

***Response to Comments on
Draft 2003 Study Plans for
Relicensing of the
Cooper Lake Project (FERC No. 2170)***

Chugach Electric Association, Inc.

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Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies

Response to Comments on Draft 2003 Study Plans for Relicensing of the Cooper Lake Project (FERC No. 2170)

INTRODUCTION

Background

Chugach Electric Association, Inc. (Chugach) is in the process of relicensing its Cooper Lake Project (Project). The current license for the Project expires at the end of April 2007, and the final application to relicense the Project must be submitted to the Federal Energy Regulatory Commission (FERC) no later than April 30, 2005.

The Initial Consultation Package (ICP) for the relicensing was issued to relicensing participants in June 2002, and additional information on baseline data collection and environmental resource studies proposed to support the relicensing effort was provided in August. Participants submitted their comments on the ICP and formal requests for relicensing studies to Chugach in early September. Based on the study requests and additional consultation on technical details, Chugach developed a set of draft study plans for 2003 relicensing studies. The 18 draft study plans were issued between mid-November and late January for review by relicensing participants.

Comments on the draft study plans were received from the U.S. Forest Service (USFS), National Marine Fisheries Service (NOAA Fisheries), U.S. Fish and Wildlife Service (USFWS), National Park Service (NPS), FERC, Alaska Department of Fish and Game (ADFG), Alaska Department of Natural Resources (ADNR), and American Whitewater Affiliation (AWA). Chugach considered all of the comments and used this guidance to revise and finalize the 2003 study plans.

Purpose and Scope of This Document

The purpose of this document is to provide an overview of Chugach's responses to participants' comments on the draft study plans and to respond to additional information and study requests that were provided with the study plan comments. The focus of this response document is on addressing policy-level (non-technical) issues as well as issues and requests that do not pertain to a particular draft study plan. For the most part, however, participants' comments focused on technical aspects of the draft study plans. These technical details (as well as editorial comments received) are addressed directly in the revised study plans, rather than in this overall response document.

Final Study Plans

Participants' requests and suggestions for modifications to technical or editorial aspects of the study plans were generally incorporated into the revised study plans. In cases where technical guidance in the study plan comments was not followed, the study plans were modified to provide

further clarification or explanation regarding the selected technical approach. In addition to making requested revisions to existing draft study plans, based on the study plan comments and requests, Chugach has also developed a new study plan to further respond to participants' ongoing questions related to potential attraction of fish in Kenai Lake to the powerhouse outfall and potential injury of fish at the turbines.

The study plans for 2003 relicensing studies have now been completed, and the final study plans are being issued along with this response document. The complete list of final 2003 study plans is as follows:

- Hydrology Study
- Stream Flow and Water Quality Study
- Cooper Creek Aquatic Habitat Analysis
- Cooper Creek Fish Resources Study
- Cooper Creek Instream Flow Study
- Cooper Lake Fish Resources Study
- Cooper Lake Macroinvertebrates Study
- Preliminary Evaluation of Entrainment in Cooper Lake
- Porcupine Creek Fish Resources Study
- Evaluation of False Attraction of Fish to the Project Powerhouse Outfall
- Evaluation of Effects of Project Operation on Kenai River Fish Habitat
- Terrestrial Vegetation Study
- Sensitive and Exotic Plant Survey
- Terrestrial Wildlife Study
- Cooper Lake and Cooper Creek Water Birds Study
- Recreation and Visual Resources User Survey
- Cooper Creek Recreational Whitewater Potential, Preliminary Evaluation
- Cultural Resources Study
- Road and Access Route Condition Survey

Chugach believes that its consultation with agency resource experts and other participants regarding the 2003 relicensing studies has greatly benefited the overall study program and the quality of the individual study plans. Chugach hopes that agency representatives will continue to remain actively engaged in the study program through the course of the 2003 field season, the review of study results and planning for any further relicensing studies deemed necessary in 2004.

Overview of Schedule for 2003

Implementation of the 2003 relicensing studies is currently underway. Currently ongoing study activities include engineering investigations, such as development of the Project operation simulation model, review of the probable maximum flood (PMF) analysis, and refining the description of future reservoir operations that would occur with proposed modifications to Cooper Lake Dam; literature review for fisheries/aquatics, wildlife, and cultural resource studies; research related to preliminary evaluation of potential fish entrainment in the Project intake in

Cooper Lake; research and preliminary information development for the recreation/visual resource user survey; and continued cooperative planning with the agency technical review team for the Cooper Creek instream flow study.

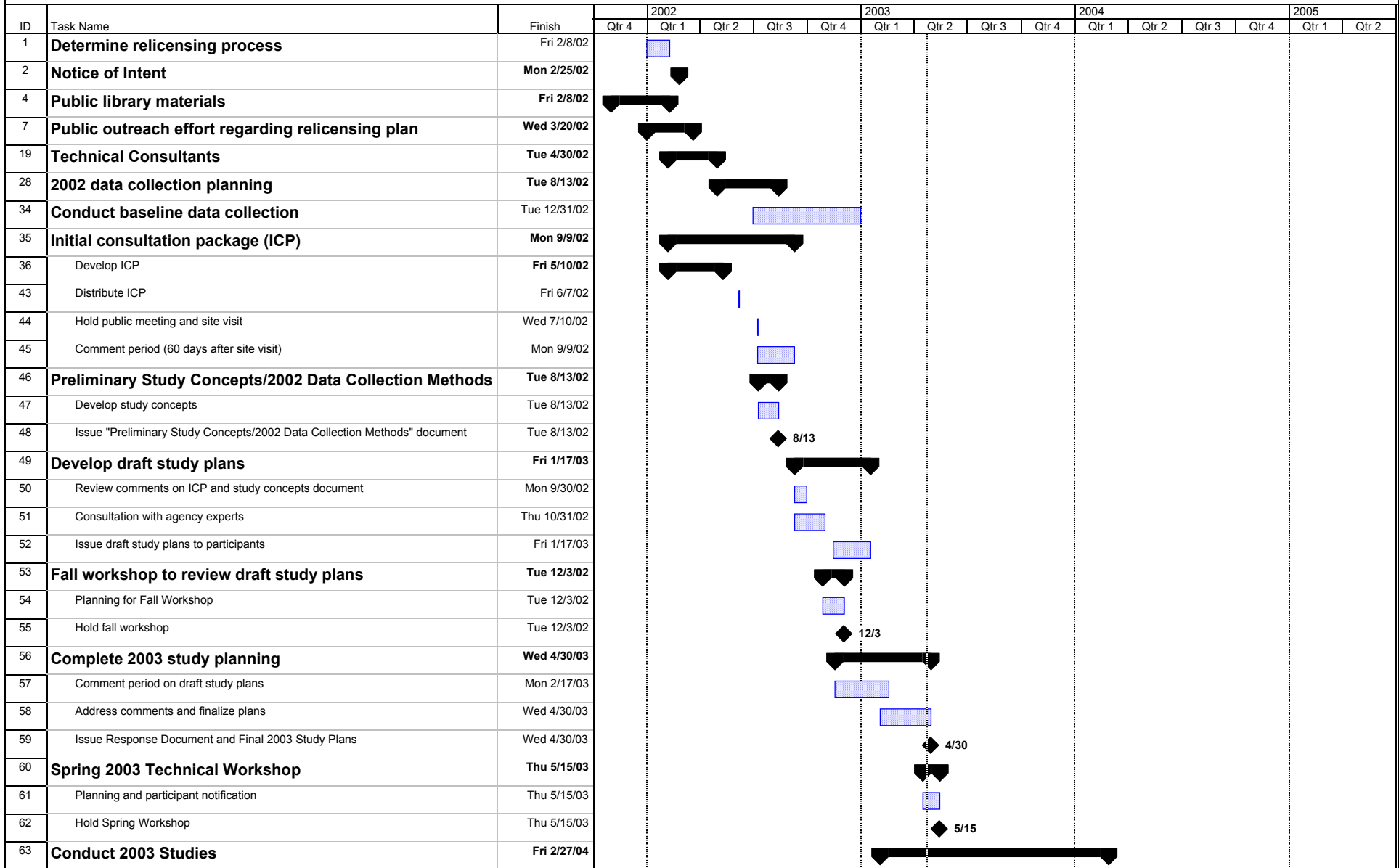
Field activities for some studies (Cooper Creek instream flow study, Cooper Lake macroinvertebrates study, and terrestrial wildlife study) are planned to begin in late April, and several other field efforts will be underway by the end of May. Field activities will largely be completed by the end of October. The attached schedule of field study activities (Attachment 1 to this document) shows the planned timeframes for fieldwork associated with each of the 2003 studies.

The remainder of the relicensing study effort for 2003 will be centered around the following general areas of activity:

- *Spring workshop*: This workshop is scheduled for May 15. The workshop will focus on presentation of interim study results from the hydrology study (in particular, development of the operations model). The workshop will also provide an opportunity to overview final 2003 study plans, review plans and schedule for specific field activities, and discuss opportunities to participate in field efforts.
- *Fall workshop*: Chugach envisions that a second workshop will be held in late fall to review the preliminary results from 2003 relicensing studies and discuss further information needs and plans for anticipated 2004 studies.
- *Planning for 2004 studies*: Study planning for 2004 relicensing studies will follow completion of 2003 study efforts. Preliminary proposals for 2004 studies will be discussed at the fall workshop, with study planning continuing through the end of 2003 toward completion of draft study plans in early 2004. The anticipated focus of 2004 studies will be follow-up information development regarding Project impacts (to supplement or expand upon results of 2003 studies) and additional engineering, economic, and environmental studies as needed to evaluate in more detail proposed Project operations and potential protection, mitigation, and enhancement measures (PMEs).

