre-cast concrete tilt-up with a sloped metal roof. Applicant proposes to site the structure at least 200-ft off the shoreline to provide an aesthetic vegetative buffer and avoid effect to the coastal zone."

The dimensions of the powerhouse should be identified more directly. The use of "*approximately"* is not appropriate.

2.1.5 Tailrace

"The tailrace is proposed as a low gradient open stream riprap-armored trapezoidal channel approximately 450-ft-long and 40-ft-wide, discharging as a new outlet to Thomas Bay. It would exit the powerhouse in a southern direction for approximately 300-ft and then turn west to Thomas Bay for approximately 150-ft in order to maintain a tree screen to visually hide the powerhouse from Thomas Bay. The tailrace would be designed to deter use by anadromous fish."

- Information is needed on the tailrace elevation.
- The DLA states *" the tailrace would be designed to deter use by anadromous fish*." More information is needed on deterrence measures proposed by the applicant. Under current conditions, there may be few salmon trying to use Cascade Creek below the falls due to limited area. A new tailrace, approximately 18,000 square feet in size, has a greater likelihood to attract salmon and should be designed with appropriate preventative measures.

2.1.6 Marine Access and Housing Units

"Access for both construction and long-term operation and maintenance of the Project will be by boat, barge, or aircraft."

How will the Swan Lake site be accessed for construction of the underground gatehouse and "weir" and spillway facilities at Swan Lake?

"The Applicant proposes to construct a new marine access facility on Thomas Bay, immediately adjacent to the powerhouse site. A new dock would be approximately 290-ft-long on a fixed pier with a 60-ft-long ramp down to a 60-ft by 30-ft float stationed to piling. The dock and adjacent

barge landing ramp would provide direct access to the site during construction and operations. Applicant intends to make the new dock available to the public after the Project begins commercial operation, barring any legal obstacles or stipulations from the USFS, as it has the potential to provide the public safe landing access for any upland use purposes."

- Studies are needed to assess potential impacts of such a facility on the marine environment.
- Materials to be used in this construction need to be identified.
- Information is needed on the impact of increased public access on the Fish, Wildlife, and recreational resources of this area.

"Two proposed housing units would be located north of the powerhouse to house workers during construction of the Project. The houses would remain after construction for use by plant operators and maintenance crews."

The proposal to retain the two housing units was first presented in SD-2 by the applicant. This proposal for on-site housing was never presented to the public during scoping meetings. Information on housing units (size, type, placement etc.) is needed. Retention of housing at the site potentially changes this from an unmanned, remotely controlled facility to an onsite controlled facility with operators and possibly family present.

"Localized transportation from the housing units to the powerhouse site would be by vehicle or by foot."

Clarification is needed on the type and size for all vehicles at this site.

3.0 IMPOUNDMENT DATA

"The Project would utilize the natural impoundment of Swan Lake, a high alpine, glacially-fed water body with a surface area of approximately 579 acres and an approximate usable stored capacity of 3,474 acre-ft (af), assuming a 6-ft operational drawdown. The water surface elevation of Swan Lake naturally fluctuates within a maximum 8-ft range, and an average annual natural fluctuation within a 6-ft range. Applicant does not propose to impound Swan Lake above its natural ordinary high water elevation and will not operate outside the

standard, natural drawdown of the lake. The Project will withdraw lake water for power generation in a manner that remains within the pre-development lake level fluctuation based on historical discharge records correlated to lake elevation stage."

- Swan Lake is not a "glacially fed water body." The main water source for Swan Lake is snow melt and rain runoff.
- Information is needed on how the ordinary high water elevation was defined.
- . Currently the lake has an average annual fluctuation of six feet and a maximum fluctuation of eight feet. This range occurs between a high water mark that has not been clearly identified and an unidentified lake low water level elevation. The applicant states that the lake will not be impounded above natural elevations and that the project will not operate outside of the natural drawdown of the lake. The applicant needs to identify and provide elevations (MSL) for the sill, top of "weir", high water mark and range of natural drawdown.

5.0 TRANSMISSION LINE AND SUBSTATION

" A 138-kV transmission line would extend underground approximately 560-ft from the powerhouse substation to tide water near the marine access facility, then cross Thomas Bay as a 2.8-mile-long undersea cable. The cable would be "jetted in," or buried in the near-shore areas. The transmission line would then transition to an overhead vertical design on single wood poles, and extend overland approximately 4.5-miles from the shoreline of Thomas Bay across the Patterson Delta to the shoreline of Frederick Sound. It would then transition back to an undersea cable and continue 7.7-miles to the shoreline of Mitkof Island. The cable would be "jetted in," or buried in the near-shore areas. From here, the line would transition back to an overhead design and continue overland 3.7-miles to the interconnection point at the existing Scow Bay substation near Petersburg."

No relevant marine studies have been conducted or are proposed for the marine portions of this project. The effects of the undersea cable have not been identified. The effects of "jetting the cable in" have not been studied or identified.

The applicant cites an interconnection point at the existing Scow Bay substation near Petersburg. In previous conversations with Petersburg Municipal Power and Light (PMPL), the applicant has been told that the utility corridors are full and the PMPL system is a power dispersion system, not a power transmission system. The existing switchyards are at a maximum capacity and can't handle additional power from Cascade Creek. PMPL has also filed statements of this with FERC on the Application for a third PP. The Southeast Alaska Power Agency (SEAPA) has stated that the applicant has failed to provide information on interconnection to the SEAPA grid and that the existing SEAPA grid can't efficiently handle what Cascade Creek LLC has proposed. The applicant *"is not proposing to construct new interconnect facilities and/or substations at the point of interconnection."* Any upgrades necessary for interties or substations, or additional substation construction should be identified as part of this project. Not including the cost of necessary intertie or power grid upgrades to allow project produced power to access markets would seem to affect the cost feasibility of this project. Identification of the intertie or power grid expansion needs will help to identify any additional studies or expansion of studies as well as additional permitting to include areas affected by additional construction sites.

EXHIBIT B

1.0 ALTERNATIVE SITES CONSIDERED

"Cascade Creek LLC (Applicant) has evaluated several sites for potential hydropower generation. Initial review of the Waterpower Resources, southeastern Alaska mainland, vicinity of Petersburg and Juneau, U.S. Geological Survey Water Supply Paper 1529 led to consideration of projects within the Thomas Bay area. The Applicant presented a Preliminary Application Document (PAD) in August 2007 to agencies and the Petersburg community for three projects: Scenery Creek P-12621, Cascade Creek P-12495, and Ruth Lake P-12619."
PP's were held by Cascade Creek LLC for Scenery and Ruth Lakes from 2006 and ending in 2009. These permits were lost to competing applications filed in 2009 by Angoon, Petersburg and Wrangell all of which were given municipal privilege. Angoon now has both Scenery Lake (FERC No. 13365) and Ruth Lake (FERC No. 13366) PP's. This statement implies that Cascade Creek LLC made a choice as to projects to pursue

After considerable evaluation the Applicant submits its Draft License Application (DLA) for the Cascade Creek Project because it is located within an area reserved for power development. Additionally, it is the most productive project with the least physical and environmental impact of the three sites considered."

Physical and environmental impacts for Scenery Lake or Ruth Lake projects have never been presented. The statement is therefore premature and further not germane to this application.

2.0 ALTERNATIVE FACILITY DESIGNS CONSIDERED

"The preferred access and transmission alternative would extend from the powerhouse to the dock facility and then cross Thomas Bay as a 2.8-mile-long undersea cable. The cable would be "jetted in," or buried in the near-shore areas. The transmission line would then extend approximately 4.5 miles from the southwestern shoreline of Thomas Bay across the Patterson delta to the shoreline of Frederick Sound. The transmission line would continue as a 7.7-mile long undersea cable to the shoreline of Mitkof Island, at which point it would continue as a 3.7-mile-long overhead line to the Scow Bay substation near Petersburg."

Information is needed on whether the cable is buried or overhead from the powerhouse to the first marine connection and again across the Patterson delta.

3.0 PROPOSED PROJECT OPERATION

3.2 Annual Plant Factor

"The annual plant factor is estimated as the ratio of the average load on the plant for a certain period of time to the capacity of the plant. The Project will have a nameplate rating of 70 MW at a gross head of 1,471-ft, and is expected to generate 204,600 MWh on average per year. Therefore, the annual plant factor under these average conditions would be 33.4 percent."

With a 70 MW rating this project would have the capacity to generate 613,200 MWh of electricity per year. That would equal a plant factor of 100.0 percent. Yet Table B-1 (Plant Factor) would seem to indicate that only 1 generator will be utilized. The applicant needs to clarify how the turbines will operate and ramp up during flood events.

