

MEMORANDUM

TO: Bishop Creek Technical Working Group Members
FROM: Bishop Creek Relicensing Team
DATE: July 26, 2018
RE: Materials for August Technical Work Group Meetings

August's Technical Working Group (TWG) meeting will continue Southern California Edison's (SCE's) hybrid ILP relicensing process¹ for the Bishop Creek Hydroelectric Project (Project). The enclosed materials represent the Bishop Creek Relicensing Team's (Team) summary of resource concerns/questions identified by the TWGs and the proposed suite of studies, and from information gathering for purposes of determining the project's effects under a new license. Discussions held with stakeholders may propose additional studies needed or may have additional elements to add to proposed studies. Therefore, Appendix A to this memo provides a template and a suggested process for making requests. Appendix B is the Federal Energy Regulatory Commission (FERC) ILP Study Criteria Guidance document.

To provide a more complete picture of the affected environment, the Team has augmented the Pre-Application Document (PAD) sections pertaining to the proposed studies. The PAD is at 70% completion in terms of where it is expected to be at the time of filing (projected for end of March 2019). The PAD will continue to be augmented while the Team focuses on study plan development, in consultation with the TWGs.

The Team is providing study plan outlines that provide an overview of SCE's: 1) rationale and nexus, 2) study goals and objectives, 3) description of study area, 4) methods, and 5) schedule. On July 5, 2018, a memorandum (July 5 Memo) was provided that summarized the proposed study plan titles and associated objectives. The study plans being distributed now are consistent with the July 5 Memo with two clarifications. First, all cultural resources studies were consolidated into a single plan because of the high degree of overlap between each of the studies. Secondly, a study plan was added that describes SCE's proposed approach towards developing an operations model. This model was referenced in some of the study titles, but after discussions with the Oversight Committee on July 13, 2018 it was determined that development of this model should have additional visibility and discussion.

The material is divided into the following packets:

1. Project Description (for all TWGs) from the PAD
 - a. General Description of the River Basin (Section 3)
 - b. Project Location, Facilities, and Operations (Section 4)
2. Terrestrial Resources TWG (Wildlife and Botanical Resources)
 - a. PAD Sections

¹ SCE is using a "Hybrid Integrated Licensing Process" (ILP) which is intended to reach early agreement on study plans. These plans would be filed with the Preliminary Application Document. Normally study plans are developed following the PAD. This process is intended to provide iterative opportunities for stakeholder input and discussion.

- i. Geology and Soils (Section 5.1)
 - ii. Botanical Resources (Section 5.4.1)
 - iii. Wildlife Resources (Section 5.4.2)
 - iv. Rare, Threatened, and Endangered Species (Section 5.5)
 - b. Study Plans
 - i. Mule Deer
 - ii. Wildlife
 - iii. Sensitive Plants
 - iv. Invasive Plants
 - v. Assessment of Black Cottonwood Abundance, Recruitment and Mortality
 - vi. Assessment of Invasive Plants
- 3. Aquatic Resources TWG
 - a. PAD Sections
 - i. Water Quality and Quantity (Section 5.2)
 - ii. Fish and Aquatics (Section 5.3)
 - iii. Rare, Threatened, and Endangered Species (Section 5.4)
 - b. Study Plans
 - i. Instream Flow
 - ii. Fish Distribution Baseline
 - iii. Operations Model
- 4. Recreation, Land Use and Aesthetics TWG
 - a. PAD Sections
 - i. Recreation (Section 5.6)
 - ii. Land-Use and Land Management (Section 5.7)
 - b. Study Plans
 - i. Recreation Facilities Condition and Public Accessibility
 - ii. Recreation Use and Needs
 - iii. Project Boundary, Lands, and Roads
- 5. Cultural Resources TWG
 - a. PAD Sections
 - i. Cultural Resources (Section 5.8)
 - ii. Tribal Resources (Section 5.11)
 - b. Study Plan
 - i. Cultural Resources and Historic Properties Study Plan

APPENDIX A: Study Plan Request Template

Bishop Creek Relicensing Study Request Template

The template below is provided for your convenience, and will help the Bishop Creek Relicensing Team incorporate additional requests for information. The guidance comes from the Federal Energy Regulatory Commission (FERC) "[Guide to Understanding and Applying the Integrated Licensing Process Study Criteria](#)" (available at www.ferc.gov and attached here). These criteria represent FERC's effort to ensure that the information needs are known before a license application is filed through a FERC-approved study plan. The approved study plan brings, to the extent possible, pre-filing finality to the identification of the information and studies needed for FERC staff to prepare its environmental document and for participants to make recommendations and provide terms and conditions.

Requestor Name:	
Agency /Affiliation:	
Primary Resource Area:	
Proposed Study Title:	

1. Study goals and objectives

18 CFR §5.9(b)(1): Describe the goals and objectives of each study proposal and the information to be obtained.

2. Relevant Resource Management Goals and Public Interest Considerations

18 CFR §5.9(b)(2): If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.

18 CFR §5.9(b)(3): If the requester is a not a resource agency, explain any relevant public interest considerations in regard to the proposed study.

3. Existing Information and Need for Additional Information

18 CFR §5.9 (b)(4): Describe existing information concerning the subject of the study proposal, and the need for additional information.

4. Project Nexus

18 CFR §5.9(b)(5): Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

5. Methods

18 CFR §5.9(b)(6): Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

6. Level of Effort and Cost

18 CFR §5.9(b)(7): Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

APPENDIX B: FERC Study Request Guidance Document



A GUIDE TO UNDERSTANDING AND APPLYING THE INTEGRATED LICENSING PROCESS STUDY CRITERIA

*Federal Energy Regulatory Commission
Office of Energy Projects*

March 2012

A GUIDE TO UNDERSTANDING AND APPLYING THE INTEGRATED LICENSING PROCESS STUDY CRITERIA

INTRODUCTION

Before the Commission can make an informed decision on a license application, it must obtain adequate information on the resources the project effects, such as soils, water quality, fish and wildlife, cultural, recreation, aesthetics, land use, and tribal resources. To obtain this information, it may be necessary for the applicant to conduct studies to assess these effects so a range of potential protection, mitigation, and enhancement measures can be explored. The Integrated Licensing Process (ILP), developed in consultation with the hydro industry, state and federal agencies, tribes, and non-governmental organizations (NGO), is designed to ensure that the information needs are known before a license application is filed through a Commission-approved study plan. The approved study plan brings, to the extent possible, pre-filing finality to the identification of the information and studies needed for Commission staff to prepare its environmental document and for participants to make recommendations and provide terms and conditions.

However, in some cases, reaching agreement on study needs can be difficult. The ILP includes a process for Commission staff to work collaboratively with license applicants, state and federal resource agencies, tribes, and non-governmental organizations to identify and resolve disagreements over studies. The process begins with the scoping of issues and the development of study requests based on existing information the applicant has obtained and provided in a pre-application document (PAD).¹ To ensure that any studies that are requested are needed for the project in question, the ILP includes seven study criteria to guide study development. Each study request is required to address the seven criteria. Following these criteria will help formulate a well-structured and informed request that can help focus discussions about the merits and applicability of a study to evaluate the effects of a project.

