REVISED STUDY PLAN DOCUMENT

SUMMARIES OF REVISED STUDY PLANS RESPONSES TO STAKEHOLDER PSP COMMENTS

WELLS HYDROELECTRIC PROJECT FERC PROJECT NO. 2149-131 SECURITY LEVEL: PUBLIC





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September 14, 2007

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1.0	INTRODUCTION1				
2.0	SUMMARIES OF REVISED STUDY PLANS				
	2.1	Cultural Resources	3		
	2.1.1	Cultural Resources Investigation	3		
	2.2	Recreation Resources	3		
	2.2.1	Evaluation of Public Access to and Use of the Wells Reservoir as it			
		Relates to Reservoir Fluctuations, Aquatic Plants, and Substrate			
		Buildup (Public Access Study)	4		
	2.2.2	An Evaluation of Recreational Needs Within the Wells Project			
		(Recreational Needs Analysis)	4		
	2.3	Terrestrial Resources	5		
	2.3.1	An Evaluation of the Effects of and Alternatives to the Existing Bird			
		and Mammal Control Programs (Piscivorous Wildlife Control Study			
		Plan)	5		
	2.3.2	Plant and Wildlife Surveys and Cover Type Mapping for the Wells			
		Hydroelectric Project 230 kV Transmission Corridor (Transmission			
		Line Wildlife and Botanical Study)	6		
	2.4	Aquatic and Water Quality	7		
	2.4.1	Survival and Rates of Predation for Juvenile Pacific Lamprey			
		Migrating through Columbia River Hydroelectric Projects (Juvenile			
		Lamprey Study)	7		
	2.4.2	An Assessment of Adult Pacific Lamprey Spawning (Lamprey			
		Spawning Assessment)	8		
	2.4.3	Adult Pacific Lamprey Passage and Behavior Study (Adult Lamprey			
		Passage Study)	8		
	2.4.4	An Investigation into the Total Dissolved Gas Dynamics of the			
		Wells Project (Total Dissolved Gas Investigation)	9		
	2.4.5	Development of a Water Temperature Model Relating Project			
		Operations to Compliance with the Washington State and EPA			
		Water Quality Standards (Water Temperature Study)	10		
	2.4.6	Continued Monitoring of DO, pH and Turbidity in the Wells			
		Forebay and Lower Okanogan River (DO, pH, and Turbidity Study)	11		
	2.4.7	Assessment of DDT and PCB in Fish Tissue and Sediment in the			
		Lower Okanogan River (Okanogan Toxins Study)	11		
3.0	RESPONSES TO STAKEHOLDER PSP COMMENTS13				
	3.1	Summaries of Stakeholder PSP Comments	15		
	311	Federal Energy Regulatory Commission	15		
	3111	Transmission Line Wildlife and Botanical Study	15		
	3112	Recreation Needs Analysis	17		
	312	National Park Service Recreation and Conservation Office and	/		
	3.1.2	City of Brewster	18		
	3121	Recreation Needs Analysis	18		
	3.1.2.1				

3.1.3	Washington Department of Fish and Wildlife	19
3.1.3.1	Juvenile Lamprey Study – Stomach Content Sampling	19
3.1.3.2	Lamprey Spawning Assessment – Training for Field Crews	19
3.1.3.3	Okanogan Toxins Study – Proposed Expanded Sampling Scope	19
3.1.3.4	Adult Lamprey Passage Study – Monitoring and Release Protocol	
	for Methods Section	20
3.1.3.5	Piscivorous Wildlife Control Study – WDFW Request for	
	Clarification	21
3.1.4	City of Brewster	21
3.1.4.1	Local Community Impact Assessment	21
3.1.5	City of Pateros.	22
3.1.5.1	Local Community Impact Assessment	22
3.1.5.2	Operation and Maintenance of Recreation Facilities	26
3.1.5.3	Visitor Information Center Feasibility Analysis	26
3.1.6	Confederated Tribes of the Umatilla Indian Reservation	27
3.1.6.1	Adult Salmon and Steelhead Passage Studies	28
3.1.6.2	Adult Lamprey Passage Study	29
3.1.6.3	Adult Lamprey Spawning Assessment	30
3.1.6.4	Adult Lamprey Habitat Study	31
3.1.6.5	Adult Lamprey Delayed Mortality Study	32
3.1.6.6	Adult Lamprey Salvage Operations	32
3.1.6.7	Juvenile Lamprey Passage Study	33
3.1.6.8	Juvenile Lamprey Drawdown Study	34
3.1.6.9	Juvenile Lamprey Habitat Study	35
REFERENC	ES	36

4.0

Table 3.0-1Douglas PUD's placement of stakeholder comments.14

APPENDIX A	SUMMARY OF CONSULTATION
APPENDIX B	PROPOSED CULTURAL STUDY PLAN
APPENDIX C	REVISED RECREATION STUDY PLANS
APPENDIX D	REVISED TERRESTRIAL STUDY PLANS
APPENDIX E	REVISED AQUATIC AND WATER QUALITY STUDY PLANS

1.0 INTRODUCTION

Public Utility District No. 1 of Douglas County (Douglas PUD) is the owner, operator and licensee of the 774.3 Megawatt (MW) Wells Hydroelectric Project (Wells Project), located on the Columbia River in central Washington. The Wells Project's current Federal Energy Regulatory Commission (FERC) license expires on May 31, 2012. Douglas PUD is seeking a new 50-year FERC license to continue to operate the Wells Project.

In August 2005, Douglas PUD initiated a series of Resource Work Group (RWG) meetings with stakeholders, who are identified in Section 2 below, regarding the upcoming relicensing of the Wells Project. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to identify resource issues and to develop preliminary study plans prior to filing the Notice of Intent (NOI) and Pre-Application Document (PAD). The RWGs were formed to discuss issues related to the Wells Project and its operations.

Douglas PUD initiated this RWG process by hosting an introductory workshop regarding the Integrated Licensing Process (ILP) on October 18, 2005. The intent of the workshop was to introduce stakeholders to FERC's new relicensing process, to provide stakeholders with information about the Wells Project and to introduce stakeholders to the relicensing schedule. At the conclusion of the workshop, stakeholders were encouraged to participate in the following four RWGs: Aquatic, Terrestrial, Cultural, and Recreation. A series of RWG meetings and site tours began in November 2005 and continued to the filing of the NOI and PAD in December 2006.

The primary goals of the RWGs were to identify resource issues and potential study needs. This process provided stakeholders and Douglas PUD an opportunity to have open dialogue about issues in advance of the rigorous timeline that began once the NOI and PAD were filed. Through 35 meetings, each RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed-Upon Study Plans. An Issue Statement is an agreed-upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWGs' efforts to apply FERC's seven study criteria to mutually determine the applicability of each individual Issue Statement. Agreed-Upon Study Plans are the finished products of the informal RWG process.

Douglas PUD submitted the NOI and PAD to FERC on December 1, 2006. The PAD included the RWGs' 12 Agreed-Upon Study Plans. The filing of these documents initiated the relicensing process for the Wells Project under FERC's regulations governing the ILP.

On May 16, 2007, Douglas PUD submitted a Proposed Study Plan (PSP) Document. The PSP Document consists of the Applicant's Proposed Study Plans (Agreed-Upon Study Plans developed by the informal RWG process), Responses to Stakeholder Study Requests and a schedule for conducting the Study Plan Meeting. The ILP required Study Plan Meeting was conducted on June 14, 2007. The purpose of the Study Plan Meeting was to provide stakeholders with an opportunity to review and comment on Douglas PUD's PSP, to review and answer questions related to stakeholder study requests and to attempt to resolve any outstanding issues with respect to the PSP Document.

This Revised Study Plan (RSP) Document has been developed in accordance with 18 CFR § 5.13. The RSP contains a summary of each of Douglas PUD's revised study plans (Section 2: Summaries of Revised Study Plans). Section 3 (Response to Stakeholder PSP Comments) contains a summary of each stakeholder comment on the PSP along with Douglas PUD's responses thereto. Section 4 (References) includes all of the personal communications and literature cited within the RSP.

Appendix A (Summary of Consultation) of the RSP includes all of the stakeholder comments (letters, e-mails, phone logs and meeting minutes) on the PSP and all of Douglas PUD's documented efforts to resolve differences over studies. The full version of each of the 12 study plans and their revisions can be found in Appendices B - E.

In accordance with the ILP regulations and as described in the FERC approved Process Plan and Schedule for the Wells Project, the RSP Document is being filed with FERC and simultaneously distributed to federal and state resource agencies, local governments, affected Indian tribes, members of the public and other interested parties.

2.0 SUMMARIES OF REVISED STUDY PLANS

Douglas PUD proposed 12 study plans as part of its PSP Document. The 12 study plans focus on Cultural (1 plan), Recreation (2 plans), Terrestrial (2 plans), and Aquatic (7 plans) resources within the Wells Project. In response to stakeholder comments to the PSP document and stakeholder comments at the June 14 Study Plan Meeting, Douglas PUD revised 5 of the 12 proposed study plans. Summaries of all the proposed study plans, for each resource area, are included below. The entire collection of study plans, as revised, is included in Appendices B - E.

2.1 Cultural Resources

Cultural issues relevant to the relicensing of the Wells Project include cultural, historical and archaeological resources. The proposed study plan related to cultural issues can be found in Appendix B. This study plan was developed by the Cultural Resource Work Group (Cultural RWG), consisting of the Bureau of Indian Affairs (BIA), Confederated Tribes of the Colville Reservation (CCT), FERC, Washington State Department of Archaeology and Historic Preservation (DAHP) and Douglas PUD. A summary of the study plan now proposed for cultural issues is provided below. Because there have been no substantive comments, the study plan contained herein has not changed since filing the PSP.

2.1.1 Cultural Resources Investigation

The Cultural RWG developed a study to conduct a Cultural Resources Investigation to resolve gaps in existing knowledge of cultural resources in the Area of Potential Effect (APE). The Cultural Resources Investigation will identify and revisit all previously recorded historic properties within the APE, resurvey high priority locations within the APE, update the current location and condition of each site, update the site forms for each site, develop a prioritized list of sites and evaluate whether they are eligible for the National Register of Historic Places. The Cultural Resources Investigation will also evaluate the Wells Project's effects on historic properties located within the FERC Project Boundary.

The results of this study will be used to develop protection, mitigation, and enhancement (PME) measures related to historic properties in the Wells Project APE for the next license term. The PME measures will be incorporated into the Historic Properties Management Plan which will be filed with FERC with the final license application in May, 2010.

2.2 Recreation Resources

Recreation issues relevant to the relicensing of the Wells Project include public recreation and aesthetic resources. The two study plans and their revisions related to recreation issues can be found in Appendix C. These study plans were developed by the Recreation Resource Work Group (Recreation RWG), consisting of the National Park Service (NPS); Washington Department of Fish and Wildlife (WDFW); Washington State Recreation and Conservation Office (RCO); Washington State Parks and Recreation Commission; the CCT; Okanogan County; the cities of Pateros, Brewster and Bridgeport; and Douglas PUD. Summaries of the

proposed study plans for Recreation issues including any revisions made since filing the PSP are provided below.

2.2.1 Evaluation of Public Access to and Use of the Wells Reservoir as it Relates to Reservoir Fluctuations, Aquatic Plants, and Substrate Buildup (Public Access Study)

There have been no substantive changes to this study plan since it was filed as part of the PSP document. The Public Access Study is summarized as follows:

The study will evaluate whether the Wells Project's public recreation facilities such as docks, boat launches and swimming areas, can be reasonably accessed under the current and proposed reservoir operating scenario. The Public Access Study will investigate accessibility to and from the water at public boat docks and launches during low reservoir elevations, how reservoir elevations affect on-water boating experiences, and whether aquatic plant growth and/or sediment accumulation at public access sites may be restricting public use of Wells Project waters.

The results of this study will be used to inform Douglas PUD and recreation management entities on existing public recreation access issues that should be addressed during the next license term.

2.2.2 An Evaluation of Recreational Needs Within the Wells Project (Recreational Needs Analysis)

Douglas PUD received comments from FERC, RCO, NPS, and the City of Brewster regarding the Recreational Needs Analysis included in the PSP Document. The study plan was modified to address these comments as follows:

- 1. FERC requested that detail be added to the methods section regarding how future recreation growth and needs will be calculated. Section 6.2 (Assess Future Recreation Demand), Step 4, was modified to include detailed methods and citations for estimating future recreation activity for the study area. RCO and NPS concurred with FERC's suggested changes (See summary in Section 3.1.1.2).
- 2. The NPS, RCO, and City of Brewster commented that the study plan should be modified to include methods for capturing evening recreational use within the Wells Project, including specific information on Hispanic use. To address this issue, a new objective was added to Section 2.0 (Goals and Objectives). In addition, Section 6.1 (Assess Existing Unmet Demand), Step 2, was modified to include collection of anecdotal information on evening recreational use. The City of Brewster, NPS, and RCO concurred with the modifications to the study plan (See summary in Section 3.1.2.1).

The revised Recreational Needs Analysis study plan is summarized as follows:

The study will analyze future recreation needs associated with operation of the Wells Project. The purpose of the Recreational Needs Analysis is to evaluate recreational use information and identify current and future recreation needs at the Wells Project. The Recreational Needs Analysis will evaluate existing recreation use data, assess the current condition of existing facilities, identify and project future recreation demand, and identify potential enhancements to meet current and future recreation needs.

2.3 Terrestrial Resources

Terrestrial issues relevant to the relicensing of the Wells Project include wetland, riparian, wildlife and botanical resources, and land use. Two proposed study plans related to terrestrial issues can be found in Appendix D. These study plans were developed by the Terrestrial Resource Work Group (Terrestrial RWG), consisting of the (United States Fish and Wildlife Service (USFWS), WDFW and Douglas PUD. Summaries of the revised study plans for Terrestrial issues, including any changes made since filing of the PSP, are included below.

2.3.1 An Evaluation of the Effects of and Alternatives to the Existing Bird and Mammal Control Programs (Piscivorous Wildlife Control Study Plan)

Douglas PUD received comments from WDFW resulting in the following changes to the study plan:

- 1. A sentence was added to Section 6 (Methods) stating that the, "*Terrestrial RWG will develop reasonable and effective control measures based on the results of this study and any other relevant local knowledge on each species.*"
- 2. The phrase "nuisance wildlife" was replaced with "piscivorous wildlife" in the title and throughout the document.

WDFW concurred with these modifications (See summary in Section 3.1.3.5). The revised Piscivorous Wildlife Control Study Plan is summarized as follows:

The study is intended to evaluate the effects of and potentially develop alternatives to the existing bird and mammal piscivorous wildlife control programs. Douglas PUD currently implements several bird and mammal control programs that are primarily related to fish survival goals within the Wells Habitat Conservation Plan (HCP). The Wells HCP requires Douglas PUD to implement a piscivorous predator control program. The goal of the piscivorous predator control program is to reduce the loss of juvenile salmon and steelhead caused by predators. Both the hatchery and tailrace piscivorous predator control programs are important in meeting the No Net Impact survival goals of the Wells HCP.

The primary objectives of the Piscivorous Wildlife Control Study are:

- Identify and count the current and historic number and species of birds and mammals feeding on fish at the Wells Project hatcheries and in the Wells Tailrace;
- Assess the potential impacts of mortality caused by piscivorous birds and mammals to ESA listed, sensitive and recreationally important species;
- Describe each of the existing piscivorous wildlife control measures, including species targeted, reason for control, frequency of control and effectiveness of the control method;

• Evaluate alternatives, including the costs and benefit of each measure recommended. The study may provide alternative methods of preventing predation of fish at the Wells Project and in hatchery rearing ponds.

The results of this study will be used by Douglas PUD to improve the effectiveness of the bird and mammal control program in order to maintain high juvenile fish survival at the Wells Project and associated hatchery facilities. The results of this study will also be used by Douglas PUD during the development of PME measures for wildlife and aquatic resources.

2.3.2 Plant and Wildlife Surveys and Cover Type Mapping for the Wells Hydroelectric Project 230 kV Transmission Corridor (Transmission Line Wildlife and Botanical Study)

At the June 14, 2007, Study Plan Meeting, FERC provided comments regarding methods for assessing electrocution and collision events along the 230 kV transmission corridor. To address these concerns, the study plan was modified as follows:

- 1. A new section, Section 4.4 Avian Interactions With Transmission Lines, was added to the Background.
- Two new sections were added to the Methods section. Section 6.2.1.4 Avian Collision Surveys, describes how collision surveys will be conducted. Section 6.2.1.5 – Literature Review, provides methods for summarizing existing literature on potential effects of transmission facilities on raptors and prairie grouse.
- 3. Section 6.2.1.2 of the study plan was modified to include more detailed methodology for the proposed prairie grouse surveys.

Both FERC and USFWS concurred with these modifications (See summary in Section 3.1.1.1). The revised Transmission Line Wildlife and Botanical Study is summarized as follows:

The study will assess the effects of the Wells Project's 230 kV transmission line corridor on wildlife. This proposed study is intended to fill the gaps in local knowledge of botanical resources, including rare, threatened and endangered (RTE) plants, invasive plant species and vegetation communities within the 235-foot wide Wells Project 230 kV transmission line corridor. The study will also analyze bird species presence, identify if bird collision with the line and structures is a problem and provide information on the extent of use and dependency on the transmission corridor by sage grouse (*Centrocercus urophasianus*) and sharp-tailed grouse (*Tympanuchus phasianellus*), both RTE species. Surveys will also be conducted for RTE mammals and reptiles. The study plan outlines methods that will be used to collect information on these plants and animals. The results of this study will be used by Douglas PUD during the development of PME measures for wildlife and botanical resources.

2.4 Aquatic and Water Quality

Aquatic and Water Quality issues relevant to the relicensing of the Wells Project include fish habitat, aquatic invertebrates, water quality, and aquatic plant resources. The 7 proposed study plans for Aquatic issues can be found in Appendix E. These study plans were developed by the Aquatic Resource Work Group (Aquatic RWG), consisting of the USFWS, WDFW, Washington Department of Ecology (WDOE), CCT, Confederated Tribes and Bands of the Yakama Nation (Yakama Nation) and Douglas PUD. Summaries of the proposed study plans for Aquatic and Water Quality issues, including any changes made since filing of the PSP, are described below.

2.4.1 Survival and Rates of Predation for Juvenile Pacific Lamprey Migrating through Columbia River Hydroelectric Projects (Juvenile Lamprey Study)

WDFW provided Douglas PUD with comments on the proposed Juvenile Lamprey Study. Per discussions with WDFW, Douglas PUD revised this study plan (See summary in Section 3.1.3.1) by making the following change:

1. Changed the examination of stomach contents to occur on-site as opposed to preserving samples and sending these samples to a laboratory for analysis. Both WDFW and Douglas PUD agreed that on-site observation of the stomach contents of predatory fish by trained field staff would be more effective in providing accurate characterization of predator diets. Samples would still be preserved according to Quality Assurance standards in case future laboratory evaluation is necessary.

WDFW concurred with these modifications (See Summary in Section 3.1.3.1). The revised Juvenile Lamprey Study is summarized as follows:

The study plan is intended to fill gaps in the local knowledge of the survival of juvenile Pacific lamprey (*Lampetra tridentata*) that migrate through the Wells Project. Although there is a growing body of information on adult Pacific lamprey and their interactions at hydroelectric projects, relatively little information exists related to the survival of outmigrating juvenile lamprey (macrophthalmia) at hydroelectric projects. A review of the recent body of literature related to juvenile lamprey survival passing through hydroelectric projects reveals that there is currently a lack of methodologies and technologies to effectively quantify the level of survival of juvenile lamprey migrating through a hydroelectric facility. In other words, no studies currently exist that document the level of survival attributed to a project's operations, nor does an accepted technology currently exist that would achieve a credible level of assessment for juvenile lamprey.

The Juvenile Lamprey Study will conduct an updated literature review which will compile all of the available information regarding juvenile lamprey survival at hydroelectric projects in the Columbia River Basin. Additionally, a field study will be implemented during the ILP study period to assess the significance of juvenile lamprey in the diets of predatory fishes and birds present in the Wells Forebay and Tailrace. Stomach samples of both predatory fishes and birds will need to be obtained and an effort will be made to coordinate with existing activities that may already be collecting such specimens.

A technical report summarizing the results of this study will be produced to provide a current state-of-the-science assessment of juvenile lamprey survival. These results will be used to address the issues raised by the Aquatic RWG, to inform future Wells Project relicensing decisions related to the effectiveness of existing predator control programs to protect juvenile lamprey, and may be used by Douglas PUD during the development of PME measures for Pacific lamprey.

2.4.2 An Assessment of Adult Pacific Lamprey Spawning (Lamprey Spawning Assessment)

There have been no substantive changes to this study plan since it was filed as part of the PSP Document. The proposed Lamprey Spawning Assessment is summarized as follows:

The study is intended to examine the effects of Wells Project operations on adult Pacific lamprey habitat, specifically spawning habitat. Currently, the information available in the mid-Columbia River on adult Pacific lamprey addresses only their migration through hydroelectric projects. No studies have been conducted to examine the presence of spawning within a project area and further whether project operations may impact lamprey spawning.

The study proposes to identify and map sites within the Wells Project where suitable spawning habitat may be available using Geographic Information Systems (GIS). These sites will then be field verified for suitability prior to the implementation of a field study. The field study will consist of spawning surveys throughout the lamprey spawning period (typically May to July) in 2008. If spawning activity is observed, an analysis will be conducted to examine whether Wells Dam operations have an effect on lamprey spawning habitat.

A technical report summarizing the results of this study will be produced to help fill the information gap identified by the Aquatic RWG and may be used by Douglas PUD during the development of PME measures for Pacific lamprey.

2.4.3 Adult Pacific Lamprey Passage and Behavior Study (Adult Lamprey Passage Study)

WDFW and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) provided Douglas PUD with comments on the proposed Adult Lamprey Passage Study.

Based upon comments submitted by WDFW, Douglas PUD revised this study plan (See summary in Section 3.1.3.4) in the following ways:

- 1. Language was added to reflect the additional installation of telemetry monitoring equipment and the resulting passage metrics from this updated telemetry array.
- 2. Language was added to ensure that there is flexibility regarding the start date of trapping activities at Wells Dam.

3. Language was added and/or edited to update the release location of tagged fish downstream of Wells Dam, the maximum holding times of captured lamprey prior to tagging, tag specifications, and the projected budget to implement the study.

Both WDFW and Douglas PUD agreed that these revisions would better address the objectives of the study and result in a more detailed study plan (See summary in Section 3.1.3.4).

Per comments received from the CTUIR, Douglas PUD revised the Adult Lamprey Passage Study plan as follows:

1. Section 9 of the proposed study plan was revised to include sharing the initial results of the Adult Lamprey Passage Study with regional lamprey passage experts from the Columbia Basin Lamprey Technical Work Group. The plan was also modified to provide an opportunity for interested stakeholders to conduct a walk through of the adult fish ladder during the scheduled winter maintenance outage.

The revised Adult Lamprey Passage Study is summarized as follows:

The study will examine the effects of the Wells Project and its operations on the migration of adult Pacific lamprey. Douglas PUD will undertake a radio-telemetry study to assess migration and passage characteristics of adult lamprey migrating through Wells Dam. Adult lamprey will be captured in the fishways at Wells Dam during August and September 2007. All captured lamprey meeting specific size criteria will be tagged and released at or below Wells Dam. Fixed-station monitoring at Wells Dam will be used to determine migration and passage characteristics of these tagged fish. A technical report summarizing the results of this study will provide the resource information needed to inform relicensing decisions related to adult lamprey passage through Wells Dam.

2.4.4 An Investigation into the Total Dissolved Gas Dynamics of the Wells Project (Total Dissolved Gas Investigation)

There have been no substantive changes to this study plan since it was filed as part of the PSP document. The proposed Total Dissolved Gas Investigation is summarized as follows:

As part of the Wells relicensing process, Douglas PUD is required to obtain a water quality certificate in accordance with section 401 of the Clean Water Act. WDOE is responsible for the issuance of a 401 certificate as well as administering the state's Water Quality Standards. As part of the 401 certification process, WDOE must determine that the Wells Project is in compliance with state water quality standards for total dissolved gas (TDG).

The Total Dissolved Gas Investigation will further examine the TDG production dynamics at the Wells Project. The specific objectives of this study are contingent upon the results from the 2006 TDG study and the TDG study scheduled for 2007.

TDG may become a water quality concern when gases supersaturate a river, lake or stream. The plunging water caused by spill at hydroelectric facilities may elevate TDG to levels that result in impaired health or even death for aquatic life residing or migrating within the affected area. Since 2003, Douglas PUD has been engaged in the assessment of TDG production dynamics at Wells Dam.

In spring of 2006, Douglas PUD examined whether or not operational scenarios (i.e. spill shaping) were able to minimize TDG production to a level that is capable of meeting the Washington State water quality standard for TDG production at Wells Dam during high flows up to 7Q10 flows (246 kcfs at Wells Dam). The 7Q10 flow is defined as the highest average flow which occurs for seven consecutive days in a ten-year period. At 7Q10 flows and above, water quality standards for TDG do not apply. Results of the 2006 study (EES et al., 2006) suggest that, at 7Q10 flows, specific operating scenarios that concentrate spill flows (crowned spill and full gate shapes) produce significantly lower levels of TDG in the Wells Tailrace. Further analysis of the 2006 data, including the collection of additional data in 2007, will provide a logical framework for decisions about the scope of continued TDG activities (i.e., more spill studies, modeling,) at Wells Dam during the ILP study period.

2.4.5 Development of a Water Temperature Model Relating Project Operations to Compliance with the Washington State and EPA Water Quality Standards (Water Temperature Study)

There have been no substantive changes to this study plan since it was filed as part of the PSP document. The proposed Water Temperature Study is summarized as follows:

As part of the 401 certification process, WDOE must determine that the Wells Project is in compliance with state water quality standards for temperature. The Aquatic RWG has identified the need to develop a water temperature model.

The development of a water temperature model is WDOE's preferred method for assessing Wells Project effects on water quality. In 2005, Douglas PUD began the initial steps for the development of a water quality model through the collection of detailed bathymetric, meteorological and water temperature data. With guidance from consultants with expertise in water quality modeling, Douglas PUD identified the CE-QUAL-W2 model (W2 model) as being appropriate for assessing temperature effects of Wells Project operation. The W2 model is widely used to support the establishment of Total Maximum Daily Load (TMDL) for Washington waters and is the generally accepted model for evaluating the effects of hydroelectric projects on state waters. Therefore, the W2 model was considered the basis for making decisions regarding data needs and data archiving.

Starting in 2005, Douglas PUD conducted a data review and data gap analysis which resulted in the implementation of a data collection program to ensure that the appropriate model-specific parameters were being collected from, within and adjacent to the Wells Project. Data collected during the new monitoring program are being archived in a format that is complementary to

future water quality modeling efforts. This data collection program was initiated in 2005 and will continue through 2007 for use in model development during the ILP study period.

Model development and implementation will proceed in consultation with the WDOE. Model results will clarify the effects of Wells Project operations as they relate to the state's narrative and/or numeric standards for temperature and will produce model output that will be important to the Wells Project 401 certification process.

2.4.6 Continued Monitoring of DO, pH and Turbidity in the Wells Forebay and Lower Okanogan River (DO, pH, and Turbidity Study)

There have been no substantive changes to this study plan since it was filed as part of the PSP document. The proposed DO, pH, and Turbidity Study is summarized as follows:

The study will collect additional Dissolved Oxygen (DO), pH, and turbidity data at the Wells Project. Douglas PUD and state and federal agencies have monitoring programs in place that collect water quality information related to these parameters. This study will augment the established sampling regimens and will provide additional information related to DO, pH and turbidity at the Wells Project.

Sampling locations for the study are the Lower Okanogan River within the Wells Project Boundary and the Wells Forebay. Study implementation is planned for 2008 with sampling occurring during periods where the probability of exceeding the water quality standard is highest (between mid-July and mid-September). A technical summary of the monitoring study will be produced to assist WDOE and other interested stakeholders in determining whether the Wells Project is in compliance with the state's water quality standards for these parameters.

2.4.7 Assessment of DDT and PCB in Fish Tissue and Sediment in the Lower Okanogan River (Okanogan Toxins Study)

There have been no substantive changes to this study plan since it was filed as part of the PSP document. The proposed Okanogan Toxins Study is summarized as follows:

As part of the 401 certification process, WDOE must assess the effect of a hydroelectric project's operations on the accumulation of toxins within reservoir sediments as they apply to the numeric and narrative criteria of the state standard.