3.3 Operation During Adverse, Mean, And High Water Years

"The Project is anticipated to serve the existing Southeast Alaska Intertie system as well as any new energy markets that may develop with future connections to the power grid."

The inability of the Southeast Alaska Intertie System to handle power from the Cascade Creek project has been documented by SEAPA in comments on Cascade Creek LLC's application for a third PP.

"Power generation and lake level management will utilize two separate controls. … The second mechanism is the lake outlet control structure, which will enable the power tunnel to become the primary lake outlet and generally maintain Swan Lake levels within their natural range throughout the year."

Flow of water into Cascade Creek will be required of this project. Determination of environmental flows for aquatic resource needs will require complete and appropriate aquatic resource studies.

"The outlet control structure would also provide release of supplemental flows to the bypass reach if necessary."

The applicant needs to define "supplemental flows" to the bypass reach.

"Power generation would be curtailed when the lake level fell to operational minimums prescribed under license, and would resume when water was again available. During this time, supplemental flows could still be released to the bypass reach via the outlet control structure bypass piping. The piping would be constructed below the minimum power generation operable lake level to provide an expanded range of release timing and lake stage if necessary."

- The applicant seems to be confusing supplemental flows with environmental flows which would be identified in a license for hydropower operations.
- Operational lake levels should be identified in the final license. Maintaining environmental flows to Cascade Creek at all times while operating or not operating the powerhouse will be required.

- The applicant has included in Exhibit D of the DLA,[5] an estimate of Total Capital Requirements for this project in excess of $188.4 million. Based on the statement in Exhibit B of the DLA, this project will be operational only for part of each year. This scenario would seem to have a large impact on the economic feasibility of this project.

"Combined tailrace and Cascade Creek post-development discharge volumes will closely resemble the pre-development discharge of Cascade Creek's natural regime on a seasonal, monthly and weekly basis, except that a portion of the predevelopment discharge from Cascade Creek will be relocated approximately ¼ mile south of the mouth of Cascade Creek."
The use of the word "portion" is not appropriate and does not reflect the true projected condition. The word majority should be used instead.

"The net effect of the outlet control structure would be to allow the relocation of the primary outlet of the lake to the power tunnel without adversely affecting lake elevation fluctuation."
The outlet control structure would remove flows from Swan Lake to Cascade Creek, changing the dynamic of Cascade Creek and the watershed.

4.0 DEPENDABLE CAPACITY AND AVERAGE ANNUAL ENERGY

4.3 Hydraulic Capacity

"The project powerhouse has been designed to accommodate nearly 100% of the typical water year flow regime."
The applicant refers to instream flows as *"if required"* throughout the DLA. Flow requirements will be difficult to develop due to incomplete aquatic resources data. There seems to be little regard in the DLA and PDEA for Cascade Creek habitat and aquatic resources.

[5] Cascade Creek LLC, FERC Project 12495, Draft License Application, Exhibit D, Statement of Project Cost and Financing, 1.0 Statement of Estimated Costs, 1.5 Total Capital Requirements, Filed with FERC February 11, 2011.

5.0 STATEMENT OF SYSTEM AND REGIONAL POWER NEEDS

"The Project will be owned and operated by the Applicant. Energy generated will be sold at wholesale price to local and regional markets, aggregators, or other wholesale purchasers of electric generation."

Again, no market has been identified and connection to PMPL substations or SEAPA intertie has been stated to be not possible. See previous comments.

"Ketchikan has sought state funding for Whitman Lake 4.5 MW which was dramatically reduced from $16 million to $1 million in 2010.

A state funding request by Ketchikan was reduced because previously received state funds had not been expended. It was a budget decision made by the state legislature.

6.0 PLANS FOR FUTURE DEVELOPMENT

"The Applicant has no current plans to further develop the Project or pursue any other improvements to the Project at this time other than what is proposed in this application."

This statement conflicts with the applicants filing for a third PP with FERC.

Exhibit C

The applicant has stated a start date of June 2015 based on receiving a FERC License by June 2013. Previous comments in the ADF&G General Statement pertain to studies which have not been completed, did not address aquatic issues, were flawed or were ignored by the applicant after consultation. Some of these studies will require more than one season and coordination of personnel and equipment to begin the work. The proposed schedule is not realistic to promote the collection of adequate data for evaluation of project impacts and formulation of recommendations.

Exhibit D

1.0 STATEMENT OF ESTIMATED COSTS

Table D-1 lists housing at a cost of more than $1.5 million. The plans call for two houses. It would seem that this cost might be just a little high.

4.0 ESTIMATED AVERAGE ANNUAL PROJECT COSTS

"Cost of Capital. The Applicant intends to obtain the total capital requirements through a 30 percent equity investment of its affiliate, Alaska Hydro Corporation, and 70 percent debt through a 30-year investment grade term loan."

- The term affiliate is questioned. Cascade Creek LLC has been identified as a totally owned subsidiary of Alaska Hydro Corporation, a Canadian company.
- Alaska Hydro Corporation may not appear to be in a financial position to complete this financial transaction as indicated by their end of year fiscal report released May 3, 2011.

"The annual cost of capital is estimated to be $16,750,000 per year for the initial 30 year operation of the Project."

- This is fixed cost only. Variable cost is estimated at another $2,890,700. Variable cost attempts to include what the applicant identified as environmental measures shown in Table D-6, Cost of Environmental Measures. Additional studies continued monitoring, additional mitigation, substation upgrades or new construction, intertie upgrade costs and cost overruns could easily place annual costs well over projected annual power revenues as reflected on Table D-7.
- Table D-7 identifies the cost of diesel generation to start at $35/ MWh in the first year and escalating at 2% annually. The next paragraph identifies the expected 50 year levelized energy cost (LEC) from the project as $102.94/MWh. The LEC is the minimum price at which energy must be sold for an energy project to break even. The cost of energy projected to be produced by this project under reported financial estimates is three times the cost of diesel energy production. That number will only go up when substation costs and intertie upgrades are appropriately added to the cost of this project.

6.0 OTHER ENERGY ALTERNATIVES

"Not only would diesel generation be a more expensive option to operate and maintain, their emissions would be detrimental to the environment."

While we agree that reduction in fossil fuel consumption is a goal to reduce emissions, the above statement is contradictory to the information reflected in Table D-7 which states the cost of diesel generation to be $35/MWh and that electricity from this project has a $102.94 LEC, as stated in the previous comment.

"The Applicant examined Ruth Lake and Scenery Creek, two potential, alternative hydroelectric projects in Thomas Bay, adjacent to the proposed Project. Based on results of an economic review and environmental impact analysis, the proposed Project was selected for further investigation and development."

This statement does not reflect the process and was addressed in comments under Exhibit B, 1.0 Alternative Sites Considered.

7.0 CONSEQUENCES OF APPLICATION DENIAL.

"If the license were denied, this would be severely detrimental to the Applicant, as they have already invested an estimated $2,900,000 in site investigations, stakeholder outreach, and application development."

Speculative investigation involves exactly that, speculation. What this, or any applicant, has chosen to spend in a speculative venture should not be a factor in a FERC licensing process.

8.0 SOURCES OF FINANCING

See comments under Exhibit D, 4.0 ESTIMATED AVERAGE ANNUAL PROJECT COSTS.

Exhibit G-6

- This map shows the powerhouse area and includes an area of roughly 150,000 square feet identified as tunnel excavation rock. What are the plans for this area? There is an elevation change of over 200 feet so this will be visible from the water. What will the depth of material placed here be?

Exhibit G-12

- This map shows the transmission line running near the airport. PMPL has utility corridors, which are full, in this location and has stated in SD-2 comments and in a Motion to Intervene, that the FAA is not open to additional easements.

ADF&G COMMENTS ON THE PDEA, STUDY PLAN REPORTS AND FONZI

The PDEA and study plans presented fail to provide sufficient information for evaluation of this project. Areas of studies are lacking (Wildlife Studies on moose and mountain goats), misplaced in the document and insufficient (Aquatic Resources Study Report) or totally missing from the PDEA (Subsistence Study and Report, Aesthetics Study and Report). This PDEA repeats language previously commented on in our DLA comments. ADF&G does not agree with the applicants FONZI finding for this project.

ADF&G EVALUATION OF THE HYDROLOGIC REPORT, COMMENTS ON HYDROLOGIC STATEMENTS IN THE PDEA.

The Alaska Department of Fish and Game (ADF&G) offers the following comments regarding hydrology data collected and reported in the PDEA and Appendix C-4[6].