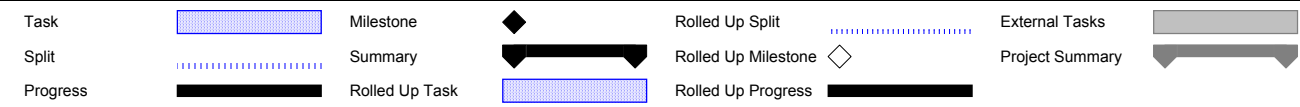
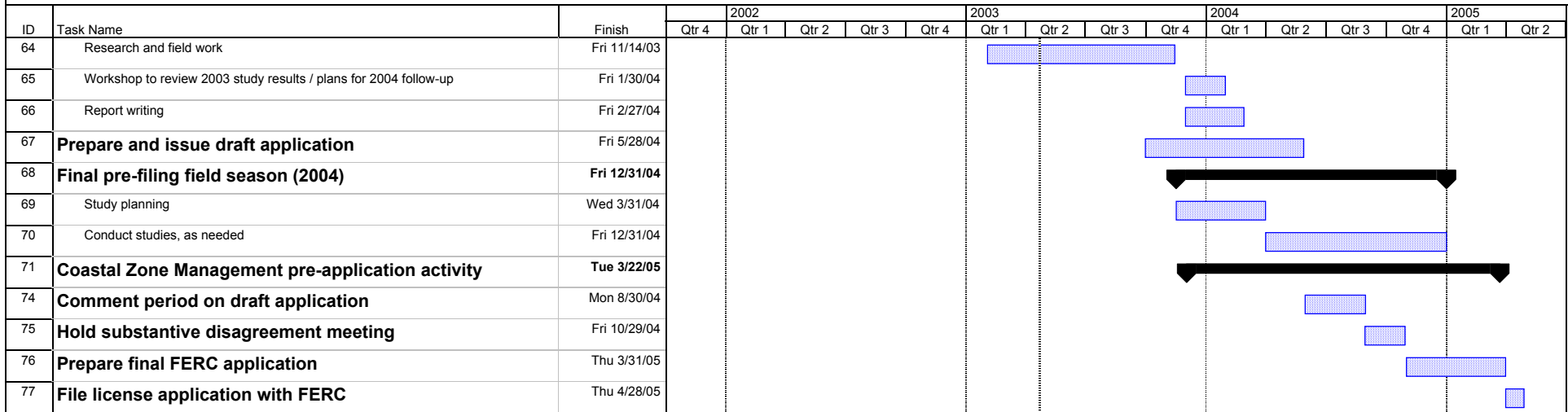
The attached updated relicensing schedule (Figure 1) shows anticipated relicensing activities and associated timeframes through the filing of the final license application in 2005.

Figure 1. Cooper Lake Project Relicensing Schedule



Task		Milestone		Rolled Up Split		External Tasks	
Split		Summary		Rolled Up Milestone		Project Summary	
Progress		Rolled Up Task		Rolled Up Progress			

Figure 1. Cooper Lake Project Relicensing Schedule



RESPONSE TO GENERAL COMMENTS/ISSUES

Baseline for Relicensing Analysis and Mitigation

Several comments on the study plans expressed the position that to fully identify “ongoing effects” of the Project and adequately identify mitigation measures, relicensing studies should assess the existing environment relative to conditions that would exist with a static reservoir level at elevation 1,168 feet (i.e., pre-Project condition of Cooper Lake). The comments requested that relicensing studies also characterize existing conditions relative to conditions that would occur with full flows in Cooper Creek and without existing supplementation of flows in the upper Kenai River due to diversion of Cooper Lake outflows through the Project powerhouse.

Chugach understands agencies’ interest in development of data to help understand historic conditions and influences on the current environment, but Chugach respectfully maintains that it is not the licensee’s responsibility to develop this information in the context of FERC relicensing. As Chugach has stated previously, the proper focus of Project impacts evaluation for relicensing is determining the effect of the Project during the next license term relative to conditions that exist at the present time — with the Project in place. FERC does not require detailed characterization of pre-project conditions for its National Environmental Policy Act (NEPA) analysis, and this policy has been upheld by the U.S. Court of Appeals, recognizing that pre-project data is often sparse to non-existent and that establishing a pre-project baseline for relicensing analysis would thus unrealistically require FERC and license applicants to “recreate a 50-year-old environmental base upon which to make present day development decisions” (*American Rivers v. FERC*, 201 F.3d 1196 [9th Cir. 1999]). Therefore, Chugach’s planned relicensing studies for the Cooper Lake Project remain focused on evaluating the effects of ongoing and proposed Project operations, including reservoir fluctuation, powerhouse operations, and maintenance activities. In addition, Chugach is collecting information that will be valuable in assessing potential PMEs, such as returning some portion of natural flows to Cooper Creek.

With regard to the specific pre-Project conditions of interest, Chugach does not agree that it is necessary to characterize conditions that would exist with a static reservoir level, unregulated flows in Cooper Creek, or no diversion of flows through the powerhouse. Maintaining a static lake level in Cooper Lake is not a reasonable alternative for the Cooper Lake Project because it would be highly impractical to operate the Project in this manner, which would significantly restrict the operational flexibility of the Project thus reducing key Project benefits. A static reservoir level would require that generation occur directly and immediately in response to inflow (flow volume and timing). Such operational requirements would largely negate the value of the Project power resource because it would no longer be available to provide useful capacity (capability to meet load), spinning reserve (which reduces the likelihood of system outages as a result of generation failures), or voltage support (to assure power quality) at times needed to meet regional system demands. (In addition, as a point of note, natural lake levels are in no way “static.” As shown in USGS gage records for Kenai Lake [USGS gaging station 15258000 at Cooper Landing], the level of this natural lake varied over a range of approximately 9 feet during 2002, and abruptly rose approximately 6 feet in mid-October due to high inflows.). Therefore, a

static-reservoir alternative will not be evaluated in relicensing studies, and is not necessary as a point of comparison for assessing future Project effects. The planned relicensing studies are intended to fully characterize the existing and potential future effects on environmental resources of current and proposed reservoir operations. Specifically, Project effects on reservoir shoreline vegetation, macroinvertebrates and dependent higher trophic-level organisms will be addressed by the planned Cooper Lake macroinvertebrate, vegetation, wildlife, and fish resource studies.

As with static reservoir level, a regime of full natural flows down Cooper Creek is incompatible with continued operation of the Project and not a necessary point of comparison for assessing future Project effects; therefore, Chugach also does not plan to evaluate an unregulated flow regime as a potential alternative for the new license, or to evaluate potential resource conditions that would be associated with such a flow regime. The range of Cooper Creek flow regimes to be evaluated as a potential PME will be discussed further with agency members of the instream flow study technical review team (“IFIM Review Team”). While the effects of a wide range of alternative flows in the creek, including full natural flows, on fish habitat can be predicted with the instream flow model, Chugach intends to utilize the results of the instream flow study to present information on what it believes is a reasonable range of alternative flow regimes in its final license application.

Similarly, because cessation of powerhouse flows is not a viable alternative for continued Project operation, planned study of Project effects on the upper Kenai River (between Kenai Lake and the Cooper Creek confluence) is designed to characterize the effects of outflows related to ongoing and potential future powerhouse operations. Continuing effects of water input rates and timing from the Project to Kenai Lake and Kenai River will be evaluated through the Hydrology Study (Project outflows, Kenai Lake levels, and effects on Kenai River discharge) and the Kenai River fish habitat study.

In summary, Chugach believes that continuing and future effects of Project operations will be addressed by the proposed studies and that these conditions can be fully and adequately evaluated without reference to a pre-Project baseline.

Proposed Project Operations / Range of Analysis

In the ICP, Chugach stated that the only operational modification that Chugach was considering proposing in the license application was to modify the dam spillway to allow safe passage of the PMF and operation of the reservoir over an increased pool-level range. The specific proposal under consideration would involve lowering the spillway to an elevation of 1,206 feet, which would allow safe passage of the PMF at a reservoir elevation of 1,220 feet and would also allow the normal maximum operating pool level to be raised to 1,206 feet.¹ With the higher operating level of the reservoir after the spillway modification, the total zone of available reservoir

¹ As has been noted previously, the Cooper Lake Dam spillway (elevation 1,210 feet msl) is currently not large enough to pass the estimated PMF if the starting reservoir level is at the licensed normal maximum elevation of 1,210 feet msl. Therefore, since the mid-1980s, to prevent a situation in which the dam could potentially be overtopped by flood flow (which would pose a significant risk of dam failure), Chugach has maintained the reservoir at a level of 1,194 feet msl or lower. This reduced normal maximum operating level ensures that there is sufficient unused storage capacity in the reservoir to be able to fully capture routine floods as well as pass the theoretical PMF-size (very rare) flood event without overtopping the dam.

fluctuation would increase from its current range of between 1,165 feet and 1,194 feet msl (with a typical annual fluctuation of approximately 10–15 feet). The new full range of operation would be between 1,165 feet and 1,206 feet msl; annual fluctuation would remain similar to current conditions (because the finite annual inflow to the reservoir would remain unchanged), but with the potential for somewhat greater variation in the mean reservoir elevation between years. In the November 2002 Supplemental Information Packet, Chugach elaborated on the nature of the dam modification proposal but explained that clarification of implications for the future reservoir operations was pending detailed reservoir operations modeling and cost/economic studies planned for 2003.

Participants have continued to request further clarification and details regarding the potential reservoir operations that would be associated with the dam modifications and increase in normal maximum reservoir operating level as described. In the comments on the study plans, agencies noted that lacking a more detailed description of proposed reservoir operations, it is incumbent upon Chugach to study the potential effects associated with the maximum possible reservoir operating range (41 feet, between elevations 1,165 and 1,206 feet msl), in a wide variety of patterns over the course of the year, and over the course of a number of years.

Chugach agrees that planned studies should evaluate the full range of potential Project effects under a new license, including reservoir operations as well as powerhouse flows into Kenai Lake. Engineering and economic studies are currently underway to confirm and refine Chugach's proposed operating range for Cooper Lake. To the extent that the range of potential future operations can be narrowed in time to inform 2003 field studies, study design will be refined accordingly. In any case, the studies will characterize the full potential range of reservoir fluctuation that Chugach may propose under the new license.

Quartz Creek to Anchorage Transmission Line

FERC staff have raised the question of whether the transmission line from the Quartz Creek Substation to Anchorage properly falls within FERC's jurisdiction. The determining factor will be whether the transmission line meets FERC's criteria for a "primary" transmission line, used solely to transmit power from the Project to load centers. Chugach will review FERC's regulations defining project transmission lines (Section 3(11) of the Federal Power Act and Subpart H, §4.70 of the Code of Federal Regulations, Title 18) and FERC's guidance document "Identifying Transmission Facilities at FERC Hydroelectric Projects" Paper No. DPR-6 (January 1993) to determine whether the Project transmission line is likely to remain within FERC's jurisdiction. If the line is determined to be non-jurisdictional, then under FERC's regulations the line cannot be included in the new license. In this case, removal of the line from the Project license could be initiated at any time, but would likely be requested in conjunction with the application for a new license for the Project.

In cases where a previously licensed transmission line is determined by FERC to be non-jurisdictional at the time of relicensing, FERC typically retains jurisdiction over the line until the licensee has obtained any other necessary permits and approvals for the line to remain in place. Chugach anticipates that a Special Use Permit would be obtained to cover continued operation and maintenance of the line on USFS land, and that any required authorization would be obtained for the portion of the line on State land. Chugach is currently consulting with the USFS

and ADNR to determine the information needs for the transmission line permitting that would be required absent FERC jurisdiction.

Regardless of FERC's jurisdiction over this transmission line, Chugach will continue to include the transmission line right-of-way (ROW) in the scope of relevant relicensing studies, to generate the resource information necessary to support, as appropriate, either relicensing of the line as part of the Project or alternative permitting requirements (e.g., USFS Special Use Permit).