The Aquatic RWG identified the need to collect more information regarding DDT and PCB in the lower Okanogan River within the Wells Project Boundary and its potential human health effects related to recreational activities. In order to satisfy this need, the Okanogan Toxins Study will collect fish and analyze fish tissue for the presence of toxins at specific recreation sites located on the lower Okanogan River. These samples will be collected and analyzed in an effort to identify human health concerns that may be related to DDT and PCB in fish in the Project area. In 2001-2002, WDOE conducted a technical assessment in support of the development of a TMDL for 1,1,1-trichloro-2,2-*bis*[*p*-chlorophenyl]ethane (DDT) and polychlorinated biphenyls (PCBs) in the Lower Okanogan River. For the purposes of the 2001-2002 assessment, the Lower Okanogan River was defined as the portion of the river from the US/Canadian border at Lake Osooyos (RM 80.2) downstream to the town of Monse (RM 5.0). During this assessment, various mediums (water, sediment, and fish tissue) at various locations in the Okanogan River were assessed for concentrations of DDT and PCB.

The study plan will augment prior information collected during the development of the TMDL consistent with the recommendations of the Water Quality Implementation Plan (WDOE, 2006) submitted by WDOE.

Sampling locations for fish during the study will include all accessible reaches of the lower Okanogan River within the Wells Project Boundary (RM 15.5 to RM 0.0). Sampling sites for sediment will include recreational sites of concern (e.g. swimming areas and boat launches) from the mouth of the Okanogan River upstream to RM 15.5. Study implementation is planned for the ILP study period (2008-2009) with sampling occurring in May 2008. Sampling frequency, timing, and methodology as well as sample analysis will be consistent with the 2001-2002 WDOE TMDL Technical Assessment as outlined in Serdar (2003) and WDOE's "Water Quality Certification for Existing Hydropower Dams: Preliminary Guidance Manual (September 2004)."

A technical report of the study will be produced that will document the concentration of DDT and PCBs in recreational fish species and in swimming areas of the lower Okanogan River within the Wells Project Boundary. The information collected during this study may help to inform the development of PME measures related to recreation in the lower Okanogan River.

3.0 **RESPONSES TO STAKEHOLDER PSP COMMENTS**

Douglas PUD's PAD included a compilation of preliminary issues and 12 study plans that were mutually developed and agreed upon by voluntary RWGs that began meeting in November 2005. FERC issued Scoping Document 1 on January 29, 2007. FERC staff conducted public scoping meetings on February 28, 2007 in the City of East Wenatchee, Washington and the City of Brewster, Washington. In accordance with ILP regulations, comments on the PAD, Scoping Document 1 and Study Requests were due to FERC by April 2, 2007. Douglas PUD's response to these comments and list of proposed studies was submitted to FERC on May 16, 2007. On June 14, 2007 Douglas PUD conducted the ILP Study Plan Meeting to discuss stakeholder comments on the PSP. In accordance with ILP regulations, comments on the PSP document were due to FERC by August 15, 2007. Douglas PUD has reviewed the meeting minutes from the Study Plan Meeting and has reviewed all of the independent communications. All of the correspondence related to stakeholder comments on the PSP have been tabulated in Table 3.0-1. Douglas PUD has reviewed suggested studies and revisions to studies according to FERC's seven criteria for study requests (18 CFR § 5.9(b)), and as a result has made modifications to five of 12 proposed study plans found in the PSP Document.

FERC's seven study request criteria are as follows:

- 1. Describe the goals and objectives of each study proposal and the information to be obtained;
- 2. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;
- 3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;
- 4. Describe existing information concerning the subject of the study proposal, and the need for additional information;
- 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;
- 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; and
- 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.

Table 3.0-1 Douglas PUD's placement of stakeholder comments.							
	Comment	Comment Did	Reference Location				
Summaries of Stakeholder	Resulted in the	Not Result in	for Stakeholder				
Comments on the PSP	Modification of	Modification of	Comment within				
211 Endowed En angre Dagulatame Ca	a Study Plan	a Study Plan	Appendix A – Table 3				
3.1.1 – Federal Energy Regulatory Co			Deces A 25 (1 (2				
Potonical Study	5.1.1.1		Pages A-35, $01, 05, 72, 05, 105, 111$				
Botanical Study			/5, 95, 105, 111,				
Bacrostion Needs Analysis	2112		Deges A 25, 105				
Recleation needs Analysis	5.1.1.2		$\begin{array}{c} \text{Fages A-55, 105,} \\ 213, 223 \end{array}$				
312 National Park Service Recreat	ion and Conserv	vation Office an	d City of Browstor				
Recreation Needs Analysis			Pages Δ_{-35} A_{5} A_{9}				
Recreation Needs Analysis	5.1.2.1		57 59 163 191				
			195 205				
3.1.3 – Washington Department of			190, 200				
Fish and Wildlife							
Juvenile Lamprey Study	3.1.3.1		Pages A-107				
Lamprey Spawning Assessment		3.1.3.2	Pages A-107				
Okanogan Toxins Study		3.1.3.3	Pages A-11				
Adult Lamprey Passage Study	3.1.3.4		Pages A-107, 203				
Piscivorous Wildlife Control Study	3.1.3.5		Pages A-183, 249				
3.1.4 – City of Brewster	1	1					
Local Community Impact Assessment		3.1.4.1	Pages A-211				
3.1.5 – City of Pateros	1	1					
Local Community Impact Assessment		3.1.5.1	Pages A-61, 63, 95,				
			105, 221				
Operation and Maintenance of		3.1.5.2	Pages A-221				
Recreation Facilities							
Visitor Information Center Feasibility		3.1.5.3	Pages A-221				
Study							
3.1.6 – Confederated Tribes of the Um	natilla Indian Re	servation	D 4 010				
Adult Salmon and Steelhead Passage and Survival Studies		3.1.6.1	Pages A-213				
Adult Lamprey Passage Study	3.1.6.2		Pages A-213				
Adult Lamprey Spawning Assessment		3.1.6.3	Pages A-213				
Adult Lamprey Habitat Study		3.1.6.4	Pages A-213				
Adult Lamprey Delayed Mortality		3.1.6.5	Pages A-213				
Study							
Adult Lamprey Salvage Operations		3.1.6.6	Pages A-213				
Juvenile Lamprey Passage Studies		3.1.6.7	Pages A-213, 223,				
			253, 257				
Juvenile Lamprey Drawdown Study		3.1.6.8	Pages A-213, 261				
Juvenile Lamprey Habitat Study		3.1.6.9	Pages A-213				

3.1 Summaries of Stakeholder PSP Comments

This section of the RSP Document includes a summary of stakeholder comments on the PSP Document and provides Douglas PUD's response to each comment based upon FERC's seven criteria for study requests (18 CFR § 5.9(b)). A total of three comment letters on the PSP Document were received either through independent communication with stakeholders or through comment letters filed with FERC by the August 15, 2007 deadline. Only the cities of Brewster and Pateros filed comments with FERC. Additional comments on the PSP were collected at the Study Plan Meeting and through other communications with stakeholders. All of the comments on the PSP Document received by Douglas PUD either formally or informally are summarized below.

3.1.1 Federal Energy Regulatory Commission

3.1.1.1 Transmission Line Wildlife and Botanical Study

David Turner (FERC) made comments during the June 14 Study Plan Meeting (See Appendix A, Study Plan Meeting Notes, dated June 14, 2007; and correspondence dated June 29 and July 3, 2007) regarding the methods for evaluating avian electrocution and collision. Mr. Turner suggested that the methods should clearly describe how collision and electrocution impacts would be quantified.

To address this issue, a new section (Section 4.4 – Avian Interactions With Transmission Lines), was added to the Background section of the proposed study plan. Section 4.4 provides background information on collision risk as well as information on the orientation of the 230 kV corridor and its proximity to water bodies and common avian migration or use areas:

Factors that influence collision risk can be divided into three categories: 1) those related to avian species, 2) those related to the environment, and 3) those related to the configuration and location of lines. Species-related factors include habitat use, body size, flight behavior, age, sex, and flocking behavior. Heavy-bodied, less agile birds or birds within large flocks may lack the ability to quickly negotiate obstacles, making them more likely to collide with overhead lines. Likewise, birds distracted by territorial, hunting, or courtship activities may collide with lines. Environmental factors influencing collision risk include the effects of weather and time of day on line visibility, surrounding land use practices that may attract birds and human activities that may flush birds into lines. Line-related factors influencing collision risk include the environment with respect to other structures or topographic features. Collisions are more likely to occur with the smaller diameter overhead static wire, which may be less visible than the wires used to transmit electricity (Chelan PUD, 2005).

Most of the 230 kV transmission line is oriented in a north to south direction. The orientation of the lines is therefore less conducive to waterfowl collision with the ground wires, conductors and towers, except where it is near Cornehl Lake and the Columbia River (See Figure 1.1-1). The most vulnerable raptors are young birds during their first migration in the fall. Fall migrating raptor use the North Cascades flyway, using the lift

from thermal and wind caused updraft ridges in Chelan County (Smith and Neal, 2007). Few raptors migrate through Douglas County and thus the orientation of the 230 kV transmission line presents little hazard.

Section 4.5 of the proposed study plan was also modified to include justification for why additional information is not needed for avian electrocution:

Electrocution of birds using the 230 kV line for perch and nest sites does not need additional data for the analysis of potential project effects. Insulators suspend each conductor eight or more feet from each lattice tower structure and approximately 24 feet between phases. The 230 kV transmission line exceeds the phase to phase and phase to ground separation of 60 inches recommended by the Avian Power Line Interaction Committee (APLIC) (2006) for the protection of raptors found in the vicinity of the transmission line corridor.

In addition, a new section (Section 6.2.1.4 – Avian Collision Surveys) was added to the Methods section of the study plan, describing in further detail how collision surveys will be conducted.

Douglas PUD developed a draft vegetation cover type map using digital air photos and ArcViewTM. With the aid of the cover type map, topographic maps, local knowledge of bird behavior, and biological and line-related factors influencing collision risk, Douglas PUD identified two areas where birds have a higher probability of colliding with the transmission lines—the portion of the 230 kV transmission line near Cornehl Lake and where it crosses the Columbia River. Consequently, surveys for dead birds will be conducted from the Wells Fish Hatchery on the west side of the 230 kV transmission line river crossing to the Columbia River and for one half mile on the east side river crossing. A second survey, approximately one mile in length, will be conducted in the Boulder Park Area approximately two miles west of Cornehl Lake. One or more observer(s) will search these sections of the 230 foot wide transmission corridor to determine the presence of dead birds.

If a dead bird is located during any of the surveys, the following data will be recorded.

- Species,
- Sex,
- Age (adult or juvenile) if possible,
- Physical condition (including broken bones, lacerations, abrasions, blood, discolorations, gunshot wounds, decomposition, feeding damage by scavengers,
- Probable cause of death, and
- GPS location.

Surveys will be conducted over five days during the spring bird migration and five days during the fall bird migration. Survey days will be spread through each migration season.

The observers will also record data for any bird found dead in the Wells 230 kV transmission line corridor during other phases of the study.

Douglas PUD also added methods (Section 6.2.1.5 – Literature Review) for conducting a literature review on potential effects of the transmission corridor on raptors and prairie grouse:

A literature review will be conducted to identify potential effects of the 230 kV transmission lines and towers on raptors and prairie grouse. Refereed journal articles and gray literature will be reviewed. The literature review will be summarized in the study report.

The FERC and USFWS concurred with all of the proposed changes (See Appendix A, correspondence dated July 9 and July 26, 2007).

3.1.1.2 Recreation Needs Analysis

Douglas PUD received comments from FERC during the June 14 Study Plan Meeting (See Appendix A, meeting notes, dated June 14, 2007) as well as after the meeting regarding the addition of detail on how future recreation growth and needs will be estimated in the Recreation Needs Analysis. Section 6.2 (Assess Future Recreation Demand), Step 4, was modified to include detailed methods and citations for calculating future recreation activity for the study area. The following methods were added for calculating national and regional participation rates for each activity and population estimates for Okanogan, Douglas, and Chelan counties:

The following steps will be utilized to estimate recreation activity for the Okanogan, Douglas and Chelan County populations (16 years and older).

- a. The calculation of participation estimates will be based on the projection indices created from Bowker et al., (1999), who utilized the National Survey on Recreation and the Environment (NSRE) descriptive findings for populations 16 years and older, not institutionalized (Cordell et al.1996) to develop participation by millions 2000-2050 on ten year increments.
- b. The county projections will be presented in a range derived from national and regional participation projection estimates. These are calculated based on the indices created for the nation and region, utilizing the same rate of increase index created by Bowker et al. (1999). To obtain the county level estimated activity participation rates, the following individuals will be contacted and steps applied.
 - 1. By county, the indexes from national and regional participation rates will be multiplied by the base number of participants (represented in millions) then divided by the base population used in national and regional calculations (Bowker et al., 1999, pp. 323-349). This will yield a national and regional participation rate for each activity by decade.

- 2. Next, the national and regional participation rates will be multiplied by the estimated Okanogan, Douglas and Chelan county populations of individuals non-institutionalized and over the age of 16, consistent with the estimate parameters developed by Bowker et al. (1999). The population estimates will come from the Washington Office of Financial Management, extracting estimates of institutionalized individuals from the Department of Corrections.
- 3. This calculation will result in a range of participation by activity for Okanogan, Douglas and Chelan counties.

The RCO and NPS concurred with these changes (See Appendix A, correspondence dated July 11, July 23, July 24, and August 10, 2007).

3.1.2 National Park Service, Recreation and Conservation Office, and City of Brewster

3.1.2.1 Recreation Needs Analysis

Susan Rosebrough (NPS) and Lee Webster (City of Brewster) raised the issue of whether the Recreation Visitor Use Assessment conducted in 2005 adequately addressed evening recreation use around the reservoir (See Appendix A, Study Plan Meeting Notes, dated June 14). Specifically, the NPS was interested in collecting additional anecdotal information on evening use by a growing Hispanic population in the region. Jim Eychaner (RCO) had also expressed interest in this issue.

The City of Brewster was specifically interested in collecting additional anecdotal information on evening use by all users around the reservoir.

To address these issues, Section 6.1, Step 2, of the Recreation Needs Study Plan was modified to include the following language:

To further understand the recreation needs of evening users as well as the growing Hispanic population in the region, Douglas PUD will conduct interviews with local community leaders (e.g., social organizations, churches) and Fish and Game officers to understand recreation use and behavior during daytime and evening hours. Douglas will also summarize current research on the specific needs of Hispanic recreation users.

The City of Brewster, NPS, and RCO concurred with these modifications (See Appendix A, correspondence dated July 23, July 24, and August 10, 2007).

3.1.3 Washington Department of Fish and Wildlife

3.1.3.1 Juvenile Lamprey Study – Stomach Content Sampling

During a phone conversation with WDFW (See Appendix A, correspondence dated July 3, 2007), it was determined that the on-site field examination of stomach contents of predators collected during the Juvenile Lamprey Study would be more appropriate than preserving and sending these samples to a laboratory. Sample discoloration and deterioration due to preservation prior to analysis and the effects on data quality were major concerns. It was agreed that after on-site analysis of stomach contents, the samples would still be preserved in case laboratory analysis was required in the future.

To address this issue, Section 6.0 of the Juvenile Lamprey Study was modified to include the following language:

All samples collected by Douglas PUD will be analyzed on-site by trained field staff and data recorded. Samples will also be preserved according to Quality Assurance/Quality Control standards in case future evaluation is necessary.

WDFW concurred with these modifications (See Appendix A, correspondence dated July 3, 2007).

3.1.3.2 Lamprey Spawning Assessment – Training for Field Crews

During a phone conversation with WDFW (See Appendix A, correspondence dated July 3, 2007), it was determined that training would be beneficial for any inexperienced staff that may be conducting lamprey spawning surveys during the assessment. Douglas PUD will provide staff with literature and opportunities to conduct spawning surveys (in collaboration with WDFW) prior to the Lamprey Spawning Assessment. Both Douglas PUD and WDFW agreed that the language regarding "training" as is detailed in the proposed study plan was sufficient. This study plan was not revised.

3.1.3.3 Okanogan Toxins Study – Proposed Expanded Sampling Scope

On April 2, 2007, prior to Douglas PUD filing the PSP Document, WDFW filed a request related to collecting additional sediment samples from selected points in Wells Reservoir as well as in the Okanogan River. As stated in Section 6.2.1.4 of the PAD, DDT and PCBs are the products of mining, industrial and agricultural activities upstream and outside of the Wells Project Boundary. WDOE has studied this issue extensively in the Okanogan River watershed through the implementation of a technical assessment (Serdar, 2003), development of a TMDL (WDOE, 2004) and the issuance of a Detailed Implementation Plan (WDOE, 2006) that recommended continuing the monitoring of fish tissues from certain fish species in the lower Okanogan River. The Detailed Implementation Plan (DIP) specifically states that "contaminants will slowly fade from the environment available to the fish through chemical breakdown, dilution, and the sequestering of these contaminants under accumulating sediments."

The proposed study developed by the Aquatic RWG is intended to be consistent with the recommendations of the DIP. Douglas PUD's proposed Okanogan Toxins Study, which calls for examining toxic pollutants in select game fish species and at select recreation sites within the Lower Okanogan River, is adequate to address the underlying issue of potential human exposure to toxins within the Wells Reservoir.

Douglas PUD believes that the additional sediment sampling requested within the mainstem portion of the Wells Project is not justified and does not satisfy at least two of FERC's study criteria: criterion 4 (need for additional information) and criterion 7 (sufficiency of alternative studies). First, there is no evidence to suggest toxic sediments have accumulated in riparian and wetland habitats along the mainstem Columbia River. Second, the additional sampling cost for sites outside of the Okanogan River is excessive relative to the additional amount of information to be obtained when no evidence of any problem exists. Finally, this informal request for information failed to address the applicable study request criteria as required by the ILP regulations. Douglas PUD's proposed alternative to the issue raised by WDFW is to conduct the originally proposed Okanogan Toxins Study described in Appendix E.

During a meeting with WDFW on April 26, 2007 (See Appendix A, correspondence dated May 1, 2007), this request was discussed and it was concluded that no additional sample sites within the mainstem portion of the Wells Project were necessary. This study plan has not been revised.

3.1.3.4 Adult Lamprey Passage Study – Monitoring and Release Protocol for Methods Section

During a phone conversation with WDFW (See Appendix A, correspondence dated July 3 and July 30, 2007), it was determined that the Adult Lamprey Passage Study Plan should be updated to reflect the additional telemetry equipment necessary to effectively assess lamprey passage characteristics at Wells Dam. Additional language was added to ensure that there is flexibility regarding the start date of trapping activities at Wells Dam. It was also determined that the downstream release location for tagged adult lamprey be located in an alcove near the fish ladder entrances. This area provides calm water allowing lamprey to re-orient themselves, reasonable proximity to the ladder entrance, and opportunities to collect data on approach and entrance into the fish ladder.

To address the issue of documenting the updated telemetry array within the study plan, Section 6.4.1 and 6.4.4 of the Adult Lamprey Passage Study Plan have been modified with additional language (See Appendix E).

To address the issue of flexibility regarding the start date of trapping activities at Wells Dam, Section 6.2 of the Adult Lamprey Passage Study Plan was modified to include the following language:

... in order to efficiently utilize available resources, the start of trapping activities will be flexible and based upon real-time fish count data at Wells Dam.

To address the issue of downstream release location, Section 3.6 of the Adult Lamprey Passage Study was modified to include the following language:

...30 will be released below Wells Dam in an area of reduced flow (alcove near ladder entrance).

WDFW concurred with these modifications (See Appendix A, correspondence dated July 3, 2007).

3.1.3.5 Piscivorous Wildlife Control Study – WDFW Request for Clarification

Douglas PUD received comments from WDFW (See Appendix A, correspondence dated July 11, 2007) regarding two issues:

- 1. WDFW asked whether the study plan should include a component to evaluate the effects of the piscivorous wildlife control program on local wildlife populations, specifically on sensitive species. This issue was discussed at length by the Terrestrial RWG during the development of the study plan. The Terrestrial RWG determined that due to the many confounding factors that affect wildlife populations, it would be difficult to design a defensible study that would provide a meaningful quantification of the effects of the control measures on statewide populations of piscivorous wildlife. However, if it is suspected that a control measure potentially has detrimental effects on the population, the Terrestrial RWG could propose PME measures to develop alternative control measures, or to further study the issue. Douglas PUD agreed to modify Section 6 (Methods) of the study plan to state, "*Terrestrial RWG will develop reasonable and effective control measures based on the results of this study and any other relevant local knowledge on each species.*"
- 2. WDFW requested that the phrase "nuisance wildlife" be replaced with "piscivorous wildlife". The study plan was modified accordingly.

WDFW concurred with these modifications (See Appendix A, correspondence dated August 15, 2007).

3.1.4 City of Brewster

3.1.4.1 Local Community Impact Assessment

The City of Brewster (Brewster) filed comments with FERC requesting that Douglas PUD study the economic impacts of the Wells Project on the neighboring communities (See Appendix A, correspondence dated March 30 and August 10, 2007). Brewster believes that the Wells Project has negatively impacted the economy of the city, neighboring communities, and Okanogan County and that there is a need for a study of "*economic loss*" and impact caused by the Wells Project. Douglas PUD does not agree that an economic study is needed for the reasons discussed below in Section 3.1.5 (City of Pateros).

Brewster also stated its belief that management of the reservoir has been "primarily for habitat conservation and that these ongoing activities have limited the increase in recreational activities." Further, Brewster states that, "access to and from the reservoir has been kept relatively low." Brewster is proposing a shift in how they believe the reservoir has been operated, moving management activities away from habitat conservation and toward increased water based recreation.

Douglas PUD is proposing a study, the Recreation Needs Analysis (Section 2.2.2), to evaluate the need, demand and project nexus related to additional public use facilities and access improvements. Douglas PUD is also proposing a Public Access Study (Section 2.2.1) to determine whether reservoir fluctuations, aquatic plants and substrate buildup are limiting public access and utilization of the Wells Project. These two relicensing studies will identify whether additional access facilities or access related measures are needed to address current and future recreation needs.

3.1.5 City of Pateros

The City of Pateros (Pateros) filed a study request with FERC requesting that Douglas PUD study the socioeconomic impacts of the Wells Project on Okanogan County and the cities of Pateros, Brewster and Bridgeport (See Appendix A, correspondence dated April 2 and August 15, 2007). Pateros has cited several issues, including the prior relocation of all or parts of the cities prior to construction of the Project, limited recreational access to the reservoir, Project land management practices, lost tax revenue due to fee title ownership of reservoir lands, loss of recreational opportunities associated with a free-flowing river, and maintenance costs of Project recreation facilities. Douglas PUD does not agree that the study requested by Pateros is warranted, and the request does not meet FERC's criteria for a study request for the reasons described below.

3.1.5.1 Local Community Impact Assessment

Pateros requested a socioeconomic study identifies three fundamental areas of disagreement with the scope of Douglas PUD's Proposed Study Plans. These are summarized below:

- (1) Pateros posits that the FPA and NEPA call for FERC to consider the social and economic effects of its action (i.e. Project licensing);
- (2) Pateros argues that such consideration should encompass the full range of Project impacts, consisting of both the original project effects dating back to project construction and continuing project effects; and
- (3) Pateros asserts that FERC must take a broad view of the "public interest" in making its decisions.

Douglas PUD responds to each of these arguments below.

• Pateros's argument that FPA and NEPA call for FERC to consider the social and economic effects of its actions.

Douglas PUD agrees that social and economic effects can be considered by FERC in the proper context, but this is subject to limitations. First, the purpose of any such socioeconomic analysis must be to identify socioeconomic impacts specifically related to the project and its proposed operations. Second, the scope of any consideration of socioeconomic effects must be limited to the extent that the Project's natural and physical environmental effects are interrelated to any social/economic impacts on the community, as recognized in the CEQ definition cited by Pateros. Therefore, FERC's analysis should not consider those areas of Pateros's socioeconomic conditions for which Pateros is the responsible entity or which are entirely unrelated to the Project, including policy decisions on community health care, economic development, tax structure, education, business incentives, and other local economic conditions. The threshold question that must be considered in scoping a socioeconomic assessment is how the specific physical effects of the Project and its operations relate to the community. In the case of the Wells Project, these effects are limited to recreation opportunity, a fact effectively conceded by Pateros when it indicates that any "mitigation" required will likely be recreation related. Douglas PUD has already agreed to study recreation use and needs related to the Project, and Pateros does not explain why such studies are not sufficient, as required by FERC's study criterion 7. Further, while Douglas PUD will provide an assessment of recreation use and needs, it is not responsible for guaranteeing or trying to maximize the revenues created by such use. It is Pateros's responsibility to promote Pateros's advantages related to the recreation opportunity provided by the Project.

The *Elkem Metals* case cited by Pateros, 45 FERC ¶61,044 (1988), does not support its requested economic study. There, FERC took socioeconomic effects on the community into account, but this was in the context of determining future minimum flows, which, if set too high, could cause the largest employer in the county with a critical impact on the economy, to shut down (45 FERC at 61,148). In other words, under consideration was a future change in project operations that had a direct nexus to potentially devastating effects on the economy. No such change is involved in the relicensing of the Wells Project, and Pateros identifies no such nexus.

Pateros suggests that Douglas PUD should broadly "*identify factors that influence regional and local economics*" without any explanation of how regional or even local economics could be materially affected by relicensing the Project, especially when no changes in Project operations are being proposed. Douglas PUD believes that it is Pateros's responsibility to understand and deal with the regional and local trends and issues driving its economy. It is not the purpose of the FERC relicensing process to transfer to licensees the normal responsibilities of municipalities. Pateros's study request clearly fails to satisfy FERC's study criterion 5, which requires an explanation of the nexus between project operations and effects on the resources to be studied.

• Pateros's argument that FERC's consideration should encompass the full range of Project impacts consisting of original construction related impacts, new impacts, and continuing impacts.

With respect to original impacts, while past environmental impacts may be relevant in determining what measures are appropriate to protect, mitigate, and enhance natural resources, FERC uses current conditions as a baseline for determining project impacts. *See American*

Rivers v. FERC, 201 F.3d 1186 at 1198 (9th Cir. 2000). To the extent impacts related to the original license have been fully mitigated, there can be no reason to consider those original impacts again. The economic impacts on Pateros from the original licensing of the Wells Project have already been fully mitigated.

In preparation for the construction of Wells Dam, portions of Pateros that were below the Wells Project Boundary were relocated. FERC determined that it was in the public interest to grant a license to Douglas PUD to construct and operate the Wells Project. As just compensation, Douglas PUD paid fair market value based on the highest and best use of the property acquired. Douglas PUD replaced or relocated public infrastructure affected by the construction of the Wells Project. Douglas PUD also reimbursed the cities of Pateros and Brewster for consulting engineers and professional planners who provided independent guidance to the cities on how the cities should be reconfigured. In addition, Douglas PUD funded and developed major parks and recreation facilities along the Wells Reservoir in Pateros, Brewster and Bridgeport. Since 1974, Douglas PUD's direct contributions toward recreation facilities have been in excess of \$8.9 million. Douglas PUD is also proposing to spend another \$3.4 million on recreation over the next five years (2008 - 2012). It is uncontested that these facilities provide economic benefits to local businesses. Finally, perhaps the greatest economic benefit to Okanogan County residents served by Okanogan County PUD, is that Okanogan PUD receives, at cost, 8% of the electricity generated at the Wells Project after meeting project obligations. This amounts to enough power and energy to cover approximately one third of Okanogan PUD's load at cost.

It is not the policy of FERC, nor is it reasonable, to require the licensee to compensate Pateros twice for the same impact, just as one would not pay once again upon relicensing for the land originally purchased for the Project. The original social and environmental impacts of the Project on the City of Pateros were fully evaluated and the appropriate mitigation was provided during the first license.

With respect to any consideration of new and continuing economic impacts of relicensing, they must have some reasonable connection to the Project's operation, and not simply constitute some effort Pateros would like to accomplish through a relicensing opportunity. For example, Pateros wants Douglas PUD to identify *"future growth opportunities*" for the city. This is well beyond what FERC has required of other licensees. The responsibility for managing Pateros's future must fall to Pateros. Finally, it is not within FERC's jurisdiction to compel the licensee to undertake activities unrelated to the project that might help Pateros grow, and therefore, such a study would not inform future license terms.

• Pateros's argument that FERC must take a broad view of the "public interest" in making its decisions.