Limited Hydrologic Data Collected

The period of record was less than one year for all four of the applicant's gages (January 1, 2010 to October 24, 2010). There were large data gaps for some of the gages, namely Falls Lake and upper Cascade Creek. The common period of record for all four gages was June 18, 2010 to October 24, 2010. The number of discharge measurements taken at each gage ranged from 4 (lower Cascade Creek, Swan Lake) to 6 (Falls Lake).

Limited hydrology data, along with complex hydrologic conditions (e.g. subsurface seepage at lake outlets) may explain why the estimated historic average annual flow from Falls Lake (263 cfs) is greater than the historic average annual flow at the downstream USGS gage (252 cfs) near saltwater. The predicted average annual flow from Falls Lake post-project is also higher (50 cfs)

[6] Cascade creek Hydroelectric Project, Hydrology Report, Prepared by Civil Science, Included as PDEA Appendix C-4 and Filed with FERC on February 11, 2011.

than the predicted average annual flow at the USGS gage post-project (36 cfs). The applicant acknowledges that more stage and discharge data, along with further study of seepage, are needed to improve the rating curve for the Falls Lake gage.

ADF&G typically recommends five years of gage data be collected to adequately describe intra- and inter-variability in flows. Discharge measurements should be measured over a wide range of flows and conditions, and across seasons and multiple years. Gaging at the earliest possible stage in a project is recommended by ADF&G. Gaging by the applicant did not begin until the final year of the second PP. As a result, the hydrologic data collected by the applicant is inadequate to accurately describe the hydrology of the Cascade Creek watershed. The applicant has not exercised due diligence to provide the requested hydrologic data.

Period Of Records used in Hydrologic Analyses

The Hydrology Report used the entire period of record from USGS gage 15026000 (Oct 1, 1917 to Nov 30, 1928 and Oct 1, 1946 to Sept 30, 1973) to estimate historic lake levels for Falls Lake and Swan Lake, and historic surface flows from Swan Lake.

In DLA Exhibit B, generation for the Project was modeled for 14-years and a 26-year average. The years modeled were 1960 through 1972 (calendar years), 2010, and the average of 26-years (Oct 1, 1946 to Sept 30, 1973). Consequently, the results of most analyses were presented for this time frame, with a few unexplained exceptions.

In the PDEA, while the results for some of the pre-project analyses were presented for the entire period of record, results for most of the pre-project and all of the post-project hydrologic analyses were presented for the periods 1960 through 1972 (calendar years), 2010, and the average of 26-years (Oct 1, 1946 to Sept 30, 1973).

The applicant does not explain why different periods of record were used for different analyses.

Seepage Flows From Swan Lake

In previous applicant documents, it was stated that the natural colluvium dam at the outlet of Swan Lake would be grouted to reduce/eliminate subsurface seepage. In the PDEA, there is no mention of grouting the outlet, however, page four of DLA Exhibit A[7] states that the Swan Lake outlet control dam would serve several purposes, including minimizing outflow leakage through the shallow substrata.

Whether seepage flows will occur post-project at the Swan Lake outlet is an important question with respect to how much water is available for power production and how much water Swan Lake will contribute to instream flows in lower Cascade Creek post-project. The PDEA and DLA Exhibit B never explicitly address :
1) whether Swan Lake surface flows or Swan Lake total flows (surface flows plus seepage flows) were used in estimating how much water was available for power production, or
2) if seepage flows from Swan Lake were included in analyses of post-project flows in Lower Cascade Creek.

Given that the project is expected to have an average dependable capacity of 22.2 MW, which approximately equals the capacity of one turbine (23.3 MW maximum capacity at 223 cfs), and that the estimated average annual total flow from Swan Lake (surface flow plus seepage flow) is 226 cfs for the years modeled (and 216 cfs for the entire period of record, see period of record comments above), it appears total flows, and not just surface flows (estimated average annual surface flow only from Swan Lake is 166 cfs), were used in estimating potential power production.

The post-project flows presented for lower Cascade Creek suggest that Swan Lake seepage flows were included in post-project analyses, although this is difficult to ascertain because of the very

[7] Cascade Creek Hydroelectric Project, DLA Exhibit A, Project Description, filed with FERC on February 11, 2011.

limited data and information provided in the PDEA on post-project flows in lower Cascade Creek.

Seepage flows from Swan Lake were estimated using a water budget model performed on flows through Falls Lake (see pg 17 in the Hydrology Report, Civil Science 2011). This analysis used surface water inflow and outflow to and from Falls Lake, combined with the volume of water impounded in the lake to account for all flows into, out of and stored in the lake. The applicant reported that the results of this analysis showed that seepage averages 28.7% of total outflow from Swan Lake during the summer months and averages 39.7% of the total outflow from Swan Lake during the winter months (December through mid-May) (pg 17 of the Hydrology Report).

None of the input data for the model was provided in the hydrology report, nor was the validity of model assumptions ever discussed. The only model results presented in the hydrology report were the 28.7% and 39.7% figures noted above. The PDEA (pg 3-70) stated that the average seepage contribution at the Swan Lake outlet ranges from 26 cfs in the winter to 135 cfs in the summer months. No explanation of how these numbers were derived was given. As previously noted, the Falls Lake gage record is suspect. Given the importance of knowing how much seepage is occurring at the Swan Lake outlet, further study is needed to adequately describe the hydrology of seepage flows from Swan Lake.

PDEA description of post-project changes to flows in Lower Cascade Creek

The PDEA makes the following general statements about post-projects effects on stream flows in lower Cascade Creek from the outlet of Swan Lake downstream to saltwater:

'Flows within the creek will remain within the range of natural conditions (pg 3-25)."

"Project operations will result in the alteration of flow into Cascade Creek. The proposed operation will, however, closely match the seasonal timing of flows and mirror the existing hydrograph albeit at a lower level of flow (pg 3-213)."

"As the Project will utilize flows from Swan Lake that would discharge into Cascade Creek under existing conditions, lower average flows are expected into the upper section of Lower

Cascade Creek; however, these flows will still be within the range of the existing natural hydrologic regime of the creek (pg 3-267).*"*

"The Applicant proposes installing a crest gate system in the Swan Lake outlet structure to pass seasonal and storm high flow events. Accordingly, Lower Cascade Creek will continue to exhibit the same basic hydrology of having surface water during periods of high flow and accretion supplying the water during periods of low flow from Swan and Falls Lake (pg 3-71).*"*

The project is designed to use nearly all of the total average flow from Swan Lake for power production (pg 3-268 states 95% of the total average flow while pg 3-62 states nearly 100%). The only time flows are expected to spill over the outlet structure and into lower Cascade Creek is when inflow to the lake exceeds 670 cfs (the capacity of the project), there is no storage available in the lake (i.e. when the lake is at an elevation of 1517 feet), if the project is operating at maximum capacity or if project components are shut down for maintenance or repair.

Flows from Swan Lake above 670 cfs are fairly rare (they occur approximately 2% of the time). Consequently, flows will rarely spill over the outlet structure and into Lower Cascade Creek. Contrary to the applicant's statements above, the proposed project will have a major impact on the hydrologic regime of lower Cascade Creek.

The PDEA also makes the following statements (in italics) about post-project flows in lower Cascade Creek:

"In addition to the flows from creeks and waterfalls in the Lower Cascade Creek drainage areas, some subsurface and accretion flows below the outlet will maintain downstream flow patterns (pg 3-104).*"*

"There will always be flow in the Bypass Reach. There would be an average flow of 50 cfs from Falls Lake (pg 3-72).*"*

"Hydrologic inputs from accretion, tributary flows, and seepage that contribute to flows released into Lower Cascade Creek from the outlet at Swan Lake may range from 75 cfs in the winter to 129 in the summer (pg 3-213).*"*

"Hydrologic inputs from Falls Lake are sufficient to maintain flows in the lower section of Lower Cascade Creek, though flows will be reduced on an average annual basis. At full plant operation, which is anticipated to occur approximately 33% of the year, average flows at Cascade Creek falls will range from 20 cfs in the winter months to 70 cfs in the summer months (pg 3-214)."

"Hydrologic studies indicate that accretion, seepage, and tributary flows will provide a sufficient habitat flow within Lower Cascade Creek to support environmental resources (pg 3-78)."

Very little information and data are provided to substantiate the numbers and conclusions stated above. How was the 50 cfs from Falls Lake derived? How were the 75 cfs in winter and 129 cfs in summer estimates derived? How were the 20 cfs in winter and 70 cfs in summer estimates derived? How much accretion flow is there and where is it coming from? The same question applies to tributary flows and seepage flows. What hydrologic studies indicate that accretion, seepage, and tributary flows will provide a sufficient habitat flow within Lower Cascade Creek to support environmental resources?