RESPONSE TO ADDITIONAL INFORMATION/STUDY REQUESTS

Project Boundary / Project Boundary Maps

New maps showing the existing Project boundary were provided with the Supplemental Information Packet issued in November 2002. Participants have requested further information on the Project boundary, including maps showing the specific location of all existing and proposed Project facilities such as roads, transmission lines, access routes, power line towers, culverts, bridges, gates, and berms. In addition, it has been requested that all wetlands and fish streams crossed by the access routes, roads, or transmission lines should be delineated and described, and that the transmission line and access route features be mapped onto a geographic information system (GIS) basemap (using global positioning system [GPS] technology) and onto recent aerial photography.

Revised maps of the existing and proposed Project boundary will be developed in 2003. As requested, the Project boundary and Project features will be mapped onto a GIS basemap and onto orthorectified aerial photography using 2002 and 2003 aerial photography. Details regarding culverts, bridges, gates and berms will be shown on maps that will be produced separately through the Road and Access Route Condition Survey. As part of the planned survey, locations where roads and access routes cross streams and wetlands will be documented and mapped. It should be noted that such details may be more relevant to future USFS Special Use Permit requirements and related State right-of-way permitting requirements than to relicensing (see discussion above regarding likely removal of the Quartz Creek to Anchorage transmission line from the Project license). Chugach will consult with the USFS and ADNR as appropriate to determine how best to present the requested detailed information regarding the transmission line access routes and associated features.

The USFS has further requested that the following features be included in the Project boundary under the new license:

- Cooper Creek from Cooper Lake Dam to the Kenai River
- Snug Harbor Road and the Cooper Lake Dam access road
- All transmission line access roads not within the transmission line ROW, and used exclusively by Chugach

Chugach does propose to modify the existing Project boundary under the new license, but the proposed changes to the boundary differ somewhat from the USFS's requests. Specifically, Chugach proposes to include the following features in the Project boundary under the new license:

- Cooper Lake Dam access road
- Spur road off Snug Harbor Road to the Project powerhouse
- Spur off Snug Harbor Road from Russian Lakes Trailhead to the intake structure on Cooper Lake
- Spur “965” off Snug Harbor Road to the adjacent transmission line

If the Quartz Creek to Anchorage transmission line is found to still meet the criteria for FERC jurisdiction under the Project license, Chugach will also propose to include all access routes used for transmission line operations and maintenance under the new license. However, Chugach does not propose to include Snug Harbor Road proper (from Cooper Landing to the Russian Lakes Trailhead) or Cooper Creek in the Project boundary, for the reasons explained below.

With regard to Cooper Creek, determination of whether the creek should be included within the Project boundary will be more appropriately made by FERC at license issuance based on conditions that may be included in the new license. In a similar situation (September 23, 2002, Order Denying Rehearing on issuance of new license for Queens Creek Hydroelectric Project No. 2694), FERC noted:

Nothing in the [Federal Power Act (FPA)] or our regulations speaks directly to the question of whether a bypassed reach should be within a project boundary or must be considered to be part of a project. The definition of “project” in FPA Section 3(11) specifies a number of works, including dams, reservoirs, powerhouses, and primary transmission lines, but does not refer to bypassed reaches. In consequence, we must determine whether a bypassed reach is part of a project based on the specifics of each case. Where a license requires either ongoing programs in a bypassed reach such that continued Commission oversight over the reach is necessary to meet those requirements, we will consider the reach to be part of the project. Where the contrary is true, we will not.

FERC further determined in this case that a requirement of release from the dam of minimum instream flows alone (without the addition of any associated project facilities or other mitigation programs) did not warrant adding the bypassed reach to the project. Given FERC’s policy as exemplified by the Queens Creek Project order, and given the fact that Chugach is proposing no specific measures relative to Cooper Creek at this time, it would be premature at this point for Chugach to decide whether it will be appropriate to include Cooper Creek into the Project boundary. Nevertheless, as has been noted, the relicensing studies program has been designed to include evaluation of the effects of potential alternative flows in Cooper Creek.

Similarly, in the case of Snug Harbor Road proper, Chugach will rely on FERC’s determination of whether this is a primary Project facility that should be included in the Project boundary. The multiple-use road serves a variety of purposes, including public access to recreation areas and access to privately owned homes along Kenai Lake. Because access to Project facilities has become a relatively small percentage of total use of this road, Chugach does not believe Snug Harbor Road should be considered primarily a Project facility or included within the Project boundary. However, for the purposes of permitting requirements for a possible USFS Special

Use Permit for the road,² and for baseline information in case FERC should determine it is appropriate to include the road in the Project boundary, the relicensing study program includes data collection along this road, as has been requested. Chugach is pursuing discussions with the USFS, ADNR, Kenai Peninsula Borough, and others regarding responsibilities and potential long-term cost-sharing for maintenance of Snug Harbor Road in keeping with ownership and use status of the road.

Finally, participants have requested that Chugach provide proper land descriptions of the entire Project area by township, range, and section, as well as by state, county, river, river mile, and closest town, in accordance with FERC licensing requirements. Most of the requested information was included in the ICP, including descriptions by township, range and section for the entire Quartz Creek to Anchorage transmission line. Chugach will continue to refine and update its survey information on existing and proposed Project lands. The final license application will include maps and survey description of the Project that are in georeferenced electronic format as well as a complete, current tabulation of federal lands (by township, range, and section) within the Project boundary.

Polychlorinated Biphenyls (PCBs)

As in past communications during the relicensing process, in its comments on the draft study plans, the USFWS continued to express its position that the presence of polychlorinated biphenyls (PCBs) in Kenai Lake (discovered during 2000–2001 upgrades of the Project powerhouse) is an ongoing Project effect that warrants further investigation and mitigation as part of the Project impacts assessment for relicensing. The USFWS further questioned interpretation of the results of Chugach’s Final Report for the Sediment Fish and Food Web Sampling Project at the Cooper Lake Hydroelectric Project (April 1, 2001); specifically, the USFWS disagreed that the outer boundary of the PCB Aroclor 1254 was determined through this study. The USFWS maintained that PCBs are present in Kenai Lake as a result, at least in part, from past conditions or facilities at the Project powerhouse, and reiterated its request that additional sampling of fish tissue from the vicinity of the powerhouse be undertaken to “assess risk to ecological or human health from consumption of fish in this area.”

As Chugach has stated previously, concerns with possible PCB contamination under the current license have been addressed to FERC’s satisfaction, and no further studies are planned.³ The comments of the USFWS regarding PCBs in Kenai Lake have previously been addressed by Chugach in multiple submittals to FERC and the U.S. Environmental Protection Agency (EPA). The results of several studies are summarized in Chugach’s April 1, 2002, Final Report and in

² Snug Harbor Road is a USFS easement across State-owned land; Chugach and the USFS are currently working to determine permitting requirements and responsibilities for Project-related use of the road.

³ In a letter dated June 13, 2002, FERC stated that, based on its review of Chugach’s Kenai Lake PCB study final report, it had determined that Chugach was not required to conduct further PCB sampling and analysis in Kenai Lake pursuant to paragraph (A)(3) of the February 1, 2001, “Order Modifying Kenai Lake Sampling Plan.” More recently, FERC responded to USFWS’s request of January 22, 2003, that FERC reconsider its interpretation of the PCB study final report and rescind its June 13, 2002, letter. In its response (dated March 4, 2003), FERC reiterated that the final PCB report satisfied the requirements of the various FERC orders on this issue. FERC also noted, “Further, it is unlikely that the Cooper Lake Project powerhouse is a continuing source of PCB contamination to Kenai Lake sediments and fish.” FERC declined to rescind its letter of June 13, 2002.

Chugach's Final Report on PCB Cleanup (February 27, 2001). These studies have already documented the nature and extent of PCBs in the vicinity of the powerhouse and determined that consumption of fish or water from Kenai Lake would pose no unacceptable risks to humans or fish. The USFWS concedes in its comments that PCBs "are no longer being released from the plant" (USFWS letter of January 31, 2003, General Comments, at p. 1). Therefore, the presence or absence of PCBs in Kenai Lake will in no way be affected by the relicensing of the Project, and the USFWS's comments regarding PCBs are irrelevant to the relicensing. As noted above, the proper scope of the Project impacts analysis for FERC relicensing is ongoing and potential future effects of Project operations. Thus, as is more pertinent to relicensing, continuing and proposed future measures for treating and managing wastewater from the Project under the new license will be described in the license application.

With respect to the USFWS's specific comments regarding interpretation of the PCB study results and requests for additional study, Chugach's April 1, 2002, Final Report documents that PCB concentrations in lake trout from the background locations of Lake Clark and Lake Louise were equal to or higher than the PCB concentrations in lake trout in Kenai Lake (Final Report at p. ES-3). Therefore, any risks to high trophic level fish-feeding animals consuming lake trout from Kenai Lake are no different than, or less than, the risk associated with consuming fish from other lakes in the region. Given these facts, no additional sampling of lake trout is necessary or appropriate.

Regarding the question of aerial extent of PCBs in sediments in Kenai Lake, Chugach's April 1, 2002, Final Report does in fact document the boundaries of PCB Aroclor 1254 in sediments in the vicinity of the plant. During the study, sporadic low level concentrations of PCB Aroclor 1260 were also detected in sediments in Kenai Lake, but with no connection to the powerhouse. The PCB Aroclor 1260 is a distinct Aroclor mixture that is different than the Aroclor 1254 found in paint at the powerhouse. As discussed in Chugach's Final Report, the likely source of most of the PCBs in Kenai Lake sediments is spawning salmon that picked up the PCBs during their migrations and residence in the Pacific Ocean. This source likely explains the detection of PCB Aroclor 1260.

Powerhouse Outfall Issues — "False Attraction" and Direct Mortality

In comments and study requests in response to the ICP, Chugach was requested to conduct a study to evaluate potential attraction of migrating salmon to outflow from the powerhouse. The concern is that for migrating fish that spawn soon after arriving at spawning areas, any delay in migration can significantly reduce the chance for spawning success. A related question was whether there was potential for fish near the powerhouse to swim into the turbine draft tubes and become injured or killed from turbine blade strikes. In its Stage 1 Response document (November 2002), Chugach pointed out that there is no evidence of fish attraction to the powerhouse (e.g., no data or observations indicating that fish congregate in the vicinity of the powerhouse, or that Kenai River salmon populations have experienced reduced spawning success, since the powerhouse began operations 42 years ago). Chugach's fisheries consultant has suggested that after multiple generations of spawning salmon in the Project area, fish would likely have adjusted to any change in water chemistry or lakeside stream flow within Kenai Lake due to diversion of Cooper Lake water through the powerhouse. In addition, Chugach noted that

the configuration of the turbines and rate of discharge during generation made it highly unlikely that fish could swim into the turbine draft tubes to encounter turbine blade strikes.