Douglas PUD agrees that FERC must consider the public interest, but FERC's consideration of the "public interest" is constrained by its own jurisdiction and statutory authority. Certainly, FERC is charged with balancing the interests of the participants in the relicensing process, but only to the extent those interests are affected by and related to FERC's authority --- use of the waterway. Therefore, it is not within FERC's authority to consider Pateros's welfare, concerns, or issues which are not reasonably related to Douglas PUD's proposed use of the waterway.

Douglas PUD is not proposing any new uses or changes in use of the waterway, and therefore, FERC's analysis must focus on any on-going impacts to Pateros related to how Douglas PUD uses the waterway. These impacts are related to recreation uses and needs, recreation access, and shoreline management, all of which Douglas PUD has either studied already or proposes to study.

To support its arguments for a socioeconomic study, Pateros asserts that the continued operation of the project in the manner that it has been operated will cause a "*loss of area businesses*", loss of tax revenue, loss of "*warehouse space*", loss of agricultural lands, and "*damage to Pateros*" *civic and social fabric*". These assertions are offered without any supporting evidence.

Pateros cites two examples of studies performed at other projects to support its arguments for a socioeconomic study. In fact, these examples are either not relevant, or actually support Douglas PUD's position. Pateros cites the study done by Chelan PUD for its Rocky Reach Project. This example is not relevant because Chelan PUD chose to use FERC's Alternative Licensing Process (ALP), the implementation of which is substantially different than the Integrated Licensing Process. For example, the ALP is not governed by the seven study request criteria required under the ILP to justify a Study Plan. Under the regulations for the ALP, licensees are often asked to conduct studies with no relationship to the Project or the FERC license. In this case, the study was conducted voluntarily by the licensee in an effort to satisfy a stakeholder study request. Ultimately the study cited by Pateros and conducted by Chelan PUD was not used to inform any license decisions and did not result in any terms or conditions for the Rocky Reach license.

Two other examples were cited in Pateros's August 15, 2007 letter. Both the SMUD and VEPCo studies cited are consistent with Douglas PUD's understanding of the circumstances in which a socioeconomic study might be justified. In both cases, and as specifically identified by Pateros, the licensee-applicants were proposing major new construction activity that would result in a significant infusion of construction workers, and thereby have a potential to cause adverse affects specifically related to new construction activities. Douglas PUD is not currently proposing to construct any significant new facilities at the Wells Project during the term of the next license.

The final example cited in Pateros's August 15, 2007 letter is AEP's Smith Mountain relicensing. This example also supports Douglas PUD's position. AEP's study plan specifically identifies that their *"socioeconomic assessment"* would evaluate issues including management of lake levels and recreation access. These are areas already studied by Douglas PUD or where additional studies were proposed. Moreover, FERC (Staff) in the Smith Mountain case specifically limited the scope of the socioeconomic analysis. First, Staff held that the study baseline must be current conditions, not pre-project conditions. Second, Staff held that certain tax-related issues were beyond the scope of relicensing. Third, Staff held that the project's effect on transportation need not be studied because there was no nexus between continued project operations and transportation needs, and the information would not inform the development of license requirements for the project. See *Appalachian Power Company*, Project No. 2210-108, Director's Determinations dated September 9, 2005 and January 10, 2007.

3.1.5.2 Operation and Maintenance of Recreation Facilities

In letters dated February 28 and April 2, 2007, Pateros identified a variety of potential recreational, civic and social opportunities and included several informal study requests, one of which included a study to identify the specific costs for operation and maintenance (O&M) of Douglas PUD recreation facilities located in Pateros. Pateros also filed comments dated August 15, 2007, reiterating this request (See Appendix A, correspondence dated February 28, April 2 and August 15, 2007). Douglas PUD does not agree that a study of O&M costs, as described by Pateros, is warranted for the reasons described below.

Under an agreement between Douglas PUD and Pateros, Pateros is responsible for routine O&M at the recreation facilities located in the city. Douglas PUD has provided major maintenance and enhancement items through the five year Recreation Action Plan Update process. The agreement for O&M expires at the end of the current license. Therefore, it is assumed that future funding responsibilities related to Wells Project recreation facilities will be renegotiated through new agreements or through the licensing process.

With this in mind, it is assumed that neither Douglas PUD nor Pateros would agree to future recreation responsibilities without having a thorough understanding of the costs involved in taking on those responsibilities for the new license term. However, as previously stated in Douglas PUD's responses in the PSP Document, it is premature to study costs, when it is yet to be determined what future measures will be required under the new license.

In order to identify future recreation needs, Douglas PUD is proposing to conduct a Recreational Needs Analysis and a Public Access Study (See study plans in Appendix C). Following completion of these studies, Douglas PUD will determine which of the identified needs are related to ongoing Wells Project operations. Douglas PUD and the Recreation RWG will develop measures appropriate for meeting the identified needs. At that time, costs will be evaluated and included in the license application. Accordingly, Pateros's study request would not inform the development of license requirements, nor does it satisfy the requirement of explaining how the existing studies are not sufficient.

3.1.5.3 Visitor Information Center Feasibility Analysis

In letters dated February 28 and April 2, 2007, Pateros made an informal study request to study the feasibility of a regional Visitor Information Center (See Appendix A, correspondence dated February 28, April 2 and August 15, 2007). Pateros also filed comments dated August 15, 2007, reiterating this request. Douglas PUD believes that the proposed Recreational Needs Analysis addresses this issue, and that a separate study to evaluate the feasibility of building a new Visitor Information Center is not warranted.

Since 2001, access to the Wells Dam Visitor Information Center has been by appointment only due to heightened security concerns. Douglas PUD recognizes that use of the facility has been reduced. However, as stated in the PSP Document, Douglas PUD is proposing to first conduct the Recreational Needs Analysis during the ILP study period in order to identify future recreation needs in the Wells Project area (See study plans in Appendix C). As part of the study, Douglas

PUD will evaluate existing pertinent information, including historic and current Visitor Information Center records. After completion of this study, Douglas PUD will evaluate the need, demand and project nexus related to reopening or relocating the existing Wells Visitor Information Center.

3.1.6 Confederated Tribes of the Umatilla Indian Reservation

The CTUIR submitted comments on the PSP to Douglas PUD by letter dated August 14, 2007 (See Appendix A, correspondence dated August 14, 2007). In their letter, sent to Mr. Shane Bickford from Chairman Jay Minthorn, the CTUIR indicate that Douglas PUD's proposed study plans may not fully and adequately assess the full extent of the Project impacts on natural resources.

In this letter, the CTUIR proposed several new studies, including passage and survival studies for adult salmon and steelhead, to be conducted over multiple years. The CTUIR included comments in their letter suggesting that Douglas PUD's proposed (PSP) adult lamprey passage, juvenile lamprey survival and adult lamprey spawning studies are inadequate and should be modified to include broader objectives.

Unfortunately, Douglas PUD has had little time to consider the CTUIR proposed studies because they were submitted so late in the extensive ILP study development process. Douglas PUD has been working with stakeholders since the middle of 2005 to identify issues and develop study plans that meet FERC's requirements for relicensing. Following the completion of 35 RWG meetings, Douglas PUD filed all of the 12 RWG approved study plans in the PAD in December 2006. FERC staff included most of these study plans in Scoping Document One (SD1) and Scoping Document Two (SD2) and discussed all of Douglas PUD's proposed study plans at the two Scoping Meetings in February 2007. Douglas PUD made several changes to the study plans based upon comments on the PAD, comments on SD1 and SD2 and further discussions at RWG meetings. The updated study plans were filed in the PSP Document on May 16, 2007. In June, Douglas PUD provided a public Study Plan Meeting to resolve any and all outstanding issues on studies.

During the past two years, CTUIR did not participate in the Aquatic RWG, did not comment on the study plans proposed in the PAD, did not attend or raise study issues during the FERC Scoping Meetings and Site Visit and did not file any study requests by the April 2, 2007 deadline for study requests as identified in the FERC approved Process Plan and Schedule for the Wells ILP and as required by 18 CFR § 5.9(a). CTUIR also did not raise these study requests at the Study Plan Meeting, has not filed a study request that addresses FERC's seven criteria for study requests per 18 CFR § 5.9(b). Apparently, CTUIR's August 14, 2007 letter was not filed at FERC per the FERC regulations and the approved Process Plan and Schedule for the Wells ILP.

Despite the procedural deficiencies and lateness of CTUIR's comments, Douglas PUD addresses below the technical reasons why the proposed studies are unnecessary. Accordingly, no new study plans have been proposed to address the study requests submitted by CTUIR in their August 14, 2007 letter. One study plan was modified to address CTUIR's comment related to the need for regional lamprey passage experts to walk through the adult fish ladders at Wells Dam following the completion of the adult lamprey passage study in the fall of 2007. Below is a listing of all of CTUIR's study requests and Douglas PUD's response to each request. As will be shown, the CTUIR study requests fail to satisfy at least two of the study request criteria, including a demonstration of the need for additional information and an explanation as to why the studies proposed by Douglas PUD are not sufficient.

3.1.6.1 Adult Salmon and Steelhead Passage Studies

The CTUIR have requested that Douglas PUD conduct additional adult salmon and steelhead passage and survival studies as part of the relicensing of the Wells Project. Their rationale for this request is stated as the desire to verify the 98% adult passage survival assumption in the Wells Habitat Conservation Plan (Wells HCP) and their assertion that Douglas PUD's existing adult passage studies are inadequate.

Douglas PUD is not proposing to conduct any salmon and steelhead passage and survival studies in the relicensing process for three reasons.

First, all of the salmon and steelhead passage and survival studies for Wells Dam are conducted through ongoing consultation with the signatory parties to the FERC approved Wells HCP. The signatory parties to the Wells HCP include the National Marine Fisheries Service (NMFS), USFWS, WDFW, CCT and Yakama Nation. The CTUIR were heavily involved in the negotiations of the HCP; however, to date, they have not signed that agreement.

Second, contrary to the CTUIR's assertion, Douglas PUD has done a large number of comprehensive adult passage studies at Wells Dam. These studies have included multiple years of passage studies for sockeye, summer/fall Chinook, spring Chinook and steelhead over a broad array of conditions. The passage studies conducted to date include two sockeye radio-telemetry passage studies (1992 and 1997), four summer/fall Chinook passage studies (1993, 1997, 1998 and 2007), two spring Chinook passage studies (1993 and 1997) and three steelhead passage and two kelt migration studies (1997, 1999-2000 and 2001-2002). Citations for these studies include: Swan et al., 1994; Stuehrenberg et al., 1995; Alexander et al., 1998, English et al., 1998; Nass et al., 2000; English et al., 2001; English et al., 2003; and LGL, Limited, 2007.

Third, in addition to the extensive number of adult telemetry passage studies, Douglas PUD has also collected extensive adult PIT-tag detection data. This is possible because Douglas PUD installed one of the first PIT-tag detection systems on the Columbia River, which continues to have one of the highest adult detection efficiencies in the entire Columbia Basin. Based upon the extensive use of PIT-tags in juvenile fish released upstream of Wells Dam, Douglas PUD, in cooperation with the University of Washington's Data Access in Real Time Website (DART), has been able to develop minimum conversion rates for adult PIT-tagged salmon and steelhead migrating through the Mid-Columbia River (McNary Dam up to and through Wells Dam). Based upon these data, the HCP Coordinating Committee has determined that the minimum conversion rates for adult PIT-tagged fish migrating from McNary Dam to Wells Dam have on average exceeded the assumed 98% per project survival rates contained within the Wells HCP (Anchor Environmental and Douglas PUD, 2007). During the past four years (2003-2006), the per project survival for spring Chinook, summer/fall Chinook, and steelhead has averaged 98.5%, 98.3%, 98.1, respectively (Columbia River DART Website, 2007; Anchor Environmental and Douglas PUD, 2007).

This high rate of adult per project conversion, from McNary Dam to Wells Dam, is excellent considering the number of potential mortality sources in this section of the Columbia River including gill nets, sea lions, recreational and ceremonial fisheries, multiple mainstem dams and several hundred miles of river before even reaching Wells Dam.

For the three reasons stated above, Douglas PUD is not proposing additional adult salmon and steelhead passage and survival studies as part of the relicensing of the Wells Project. To do so would be contrary to the FERC approved Wells HCP, is unnecessary, and would be a waste of resources given the large number of adult passage studies already conducted and given the high rates of adult passage through the ladders and survival through the dams.

3.1.6.2 Adult Lamprey Passage Study

With regard to adult Pacific lamprey survival and passage, the CTUIR has requested "*at least one year of baseline study with at least 50 tagged lamprey to discern individual passage bottlenecks within the dam.*" As is detailed in the RSP (See Appendix E), in collaboration with Aquatic RWG members Douglas PUD is proposing to conduct a study to assess the existence of any potential impediments to adult lamprey passage at Wells Dam. The revised Adult Lamprey Passage Study includes a proposal to capture and tag 40 adult lamprey at Wells Dam. This target sample size is based upon tagging 10% of the 400 fish that, on average, are annually counted passing Wells Dam from 1998 to 2005 (excluding 2006 when 21 were counted). This target sample size is supported by the Aquatic RWG, is consistent with the percentage of lamprey tagged during the 2003 Rocky Reach adult lamprey passage study (10.1%) and is intended to avoid the excessive handling and tagging of the relatively small population of lamprey passing Wells Dam.

With regard to potential difficulties in meeting the revised Adult Lamprey Passage Study target sample size, the CTUIR recommends "*obtaining lamprey from a downstream source and transporting, acclimating and releasing these fish below Wells Dam to discern passage metrics at the fishways.*" Douglas PUD believes that using fish transported from an off-site source to assess passage at Wells Dam is inappropriate and could potentially provide an inaccurate assessment of passage at Wells Dam. Relatively little is known about the bioenergetics, site fidelity (homing) and migratory and overwintering behavior and timing of Pacific lamprey. This lack of knowledge combined with utilizing fish not captured at the study site potentially compromises data quality and may confound the results of the assessment. Douglas PUD believes that in order to provide reliable information, it is critical to minimize confounding factors and conduct the assessment using fish captured at Wells Dam. In support of one of the objectives of the proposed Adult Lamprey Passage Study (See Appendix E), Douglas PUD has already developed efficient capture techniques for lamprey by modifying a trap design that was successfully implemented at Rocky Reach Dam.

The CTUIR also requested that Douglas PUD be "consistent with management plans for other recently relicensed FERC projects at Willamette Falls and Rocky Reach, a walk through the Project's fishways after winter dewatering with regional lamprey passage experts from the Columbia Basin Technical Lamprey Workgroup should occur in the winter of 2007-2008 to visually identify potential passage problems and develop recommendations for operational

and/or structural modifications." Douglas PUD is supportive of conducting a walk through the Wells fishway for regional lamprey passage experts during the maintenance period after the 2007 proposed adult passage study is complete and results have been disseminated to the Aquatic RWG.

To address this issue, Section 9.0 of the Adult Lamprey Passage Study was revised to include the following language:

Additionally, Douglas PUD will provide the initial study results to regional lamprey passage experts from the Columbia Basin Lamprey Technical Workgroup as a precursor to a Wells fishway walk through. The walk through will occur during winter maintenance of the Wells fishways and is in support of the objective to identify potential areas of improvement to existing upstream fish passage facilities for the protection and enhancement of adult lamprey at the Wells Project.

The CTUIR also requested that "hydraulic analysis of the fishway at key areas (entrances, weirs and exits) should be conducted concurrently with the radio-telemetry assessment." Similar to other Columbia River hydroelectric facilities, the fishways at Wells Dam are operated using an auxiliary water supply system and diffusion grates which create extremely even and stable hydraulic conditions within the collection gallery of the fish ladder.

In 2006, in concert with the HCP Coordinating Committee, Douglas PUD developed a physical and computational model of the entire collection gallery portion of the Wells fish ladder. This model identified one area within the ladder that could be optimized to increase salmon and steelhead travel times and to improve upon fish passage rates for lamprey. Based upon the recommendations from this model, the HCP Coordinating Committee recommended that Douglas PUD install a test baffle in one of the two adult fish ladders and then compare the passage rates between the modified and unmodified fish ladders. During July of 2007, 200 summer/fall Chinook were radio-tagged to evaluate fish passage relative to this new enhancement to the fish ladder. In the summer and fall of 2007, 40 adult Pacific lamprey will also be radio-tagged to determine their relative passage success through an enhanced and through an unmodified fish ladder.

Douglas PUD believes that additional, hydraulic analysis beyond the current (2006) hydraulic model would be redundant and unnecessary to assess passage concerns for adult lamprey. The lamprey passage study being conducted in 2007 should provide sufficient information to inform future changes in the adult fish ladder to allow salmon, steelhead and lamprey to ascend Wells Dam.

3.1.6.3 Adult Lamprey Spawning Assessment

The CTUIR requests that "*lamprey should be tracked to spawning areas and if possible, monitored for spawning success.*" The timing of peak adult Pacific lamprey passage at Wells Dam typically occurs in August and September which suggests that the majority of lamprey migrating upstream of Wells Dam will overwinter until the following spring prior to spawning. A Lotek NTC-4-2L tag which is the recommended size tag given the size characteristics of lamprey at Wells Dam, has a maximum tag life of 87 days with a 5 second burst rate. Reducing
the burst rate to 10 seconds may double tag life to 174 days which is still inadequate to track fish to spring spawning grounds and would also compromise the detection efficiency during the passage portion of the study, therefore compromising data quality and the results of the proposed lamprey passage assessment.

There are therefore significant logistical challenges to combining a spawning assessment with the revised Adult Lamprey Passage Study.

However, the importance of gathering information related to the availability of spawning habitat and the existence of lamprey spawning within the Wells Project has been discussed at length by the Aquatic RWG. In collaboration with the Aquatic RWG, Douglas PUD is proposing to conduct a Lamprey Spawning Assessment that will identify potential spawning areas and monitor spawning activity and success within the Wells Project. If spawning activity is observed, an analysis will be conducted to examine whether Wells Dam operations have an effect on lamprey spawning habitat and resultant incubation. See Section 2.1.2 and Appendix E for a full description of the revised Lamprey Spawning Assessment.

The CTUIR requests that "lamprey should be tracked into tributary areas and spawning success should be monitored if feasible." In the revised Lamprey Spawning Assessment (Section 2.1.2 and Appendix E), Douglas PUD outlines several objectives to address spawning and potential impacts to lamprey incubation within the Wells Project Boundary including the inundated portions of both the Methow and Okanogan rivers. Douglas PUD is focused on assessments in areas where Project operations may potentially affect natural resources and recognizes its responsibility to address impacts to natural resources with a clear nexus to Wells Project operations consistent with FERC's study criteria (18 CFR § 5.9 (b)). By definition, areas potentially impacted by the Wells Project operations are found within the Wells Project Boundary. Douglas PUD's proposed Lamprey Spawning Assessment will address the CTUIR's concern regarding lamprey spawning within the Wells Project Boundary. However, Douglas PUD does not believe that there is a project nexus between lamprey spawning success upstream of the Wells Project Boundary and the operations of the Wells Project. Furthermore, Douglas PUD is uncertain how the collection of lamprey spawning information outside the Wells Project Boundary will inform future license decision. Additional details regarding Douglas PUD's revised Lamprey Spawning Assessment can be found in Appendix E of the RSP Document.

3.1.6.4 Adult Lamprey Habitat Study

The CTUIR requests that Douglas PUD "*identify adult lamprey holding habitat within the Project area and upstream of the Project in tributaries.*" With regard to adult lamprey holding habitat, the Aquatic RWG, during its issue development and determination phase, identified two types of habitat: spawning and overwintering (holding) habitat. The group agreed that there is unlikely a Project effect on adult lamprey overwintering habitat (See issue determination statement in the revised Lamprey Spawning Assessment in Appendix E). Literature suggests that overwintering habitat for adult lamprey consists of deep pools. In the Wells Reservoir deepwater habitat is plentiful and undisturbed by Project operations. With regard to assessments outside of the Wells Project Boundary, Douglas PUD has developed all of its proposed studies with careful attention to meeting FERC's study criteria (18 CFR § 5.9 (b)). Douglas PUD recognizes its responsibility to address potential impacts to natural resources that have a clear nexus to Wells Project operations. In order to meet this criterion, Douglas PUD has focused all of the proposed relicensing studies within the FERC designated Project Boundary.

The Aquatic RWG has agreed that a study to examine project effects on adult lamprey holding habitat were not an issue requiring study, but did recommend a study to determine whether adult lamprey are spawning within the Wells Project and if so, whether the operation of Wells Dam is affecting this habitat. A study to address project impacts on lamprey spawning is currently proposed (See Appendix E).

3.1.6.5 Adult Lamprey Delayed Mortality Study

The CTUIR requests that Douglas PUD "evaluate delayed mortality or post Project effects by monitoring lamprey after they leave the Project boundaries, particularly where they hold and spawn in tributary streams." In general, the causes of delayed mortality are often complex and difficult to discern. Many years and significant amounts of funding have been dedicated to examining delayed mortality for salmonids within the Federal Columbia River Power System. Based upon the available information, there is still not consensus as to the existence and/or the causes of delayed mortality within this system. As is consistent with FERC study criteria, all of Douglas PUD's proposed studies for Pacific lamprey (See Appendix E) are designed to assess measurable impacts that have a clear nexus to the Wells Project and whose results will ultimately inform the development of licensing decisions. Douglas PUD believes that a request to address the operations of the Wells Project with regard to delayed mortality outside the Wells Project Boundary would not provide information that meets these criteria (Also see Section 3.1.6.3).

3.1.6.6 Adult Lamprey Salvage Operations

The CTUIR requests that Douglas PUD "develop operations and maintenance procedures that would avoid lamprey impacts from dewatering fishways and other dam operations." Douglas PUD dewaters each of the two fish ladders at Wells Dam once annually in the winter. Maintenance of fish pumps and screens are conducted at that time. These operations are intended to protect all aquatic species found within the fish ladders but in particular are oriented toward salmon, steelhead, bull trout and lamprey. The specific details regarding Douglas PUD's Adult Ladder Dewatering Plan can be found in the Wells HCP Agreement, Appendix A: Adult Fish Passage Plan.

During fishway dewatering, Douglas PUD staff remove and count all fish found within the Wells fishways prior to the ladders being completely dewatered. All fish are then transported to a release point in the Wells forebay if removed from the East ladder and the tailrace from the West ladder. Over the past seven years only a handful of adult lamprey have been observed during winter time dewatering operations.

3.1.6.7 Juvenile Lamprey Passage Study

The CTUIR requests that Douglas PUD "*implement a baseline study in 2008 or 2009 to examine juvenile passage through Project-specific routes.*" Current state-of-the-science indicates that radio-telemetry tag technology is currently not available without affecting the behavior and performance of juvenile lamprey. Schreck et al. (2000) reported that "an external radio tag placed on juvenile lamprey remained on 75% of lamprey for 3 days" as is stated in the CTUIR comments; however, Schreck et al. (2000) also concluded during this same study that external radio tags affected fish performance and as such did not recommend using this tagging technique for fish passage, behavior and survival studies.

In order to accurately assess route specific passage, it is critical that tagging procedures not affect the behavior or swimming performance of test fish and that extensive analysis prior to implementing such a study be conducted to ensure the data collected will be accurate and unbiased. Schreck et al. (2000) concurred with this need in his assessment that the "analysis of fish performance is desirable to insure that the implantation or external attachment of telemetry devices does not alter the natural migratory behavior of outmigrant lamprey."

Currently, the smallest radio-tag currently manufactured by Lotek is the NTC-M-1. This tag weighs 0.37 grams and has dimensions of 5.2mm x 3.0mm x 13.4mm. The weight and dimensions of this tag are comparable to the smallest radio tag available during the initiation of Schreck et al.'s 2000 study. The tag tested by Schreck et al. (2000) was produced by Titley Electronics PTY LTD and weighed approximately 0.4 grams in air with dimensions of 6.0mm X 2.0mm X 12.5mm. Schreck et al. (2000) concluded that although "there were several attempts at surgical implantation of this radio-tag, the size of this tag combined with the morphology of juvenile Pacific lamprey prevents an internal application even in the largest of the animals we received".

A review of the most current body of literature concludes that there are no available methodologies and technologies to accurately, and without bias, quantify the route of passage or level of survival of juvenile lamprey migrating through a hydroelectric facility. Furthermore, email correspondence to verify personal communications regarding tag development and its current availability for study implementation yielded conclusions inconsistent with the CTUIR comment letter (See Appendix A, correspondence dated August 16 and 17, 2007). Internal tags are not yet small enough to be implanted in juvenile lamprey and external tagging has unquantifiable effects on fish behavior and performance. Even when a tag technology is available to address these issues, analysis of tag effects on fish health, behavior, and performance are critical prior to implementation in the field. Furthermore, obtaining macrophthalmia in sufficient numbers within the Project to meet sample size requirements for a statistically rigorous study is not practicable. In lieu of being able to directly measure survival, Douglas PUD, in collaboration with the Aquatic RWG is proposing to conduct an updated literature review of all of the available information regarding juvenile lamprey survival at hydroelectric projects in the Columbia River Basin. Additionally, a field study will be implemented to assess the significance of juvenile lamprey in the diets of predatory fishes and birds present in the Wells Forebay and Tailrace. The information collected from the proposed study will help to inform future Wells

Project licensing decisions (See Appendix E for the goals and objectives of the revised Juvenile Lamprey Study).

3.1.6.8 Juvenile Lamprey Drawdown Study

The CTUIR letter included one sentence requesting that "a planned drawdown of the Wells Pool, particularly at the tributary mouths that are impounded by the Pool such as the Methow and Okanogan, should occur and monitoring of sediments for presence of lamprey, using electrofishing methods described by Luzier (2007) should be implemented and evaluated."

The letter failed to describe the need for the requested information (criterion 4), how the study would be conducted (criterion 6) and how the results of the study would be used to inform license requirements (criterion 5). This same issue was discussed at length by the Aquatic RWG and that group concluded that simply counting lamprey ammocoetes at the mouth of the Methow and Okanogan rivers would not result in information that would be informative at a population level and would not help to inform license decisions. Lastly, the publication used in the CTUIR letter, to support the methods proposed in their study request, Luzier (2007), does not exist based upon personal communications with Christina Luzier (USFWS) (See Appendix A, correspondence dated August 22, 2007).

The Wells Project is a run-of-river project meaning that on average, daily inflow to the Wells Reservoir equals daily outflow. The limited active storage of the Wells Reservoir is only sufficient to regulate flows on a daily basis. Reservoir fluctuations and power generation are largely driven by the discharge of water from Chief Joseph and Grand Coulee dams. It is in Douglas PUD's own interest to maintain a full reservoir; however, the Wells Project is one of seven dams that operate in a coordinated manner through the Hourly Coordinating Agreement to follow regional electric demand. In most instances the infrequent reservoir operations, below 774, are a direct result of system operations outside of Douglas PUD control including river regulation by upstream storage and power projects, unscheduled reductions in discharge from Chief Joseph and Grand Coulee dams, actions in response to fish, wildlife and water quality regulations, natural stream flow variations, requirements within the Mid-Columbia Hourly Coordinating Agreement, Hanford Reach Fall Chinook Protection Program and FERC license requirements.

A recent review of the effects of water level fluctuations on natural resources further concluded that the effect of infrequent reservoir operations on Pacific lamprey is expected to be negligible on juvenile and adult lamprey. Ammocoetes are the only Pacific lamprey life-stage that uses littoral habitat and have limited mobility. However, the nature of infrequent reservoir operations at the Wells Project likely limits the potential for stranding and associated impacts to the Pacific lamprey population (DTA, 2006).

Douglas PUD does not agree that artificially lowering the Wells Reservoir and monitoring the sediment for the presence of lamprey will provide substantive information that can inform the Wells relicensing process at a level greater than the conclusions already drawn from existing information. As discussed by the Aquatic RWG during the collaborative issue scoping, issue determination and proposed study plan development phase, the current methodologies to assess

abundance of juvenile lamprey within the sediment is not yet developed at a level of resolution necessary to quantitatively assess juvenile lamprey abundance with any confidence.

3.1.6.9 Juvenile Lamprey Habitat Study

The CTUIR requests that "a study should be implemented by Douglas to enable you to identify where juvenile lamprey are located within the tributary streams above the Project and what habitat conditions are preferred." After a review of the literature related to juvenile Pacific lamprey habitat selection, Douglas PUD has concluded that there is an abundance of existing information related to this topic. In addition to Cochnauer and Claire (2000), information specifically detailing the characteristics of juvenile lamprey habitat can be found in Beamish and Levings, (1991), Lê et al. (2004), Pirtle et al. (2003) and Richards (1980). Given that sufficient information exists to address this issue, Douglas PUD does not agree that gathering this information will further inform the Wells Relicensing process beyond existing and available information.