Swan Lake

The PDEA presents the average, as well as the 15-year minimum and 15-year maximum, post-project Swan Lake elevations in Figure 3-18 (pg 65). No information or description is given on how post-project lake elevations were estimated. No project operations model was provided. Essentially the only information provided on post-project lake elevations is that elevations will be kept between 1511 and 1517 feet. Exhibit B, ("Project Operation and Resource Utilization") states that the project *"will not operate significantly below the natural drawdown of the lake"* (pg 7). How far below the natural drawdown of the lake is significant? No information is given on the rate of change in lake elevations that will occur from project operations. Will elevations bounce back and forth between 1511 and 1517 throughout the year? Will elevations mimic the natural seasonal changes in elevation? If the lake was at maximum elevation when a large flow event occurred, would the penstock flow (670 cfs) and spill flow be sufficient to keep the lake from rising above 1517 feet? The PDEA does not provide enough information to evaluate post-

project effects on Swan Lake elevations and as such, it does not provide enough information to evaluate project effects on aquatic resources.

Falls Lake

As noted in the PDEA, the Falls Lake stage versus discharge relationship is complex due to the nature of the colluvium dam at its outlet. We agree with the applicant that more gaging and studies are needed to understand and accurately define this relationship. From the limited stage data available, it is apparent that Falls Lake experiences large (and probably rapid) seasonal fluctuations in stage, however, at this time there is not enough information to describe historic lake levels, as the PDEA attempts to do. The PDEA provides no information on how Falls Lake post-project flows were estimated. Nor does it discuss post-project inflows into Falls Lake except to say "once the project starts up, the inflow from Swan Lake will diminish, leaving some subsurface flow from Swan Lake and numerous creeks and waterfalls from its sub-basin area" (pg 3-65 and 3-66). Given the lack of information on post-projects flows into Falls Lake, and lack of data on the relationship between inflows and lake levels, post-project effects on Falls Lake seasonal lake elevations cannot be evaluated until further studies are carried out. During the winter of 2010-2011, Falls Lake levels were described as 30 feet from full. This low flow period would probably be mimicked by summer project operations. Falls Lake could be completely changed or possibly eliminated. As evidenced by the winter drawdown that naturally occurs from low flows into Falls Lake, it is much easier to estimate what summer lake conditions would look like. Fisheries resources and recreational opportunity at the much used Falls Lake cabin would be severely impacted. Habitat would be lost.

ADF&G COMMENTS ON THE AQUATIC RESOURCE STUDY REPORTS

The Aquatic Resources Study Report was included in a series of study plans and reports which were made available to agencies after the Draft License Application (DLA) and Preliminary Draft Environmental Assessment (PDEA) were filed with FERC on February 11, 2011. The applicant has stated that studies were available to the agencies in December of 2010. We did not have access to studies in December 2010 or even at the time of the applicant's filing of the DLA and PDEA. They were added to the filing several days after the initial filing occurred. While other studies are listed as Appendices in the PDEA, the applicant failed to list the Aquatic Resource Study, but instead placed it at the end of a hydro acoustic study report as part of Appendix C-1. Since the report appeared to be missing , we tried to obtain a backup from the Thomas Bay Hydro website, but the study failed to download. We finally found the reportt on the CD supplied by the applicant but it was not listed in the table of contents nor properly identified in the PDEA document.

Agency staff spent many hours through consultations to make numerous recommendations to improve proposed studies and to evaluate studies presented. Many problems with the studies could have been avoided if the applicant had sought to prepare study plans well in advance of the 2010 field season, and/or had accepted ADF&G's consultations to improve scientific validity of the studies. Study plans were written and withdrawn by the applicant and final draft plans were never provided to agencies until after some studies were conducted. To compound the problem, the applicant was very late into the second Preliminary Permit before most studies were initiated. Data collection was rushed and in most cases failed to address issues sufficiently, such as seasonality. Studies believed by the agencies to be essential to provide baseline information, such as fish habitat utilization telemetry studies coupled to spawning studies, were eliminated and declared non nexus by the applicant.

ADF&G contends the study results presented, do not supply requested information, lack a basis in science, fail to properly analyze properly what little data was collected and misrepresent the environmental condition of the Cascade Creek Watershed. It draws conclusions not based in fact and which are not defensible. To facilitate evaluation, comments are referenced and numbered and citations are included in footnotes. Comment categories were developed and comments

were catalogued under each category. The comment categories and associated comment numbers are as follows:

1. **Inconsistency between concurrent project documents:**

   Comment: 1, 57, S-2

2. **Information needs (and concerns) not addressed in 2010 studies:**

   Comment: 2, 23, 24, 31, 50, 59, 52, 55

3. **Requested field studies not completed:**
   Comment: 2, 12, 14, 15, 16, 18, 21, 23, 24, 29, 32, 40, 46, 48, 50, 53, 55, S-1
4. **Scientific process was not identified or followed. :**
   Comment: 2, 4, 5, 6, 29, 33, 34, 37, 39, 40, 41, 42, 43, 44, 54, 55, S-1, S-2, S-4, S-5, S-6
5. **Communication issues:**
   Comment: 16, 18, 25, 26, 30, 31, 45, 58
6. **Results suggest additional research/understanding needed:**
   Comments: 20, 54, 55, 56, S-1, S-2

The following specific comments were compiled by ADF&G staff. References cited in the comments by footnote are available in Appendix A, on the FERC website filed under Cascade Creek Project P-12495, or from the referenced source.

Proposed Structures

1. The description of the proposed structures did not match up with other concurrent applicant provided documentation identifying inclusion of houses, docks, loading ramps, and a building involved with Swan Lake's outlet control structure.

2. [p1,par 2] We find major unresolved conflicts between proposed operation activity and the final sentence that states, *"the outlet control structure would be designed to allow fish to emigrate from the lake as has occurred naturally"*. Our concerns are:
   a. Inconsistency with the 2010 Project Operation Concept Plan which on page 2, section: Lake Level Control Mechanisms states, *"The outlet control structure will*

be designed to allow fish to spill out of the lake as has occurred naturally. Return passage may be provided if necessary…"

b. Based on Cascade Creek's observations, photographs {Aquatic Resouce Studies, Appendix 5-1, Photos 5-1.8 and 5-1.9} and measurements of flow in 2010, fish would not spill out as has occurred naturally. The project's outlet control structure will seal-off sub-surface flows, and the remaining small amount of spill (yet not detailed) will not provide enough flows immediately downstream to provide unobstructed surface flows and associated habitat, which naturally would be available at all times when flows allow. This does not indicate structure design and operation consistent with "a" above since after sealing subsurface leakage it would be similar to spilling buckets of water into a pile of rock. Fish would not have free and uninhibited passage in any direction.

c. Studies to determine and document habitat utilization and movements for rainbow trout between Swan Lake and adjacent waters downstream have been requested repeatedly by ADF&G since the initial PAD was prepared. After initiating efforts to carry out studies in 2010, the applicant took an opposing position against conducting the studies during late-summer 2010, claiming these studies were now non-nexus to the project. As a result there has been no baseline information collected necessary to determine whether fish passage is needed at the outlet structure. Although Cascade Creek LLC had ample time to fund and develop the requested studies from 2007 through 2010, they did not perform the studies needed to allow an environmental assessment of this project. The following shows a history of ADF&G comments and consultations regarding these topics:

- Repeated requests occurred initially by ADF&G, in comments[8] filed 11/23/07 on the Preliminary Application Document (PAD)11/21/2007 Section III (Comments on Project Study Needs) subsection B (Cascade Creek Project, FERC project P-12495 (and P-13048), page 23, #17(a));

[8] ADF&G comments were filed with FERC (20070803-5168) on 11/21/2007, on the PAD which was filed by Cascade Creek LLC with FERC on 8/3/2007.

- Comment in reference to Cascade Creek's 2008 Field Season Study Plan[9] (August 20, 2008) on page 8, paragraph 2, " A determination of whether or not trout travel up & downstream between the outlet and a large downstream side pool would need to be made prior to review of any outlet modification proposal.";
- ADF&G's SD-1comments on 7/17/2009[10], Aquatic Habitat Use and Function, Page 17, study numbered #11 (e)};
- Next, following requests from Cascade Creek during a March 2010 meeting ADF&G presented a matrix of revised study needs[11] associated with Run of River style Operation model, which included this study;
- Consultation on the July 16 draft " Aquatic Resources Study Plan[12] [see table 1-1, and Section 3 (Fish Telemetry),
- The August 31, 2010, Radio Telemetry draft study plan[13] and ADF&G consultation/response draft[14].