On May 18, 2010, Commission staff began an evaluation of the effectiveness of the ILP. Commission staff requested input from stakeholders on how well the ILP was achieving its goal of providing a predictable, efficient, and timely licensing process and what might be done better within the framework of

¹ The pre-application document (PAD) brings together all of the existing information relevant to the project proposal that is in the potential applicant's possession or that can be obtained with the exercise of due diligence.

the existing regulations to achieve this goal. Most comments received during this effort focused on the study plan development process and the need for greater clarity on how the Commission applies the study criteria in evaluating study requests. The purpose of this document is to help stakeholders craft study requests (18 CFR § 5.9(b)) that clearly identify and explain the basis of their information needs and recommended study methods.

ORGANIZATION OF GUIDANCE DOCUMENT

This document leads with an explanation of each of the study criteria. This is followed by answers to frequently asked questions that have arisen in applying the study criteria. Examples of study requests prepared by staff are provided in Appendix A. The structure provided in the examples may be used as a template for a study request; however, the Commission’s approval of a study request is based on the content of the request, rather than the specific format. Note, because the Commission does not establish resource management goals, criterion 18 CFR § 5.9(b)(2) does not apply to the Commission, and thus the study request examples in Appendix A do not address this criterion.

STUDY REQUEST CRITERIA

A study request must address each of the following criteria:

Goals and Objectives

§5.9(b)(1) Describe the goals and objectives of each study proposal and the information to be obtained.

This section of the study request provides the context in which the study is being requested, describes what the study is intended to accomplish, and the specific information to be obtained. Study goals are typically general statements that provide the overall context for what the study is trying to accomplish. Study goals should clearly relate the study or information to be obtained to the evaluation of the effects of the project on a particular resource(s). Study objectives are more focused, describing the specific, tangible products the study should deliver. In other words, study objectives should identify the specific information to be gathered to achieve the study goals.

Relevant Resource Management Goals and Public Interest Considerations

§5.9(b)(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.
§5.9(b)(3) If the requester is a not a resource agency, explain any relevant public interest considerations in regard to the proposed study.

This section should clearly establish the connection between the affected resource and the management goals of the requesting agency or tribe or, in the case of non-governmental organizations or members of the public, between the affected resource and the relevant public interest.

Be as specific as possible. A statement by an agency relating its study request to a legal, regulatory, or policy mandate is entitled to appropriate consideration, but it may be difficult to determine just how the information that will be obtained will achieve that legal, regulatory, or policy mandate. It is much easier to understand the relationship between specific data that would be acquired and a specific management goal than to broadly stated mandates established in law or regulation. For example, if a state has a specific management goal to obtain a certain quantitative measure (e.g., fish per mile) of the quality of a trout fishery in a stream reach that is affected by a project, the agency should thoroughly explain how the study request relates to that management goal.

Unlike agencies, members of the public and non-governmental organizations do not have specific regulatory mandates, but nonetheless have legitimate concerns about how a project may affect a public resource of importance to them. In such a case, the study request needs to explain how the information to be obtained relates to this specific concern or interest. For example, the members of a group may represent a segment of the public that enjoys and promotes whitewater boating opportunities. It may request a controlled-flow study to determine how project flow releases affect boating opportunities. It is much more effective if such a group describes how a requested study would meet its goals of making available a particular class of whitewater boating flows for that region, rather than simply noting the interests of its membership in promoting suitable boating flows (see Appendix A for a detailed example of a study request).

Existing Information and Need for Additional Information

§5.9(b)(4) Describe existing information concerning the subject of the study proposal, and the need for additional information.

The purpose of this section is to identify gaps in existing data and what additional information is needed to assess project effects. It is important that the study request first generally describes existing information provided in the pre-application document or in other information sources relevant to the project. Then, given this context, the request should clearly explain why the existing information is inadequate.

For example, studies to quantify fish entrainment and associated mortality are commonly requested by agencies and others. However, if entrainment studies have been conducted at nearby projects with similar turbines and that affect similar species, there may be sufficient information to assess effects at the project in question. In this case, if an entity believes it needs more site-specific information, it should clearly explain why the existing information is not relevant or why a more precise answer is needed.

Project Nexus

§5.9(b)(5) Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

This section of a study request should clearly explain the connection between the project and its potential effect on the applicable resource. A reasonable connection between project construction or operation and potential effects on the resource in question is a threshold requirement that must be demonstrated for the Commission to require that an applicant gather the requested information. Just as important, this section should also explain how the information would be used to develop license requirements. This part of this criterion is often overlooked by study proponents.

For example, say an entity requests a survey for a federally endangered fish species and its habitat downstream of an existing project that operates in a peaking mode; that is, the project generates during peak demand periods and stores water during off-peak periods such that there are fluctuations in water levels within the reservoir and downstream of the powerhouse. If one of the factors leading to the listing of the fish has been the loss of spawning habitat, the study proponent could easily demonstrate a nexus between the presence of the fish or its habitat

downstream of the project and the project's effect on spawning habitat due to fluctuating flows from its peaking operation. If the study found the listed species within the affected reach but in low numbers compared to comparable unregulated reaches, the new license might include measures to improve spawning habitat such as modifications in the timing and magnitude of releases or habitat improvements in the affected reach. If spawning habitat is a cumulatively affected resource in the basin, the requested project-specific information would also help staff conduct its cumulative effects analysis.

Sometimes the geographic scope of the study request includes not only the mainstem of the river below the dam, but also upstream and downstream tributaries and the upstream river reach. This information may be of value to the agency managing the fishery resource, but the connection to project operation in the above example is more difficult to draw if the tributaries and upstream river reach are not influenced by the fluctuating flows caused by peaking operations. In this example, the proponent would need to provide a strong rationale for how fish habitat in the tributaries and the river reaches upstream of the project is affected by the project and how that data will be used to inform a license requirement. Otherwise, staff may not recommend a survey for the endangered fish in the tributaries or upstream river reach. If, however, spawning habitat is a cumulatively affected resource in the basin, staff may request that the applicant provide information that is currently available on upstream habitat to help staff conduct its cumulative effects analysis. Staff would not, however, typically recommend that a licensee conduct studies on effects caused by developmental activities over which the licensee has no control. Finally, in some cases, it may become obvious after the initial study season, that addressing a project-specific effect is either not possible or not reasonable. In such cases, an applicant might propose, and staff might recommend, a study of off-site enhancement measures.