Further agency comment in response to the draft study plans, however, indicates continuing question about potential “false attraction” and injury/mortality at the Project powerhouse. Chugach was again requested to investigate the potential for these adverse effects to occur at the powerhouse outfall. The suggested study approach included documenting the velocity profile of the tailrace discharge using a flow meter; using trapping or netting in the tailwater area at the appropriate season to establish whether fish are present; and using radio telemetry to document fish behavior (length of stay) near the outfall, if fish are detected. Further, it was suggested that if captured salmon showed signs of turbine blade strikes or abrasion, the potential for fish injury at the turbines should also be examined.

Chugach again notes that agencies have presented no information that would support the hypothesis that fish delay at the tailrace is occurring or having an adverse effect on the salmon population(s) that use this lake. In addition, Chugach is aware of no anecdotal information that would suggest that fish are present in the tailrace. Nevertheless, Chugach agrees that documenting velocities and outflow timing at the powerhouse tailrace is appropriate for further characterizing possible Project effects. Chugach has developed a study plan (which accompanies this document) to describe proposed calculation of velocity and delineation of the velocity interface near the outfall. However, Chugach remains concerned that any study of fish behavior in relation to the outfall would lack meaning with respect to ongoing Project effects. The passage of time, lack of pre-Project comparative information, and lack of information relative to Kenai Lake fish populations as a whole would prevent any meaningful conclusions regardless of study results. Additionally, Chugach is concerned with any study design that would require Chugach to prove the “negative” — i.e., that absolutely no fish are attracted to any degree to the tailrace or that there is no amount of temporary delay for any fish at the tailrace. Such study results would be impossible to achieve regardless of study design. Therefore, Chugach does not propose to include trapping/netting or radio tagging of fish at the tailrace in the study plan.

Regarding the potential for fish injury at the turbines, Chugach again notes, as discussed in section 3.3.3 of the November 2002 Stage 1 Response document, that turbine blade injury of adults at the powerhouse is highly unlikely, given local velocities vs. fish swimming velocities, and given the vertical configuration of the draft tubes. Without evidence or reason to indicate that injury/mortality of fish due to turbine blade strikes may be occurring or affecting salmon populations, Chugach continues to disagree that a specific investigation to address this hypothetical occurrence is necessary.

Reservoir Storage Capacity Curve

To address questions regarding present-day accuracy of the reservoir storage capacity curve that was presented in the ICP, the November 2002 Supplemental Information Packet explained that Chugach did not expect that the accuracy of the storage curve for the usable storage behind Cooper Lake has changed appreciably since the curve was originally developed, because factors such as siltation that could potentially reduce available storage capacity in a reservoir would only significantly affect the deeper portions of Cooper Lake (i.e., well below the 1,165-foot-msl elevation that marks the base of the usable storage area of the reservoir). However, further

questions regarding current reservoir storage capacity were posed along with comments submitted in response to the draft study plans, and Chugach was requested to evaluate the potential change in reservoir storage capacity that may have occurred since original development of the storage capacity curve.

To address continuing questions about the degree to which sedimentation may have diminished the available storage capacity of the reservoir (i.e., above elevation 1,165 ft msl), Chugach proposes to conduct a reconnaissance evaluation that will entail:

- Comparison (and digitization, if feasible) of pre-Project aerial photographs and new aerial photographs taken during drawdown to calculate volume of sediment accumulated
- Description of existing and past observations regarding accumulation of sediment in the drawdown zone

Further explanation of the methodology for accomplishing the reconnaissance-level investigation to evaluate possible changes to the reservoir storage capacity curve will be included in the draft license application.

RESPONSE TO SPECIFIC COMMENTS ON THE DRAFT STUDY PLANS

Hydrology Study

Summary of Hydrology Information

Agencies requested a number of clarifications to and modifications of the scope of the draft study plan for the Hydrology Study. Several of the requests pertained to the proposed summary of historic, existing and proposed hydrology data (Task 4.1 in the study plan). Among these, Chugach was asked to provide more detailed information on powerhouse outflows, beyond the monthly outflow information provided in the Supplemental Information Packet; specifically, mean daily discharges (or, preferably, mean quarter-day discharges) from the penstock were requested. Chugach agrees that a more detailed characterization of daily powerhouse operations will be useful in the evaluation of the potential effects of the Project on Kenai Lake and the Kenai River. Toward this end, Chugach has summarized daily average powerhouse flow data for 2002 (determined from hourly generation that has been recorded at the Project since the powerhouse upgrades were completed in April 2001). This information is presented in a memorandum (dated March 14, 2003, re: Kenai Lake Levels and Powerhouse Flows) that is attached to the final study plan for the Hydrology Study.

Also regarding Task 4.1, it was requested that the summarization of data for the stream gaging sites and powerhouse outflow include the following elements:

- Probability of exceedence of daily average flows for each month
- Probability of exceedence of daily average flows for the period of record
- Probability of exceedence of annual average flow for period of record
- Annual hydrograph showing daily averages, minimum, maximum
- Frequency curves for peak and minimum daily average flows

It was also suggested that the historical data be used as the basis for synthesizing historical flows where data are missing. Chugach will use all available hydrology data to describe existing conditions and to incorporate into modeling of potential Project operations scenarios. The existing data are suitable for these purposes, and there is no need to simulate historical data to adequately model Project generation under alternative operations scenarios. Chugach does not plan to simulate hydrology data to fill gaps in the historical record.

In the comments on the draft study plan, it was noted that the size of Kenai Lake probably serves to greatly attenuate daily flow fluctuations from the powerhouse, but participants identified the need for further hydrologic analysis to characterize the relation between Project powerhouse outflow, Kenai Lake levels, and outflow to the Kenai River. Specifically, Chugach was requested to evaluate water travel time from the powerhouse to the mouth of Kenai Lake, and the effect of large flow fluctuations at the powerhouse on outflows from Kenai Lake, particularly for times of the year when Kenai River flows are 1,000 cfs or less. Chugach agrees that flow fluctuations in the upper Kenai River resulting from Project outflows are likely to be greatly attenuated by Kenai Lake, resulting in a relatively steady augmentation of flows to the upper Kenai River (above the Cooper Creek confluence). Powerhouse flows and timing, and the magnitude of fluctuation/attenuation of flows through Kenai Lake into the Kenai River are being evaluated through a separate simulation model as a component of the Hydrology Study (see March 14, 2003, memorandum attached to the Hydrology Study plan. The evaluation using this model focuses on periods of time when outflows from Kenai Lake are 1,000 cfs or less.

Reservoir Operation Simulation Model

Comments pertaining to Task 4.2, development of a reservoir operation simulation model for Cooper Lake, indicated that a more detailed description of the proposed model was needed to help agencies understand the features of the proposed model, including assumptions and limitations of the model. In addition, concern was expressed that the monthly time-step for the model as proposed in the draft study plan might not provide sufficiently detailed information on daily maximum and minimum reservoir elevations. To address this concerns, it was requested that the model provide the following capabilities:

- Operation on a daily time-step (or, at a minimum, a weekly time-step).
- Ability to run for multiple years (preferably over the full period of inflow record), in order to evaluate the effects of several dry years, or wet years on the water budget.
- Ability to set target reservoir elevations for recreation, wildlife and other resources (i.e., set rule curve) on at least a weekly time-step.
- Ability to set relative priorities for operational constraints on Cooper Lake outflows.
- Ability to set the turbine maintenance schedule.
- Ability to represent physical changes to the Project such as routing Stetson Creek into Cooper Lake, and releasing water from the reservoir into Cooper Creek.
- Ability to provide model output display in tabular or graphic formats.
- Ability to display violations of any operational constraints.

Chugach understands that for some projects with more complex configurations and operational constraints, it is appropriate to develop operations models with the detailed input and modeling capabilities that have been requested. However, for the purposes of modeling generation under

potential alternative operations scenarios at the Cooper Lake Project, a more simplified model, with a monthly time scale, is adequate and appropriate.⁴ Chugach proposes to use the monthly simulation model to study generation options and generation implications of alternative operations, which is information needed to support development of the license application. It will be used to determine:

- The reduction in Project power generation that would occur in the event instream flow releases are made into Cooper Creek from potential new facilities that could be constructed at Cooper Lake Dam.
- The increase in Project generation that could be possible if flow diversions are made from Stetson Creek through potential new facilities into Cooper Lake.
- The potential gain in Project power generation that would result from raising the maximum operating level of Cooper Lake from elevation 1,194 msl to elevation 1,206 msl (in conjunction with potential modification of the spillway to allow safe passage of the PMF).

To the extent that additional operations alternatives or constraints may be proposed and evaluated, the model will be modified as necessary to provide the capability to be able to predict hydrologic factors and generation associated with these potential alternatives.

A further request was that the reservoir operation simulation model be able to accurately evaluate the historic (pre-Project) range of reservoir level fluctuations in Cooper Lake. Chugach does not anticipate that the operations model will include this ability because it would require making a number of detailed assumptions about configuration and hydraulic geometry of the pre-Project outlet to the creek — assumptions and model components that are not needed to evaluate the range of existing and potential future reservoir operations.

Probable Maximum Flood (PMF) Estimate

Task 4.3 in the draft study plan described Chugach's plans to reevaluate the existing estimate for the PMF into Cooper Lake (which was based on a study completed in 1984) and to update the PMF estimate if necessary using current meteorological data and methodologies.⁵ Given Chugach's potential proposal to lower the existing spillway elevation and raise the normal maximum reservoir level, agencies requested that Chugach also describe the estimated frequency, magnitude and duration of potential spills from the reservoir at inflows less than the PMF, based on the same assumptions about reservoir levels, antecedent conditions, etc., used in the PMF calculations.

Reevaluation of the 1984 PMF estimate is currently underway as part of the Hydrology Study. As described in the study plan, if the results of the reevaluation indicate it is warranted, a new PMF study will be conducted using up-to-date methodologies and assumptions. As requested, the new or confirmed PMF estimate will be used to determine the frequency, magnitude, and

⁴ Available historical data for input to the Cooper Lake Project operations model is limited to monthly data up until late 2001 when new monitoring capabilities were added as part of the powerhouse upgrade and rehabilitation that allow for the capture of flow and generation data on an hourly basis.

⁵ Evaluation of the PMF is being conducted as a routine component of requirements for FERC Part 12 safety regulations. The PMF evaluation is not a required relicensing study; however, the results of the PMF evaluation are being used as input to the hydrology study for relicensing.

duration of potential spills from Cooper Lake under proposed Project operations. In addition, the HEC-1 model being used to perform the PMF routing studies will also be used to evaluate the potential flood implications for several theoretical flood events of a magnitude less than the PMF (e.g., up to the estimated 500-year event).

Study Timing and Linkages to Other Studies

As part of Task 4.3 in the draft study plan, Chugach proposed to evaluate the potential for a diversion of Stetson Creek and the resulting implications for Project operations. In the comments on the draft study plans, there were questions, however, as to the linkage between this analysis and the ongoing data collection from Cooper and Stetson creeks for the Stream Flow and Water Quality Study. In response, Chugach notes that the ongoing stream flow monitoring in Cooper Creek and Stetson Creek will be used in conjunction with the hydraulic and temperature modeling of Cooper Creek. However, a sufficient period of data collection will not have been completed soon enough to incorporate this ongoing data collection into the summary of the historical hydrologic record, which is the basis for the evaluation of potential diversion of Stetson Creek.