Furthermore, as discussed before, in order to meet the Project nexus study criteria outlined by FERC, Douglas PUD is focused on assessments in areas where Project operations may potentially affect natural resources. By definition, these areas are found within the Project Boundary. Douglas PUD does not believe that locating juvenile lamprey in tributary streams and documenting habitat preferences above Wells Project Boundary, where there are no effects from Project operations, will be useful in making licensing decision regarding the Wells Project.

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Appendix A Summary of Consultation

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Introduction

In August 2005, Douglas PUD initiated a series of Resource Work Group (RWG) meetings with stakeholders regarding the upcoming relicensing of the Wells Project. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to identify resource issues and to develop preliminary study plans that could be included into the PAD. Four RWGs: Aquatic, Terrestrial, Cultural, and Recreation were formed to develop study plans.

Through 35 RWG meetings, each of the four RWGs cooperatively developed a list of "agreed-upon" study plans. In total, 12 "agreed-upon" study plans were filed within the PAD on December 1, 2006. Appendix A, Table 1 (Consultation Record Supporting the PAD) of the RSP Document contains all of the correspondence and meeting materials leading up to the filing of the PAD.

Following the filing of the PAD, FERC issued Scoping Document 1 on January 29, 2007. FERC staff conducted public scoping meetings on February 28, 2007 in the City of East Wenatchee, Washington and the City of Brewster, Washington. In accordance with ILP regulations, comments on the PAD, Scoping Document 1 and study requests were due to FERC by April 2, 2007. On May 16, 2007, FERC issued the Revised Scoping Document and Douglas PUD filed the PSP Document with FERC. The PSP Document contained Douglas PUD's response to stakeholder comments and included all 12 proposed study plans. Appendix A, Table 2 (Consultation Record Supporting the PSP Document) of the RSP Document contains all of the correspondence and meeting materials leading up to the filing of the PSP Document.

On June 14, 2007 Douglas PUD conducted the ILP Study Plan Meeting to collect stakeholder comments on the PSP. The purpose of the Study Plan Meeting was to provide stakeholders with an opportunity to review and comment on Douglas PUD's PSP Document, to review and answer questions related to stakeholder study requests and to attempt to resolve any outstanding issues with respect to the PSP Document.

In accordance with ILP regulations, comments on the PSP document were due to FERC by August 15, 2007. A total of three comment letters on the PSP Document were received either through independent communication with stakeholders or through comment letters filed with FERC by the August 15, 2007 deadline. Only the cities of Brewster and Pateros filed comments with FERC. Additional comments on the PSP were collected at the June 14, 2007 Study Plan Meeting and through independent communication with stakeholders. Appendix A, Table 3 (Consultation Record Supporting the RSP Document) of the RSP Document includes all of the stakeholder comments (letters, e-mails, phone logs and meeting minutes) on the PSP Document and contains all of Douglas PUD's documented efforts to resolve differences over studies.

In addition to Appendix A (Summary of Consultation), Douglas PUD has also made all of the ILP related material readily available throughout the study planning and development process. These documents can be found under the Communication and Meetings pages on the Wells Project Relicensing website at <u>www.douglaspud.org/relicensing</u>.

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Table 1 – Consultation Record Supporting the Pre-Application Document (PAD)		
Date	Consultation Document	Source
August 8, 2005	Information Request Letter	PAD Appendix B – 4
August 31, 2005	Stakeholder Outreach Letter	PAD Appendix B – 10
September 20, 2005	Stakeholder Outreach Letter	PAD Appendix B – 16
Aug – Oct 2005	Responses Received from Information Request Letter	PAD Appendix B – 22
Aug – Oct 2005	Critical Stakeholders Outreach Meetings	PAD Appendix B – 39
Aug – Oct 2005	Thank You Letters to Critical Stakeholders	PAD Appendix B – 41
October 18, 2005	ILP Workshop	PAD Appendix B – 44
October 18, 2005	ILP Workshop Sign-In Sheet	PAD Appendix B – 46
October 18, 2005	RWG Sign-In Sheets	PAD Appendix B – 48
October 24, 2005	Thank You Email after ILP Workshop	PAD Appendix B – 53
November 7, 2005	Meeting Notes from ILP Workshop	PAD Appendix B – 55
Oct 2005 – Oct 2006	RWG Meetings Schedule	PAD Appendix B – 61
November 15, 2005	Aquatic RWG Meeting	PAD Appendix B – 64
November 18, 2005	Cultural RWG Meeting	PAD Appendix B – 81
November 17, 2005	Recreation RWG Meeting	PAD Appendix B – 103
November 16, 2005	Terrestrial RWG Meeting	PAD Appendix B – 119
November 2005	Wells Project Tours and Participants	PAD Appendix B – 134
December 1, 2005	Letter to FERC requesting designation as non-federal representative for ESA consultation	PAD Appendix B – 136
December 7, 2005	Letter to Douglas PUD from FERC granting authorization to conduct day-to-day Section 106	PAD Appendix B – 139
December 7, 2005	Letter to Douglas PUD from FERC designating non-federal representative for ESA	PAD Appendix B – 142
January 9, 2006	Aquatic RWG Meeting	PAD Appendix B – 145
January 12, 2006	Cultural RWG Meeting	PAD Appendix B – 157
January 13, 2006	Recreation RWG Meeting	PAD Appendix B – 165
January 11, 2006	Terrestrial RWG Meeting	PAD Appendix B – 193
February 2, 2006	Aquatic RWG Meeting	PAD Appendix B – 204
February 9, 2006	Cultural RWG Meeting	PAD Appendix B – 243
February 10, 2006	Recreation RWG Meeting	PAD Appendix B – 267
February 8, 2006	Terrestrial RWG Meeting	PAD Appendix B – 282
February 1, 2006	Letter to Douglas PUD from WDFW regarding Relicensing Priorities	PAD Appendix B – 298
February 17, 2006	Letter to WDFW from Douglas PUD regarding Relicensing Priorities	PAD Appendix B – 304
March 2, 2006	Aquatic RWG Meeting	PAD Appendix B – 306
March 10, 2006	Recreation RWG Meeting	PAD Appendix B – 327
February 24, 2006	Terrestrial RWG Meeting	PAD Appendix B – 344

Table 1 – Consultation Record Supporting the Pre-Application Document (PAD)		
March 22, 2006	Email regarding Wells Project Tour	PAD Appendix B – 366
April 3, 2006	Letter to Douglas PUD from City of Pateros regarding Issue Statements	PAD Appendix B – 368
April 6, 2006	Aquatic RWG Meeting	PAD Appendix B – 370
April 11, 2006	Memo to Cultural RWG regarding Wells Area of Potential Effect (APE)	PAD Appendix B – 383
April 14, 2006	Recreation RWG Meeting	PAD Appendix B – 385
March 23, 2006	Terrestrial RWG Meeting	PAD Appendix B – 396
May 31, 2006	Letter to CCT from FERC regarding Consultation with the CCT	PAD Appendix B – 411
July 18, 2006	Letter to DAHP from Douglas PUD regarding Project Area of Potential Effect	PAD Appendix B – 415
July 18, 2006	Letter to CCT from Douglas PUD regarding Project Area of Potential Effect	PAD Appendix B – 417
July 21, 2006	Aquatic RWG Meeting	PAD Appendix B – 419
July 27, 2006	Cultural RWG Meeting	PAD Appendix B – 468
July 14, 2006	Recreation RWG Meeting	PAD Appendix B – 476
July 20, 2006	Terrestrial RWG Meeting	PAD Appendix B – 521
July 24, 2006	Letter to Douglas PUD from DAHP concurring with Project Area of Potential Effect	PAD Appendix B – 585
July 25, 2006	Letter to BIA from Douglas PUD regarding Section 106 Consultation	PAD Appendix B – 587
August 29, 2006	Aquatic RWG Meeting	PAD Appendix B – 589
September 14, 2006	Aquatic RWG Meeting	PAD Appendix B – 654
September 7, 2006	Cultural RWG Meeting	PAD Appendix B – 673
September 12, 2006	Terrestrial RWG Meeting	PAD Appendix B – 679
Sept - Nov 2006	Wells Project Relicensing Policy Meetings	PAD Appendix B – 738
September 27, 2006	Phone Conversation with the Umatilla Tribes regarding Request for Policy Outreach Meeting	Communication page
September 28, 2006	Cultural RWG Meeting	PAD Appendix B – 747
October 19, 2006	Cultural RWG Meeting	PAD Appendix B – 753
October 25, 2006	Letter to Douglas PUD from CCT concurring with Project Area of Potential Effect	PAD Appendix B – 773

Table 2 – Consultation Record Supporting the Proposed Study Plan Document (PSP)		
Date	Consultation Document	Source
December 1, 2006	Douglas PUD files NOI and PAD	Communication page
December 4, 2006	Email regarding Wells Project ILP begins to Aquatic RWG	Communication page
December 12, 2006	Email regarding Wells Project ILP begins to Terrestrial RWG	Communication page
December 12, 2006	Email regarding Wells Project ILP begins to Recreation RWG	Communication page
December 12, 2006	Email regarding Wells Project ILP begins to Cultural RWG	Communication page
December 13, 2006	Email regarding Date change to Cultural RWG	Communication page
December 21, 2006	Email regarding Cultural RWG Meeting Information	Communication page
December 26, 2006	Email regarding Dates for Aquatic RWG Meetings	Communication page
January 10, 2007	Email regarding Cultural Resources Data Review	Communication page
January 12, 2007	Email regarding Cultural Resources Investigation and RWG Agenda	Communication page
January 17, 2007	Cultural RWG Meeting	Meetings page
January 19, 2007	Email regarding Draft Cultural RWG Meeting Notes	Communication page
January 22, 2007	Email regarding Agenda for Terrestrial RWG Meeting	Communication page
January 23, 2007	Email regarding Agenda for Recreation RWG Meeting	Communication page
January 24, 2007	Email regarding Suggested date change for Cultural RWG Meeting	Communication page
January 25, 2007	Email regarding Date changed for Cultural RWG Meeting	Communication page
January 30, 2007	Email regarding White Sturgeon Assessment	Communication page
January 30, 2007	Email regarding FERC issues Scoping Document 1	Communication page
February 2, 2007	Email regarding Final Cultural RWG Meeting Notes	Communication page
February 6, 2007	Terrestrial RWG Meeting	Meetings page
February 7, 2007	Aquatic RWG Meeting	Meetings page
February 8, 2007	Email regarding Draft Terrestrial RWG Meeting Notes	Communication page
February 9, 2007	Email regarding Aquatic Study Plans from PAD	Communication page
February 9, 2007	Recreation RWG Meeting	Meetings page
February 13, 2007	Email regarding Question about Policy Meeting	Communication page
February 13, 2007	Email responding to Question about Policy Meeting	Communication page
February 16, 2007	Email regarding Recreation data question	Communication page
February 16, 2007	Email regarding Response to recreation data question	Communication page
February 16, 2007	Email regarding Final Terrestrial RWG Meeting Notes	Communication page
February 21, 2007	Phone conversation with BLM	Communication page
February 23, 2007	Email regarding Final Recreation RWG Meeting Notes	Communication page
February 23, 2007	Email regarding Final Aquatic RWG Meeting Notes	Communication page

Table 2 – Consultation Record Supporting the Proposed Study Plan Document (PSP)		
February 27, 2007	Email regarding Agenda for Cultural RWG Meeting	Communication page
February 28, 2007	Letter to FERC from Pateros regarding Comments on PAD and SD1	Communication page
March 1, 2007	Fax regarding Douglas PUD and BIA Meeting Notes	Communication page
March 7, 2007	Phone conversation with USFWS	Communication page
March 7, 2007	Email regarding Cultural Resources Scope of Work	Communication page
March 8, 2007	Cultural RWG Meeting	Meetings page
March 9, 2007	Email regarding Draft Cultural RWG Meeting Notes	Communication page
March 16, 2007	Email regarding Final Cultural RWG Meeting Notes	Communication page
March 19, 2007	Letter to FERC from Betty Wagoner regarding Scoping	Communication page
March 22, 2007	Email to FERC from Douglas PUD regarding Sharp-tailed grouse	Communication page
March 27, 2007	Email to FERC from Douglas PUD regarding Mule deer	Communication page
March 29, 2007	Letter to FERC from Friends of Fort Okanogan regarding Comments on relicensing process	Communication page
March 30, 2007	Letter to FERC from Douglas PUD regarding Comments on Scoping Meeting Transcripts	Communication page
March 30, 2007	Letter to FERC from Douglas PUD regarding SD1	Communication page
March 30, 2007	Letter to FERC from WDOE regarding Comments on PAD and SD1	Communication page
March 30, 2007	Letter to FERC from City of Brewster regarding Comments on PAD and SD1	Communication page
March 30, 2007	Letter to FERC from WDFW regarding Comments on PAD and SD1	Communication page
March 30, 2007	Letter to Douglas PUD from FERC regarding Comments on PAD and Study Requests	Communication page
March 30, 2007	Letter to FERC from City of Pateros regarding Comments on PAD and SD1	Communication page
March 30, 2007	Letter to FERC from USFWS regarding Comments on PAD and SD1	Communication page
April 2, 2007	Letter to FERC from BIA regarding Comments on PAD and SD1	Communication page
April 3, 2007	Letter to FERC from City of Brewster regarding Comments on PAD and SD1 (paper filing)	Communication page
April 4, 2007	Updated Letter to FERC from City of Pateros regarding Comments on PAD and SD1	Communication page
April 5, 2007	Email regarding Agenda for Aquatic RWG Meeting	Communication page
April 5, 2007	Email regarding Agenda for Terrestrial RWG Meeting	Communication page
April 6, 2007	Email regarding Cancellation of Recreation RWG Meeting	Communication page
April 6, 2007	Updated Letter (paper copy to FERC) from WDOE regarding Comments on PAD and SD1	Communication page
April 9, 2007	Email regarding Agenda for Cultural RWG Meeting	Communication page
April 9, 2007	Updated Letter (paper copy to FERC) from USFWS regarding Comments on PAD and SD1	Communication page
April 10, 2007	Email regarding Cultural Resources Investigation	Communication page
April 13, 2007	Email regarding Cancellation of Aquatic RWG Meeting	Communication page
April 13, 2007	Email regarding Cancellation of Terrestrial RWG Meeting	Communication page
April 23, 2007	Email regarding Draft Cultural RWG Meeting Notes	Communication page
April 23, 2007	Email to WDFW from Douglas PUD regarding Study Request Meeting	Communication page

Table 2 – Consultation Record Supporting the Proposed Study Plan Document (PSP)		
April 24, 2007	Letter to FERC from Douglas PUD regarding Reply Comments on SD1 and PAD	Communication page
April 25, 2007	Email regarding Final Cultural RWG Meeting Notes	Communication page
April 30, 2007	Email to USFWS from Douglas PUD regarding Study Request Meeting	Communication page
April 30, 2007	Email regarding Final Cultural RWG Meeting Notes	Communication page
April 30, 2007	Email to WDOE regarding Agenda for TDG Meeting	Communication page

Table 3 – Consultation Record Supporting the Revised Study Plan Document (RSP)		
Date	Consultation Document	Source-Appendix A
May 1, 2007	Summary Notes from Meeting with WDFW regarding Study Requests and Comments on the PAD	Page A - 11
May 16, 2007	Transmittal Letter to FERC from Douglas PUD regarding Proposed Study Plan Document	Page A - 15
May 31, 2007	Email to Stakeholders from Douglas PUD regarding Agenda for Study Plan Meeting	Page A - 31
June 28, 2007	Email to Stakeholders from Douglas PUD regarding Draft Study Plan Meeting Notes	Page A - 35
June 29, 2007	Email to Douglas PUD from City of Brewster regarding Draft Study Plan Meeting Notes	Page A - 45
June 29, 2007	Email to City of Brewster from Douglas PUD regarding Draft Study Plan Meeting Notes	Page A - 49
June 29, 2007	Email to Douglas PUD from City of Brewster regarding Draft Study Plan Meeting Notes	Page A - 57
June 29, 2007	Email to City of Brewster from Douglas PUD regarding Recreation Needs Analysis	Page A - 59
June 29, 2007	Email to Douglas PUD from FERC regarding Draft Study Plan Meeting Notes	Page A - 61
June 29, 2007	Email to FERC from Douglas PUD regarding Draft Study Plan Meeting Notes	Page A - 63
July 2, 2007	Email to FERC from Douglas PUD regarding Updated 230 kV Transmission Line Study Plan	Page A - 73
July 2, 2007	Email to Douglas PUD from FERC regarding Draft Study Plan Meeting Notes	Page A - 95
July 2, 2007	Email to FERC from Douglas PUD regarding Draft Study Plan Meeting Notes	Page A - 105
July 3, 2007	Phone Conversation with WDFW regarding Lamprey Study Plan Methodology	Page A - 107
July 3, 2007	Email to Douglas PUD from FERC regarding Updated 230 kV Transmission Line Study Plan	Page A - 111
July 3, 2007	Email to FERC from Douglas PUD regarding Updated 230 kV Transmission Line Study Plan	Page A - 133
July 9, 2007	Phone Conversation with FERC regarding 230 kV Transmission Line Study Plan	Page A - 135
July 9, 2007	Letter to DAHP and CCT from Douglas PUD regarding Triennial Archaeological Monitoring	Page A - 137
July 11, 2007	Email to Stakeholders from Douglas PUD regarding Final Study Plan Meeting Notes	Page A - 153
July 11, 2007	Email to NPS, City of Brewster, and IAC from Douglas PUD regarding Recreation Needs Analysis	Page A - 163
July 11, 2007	Phone Conversation with WDFW regarding Nuisance Wildlife Control Study	Page A - 183
July 12, 2007	Letter to Douglas PUD from DAHP regarding Triennial Archaeological Monitoring	Page A - 185
July 16, 2007	Letter to Douglas PUD from WDFW regarding White Sturgeon Supplementation Efforts	Page A - 187
July 23, 2007	Email to Douglas PUD from IAC regarding Recreation Needs Analysis	Page A - 191
July 24, 2007	Email to Douglas PUD from NPS regarding Recreation Needs Analysis	Page A - 195
July 26, 2007	Phone Conversation with USFWS regarding 230 kV Transmission Line Study Plan	Page A - 199
July 30, 2007	Phone Conversation with WDFW regarding Downstream Release Location for Tagged Lamprey	Page A - 203
August 10, 2007	Email to Douglas PUD from City of Brewster regarding Recreation Needs Analysis	Page A - 205
August 10, 2007	Letter to FERC from City of Brewster regarding Comments on Proposed Study Plan	Page A - 211
August 14, 2007	Letter to Douglas PUD from Umatilla Tribes regarding Comments on Proposed Study Plan	Page A - 213
August 15, 2007	Letter to FERC from City of Pateros regarding Comments on Proposed Study Plan	Page A - 221
August 15, 2007	Email to Douglas PUD from WDFW regarding Nuisance Wildlife Control Study	Page A - 249

Table 3 – Consultation Record Supporting the Revised Study Plan Document (RSP)		
August 16, 2007	Email to Douglas PUD from Oregon State University regarding Tag Technology for Lamprey	Page A - 253
August 17, 2007	Email to Douglas PUD from USGS regarding Tags to Evaluate Juvenile Lamprey Passage	Page A - 257
August 22, 2007	Phone Conversation with USFWS regarding letter citation from the Umatilla Tribes	Page A - 261

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Records of Consultation

Summary Notes from Meeting with WDFW regarding Study Requests and Comments on the PAD From: Shane Bickford Sent: Tuesday, May 1, 2007 4:53 PM To: Mary Mayo Subject: Meeting Notes 4/26/07 with WDFW

Mary,

Here are the meeting notes from April 26, 2007 with WDFW. Please post to the website.

Cheers,

Shane

Meeting Notes

Wells Hydroelectric Project Relicensing Douglas County PUD April 26, 2007 9:00-12:00 am

Douglas PUD
1151 Valley Mall Parkway
East Wenatchee, WA 98802
Bao Le (509) 881-2323
Review and discuss WDFW study requests and comments filed with FERC on April 2, 2007.
Carmen Andonaegui (WDFW)
Bob Clubb (Douglas PUD)
Shane Bickford (Douglas PUD)
Bao Le (Douglas PUD)

Comments on the PAD study plans

WDFW submitted various comments on the study plans filed within the PAD. Specifically, WDFW and Douglas PUD met to discuss WDFW's April 2, 2007 study request and comments. Study requests discussed during this meeting included WDFW's request to expand the scope of the proposed Okanogan Toxins Study to include sampling sites within the mainstem Columbia River, WDFW's request for an aquatic invasive species monitoring program into the Proposed Study Plan Document, and WDFW's request for a resident fish monitoring study every ten years throughout the license term starting in 2008. Other topics of discussion included the geographic scope of SD1 and the scope of regional water quality monitoring as required by recently issued 401 water quality certificates.

Items of Agreement

- WDFW and Douglas PUD agreed that the scope of the proposed Okanogan River Toxins Study does not need to be expanded to include sampling sites within the mainstem Columbia River.
- WDFW and Douglas PUD agreed that the existing aquatic invasive species monitoring program for the Wells Project is adequate and that provided that these monitoring efforts continued through 2009 that additional invasive species monitoring study is not needed at this time.

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Transmittal Letter to FERC from Douglas PUD regarding Proposed Study Plan Document



1151 Valley Mall Parkway • East Wenatchee, Washington 98802-4497 • 509/884-7191 • FAX 509/884-0553 • www.douglaspud.org

May 16, 2007

Honorable Kimberly D. Bose, Secretary Federal Energy Regulatory Commission 888 First Street, NE Washington DC 20426

Subject: Wells Hydroelectric Project No. 2149-131 Proposed Study Plan Document



Dear Secretary Bose:

In accordance with 18 C.F.R. § 5.11, Public Utility District No. 1 of Douglas County, Washington (Douglas PUD), licensee of the Wells Hydroelectric Project, hereby submits one original paper copy and eight compact disk copies of its Proposed Study Plan (PSP) Document for the Wells Project. The PSP Document is also being distributed to those entities listed on the attached Relicensing Distribution List in accordance with Douglas PUD's Communication Protocol.

The PSP Document consists of Applicant Proposed Study Plans and Responses to Stakeholder Study Requests. The Applicant Proposed Study Plans include 12 study plans that have been mutually developed and agreed upon by stakeholders and Douglas PUD. The Reponses to Stakeholder Study Requests include responses to Study Requests Deemed Appropriate for Study, Study Requests with Alternative Study Methodology and Study Requests Not Appropriate for Study. Additionally, pursuant to 18 C.F.R. § 5.11(6)(e), the PSP Document includes a Proposal for Conducting a Study Plan Meeting during the 90-day period outlined in 18 C.F.R. § 5.12.

If you have any questions or require further information, please contact me at (509) 884-7191.

Sincerely,

Shane Bickford Supervisor of Relicensing

Cc: Relicensing Distribution List

American Public Power Association Government Relations Joe Nipper, Senior V.P. 2301 M Street, NW Washington, DC 20037-1484

American Rivers, Inc. Brett Swift, Deputy Regional Director 320 SW Stark Street, Suite 412 Portland, OR 97204

Avista Corporation Gary G. Ely, Chairman of the Board/CEO P.O. Box 3727 Spokane, WA 99220-3727

Avista Corporation Ron Peterson, V.P., Energy Resources P.O. Box 3727 Spokane, WA 99220-3727

Bonneville Power Administration Integrated Fish & Wildlife Program Bill Maslen, Director P.O. Box 3621 Portland, OR 97208-3621

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Bureau of Indian Affairs Bob Dach 911 NE 11th Avenue Portland, OR 97232 American Rivers, Inc. Rob Masonis, Senior Director 4005 20th Ave. West, Suite 221 Seattle, WA 98199

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Bureau of Indian Affairs Sharon Yepa, Superintendent P.O. Box 389 Wellpinit, WA 99040

Bureau of Indian Affairs Chuck James, Area Archaeologist 911 NE 11th Avenue Portland, OR 97232

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Bureau of Land Management Diane Priebe, Recreation Planner 915 N. Walla Walla Avenue Wenatchee, WA 98801-1521

Bureau of Land Management State Director P.O. Box 2965 Portland, OR 97208-2965

Bureau of Reclamation James B. Blanchard, Special Projects Officer P.O. Box 815 Ephrata, WA 98823

Chelan County Commissioners 400 Douglas Street, Suite 201 Wenatchee, WA 98801

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Chelan County Public Utility District Michelle Smith, Licensing & Compliance P.O. Box 1231 Wenatchee, WA 98807-1231

City of Brewster Lee Webster, Mayor P.O. Box 340 Brewster, WA 98812

City of Bridgeport Jean Hardie, Administrative Assistant P.O. Box 640 Bridgeport, WA 98813

City of Pateros Gail Howe, Mayor P.O. Box 8 Pateros, WA 98846

Columbia Basin Fish & Wildlife Authority Brian Lipscomb, Executive Director 851 SW 6th Avenue, Suite 260 Portland, OR 97204

Columbia River Inter-Tribal Fish Commission Robert Heinith, Hydro Program Coordinator 729 NE Oregon, Suite 200 Portland, OR 97232

Confederated Tribes and Bands of the Yakama Nation Timothy R. Weaver, Attorney 402 E. Yakima Ave., Suite 190 Yakima, WA 98907 Chelan County Public Utility District Keith Truscott, Licensing & Environmental P.O. Box 1231 Wenatchee, WA 98807-1231

City of Bridgeport Steven Jenkins, Mayor P.O. Box 640 Bridgeport, WA 98813

City of East Wenatchee Steve Lacey, Mayor 271 Ninth Street NE East Wenatchee, WA 98802

City of Pateros George Brady, City Councilman P.O. Box 8 Pateros, WA 98846

Columbia River Inter-Tribal Fish Commission Rob Lothrop, Policy Manager 729 NE Oregon, Suite 200 Portland, OR 97232

Confederated Tribes and Bands of the Yakama Nation Manager of Cultural Resources Program Johnson Meninick P.O. Box 151 Toppenish, WA 98948

Confederated Tribes and Bands of the Yakama Nation Steve Parker, Fisheries Division P.O. Box 151 Toppenish, WA 98948

Confederated Tribes and Bands of the Yakama Nation Paul Ward, Environmental Manager P.O. Box 151 Toppenish, WA 98948

Confederated Tribes of the Colville Reservation Martin Bohl, Executive Director P.O. Box 150 Nespelem, WA 99155

Confederated Tribes of the Colville Reservation Natural Resources Committee Chair Debbie Louie P.O. Box 150 Nespelem, WA 99155

Confederated Tribes of the Colville Reservation Joe Peone, Fish & Wildlife Director P.O. Box 150 Nespelem, WA 99155

Confederated Tribes of the Colville Reservation Steve Suagee, Reservation Attorney P.O. Box 150 Nespelem, WA 99155

Confederated Tribes of the Colville Reservation Bill Towey 910 N. Washington Spokane, WA 99201

Confederated Tribes of the Colville Reservation Guy Moura, TCP Coordinator P.O. Box 150 Nespelem, WA 99155 Confederated Tribes and Bands of the Yakama Nation Bob Rose, Asst. Environmental Manager P.O. Box 151 Toppenish, WA 98948

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Confederated Tribes of the Colville Reservation Doug Seymour, Cultural Committee Chair P.O. Box 150 Nespelem, WA 99155

Confederated Tribes of the Colville Reservation Tribal Historic Preservation Officer Camille Pleasants P.O. Box 150 Nespelem, WA 99155

Confederated Tribes of the Colville Reservation Sharon Redthunder, Real Property Officer P.O. Box 150 Nespelem, WA 99155

Confederated Tribes of the Colville Reservation Jerry Marco, Director P.O. Box 150 Nespelem, WA 99155

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Confederated Tribes of the Colville Reservation Mike Palmer, Parks & Recreation Manager P.O. Box 150 Nespelem, WA 99155

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Winston & Strawn LLP William Madden, Attorney 1700 K Street, NW Washington, DC 20006-3817 Email to Stakeholders from Douglas PUD regarding Agenda for Study Plan Meeting From: Mary Mayo

Sent: Thursday, May 31, 2007 3:53 PM

To: Art Viola; Bill Towey; Bob Clubb; Bob Dach; Bob Heinith; Bob Jateff; Bob Rose; Brad Hawkins; Brad James; Bryan Nordlund; Carl Merkle; Carmen Andonaegui; David Turner (david.turner@ferc.gov); Dennis Beich; Joe Miller; Joe Peone; John Devine; Jonathan Merz; Keith Kirkendall; Mark Miller; Mary Mayo; Molly Hallock; Pat Irle; Robert Easton; Sally Sovey; Shane Bickford; Steve Lewis; Steve Parker; Tony Eldred (eldredte@dfw.wa.gov); Bob Clubb; Camille Pleasants; Chuck James; Frank Winchell; Glenn Hartmann (glenn@wshsinc.com); Gordon Brett; Guy Moura; Margaret Berger; Mary Mayo; Richard Bailey; Rob Whitlam; Scott Kreiter; Shane Bickford; Timothy Bachelder; Andy Lampe; Bill Fraser; Bob Fateley; Brenda Crowell; Chris Parsons; Diane Priebe; Gail Howe; George Brady; Jean Hardie; Jim Eychaner; Jim Harris; Lee Webster; Mary Hunt; Mike McCory; Mike McKee; Mike Nickerson; Mike Palmer; Neal Hedges; Pat Haley; Patricia Leppert; Susan Rosebrough; Beau Patterson; Dan Trochta; Dinah Demers; James Rees; Jim McGee; Marc Hallett; Matt Monda; Allison O'Brien; Bao Le; Bill Tweit; Dale Bambrick; Denise Mills; Derek Sandison; Paul Ward; Preston Sleeger; Rosy Mazaika; Sally Sovey; Susan Martin; Tom Scribner; William Schurger

Subject: Study Plan Meeting Agenda

Attachments: Final_Study_Plan_Meeting_Agenda_6-14-07.pdf; Directions_to_Douglas_PUD.pdf

Please find attached the agenda for the Wells Hydroelectric Project Relicensing Study Plan Meeting on June 14, 2007. The meeting will begin at 9:00 AM and will end at 4:00 PM. The location for the meeting is in the auditorium at Douglas County PUD's Headquarters, 1151 Valley Mall Parkway, East Wenatchee, Washington. Please note that also attached are driving directions for those of you that may need them.