Following the comments and consultations described, on September 10, 2010, Cascade Creek's consultant, Oasis Environmental distributed an email[15] pronouncing intentions that all work would cease on Habitat Utilization studies. Those studies included a radio telemetry project to be initiated in the fall of 2010 that would carry through summer 2011, which would also be integrated with spawning studies to be conducted in the spring of 2011.

1.2. Aquatic Resource Study Objectives

[9] 2008 Field Season Study Plan, submitted to agencies on August 21, 2008. See APPENDIX A.
[10] ADF&G comments on SD-1, Dated July 17, 2009 and filed with FERC (20090720-5011).
[11] Study matrix developed by ADF&G and sent to Cascade Creek LLC on April 23, 2011, following Study Plan review communication with Cascade Creek LLC in March of 2010 regarding design change to run of river. See APPENDIX A.
[12] ADF&G review of and consultation on the July 16, 2010 draft Aquatic Resources Study Plan. See APPENDIX A
[13] Cascade Creek LLC Radio Telemetry Study Plan See APPENDIX A
[14] ADF&G edits and revisions submitted to applicant on 8-31-2010. See APPENDIX A
[15] Sept 10, 2010 email from Oasis Environmental. See APPENDIX A

4. The Habitat Utilization study and the Spawning Study, which were determined to be non-nexus by the applicant, were designed to collect baseline information utilizing radio telemetry methods which would have:

a. Used fixed antenna-data logging stations at key locations, specifically covering the outlet from Swan Lake, and the inlet areas of Upper Cascade and the "Spring Creek" areas. Together, with some limited aerial tracking flights, this would have:

- Identified important spawning areas used by rainbow trout throughout the project area.
- Identified the timing windows specific to rainbow trout spawning movements in the project area with direct linkage or correspondence to hydrologic conditions.
- Identified movements between lake and stream segments in the project area, including the gathering of date, time and direction of movements through Swan Lake's outlet area to establish needs for accommodation of fish passage.
- Identified areas of habitat important for the feeding trout populations relative to the locations of project structures and operations, such as the outlet area of Swan Lake and segment of Cascade Creek downstream to the barrier falls spilling into Falls Lake.

1.2.1. Study Scope

6. It is important to note that Cascade Creek and its consultant, Oasis Environmental, failed to consult with the ADF&G for review of final plans, which were released in the SD-2 document[16].

7. It should be noted that the study plans were completed **after** the majority of attempted field studies were completed. This does not follow normally accepted protocols for conducting scientific studies nor follows the ALP licensing process.

8. It should be noted that there were never any consultations held or formalized study plans either developed or discussed, as indicated in the bulleted study *component "Fish Passage Survey"*.

[16] Cascade Creek LLC filed the SD-2 with FERC (20101015-5160) on October 15, 2010.

1.4. Rainbow Trout Fishery Background (page 4)

9. More information is needed on Swan Lake and associated Cascade Creek watershed fishery". Only fish posulation estimates were presented. Other key attributes of this fishery include:

- It is the only alpine-setting lake in the Petersburg Ranger District that currently provides a US Forest Service Public Use cabin where users can come to fish and recreate.
- Swan Lake and associated flowing waters are unique in providing for both lake and stream sport fishery opportunities.
- It is by far the least expensive fly-out fishing opportunity from Petersburg that allows anglers rainbow trout angling, and is currently the only such fishery with onsite FS cabin since the closing of the Deboer Lake Forest Service (USDA-FS) cabin.
- Even though the applicant used the ADF&G 2006 cabin use study (Harding et al 2009[17]) in a concurrent examination on fishing in the recreation study report, the authors failed to report how Swan Lake compared to other fisheries. One example of this was where the Swan Lake trout fishing experience was evaluated against 78 other USFS public use cabins located on lake or streams in Southeast Alaska that provide fishing opportunities for trout or steelhead. The Swan Lake trout fishery in 2006 received a fifth (5^{th}) placement out of 79 in terms of receiving excellent ratings from cabin users. It should also be noted that its ranking surpassed those from all of the other 14 cabins that were surveyed in the Petersburg/Wrangell/Kake area.
- Visitors coming to fish in the Swan Lake/Cascade Creek drainage are afforded a host of other recreational opportunities during their stays such as photography, hiking, mountain climbing and bird watching, as well as recreational or subsistence hunting and gathering.
- Fishing experiences in the watershed including and upstream of Falls Lake are enhanced by phenomenal alpine and mountain scenery that surround the watershed. This is unrivaled in the area.

[17] R. D. Harding, K. A. Kondzela, and R. P. Marshall. 2009. Survey of Anglers Using Southeast Alaska Recreational Cabins during 2006. Alaska Department of Fish and Game, Fishery Data Series No. 09-60, Anchorage.

1.3.1 Rainbow Trout Life History Background (near end, page 5)

10. The stated sentence, *"The above observations of RBT are general to the population and not specific to the trout at Cascade Creek or Swan Lake project area"* is incorrect as written. It should state that "The above observations of RBT are general to the **species** and not specific…."

2. Upper Cascade Creek Geomorphic and Aquatic Habitat Survey (page9)

11. These were two separate surveys or studies, each with their own objectives, which should be identified and treated individually.

12. [page 15, section 2.2.3.2. Spring Creek] *"After an initial reconnaissance of this stream system and associated wetlands, we determined that use of the standard Tier Two stream survey protocol would not be very useful, considering the homogeneity of this spring-fed system."* A unilateral, non-communicated decision was made by the applicants consultants that significantly diminished the study methodology from the agreed upon Tier II survey methodology to a more cursory survey. No dates of this change are provided in text. There were no communications with the resource agencies involved in consultations to disclose this, and furthermore these changes were not reported in subsequent study plan meetings, or the final habitat study plan (October 1, 2010). It is important to understand that the agencies had initially sought a Tier III methodology framework (with a yet higher level of field work and information collected) which was negotiated down to a less rigorous Tier II study framework.

13. [page 29, section 2.3.3. Spring Creek Survey Results] There was no map to show the entirety of Spring Creek and portions that were actually included in the study nor what was actually surveyed. There were no GPS coordinates provided showing the upper endpoint of surveys. There was only one reference to another aerial photo of Upper Cascade Creek (Figure 2.1.c), which showed some stations, but nothing definitive indicating the starting location.

14. Longitudinal profile data is needed

15. The agreed upon area area for the Spring Creek was not fully surveyed. Agreed upon survey distance was 1,100 lineal meters (see Final Aquatic Resources Study Plan, Section 3.2. Fish

Habitat Survey Methods, pg 13, 1st sentence), however the results state the total lineal distance surveyed was 1,713 feet (~525 meters). Hence, only 48% of the distance was surveyed, and did not include the longitudinal profile data.

16. There were no dates reported for the days when field work was performed.

17. Water velocities were not measured with accepted hydrological instruments, they were estimated.

18. [page 32-33, section 2.4. Discussion] *"Given the preponderance of silts and muds overlaying the reach, it seems unlikely that such spawning habitat occurs in great abundance upstream of the point surveyed" and "The Spring Creek is near-center in the floodplain where the actual survey work began, while further upstream the creek's channel is closer to the valley's side where increased stream gradients and different substrates would be likely."* There is not data to support this statement since the area upstream was not surveyed according to the study plan. Further upstream the creek's channel is closer to the valley's side where increased stream gradients with more suitable spawning substrate would be likely.

3.1. Bathymetry

19. [Introduction, pg 35, par 2]*"In their comments on the January 2010 Draft Aquatic Resources Study Plan, ADFG requested high quality bathymetric mapping of the delta area in Swan Lake as well as Falls Lake. Mapping of the latter waterbody should contain sufficient resolution to afford evaluation of the aquatic habitat area currently dewatered during seasonal changes in Cascade Creek discharge."* This presents only part of the reason for the bathymetry in Falls Lake. Cascade Creek's visit during winter 2009-2010 found Falls Lake levels had dropped more than 30 feet, stranding hydrologic sampling equipment. This occurred during a cold spell which reduced streamflows in Cascade Creek to what was probably the lowest, or near lowest flow. This observation was shared with agency staff during the March 2010 meeting, and again validated the need to examine Falls Lake bathymetry. Under the project's proposed operation, flows received into Falls Lake from Upper Cascade Creek watershed would be greatly

diminished by diverting most of Swan Lake's outflows into the hydroelectric project's penstock. This in turn could result in dramatic reduction in habitat volume in Falls Lake, which depending greatly on flow contribution from Swan Lake.

20. [Introduction, page 35] It should be noted that for a EA or an EIS, there will be a need for modeled interaction between flow levels at Falls Lake and habitat volume (stratified by depth classes) and resulting habitat diversity and quality. Since there will likely be an instream flow requirement, it would be most beneficial to provide information across a range of streamflows seen at Swan Lake outlet and Falls Lake. Unfortunately, appropriate and sufficient hydrologic data is lacking to complete these tasks.