Proposed Methodology

<p>§5.9(b)(6) Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.</p>

Study requests should be as detailed as possible on the scope and methods of the proposed study so staff and the project applicant clearly understand what is being requested and an adequate study plan can be developed. The study proponent may describe the proposed methodology by outlining specific methods to be implemented (e.g., study area, study sites, data collection methods, etc.) or by simply referencing an approved and established study protocol or methodology

(e.g., Henderson 1999, or Missouri State Water Quality Sampling Protocols for Lead, 1999). The requestor could give examples of the use of the methodologies under similar circumstances. The requested study methodology must be generally accepted in the scientific community for the purpose for which it would be used. For example, just because a PHABSIM (Physical Habitat Simulation Models) is a generally accepted methodology for determining the relationship of flow to fish habitat, it is not an accepted methodology for answering questions about fish populations.

In some cases, there may be a number of methods available to fill the information gap. If the study proponent does not have a preference (e.g., IFIM or a Delphi study² to evaluate habitat-flow relationships), the requestor should be specific about the type of data to be gathered (e.g., amount of coho salmon spawning habitat at flows of 5, 10, and 20 cubic feet per second).

Level of Effort and Cost

§5.9(b)(7) Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

This criterion is not concerned solely with cost, but rather also with the level of effort that would be needed to properly conduct the study. To estimate the level of effort and cost, a study proponent should, at a minimum, estimate the number of hours or person-days that would be required to conduct the requested study and any identifiable incidental tasks (e.g., report preparation,). The information gained under this criterion is also useful in weighing the costs and benefits of different methods for obtaining the needed information.

At the time participants provide study requests, proposed alternative methods for gathering data to address the issue may or may not have been proposed (e.g., an applicant, anticipating the issue, may have proposed a study in some detail in its PAD). Where alternative methods of obtaining the data have been proposed, it is important that the study proponent explain why the proposed alternative study methods would not be adequate to meet the stated study objectives. Where such information is lacking, it is difficult for the applicant, Commission staff, and other stakeholders to compare the level of effort and cost with the type and quality of the information that would be obtained under the various proposed methodologies. Commission staff can make better informed decisions on studies when all this information is available.

² In general terms, a Delphi study is a survey technique that is widely used and an accepted method for gathering data from a group of biologists with expertise about a common topic.

FREQUENTLY ASKED QUESTIONS

Staff compiled the following list of questions from experience in implementing the ILP and comments received during its examination of the effectiveness of the ILP. The answers are intended to further clarify staff's expectations and use of the ILP study criteria. Most questions deal with study nexus and cost. The answers should be considered as general guidance, as each proceeding is based on project-specific circumstances.

Is there a difference between an additional information request and a study request?

Section 5.9(a) of the Commission's regulations provides parties the opportunity to request information to be gathered or to request studies. The regulations do not differentiate between information requests and study requests.

In practice, however, Commission staff treats additional information needs differently than study requests in that staff does not address the study criteria. Additional information is information that is readily available and that can be provided to help clarify the proposal. Collecting this information should not rise to the level of conducting field work, performing a detailed analysis, or modeling to develop the data. This existing information should be relevant to the project proposal, is in the applicant's possession, or can be obtained with the exercise of due diligence. Staff often asks that this information be made available, preferably prior to scoping, but no later than issuance of the applicant's proposed study plan so as to effectively inform scoping and study plan development.

Is establishing "any" project effect on a resource sufficient to establish a nexus, and, if such nexus is established, then would any study request related to the resource be approved?

The nexus established between the project and the resource of interest should relate to the specific question/issue being studied and should show that the information that would be gathered from the study would inform a potential license requirement. Even if a nexus between project construction or operation and resource effects is demonstrated (e.g., fish entrainment), it does not necessarily mean that a study request will be approved. The criteria are considered as a whole, in light of the circumstances of the individual proceeding, and any applicable Commission policies and practices.³ For example, the cost of an alternate method may make a different study more appropriate.

³ See Hydroelectric Licensing under the Federal Power Act, Final Rule, 68 Fed. Reg. 51080 (August 25, 2003) at p 99.

Does a study requestor have to prove and/or quantify a direct project effect on a resource to establish a reasonable nexus to the project? What is meant by reasonable? What deference is given to expert agency opinion in determining nexus?

While the requestor does not have to definitively “prove” or “quantify” a direct project effect in order to establish a nexus, the study proponent is responsible for demonstrating a clear connection between project construction and operation and any potential effect on the resource being studied. A study request should demonstrate that there is a potential project effect associated with the resource, explain why a specific aspect of project construction or operation is a likely or probable source of the effect, and explain how the information that would be obtained may be used to define alternatives to address the effect. A study proponent should be able to provide some information to reasonably support the connection to project effects.

In staff’s view, the word *reasonable* means “fair and sensible” or “based on good sense.” Whether a study request is *reasonable* is decided on a case-by-case basis. The varying levels of available information, expert agency opinion, and circumstances of each project are taken into account when making a determination on whether a requested study has a nexus to the project and whether the results from that study will inform the development of protection, mitigation, or enhancement measures. Generally, a “reasonable nexus” exists where a clear and distinct path can be traced between a specific and definable project operation, construction, or maintenance effect and the resource to be studied.

Does a study request have to demonstrate with certainty that it will result in a license condition? Does the license condition have to be one sanctioned by FERC to be acceptable?

Demonstrating with “certainty” that a study will result in a license condition would be premature at this stage in the process. Such a determination would be based on staff’s environmental analysis of the proposed and recommended measures. Section 5.9(b)(5) (criterion 5) merely requires that a study request demonstrate how the results from the study will be used to inform the development of license requirements within the Commission’s jurisdiction. The study results may or may not demonstrate that a license requirement is warranted, but staff still needs to conduct its National Environmental Policy Act (NEPA) analysis. For example, fluctuating flow releases may affect a special status frog if that frog’s breeding and tadpole rearing habitat is present below the project. In this case, if habitat surveys for the frog do not identify the presence of the target habitat, protective measures may not be appropriate to consider further. If the habitat is observed, protective measures, such as changes in project

operation to reduce flow fluctuations during critical breeding and rearing periods, may be appropriate to consider further. In either case, the information that would be obtained from the surveys would be useful to inform whether a license requirement is needed and, if so, what.

How does FERC consider indirect and cumulative effects in establishing a nexus to project effects? How does FERC separate project effects when there are multiple causes (e.g., water supply, irrigation, and flood control) and how does this affect the scope of studies? How does FERC define the scope of cumulative effects and how does this affect the scope of study?

The Commission uses the Council of Environmental Quality's (CEQ's) definition of direct, indirect, and cumulative effects in determining effects at existing and proposed projects. CEQ defines direct effects as "those effects that occur in the same place and at the same time and are a direct result of the proposed action."⁴ CEQ defines indirect effects as "effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."⁵ CEQ defines a cumulative effect as the effect "on the environment that results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities."⁶ For example, soil disturbing actions associated with the construction of a new dam could increase already elevated levels of sediment in a stream from upstream timber harvesting practices, further reducing the quantity and quality of available salmon spawning habitat within the reach downstream from the proposed project.