Douglas PUD's proposed study plans and stakeholders' study requests will be discussed at this meeting. For questions, please contact Shane Bickford at (509) 881-2208 or sbickford@dcpud.org.

Thank you.

Mary E. Mayo Douglas County PUD 1151 Valley Mall Parkway East Wenatchee, WA 98802 Phone: (509) 881-2488 Fax: (509) 884-0553 mmayo@dcpud.org



Agenda

Study Plan Meeting

Wells Hydroelectric Project Relicensing Douglas County PUD Auditorium 1151 Valley Mall Parkway East Wenatchee, Washington

> June 14, 2007 9:00 am – 4:00 pm

1. Welcome and Introductions

2. Meeting Goals and Objectives

3. Resource Work Groups

4. 12 Agreed-Upon Study Plans

- a. Cultural Study Plans
- b. Recreation Study Plans
- c. Terrestrial Study Plans
- d. Aquatic and Water Quality Study Plans

5. Lunch (Provided by Douglas PUD)

6. Summary of Stakeholder Study Requests

- a. Recreation and Socioeconomic Issues
 - i. Study Requests Deemed Appropriate for Study (none)
 - ii. Study Requests with Alternative Study Methodology (3)
 - iii. Study Requests Not Appropriate for Study (4)
- b. Terrestrial Wildlife and Botanical Issues
 - i. Study Requests Deemed Appropriate for Study (none)
 - ii. Study Requests with Alternative Study Methodology (none)
 - iii. Study Requests Not Appropriate for Study (1)
- c. Aquatic and Water Quality Issues
 - i. Study Requests Deemed Appropriate for Study (none)
 - ii. Study Requests with Alternative Study Methodology (1)
 - iii. Study Requests Not Appropriate for Study (2)

Appendix Schedule and Next Steps

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Email to Stakeholders from Douglas PUD regarding Draft Study Plan Meeting Notes

From:	Shane Bickford	
Sent:	Thursday, June 28, 2007 11:57 AM	
То:	Mike Nickerson (alta.lake@parks.wa.gov); Carmen Andonaegui (andonca@dfw.wa.gov); 'Sally Sovey'; David Turner (david.turner@ferc.gov); 'Patricia Leppert'; 'Robert Easton'; cascadeb@televar.com; Lee Webster (brewstermayor@hotmail.com); Bob Heinith (heib@critfc.org); Jim Eychaner (jime@iac.wa.gov); Stephen T. Lewis (Stephen_Lewis@fws.gov); Nick Christoph; Susan Rosebrough (susan_rosebrough@nps.gov); Tony Eldred (eldredte@dfw.wa.gov)	
Cc:	Bao Le; Bill Dobbins; Bob Clubb; Brad Hawkins; Brian R. Gish (briangish@dwt.com); Gar Jeffers (garj@jdsalaw.com); Gordon Brett; Jim McGee; Jim Vasile (jimvasile@dwt.com); Mary Mayo; Scott Kreiter; Stan Bastian (stanb@jdsalaw.com)	
Subject:	Study_Plan_MeetingMeeting_Summary_6-14-07.pdf	
Attachments:	Study_Plan_MeetingMeeting_Summary_6-14-07.pdf	

Good Morning!

Please find attached the draft meeting minutes for the June 14th Wells Relicensing - Study Plan Meeting. If you have any suggested changes to the meeting minutes please send us your proposed revisions by Friday July 6th. The final meeting minutes will be posted on the Wells Relicensing website and will be distributed to meeting participants via e-mail.

Regards,

Shane Bickford Supervisor of Relicensing Public Utility District No. 1 of Douglas County 1151 Valley Mall Parkway East Wenatchee, Washington 98802-4497 509.881.2208



Study Plan Meeting

Meeting Summary

Wells Hydroelectric Project Relicensing Douglas County PUD Auditorium 1151 Valley Mall Parkway East Wenatchee, Washington

> June 14, 2007 9:00 am –12:00 pm

ATTENDEES:

Please see attached Sign-In Sheet for attendees.

Shane Bickford, Douglas PUD, welcomed everyone to the meeting. He gave an overview of the Proposed Study Plan (PSP) meeting goals and objectives and the materials handed out prior to the meeting (agenda, baseline study list, resource chronology and power point presentation). All of the studies contained within the PSP were based on FERC's seven study criteria, which is located within the pages of the PSP document, in the CFR, on FERC's website and on Douglas PUD's website.

In 2005, Douglas PUD began the Resource Work Group (RWG) meetings. The goals of the RWG meetings were to engage the stakeholders and to learn about FERC's Integrated Licensing Process (ILP), identify and evaluate issues against FERC's Study Criteria, develop the study plans, and ultimately file the study plans in the Pre-Application Document (PAD). Douglas PUD wanted to get information out early to assist in the decision making process. Shane reviewed the list of Baseline Studies and FERC's seven study request criteria.

The 12 issues identified by the RWGs, that met FERC's seven study criteria, were collaboratively developed by the RWGs into "Agreed Upon" Study Plans and were included into the PAD and filed with FERC on December 1, 2006. An updated version of the 12 study plans were included in the PSP that was filed with FERC on May 16, 2007.

Scott Kreiter, Douglas PUD, discussed the objectives of the Cultural, Recreation and Land Use, and Terrestrial study plans contained within the PSP. The list of the study plans for these resource areas are as follows:

- Cultural Cultural Resources Investigation
- Recreation and Land Use Public Access Study, Recreational Needs Analysis
- Terrestrial Nuisance Wildlife Control Study, Transmission Line Wildlife and Botanical Study

Bao Le, Douglas PUD, discussed the objectives of the Aquatic study plans contained within the PSP. The list of the study plans for this resource area is as follows:

• Aquatic – Juvenile Lamprey Study, Lamprey Spawning Assessment, Adult Lamprey Passage Study, Total Dissolved Gas Investigation, Water Temperature Study, DO, pH and Turbidity Study, Okanogan Toxins Study

Shane Bickford gave a summary of the stakeholder's study requests filed with FERC by the April 2nd deadline. He also reviewed the criteria that Douglas PUD used to identify a study request and reviewed the criteria used to categorize study requests as either formal or informal study requests.

Eleven comment/study request letters were filed with FERC by the April 2nd deadline for study requests. Douglas PUD categorized each study request as either a formal or informal study request. Douglas PUD counted only one formal study request. The other ten study requests were considered informal due to their lack of information. All of the 11 study requests (formal and informal) were categorized further as being: 1) Appropriate for Study, 2) Appropriate for Study with Alternative Methodology, or 3) Not Appropriate for Study. None of the 11 study requests were grouped into the first category, four (4) were grouped into the second category and seven (7) were grouped into the third category.

Summary of Stakeholder Study Requests

Recreation and Socioeconomic Issues – Study Requests deemed Appropriate with Alternative Study Methodology

Cities of Brewster & Pateros – Visitor Information Center Cities of Brewster & Pateros – Need for Public Use Facilities and Access Cities of Brewster & Pateros – Boat Storage

Scott Kreiter provided Douglas PUD's view of the Visitor Information Center, Boat Storage and Public Use study requests. Douglas PUD viewed all three of these requests as informal study requests as they did not attempt to address FERC's seven study criteria. Scott indicated that rather than studying whether a new visitor information center, boat storage or any new public use facilites would increase visitor use of the project area that it would be more appropriate to first study whether there is an identified need for various recreational improvements and then, if a need has been identified and that need is closely related to project purposes, Douglas PUD will work with stakeholders to determine how best to meet those needs.

George Brady, City of Pateros, informed the meeting participants that the Visitor Center at Wells Dam was closed in 2001. He did not view this study request as a request for a new facility but as a reminder that Douglas PUD needs to either open or replace the existing center. David Turner and Bob Easton, FERC, asked how Douglas PUD would assess the number of people using the visitor center given that it is now closed and did the PUD have any available data on visitor use? Scott Kreiter indicated that the PUD had conducted a Visitor Use Assessment in 2005-2006 and that the data from that study would be used during the development of the Needs Assessment. Shane Bickford added that the Wells Dam Visitor Center has a visitor log that includes the number of visits observed both before and after September 2001. Jim Eychaner, IAC, mentioned that Washington State has available information and that data may be helpful during the development of the Needs Assessment.

Recreation and Socioeconomic Issues - Study Requests Not Appropriate for Study

Betty Wagoner – Access to Wells Reservoir

Scott Kreiter indicated that this issue was also categorized as an informal study requests as it did not attempt to address FERC's seven study criteria. Douglas PUD does not believe a study is needed for the requested information as this issue will be addressed in the Shoreline Management Plan. This management plan will balance the needs for fish and wildlife habitat protection versus the desire by local stakeholders to have private docks located on Douglas PUD property within the Wells Project boundary.

City of Pateros – Impacts of Wells Project on Local Communities

Scott Kreiter indicated that this was the only study request that attempted to address FERC's seven study criteria. He also indicated that Douglas PUD was not proposing to conduct this study because the information would not be of use during the development of license requirements and because the study was focused on original project impacts that were already mitigated during the term of the first license. He also indicated that there are a lot of factors that impact the economy and that socio-economic studies can be very subjective. The issues raised are not appropriate for study but may be better suited to a one-on-one discussion between Douglas PUD and the City of Pateros. George Brady stated that he thinks that Wells Dam has had a negative impact on all three cities and in particular on Pateros during project construction. George indicated that the entire downtown business corridor was displaced by the Project and that these impacts have not been properly mitigated.

Bob Easton, FERC, pointed out that FERC has historically not required licensees to compensate adjacent communities for original project impacts during relicensing. He asked George Brady what he would do with the information collected from the proposed socio-economics study. He encouraged Pateros to look for the nexus to ongoing project operations. David Turner, FERC, said that this meeting and the upcoming filing deadline provide an opportunity for the City of Pateros to present additional information to bolster their study request. As written, the current socio-economics study request is not expected to be recommended given FERC's prior precedence. He also indicated that city's infrastructure, such as roads, water and sewer, are the responsibility of the city and not the licensee.

City of Brewster – Sewer Treatment Plant Expansion

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott also indicated that this is not a project related issue and has no nexus to project operations. Lee Webster, City of Brewster, indicated that this was not a study request but rather a placeholder for future discussions related to expansion of the sewer treatment plant. Lee Webster said that the city is undergoing its third phase of updating the sewer. The next phase will have to last for the next 15-20 years and will be cost prohibitive for the city. There is no room for expansion at the existing site.

City of Pateros – Maintenance and Operation of Recreation Facilities

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott also indicated that costs for Operation & Maintenance could not accurately be developed until the Needs Assessment has developed an accurate picture of future needs and proposed facilities.

Terrestrial Wildlife and Botanical Issues - Study Requests Not Appropriate for Study

Bureau of Indian Affairs – Pre-Project Habitat Evaluation

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott noted that BIA recently toured the Wells Project and the BIA representatives indicated that they were comfortable with the wetland and riparian mitigation measures currently in place and expected to be in place during the next license term. However, BIA indicated that they still may file comments in the future should other issues arise.

David Turner, FERC, wanted to stress a couple of points. Specific methods should be identified or spelled out in each study plan. Make sure that time frames are clear and which species are identified. Shane Bickford, Douglas PUD, indicated that the study plans contained within the PSP were developed through active negotiations and that the intent was to agree on the goals and objectives for each study and that each of the documents was rigorously reviewed and collaboratively developed by the RWGs. The methods sections are as specific as each RWG choose to make them and varies from being very general for the cultural resource study plan to very specific in the adult lamprey spawning assessment and adult lamprey telemetry study plans.

Douglas PUD agreed to update the 230 kV transmission line study to increase the level of specificity related to methods and survey techniques and to update the Recreation Needs Assessment to include several of the issues discussed during today's meeting.

Aquatic and Water Quality Issues – Study Requests deemed Appropriate for Study with Alternative Study Methodology

WDFW – Toxins Study

Bao Le, Douglas PUD, informed the group that Douglas PUD met with WDFW on May 26, 2007 to discuss their proposed alterations to the existing toxins study plan. After clarifying the study design, it was agreed that there was no need to expand the scope of the existing (PSP proposed) toxins study to include the sampling sites on the mainstem Columbia River. Bob Heinith, Columbia Inter-Tribal Fish Commission, asked if the toxins study would be sampling any anadromous fish species. Bao Le, Douglas PUD, indicated that the study will sample toxins in the tissue of three species of resident fish. The fish selected for sampling are of recreational interest, live within or adjacent to the Wells Project their entire life and are the same species sampled by WDOE during past surveys.

Carmen Andonaegui, WDFW, asked whether there has been a toxin study conducted on the mainstem Columbia River. Bao indicated that he was not aware of any sampling and that there was no indication that there has been a toxins problem along the mainstem Columbia River, within the Wells Reservoir.

Lee Webster, City of Brewster, wanted to know why large mouth bass were not included in the toxins study. Shane Bickford, Douglas PUD, indicated that the intent of the study was to followup on recommendations made within the WDOE's Detailed Implementation Plan (DIP). The DIP recommended that future monitoring be conducted to track the levels of toxins found in fish and sediment over time to determine whether toxin levels are being diluted by new, cleaner material entering the river or whether the prevalence of DDT and PCBs are increasing. Therefore the toxin study plan is based around sampling the same fish that where sampled during prior studies conducted by WDOE. Bob Heinith, CRITFC, asked about whether the study would also be looking at the percentage of toxins in the sediment of the Okanogan River. Shane Bickford, Douglas PUD, indicated that several past studies have collected and analyzed sediments sampling for toxins and that the study proposed by Douglas PUD, in the PSP, will also include sediment sampling using the same or similar sampling protocol. Bao Le indicated that indeed the study will look at sediment cores and that sampling sites were identified based upon their tie to human health concerns (recreation sites). The results of the study will be used to educate and inform recreational user of the Okanogan River, within Project Boundary.

Aquatic and Water Quality Issues - Study Requests Not Appropriate for Study

WDFW – Aquatic Invasive Species (AIS)

Bao Le described Douglas PUD's rationale for not proposing to conduct WDFW's AIS study request. Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Bao Le, indicated that Douglas PUD did not consider this study request appropriate for study because the request information is already being collecting through coordinated activities with Portland State and WDFW Nuisance Species program. Current efforts include annual quagga mussel and zebra mussel monitoring and the completion of a base studies on aquatic weeds, including milfoil, and exotic macroinvertebrates. Therefore

These issues were discussed with WDFW and they agreed that because the information was already being collected that there was no additional need to conduct a separate relicensing study on Aquatic Invasive Species.

WDFW – Pikeminnow Removal Program on Resident Fish

Bao Le discussed that Douglas PUD is already doing a number of things to address this issue on a yearly basis and have discussed this issue with WDFW. It was decided that no additional RWG meetings were needed to discuss this issue as Douglas PUD had previously met with WDFW, on May 26th, and that at that meeting WDFW agreed that there was no need to conduct this study during the ILP study period.

This concluded the discussion of the stakeholder study requests.

Shane Bickford asked for additional comments related to the studies discussed during today's meeting.

There was a discussion on the Shoreline Management Plan and how this management plan will address a variety of issues that are common to all of the resource areas. Lamprey predation was discussed at length. Bao Le said no one knows how to quantify population abundance for juvenile Pacific lamprey. Sampling technology is still being developed and little is known about the behavior of juvenile lamprey in the substrate. George Brady was concerned about the effects of low water on juvenile lamprey. Bao Le mentioned that 98% of the time, Wells Dam operates within 2 feet of the normal elevation (781). It is difficult to quantify the impact of operations on juvenile lamprey given that lamprey collection techniques are still rather crude and unable to accurately count the number of lamprey in a given area of reservoir strata.

Susan Rosebrough asked whether issues related to the Recreational Use Assessment had been resolved. In particular Susan wanted to know if prior questions related to the conduct of the Visitor Use Assessments had been addressed. Specifically, questions related to counts of people participating during festivals, "after-hours" counting and collection of data from minority user groups that did not speak English. Scott Kreiter, Douglas PUD, mentioned that he would follow up with Susan to address her questions about how Douglas PUD had addressed prior questions related to the Visitor Use Assessment.

Shane Bickford went over the ILP timeline and talked about when the next round of comments are due. Douglas PUD will get together with folks who have raised issues today in an effort to understand and hopefully resolve their issues. Shane Bickford asked if there were any other issues to be covered during today's meeting.

Steve Lewis, FWS, raised questions about scientific validity for certain studies and that there may be a need for 2 years of studies for specific issues. Shane Bickford indicated that the second year of ILP studies is intended to answer questions from the first year, if there are any. Bao agreed that if the data are insufficient, then a second year will need to be done. David Turner and Robert Easton, FERC, indicated that the regulation was developed to address the need for a second year of study. The regulations indicate that a second year of study shall be based upon the failure to achieve the goals identified in the first year study plan. A second year of study might also be required in the instance that the field season, for the first year study, was not representative of average conditions (e.g. high water or dry year). Scenarios were discussed including what would happen if sample size targets for a study were not met or what would happen if the study year was unusually dry or wet. FERC staff reviewed their criteria for determining whether there is a need for a second year.

Meeting adjourned at 12:05 pm.

SIGN IN SHEET STUDY PLAN MEETING June 14, 2007 Douglas County PUD 1151 Valley Mall Parkway

East Wenatchee, WA

	NAME	ORGANIZATION	TELEPHONE NO.	EMAIL ADDRESS	
	MIKENICKERS	N WA. STATE PARKS	923-2473	ALTALAKE & PARKST	NA, Go
	Carmen Andar	- Jul aDFW	754-604624	andoncap dfw.wa.gi	5
	Michelle Mazzok	Resource Solutions	\$669.4442	m. mazzola@usa. net	
ľ	Jucefille	BLM	665-2100	ssovey@br.blm.gov	
	David Furner	FERC	202-502-6091	David Turner CFERC. 000	
	DAth leppert	FERC	(202) 502-6034	patricia. leppert Steve. gov	
/	Bob Easton	11	202 502 6045	robert. easton@fess.gov	
	George Bord	y PAYeres	509.923-2319	chsendeb@things.c	Céq
	Cee Webster	City of Brewskr	509-689-3464	brewster mayor@hotmail.com	
	(Far firm)	and-goughs	(10) 300	2	
	BOD HEINITY	CiLITI-C /	60 902 304	heiblecritte.org	
	Storm / 1	FWST	509/14 5-2505	Jue (la	
	Brod Hapking	Douglas PUD	500 0847191	hearting Odeand and	
	Nick Christoph	ON CO PUD	427-9472	Wick (Q okpun.org	
	Dan Boettger	ok co pub	422-8425	dan_bookpud.org	
	Shaye Bickpord	ACPNIS	881-2208	spickpordadeprotion	7
	Skan Kojam.	NB	0220-4121	SUDCIM RESERVEDANDE	/ {
	Jon JFlack	UDFW)			
	- Kaul Nelson	Citizen	782-2104	paulnelsen 11 @yaheo.com	
	Jim My Ser	Depud	509-834-7191	Image @ DCPAD. Org	
	Many Mayo		(1	mmuysedcpud.org	
	Scott Kneiter	DCPUD	l 9 E 1	Scattledepudiors	
	510,6	LCPUD		Daol Oskpro. ozg	
	DAppellaalabuss	DUPUD	(/)	billd@dcpud.org	

SIGN IN SHEET STUDY PLAN MEETING June 14, 2007 Douglas County PUD 1151 Valley Mall Parkway East Wenatchee, WA

NAME	ORGANIZATION	TELEPHONE NO.	EMAIL ADDRESS
Gordon Brett Bob Clubb	DCPUD	884-7191	gordonbedcpud.org bobcedcpud.org
Appendix A - 44			

Email to Douglas PUD from City of Brewster regarding Draft Study Plan Meeting Notes

From:	Lee Webster [brewstermayor@hotmail.com]
Sent:	Friday, June 29, 2007 8:15 AM
То:	Shane Bickford; alta.lake@parks.wa.gov; andonca@dfw.wa.gov; sally_sovey@blm.gov;
	david.turner@ferc.gov;
	cascadeb@televar.com; heib@critfc.org; jime@iac.wa.gov; Stephen_Lewis@fws.gov;
	nchristoph@co.okanogan.wa.us; susan_rosebrough@nps.gov; eldredte@dfw.wa.gov
Cc:	Bao Le; Bill Dobbins; Bob Clubb; Brad Hawkins; briangish@dwt.com; garj@jdsalaw.com;
	Gordon Brett; Jim McGee; jimvasile@dwt.com; Mary Mayo; Scott Kreiter;
	stanb@jdsalaw.com
Subject:	RE: Study_Plan_MeetingMeeting_Summary_6-14-07.pdf

Good Morning Shane,

Appendix A - 46

Regarding the concerns Susan Rosebrough brought up about the Recreational Use Assessment: Would you mind including that I had (and voiced) similar concerns?

Also, if it is possible, I would like to be included in the follow up to those questions.

Thank you,

Lee Webster

```
>From: "Shane Bickford" <ShaneB@dcpud.org>
>To: <alta.lake@parks.wa.gov>,<andonca@dfw.wa.gov>,"Sally Sovey"
><sally_sovey@blm.gov>,<david.turner@ferc.gov>,"Patricia Leppert"
><patricia.leppert@ferc.gov>,"Robert Easton"
><Robert.Easton@ferc.gov>,<cascadeb@televar.com>,<brewstermayor@hotmail.
>com>,<heib@critfc.org>,<jime@iac.wa.gov>,<Stephen_Lewis@fws.gov>,"Nick
>Christoph"
><nchristoph@co.okanogan.wa.us>,<susan_rosebrough@nps.gov>,<eldredte@dfw
>.wa.gov>
>CC: "Bao Le" <baol@dcpud.org>,"Bill Dobbins" <billd@dcpud.org>,"Bob Clubb"
><BobC@dcpud.org>,"Brad Hawkins"
><BradH@dcpud.org>,<briangish@dwt.com>,<garj@jdsalaw.com>,"Gordon Brett"
><gordonb@dcpud.org>, "Jim McGee"
><JimM@dcpud.org>,<jimvasile@dwt.com>,"Mary
>Mayo" <MaryM@dcpud.org>,"Scott Kreiter"
><scottk@dcpud.org>,<stanb@jdsalaw.com>
>Subject: Study_Plan_Meeting_-_Meeting_Summary_6-14-07.pdf
>Date: Thu, 28 Jun 2007 11:56:39 -0700
>Good Morning!
>
>
>
>Please find attached the draft meeting minutes for the June 14th Wells
>Relicensing - Study Plan Meeting. If you have any suggested changes to
>the meeting minutes please send us your proposed revisions by Friday
>July 6th. The final meeting minutes will be posted on the Wells
>Relicensing website and will be distributed to meeting participants via
>e-mail.
>
>
>
>Regards,
>
>
>
>Shane Bickford
```

>
Supervisor of Relicensing
>
Public Utility District No. 1 of Douglas County
>
1151 Valley Mall Parkway
>
East Wenatchee, Washington 98802-4497
>
509.881.2208
>
>

><< Study_Plan_Meeting_-_Meeting_Summary_6-14-07.pdf >>

Make every IM count. Download Messenger and join the i'm Initiative now. It's free. http://im.live.com/messenger/im/home/?source=TAGHM_June07

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Email to City of Brewster from Douglas PUD regarding Draft Study Plan Meeting Notes

Attachments: PCDOCS1-#99059-v5-Study_Plan_Meeting_-_Meeting_Summary_6-14-07.DOC



----Original Message----From: Shane Bickford Sent: Friday, June 29, 2007 8:25 AM To: 'Lee Webster' Cc: Bob Clubb; Scott Kreiter Subject: RE: Study_Plan_Meeting_-_Meeting_Summary_6-14-07.pdf

Lee,

Does the proposed change on page 6 accurately capture your requested change in the meeting minutes? Drop me a line if this change is acceptable.

Thanks for the comments. They are appreciated.

Cheers, Shane

AU.D.

Study Plan Meeting

Meeting Summary

Wells Hydroelectric Project Relicensing Douglas County PUD Auditorium 1151 Valley Mall Parkway East Wenatchee, Washington

> June 14, 2007 9:00 am -12:00 pm

ATTENDEES:

Please see attached Sign-In Sheet for attendees.

Shane Bickford, Douglas PUD, welcomed everyone to the meeting. He gave an overview of the Proposed Study Plan (PSP) meeting goals and objectives and the materials handed out prior to the meeting (agenda, baseline study list, resource chronology and power point presentation). All of the studies contained within the PSP were based on FERC's seven study criteria, which is located within the pages of the PSP document, in the CFR, on FERC's website and on Douglas PUD's website.

In 2005, Douglas PUD began the Resource Work Group (RWG) meetings. The goals of the RWG meetings were to engage the stakeholders and to learn about FERC's Integrated Licensing Process (ILP), identify and evaluate issues against FERC's Study Criteria, develop the study plans, and ultimately file the study plans in the Pre-Application Document (PAD). Douglas PUD wanted to get information out early to assist in the decision making process. Shane reviewed the list of Baseline Studies and FERC's seven study request criteria.

The 12 issues identified by the RWGs, that met FERC's seven study criteria, were collaboratively developed by the RWGs into "Agreed Upon" Study Plans and were included into the PAD and filed with FERC on December 1, 2006. An updated version of the 12 study plans were included in the PSP that was filed with FERC on May 16, 2007.

Scott Kreiter, Douglas PUD, discussed the objectives of the Cultural, Recreation and Land Use, and Terrestrial study plans contained within the PSP. The list of the study plans for these resource areas are as follows:

- Cultural Cultural Resources Investigation
- Recreation and Land Use Public Access Study, Recreational Needs Analysis
- Terrestrial Nuisance Wildlife Control Study, Transmission Line Wildlife and Botanical Study

Bao Le, Douglas PUD, discussed the objectives of the Aquatic study plans contained within the PSP. The list of the study plans for this resource area is as follows:

• Aquatic – Juvenile Lamprey Study, Lamprey Spawning Assessment, Adult Lamprey Passage Study, Total Dissolved Gas Investigation, Water Temperature Study, DO, pH and Turbidity Study, Okanogan Toxins Study

Shane Bickford gave a summary of the stakeholder's study requests filed with FERC by the April 2nd deadline. He also reviewed the criteria that Douglas PUD used to identify a study request and reviewed the criteria used to categorize study requests as either formal or informal study requests.

Eleven comment/study request letters were filed with FERC by the April 2nd deadline for study requests. Douglas PUD categorized each study request as either a formal or informal study request. Douglas PUD counted only one formal study request. The other ten study requests were considered informal due to their lack of information. All of the 11 study requests (formal and informal) were categorized further as being: 1) Appropriate for Study, 2) Appropriate for Study with Alternative Methodology, or 3) Not Appropriate for Study. None of the 11 study requests were grouped into the first category, four (4) were grouped into the second category and seven (7) were grouped into the third category.