3.2.Bathymetry Results and Discussion [pg 47]

21. The bathymetry project apparently did not reference results to surveyed benchmarks, but instead related the collected data to water surface levels. This will result in a loss of useful data if water level sampling has data gaps during key time periods, or is suspended. The study may also not be scientifically repeatable.

22. Survey results need to includee specific times, dates, and water surface levels recorded (used as final reference) by survey location (i.e. Falls Lake, Swan Lake, tidewater). The information provided is insufficient :e.g.: (*"Bathymetric surveys were conducted by a two-person field crew over a one week period ranging from August 19 to August 26, 2010.")*

4. Limnology

23. More information is needed on the potential for gas supersaturation in the tailrace, since fish such as Dolly Varden, rainbow trout, and juvenile salmon may be attracted to tailrace freshwater flows.

The applicant stated in the Final Aquatic Resources Study Plan, found in the SD-2, that, *"concerns regarding gas supersaturation (in) the tailrace will be addressed through literature*

review and a summary report accompanying the limnology report". This issue has not been sufficiently addressed.

5. Cascade Creek Fishery Investigations

24. [pg 71, 1st sentence] *"Fisheries investigations during the summer and fall of 2010 were focused on two areas of study: 1) a mark and recapture and seasonal distribution study to determine the abundance of the RBT stock in Falls Lake and the Pond and inventory other species of fish that may be present in the lake and Lower Cascade Creek system; and 2) a limited rainbow spawning survey focusing on creeks that enter Swan Lake."*

This section identifies two (2) of the studies that were requested, and which Cascade Creek LLC and its consultant Oasis Environmental documented in draft study plans. However, no formal rainbow trout spawning study was performed in 2010. Only a site visit/reconnaissance trip was conducted during May 22nd -23rd, as reported by e-mails[18] from John Gangemi of Oasis Environmental. The attempts to mark and recapture resulted in minimal marking of fish and few or no recaptures. There can be no statistical validity to these efforts and therefore data collected is of no value for estimating fish abundance.

25. [pg 71, Introduction, 1st par, 2nd to last sentence] *"In Lower Cascade Creek, upstream movement from Falls Lake to the Pond is restricted by several waterfalls and cascades."* This statement falls short of the entire picture for rainbow trout in Lower Cascade Creek. It should indicate that rainbow trout may pass through the outlet area of Falls Lake and into the lowermost reaches of Cascade Creek. It is unknown whether rainbow trout located above the barrier falls near tidewater can return back upstream and into Falls Lake.

[18] May 19, 2010 and May 24, 2010 emails from John Gangemi, Oasis Environmental regarding rainbow trout spawning.

26. [pg 71, Introduction, 1st par, last sentence] The statement, *"Upstream movement between the Pond and Swan Lake is deemed to be restricted"* is unfounded. The applicant did not perform a scientifically based fish barrier study.

27. [pg 71, Introduction, 2nd par, last sentence] *"This fishery resource is believed to be a monoculture."* Monoculture is incorrectly used in describing a self-sustaining population of rainbow trout. Typically, the term used to describe intensive culturing practices of a single species, such as in a oyster farm. If the presence of Dolly Varden is observed in Lower Cascade Creek it may alter the ideas of only a single species in the drainage.

28. [pg 72, Introduction, 2nd par, 2nd sentence] *"This was the only trip to the project site that was specifically designed to observe spawning fish."* The field trip referenced here (May 2010) was for area reconnaissance as well as to place water temperature loggers {see comment #25}. This is stated in the results section on pg 93.

29. [pg 72, sect 5.2. Objectives] Objective section did not include any accompanying quality control criteria, such as estimating the abundance of rainbow trout to be within 25% of the true abundance, 95% of the time. We have recommended scientifically based sampling methods. Other Alaskan hydropower projects have prepared study plans similar to this request, e.g. (Cooper Lake Fish Resource Study: Final 2003 Study Plan[19] pages 14-18).

30. [pg 72, sect 5.2. Objectives] ADF&G did not request a determination of sex of captured RBT. This is an invasive procedure which would increase stress and may result in increased mortality on fish surveyed.

31. [pg 72, sect 5.2. Objectives] ADF&G did not request or expect abundance estimation within the lower portions of Cascade Creek below Falls Lake, but ADF&G did repeatedly request

[19] Cooper Lake Fish Resource Study, Final 2003 Study Plan (20030513-0186) Filed with FERC May 6, 2003. Cooper Lake Project (FERC No. 2170) Prepared by John Morsell, Northern Ecological Services, Prepared for Chugach Electric Association, Inc., April 2003.

seasonal fishery inventory sampling to adequately characterize fish species that inhabit the lower stream reach throughout the year. The department would not request abundance estimation during late-fall to winter due to concerns with seasonal changes in behavior (reduced scope of activity and feeding) that may influence or introduce bias, or invalidate assumptions associated with mark-recapture studies. Furthermore, conducting a study during the onset of winter would add logistical complications in remote areas such as this.

32. [pg 73, sect 5.3.1. Mark Recapture Study Methods] Study plans did not include sufficient information geographic stratification. The final Study Plan was released only in SD2, dated October 1, 2010, for which ADF&G was not given any opportunity to review

33. [pg 77, sect 5.3.1. Mark Recapture Study Methods] The consultant's reported use of measuring Catch per unit effort (CPUE) as a means *"to compare and evaluate the effectiveness of capture sampling"* is not applicable, particularly given the lack of sampling effort expended by the consultant's field crews. ADF&G had earlier provided recommendations in consultations regarding development of study plans against using CPUE as a proxy for abundance. Furthermore, when sampling effort is so low, estimating CPUE with zero catches, or very low catches, has no basis.

34. [pg 78, sect 5.3.1. Mark Recapture Study Methods] *"In addition to checking fish for partial caudal fin clips, captured individuals were examined for external morphological characteristics indicative of sex. Specifically, anatomy of the urogenital (vent) opening was noted."* There is no rationale or citations provided to support examination of the urogenital (vent) opening. This level of inspective sampling was not requested.

35. [pg 81, sect 5.4. Results, 3rd sentence] Seasonal fish inventories were planned to occur in Lower Cascade Creek downstream of Falls Lake to document use by fish use throughout the year. This type of sampling was never requested by ADF&G or other involved agencies at Falls Lake or "the Pond" since overwintering would be expected in these deeper basins.

36. [pg 81, sect 5.4. Results, 4th sentence] *"The spawning survey was limited to a single reconnaissance effort on Upper Cascade Creek associated with deployment of temperature probes."* There was no spawning study in 2010 since Cascade Creek LLC waited too long to begin timely development of study plans for the 2010's spawning season. Observations were made by Oasis Environmental during their reconnaissance trip that was primarily to install water temperature monitoring equipment. A spawning study would have been conducted in 2011 in conjunction with a habitat utilization study (utilizing radio telemetry) however Cascade Creek LLC declared these two very important studies to be non-Nexus to the project.

37. [pg 81, sect 5.4. Results, 5th sentence] *"Potential barriers to upstream fish passage were documented for each reach in Lower Cascade Creek as well as Upper Cascade Creek."* ADF&G was never consulted on this study and has not reviewed any study plans, methods or criteria for this evaluation.

38. [pg 81, sect 5.4. Results, 2nd to last sentence] *"In addition, fishery biologists performed reconnaissance investigations on tributaries to Swan Lake and Lower Cascade Creek noting fish passage barriers, presence of spawning habitat, and presence/absence of fish, in particular, searching for YOY fish indicating presence of spawning habitat in the tributary."* YOY rainbow trout would not be present until late July or August. Information is needed on the dates that these reconnaissance investigations took place. We would also like to review the study plan for reconnaissance investigations.

39. pg 81, sect 5.4.1. Mark-Recapture Study] Sampling details should have been collected and provided to the agencies, such as trap set- and trap-pull times, soak (fishing) time per set, time of day. Tables such as 5-2, 5-3, 5-4, and 5-5 should clearly indicate setting dates and pull (sampling) date.

40. pg 81, sect 5.4.1.1. The Pond] Low sampling effort and resulting low catch rates can provide misleading interpretations. See comments above regarding need for adequate sampling designs

to provide for statistically sound interpretations Examples of potential misleading interpretations include *"Hoop nets caught the largest and smallest RBT which suggests that traps [indicating hoop nets] were not size selective"*, or calculating estimates of CPUE based on 1 or few fish from a single hoop net.