Under the NEPA, staff must consider all impacts, whether they are direct, indirect, or cumulative, as long as they are reasonably foreseeable. Direct effects are the first effects to be identified in a licensing proceeding because they are the ones directly attributable to the project and its operation, and can be addressed by the applicant at the project through changes in operation or other actions at the project. Moreover, understanding the project's direct effects on a resource is necessary to properly inform any analysis of indirect or cumulative effects. In

⁴ 40 C.F.R. §1508.8(a).

⁵ 40 C.F.R. §1508.8(b).

⁶ 40 C.F.R. §1508.7.

other words, if the project is not directly affecting a resource, it is not, by definition, part of the indirect or cumulative effects on the resource.

Generally, for the Commission to support a study request to address indirect effects, the study proponent should show that the effects are reasonably certain to occur, the effects would be attributable to the licensing action, the project's contribution to the indirect effects are measurable and would be significant enough to warrant the cost of the study, and the results of the study would contribute in a meaningful way to license conditions. Often, indirect effects (e.g., future development that may occur from water withdrawals or supplied generation) are so speculative that any analysis is not likely to be meaningful. Consequently, Commission staff will require applicants to conduct studies that evaluate direct project effects first; studies to evaluate indirect effects may be possible as more information on the project's direct effects becomes available.

The Commission's policy is to address cumulative impacts in considering original and new licenses to the fullest extent possible, consistent with the Commission's responsibility to avoid undue delay in the licensing process and to avoid undue delay in the amelioration of individual impacts at licensing.⁷ Commission staff will consider cumulative effects in its environmental document, when appropriate, based on existing information.⁸ If the project contributes to cumulative effects, staff may require additional information from the applicant on the project to assess the issues appropriately. Information on past effects may be relevant to determining what conditions may be needed for the new license. However, staff would not require an applicant to conduct studies related to effects from other, non-project developmental activities. Commission staff or its contractor would use existing information to address those cumulative effects.

Likewise, where information is being sought solely to look at historic effects, Commission staff will not require an applicant to reconstruct pre-project conditions, because that is not the baseline from which the Commission conducts its environmental analysis.⁹

⁷ See *FERC Statutes and Regulations, Use of Reserved Authority in Hydropower Licenses to Ameliorate Cumulative Impacts: Policy Statement* (December 14, 1994) (RM93-25-000), 59 F.R. 66714, at ¶ 31,218.

⁸ See *FERC Statutes and Regulations, Hydroelectric Relicensing Regulations Under the Federal Power Act; Order on Rehearing*, Order No. 513-A, December 26, 1989, (RM87-33-001) 55 F.R. 4, [¶30,869] at p. 31,615—reaffirming that “a potential applicant would not be responsible for conducting studies to gather data on other projects that may be necessary to assess cumulative environmental impacts of those projects and the potential applicant's project.”

⁹ The Commission's choice of current environmental conditions as the baseline for environmental analysis in relicense cases was affirmed in *American Rivers v. FERC*, 187 F.3d 1007, amended and rehearing denied, 201 F.3d 1186 (9th Cir., 1999); *Conservation Law Foundation v. FERC*, 216 F.3d 41 (D. C. Cir. 2000).

Are studies limited to measuring project effects, or can they gather information that would evaluate proposed environmental measures?

Requested studies can look at the feasibility of alternative measures to address project effects or serve project purposes. If a project's effect on the resource of interest is confirmed and all parties agree that the need for a measure is likely, then it may be appropriate to require feasibility studies (e.g., engineering designs for fish passage alternatives). Where such effects are debated, it may be premature to identify potential protection, mitigation, and enhancement measures until the results of the studies of project effects are known. The Commission encourages the development of plans and measures to be filed with a license application; therefore, evaluations of potential measures may be needed pre-filing.

How will FERC fulfill the ILP objective of coordinating with other agency processes if it does not support other agencies' study needs, particularly those with mandatory conditioning authority?

The ILP sets out the steps that are to be followed to bring, to the extent possible, pre-filing finality to the identification of what information and studies are needed for the Commission to provide a sound evidentiary basis for its licensing decision and for other participants in the process to make recommendations and provide terms and conditions. This includes required meetings to informally resolve disagreements over study needs.

Commission staff endeavors to ensure that requestors' interests are vetted. Nevertheless, agency information interests may differ from that of the Commission's. Commission staff will ensure that applicants are aware of the potential mandatory nature of certain agency requirements, and that these agencies may require additional information to fulfill their responsibilities. Therefore, as noted below, some studies may need to be conducted in concert with but outside of the Commission-approved study plan.

Are applicants barred from conducting studies that FERC does not require in its study plan determination?

No. The Commission recognizes that other agencies may have their own statutory or regulatory authorities with information interests that differ from the Commission's. The Commission will only require studies and subsequent data consistent with its jurisdictional authority under the Federal Power Act. However, the Commission's study plan determination in no way prevents an applicant from conducting additional studies to meet statutory or regulatory responsibilities, or the information interests of others. In these cases, the Commission's study plan determination will include the following statement: "Nothing in this study plan

determination is intended, in any way, to limit any agency's proper exercise of any independent statutory authority to require additional studies.”

Are phased study requests acceptable and what should be included in a phased study request? Do the Commission's standards (18 CFR section 5.15 (d) and (e)) for requesting modifications to the study or a new study based on the first phase study results still apply for phased studies?

Phased studies are acceptable and sometimes unavoidable. So staff can evaluate the study in full, phased study requests should include all components of a standard study plan (e.g. goals and objectives, methodology) for each of the study phases. The study request should clearly identify the “triggers” or thresholds that must be met during the first phase of the study to justify the implementation of the second phase.

In some rare cases, it may not be practical to identify the appropriate triggers before the first study phase and data collection has been completed. In these circumstances, the phased study plan should clearly articulate a decision-making process that will be used when deciding whether or not the proposed second study phase is needed based on the first phase study results.

The results from the first year of studies may inform the need for further study. The ILP regulations anticipate these circumstances and provide a process for modifying the existing study or requiring a new study as a result of new information (18 CFR section 5.15 (d) and (e)). If the triggers and methods for conducting subsequent phases of the study are well defined and have been fully vetted through the study development process, there should be no reason why the standards for requesting study modifications or new studies should be different for phased studies.

Considering that project operation, and its effect on lake level and stream flow, are typical issues where there are differences of opinion regarding the scope of effects and project nexus, shouldn't the Commission routinely require a project operation model to show the degree of effect and connection to project operation?

Many applicants develop or use a project operation model to help participants in the licensing process understand: how a project operates; whether modifications are or are not feasible; and how modifications to operation might alter environmental conditions and affect project economics. Such models are useful tools for conducting an analysis of effects and alternatives, and can help determine the scope of issues and corresponding analysis. Commission staff will consider any study requests that propose the use of operation models in

accordance with the study criteria and will require their use as appropriate. However, the circumstances of each case will dictate what needs to be modeled and how; therefore, the Commission cannot routinely require the need and type of model from the onset of the process.

When are multi-year studies acceptable?