Similar study sequencing and linkage questions were raised relative to the proposed schedule for Tasks 4.1 and 4.2 and the ongoing stream flow data monitoring. As with the analysis of the Stetson Creek diversion potential, the ongoing stream flow data collection will not have progressed far enough by spring 2003 to incorporate it into either the summary of historic hydrology data or development of the operations model. However, the new stream flow data will be used at a later time to help calibrate the operations model.

Stream Flow and Water Quality Study

Existing limnological data for Cooper Lake was summarized in the ICP. ADFG has recommended that Chugach collect additional limnological data from Cooper Lake if necessary to evaluate current limnological conditions, primarily through quantifying zooplankton populations and documenting physical and euphotic characteristics of the reservoir. Chugach agrees that characterization of existing conditions in Cooper Lake is necessary to allow comparison to future conditions, to evaluate the effects of any changes in reservoir operations. However, existing data appear to be adequate for this purpose. A joint ADFG/USFS limnology study was conducted in 1998. ADFG limnologists conducted the detailed survey using accepted ADFG methodology (as summarized in the Cooper Creek Watershed Analysis, USFS 2002). The 1998 study provides very good information on existing conditions for all the parameters that have been requested by ADFG to be included in data collection for relicensing. Given this existing information, Chugach does not plan to collect the additional requested limnological data for relicensing.

Cooper Creek Aquatic Habitat Survey

The comments received on this draft study plan indicated approval of the scope and technical details of the study. There were no requested changes to this study plan.

Cooper Creek Fish Resources Study

Comments received on this study plan all dealt with technical aspects of the study. These comments are addressed directly in the final study plan.

Cooper Creek Instream Flow Study

Agencies have noted that the planned Cooper Creek instream flow study is a complex modeling exercise involving detailed data collection and multiple modeling methodologies, and have agreed with Chugach's proposed use of a technical review team (the "IFIM Review Team," including agency representatives) as an integral component of this study. In the comments on the draft study plan, agencies emphasized that periodic meetings and updates should be held with the IFIM Review Team. In addition, concern was expressed that participation on the IFIM Review Team would be limited to the representation noted in the draft study plan (i.e., experts from ADFG, USFS, HDR Alaska, Inc., and Northern Ecological Services), and it was requested that participation be made open to all resource agencies and interested public members.

Regarding the request for periodic meetings and updates with the technical review team during the course of the instream flow study, Chugach notes that — as requested — the study is designed to incorporate technical review and updates with the IFIM Review Team at appropriate milestones during the study. In addition, technical memoranda regarding specific study components will be distributed periodically during the instream flow study. Chugach also notes that participation in study planning for the instream flow study, including participation in the IFIM Review Team, has not been restricted. The members of the team listed in the draft study plan were simply those attendees at the December 5, 2002, instream flow workshop who expressed interest in participating in selection of study transects. The IFIM Review Team currently consists of 26 people from all involved State and federal agencies, as well as representatives of Chugach. Other interested agency representatives and members of the public are encouraged to remain involved through review and comment on periodic technical memoranda and other documents that will be generated through this study; all materials related to this and other studies will continue to be made available to all relicensing participants on the Cooper Lake Project relicensing website.

As described in the study plan, the Cooper Creek instream flow study will use hydraulic modeling in conjunction with species-specific habitat suitability criteria to develop quantitative predictions of habitat that would exist under alternative flows in the creek. Agencies have requested that one alternative scenario that should be modeled for comparative purposes is the amount and location of habitat that would be available if Cooper Creek were to receive full flows from Cooper Lake. While a range of potential flows in the creek will be evaluated through the study, as noted above, a regime of full natural flows down Cooper Creek is incompatible with continued operation of the Project and is not a necessary point of comparison for assessing future project effects. Therefore, Chugach does not plan to evaluate an unregulated flow regime as a potential alternative for the new license. Cooper Creek flows to be evaluated through the instream flow study as a potential PME will be discussed further with agency members of the instream flow study technical review team.

Agencies have pointed out that modeling the hydraulics, habitat, and temperature associated with flows significantly greater than those that have occurred in Cooper Creek since construction of the Project may require making certain assumptions about how the stream channel might be expected to change under a flow regime with greater baseflows. The idea is that the active channel has likely adjusted to a smaller size in the 40 years since the water was diverted from it and would widen (at least locally) with the addition of instream flows from Cooper Lake. An example of the potential problem that arises for modeling and interpretation of results if only the existing channel cross section is used in the analysis is that habitat quantity and type would be different if a given flow occurred as overbank flow (i.e., overtopping the existing channel) vs. within-channel flow for a larger channel. Similar considerations come into play for sediment transport and temperature modeling aspects of the study.

To address uncertainties about potential channel changes with higher flows, Chugach proposes to use the services of an expert stream morphologist (on the HDR study team) to conduct an assessment of how stream morphology in Cooper Creek would be expected to change with higher stream flow. This assessment will take into account the effects on stream morphology of fine and coarse sediment and large wood in the channel. The results will be taken into account in evaluating the modeling results for the instream flow study.

Finally, as noted above under discussion of the Hydrology Study, agencies have requested information to understand the potential for, and potential effect of, periodic spills from Cooper Lake into Cooper Creek that might be expected under alternative reservoir operations (i.e., with lowered spillway and higher normal maximum operating level, as is being considered by Chugach). Of particular interest is the effect on the reaches of the creek above its confluence with Stetson Creek, because these reaches have a highly reduced flow regime under current operations, and adjustments of the channel over time to this reduced flow regime has led to reduced channel capacity. The USFS has specifically stated that maintaining the capacity of the channel in all reaches to ensure that the channel can convey water “without excessive damage to the habitat” is a resource goal. In response, Chugach notes that if potential future Project operations under the new license include increased potential for periodic, infrequent uncontrolled spills into Cooper Creek, Chugach will evaluate the need for either potential channel modifications to adequately convey such flows or modified reservoir operations to reduce the spill potential.

Cooper Lake Fish Resources Study

Among the comments received on the draft study plan for this study was a request to model how rainbow trout and Arctic char populations in Cooper Lake would respond to a stable reservoir level at 1,168 feet above msl, with established shoreline and inlet stream riparian vegetation. As noted above, maintaining a static lake level in Cooper Lake is not a reasonable alternative for the Cooper Lake Project because it would be impossible to operate the Project in this manner; further, it is not necessary as a point of comparison for assessing future Project effects. Therefore, the study will not address potential effects of a static reservoir level.

All other comments received on this study plan dealt with technical aspects of the study. These comments are addressed directly in the final study plan.

Cooper Lake Macroinvertebrates Study

As with the Cooper Lake fish resources study, comments on the draft study plan for the Cooper Lake macroinvertebrates study requested that the study include modeling of population dynamics for littoral macroinvertebrates with a stable reservoir level at 1,168 feet msl. Again, because a stable reservoir scenario is not possible with the continued operation of the Project, and because the information is not required for FERC's NEPA analysis, this alternative will not be evaluated in the relicensing studies.

Another request for the macroinvertebrates study was that instead of the study plan's proposed single sampling station in each of the five representative habitat type (for a total of five transects) in Cooper Lake, the transects be located in habitat types in accordance with the relative abundance of each habitat type (e.g., if 80% of the survey sites contain sand, then 80% of the sampling sites should contain sand). To address this comment, Chugach has modified the distribution of transects for this study to achieve sample collection that is more proportional to the relative abundance of habitat types around the reservoir. The total number of transects for this study has been increased from five to seven, a sampling effort that will provide a qualitative yet accurate understanding of existing conditions in the reservoir fluctuation zone. The information sought and objectives of this study do not warrant the substantial increase in field and analysis time and cost that would result from further increasing the number of transects planned.

Preliminary Evaluation of Entrainment in Cooper Lake

The draft study plan for the preliminary entrainment evaluation focused on literature review and analysis of existing Project-specific information to evaluate the relative risk of entrainment of fish into the Project intake structure in Cooper Lake. In addition to this proposed office-based scope of work, collection of additional information in the field was requested by agencies in their comments on the draft study plan. One of these requests was that the study include further underwater videography to view spawning Arctic char in close proximity to the Project intake, and that observation of these spawning char be made and recorded during an extended time period when the intake is operating at maximum flow. In addition, it was suggested that determination of intake velocities and sampling for fish presence during Project operation could provide further insight regarding the potential for entrainment.

In response to these comments, Chugach has modified the study plan to incorporate underwater observations in the vicinity of the intake structure, as requested. A remotely operated vehicle (ROV) or diver will be utilized to observe fish presence within the intake channel four times during the year under normal operating conditions. If significant numbers of fish are observed near the intake opening during any of these observation periods, then flow through the power plant will be increased to full capacity and the response of the fish will be observed. The modified scope of work also includes developing velocity profiles within the intake channel and at the trash rack (based on field velocity measurements and depicted in a velocity contour map).

ADFG further commented that if entrainment is determined to be likely based on the results of the preliminary entrainment evaluation, Chugach should immediately begin additional study or, alternatively, forgo further entrainment studies and proceed with installation of screening or

other protective measure to reduce entrainment. As Chugach has noted previously, the need for further study of potential entrainment in Cooper Lake will be determined based on the results of the preliminary entrainment evaluation as well as the results of the Cooper Lake fish resources study, which also are relevant to any determination of entrainment effects (i.e., whether the population appears to be adversely impacted).

Porcupine Creek Fish Resources Study

This study was developed to address concerns regarding the effects of occasional releases from the penstock valve into Porcupine Creek; these releases are typically made every several years for the purposes of routine inspection and maintenance of the penstock. In the draft study plan, it was noted that Chugach proposed to limit such releases from the valve to approximately 1 cfs to minimize the impact to Porcupine Creek. Noting that the proposed 1 cfs would be an operational rather than structural limitation, agencies requested further information regarding the structural capacity of the valve outflow, as well as the actual volumes, timing, or duration of flows from the valve system in 2001 during drawdown of Cooper Lake during powerhouse upgrades. Chugach was also requested to clarify how it proposes to manage reservoir levels in times of powerhouse shutdown in the future.

As noted in the study plan, up to 60 cfs can be released through the penstock valve without causing erosion to the piping. Total structural capacity of the valve is 150 cfs, but discharge of this magnitude has never been released through the valve. During the 2000–2001 powerhouse upgrade, although the reservoir had been drawn down in preparation for the upgrade work, the unanticipated PCB cleanup at the powerhouse delayed the upgrade work significantly, while the reservoir level rose progressively. Thus, it became necessary to release flows through the penstock valve to prevent the level of Cooper Lake from exceeding the safe maximum operating level of 1,194 ft msl. (Total flow volume released through the valve during 2001 is unknown.)