41. Table 5-2 does not explain the **not sampled* below the table in table notes. The reason for incomplete sampling should be stated. Deployment of gear needs better description. Depth of hoop nets, substrate type, geomorphic area, nearby habitat features or differences all have an effect on sampling success. Was sampling random and stratified or selective? Selectivity can increase or decrease the catch and greatly affect CPUE.

42. pg 83, sect 5.4.1.2. [Upper Falls Lake, 1st sentence] The statement that September catch was six times greater than the total catch in August either needs to be qualified. That would mean this was based on one night of sampling, which as stated earlier is insufficient and violates assumptions of equal probability of capture.

43. pg 85, sect 5.4.1.3. [Lower Falls Lake, 1st sentence] Same comment applies as with Upper Falls Lake comment 42 above, plus, Table 5-4 (page 86) As currently interpreted, this indicates that only 0 minnow traps were fished from August 19th until August 20th which contrasts significantly with the fishing effort in September. The3 applicant has not explained this contrast. Comparisons are judged to be invalid when 1) effort is very low (substandard), and; 2) the amount of gear used in each sampling event is markedly different.

44. pg 85, sect 5.4.1.3. [Lower Falls Lake, last sentence] The capture of the larger trout in the minnow trap may relate to how the sampling gear was set, in relation to current flow, and also its location relative to where the trout was/were.

45. pg 87, sect 5.4.1.4. [Lower Cascade Creek Reach 2] The applicant should refrain from presenting average lengths based on 3 fish, and should not attempt length comparisons from the various water bodies that were sampled given the limited data set.

46. pg 89, sect 5.4.2. [Lower Cascade Creek Seasonal Fisheries Inventory Reach 1] It is unknown why sampling was not conducted in both August and September, since during September there were near drought conditions for an extended period, and crews were onsight during both months.

47. pg 93, sect 5.4.4. [Rainbow trout Spawning Survey Results] There was nothing that can be considered a rainbow trout spawning survey in 2010. Delays by the applicant to secure biological consultants until spring, likely led to the opportunistic survey.

48. pg 95, sect 5.5. [Discussion] The reported fishery participation and harvest data is restricted to only anglers who reserved and stayed at the Forest Service public use cabin, which does not include hikers' fishing and the anglers who fly in to fish. Because of this, the cabin survey estimates only represent a minimum estimate for fishing activity. The department's primary source of participation, catch and harvest data is from the Statewide Harvest Survey (SWHS) estimates, but this program is commonly constrained in many remote fisheries by low numbers of survey responses. Site specific estimates are not generated and reported without 12 or more responses, and in recent years Swan Lake has included up to 10 responses. In 2006, there was only one response to the SWH survey during the same time as reported on in the cabin survey.

49. pg 95, sect 5.5., para. 3 [Discussion] - We have the following questions and comments regarding the ability to perform repetitive sampling events to estimate abundance in the Cascade Creek drainage after passage of winter:

a. How can it be shown that the sampled water bodies are closed to immigration and emigration over longer periods of time (sampling hiatus) when downstream movement is not ruled out and is thought to have led to colonization of rainbow trout downstream to tidewater. The applicant/consultants have not conducted recommended habitat utilization

studies that would help address movements by rainbow trout within Lower Cascade Creek, and between Lower Cascade Creek and Upper Cascade Creek and Swan Lake.

b. Deaths can and will occur during periods of time ranging from short (such as during a sampling hiatus) or longer term, such as between fall 2010 and summer 2011. Births will also occur, although for a more typical fish population assessment, recruitment would be more of an immediate issue. Recruitment would include new additions to the size or age classes that can be sampled effectively by the gear type and methodology employed. Since minnow traps and hoop traps could both capture very small rainbow trout, it is entirely likely that fish too small in 2010 might ***recruit*** by growth during a prolonged sampling hiatus, and invalidate this assumption because they would be new additions to the sampled population in 2011 (depending on growth, these might include 2010 young of the year).

c. There may be problems identifying fish marked with partial fin clips, which are commonly used in shorter-term stock assessment projects since they may not be 100% identifiable in the following year.

d. All fish will not have an equal probability of capture over time for a number of reasons seen in the assumptions #1 and #2 (population is closed physically and demographically), plus for additional reasons associated with low levels of sampling effort within each sampling event and geographic strata (i.e. upper Falls Lake, “the Pond”, lower Falls Lake). In the mark-recapture study the reporting indicates the sampling events only included 1 night of sampling. This low level of sampling effort would be considered as deficient by most researchers conducting stock assessments. With the very short sampling effort there is a much higher risk that not all fish have similar probability of being captured or recaptured as compared to stock assessments that sample for multiple days and nights. Greater sampling effort is often used to achieve sampling goals. This includes adequate sample sizes for marked, examined, and recaptured fish and rigorous sampling effort help to attain those goals (sampling targets) as well as serves to improve or equalize capture probability.

50. pg 98, sect 5.5. [Discussion]: More information and discussion is needed for the water temperature study .

51. pg 98, sect 5.5. [Discussion]: Information presented on the relationship between rainbow trout and water temperature is limited and speculative. Rainbow trout have adapted well to living in Alaska, and in Swan Lake and Cascade Creek and have a sustainable population without stocking. Although there could be, or is a temperature preference held by the Cascade Creek populations for spawning, other factors/co-variables associated with a preference (i.e. habitat) are likely. The rainbow trout population has colonized Upper and Lower Cascade Creek and associated water bodies and sustained itself for more than 50 years in an oligotrophic basin and watershed. This fishery provides for a high quality fishery experience and has been more successful than other Thomas Bay lakes that received trout stocking (Deboer and Spurt Cove), both of which failed to attract visitor to justify continuation of Forest Service public use cabins. that the trout have been thermally blocked out of Upper Cascade Creek is without scientific merit or evidence since applicant:

a. did not install continuous recording temperature loggers in both Upper Cascade Creek and the adjacent “spring creek” ;
b. did not recount earlier 2010 communications that indicated rainbow trout actively spawned approximately 300m upstream from Swan Lake as noted during an ADF&G drift diving survey.

52. pg 101, sect 6.1. [Benthic Macroinvertebrate Methods and Study area], last sentence: This sentence falls short of what was requested by ADF&G including the reasons for invertebrate and zooplankton sampling. The department’s interest in studying invertebrates in Lower Cascade Creek and Falls Lake is based on the fact that proposed hydroelectric operation would/will dramatically reduce streamflows through the bypassed reach (Lower Cascade Creek). Flow reduction in this reach is of concern for multiple reasons, including the continued needs for invertebrate prey items for rainbow trout. Food density and quality in the proposed bypass reach (lower Cascade Creek) is influenced by drifting invertebrates (macroinverts and microinverts or zooplanktors) and nutrients from Swan Lake’s outlet flows, along with benthic

macroinvertebrate (BMI)production in Lower Cascade Creek, and any resident microinvertebrate /zooplankton communities within Falls Lake. Midwinter field visits by Cascade Creek LLC in 2010 found that Falls Lake water level had dropped by ~ 30 feet during times when winter inflows were minimal, suggesting the basin's inherent leakiness would lead to significant reduction in aquatic habitat volume in Falls Lake during proposed "run of the river" project operation. Having a reduced habitat volume over a significantly prolonged portion of the year (by markedly reduced flows) may further limit composition and the net production of invertebrate prey within Falls Lake for the rainbow trout population. Furthermore, the department recommended during consultations (refer to Appendix A for July 16, 2010 draft Aquatic Resources Study Plan,, ADF&G comments, pg 27, comment# DFF52) that sampling should also include Swan Lake outlet drift invertebrate contributions, and sampling to understand current foods used by trout in Falls Lake. These recommendations were not addressed in the BMI study.

53. pg 102, sect 6.3. [Benthic Macroinvertebrate Results]: A single day's field sampling (August 13, 2010) is not considered to be scientifically valid for describing and characterizing the invertebrate community in Lower Cascade Creek since it is commonly known that invertebrate communities change seasonally? The applicant fails to explain why the sampling intensity dropped from 5 replicate BMI samples per site (July 16th draft Aquatic Resources Study Plan) to 3 replicate samples in the October 1, 2010 "final" Aquatic Resources Study Plan ? This number of replicates per site sample is barely enough, not to mention the lack of temporally-stratified sampling at the selected sites (4) over a wider time frame. It would appear that the final plan (no agency review) clearly was written after the BMI field work was completed.

54. pg 109, sect 6.4., paragraph 3 [Benthic Macroinvertebrate Discussion]: *"Additional sampling events in the spring and fall periods would likely result in collection of additional BMI taxa."* Given that seasonality effects on BMI sampling for community composition occur, the statement in this sentence regarding potential results with additional spring and fall sampling trips (increase in BMI taxa), and, given the very limited BMI sampling by Oasis during 2010(one

day in August), the applicant has not explained the basis on how this very limited-scope can be used to characterize BMI communities in Lower Cascade Creek.