Summary of Stakeholder Study Requests

Recreation and Socioeconomic Issues – Study Requests deemed Appropriate with Alternative Study Methodology

Cities of Brewster & Pateros – Visitor Information Center Cities of Brewster & Pateros – Need for Public Use Facilities and Access Cities of Brewster & Pateros – Boat Storage

Scott Kreiter provided Douglas PUD's view of the Visitor Information Center, Boat Storage and Public Use study requests. Douglas PUD viewed all three of these requests as informal study requests as they did not attempt to address FERC's seven study criteria. Scott indicated that rather than studying whether a new visitor information center, boat storage or any new public use facilites would increase visitor use of the project area that it would be more appropriate to first study whether there is an identified need for various recreational improvements and then, if a need has been identified and that need is closely related to project purposes, Douglas PUD will work with stakeholders to determine how best to meet those needs.

George Brady, City of Pateros, informed the meeting participants that the Visitor Center at Wells Dam was closed in 2001. He did not view this study request as a request for a new facility but as a reminder that Douglas PUD needs to either open or replace the existing center. David Turner and Bob Easton, FERC, asked how Douglas PUD would assess the number of people using the visitor center given that it is now closed and did the PUD have any available data on visitor use? Scott Kreiter indicated that the PUD had conducted a Visitor Use Assessment in 2005-2006 and that the data from that study would be used during the development of the Needs Assessment. Shane Bickford added that the Wells Dam Visitor Center has a visitor log that includes the number of visits observed both before and after September 2001. Jim Eychaner, IAC, mentioned that Washington State has available information and that data may be helpful during the development of the Needs Assessment.

Recreation and Socioeconomic Issues - Study Requests Not Appropriate for Study

Betty Wagoner - Access to Wells Reservoir

Scott Kreiter indicated that this issue was also categorized as an informal study requests as it did not attempt to address FERC's seven study criteria. Douglas PUD does not believe a study is needed for the requested information as this issue will be addressed in the Shoreline Management Plan. This management plan will balance the needs for fish and wildlife habitat protection versus the desire by local stakeholders to have private docks located on Douglas PUD property within the Wells Project boundary.

City of Pateros - Impacts of Wells Project on Local Communities

Scott Kreiter indicated that this was the only study request that attempted to address FERC's seven study criteria. He also indicated that Douglas PUD was not proposing to conduct this study because the information would not be of use during the development of license requirements and because the study was focused on original project impacts that were already mitigated during the term of the first license. He also indicated that there are a lot of factors that impact the economy and that socio-economic studies can be very subjective. The issues raised are not appropriate for study but may be better suited to a one-on-one discussion between Douglas PUD and the City of Pateros. George Brady stated that he thinks that Wells Dam has had a negative impact on all three cities and in particular on Pateros during project construction. George indicated that the entire downtown business corridor was displaced by the Project and that these impacts have not been properly mitigated.

Bob Easton, FERC, pointed out that FERC has historically not required licensees to compensate adjacent communities for original project impacts during relicensing. He asked George Brady what he would do with the information collected from the proposed socio-economics study. He encouraged Pateros to look for the nexus to ongoing project operations. David Turner, FERC, said that this meeting and the upcoming filing deadline provide an opportunity for the City of Pateros to present additional information to bolster their study request. As written, the current socio-economics study request is not expected to be recommended given FERC's prior precedence. He also indicated that city's infrastructure, such as roads, water and sewer, are the responsibility of the city and not the licensee.

City of Brewster – Sewer Treatment Plant Expansion

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott also indicated that this is not a project related issue and has no nexus to project operations. Lee Webster, City of Brewster, indicated that this was not a study request but rather a placeholder for future discussions related to expansion of the sewer treatment plant. Lee Webster said that the city is undergoing its third phase of updating the sewer. The next phase will have to last for the next 15-20 years and will be cost prohibitive for the city. There is no room for expansion at the existing site.

City of Pateros - Maintenance and Operation of Recreation Facilities

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott also indicated that costs for Operation & Maintenance could not accurately be developed until the Needs Assessment has developed an accurate picture of future needs and proposed facilities.

Terrestrial Wildlife and Botanical Issues - Study Requests Not Appropriate for Study

Bureau of Indian Affairs - Pre-Project Habitat Evaluation

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott noted that BIA recently toured the Wells Project and the BIA representatives indicated that they were comfortable with the wetland and riparian mitigation measures currently in place and expected to be in place during the next license term. However, BIA indicated that they still may file comments in the future should other issues arise.

David Turner, FERC, wanted to stress a couple of points. Specific methods should be identified or spelled out in each study plan. Make sure that time frames are clear and which species are identified. Shane Bickford, Douglas PUD, indicated that the study plans contained within the PSP were developed through active negotiations and that the intent was to agree on the goals and objectives for each study and that each of the documents was rigorously reviewed and collaboratively developed by the RWGs. The methods sections are as specific as each RWG choose to make them and varies from being very general for the cultural resource study plans to very specific in the adult lamprey spawning assessment and adult lamprey telemetry study plans.

Douglas PUD agreed to update the 230 kV transmission line study to increase the level of specificity related to methods and survey techniques and to update the Recreation Needs Assessment to include several of the issues discussed during today's meeting.

Aquatic and Water Quality Issues – Study Requests deemed Appropriate for Study with Alternative Study Methodology

WDFW - Toxins Study

Bao Le, Douglas PUD, informed the group that Douglas PUD met with WDFW on May 26, 2007 to discuss their proposed alterations to the existing toxins study plan. After clarifying the study design, it was agreed that there was no need to expand the scope of the existing (PSP proposed) toxins study to include the sampling sites on the mainstem Columbia River. Bob Heinith, Columbia Inter-Tribal Fish Commission, asked if the toxins study would be sampling any anadromous fish species. Bao Le, Douglas PUD, indicated that the study will sample toxins in the tissue of three species of resident fish. The fish selected for sampling are of recreational interest, live within or adjacent to the Wells Project their entire life and are the same species sampled by WDOE during past surveys.

Carmen Andonaegui, WDFW, asked whether there has been a toxin study conducted on the mainstem Columbia River. Bao indicated that he was not aware of any sampling and that there was no indication that there has been a toxins problem along the mainstem Columbia River, within the Wells Reservoir.

Lee Webster, City of Brewster, wanted to know why large mouth bass were not included in the toxins study. Shane Bickford, Douglas PUD, indicated that the intent of the study was to followup on recommendations made within the WDOE's Detailed Implementation Plan (DIP). The DIP recommended that future monitoring be conducted to track the levels of toxins found in fish and sediment over time to determine whether toxin levels are being diluted by new, cleaner material entering the river or whether the prevalence of DDT and PCBs are increasing. Therefore the toxin study plan is based around sampling the same fish that where sampled during prior studies conducted by WDOE. Bob Heinith, CRITFC, asked about whether the study would also be looking at the percentage of toxins in the sediment of the Okanogan River. Shane Bickford, Douglas PUD, indicated that several past studies have collected and analyzed sediments sampling for toxins and that the study proposed by Douglas PUD, in the PSP, will also include sediment sampling using the same or similar sampling protocol. Bao Le indicated that indeed the study will look at sediment cores and that sampling sites were identified based upon their tie to human health concerns (recreation sites). The results of the study will be used to educate and inform recreational user of the Okanogan River, within Project Boundary.

Aquatic and Water Quality Issues - Study Requests Not Appropriate for Study

WDFW – Aquatic Invasive Species (AIS)

Bao Le described Douglas PUD's rationale for not proposing to conduct WDFW's AIS study request. Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Bao Le, indicated that Douglas PUD did not consider this study request appropriate for study because the request information is already being collecting through coordinated activities with Portland State and WDFW Nuisance Species program. Current efforts include annual quagga mussel and zebra mussel monitoring and the completion of a base studies on aquatic weeds, including milfoil, and exotic macroinvertebrates. Therefore

These issues were discussed with WDFW and they agreed that because the information was already being collected that there was no additional need to conduct a separate relicensing study on Aquatic Invasive Species.

WDFW - Pikeminnow Removal Program on Resident Fish

Bao Le discussed that Douglas PUD is already doing a number of things to address this issue on a yearly basis and have discussed this issue with WDFW. It was decided that no additional RWG meetings were needed to discuss this issue as Douglas PUD had previously met with WDFW, on May 26th, and that at that meeting WDFW agreed that there was no need to conduct this study during the ILP study period.

This concluded the discussion of the stakeholder study requests.

Shane Bickford asked for additional comments related to the studies discussed during today's meeting.

There was a discussion on the Shoreline Management Plan and how this management plan will address a variety of issues that are common to all of the resource areas. Lamprey predation was discussed at length. Bao Le said no one knows how to quantify population abundance for juvenile Pacific lamprey. Sampling technology is still being developed and little is known about the behavior of juvenile lamprey in the substrate. George Brady was concerned about the effects of low water on juvenile lamprey. Bao Le mentioned that 98% of the time, Wells Dam operates within 2 feet of the normal elevation (781). It is difficult to quantify the impact of operations on juvenile lamprey given that lamprey collection techniques are still rather crude and unable to accurately count the number of lamprey in a given area of reservoir strata.

Susan Rosebrough, <u>National Park Service</u>, and <u>Lee Webster</u>, <u>Brewster</u>, asked whether issues related to the Recreational Use Assessment had been resolved. In particular Susan <u>and Lee</u> wanted to know if prior questions related to the conduct of the Visitor Use Assessments had been addressed. Specifically, questions related to counts of people participating during festivals, "after-hours" counting and collection of data from minority user groups that did not speak English. Scott Kreiter, Douglas PUD, mentioned that he would follow up with <u>Lee and</u> Susan to address <u>their</u> questions about how Douglas PUD had addressed prior questions related to the Visitor Use Assessment.

Shane Bickford went over the ILP timeline and talked about when the next round of comments are due. Douglas PUD will get together with folks who have raised issues today in an effort to understand and hopefully resolve their issues. Shane Bickford asked if there were any other issues to be covered during today's meeting.

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Meeting adjourned at 12:05 pm.

Deleted: her

Email to Douglas PUD from City of Brewster regarding Draft Study Plan Meeting Notes -----Original Message-----From: Lee Webster [mailto:brewstermayor@hotmail.com] Sent: Friday, June 29, 2007 2:48 PM To: Shane Bickford Subject: RE: Study_Plan_Meeting_-_Meeting_Summary_6-14-07.pdf

Great. Thank you.

Lee

Email to City of Brewster from Douglas PUD regarding Recreation Needs Analysis From: Scott Kreiter Sent: Friday, June 29, 2007 8:32 AM To: Lee Webster Cc: Shane Bickford Subject: RE: Study_Plan_Meeting_-_Meeting_Summary_6-14-07.pdf

Lee,

We're working on it. I talked with Jim Eychaner, Susan Rosebrough and Kelly Bricker. We all agreed that we need to more adequately address this issue in the Rec Need Study. The plan is for Kelly to add draft language to the study plan. Once Kelly makes the changes, I'll send the new language to you, Jim, and Susan to comment on. Once we all have something we like, we'll send it out to the rest of the RWG.

In short, Jim, Susan, and Kelly all expressed that there is a ton of information out there in the literature about unique needs of hispanic/latino communities. In addition to including that information, the consultant will talk with community leaders (i.e. hispanic community leaders, local fish/game enforcement, etc.) to get an idea of specific local needs.

Hope this helps. Will be in touch soon. -Scott

Email to Douglas PUD from FERC regarding Draft Study Plan Meeting Notes rom: Robert Easton [mailto:Robert.Easton@ferc.gov]
Sent: Friday, June 29, 2007 11:14 AM
To: Shane Bickford
Cc: David Turner
Subject: RE: Study_Plan_Meeting_-_Meeting_Summary_6-14-07.pdf

Shane,

The minutes look pretty good and we could probably get by leaving them as they are; however, since you are giving us a chance to provide input we would appreciate it if you made the following changes.

Let me know if you have any questions. Thanks, Bob

Under **City of Pateros—Impacts of Wells Project on Local Communities**, change last sentence of second paragraph to read:

Based on our experience, we have not seen the Commission require improvements to a city's infrastructure, such as roads, water and sewer, in a relicensing case. Usually these improvements are the responsibility of the city.

Under **Terrestrial Wildlife and Botanical Issues** add a heading for transmission line surveys after the first paragraph and replace the second paragraph with the following text:

David Turner, FERC, pointed out that avian electrocution and collision with project transmission line was identified as an issue at scoping based on our understanding of the issue statement. The transmission study proposes to look at habitat types and for evidence of dead birds, but does not explain how a risk assessment would be conducted. David Turner recommended that Douglas and the resource work group consider and develop a risk assessment protocol that clearly describes how the assessment of project impacts will be conducted. David Turner pointed to the example of a risk assessment protocol used by PacifiCorp that is described in AVIAN PROTECTION PLAN (APP)

GUIDELINES issued by the Edison Electric Institute and Fish and Wildlife Service.

As a general matter, David Turner, FERC, wanted to stress a couple of points with regard to studies. Specific methods should be identified or spelled out in each study plan to the greatest extent possible. For example, make sure the timeframes for searching for noxious weeds or protected plants within the transmission line corridor are clearly defined. We are trying to avoid criticisms of study methods later in the process that may lead to recommendations for further study. Then continue with the remaining paragraph as written.
Email to FERC from Douglas PUD regarding Draft Study Plan Meeting Notes

Attachments: PCDOCS1-#99059-v6-Study_Plan_Meeting_-_Meeting_Summary_6-14-07.DOC

From: Shane Bickford
Sent: Friday, June 29, 2007 2:03 PM
To: 'Robert Easton'
Cc: David Turner; Bob Clubb; Scott Kreiter
Subject: RE: Study_Plan_Meeting_-_Meeting_Summary_6-14-07.pdf

Bob,

I added the suggested text into the meeting minutes for the Study Plan Meeting. Please see the changes in the attached document and let me know if this fits with your recommendations.

Regards,

Shane Bickford Supervisor of Relicensing Public Utility District No. 1 of Douglas County 1151 Valley Mall Parkway East Wenatchee, Washington 98802-4497 509.881.2208

AU.D.

Study Plan Meeting

Meeting Summary

Wells Hydroelectric Project Relicensing Douglas County PUD Auditorium 1151 Valley Mall Parkway East Wenatchee, Washington

> June 14, 2007 9:00 am -12:00 pm

ATTENDEES:

Please see attached Sign-In Sheet for attendees.

Shane Bickford, Douglas PUD, welcomed everyone to the meeting. He gave an overview of the Proposed Study Plan (PSP) meeting goals and objectives and the materials handed out prior to the meeting (agenda, baseline study list, resource chronology and power point presentation). All of the studies contained within the PSP were based on FERC's seven study criteria, which is located within the pages of the PSP document, in the CFR, on FERC's website and on Douglas PUD's website.

In 2005, Douglas PUD began the Resource Work Group (RWG) meetings. The goals of the RWG meetings were to engage the stakeholders and to learn about FERC's Integrated Licensing Process (ILP), identify and evaluate issues against FERC's Study Criteria, develop the study plans, and ultimately file the study plans in the Pre-Application Document (PAD). Douglas PUD wanted to get information out early to assist in the decision making process. Shane reviewed the list of Baseline Studies and FERC's seven study request criteria.

The 12 issues identified by the RWGs, that met FERC's seven study criteria, were collaboratively developed by the RWGs into "Agreed Upon" Study Plans and were included into the PAD and filed with FERC on December 1, 2006. An updated version of the 12 study plans were included in the PSP that was filed with FERC on May 16, 2007.

Scott Kreiter, Douglas PUD, discussed the objectives of the Cultural, Recreation and Land Use, and Terrestrial study plans contained within the PSP. The list of the study plans for these resource areas are as follows:

- Cultural Cultural Resources Investigation
- Recreation and Land Use Public Access Study, Recreational Needs Analysis
- Terrestrial Nuisance Wildlife Control Study, Transmission Line Wildlife and Botanical Study

Bao Le, Douglas PUD, discussed the objectives of the Aquatic study plans contained within the PSP. The list of the study plans for this resource area is as follows:

• Aquatic – Juvenile Lamprey Study, Lamprey Spawning Assessment, Adult Lamprey Passage Study, Total Dissolved Gas Investigation, Water Temperature Study, DO, pH and Turbidity Study, Okanogan Toxins Study

Shane Bickford gave a summary of the stakeholder's study requests filed with FERC by the April 2nd deadline. He also reviewed the criteria that Douglas PUD used to identify a study request and reviewed the criteria used to categorize study requests as either formal or informal study requests.

Eleven comment/study request letters were filed with FERC by the April 2nd deadline for study requests. Douglas PUD categorized each study request as either a formal or informal study request. Douglas PUD counted only one formal study request. The other ten study requests were considered informal due to their lack of information. All of the 11 study requests (formal and informal) were categorized further as being: 1) Appropriate for Study, 2) Appropriate for Study with Alternative Methodology, or 3) Not Appropriate for Study. None of the 11 study requests were grouped into the first category, four (4) were grouped into the second category and seven (7) were grouped into the third category.

Summary of Stakeholder Study Requests

Recreation and Socioeconomic Issues – Study Requests deemed Appropriate with Alternative Study Methodology

Cities of Brewster & Pateros – Visitor Information Center Cities of Brewster & Pateros – Need for Public Use Facilities and Access Cities of Brewster & Pateros – Boat Storage

Scott Kreiter provided Douglas PUD's view of the Visitor Information Center, Boat Storage and Public Use study requests. Douglas PUD viewed all three of these requests as informal study requests as they did not attempt to address FERC's seven study criteria. Scott indicated that rather than studying whether a new visitor information center, boat storage or any new public use facilites would increase visitor use of the project area that it would be more appropriate to first study whether there is an identified need for various recreational improvements and then, if a need has been identified and that need is closely related to project purposes, Douglas PUD will work with stakeholders to determine how best to meet those needs.

George Brady, City of Pateros, informed the meeting participants that the Visitor Center at Wells Dam was closed in 2001. He did not view this study request as a request for a new facility but as a reminder that Douglas PUD needs to either open or replace the existing center. David Turner and Bob Easton, FERC, asked how Douglas PUD would assess the number of people using the visitor center given that it is now closed and did the PUD have any available data on visitor use? Scott Kreiter indicated that the PUD had conducted a Visitor Use Assessment in 2005-2006 and that the data from that study would be used during the development of the Needs Assessment. Shane Bickford added that the Wells Dam Visitor Center has a visitor log that includes the number of visits observed both before and after September 2001. Jim Eychaner, IAC, mentioned that Washington State has available information and that data may be helpful during the development of the Needs Assessment. Recreation and Socioeconomic Issues - Study Requests Not Appropriate for Study

Betty Wagoner - Access to Wells Reservoir

Scott Kreiter indicated that this issue was also categorized as an informal study requests as it did not attempt to address FERC's seven study criteria. Douglas PUD does not believe a study is needed for the requested information as this issue will be addressed in the Shoreline Management Plan. This management plan will balance the needs for fish and wildlife habitat protection versus the desire by local stakeholders to have private docks located on Douglas PUD property within the Wells Project boundary.

City of Pateros - Impacts of Wells Project on Local Communities

Scott Kreiter indicated that this was the only study request that attempted to address FERC's seven study criteria. He also indicated that Douglas PUD was not proposing to conduct this study because the information would not be of use during the development of license requirements and because the study was focused on original project impacts that were already mitigated during the term of the first license. He also indicated that there are a lot of factors that impact the economy and that socio-economic studies can be very subjective. The issues raised are not appropriate for study but may be better suited to a one-on-one discussion between Douglas PUD and the City of Pateros. George Brady stated that he thinks that Wells Dam has had a negative impact on all three cities and in particular on Pateros during project construction. George indicated that the entire downtown business corridor was displaced by the Project and that these impacts have not been properly mitigated.

Bob Easton, FERC, pointed out that FERC has historically not required licensees to compensate adjacent communities for original project impacts during relicensing. He asked George Brady what he would do with the information collected from the proposed socio-economics study. He encouraged Pateros to look for the nexus to ongoing project operations. David Turner, FERC, said that this meeting and the upcoming filing deadline provide an opportunity for the City of Pateros to present additional information to bolster their study request. As written, the current socio-economics study request is not expected to be recommended given FERC's prior precedence. <u>Based on our experience, we have not seen the Commission require improvements to a city's infrastructure, such as roads, water and sewer, in a relicensing case. Usually these improvements are the responsibility of the city.</u>

City of Brewster – Sewer Treatment Plant Expansion

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott also indicated that this is not a project related issue and has no nexus to project operations. Lee Webster, City of Brewster, indicated that this was not a study request but rather a placeholder for future discussions related to expansion of the sewer treatment plant. Lee Webster said that the city is undergoing its third phase of updating the sewer. The next phase will have to last for the next 15-20 years and will be cost prohibitive for the city. There is no room for expansion at the existing site.

Deleted: He also indicated that city's infrastructure, such as roads, water and sewer, are the responsibility of the city and not the licensee.

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City of Pateros – Maintenance and Operation of Recreation Facilities

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott also indicated that costs for Operation & Maintenance could not accurately be developed until the Needs Assessment has developed an accurate picture of future needs and proposed facilities.

Terrestrial Wildlife and Botanical Issues - Study Requests Not Appropriate for Study

Bureau of Indian Affairs - Pre-Project Habitat Evaluation

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott noted that BIA recently toured the Wells Project and the BIA representatives indicated that they were comfortable with the wetland and riparian mitigation measures currently in place and expected to be in place during the next license term. However, BIA indicated that they still may file comments in the future should other issues arise.

Transmission Line Surveys

David Turner, FERC, pointed out that avian electrocution and collision with project transmission line was identified as an issue at scoping based on our understanding of the issue statement. The transmission study proposes to look at habitat types and for evidence of dead birds, but does not explain how a risk assessment would be conducted. David Turner recommended that Douglas and the resource work group consider and develop a risk assessment protocol that clearly describes how the assessment of project impacts will be conducted. David Turner pointed to the example of a risk assessment protocol used by PacifiCorp that is described in AVIAN PROTECTION PLAN (APP) GUIDELINES issued by the Edison Electric Institute and Fish and Wildlife Service.

Shane Bickford, Douglas PUD, indicated that the study plans contained within the PSP were developed through active negotiations and that the intent was to agree on the goals and objectives for each study and that each of the documents was rigorously reviewed and collaboratively developed by the RWGs. The methods sections are as specific as each RWG choose to make them and varies from being very general for the cultural resource study plan to very specific in the adult lamprey spawning assessment and adult lamprey telemetry study plans.

As a general matter, David Turner, FERC, wanted to stress a couple of points with regard to studies. Specific methods should be identified or spelled out in each study plan to the greatest extent possible. For example, make sure the timeframes for searching for noxious weeds or protected plants within the transmission line corridor are clearly defined. We are trying to avoid criticisms of study methods later in the process that may lead to recommendations for further study. Then continue with the remaining paragraph as written.

Douglas PUD agreed to update the 230 kV transmission line study to increase the level of specificity related to methods and survey techniques and to update the Recreation Needs Assessment to include several of the issues discussed during today's meeting.

Deleted: David Turner, FERC, wanted to stress a couple of points. Specific methods should be identified or spelled out in each study plan. Make sure that time frames are clear and which species are identified. Aquatic and Water Quality Issues – Study Requests deemed Appropriate for Study with Alternative Study Methodology

WDFW - Toxins Study

Bao Le, Douglas PUD, informed the group that Douglas PUD met with WDFW on May 26, 2007 to discuss their proposed alterations to the existing toxins study plan. After clarifying the study design, it was agreed that there was no need to expand the scope of the existing (PSP proposed) toxins study to include the sampling sites on the mainstem Columbia River. Bob Heinith, Columbia Inter-Tribal Fish Commission, asked if the toxins study would be sampling any anadromous fish species. Bao Le, Douglas PUD, indicated that the study will sample toxins in the tissue of three species of resident fish. The fish selected for sampling are of recreational interest, live within or adjacent to the Wells Project their entire life and are the same species sampled by WDOE during past surveys.

Carmen Andonaegui, WDFW, asked whether there has been a toxin study conducted on the mainstem Columbia River. Bao indicated that he was not aware of any sampling and that there was no indication that there has been a toxins problem along the mainstem Columbia River, within the Wells Reservoir.

Lee Webster, City of Brewster, wanted to know why large mouth bass were not included in the toxins study. Shane Bickford, Douglas PUD, indicated that the intent of the study was to followup on recommendations made within the WDOE's Detailed Implementation Plan (DIP). The DIP recommended that future monitoring be conducted to track the levels of toxins found in fish and sediment over time to determine whether toxin levels are being diluted by new, cleaner material entering the river or whether the prevalence of DDT and PCBs are increasing. Therefore the toxin study plan is based around sampling the same fish that where sampled during prior studies conducted by WDOE. Bob Heinith, CRITFC, asked about whether the study would also be looking at the percentage of toxins in the sediment of the Okanogan River. Shane Bickford, Douglas PUD, indicated that several past studies have collected and analyzed sediments sampling for toxins and that the study proposed by Douglas PUD, in the PSP, will also include sediment sampling using the same or similar sampling protocol. Bao Le indicated that indeed the study will look at sediment cores and that sampling sites were identified based upon their tie to human health concerns (recreation sites). The results of the study will be used to educate and inform recreational user of the Okanogan River, within Project Boundary.

Aquatic and Water Quality Issues - Study Requests Not Appropriate for Study

WDFW – Aquatic Invasive Species (AIS)

Bao Le described Douglas PUD's rationale for not proposing to conduct WDFW's AIS study request. Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Bao Le, indicated that Douglas PUD did not consider this study request appropriate for study because the request information is already being collecting through coordinated activities with Portland State and WDFW Nuisance Species program. Current efforts include annual quagga mussel and zebra mussel monitoring and the completion of a base studies on aquatic weeds, including milfoil, and exotic macroinvertebrates. Therefore

These issues were discussed with WDFW and they agreed that because the information was already being collected that there was no additional need to conduct a separate relicensing study on Aquatic Invasive Species.

WDFW - Pikeminnow Removal Program on Resident Fish

Bao Le discussed that Douglas PUD is already doing a number of things to address this issue on a yearly basis and have discussed this issue with WDFW. It was decided that no additional RWG meetings were needed to discuss this issue as Douglas PUD had previously met with WDFW, on May 26th, and that at that meeting WDFW agreed that there was no need to conduct this study during the ILP study period.

This concluded the discussion of the stakeholder study requests.

Shane Bickford asked for additional comments related to the studies discussed during today's meeting.

There was a discussion on the Shoreline Management Plan and how this management plan will address a variety of issues that are common to all of the resource areas. Lamprey predation was discussed at length. Bao Le said no one knows how to quantify population abundance for juvenile Pacific lamprey. Sampling technology is still being developed and little is known about the behavior of juvenile lamprey in the substrate. George Brady was concerned about the effects of low water on juvenile lamprey. Bao Le mentioned that 98% of the time, Wells Dam operates within 2 feet of the normal elevation (781). It is difficult to quantify the impact of operations on juvenile lamprey given that lamprey collection techniques are still rather crude and unable to accurately count the number of lamprey in a given area of reservoir strata.

Susan Rosebrough, <u>National Park Service</u>, and <u>Lee Webster</u>, <u>Brewster</u>, asked whether issues related to the Recreational Use Assessment had been resolved. In particular Susan <u>and Lee</u> wanted to know if prior questions related to the conduct of the Visitor Use Assessments had been addressed. Specifically, questions related to counts of people participating during festivals, "after-hours" counting and collection of data from minority user groups that did not speak English. Scott Kreiter, Douglas PUD, mentioned that he would follow up with <u>Lee and</u> Susan to address <u>their</u> questions about how Douglas PUD had addressed prior questions related to the Visitor Use Assessment.

Shane Bickford went over the ILP timeline and talked about when the next round of comments are due. Douglas PUD will get together with folks who have raised issues today in an effort to understand and hopefully resolve their issues. Shane Bickford asked if there were any other issues to be covered during today's meeting.

Steve Lewis, FWS, raised questions about scientific validity for certain studies and that there may be a need for 2 years of studies for specific issues. Shane Bickford indicated that the second year of ILP studies is intended to answer questions from the first year, if there are any. Bao agreed that if the data are insufficient, then a second year will need to be done. David Turner and Robert Easton, FERC, indicated that the regulation was developed to address the need for a second year of study. The regulations indicate that a second year of study shall be based upon the failure to achieve the goals identified in the first year study plan. A second year of study might also be required in the instance that the field season, for the first year study, was not representative of average conditions (e.g. high water or dry year). Scenarios were discussed including what would happen if sample size targets for a study were not met or what would

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happen if the study year was unusually dry or wet. FERC staff reviewed their criteria for determining whether there is a need for a second year.