The Commission must have adequate information to make an informed decision. This may be based on one or more years of study. In most cases, one or two years of data gathering should be adequate. While multi-year studies may be necessary in certain circumstances, the amount of information the Commission needs to address an issue is case-specific and will depend on the amount and quality of existing information and the precision of the required analysis.

For example, resource agencies often request multiple years of gaging records in order to reduce the level of uncertainty in defining available flows and prescribing flows to sustain aquatic habitats and ecological processes under various conditions (e.g., drought, average, and above-average flow years). If there are no flow data for the affected reach, it may be reasonable to require gaging data to be compiled for multiple years in order to adequately model flows. However, if there are nearby watersheds with similar aspect, slope, and other environmental conditions, flows may be synthesized to reflect with reasonable certainty what might be expected in the affected basin, thereby reducing or eliminating the level of information needed, thus forgoing the need for multiple years of data.

Furthermore, section 5.15 (d) of the ILP permits stakeholders to request additional years of study if good cause is shown. Good cause could include equipment failures, drought, new endangered species listings, etc.

When should field studies be required, or in the converse, when is a literature review adequate?

The answer depends on availability and quality of existing information relevant to the issue. Much information has been developed concerning effects of hydroelectric projects on environmental resources. If relevant information exists, deference will be given to the more cost-effective approach of gathering the data. If site-specific information is necessary to inform the development of license conditions, field studies may or may not be needed. For example, site-specific fish sampling data may be available in the literature but it could be considered outdated and of limited value if project operation changed significantly since the last time the data were collected. In other situations where there was little change in the project environment since the last data collection, site-specific field data may not be needed. If it is unknown whether existing information would be

sufficient, a literature search may be required first, followed by field studies as may be needed to supplement the literature data.

If a study proponent does not believe that relevant information exists, the proponent should explain why as set forth in criterion (4)—describe existing information concerning the subject of the study proposal, and the need for any additional information.

How does a FERC project boundary affect studies?

Project effects on environmental resources may extend beyond the project boundary. For example, the project boundary may end at the tailrace below a hydropower project, but the effects of the project operation on flows may extend much farther downstream. Therefore, it is not necessarily appropriate to use the project boundary to limit the geographic scope of studies. The geographic scope of each study should be commensurate with the effects of the project on the resource in question.

How does FERC's baseline affect study scope?

The Commission uses current conditions as its baseline for evaluating project effects and alternatives. This consists of the environment as it exists at the time of licensing. For projects up for relicensing, this does not include pre-project conditions, which the courts have affirmed.¹⁰ Consequently, the Commission does not generally require an applicant to re-create pre-project conditions.

The Commission does, however, require information to assess continuing project effects, assuming those effects can be addressed under continued project operation. For example, a study that quantifies how much habitat is affected by fluctuating water levels at a peaking project may be acceptable if the information is to be used to inform how much habitat might be made available by modifying operation to reduce the fluctuations. However, a study that seeks to quantify the amount of aquatic or terrestrial habitat inundated by the project reservoir would not be approved by the Commission because it seeks to re-create pre-project conditions, with the likely result being a request to mitigate an impact that was addressed when the project was constructed.

Would FERC reject a study solely based on cost? How does FERC assign value to increments of information when determining why costs are reasonable or unreasonable?

¹⁰ See *American Rivers v. FERC*, 187 F.3d 1007, amended and rehearing denied, 201 F.3d 1186 (9th Cir, 1999); *Conservation Law Foundation v. FERC*, 216 F.3d 41 (D. C. Cir. 2000).

Section 5.9(b)(7) (criterion 7) requires that study requests consider the level of effort and cost of the study being requested and why an alternative (less costly) study would not be sufficient to meet the information needs. A study would not be rejected based on cost alone. Rather, the decision is based on whether the information is needed and whether that information can be gathered in a more cost-effective manner.

The cost of the study should be in line with the potential level of effect. For example, we would not require a million dollar study to determine a precise answer to a minor potential impact. If the cost of the study appears to be out of line with the magnitude of the potential impact based on available information, the Commission may rely on existing information to assess the effects and may or may not require measures based on that information.

How should stakeholders with limited expertise and resources estimate costs of conducting studies? Are there any tools to assist stakeholders with estimating the cost of conducting studies?

Entities requesting a study should provide information on the level of effort required to do the study (e.g., X number of people in the field for X number of days at \$X/day), and if unable to give a specific cost, an estimate of the range of costs. Commission staff encourages agencies, NGOs, and the public to share information on level of effort and cost.

APPENDIX A EXAMPLE STUDY REQUESTS

The following examples are study requests issued by staff. They are provided for illustrative purposes only.

Controlled-Flow Whitewater Boating Study

§5.9(b)(1) — *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to evaluate the effects of project operation on the availability of whitewater recreational opportunities downstream of Culmback Dam, and to identify potential measures to alleviate those effects and enhance whitewater boating opportunities. The objectives of the study are to:

1. Determine the range of flows and the optimum flow that would provide whitewater boating opportunities in the project bypassed reach of the Sultan River.
2. Determine the number of days per month that minimum and optimum flows for whitewater boating are available under the project's current and any proposed mode of operation.
3. Determine the operational feasibility, effects on generation, and cost of providing scheduled releases for whitewater boating at the project and provide an estimate of potential whitewater boating use in annual visits if scheduled releases were provided.
4. Determine existing and potential river access needs and routes, challenges with utilizing those areas and routes, and identify potential solutions to those challenges.
5. Determine any competing recreational uses (e.g., steelhead fishing) or other resources (e.g., listed salmon and steelhead habitat) that may be adversely affected by scheduled releases.

§5.9(b)(2) — *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) — *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is

located. When reviewing a proposed action, the Commission must consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values.

Comments provided by representatives of American Whitewater during scoping indicate a strong interest in restoring boating opportunities in the 11-mile-long segment of the Sultan River from Culmback Dam to the powerhouse because of its long run, consistent technical challenges, and scenic canyon setting. The next 2-mile long reach of the Sultan River beginning immediately below the powerhouse to the Trout Farm access is already a popular whitewater recreation river. Providing whitewater boating flows in the project bypassed reach would substantially lengthen the run. The Sultan River is located within an hour's drive of Seattle, Washington. Thus, to fully evaluate the project's effect on whitewater recreation opportunities and to balance potential enhancement opportunities with their costs, a controlled-flow whitewater boating study is relevant to the Commission's public interest determination.

§5.9(b)(4) — *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

In the PAD, the applicant notes that flows suitable for boating are available in the bypassed reach during controlled releases when the project is shut down, during rare spill events, and during periods of intense, heavy rainfall. While these events can occur on a yearly basis, they are unpredictable, flashy, and of short duration. Coupling these conditions with limited access may explain why few paddlers have been observed using the project bypassed reaches.

American Whitewater's web site indicates this section of the river can be boated at flows between 400 cfs and 1,500 cfs, with ideal conditions occurring between 600 and 1,000 cfs. At these flows, the reach between Culmback Dam and the diversion dam provides Class III and IV rapids. However, as noted by American Whitewater in their July 14, 2005, comments, this evaluation is based on a few observations that were made during changing conditions; therefore American Whitewater questions its flow estimates.