Chugach has made an operational decision to limit flows released from the penstock during periodic maintenance activities to approximately 1 cfs. This practice will be followed during the new license term. During future situations in which the powerhouse may be shut down for maintenance or overhaul, the work would be timed to start after the reservoir had been drawn down to avoid having to use the penstock valve to maintain a safe reservoir level. Chugach does not anticipate any emergency situations during the new license term that would involve having to release flows through the penstock valve as in the 2001 upgrade work.

Other comments on the study plan indicated that with the proposed limitation of flow releases from the valve to approximately 1 cfs, the remaining concern for Porcupine Creek fish resources is the upstream passage barrier created by the perched culvert on the Snug Harbor Road spur to the powerhouse. Agencies noted that replacement of this culvert would provide fish access to the upstream 0.4 mile of stream for spawning and rearing. Chugach agrees that replacement of the culvert may benefit fish resources in the creek. If the planned study of fish resources in Porcupine Creek indicates the presence of suitable fish habitat, then Chugach will consider removing the culvert and replacing it with a bridge.

Evaluation of Effects of Project Discharge on Kenai River Fish Habitat

Comments received on this study plan all dealt with technical aspects of the study. These comments are addressed directly in the final study plan.

Terrestrial Vegetation Study

Comments received on this study plan all dealt with technical aspects of the study. These comments are addressed directly in the final study plan.

Sensitive and Exotic Plant Survey

Most of the comments on this draft study plan pertained to technical aspects of the study and are addressed in the final study plan. In addition, Chugach was requested to clarify the proposed study area to be covered by this study. These comments also specifically requested that a category of “access roads not within the powerline corridor” be added to the list of roads and access routes to be surveyed for sensitive and exotic plants.

It has been Chugach’s intent from the outset to include all Project-related access routes on USFS lands in this study, including those not within the powerline corridor. Because only the USFS had identified an interest in evaluating Project effects on sensitive and exotic plant species (to meet specific USFS management objectives and requirements), no proposal initially was made to survey for such species on lands under other ownership jurisdictions, and the final 2003 study plan remains focused on USFS-managed lands remains. However, Chugach has been pursuing further consultation with the State regarding potential information needs and study approaches relative to State permitting of roads and access routes along the Project transmission lines in the event that FERC eventually determines that the transmission line should no longer be part of the Project.

Terrestrial Wildlife Study

Questions and comments related to the scope and approach of the study, as described in the draft study plan, included a request that the study be able to characterize habitat quantity and quality around Cooper Lake between elevations 1,194 and 1,206 feet msl and to address the question of whether this zone of habitat would be “replaceable” if the maximum normal operating level of the reservoir is raised to 1,206 feet msl. The study plan has been clarified to indicate that the quantity and quality of wildlife habitat around Cooper Lake between elevations 1,194 and 1,206 feet msl will be described and that the scope of the study will allow evaluation of the relative importance (and implications of re-inundation) of wildlife habitat around Cooper Lake between elevations 1,194 and 1,206 feet above msl.

A related comment requested that the study also characterize the quantity and quality of wildlife habitat around Cooper Lake that would be expected to exist assuming a static water level at 1,168 feet msl. For the reasons cited above, the study will not address wildlife habitat conditions that might be present with a static lake level.

Regarding the proposed scope and methods described for characterizing brown bear use of the Project area and potential Project effects on brown bears, questions were raised about the proposed use of the Cumulative Effects Model of the Interagency Brown Bear Study Team and its use in modeling conditions both with and without the Project. The study plan has been revised to reflect the fact that members of the Interagency Brown Bear Study Team have recently indicated to Chugach that they do not believe the Cumulative Effects Model would be an appropriate tool for modeling existing and potential future effects of the Project. Furthermore, the model will not be used to evaluate conditions that would exist in the absence of the Project. As noted previously, analysis of pre-project conditions is not required for evaluation of project impacts, based on FERC's baseline policy. Similarly, in response to comments requesting that the study also model the effect of returning full flows to Cooper Creek on wildlife other than brown bears (including eagles, harlequin ducks, and other waterbirds), Chugach reiterates that it does not propose to model the effects of full flows in Cooper Creek on brown bears or other wildlife, for reasons stated above. Rather, based on outcome of the Cooper Creek instream flow study and other related efforts, a range of potential effects on wildlife under potential alternative flow regimes in the creek will be estimated.

Comments on the draft study plan also requested that Chugach clarify its plans for future vegetation management practices along the Project transmission lines and that the study characterize the ongoing effects on wildlife habitat of vegetation removal along the powerlines for both "cut and uncut" conditions. In response, Chugach notes that in the foreseeable future, no changes are planned to its existing vegetation management practices and maintenance schedule along the transmission lines, as detailed in the ICP.⁶ The scope of the study includes evaluating effects on wildlife habitat of existing/ongoing vegetation management practices along the Project transmission lines. As described in the study plan, the study will determine habitat quantity and quality through aerial photo interpretation and digitization. However, the study will not attempt to quantify habitat that would exist along the transmission lines in an "uncut" condition because the "uncut" condition is not relevant to the evaluation of continuing effects of managing vegetation along the transmission line rights-of-way.

Another aspect of the study involving the Project transmission lines is the proposed review of existing information and consultation with agencies to evaluate the possible hazard posed by the lines to migratory birds. Agency comments on the draft study plan suggested that Chugach should determine whether existing power poles are consistent with guidelines in "Suggested Practices for Raptor Protection – State of the Art in 1996" by the Avian Power Line Interaction Committee (APLIC), and stated that any proposed new poles should be built to these specifications. Chugach's initial assessment indicates that the design of the 115- and 69-kV transmission lines is consistent with the APLIC guidelines and that the transmission lines thus pose a minimum risk for electrocution. Existing data will be reviewed to confirm this assessment. However, a 4.16-kV distribution line between the powerhouse and the intake on Cooper Lake has been built to older design parameters and will be investigated for compliance with the APLIC guidelines by determining critical distances between energized and grounded

⁶ The information on frequency of vegetation clearing has been updated in the study plan from the information presented in the ICP, which indicated vegetation clearing occurred on 6–8 year cycle. Vegetation clearing along the transmission line is managed on a 9–10 year cycle.

parts. In addition, in accordance with Chugach's standard practice, any new transmission line poles installed during the course of the new license would be designed to the APLIC guidelines.

Cooper Lake and Cooper Creek Water Birds Study

The objective of the Cooper Lake and Cooper Creek water birds study is to characterize ongoing and potential future impacts of reservoir operations (including evaluation of the quality of nesting habitat available around the 1,206-foot elevation) on waterbird habitat and nesting success around Cooper Lake. However, as with comments on other study plans, agency requests for this study continue to include the request to evaluate conditions that would exist with a static reservoir level at 1,168 feet msl. As explained above, Chugach does not intend to evaluate such a condition in relicensing studies because it is not a viable proposal for future operation of the Project and is not required as a point of comparison for FERC's NEPA analysis.

Recreation and Visual Resources User Survey

The USFS commented that the recreation and visual resources user survey should include an assessment of the effects to recreation and scenery as Cooper Lake is fluctuated over its full potential operating range, and should separately evaluate the effects to recreation and scenery of operating the reservoir at a static water level. Chugach notes that the user survey is not the appropriate instrument to evaluate effects on recreation and scenery of reservoir fluctuations over the full range of operations. The number of visitors to Cooper Lake who will be available to survey will not be large enough to provide statistically valid results. In addition, during months with the greatest drawdown, the shoreline is not readily visible under the accumulated snowpack. Instead of the survey instrument, Chugach proposes to use professional judgment to determine the effect of reservoir operations on visual quality and recreation. For the reasons mentioned above, however, the study will not evaluate scenery associated with a static reservoir level.

An additional USFS request was that the study include an assessment of the recreation effects to Cooper Creek Campground and the lower half-mile of Cooper Creek of a scenario where full flows were returned to Cooper Creek (with salmon and rainbow trout runs present). The planned summer recreation survey will include questions about sportfishing opportunities and experience in the Project area. From this information, Chugach expects to be able to develop a range of potential sportfishing opportunities that might be associated with alternative flow regimes in Cooper Creek. Again, however, an unregulated flow regime is incompatible with continued operation of the Project and will not be evaluated as a potential alternative for the new license.

Regarding the study component to characterize winter recreation use initiated from the Snug Harbor Road parking area, the USFS expressed concern that the proposed three survey days may be insufficient to provide reliable or statistically valid user information, particularly in the unseasonably warm 2002/2003 winter. The USFS requested that the study plan: identify the confidence level of the survey, with a minimum acceptable level set at 80 percent; explain how the confidence level would be met within the planned time period; and identify what businesses, local residents, and groups will be surveyed to acquire information on economic effects. Finally, the USFS requested that the study identify and evaluate the broader role that the whole of southcentral Alaska plays in the winter recreation use of the Cooper Lake area.

Chugach agrees that the planned survey will not provide statistically valid results on winter recreation use from the Snug Harbor Road parking area, but believes that the overall evaluation is nonetheless well designed and will provide accurate results to describe existing and potential future Project effects for the relicensing analysis. The planned evaluation of winter recreation use in the Project area will not be based on a statistically valid survey. Because visitor numbers were expected to be too low as a result of the extremely low 2002/2003 snowpack in the Project area, the in-person winter surveys, as originally planned and described in the draft study plan, have been eliminated from the study. Instead, Chugach plans to conduct targeted interviews of local residents, vendors, and user groups (e.g., commercial recreation providers and user groups in the Cooper Landing area) to determine the levels of winter use of the Project area. These interviews will allow existing winter recreation use and trends to be characterized accurately.

With respect to the suggested need for evaluation of the “broader role” of southcentral Alaska in winter recreation use of the Project area, Chugach does not intend to conduct a broader survey; such a survey effort would need to be very extensive to obtain statistically meaningful results for the relicensing study. Instead, the study will rely on interviews with residents, vendors, and user groups to evaluate regional aspects of Project-area winter recreation. Development of focus groups for those with exceptional interest in the study is also a possibility.

Similar concern was expressed that the proposed user survey may be insufficient to provide reliable or statistically valid information regarding summertime recreation use of the Project area. The USFS also requested that survey have the ability to evaluate summer recreation trends and thresholds, where additional recreation opportunities in the Project area are viable. Chugach anticipates that the summer recreation survey will yield responses from roughly 300 visitors to the Project area. This response level will provide results with a confidence level of 80% or greater. The final study plan has clarified this and other aspects of the proposed study, including businesses and groups that will be targeted for the resident, vendor, and user group interviews. However, the survey will not be designed to seek “latent demand” information from visitors; direct questioning regarding use of potential future recreation opportunities does not yield reliable information.