55. Pg 109, sect 6.4 paragraph 4 [Benthic Macroinvertebrate Discussion]: *"Falls Lake was not conducive to bottom sampling using an Ekman or Ponar grab type device due to the angular boulder substrate. Instead, three replicate tows were taken with a zooplankton net in the pelagic zone of Falls Lake. No BMI were collected in these samples despite filtering 400 liters of lake column in each tow. Field staff did collect numerous BMI (Plecoptera and Trichoptera) in the minnow traps and hoop nets deployed in Upper Falls Lake near the inlet falls. These traps also had the highest CPUE. Traps located elsewhere in Falls Lake contained few if any BMI. "* The applicant seems has not utilized correct sampling methodology or sampling gear type for the collection of benthic macroinvertebrates.

56. pg 110, sect 6.4., Last sentence [Benthic Macroinvertebrate Discussion]: *"ADFG determined that BMI sampling was not necessary in Upper Cascade Creek or the adjacent Spring Creek based on the natural lake level operation regime."* For clarification, ADF&G did not request BMI sampling in Upper Cascade Creek in response to requests from the applicant to refocus/reduce the department's information needs that were nexus to the redefined project, as of March 2010. Since the revised operation did not seek a typical storage-type operation, it no longer included lake level manipulation (storage and drawdown) that would demand more extensive study on both Upper Cascade Creek and Swan Lake, including significant studies on lotic and lentic BMI. However, our requested BMI and habitat utilization studies had a focused basis to establish availability of a variety of invertebrate foods (drifting or resident BMI) as well as to follow or track trout residence and passage through the various stream segments affected by the proposed development. This is why BMI sampling was planned for Lower Cascade Creek segments and water bodies (Falls Lake).

57. Appendix 2-5: Photos need dates and correlation with streamflow consistently throughout this section and all parts of the document, similar to Appendix 5-1. A photo captioned as "usual fall flows" was taken during the highest flows seen at the site on many years if not ever.

58. Appendix 5-1: We are unsure if discharges reported in the caption include total discharge (estimated leakage flow plus measured streamflow) when taken from the Swan Lake outlet.

Appendix 5-1 Cascade Creek Fish Passage Barrier photos: September 2010 presented Southeast Alaska with a prolonged period of very dry conditions. In this section of the report there are photographs of those conditions that were taken by field crews during this time. It is noted that photos of potential barriers share the common factor (all were considered barriers under low flow conditions), and the Appendix does not include photographs at the same sites under both more typical and peak flow conditions. Since there were no formal studies requested or otherwise planned on fish passage barriers, the reporting on potential barriers can only be considered speculative, and not a result of the legitimate field studies. The applicant also presented some of these photos, along with others, at the September 28, 2010 meeting in Petersburg, that in particular showed the extremely low water conditions at the significant barrier waterfall near tidewater. However, the same or similar images taken during the same site visit were used in the applicants Recreation surveys (both the Outfitter/Guide and Boater and Pilot versions) in a section of the survey with questions focused on aesthetics and preferences (located between question #22b and #23a in the Boater/Pilot version and labeled as "Cascade Creek (Average Fall Flow))." We ask why are pictures that clearly showed the very low fall flows in 2010 being used in a survey labeled as "Average Fall Flow"? The flow information gaged on 9/21/2010 in lower Cascade Creek, reported 123 cfs, (Final Hydrology Report, Figure 3, and Table 1) and indicates this flow level might only represent ~ 50% of the mean or median flow for that time of year, at that location.

Comments for Supplement to Aquatic Resource Report- December 2010 Aquatic Sampling Event

Comments in this section are identified as S-1., S-2. etc.

S-1. Page 1, par 1: The department initially, and has continued to request that fisheries inventory work in Lower Cascade Creek be conducted seasonally through multiple sampling surveys spaced throughout the year.

S-2. Section 1.1. [December Study Objectives]: The second and third bulleted study objectives reported were never part of previous Aquatic Resources Study Plans. The final study plan (dated October 1, 2010) included one objective, shown as #5. It limits work to characterizing fish presence/absence in Lower Cascade Creek on a bi-monthly basis. There are no other objectives or methods developed to support stream habitat assessment or documentation of fish barriers. The consultants requested and we agreed to use of a helicopter to gather single pass video footage in lieu of on-the-ground surveys. Once consultant staff experienced low flow conditions at Cascade Creek this past fall (September 2010) they could in fact get in the creek more than they had thought previously.

S-3. Section 1.1. [December Study Objectives]: It needs to be clarified that Doug Fleming, ADF&G Division of Sport Fish Area Management Biologist, suggested in the phone consultation with the applicant after the September 28, 2010 agency meeting in Petersburg, that use of a hoop net would allow easier capture of larger adult-sized fish if present, such as Dolly Varden, particularly since they are fall spawners.

S-4. Section 1.3.3. [Passage Barriers]: As previously discussed, there have not been any scientifically-based methodology or criteria to substantiate barriers within this or the Aquatic Resources report. Moreover, what is the reason to determine barriers in the lowest reaches in Cascade Creek since it is known that rainbow trout and Dolly Varden do have a presence, and have persisted until this point? Regardless of barriers in this section, future flows of water may determine the future persistence of resident Dolly Varden and wild spawned rainbow trout as they attempt to carry out their current life histories, or whether they can adapt further to significant changes in their already challenging habitat.

S-5. Section 1.4., pg 17, par 1 [Conclusions]: It would be best to just report the length (104mm). Typically, there is considerable overlap in size composition from coho juveniles of differing age. Judging the age for a single coho salmon juvenile to be age 2 is ill founded, and not defensible. ADG&G age determination protocol for Southeast Alaska coho salmon in smolt tagging projects uses scales to determine age.

S-6. Section 1.4., pg 17 [Conclusions] The authors have not demonstrated that any barriers to upstream migration exist, other than by the size of falls, such as at the head of Reach 1A , and the falls dropping into Falls Lake. Until studies based on scientific rigor have been conducted, misleading statements such as the following should be removed:

> [par 2] *" Rainbow trout and Dolly Varden are limited to downstream movement for the most part due to the frequency of impassible barriers to upstream passage in Reach 1B."*
>
> [par 3] "*The frequency of upstream fish barriers in Reach 1B coupled with the general lack of spawning gravels influences the abundance and size class composition for both rainbow trout and Dolly Varden"*

WILDLIFE STUDIES REPORT

ADF&G feels that the wildlife studies and report is lacking, since recommended studies on moose and mountain goats have not been carried out. Additional studies on furbearers need to be developed and completed.

RECREATIONAL RESOURCES STUDY AND REPORT

These study plans and reports are incomplete, use questionable methods and do not sample all user groups identified during consultations. There is little value in what has been presented and further discussion on methods and needed studies is needed.

CASCADE CREEK HYDROELECTRIC PROJECT
PRELIMINARY TERMS AND CONDITIONS

Introduction:

Due to the lack and inadequacy of study data provided by the applicant, ADF&G is unable to recommend Preliminary Terms and Conditions at this time. The following is a list of topics that may be included when sufficient information is provided for review and analysis:

- Instream Flows:
- Ramping Rates:
- Stream Gaging, Flow Monitoring and Compliance with Instream Flow Requirements:
- Monitoring of Instream Flows and Fish Populations During Operations:
- Startup and Shutdown Procedures:
- Fish Exclusion: (Intake Screening and Tailrace Design)
- Lake Level and Fish Passage and Habitat (Tributaries into and out of Lake):
- Erosion and Sediment Control Plan:
- Erosion and Sediment Monitoring Plan and Fuel and Hazardous Substance Spill Plan:
- Erosion and Sediment Monitoring
- Noxious Weed Control Plan
- Fuel and Hazardous Substance Spill Plan
- Treat Condensate and Leakage from Turbines and other Equipment to Remove Pollutants:
- Environmental Compliance Monitor (ECM):
- Notification of Non-compliance event:

- Annual Project Review meeting:
- Access to Site By ADF&G Employees:
- Timing of Instream Activities:
- Mitigation:
- Avian Electrocution:
- Bear Safety Plan:
- Helicopter and Airplane Controls to Minimize Impacts to Mountain Goats:
- Penstock Burial to Maintain Wildlife Migration Corridor:
- Restricting Road Access and Land Use to Minimize Fish and Wildlife Impacts:
- Stream Buffers and Location of Facilities:
- State Land Interests:
- Unique Terms and Conditions:

.

Thank you for consideration of our comments and concerns.

Sincerely,

/s/

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Attachments: APPENDIX A

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