An informal single flow study was conducted on the Sultan River by the applicant on December 12 and 13, 2005. Flows of 650 cfs were released from Culmback Dam, resulting in gaged flows between 668 cfs and 673 cfs at the diversion dam. Even though the study was conducted during the winter under less than ideal conditions, and with limited notice, 34 boaters participated in the study. Thirty-one participants returned completed survey forms. The informal study indicates that flows of 650 cfs are acceptable, but slightly, to much higher, flows

were desired. The informal single flow study did not seek to quantify minimum or optimum flows.

Although the applicant have created five designated public day-use river access sites as part of the project recreation plan since 1991, access has been limited by gate closures and, in the reach immediately below Culmback Dam, by terrain.

No formal studies have been done to determine the range of boatable flows or to evaluate whitewater boating access needs. A controlled-flow study and identification of potential access areas will help identify whitewater boating enhancement opportunities.

§5.9(b)(5) — Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

Project operation affects available instream flows for whitewater boating in the Sultan River, in part, by diverting flows from the 11-mile-long reach between Culmback Dam and powerhouse. A minimum instream flow of 20 cfs is provided from Culmback Dam to benefit aquatic resources in the 6-mile-long portion of the Sultan River between Culmback Dam and the diversion dam. A seasonal minimum instream flow between 95 and 175 cfs is released at the diversion dam to support fishery resources in the 5-mile-long reach of the Sultan River between the diversion dam and the powerhouse. Total flow below the diversion dam is also reduced by water withdrawals for municipal water supply, which averaged 129 cfs in 2004. Project minimum instream flows do not appear to provide suitable boating flows. An analysis of project operations relative to a range of boatable flows would help form the basis for determining the project's ability to enhance whitewater boating opportunities.

§5.8(b)(6) — Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field seasons(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

Using accepted practices for a controlled-flow study as described in Whittaker et al. (1993), conduct a controlled-flow study of a range of alternative flow releases to determine the minimum and optimum instream flow needed for whitewater boating in the following reaches: (1) below Culmback Dam to the diversion dam, and (2) diversion dam to the powerhouse. Evaluate access concerns (including time of day, seasons, and distance from trails) that may

influence recreational experiences. These methods have been used at several hydroelectric projects to evaluate whitewater boating opportunities (for example, Chelan County Public Utility District's Lake Chelan No. 637; and City of Tacoma's Nisqually Project No. 1862)

Prepare a report that describes the whitewater boating attributes of the range of flows examined, including level of difficulty, portage requirements, length of trip, experiences, etc. Identify the minimum acceptable and optimal flow for each reach and describe the frequency of availability of the identified flows under current and any proposed project operations. Describe the operational feasibility and cost of providing scheduled releases for whitewater boating use at the project and provide an estimate of potential whitewater boating use in annual visits for the reaches if: (a) the minimum stream flow was made available at scheduled times and (b) the optimum stream flow was made available at scheduled times. Identify potential measures that would improve whitewater boating access.

Describe any competing recreational uses or other resources (e.g., fishing and fishery impacts) that could be adversely affected by providing scheduled releases of minimum and optimum flows for whitewater boating. This would include resources in the Sultan River between Culmback Dam and the powerhouse, as well as downstream of the powerhouse.

§5.9(b)(7) — Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

The cost for preparing the study plan, conducting the study, and preparing the report is estimated to be between \$50,000 and \$75,000, which does not include the cost of providing the flows. Two to three people would be expected to spend three or four days to prepare the study plan, three to four days of field work (including conducting and documenting the two or three study flows), and ten to twelve days to prepare and finalize reports. Given the length of the reach (11 miles) and access limitations, we assume only one flow per day could be tested.

The co-licensees believe a desktop analysis should be conducted to determine whether a controlled-flow study is necessary and, if so, to guide the scoping of any flow study. Desktop analyses are designed to pull together existing information about channel characteristics, hydrology, river recreational opportunities, access points, and flows in order to determine if whitewater resources are present and affected by a project and if additional evaluations are warranted. The information that would be derived from the desktop analysis is included in the PAD. The river reaches in question have been paddled and rough estimates of study flows are possible; therefore, any intermediate steps between a

desk top analysis and a controlled-flow study do not appear warranted. More quantified analyses of a controlled-flow study are needed to define the range of boatable flow levels, and to assess the effects of these flows on generation, project economics, and competing resources.

Literature Cited

Whittaker, Doug, Bo Shelby, William Jackson. 1993. Instream flows for recreation: a handbook on concepts and research methods. U.S. Department of Interior, National Park Service Rivers and Trails Conservation Program, Oregon State University, and National Park Service Water Resources Division. January 1993.

Transmission Line Vegetation and Wildlife Habitat Mapping

Goals and Objectives

§5.9 (b)(1) — *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to evaluate the effects of the construction, operation, and maintenance of the overland transmission lines, control buildings, substation, access roads, and any potential staging areas on the distribution and composition of vegetation and wildlife habitats, including wetlands, and the effects of those actions on wildlife inhabiting those habitats.

Specifically, the objectives of the study include:

- Identify, describe, classify, and map vegetation cover types in areas that would be affected by project construction, operation, and maintenance of the control buildings, substation, access roads, and any potential staging areas.
- Document the number, location, and extent of existing wetland areas, and analyze the impact of any project construction, maintenance, and operation on wetland areas.
- Identify project-related actions that may influence the distribution and composition of vegetation communities, including wetlands; quantify the acres of habitat that would be affected; and identify the measures that may be taken to protect or mitigate adverse effects on the vegetation communities and wetlands.
- Identify wildlife that may be associated with the affected habitats and determine the extent of potential effects on these species.

§5.9(b)(2) — *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) — *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

Sections 4(e) and 10(a) of the FPA require the Commission to give equal consideration to all uses of the waterway on which a project is located. When reviewing a proposed action, the Commission must consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values.

Vegetation communities and the wildlife habitat they support, including wetlands, are resources of particular interest for a variety of reasons including their ecological functions, sporting interest, and subsistence use. Describing the effects on these resources is necessary to fulfill the Commission's responsibilities under NEPA. Ensuring that environmental measures pertaining to these resources are considered in a reasoned way is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) — *Describe existing information concerning the subject of the study proposal, and the need for additional information.*

Information on wildlife and botanical resources in the PAD includes:

- A general description of the vegetation types and wildlife species that may occur in the area.
- Large scale maps of the wetlands around Anchorage and along the Seward Highway.

The general information about the habitats and wildlife in the PAD is too broad to adequately describe the existing environment and evaluate potential impacts of the construction or operation of the project transmission lines, control buildings, substations, access roads, and any potential staging areas on the above resources. Apparently no plant or wildlife surveys have been completed within the proposed transmission line corridors, or in the areas of the other project features. No staging areas were identified in the PAD, but we suspect that some would be necessary for staging construction of the transmission line and transitioning from the subsea cable to the overhead transmission line.