Meeting adjourned at 12:05 pm.

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Email to FERC from Douglas PUD regarding Updated 230 kV Transmission Line Study Plan

Attachments: 230 kV transmission line study (modified per FERC comments) 6-28-07.doc

From: Shane Bickford
Sent: Monday, July 02, 2007 4:15 PM
To: David Turner
Cc: 'Robert Easton'; Bob Clubb; Jim McGee; Scott Kreiter; Shane Bickford
Subject: Updated 230 kV transmission line study plan

David,

Please find attached the revised 230 kV wildlife, botanical and RTE resources study plan. We have modified the plan to reflect your comments at the study plan meeting. Our changes are tracked in red. Specifically we added a section describing why we will not be studying avian electrocution (line spacing), added the methods for the collision objective and why we selected the two locations for survey (based upon bird behavior, existing botanical cover types and based a lack of documented effect). Jim also added in the timing for the noxious week survey and the citation for the avian collision committee (APLIC).

Please review and send us your comments. If you approve of the proposed changes we will next send the study plan back to the Terrestrial RWG for consideration.

Regards,

Shane Bickford Supervisor of Relicensing Public Utility District No. 1 of Douglas County 1151 Valley Mall Parkway East Wenatchee, Washington 98802-4497 509.881.2208

PLANT AND WILDLIFE SURVEYS AND COVER TYPE MAPPING FOR THE WELLS HYDROELECTRIC PROJECT 230 kV TRANSMISSION CORRIDOR (Transmission Line Wildlife and Botanical Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

June 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington

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For copies of this study plan, contact:

Public Utility District No. 1 of Douglas County Attention: Relicensing 1151 Valley Mall Parkway East Wenatchee, WA 98802-4497 Phone: (509)884-7191 E-Mail: <u>relicensing@dcpud.org</u>

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ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5). A Terrestrial Resource Work Group (RWG), which is composed of stakeholders and Douglas PUD staff, was formed for the purposes of identifying issues and information gaps that may require study during the relicensing of the Wells Hydroelectric Project. The Terrestrial RWG, through a series of technical meetings, has identified the need for a study to assess the effects of the Project's 230 kV transmission line corridor on wildlife.

This proposed study is intended to fill the gaps in local knowledge of botanical resources, including rare, threatened and endangered (RTE) plants, invasive plant species, and vegetation communities within the 235-foot Wells Project 230 kV transmission line corridor. The study will also provide bird species presence, identify if bird <u>collision</u>, with the line and structures, is a problem and provide information on the extent of use and dependency on the transmission corridor by sage grouse (*Centrocercus urophasianus*) and sharp-tailed grouse (*Tympanuchus phasianellus*), both RTE species. A literature review will be conducted to identify potential effects of the 230 KV transmission lines and towers on raptors and prairie grouse. Surveys will also be conducted for RTE mammals and reptiles. The study plan outlines methods that will be used to collect information on these plants and animals.

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Page 1

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.8 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project, owned, and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).

Page 2





1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The overall goal of the wildlife and botanical surveys along the Project transmission lines is to provide information needed to guide land management decisions, avoid damage to valuable habitat during future transmission corridor management activities and minimize the spread of invasive weeds. The study will provide baseline data on birds found near the corridor and information on the presence of rare, threatened and endangered (RTE) plant or animal species in the corridor. In addition, this study will provide information needed to meet the FERC requirements during the Wells ILP. The study objectives are divided into botanical and wildlife resource categories.

Page 4

Pursuant to CFR 18.5(vii), RTE species in this study plan include:

- Federally listed as threatened, endangered, proposed or candidates under the ESA;
- State listed as threatened or endangered;
- State listed as candidate (wildlife only);
- State listed as sensitive (plants only); or
- State listed as Review List 1 (plants only).

2.1 Botanical Resources

The main objectives of the botanical study are:

- (1) Identify and document the location of RTE plant species that occur within the transmission line corridor.
- (2) Identify and classify the specific vegetation cover types in the study area.
- (3) Generate detailed information on the species composition and classification of these plant communities and their structures.
- (4) Create a detailed Geographic Information System (GIS) cover type map of the study area showing the locations of these plant communities, their distribution, areas of coverage (acres), and note locations of habitats of special concern or unique areas observed.
- (5) Identify any invasive plant species in the transmission corridor. For this transmission line corridor study, invasive species are Washington State Class A and B-designate noxious weeds.

2.2 Wildlife Resources

2.2.1 Avian

The main objectives of the avian study are:

- (1) Identify and document the location of any federal and state RTE avian species that use the study area.
- (2) Describe the habitat features used by RTE avian species observed within the corridor.
- (3) Document the presence of other avian species and provide relative abundance for birds using the study area.
- (4) Document raptor and corvid nesting and sharp-tailed and sage grouse use within the study area.

Page 5

(5) Document any evidence under the transmission line of avian collisions.

2.2.2 Mammal

The main objectives of the mammal study are:

- (1) Identify and document the location of federal and state RTE mammal species that use the study area.
- (2) Describe the habitat features used by RTE mammals observed within the corridor.
- (3) Document the presence of other mammal species in the study area.

2.2.3 Reptile

The main objectives of the reptile study are:

- (1) Identify and document the location of federal and state RTE reptile species that use the study area.
- (2) Describe the habitat features used by RTE reptiles observed within the corridor.
- (3) Document the presence of other reptile species in the study area.

3.0 STUDY AREA

Two 230 kV transmission lines connect Wells Dam with the Douglas switchyard next to Rocky Reach Dam (Figure 1.1-1). The transmission lines occupy a 235-foot corridor that is 41 miles long. The transmission lines begin at Wells Dam, cross the Columbia River from Carpenter Island in Chelan County to Douglas County. The transmission lines travel southeast to the Boulder Park area then turn southwest across wheat fields, past the town of Waterville and over Badger Mountain. The lines descend the west slope of Badger Mountain and end at Douglas Switchyard. The study area is the 235-foot transmission line corridor, excluding all actively cultivated fields.

4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Botanical Resources

The US Fish and Wildlife Service (FWS) maintains a list of all plants that are listed or proposed as threatened or endangered under the Endangered Species Act. In addition to the federal list, Washington Department of Natural Resource's Natural Heritage Program (WNHP) maintains a database on the known locations of federally listed and proposed, as well as state listed threatened, endangered, sensitive and Review List 1 plants in Washington. Historic rare plant information is also available at both Washington State University and University of Washington.

Invasive plant species potentially occurring in the study transmission line corridor are available from the Washington State Weed Board and Washington State Extension Service.

4.2 Wildlife Resources

The FWS maintains a list of all wildlife listed or proposed as threatened or endangered under the Endangered Species Act. The Washington Department of Fish and Wildlife (WDFW) maintains a list of all wildlife species listed or proposed for listing under the WAC-232-12-297. WDFW also maintains a list of RTE species and a database with locations of all recorded sightings. Cassidy et.al. (1997) also provides species range information for all wildlife that may be found in the transmission line corridor.

4.3 Transmission Corridor Maintenance

Douglas PUD conducts an ongoing maintenance program on the 230 kV transmission corridor. Maintenance activities include noxious weed control at transmission corridor structures and along access roads in the spring and fall. Target weed species are primarily diffuse knapweed (*Centaurea diffusa*) and Dalmatian toadflax (*Linaria dalmatica*). Transline[®] herbicide is applied in the spring as a contact herbicide with a limited residual and is also used for spot applications in the fall. Transline[®] is used because it has minimal impacts on native grass species and sagebrush shrub species. Douglas PUD releases the biological control insect *Calophasia lunula* to control Dalmatian toadflax. Weedar-64[®] and Curtail[®] are also used to control broadleaf weeds.

The maintenance program also includes an overall inspection for damaged roads or structures. Tower structures are inspected on foot or using a four-wheeled all terrain vehicles (ATV) with low pressure tires. At the request of land owners, maintenance roads were not constructed across approximately 25 miles of wheat fields, on the Waterville Plateau, when the transmission lines were built. Existing roads require periodic maintenance if there is damage to the road from storms or rock falls or if the road requires grading for repairs to the 230 kV lines.

4.4 Terrestrial Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established a Terrestrial Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Terrestrial RWG collaboratively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future

relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Terrestrial RWG is proposing to conduct a study to collect baseline botanical information for the existing 230 kV transmission line running from Wells Dam to Douglas Switchyard.

This proposed study is intended to fill data gaps in local knowledge of botanical resources including RTE and invasive plant species. This study will also provide information on bird species presence, identify if bird collision is a problem and provide information on the possible use of the transmission corridor by sharp-tailed or sage grouse. The study will also provide information on Washington ground squirrel and striped whipsnake which are both RTE <u>species</u>, which have <u>ranges</u> that overlaps with the study area.

Electrocution of bird using the 230 kV line for perch and nest sites is not an issue and will not be studied. Insulators suspend each conductor eight or more feet from each lattice tower structure and approximately 24 feet between phases. The 230 kV transmission line exceeds the phase to phase and phase to ground separation of 60 inches recommended by the Avian Power Line Interaction Committee (APLIC) (2006) for the protection of raptors found in the vicinity of the transmission line corridor.

4.5 Issue Statements

Issue Statement (PAD Section 6.2.3.2)

Presence of the transmission lines could kill or injure birds and the presence of the transmission towers could affect wildlife behavior and use of adjacent habitat.

Issue Determination Statement (PAD Section 6.2.3.2)

The Wells Project license includes two 230 kV single-circuit transmission lines. The lines run 41 miles in length from the switchyard at Wells Dam to the Douglas Switchyard operated by Douglas PUD. The lines run parallel to each other on 45-85 foot steel towers along a common 235-foot wide corridor.

The transmission lines and towers could have impacts on wildlife, including bird collisions and raptor nesting. Baseline studies have not been completed to assess these potential impacts. Wildlife and botanical species inventories have not been completed along the transmission corridor.

The RWG agrees that a study is needed during the two-year ILP study period and is proposing to complete baseline wildlife and RTE inventories along the transmission corridor. In addition to documenting baseline conditions, this study would be used to document presence (whether raptors, corvids and prairie grouse are found within or adjacent to the transmission corridor). A literature review will also be completed to specifically identify potential effects on raptors and prairie grouse.

Page 8

Transmission Line Wildlife and Botanical Study Wells Project No. 2149 Deleted: species, that Deleted: a range

Issue Statement (PAD Section 6.2.3.3)

Maintenance of the transmission corridor could affect wildlife and/or botanical species (e.g. weed control and road maintenance).

Issue Determination Statement (PAD Section 6.2.3.3)

The Wells Project license includes two 230 kV single-circuit transmission lines. The lines run 41 miles in length from the switchyard at Wells Dam to the Douglas Switchyard operated by Douglas PUD. The lines run parallel to each other on 45-85 foot steel towers along a common 235-foot wide corridor.

Maintenance activities along the transmission corridor could have an impact on wildlife and botanical resources. Wildlife and botanical species inventories have not been completed along the transmission corridor.

The resource work group agrees that a study is needed during the two-year ILP study period and is proposing to complete baseline wildlife, botanical and RTE inventories along the transmission corridor.

There is some existing information on botanical and avian resources in the study area as described below.

5.0 **PROJECT NEXUS**

The two Wells 230 kV transmission lines were included in the FERC order issuing the Wells Project license (issued: July 12, 1962). Exhibit K maps of the transmission line corridor transmitted copies of as build Exhibits J and K showing the route of the transmission line of the Wells Project 2149. FERC approved the Exhibit J and K drawings and amended the license by order (issued: January 5, 1979).

The results of the RTE botanical and wildlife surveys will be used for Section 7 consultation under the ESA. Direct effects of the transmission corridor and/or maintenance of the corridor on RTE species or habitats are unknown. Ongoing maintenance of the transmission corridor could adversely affect RTE plants or wildlife, if any are present. The avian and botanical surveys will also be used to help guide future corridor management activities and to determine whether additional measures are needed to reduce the spread of noxious weeds and bird collisions.

6.0 METHODOLOGY

The methods for conducting the botanical and terrestrial surveys described in the goals and objectives are each described below.

Page 9

6.1 Botanical

6.1.1 RTE Plant Surveys

The surveys for RTE plants will comprise the following tasks: (1) pre-field review; (2) field surveys; and (3) documentation and mapping of results. Each task is described below.

The pre-field review task consists of developing a "target" list of RTE plant species to guide field surveys. The pre-field review task will be initiated by sending letters to the FWS and WNHP requesting the latest information on RTE plant species known to occur or potentially occurring in or near the Wells Project area. The target list of RTE species potentially occurring in the Wells Project area will be developed based on input from the FWS and WNHP. Information on habitat requirements, such as elevation, soils, and associated vegetation community, will be used to refine the list to those species most likely to be found in or near the Project area. This information will also be used to identify the habitats to be surveyed, with an emphasis on those that support RTE species with federal or state status as threatened or endangered. Botanists from the WNHP will also be asked for any additional information related to RTE species that may occur in the area.

Prior to beginning field surveys, project botanists will review the morphological characteristics of target RTE plant species to develop a search image, which improves detection and recognition abilities. This process will include reviewing herbarium specimens and collecting information on vegetative, floral, and fruit characteristics for each target species and other species that are closely related or otherwise difficult to distinguish from the target RTE species.

Surveys for RTE plants in the transmission line corridor will involve visually searching suitable habitat. RTE plant surveys will be conducted on foot using a random meander approach described in Nelson (1985). Surveys will be conducted by botanists experienced in conducting RTE plant surveys.

The habitat requirements of RTE species will be used to refine survey efforts. Habitats with a high probability of supporting one or more RTE plants will receive thorough coverage. Habitats with a lower likelihood of supporting these species will be surveyed less intensively. Actively cultivated fields will not be surveyed. RTE species will be recorded and mapped when encountered and habitats will be described.

The timing of RTE plant surveys is critical to the success and validity of the survey. The number of surveys to be conducted in 2008 will be determined by the blooming period of each RTE plant species. Surveys are expected to be conducted in early May, mid to late June and early August.

RTE plants will be identified in the field using the Flora of the Pacific Northwest (Hitchcock and Cronquist 1973) and the Field Guide to Selected Rare Plants of Washington (WNHP 2004). A variety of sources will be utilized to verify tentative species identification including other floras, published papers, herbarium specimens, and consultation with appropriate taxonomic specialists. A list of all plant species identified during field surveys will be compiled and provided in the final report.

Page 10

WNHP sighting forms will be completed for each RTE plant population found in the transmission line corridor. Data collected will include population size and area, phenology, habitat, slope, aspect, elevation, soils, and associated species. Factors affecting survival of RTE species (e.g., deer browse, disturbance, etc.) will be noted if applicable. The population locations will be mapped on survey maps and Global Positioning System (GPS) coordinates will be collected to verify the mapped location. Photographs will be taken of the RTE plants and habitats where they are growing.

Population size for RTE species will be visually estimated (for large populations) or counted (for small populations). For large RTE plant populations (and with agency permission), a voucher specimen will be collected, pressed, and dried for deposition at the University of Washington Herbarium. Where collection poses a risk to the population, photographs will aid in verification by taxonomic specialists.

6.1.2 Invasive Species Surveys

The surveys for invasive plants will comprise the following tasks: (1) pre-field review; (2) field surveys; and (3) documentation and mapping of results. Each task is described below.

Invasive species surveys will be focused on plants listed in Washington State as Class A and Class B Designate weeds. Class A weeds are non-native species with a limited distribution in the state; eradication of all Class A weeds is required by state law. Class B weeds are non-native species whose distribution is limited to portions of Washington State and control requirements vary between counties. A list of weed species will be developed of all Class A and B weeds found in Douglas County. Prior to beginning field season surveys, botanists will review the morphological characteristics of Class A and B weeds to develop a search image, which improves detection and recognition abilities.

Surveys for invasive plant species will be conducted in the transmission line corridor. These surveys will be conducted in conjunction with RTE plant surveys and field verification of the Vegetation Cover Type Map. Since many invasive species are easiest to see and identify later in the growing season, these surveys will be conducted in the <u>late</u> June to <u>early</u> August time period. All class A or B species will be mapped.

Infestations of invasive species will be mapped on project maps and GPS coordinates will be collected to verify the mapped location. Each infestation will be mapped as accurately as possible, to a resolution of 0.1 acre. Data gathered for each infestation will include the estimated total number of plants and the aerial cover and density by cover by class, as developed by the North American Weed Management Association (NAWMA 2003): trace (T=<1%), low (L=1-5%), moderate (M=5.1-25%), and high (H=25.1-100%).

6.1.3 Cover Type Mapping

The vegetation mapping study will involve three phases of work. The first two phases will identify general cover types through photo interpretation and field verification. The third phase will be the production of the final cover type map.

Page 11

Douglas PUD received digitized color aerial photography of Douglas County from Natural Resources Conservation Service. The color digital orthophotos have a pixel resolution of one meter. Using these digital orthophotos, general vegetation types will be delineated by heads-up digitizing in ArcView Geographic Information System (GIS). Vegetation types and land use classifications will also be assigned.

ArcView GIS will be used to generate field maps containing the color orthophotography and the cover type polygons. Preliminary maps of vegetation cover types will be verified in the field by a botanist. This work will be completed while conducting RTE and invasive plant surveys. Field verification will involve checking a subset of the boundaries of the cover type polygons and correcting the assigned cover type classification and reassigning correct classifications as needed. Corrections to the boundaries and cover type designations will be made directly on field copies of the maps.

Additional data will be collected during the field verification to describe the characteristics of each mapped cover type including species composition, stand structure, habitat quality and land use. Information collected will include:

- Plant species composition, including the dominate and more prominent associated species in each vegetation layer (tree, shrub and herbaceous layers);
- Structural data, including estimates of average heights and aerial cover of each vegetation layer;
- Predominant land use(s) associated with each cover type;
- Rare, unique and particularly high quality vegetation/habitat will be noted.

The contractor will use ArcView GIS to change any cover type polygons found to be in error during the field verification of the cover type map. The contractor will provide Douglas PUD with copies of all map products.

The contractor will be responsible for all equipment necessary to complete the field verification work.

6.2 Wildlife

Assessments to be conducted include avian point counts, prairie grouse, raptor and corvid nesting surveys. In addition, surveys will be conducted for reptiles and mammals. Incidental to all wildlife and botanical surveys, avian mortalities will be located, recorded and collected. Special emphasis will be made to documenting the presence of RTE species and their habitat during these surveys.

6.2.1 Avian Surveys

6.2.1.1 Point Counts

Avian surveys will be conducted to gather data on bird species that use various habitat types in the vicinity of the Wells Project 230 kV transmission line corridor. Surveys will be conducted four times from the first of May through the end of June, which is considered the peak of

breeding season in North Central Washington. Four fall surveys will be conducted from September to October to capture the variability of the fall avian migration.

Assessing avian use during the breeding season will involve the use of point count stations (Bibby et al. 1992, Ralph et al. 1995) and transects (Leukering et al. 2000, Altman and Bart 2001). Because of the high degree of ecological variability associated with "special species" which are those species that: (1) are in habitats that are not well monitored, (2) are too rare or erratic to be sampled effectively, or (3) have an ecology that is not conducive to standard methodologies (e.g., inconspicuous, colonial, nocturnal, low densities), Altman and Bart (2001) recommend using a combination of monitoring methods to gather occurrence and relative abundance data. Thus, a combination of point count stations and transects distributed throughout the study area will be sampled to maximize the probability of detecting the less common species as well as collecting adequate data on all species. This approach is termed a "point transect" (Altman and Bart 2001) and involves conducting standard 5-minute point count surveys at stations (Bibby et al. 1992, Ralph et al. 1995) and recording all detections of special species while walking routes between point count stations (Altman and Bart 2001). Point count stations will be a minimum of 820 ft (250 m) apart to avoid double-counting individual birds.

Avian surveys during the breeding season will take place between sunrise and 10:00 am (Altman and Bart 2001) and fall surveys will also start at sunrise and be completed by noon. Each bird detected via visual sighting or auditory call will be recorded, as well as the primary habitat type and the estimated distance from station center in 16 ft. (5 m) increments. All mammals or reptiles seen will also be recorded. Data will also be recorded to gather information on likely nesting or foraging behaviors or signs. Detections at point count stations will be divided into two time periods: 0-3 minutes and 3-5 minutes. For each detection made along survey transects, biologists will record species, number of individuals, habitat, and behavior. GPS will be used to document the point count and transect locations and to estimate the linear length of the transect survey. All biologists conducting the avian surveys will have expertise in auditory as well as visual identification of birds.

To provide a general description of the land surveyed, biologists will record habitat data at each survey station/transect. Habitat parameters will be estimated qualitatively and will include:

- Tree layer cover, height, and average diameter at breast height (DBH),
- Shrub layer height and cover,
- Herbaceous layer height and canopy cover,
- Snag and Large Woody Debris (LWD) abundance, and
- Dominant species.

Locations of avian survey stations and transects will be stratified based on: (1) study area zone, (2) vegetation cover type, and (3) adjacent land use immediately outside of the study area. The actual number of point-transects and point count stations will be determined following further review of aerial photography. However, based on study area size, it is anticipated that approximately 50-70 stations will be established along the point-transects, which will be distributed among the five study area zones in proportion to their relative land base and river length.

> Transmission Line Wildlife and Botanical Study Page 13

Wells Project No. 2149

All data will be entered into and stored in a database. Analysis of avian data will involve calculation of species richness and species relative abundance (number per station per survey period) for each of the five habitats and for the five study area zones. Data collected during the walking and boat transect portions of the surveys will be analyzed independently from the point count stations. ArcView GIS will be used to develop report maps that display survey locations and significant findings.

6.2.1.2 Prairie Grouse Surveys

Field surveys will be conducted during two time periods (late winter after snow melts and in September). Grouse transects will be placed randomly within large continuous blocks of native habitat in the study area along the transmission line corridor. A biologist will walk the transect looking for evidence of sage grouse or sharp-tailed grouse. All evidence of grouse use will be recorded and feathers collected for verification. Geographic coordinates of the location of any grouse observations will be established with a GPS receiver and recorded for later mapping.

All data will be stored in a database and mapped using ArcVeiw GIS.

6.2.1.3 Raptor and Corvid Nest Surveys

The raptor and corvid nest surveys will be conducted along the length of the transmission line corridor. A helicopter will be used during the surveys to search the transmission line lattice towers and the surrounding large conifer and deciduous trees, within 1/4 mile, for nests. The helicopter will travel at a speed that allows the observer to scan each tower and all the likely trees. The helicopters will remain far enough away from the nest to prevent the adults from flushing. A biologist familiar with raptor and corvids nesting will accompany the pilot and conduct the nest surveys and record data. The survey will be conducted in late May.

6.2.1.4 <u>Avian Collision Surveys</u>

Factors that influence collision risk can be divided into three categories: those related to avian species, those related to the environment, and those related to the configuration and location of lines (Chelan PUD, 2005) Species-related factors include habitat use, body size, flight behavior, age, sex, and flocking behavior. Heavy-bodied, less agile birds or birds within large flocks may lack the ability to quickly negotiate obstacles, making them more likely to collide with overhead lines. Likewise, inexperienced birds as well as those distracted by territorial, hunting, or courtship activities may collide with lines. Environmental factors influencing collision risk include the effects of weather and time of day on line visibility, surrounding land use practices that may attract birds and human activities that may flush birds into lines. Line-related factors influencing collision risk include the configuration and location of the line and line placement with respect to other structures or topographic features. Collisions are more likely to occur with the overhead static wire, which may be less visible than the other wires due to its smaller diameter.

Douglas PUD developed a draft vegetation cover type map using digital air photos and ArcViewTM. With the aid of the cover type map, topographic maps and local knowledge of bird

Page 14

behavior, Douglas PUD was able to identify areas where birds have a higher probability of colliding with the transmission lines.

Members of the Terrestrial RWG, raised a concern that waterfowl could be colliding with the 230 kv line. Fortunately, most of the 230 kV transmission lines, over most of its length, are oriented in a north to south direction. The orientation of the lines is therefore less conducive to waterfowl collision with the ground wires, conductors and towers (See Figure 1.1-1). Waterfowl fowl flying to or from the Rocky Reach Reservoir to the wetlands or grain fields on the Waterville Plateau could be more vulnerable to colliding with the lines when compared with the more numerous waterfowl that fly to or from the Wells Reservoir to the plateau on a northern or southern path.

Concern was also expressed that raptors may also collide with the lines. The most vulnerable raptors are young birds during their first migration in the fall. Fall migrating raptor use the North Cascades flyway, using the lift from thermal and wind caused updrafts ridges in Chelan County (Smith and Neal, 2007). Few raptors migrate through Douglas County and the orientation of the 230 kV transmission line presents little hazard.

Portions of the Wells 230 Kv transmission line are adjacent to areas where birds may be attracted including a nearby lake and river crossing. It is unlikely that a bird that has collided with the transmission line ground wire or conductor at the Columbia River crossing below Wells Dam will be recovered if the birds fall into the river. Surveys for dead birds will be conducted from the Wells Fish Hatchery on the west side of the 230 Kv transmission line river crossing. The survey will be continued for one half mile on the east side river crossing. A second survey, approximately one mile in length, will be conducted in the Boulder Park Area approximately two miles west of Cornehl Lake. One or more observer(s) will search these sections of the 230 foot wide transmission corridor to determine the presence of dead birds.

If a dead bird is located during surveys, the following data will be recorded:

- <u>Species</u>
- <u>Sex</u>
- Age (adult or juvenile) if possible
- Physical condition (including broken bones, lacerations, abrasions, blood, discolorations, gunshot wounds, decomposition, feeding damage by scavengers.
- <u>Probable cause of death</u>
- <u>GPS location.</u>

Surveys will be conducted five days during the spring bird migration and five days during the fall bird migration. survey days will be spread through each migration seasons.

The observers will also record data for any bird found dead in the Wells 230 Kv transmission line corridor during other phases of the study.

6.2.1.5 <u>Literature Review</u>

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Page 15

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A literature review will be conducted to identify potential effects of the 230 Kv transmission lines and towers on raptors and prairie grouse. Refereed journal articles and gray literature will be reviewed. The literature review will be summarized in the study report.

6.2.2 Mammal Surveys

Mammals using the project area will be documented by recording visual observations or sign, including scats, tracks and calls incidental to all field surveys (Call 1986). All observations of RTEs mammals will be recorded, habitat characteristics identified and locations mapped.

6.2.3 Reptile Surveys

The use of the study area by striped whipsnake and other reptiles will be documented by visual encounter surveys (VES). Surveys will be conducted in representative native habitat, within the study area. Surveys will be conducted only during warm weather. The VES method involves searching habitat in a defined area, examining ground vegetation and under large objects (large rocks and woody debris) that may provide cover. All cover objects will be returned to their original position to avoid degradation of habitat. All reptiles will be identified without capturing them, if possible. If necessary, attempts will be made to capture individuals for identification, which will be followed by immediate release. All observations of RTEs reptiles will be recorded, habitat characteristics identified and locations mapped.

6.3 Documentation

Results of the botanical and wildlife surveys will be documented in a single report. The report will also summarize the methods used for each of the surveys. The results section of the report will include botanical information and wildlife species documented in the Project area. It will also include a matrix of wildlife species by habitat type and results of analyses of species abundance and distribution. Maps of survey locations and the distribution of RTE species will also be part of the report. A draft report will be produced for review prior to preparing the final report.

The report will also include a description of the transmission corridor maintenance program. Potential impacts of the maintenance program to native habitat and RTE wildlife will be identified and summarized in the report.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

The botanical and wildlife studies will require botanists and biologists with requisite experience to conduct all surveys described above.

The contractors will be responsible to provide a helicopter for the raptor surveys.

The contractors will be responsible for all field data sheets, notebooks, binoculars, flora and other personal field equipment.

Page 16

The contractors will be responsible for obtaining any permits required for the study.

8.0 BUDGET

The estimate for total person hours required to complete the study is approximately 1756 hours. The botanical portion of the study is estimated at 848 person hours and the wildlife portion of the study at 908 person hours. Estimated hours include pre-field preparation, all field work, data analysis and report writing. The study is estimated to cost \$165,000.