ADFG repeated its request from its September 2002 comment letter that Chugach’s planned recreation resources study include evaluation of the effect of proposed Cooper Lake operations (stage fluctuations and potential increase in maximum reservoir level) on reservoir freezing and human access and safety. Chugach recognizes that its planned approach for addressing this study request warrants clarification. The requested information will be developed through both the Hydrology Study and the recreation resources study. The assessment of potential access and safety impacts associated with wintertime reservoir operations will characterize the reservoir edge during winter drawdown and users’ perceptions and experience related to these conditions that may affect their use of the reservoir area. The Hydrology Study component will entail modeling of reservoir levels under existing and proposed operations, along with qualitative description of winter ice conditions and the possible role of reservoir drawdown (including timing) on ice formation and ice barriers. The final study plan for the Hydrology Study has been clarified to indicate that modeling of reservoir ice formation per se is not proposed. The planned winter recreation study component of this assessment entails targeted interviews of local residents, vendors, and user groups that will include questions designed to elicit information

regarding human access to and use of the reservoir during winter conditions. Specific activities addressed by the interviews will include ice fishing, snowshoeing/skiing, and snowmachining. The responses to these interviews will be used to determine the level of use occurring on the reservoir during winter conditions, from which the expected level of impact from any identified access or safety concerns can be determined. The information regarding the possible role of reservoir operations on reservoir ice conditions will also be used to assist in studying how various potential reservoir operating scenarios might affect winter wildlife crossing and icing effects on riparian habitats.

A number of comments on the draft study plan dealt with the issue of how existing whitewater boating recreation use and opportunities (existing as well as potential opportunities) in the Project area would be addressed in the relicensing study. It was noted that the draft user survey included no questions that would provide information related to kayaking, and that because Cooper Creek currently has no whitewater recreation, the survey is unlikely to provide useful information regarding potential use of the creek for whitewater boating. Some commenters suggested modifications to the survey, while others recommended making clear in the study plan that the survey would not address potential whitewater recreation in Cooper Creek. Chugach agrees that the user survey alone is not the appropriate mechanism to obtain this information. In addition to modifying the survey questions to specifically seek information on “whitewater boating,” the recreation study will be modified to include interviews with rafters and kayakers in the Cooper Landing area to determine the range of boating expertise in the area and targeted information regarding existing boating opportunities and use in the area. In addition, the planned Cooper Creek whitewater evaluation has been expanded to include on-site assessment of boatability of Cooper Creek by interested whitewater boaters.

Cooper Creek Recreational Whitewater Potential, Preliminary Evaluation

The draft study plan for the preliminary evaluation of whitewater boating potential on Cooper Creek generated several comments regarding the proposed scope and approach of the study. Among the comments were requests that the study evaluate Cooper Creek for its potential kayaking and rafting opportunities at flows higher than now exist (a range of flows up to 600 cfs was suggested). AWA recommended that, as an initial phase, the evaluation include a field reconnaissance conducted by a group consisting of interested stakeholders and whitewater boaters, followed by an on-water boating study if deemed appropriate based on the field reconnaissance.

In response to the comments and recommendations on the draft study plan, Chugach has substantially modified the planned evaluation of Cooper Creek whitewater boating potential. Chugach has retained the services of an expert in whitewater boating studies (Doug Whittaker, PhD., Confluence Research and Consulting)) who has assisted in framing a modified study approach. The planned approach involves conducting a field evaluation of access and safety issues, in conjunction with a land-based reconnaissance evaluation of boatability of Cooper Creek. Chugach agrees that it is appropriate to have interested stakeholders participate in the field reconnaissance. Chugach proposes to incorporate into the study findings input from the stakeholders who participate in the field reconnaissance.

AWA further recommended that the study plan clearly define subsequent steps in the study should the preliminary evaluation indicate there is significant potential for whitewater boating opportunities on Cooper Creek. AWA specifically recommended a method that has been applied at other FERC hydropower projects undergoing relicensing. Chugach appreciates suggestions regarding potential future steps in the whitewater boating feasibility evaluation. However, it should be noted that a second phase of the evaluation as suggested in the example study method provided by AWA would involve releases of water from the dam to allow the evaluation of any flows above what is currently available from Stetson Creek and other accretion flow. Chugach reiterates that the lack of a gate structure at the Cooper Lake Dam and the current constraint on maximum reservoir level for safety reasons precludes the possibility of any flow releases to Cooper Creek for the purposes of relicensing studies. Chugach believes that methods for additional phases of the whitewater boating feasibility analysis, if determined necessary, would best be determined after the preliminary land-based evaluation.

Chugach is amenable to the idea of including as a potential subsequent study phase an on-water boating component in the feasibility evaluation, should further evaluation be determined necessary after the first phase *and* should an on-water boating evaluation be deemed acceptable based on safety considerations identified during the on-land reconnaissance. Again, however, flows for such a boating evaluation can only be those flows available with the existing diversion (i.e., limiting Cooper Creek flows to Stetson Creek inflow plus other accretion); because Cooper Lake Dam lacks a gate or other release structure, it is not possible to release flows from the dam. If an on-water boating component of the study is undertaken, Chugach will rely on the recommendations of the study expert regarding what range of existing flows in Cooper Creek would be most suitable to an on-water boating component to the evaluation.

In response to the USFS's request that Chugach develop an analysis of potential economic benefits to the local area should whitewater opportunities be available on Cooper Creek, Chugach notes that plans for the requested economic analysis will be deferred until after the results of the whitewater feasibility analysis are evaluated.

Cultural Resources Study

The USFS requested clarification of the area of potential effect (APE) for the study components described in the draft study plan for the cultural resources study; specifically, it was requested that the recreation use buffer be specified in terms of distance as well as be clarified in terms of what recreation areas are proposed for inclusion in the APE. The final study plan has been clarified to explain that the APE includes the area of direct (existing and potential future) Project effects plus a recreational use buffer. A preliminary APE will be identified prior to the beginning of the 2003 fieldwork. However, as noted in the final study plan, the APE will be modified as needed during the course of the cultural resources evaluation, as more information on the Project area is developed. For example, the recreational use buffer that is part of the APE (e.g., recreational use buffer around Cooper Lake) will become more clearly delineated through the planned recreation and visual resources study, as more information becomes available about the extent of existing Project-related recreation use and activities. The APE will also evolve as other relicensing studies provide information to better define the nature and extent of potential future Project effects. .

The USFS also commented on the presence of at least two historic cabin sites adjacent to Cooper Lake, and requested that the sites be evaluated to determine the potential erosional impact on these sites of increasing the maximum normal operating level of the reservoir to elevation 1,206 feet msl. Chugach is aware of these two historic cabin sites. The sites will be sought out during the cultural resource surveys, as will all sites that are identified through the review of existing literature and database information.

Road and Access Route Condition Survey

ADNR noted that the Division of Mining Land and Water is interested in the types of Project-related access routes located on State land, and requested that Chugach's proposed road and access route survey be extended to cover State land as well as USFS land. The study plan has been modified to include State land as requested by ADNR. Chugach is currently consulting further with ADNR as to whether the State has additional specific information needs and study approaches relative to roads and access routes along the Project transmission lines.

The USFWS commented that it was not possible to determine from the draft study plan whether the proposed study methods were adequate because the methods were not described in detail in the study plan (instead the source document for the methodology was referenced – USFS technical document FSH 7709.58 – Transportation System Maintenance Handbook: Region 10 Supplement No. 7700.58-2002-1). The USFWS suggested either including the technical document as an additional appendix to the study plan or summarizing the methods directly in the study plan. In response, Chugach notes that the methodologies contained in the USFS handbook are very detailed and not amenable to summarization in meaningful fashion. Also, the length of the full handbook (94 pages) does not lend itself to attaching as an appendix to the study plan. However, for those interested in reviewing the survey protocols, the handbook is available at HDR's office⁷ or online at <http://www.fs.fed.us/im/directives/dughtml/fieldfsh7000.html>. Chugach intends to follow the protocols in the USFS handbook for those elements specified in Appendix A of the study plan.

Agencies noted that that the draft study plan did not appear to include items that had been requested for study, such as mapping of all wetlands crossed by access roads, mapping of fish streams crossed by the power line and/or access roads, or mapping of all noted features on a GIS layer and recent (1998 or later) aerial photography or orthophotography. The road and access route condition survey is designed to be an overlapping study effort with other relicensing studies, including the vegetation mapping, wildlife study, and cultural resources survey. Together with the information from the road and access route survey, these other studies will provide the requested information regarding wetlands and streams crossed by the roads and access routes. All study information will be mapped using a basemap developed from 1998 or more recent aerial photography (new aerial photography will be flown where existing coverage is inadequate). The study plan will be clarified to indicate where road / access route survey data would be collected relative to streams and wetlands.

Further information requested to be developed through the road and access route survey included information to evaluate the adequacy of existing culverts for fish passage, and the need for fish

⁷ For information, please contact HDR Alaska, Inc., at (907) 274-2000.

passage improvements, access restrictions, or other mitigation along the access routes. The road and access route condition survey, together with related study efforts, will include assessment of adequacy of culverts for fish passage, and identification of stream and wetland crossings along the roads and access routes. The need for and scope of subsequent study efforts (such as evaluation of potential impacts to fish habitat associated with specific stream crossings) will be determined based on the findings of the road and access route condition survey.

Attachment 1

Schedule of Field Activities for 2003 Relicensing Studies

Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies

Study	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	1-Apr-03	2-Apr-03	3-Apr-03	4-Apr-03	5-Apr-03	6-Apr-03	7-Apr-03	8-Apr-03	9-Apr-03	10-Apr-03	11-Apr-03
IFIM Study											
Kenai River S											
Aquatic Habitat											
Cooper Lake Fish											
Cooper Creek Fish											
Porcupine Creek											
Cooper Lake Macroinvertebrates											
Water Birds											
Wildlife											
Vegetation/Sensitive Plants											
Exotic Plants											
Road Condition Survey											
	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	1-May-03	2-May-03	3-May-03	4-May-03	5-May-03	6-May-03	7-May-03	8-May-03	9-May-03	10-May-03	11-May-03
IFIM Study											
Kenai River S											
Aquatic Habitat											
Cooper Lake Fish											
Cooper Creek Fish											
Porcupine Creek											
Cooper Lake Macroinvertebrates											
Water Birds											
Wildlife											
Vegetation/Sensitive Plants											
Exotic Plants											
Road Condition Survey											

Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies

Study	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday
	12-Apr-03	13-Apr-03	14-Apr-03	15-Apr-03	16-Apr-03	17-Apr-03	18-Apr-03	19-Apr-03	20-Apr-03	21-Apr-03	22-Apr-03	23-Apr-03
IFIM Study												
Kenai River S												
Aquatic Habitat												
Cooper Lake Fish												
Cooper Creek Fish												
Porcupine Creek												
Cooper Lake Macroinvertebrates												
Water Birds												
Wildlife												
Vegetation/Sensitive Plants												
Exotic Plants												
Road Condition Survey												
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	12-May-03	13-May-03	14-May-03	15-May-03	16-May-03	17-May-03	18-May-03	19-May-03	20-May-03	21-May-03	22-May-03	23-May-03
IFIM Study												
Kenai River S												
Aquatic Habitat												
Cooper Lake Fish												
Cooper Creek Fish												
Porcupine Creek												
Cooper Lake Macroinvertebrates												
Water Birds												
Wildlife												
Vegetation/Sensitive Plants												
Exotic Plants												
Road Condition Survey												

Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies

Study	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	
	24-Apr-03	25-Apr-03	26-Apr-03	27-Apr-03	28-Apr-03	29-Apr-03	30-Apr-03	
IFIM Study								
Kenai River S								
Aquatic Habitat								
Cooper Lake Fish								
Cooper Creek Fish								
Porcupine Creek								
Cooper Lake Macroinvertebrates								
Water Birds								
Wildlife								
Vegetation/Sensitive Plants								
Exotic Plants								
Road Condition Survey								
	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	24-May-03	25-May-03	26-May-03	27-May-03	28-May-03	29-May-03	30-May-03	31-May-03
IFIM Study								
Kenai River S								
Aquatic Habitat								
Cooper Lake Fish								
Cooper Creek Fish								
Porcupine Creek								
Cooper Lake Macroinvertebrates								
Water Birds								
Wildlife								
Vegetation/Sensitive Plants								
Exotic Plants								
Road Condition Survey								

Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies



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Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies



Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies

Study	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday
	1-Aug-03	2-Aug-03	3-Aug-03	4-Aug-03	5-Aug-03	6-Aug-03	7-Aug-03	8-Aug-03	9-Aug-03	10-Aug-03	11-Aug-03
IFIM Study											
Kenai River S											
Aquatic Habitat											
Cooper Lake Fish	█										
Cooper Creek Fish				█	█	█	█	█	█		█
Porcupine Creek											
Cooper Lake Macroinvertebrates											█
Water Birds				█	█	█	█	█	█		
Wildlife											
Vegetation/Sensitive Plants											
Exotic Plants											
Road Condition Survey	█			█	█	█	█	█	█		
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
	1-Sep-03	2-Sep-03	3-Sep-03	4-Sep-03	5-Sep-03	6-Sep-03	7-Sep-03	8-Sep-03	9-Sep-03	10-Sep-03	11-Sep-03
IFIM Study											
Kenai River S											
Aquatic Habitat											
Cooper Lake Fish											
Cooper Creek Fish											
Porcupine Creek											
Cooper Lake Macroinvertebrates								█	█	█	█
Water Birds											
Wildlife											
Vegetation/Sensitive Plants											
Exotic Plants											
Road Condition Survey											

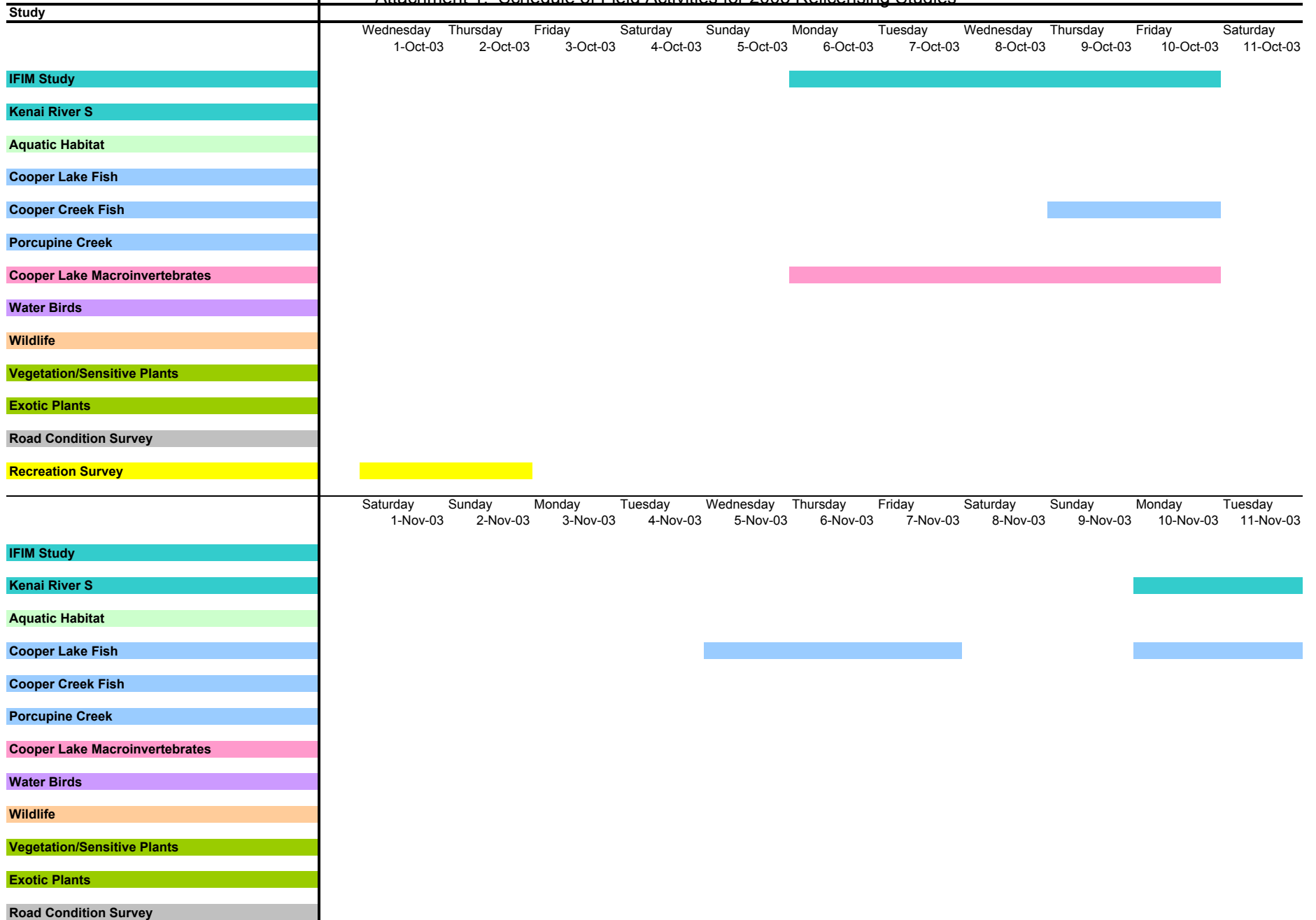
Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies

Study	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	12-Aug-03	13-Aug-03	14-Aug-03	15-Aug-03	16-Aug-03	17-Aug-03	18-Aug-03	19-Aug-03	20-Aug-03	21-Aug-03	22-Aug-03	23-Aug-03
IFIM Study												
Kenai River S												
Aquatic Habitat												
Cooper Lake Fish												
Cooper Creek Fish												
Porcupine Creek												
Cooper Lake Macroinvertebrates												
Water Birds												
Wildlife												
Vegetation/Sensitive Plants												
Exotic Plants												
Road Condition Survey												
	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday
	12-Sep-03	13-Sep-03	14-Sep-03	15-Sep-03	16-Sep-03	17-Sep-03	18-Sep-03	19-Sep-03	20-Sep-03	21-Sep-03	22-Sep-03	23-Sep-03
IFIM Study												
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Cooper Lake Fish												
Cooper Creek Fish												
Porcupine Creek												
Cooper Lake Macroinvertebrates												
Water Birds												
Wildlife												
Vegetation/Sensitive Plants												
Exotic Plants												
Road Condition Survey												

Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies

Study	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
	24-Aug-03	25-Aug-03	26-Aug-03	27-Aug-03	28-Aug-03	29-Aug-03	30-Aug-03	31-Aug-03
IFIM Study								
Kenai River S								
Aquatic Habitat								
Cooper Lake Fish								
Cooper Creek Fish								
Porcupine Creek								
Cooper Lake Macroinvertebrates								
Water Birds								
Wildlife								
Vegetation/Sensitive Plants								
Exotic Plants								
Road Condition Survey								
	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	
	24-Sep-03	25-Sep-03	26-Sep-03	27-Sep-03	28-Sep-03	29-Sep-03	30-Sep-03	
IFIM Study								
Kenai River S								
Aquatic Habitat								
Cooper Lake Fish								
Cooper Creek Fish								
Porcupine Creek								
Cooper Lake Macroinvertebrates								
Water Birds								
Wildlife								
Vegetation/Sensitive Plants								
Exotic Plants								
Road Condition Survey								

Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies



Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies

Study	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	
	12-Oct-03	13-Oct-03	14-Oct-03	15-Oct-03	16-Oct-03	17-Oct-03	18-Oct-03	19-Oct-03	20-Oct-03	21-Oct-03	22-Oct-03	23-Oct-03	
IFIM Study		[Activity]											
Kenai River S													
Aquatic Habitat													
Cooper Lake Fish		[Activity]							[Activity]				
Cooper Creek Fish													
Porcupine Creek													
Cooper Lake Macroinvertebrates													
Water Birds													
Wildlife													
Vegetation/Sensitive Plants													
Exotic Plants													
Road Condition Survey													
Recreation Survey													
	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
	12-Nov-03	13-Nov-03	14-Nov-03	15-Nov-03	16-Nov-03	17-Nov-03	18-Nov-03	19-Nov-03	20-Nov-03	21-Nov-03	22-Nov-03	23-Nov-03	
IFIM Study													
Kenai River S													
Aquatic Habitat													
Cooper Lake Fish	[Activity]												
Cooper Creek Fish													
Porcupine Creek													
Cooper Lake Macroinvertebrates													
Water Birds													
Wildlife													
Vegetation/Sensitive Plants													
Exotic Plants													
Road Condition Survey													

Attachment 1. Schedule of Field Activities for 2003 Relicensing Studies

Study	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
	24-Oct-03	25-Oct-03	26-Oct-03	27-Oct-03	28-Oct-03	29-Oct-03	30-Oct-03	31-Oct-03
IFIM Study								
Kenai River S								
Aquatic Habitat								
Cooper Lake Fish	█				█			
Cooper Creek Fish								
Porcupine Creek								
Cooper Lake Macroinvertebrates								
Water Birds								
Wildlife								
Vegetation/Sensitive Plants								
Exotic Plants								
Road Condition Survey								
Recreation Survey								
	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	
	24-Nov-03	25-Nov-03	26-Nov-03	27-Nov-03	28-Nov-03	29-Nov-03	30-Nov-03	
IFIM Study								
Kenai River S								
Aquatic Habitat								
Cooper Lake Fish								
Cooper Creek Fish								
Porcupine Creek								
Cooper Lake Macroinvertebrates								
Water Birds								
Wildlife								
Vegetation/Sensitive Plants								
Exotic Plants								
Road Condition Survey								