The applicant proposes to study the area where the transmission line would cross over or by the Anchorage Wildlife Refuge to see what wetland habitat is present and how it can be preserved or replaced if disturbed. The applicant also proposes to study wetlands in the area of entrance into Possession Point for laying transmission line into the corridor along the coast in Kenai Borough. However, the applicant does not propose any other studies on vegetation or wildlife.

More information is needed on construction effects on wetlands. However, as noted above, more information is also needed on other habitats affected by the proposed project.

Project Nexus

§5.9(b)(5) — *Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.*

Power would be transmitted to Anchorage and the Kenai Peninsula through a combination of undersea cables and overhead transmission lines. Power would be delivered through an undersea cable to a control building on the shore of Possession Point, converted to AC and stepped-up to 240 kilovolts, and then delivered through a new 52-mile-long transmission line that would tie into the Homer Electric grid at the Homer Electric Association substation near Nikiski. A submarine cable would also run north, transition to an overhead line near Port Campbell, and be built along Raspberry Road for 10 miles to tie into Chugach Electric substation on Electron Drive. It also appears that the construction of the Kenai portion of the transmission line would require building an access road within the transmission corridor as only a trail now exists within the corridor.

Construction, operation, and maintenance of the overland transmission lines, control buildings, substations, access roads, and any potential staging areas, could adversely affect wetlands and other wildlife habitats and their associated wildlife through direct loss, disturbance, or habitat alterations. If potential effects on these resources are identified, environmental measures may be developed to reduce or eliminate these effects, including construction scheduling and avoidance of sensitive areas, or as suggested, creation of additional habitat. These potential measures would form the basis for any license articles that may be issued by the Commission.

Proposed Methodology

§5.8(b)(6) — *Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.*

Proposed methods include:

- Using a qualified biologist knowledgeable in area vegetation and wildlife, identify, classify, and delineate on a map major vegetation cover types within transmission line corridor rights-of-way, and within the construction footprint of the control buildings, substations, access roads, and any potential construction staging areas. You may use existing aerial photography, on the ground surveys, or a combination of the two to identify and map the cover types. The survey area for the transmission line

corridors shall include the area from the transition from the undersea cable on Possession Point to the interconnection with the existing grids.

- Ground-truth any remote-sensing mapping efforts, record all wildlife observed (directly or indirectly) and any noxious weeds observed during survey efforts.
- Describe each cover type by species composition, successional stage, and aerial extent (acreage) within the survey area.
- Record and map the extent of all wetlands identified during survey efforts. Wetland classifications should distinguish the degree of inundation (seasonally flooded, permanently flooded).
- Based on existing literature and opportunistic observations during the vegetation surveys, identify wildlife species that may inhabit or use the identified habitats.
- Document the effects of any vegetation clearing associated with the new transmission lines at a landscape scale (e.g., within a 0.5-mile-wide corridor).
- Prepare a report that includes the above mapping effort, and identifies, describes, and assesses the extent to which project-related actions and activities may affect the identified habitats and wildlife species dependent on these habitats. The analysis should consider number and placement of poles and any access roads that would be needed to construct and maintain the transmission line. The analysis should consider the effects of fragmenting existing habitats. The report should contain any proposed measures to reduce or mitigate identified effects on these habitats and associated wildlife.

Level of Effort and Cost

§5.9(b)(7) — *Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.*

The estimated cost of this work is approximately \$45,000, depending upon the level of information that might be obtained from existing sources (e.g. existing aerial photos). The mapping and survey efforts can be completed within one year.

One or two technicians would be expected to spend approximately one or two days to review existing aerial photos and initially map vegetation, 10 days to complete field work, and three days to finalize and refine maps and prepare reports.

Dissolved Oxygen and Temperature Assessment

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to evaluate the dissolved oxygen (DO) concentration of water entering the Mason Dam intake within Phillips Reservoir, and then discharged immediately downstream of the Dam into the Powder River during summer conditions. More specifically, the goal of this proposed study is to define a baseline condition that will provide for a better understanding of the potential for project-related effects, and possible mitigation strategies. The objectives of the study are to:

1. Identify the dissolved oxygen and temperature profile within Phillips Reservoir, in the vicinity of the Mason Dam intake.
2. Identify the DO concentration of water entering the Mason Dam intake at its approximate depth and vicinity.
3. Describe any temporal variations of DO concentration and temperature.
4. Identify and describe reservoir stratification.
5. Describe the DO concentration of water in the stilling basin immediately below Mason Dam.
6. Describe the attenuation of DO in the Powder River downstream of Mason Dam.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

Adequate concentrations of dissolved oxygen are required by aquatic organisms for subsistence, and are therefore essential to the integrity and sustainability of a healthy ecosystem. Ensuring that the effect of project construction and operation pertaining to this resource is considered in a reasoned way is relevant to the Commission's public interest determination.

Background and Existing Information

§5.9(b)(4) – Describe existing information concerning the subject of the study proposal, and the need for additional information

Review of the Baker County's Pre-Application Document (PAD), and watershed assessment document, as well as a preliminary review of scientific literature revealed no information pertaining to baseline measurements or monitoring programs associated with the dissolved oxygen concentrations within Phillips Reservoir or the Powder River in the vicinity of Mason Dam. In the "preliminary issues" section of the PAD, the applicant recognizes the potential for project-related effects on the oxygenation of water. However, the applicant proposes no study that would address this potential project-related effect. Therefore, additional information on DO is needed to address this issue.

Project Nexus

§5.9(b)(5) – Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

Currently, water releases from Mason Dam are drawn from the hypolimnetic region of Phillips Reservoir. The water released from Mason Dam demonstrates high levels of kinetic energy as demonstrated by its extremely turbulent nature. Turbulence increases the surface area of water, allowing for greater assimilation of atmospheric gases (including oxygen) into the water. Project-related actions, such as the installation of a turbine, will harness the kinetic energy of the water, thereby reducing the turbulence of water entering the stilling basin. This will result in a reduction in the amount of surface area, limiting the water's ability to dissolve oxygen into solution. If water in the vicinity of the intake structure within Phillips Reservoir has a low dissolved oxygen content, operation of the project could result in the perpetuation of low DO waters downstream of Mason Dam, potentially resulting in harm to fish.

Temperature and dissolved oxygen concentration are water quality attributes that are closely linked. The extent and timing of thermal stratification

and mixing in reservoirs are primary factors in determining when and at what depth anoxic or biologically critical oxygen conditions might occur. Typically, anoxic or biologically critical oxygen conditions are most likely to exist during summer months, when reservoir stratification is pronounced, and mixing has ceased. Therefore, a profile of both temperature and dissolved oxygen concentration within Phillips Reservoir in the vicinity of the Mason Dam intake structure is considered necessary to develop a more complete understanding of potential project-related effects.

This requested study would help establish a baseline condition for the system in question, and form the basis for inclusion of potential license requirements to protect the water quality of the Powder River downstream of the Mason Dam.

Proposed Methodology

§5.8(b)(6) – Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

Using generally accepted practices in the scientific community:

1. Monitor and record dissolved oxygen concentration and water temperature at the approximate location (within a radius of 10 meters) of the Mason Dam intake within Phillips Reservoir. Temperature and DO measurements should begin one meter below the surface of Phillips Reservoir, with subsequent measurements taken every meter, terminating at the approximate depth (within 1 meter) of the Mason Dam intake structure. Sampling should take place at least once a week, beginning on July 1st and ending on October 1st. During each sampling event, reservoir surface elevation should be recorded.
2. Monitor and record the concentration of dissolved oxygen at 4 sites downstream from Mason Dam, on the Powder River. Timing of river sampling should coincide with Phillips Reservoir sampling efforts. The first sampling site should be located within the Mason Dam stilling basin. Each subsequent sampling site should be located longitudinally downstream from the first sampling site, and at approximately equidistant intervals. The final site should be located at the United States Forest Service boundary. Exact sampling locations within the specified framework should be chosen at random, using a scientifically

accepted method. The habitat type of each sampling location should be identified and recorded (i.e. pool, run, riffle, etc.).

3. Prepare a report that includes an analytical summary and graphical representations of the data from the above studies, including average temperature and dissolved oxygen concentration with associated measures of confidence. The report should include a histogram of depth, temperature, and dissolved oxygen within Phillips Reservoir and a graphical representation of any changes of these components over time. Similarly, the report should include a histogram of river distance and dissolved oxygen content, and a graphical representation of any changes of this component over time. All data points used to develop the report (including date and time of collection) should be included within an appendix to the report.

Level of Effort and Cost

§5.9(b)(7) – Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

The estimated cost of this work is approximately \$6,400. The dissolved oxygen monitoring survey may be completed within one study season.

One to two technicians would be expected to spend four or five hours each week, for approximately 12 weeks to conduct field work. Report preparation should take a biologist a half work day.

Cultural Resources Assessment

Goals and Objectives

§5.9(b)(1) – *Describe the goals and objectives of each study proposal and the information to be obtained.*

The goal of this study is to evaluate the project construction, operation, and maintenance effects on archeological resources and historic structures. Objectives in support of this goal include: (1) identification and documentation of archaeological and historic-era properties within the area of potential effect (APE), (2) determination of potential project effects on archeological and historic-era properties within the APE, and (3) evaluation of National Register of Historic Places (NRHP) eligibility (as appropriate and necessary) for properties affected by the project.

§5.9(b)(2) – *If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.*

Not applicable.

§5.9(b)(3) – *If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.*

Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located, and what conditions should be placed on any license that may be issued. In making its license decision, the Commission must equally consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values. Any license issued shall be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses.

In addition, the licensing of the project is a federal undertaking and a license issued by the Commission will permit activities that may “...cause changes in the character or use of historic properties, if any such historic properties exist...” (36 CFR § 800.16(d)). The Commission must, therefore, comply with Section 106 of the National Historic Preservation Act, as amended, which requires the head of any federal department or independent agency having authority to license an undertaking to take into account the effect of the undertaking on historic properties. Historic properties are any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP (36 CFR § 800.16). Assessment of historic properties is conducted in continuous

consultation with the Commission, the Oregon State Historic Preservation Officer (SHPO), the USDA Forest Service – Wallowa-Whitman National Forest (WWNF), the US Bureau of Reclamation (Reclamation), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), and any other interested party or Native American Tribe.

Native American interests and historic properties exist throughout the region and we believe some sites have been identified in the vicinity of the project; however, sufficient cultural resource identification has not been completed. Project construction, operation, and maintenance may affect the value and integrity of cultural resources in the vicinity of the project. Ensuring that the effect of project construction and operation pertaining to this resource is considered in a reasoned way is relevant to the Commission’s public interest determination.

Background and Existing Information

§5.9(b)(4) – Describe existing information concerning the subject of the study proposal, and the need for additional information

While useful for understanding the history of the area, Baker County’s Pre-Application Document (PAD), and the Upper Powder River Watershed Assessment revealed little information pertaining to specific historic properties in the vicinity of Mason Dam and the applicant did not propose a study to address this resource and potential project-related effects. The “Supplemental No. 1 to Pre-Application Document for P-12058-002” identified two properties on the NRHP: the Sumpter Valley Railway Historic District and the Sumpter Valley Gold Dredge. Due to the possibility of additional historic properties or archeological sites, a survey of the project’s APE is needed. Once known sites in the APE have been documented, potentially eligible historic properties, and any project effects upon them, should be identified.

Project Nexus

§5.9(b)(5) – Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirements.

Project-related activities, especially ground-disturbing activities, related to construction, operation, and maintenance, could adversely affect archaeological and historic properties through disturbance or direct loss. The survey would provide information on historic and archeological sites located within the APE and the subsequent report would provide information on which sites are potentially

eligible for the NRHP and any potential effects of the project on these sites. If there would be an adverse effect on Historic Properties, an applicant-prepared Historic Properties Management Plan (HPMP), developed in consultation with the Commission, the SHPO, CTUIR, and other interested parties, would likely be necessary to avoid or mitigate effects. We recommend that Baker County file the HPMP with the license application. The implementation of the HPMP could then be required in any new license.

Proposed Methodology

§5.8(b)(6) – Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate field season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant tribal values and knowledge.

The generally accepted practice is to conduct a literature review and field reconnaissance. The field reconnaissance survey should be conducted within the project APE and the APE should consist of lands within 100 feet of the proposed project boundary (exclusive of the reservoir) and any construction staging areas, and 50 feet on either side of the proposed transmission line route. Prior to conducting the survey and report, Baker County should consult with the Oregon SHPO, WWNF, Reclamation, the CTUIR, and any other interested entities on: (a) appropriateness of the APE; (b) methods on how the survey should be conducted; (c) anticipated effects on cultural resources; and (d) what properties are and are not considered eligible for the National Register. A preliminary report identifying any discovered sites should be completed after the initial reconnaissance phase. This report should be reviewed by Baker County, the SHPO, the WWNF, Reclamation, CTUIR, and the Commission. Based on consultation regarding the preliminary report, the parties should determine if a more intensive field survey is necessary.

The final Cultural Resources Report should include all the information necessary to satisfy the objectives listed here under 5.9(b)(1). The evaluation of project effects on cultural resources should include both site-specific effects (i.e., erosion, vehicular traffic, etc.) and all potential future effects.

Level of Effort and Cost

§5.9(b)(7) – Describe considerations of level of effort and cost, as applicable, and why any proposed alternative studies would not be sufficient to meet the stated information needs.

The cost is estimated to be about \$12,000, depending on the intensity of the surveys. Two technicians would be expected to spend forty hours each week, for approximately two to four weeks to conduct field work. Report preparation should take an archeologist one week.