9.0 SCHEDULE

Planning for plant surveys will begin shortly after the issuance of FERC's Study Plan Determination in October 2007, with a pre-field research to refine a list of potential RTE plants and invasive species. Applications for permits that may be required for the botanical studies will be sent in during late 2007. Plant collections in the University of Washington herbarium will be studied to develop a sight picture of the RTE plants. Botanical field work is scheduled between May and the end of August 2008 and is dependent on the time RTE species bloom.

Planning for the wildlife surveys will begin in late 2007 with the application for a Scientific Collection Permit from WDFW. The wildlife field studies will begin in May 2008 and continue through the end of October 2008.

An Initial Study Report will be provided to the Terrestrial RWG, stakeholders and FERC in October 2008 with a final report summarizing the study results provided by October 2009.

10.0 REFERENCES

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Page 18

Email to Douglas PUD from FERC regarding Draft Study Plan Meeting Notes

Attachments: PCDOCS1-#99059-v6-Study_Plan_Meeting_-_Meeting_Summary_6-14-07 easton.DOC

From: Robert Easton [mailto:Robert.Easton@ferc.gov]
Sent: Monday, July 02, 2007 6:56 AM
To: Shane Bickford
Subject: RE: Study_Plan_Meeting_-_Meeting_Summary_6-14-07.pdf

Shane,

Sorry to do this, but I made a few more changes. I revised the one sentence to indicate who made the statement and I deleted the other sentence that was just editing instructions.

Thanks, Bob

AU.D.

Study Plan Meeting

Meeting Summary

Wells Hydroelectric Project Relicensing Douglas County PUD Auditorium 1151 Valley Mall Parkway East Wenatchee, Washington

> June 14, 2007 9:00 am –12:00 pm

ATTENDEES:

Please see attached Sign-In Sheet for attendees.

Shane Bickford, Douglas PUD, welcomed everyone to the meeting. He gave an overview of the Proposed Study Plan (PSP) meeting goals and objectives and the materials handed out prior to the meeting (agenda, baseline study list, resource chronology and power point presentation). All of the studies contained within the PSP were based on FERC's seven study criteria, which is located within the pages of the PSP document, in the CFR, on FERC's website and on Douglas PUD's website.

In 2005, Douglas PUD began the Resource Work Group (RWG) meetings. The goals of the RWG meetings were to engage the stakeholders and to learn about FERC's Integrated Licensing Process (ILP), identify and evaluate issues against FERC's Study Criteria, develop the study plans, and ultimately file the study plans in the Pre-Application Document (PAD). Douglas PUD wanted to get information out early to assist in the decision making process. Shane reviewed the list of Baseline Studies and FERC's seven study request criteria.

The 12 issues identified by the RWGs, that met FERC's seven study criteria, were collaboratively developed by the RWGs into "Agreed Upon" Study Plans and were included into the PAD and filed with FERC on December 1, 2006. An updated version of the 12 study plans were included in the PSP that was filed with FERC on May 16, 2007.

Scott Kreiter, Douglas PUD, discussed the objectives of the Cultural, Recreation and Land Use, and Terrestrial study plans contained within the PSP. The list of the study plans for these resource areas are as follows:

- Cultural Cultural Resources Investigation
- Recreation and Land Use Public Access Study, Recreational Needs Analysis
- Terrestrial Nuisance Wildlife Control Study, Transmission Line Wildlife and Botanical Study

Bao Le, Douglas PUD, discussed the objectives of the Aquatic study plans contained within the PSP. The list of the study plans for this resource area is as follows:

• Aquatic – Juvenile Lamprey Study, Lamprey Spawning Assessment, Adult Lamprey Passage Study, Total Dissolved Gas Investigation, Water Temperature Study, DO, pH and Turbidity Study, Okanogan Toxins Study

Shane Bickford gave a summary of the stakeholder's study requests filed with FERC by the April 2nd deadline. He also reviewed the criteria that Douglas PUD used to identify a study request and reviewed the criteria used to categorize study requests as either formal or informal study requests.

Eleven comment/study request letters were filed with FERC by the April 2nd deadline for study requests. Douglas PUD categorized each study request as either a formal or informal study request. Douglas PUD counted only one formal study request. The other ten study requests were considered informal due to their lack of information. All of the 11 study requests (formal and informal) were categorized further as being: 1) Appropriate for Study, 2) Appropriate for Study with Alternative Methodology, or 3) Not Appropriate for Study. None of the 11 study requests were grouped into the first category, four (4) were grouped into the second category and seven (7) were grouped into the third category.

Summary of Stakeholder Study Requests

Recreation and Socioeconomic Issues – Study Requests deemed Appropriate with Alternative Study Methodology

Cities of Brewster & Pateros – Visitor Information Center Cities of Brewster & Pateros – Need for Public Use Facilities and Access Cities of Brewster & Pateros – Boat Storage

Scott Kreiter provided Douglas PUD's view of the Visitor Information Center, Boat Storage and Public Use study requests. Douglas PUD viewed all three of these requests as informal study requests as they did not attempt to address FERC's seven study criteria. Scott indicated that rather than studying whether a new visitor information center, boat storage or any new public use facilites would increase visitor use of the project area that it would be more appropriate to first study whether there is an identified need for various recreational improvements and then, if a need has been identified and that need is closely related to project purposes, Douglas PUD will work with stakeholders to determine how best to meet those needs.

George Brady, City of Pateros, informed the meeting participants that the Visitor Center at Wells Dam was closed in 2001. He did not view this study request as a request for a new facility but as a reminder that Douglas PUD needs to either open or replace the existing center. David Turner and Bob Easton, FERC, asked how Douglas PUD would assess the number of people using the visitor center given that it is now closed and did the PUD have any available data on visitor use? Scott Kreiter indicated that the PUD had conducted a Visitor Use Assessment in 2005-2006 and that the data from that study would be used during the development of the Needs Assessment. Shane Bickford added that the Wells Dam Visitor Center has a visitor log that includes the number of visits observed both before and after September 2001. Jim Eychaner, IAC, mentioned that Washington State has available information and that data may be helpful during the development of the Needs Assessment.
Recreation and Socioeconomic Issues - Study Requests Not Appropriate for Study

Betty Wagoner - Access to Wells Reservoir

Scott Kreiter indicated that this issue was also categorized as an informal study requests as it did not attempt to address FERC's seven study criteria. Douglas PUD does not believe a study is needed for the requested information as this issue will be addressed in the Shoreline Management Plan. This management plan will balance the needs for fish and wildlife habitat protection versus the desire by local stakeholders to have private docks located on Douglas PUD property within the Wells Project boundary.

City of Pateros - Impacts of Wells Project on Local Communities

Scott Kreiter indicated that this was the only study request that attempted to address FERC's seven study criteria. He also indicated that Douglas PUD was not proposing to conduct this study because the information would not be of use during the development of license requirements and because the study was focused on original project impacts that were already mitigated during the term of the first license. He also indicated that there are a lot of factors that impact the economy and that socio-economic studies can be very subjective. The issues raised are not appropriate for study but may be better suited to a one-on-one discussion between Douglas PUD and the City of Pateros. George Brady stated that he thinks that Wells Dam has had a negative impact on all three cities and in particular on Pateros during project construction. George indicated that the entire downtown business corridor was displaced by the Project and that these impacts have not been properly mitigated.

Bob Easton, FERC, pointed out that FERC has historically not required licensees to compensate adjacent communities for original project impacts during relicensing. He asked George Brady what he would do with the information collected from the proposed socio-economics study. He encouraged Pateros to look for the nexus to ongoing project operations. David Turner, FERC, said that this meeting and the upcoming filing deadline provide an opportunity for the City of Pateros to present additional information to bolster their study request. As written, the current socio-economics study request is not expected to be recommended given FERC's prior precedence. David and Bob indicated that based on what they have seen in other proceedings, the Commission does not generally require improvements to a city's infrastructure, such as roads, water and sewer, in a relicensing case. Usually these improvements are the responsibility of the city.

City of Brewster – Sewer Treatment Plant Expansion

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott also indicated that this is not a project related issue and has no nexus to project operations. Lee Webster, City of Brewster, indicated that this was not a study request but rather a placeholder for future discussions related to expansion of the sewer treatment plant. Lee Webster said that the city is undergoing its third phase of updating the sewer. The next phase will have to last for the next 15-20 years and will be cost prohibitive for the city. There is no room for expansion at the existing site.

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City of Pateros – Maintenance and Operation of Recreation Facilities

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott also indicated that costs for Operation & Maintenance could not accurately be developed until the Needs Assessment has developed an accurate picture of future needs and proposed facilities.

Terrestrial Wildlife and Botanical Issues - Study Requests Not Appropriate for Study

Bureau of Indian Affairs - Pre-Project Habitat Evaluation

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott noted that BIA recently toured the Wells Project and the BIA representatives indicated that they were comfortable with the wetland and riparian mitigation measures currently in place and expected to be in place during the next license term. However, BIA indicated that they still may file comments in the future should other issues arise.

Transmission Line Surveys

David Turner, FERC, pointed out that avian electrocution and collision with project transmission line was identified as an issue at scoping based on our understanding of the issue statement. The transmission study proposes to look at habitat types and for evidence of dead birds, but does not explain how a risk assessment would be conducted. David Turner recommended that Douglas and the resource work group consider and develop a risk assessment protocol that clearly describes how the assessment of project impacts will be conducted. David Turner pointed to the example of a risk assessment protocol used by PacifiCorp that is described in AVIAN PROTECTION PLAN (APP) GUIDELINES issued by the Edison Electric Institute and Fish and Wildlife Service.

Shane Bickford, Douglas PUD, indicated that the study plans contained within the PSP were developed through active negotiations and that the intent was to agree on the goals and objectives for each study and that each of the documents was rigorously reviewed and collaboratively developed by the RWGs. The methods sections are as specific as each RWG choose to make them and varies from being very general for the cultural resource study plan to very specific in the adult lamprey spawning assessment and adult lamprey telemetry study plans.

As a general matter, David Turner, FERC, wanted to stress a couple of points with regard to studies. Specific methods should be identified or spelled out in each study plan to the greatest extent possible. For example, make sure the timeframes for searching for noxious weeds or protected plants within the transmission line corridor are clearly defined. We are trying to avoid criticisms of study methods later in the process that may lead to recommendations for further study.

Douglas PUD agreed to update the 230 kV transmission line study to increase the level of specificity related to methods and survey techniques and to update the Recreation Needs Assessment to include several of the issues discussed during today's meeting.

Deleted: David Turner, FERC, wanted to stress a couple of points. Specific methods should be identified or spelled out in each study plan. Make sure that time frames are clear and which species are identified.

Deleted: Then continue with the remaining paragraph as written.

Aquatic and Water Quality Issues – Study Requests deemed Appropriate for Study with Alternative Study Methodology

WDFW - Toxins Study

Bao Le, Douglas PUD, informed the group that Douglas PUD met with WDFW on May 26, 2007 to discuss their proposed alterations to the existing toxins study plan. After clarifying the study design, it was agreed that there was no need to expand the scope of the existing (PSP proposed) toxins study to include the sampling sites on the mainstem Columbia River. Bob Heinith, Columbia Inter-Tribal Fish Commission, asked if the toxins study would be sampling any anadromous fish species. Bao Le, Douglas PUD, indicated that the study will sample toxins in the tissue of three species of resident fish. The fish selected for sampling are of recreational interest, live within or adjacent to the Wells Project their entire life and are the same species sampled by WDOE during past surveys.

Carmen Andonaegui, WDFW, asked whether there has been a toxin study conducted on the mainstem Columbia River. Bao indicated that he was not aware of any sampling and that there was no indication that there has been a toxins problem along the mainstem Columbia River, within the Wells Reservoir.

Lee Webster, City of Brewster, wanted to know why large mouth bass were not included in the toxins study. Shane Bickford, Douglas PUD, indicated that the intent of the study was to followup on recommendations made within the WDOE's Detailed Implementation Plan (DIP). The DIP recommended that future monitoring be conducted to track the levels of toxins found in fish and sediment over time to determine whether toxin levels are being diluted by new, cleaner material entering the river or whether the prevalence of DDT and PCBs are increasing. Therefore the toxin study plan is based around sampling the same fish that where sampled during prior studies conducted by WDOE. Bob Heinith, CRITFC, asked about whether the study would also be looking at the percentage of toxins in the sediment of the Okanogan River. Shane Bickford, Douglas PUD, indicated that several past studies have collected and analyzed sediments sampling for toxins and that the study proposed by Douglas PUD, in the PSP, will also include sediment sampling using the same or similar sampling protocol. Bao Le indicated that indeed the study will look at sediment cores and that sampling sites were identified based upon their tie to human health concerns (recreation sites). The results of the study will be used to educate and inform recreational user of the Okanogan River, within Project Boundary.

Aquatic and Water Quality Issues - Study Requests Not Appropriate for Study

WDFW – Aquatic Invasive Species (AIS)

Bao Le described Douglas PUD's rationale for not proposing to conduct WDFW's AIS study request. Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Bao Le, indicated that Douglas PUD did not consider this study request appropriate for study because the request information is already being collecting through coordinated activities with Portland State and WDFW Nuisance Species program. Current efforts include annual quagga mussel and zebra mussel monitoring and the completion of a base studies on aquatic weeds, including milfoil, and exotic macroinvertebrates. Therefore

These issues were discussed with WDFW and they agreed that because the information was already being collected that there was no additional need to conduct a separate relicensing study on Aquatic Invasive Species.

WDFW - Pikeminnow Removal Program on Resident Fish

Bao Le discussed that Douglas PUD is already doing a number of things to address this issue on a yearly basis and have discussed this issue with WDFW. It was decided that no additional RWG meetings were needed to discuss this issue as Douglas PUD had previously met with WDFW, on May 26th, and that at that meeting WDFW agreed that there was no need to conduct this study during the ILP study period.

This concluded the discussion of the stakeholder study requests.

Shane Bickford asked for additional comments related to the studies discussed during today's meeting.

There was a discussion on the Shoreline Management Plan and how this management plan will address a variety of issues that are common to all of the resource areas. Lamprey predation was discussed at length. Bao Le said no one knows how to quantify population abundance for juvenile Pacific lamprey. Sampling technology is still being developed and little is known about the behavior of juvenile lamprey in the substrate. George Brady was concerned about the effects of low water on juvenile lamprey. Bao Le mentioned that 98% of the time, Wells Dam operates within 2 feet of the normal elevation (781). It is difficult to quantify the impact of operations on juvenile lamprey given that lamprey collection techniques are still rather crude and unable to accurately count the number of lamprey in a given area of reservoir strata.

Susan Rosebrough, <u>National Park Service</u>, and <u>Lee Webster</u>, <u>Brewster</u>, asked whether issues related to the Recreational Use Assessment had been resolved. In particular Susan <u>and Lee</u> wanted to know if prior questions related to the conduct of the Visitor Use Assessments had been addressed. Specifically, questions related to counts of people participating during festivals, "after-hours" counting and collection of data from minority user groups that did not speak English. Scott Kreiter, Douglas PUD, mentioned that he would follow up with <u>Lee and</u> Susan to address <u>their</u> questions about how Douglas PUD had addressed prior questions related to the Visitor Use Assessment.

Shane Bickford went over the ILP timeline and talked about when the next round of comments are due. Douglas PUD will get together with folks who have raised issues today in an effort to understand and hopefully resolve their issues. Shane Bickford asked if there were any other issues to be covered during today's meeting.

Steve Lewis, FWS, raised questions about scientific validity for certain studies and that there may be a need for 2 years of studies for specific issues. Shane Bickford indicated that the second year of ILP studies is intended to answer questions from the first year, if there are any. Bao agreed that if the data are insufficient, then a second year will need to be done. David Turner and Robert Easton, FERC, indicated that the regulation was developed to address the need for a second year of study. The regulations indicate that a second year of study shall be based upon the failure to achieve the goals identified in the first year study plan. A second year of study might also be required in the instance that the field season, for the first year study, was not representative of average conditions (e.g. high water or dry year). Scenarios were discussed including what would happen if sample size targets for a study were not met or what would

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happen if the study year was unusually dry or wet. FERC staff reviewed their criteria for determining whether there is a need for a second year.

Meeting adjourned at 12:05 pm.

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Email to FERC from Douglas PUD regarding Draft Study Plan Meeting Notes From: Shane Bickford
Sent: Monday, July 02, 2007 9:44 AM
To: 'Robert Easton'
Cc: David Turner
Subject: RE: Study_Plan_Meeting_-_Meeting_Summary_6-14-07.pdf

Bob,

Your suggested edits look good. I have accepted them all. Thanks for the catch on the editing instructions. We are also working on the suggested edits to the study plans including the 230 kV study plan and the recreation needs analysis study plan.

Regards,

Shane Bickford Supervisor of Relicensing Public Utility District No. 1 of Douglas County 1151 Valley Mall Parkway East Wenatchee, Washington 98802-4497 509.881.2208 Phone Conversation with WDFW regarding Lamprey Study Plan Methodology



Wells Project Relicensing Phone Conversation Summary

Call To:	Molly Hallock, WDFW
Call From:	Bao Le, Douglas PUD
Date:	July 3, 2007
Time:	9:00am
Subject:	Lamprey Study Plan methodolgy

Summary:

During the FERC Study Plan Meeting, Carmen Andonaegui commented that Douglas PUD needs to touch base with Molly Hallock (WDFW's lamprey technical contact) one last time to make sure that she approves of the methodologies for the three lamprey study plans.

In a phone conversation today with Molly, we discussed these three study plans and were able to reach consensus on all three of the proposed lamprey study plans. For each of the three study plans, main issues discussed and conclusions are as follows:

1. Adult Passage Study: Molly wants to make sure that there is telemetry equipment that will address adult lamprey approaches up to the ladder. I was sure that we have addressed this issue with the installation of some equipment outside of the fish ladder entrances.

We also discussed hold over times and Molly is in agreement that hold over times (up to 60 hours) are not likely an issue given the migratory behavior of lamprey. However, we agreed that we would be as diligent as possible in keeping hold over times to a minimum and that I would send Molly a trapping schedule as soon as we were able to finalize one.

Lastly, we discussed needed flexibility in trapping activities since peak passage has typically occurred in August and September but our largest run in 2003 peaked in late October. We agreed that working with the fish counters and having flexibility with consultant activities would allow us the best chance of trapping during the peak.

2. Adult Spawning Study: Molly and I agreed that although I have experience with lamprey spawning assessments, that it would be beneficial as is described in the study plan to provide some training to any other field personal. I conveyed to her that we would do some theoretical

training here at the PUD and couple that with going over to Olympia next spring to do some lamprey spawning surveys with WDFW as a follow up field exercise. She thought that this would be most beneficial.

3. Juvenile Lamprey Predation Study: I suggested the potential advantages of examining stomachs on-site as opposed to preserving and sending these samples to a lab. We agreed that sending stomachs to the lab, in both of our experiences, did not provide added information due to the discoloration and deterioration that inevitably occurs during preservation. We both agreed that on-site observation would be more effective and that stomach contents could be collected for future QA/QC if needed. Consultants conducting the study will need to have experience or training in stomach content examination. I will change this in the study plan.

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Email to Douglas PUD from FERC regarding Updated 230 kV Transmission Line Study Plan Attachments: 230 kV transmission line study (modified per FERC comments) 6-28-07.doc

From: David Turner [mailto:David.Turner@ferc.gov]
Sent: Tuesday, July 03, 2007 9:48 AM
To: Shane Bickford
Subject: RE: Updated 230 kV transmission line study plan

Shane,

I have provided comments and suggested revisions in the attached study plan. I used Word's comment feature to insert the comments. Most are editorial and organization in character.

I have one concern about the statement regarding the movement pathways for waterfowl from Rocky Reach. The sentence seems to suggest that Rocky Reach birds are vulnerable to collision with the project transmission line, but not birds originating from the Wells reservoir. While this may be true, the issue is whether the Well's transmission line represents a collision hazard to waterfowl, irrespective of the reservoir they may be flying to or from. If my interpretation of the statement is true, does this affect the number of areas that are likely to represent a collision hazard and the amount of area that needs to be surveyed?

David Turner 202-502-6091

PLANT AND WILDLIFE SURVEYS AND COVER TYPE MAPPING FOR THE WELLS HYDROELECTRIC PROJECT 230 kV TRANSMISSION CORRIDOR (Transmission Line Wildlife and Botanical Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

June 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington

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For copies of this study plan, contact:

Public Utility District No. 1 of Douglas County Attention: Relicensing 1151 Valley Mall Parkway East Wenatchee, WA 98802-4497 Phone: (509)884-7191 E-Mail: <u>relicensing@dcpud.org</u>

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ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5). A Terrestrial Resource Work Group (RWG), which is composed of stakeholders and Douglas PUD staff, was formed for the purposes of identifying issues and information gaps that may require study during the relicensing of the Wells Hydroelectric Project. The Terrestrial RWG, through a series of technical meetings, has identified the need for a study to assess the effects of the Project's 230 kV transmission line corridor on wildlife.

This proposed study is intended to fill the gaps in local knowledge of botanical resources, including rare, threatened and endangered (RTE) plants, invasive plant species, and vegetation communities within the 235-foot Wells Project 230 kV transmission line corridor. The study will also provide bird species presence, identify if bird <u>collision with the line and structures is a potential problem</u>, and provide information on the extent of use and dependency on the transmission corridor by sage grouse (*Centrocercus urophasianus*) and sharp-tailed grouse (*Tympanuchus phasianellus*), both RTE species. A literature review will be conducted to identify potential effects of the 230 KV transmission lines and towers on raptors and prairie grouse. Surveys will also be conducted for RTE mammals and reptiles. The study plan outlines methods that will be used to collect information on these plants and animals.



Page 1

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.8 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project, owned, and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).

Page 2





1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The overall goal of the wildlife and botanical surveys along the Project transmission lines is to provide information needed to guide land management decisions, avoid damage to valuable habitat during future transmission corridor management activities and minimize the spread of invasive weeds. The study will provide baseline data on birds found near the corridor and information on the presence of rare, threatened and endangered (RTE) plant or animal species in the corridor. In addition, this study will provide information needed to meet the FERC requirements during the Wells ILP. The study objectives are divided into botanical and wildlife resource categories.

Page 4

Pursuant to CFR 18.5(vii), RTE species in this study plan include:

- Federally listed as threatened, endangered, proposed or candidates under the ESA;
- State listed as threatened or endangered;
- State listed as candidate (wildlife only);
- State listed as sensitive (plants only); or
- State listed as Review List 1 (plants only).

2.1 Botanical Resources

The main objectives of the botanical study are:

- (1) Identify and document the location of RTE plant species that occur within the transmission line corridor.
- (2) Identify and classify the specific vegetation cover types in the study area.
- (3) Generate detailed information on the species composition and classification of these plant communities and their structures.
- (4) Create a detailed Geographic Information System (GIS) cover type map of the study area showing the locations of these plant communities, their distribution, areas of coverage (acres), and note locations of habitats of special concern or unique areas observed.
- (5) Identify any invasive plant species in the transmission corridor. For this transmission line corridor study, invasive species are Washington State Class A and B-designate noxious weeds.

2.2 Wildlife Resources

2.2.1 Avian

The main objectives of the avian study are:

- (1) Identify and document the location of any federal and state RTE avian species that use the study area.
- (2) Describe the habitat features used by RTE avian species observed within the corridor.
- (3) Document the presence of other avian species and provide relative abundance for birds using the study area.
- (4) Document raptor and corvid nesting and sharp-tailed and sage grouse use within the study area.

Page 5

(5) Document any evidence under the transmission line of avian collisions.

2.2.2 Mammal

The main objectives of the mammal study are:

- (1) Identify and document the location of federal and state RTE mammal species that use the study area.
- (2) Describe the habitat features used by RTE mammals observed within the corridor.
- (3) Document the presence of other mammal species in the study area.

2.2.3 Reptile

The main objectives of the reptile study are:

- (1) Identify and document the location of federal and state RTE reptile species that use the study area.
- (2) Describe the habitat features used by RTE reptiles observed within the corridor.
- (3) Document the presence of other reptile species in the study area.

3.0 STUDY AREA

Two 230 kV transmission lines connect Wells Dam with the Douglas switchyard next to Rocky Reach Dam (Figure 1.1-1). The transmission lines occupy a 235-foot corridor that is 41 miles long. The transmission lines begin at Wells Dam, cross the Columbia River from Carpenter Island in Chelan County to Douglas County. The transmission lines travel southeast to the Boulder Park area then turn southwest across wheat fields, past the town of Waterville and over Badger Mountain. The lines descend the west slope of Badger Mountain and end at Douglas Switchyard. The study area is the 235-foot transmission line corridor, excluding all actively cultivated fields.

4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Botanical Resources

The US Fish and Wildlife Service (FWS) maintains a list of all plants that are listed or proposed as threatened or endangered under the Endangered Species Act. In addition to the federal list, Washington Department of Natural Resource's Natural Heritage Program (WNHP) maintains a database on the known locations of federally listed and proposed, as well as state listed threatened, endangered, sensitive and Review List 1 plants in Washington. Historic rare plant information is also available at both Washington State University and University of Washington.

Invasive plant species potentially occurring in the study transmission line corridor are available from the Washington State Weed Board and Washington State Extension Service.

4.2 Wildlife Resources

The FWS maintains a list of all wildlife listed or proposed as threatened or endangered under the Endangered Species Act. The Washington Department of Fish and Wildlife (WDFW) maintains a list of all wildlife species listed or proposed for listing under the WAC-232-12-297. WDFW also maintains a list of RTE species and a database with locations of all recorded sightings. Cassidy et.al. (1997) also provides species range information for all wildlife that may be found in the transmission line corridor.

4.3 Transmission Corridor Maintenance

Douglas PUD conducts an ongoing maintenance program on the 230 kV transmission corridor. Maintenance activities include noxious weed control at transmission corridor structures and along access roads in the spring and fall. Target weed species are primarily diffuse knapweed (*Centaurea diffusa*) and Dalmatian toadflax (*Linaria dalmatica*). Transline[®] herbicide is applied in the spring as a contact herbicide with a limited residual and is also used for spot applications in the fall. Transline[®] is used because it has minimal impacts on native grass species and sagebrush shrub species. Douglas PUD releases the biological control insect *Calophasia lunula* to control Dalmatian toadflax. Weedar-64[®] and Curtail[®] are also used to control broadleaf weeds.

The maintenance program also includes an overall inspection for damaged roads or structures. Tower structures are inspected on foot or using a four-wheeled all terrain vehicles (ATV) with low pressure tires. At the request of land owners, maintenance roads were not constructed across approximately 25 miles of wheat fields, on the Waterville Plateau, when the transmission lines were built. Existing roads require periodic maintenance if there is damage to the road from storms or rock falls or if the road requires grading for repairs to the 230 kV lines.

4.4 Terrestrial Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established a Terrestrial Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Terrestrial RWG collaboratively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future

relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Terrestrial RWG is proposing to conduct a study to collect baseline botanical information for the existing 230 kV transmission line running from Wells Dam to Douglas Switchyard.

This proposed study is intended to fill data gaps in local knowledge of botanical resources including RTE and invasive plant species. This study will also provide information on bird species presence, identify if bird collision is a problem and provide information on the possible use of the transmission corridor by sharp-tailed or sage grouse. The study will also provide information on Washington ground squirrel and striped whipsnake which are both RTE <u>species</u>, which have <u>ranges</u> that overlaps with the study area.

Electrocution of birds using the 230 kV line for perch and nest sites does not need additional data of analysis of potential project effects. Insulators suspend each conductor eight or more feet from each lattice tower structure and approximately 24 feet between phases. The 230 kV transmission line exceeds the phase to phase and phase to ground separation of 60 inches recommended by the Avian Power Line Interaction Committee (APLIC) (2006) for the protection of raptors found in the vicinity of the transmission line corridor.

4.5 Issue Statements

Issue Statement (PAD Section 6.2.3.2)

Presence of the transmission lines could kill or injure birds and the presence of the transmission towers could affect wildlife behavior and use of adjacent habitat.

Issue Determination Statement (PAD Section 6.2.3.2)

The Wells Project license includes two 230 kV single-circuit transmission lines. The lines run 41 miles in length from the switchyard at Wells Dam to the Douglas Switchyard operated by Douglas PUD. The lines run parallel to each other on 45-85 foot steel towers along a common 235-foot wide corridor.

The transmission lines and towers could have impacts on wildlife, including bird collisions and raptor nesting. Baseline studies have not been completed to assess these potential impacts. Wildlife and botanical species inventories have not been completed along the transmission corridor.

The RWG agrees that a study is needed during the two-year ILP study period and is proposing to complete baseline wildlife and RTE inventories along the transmission corridor. In addition to documenting baseline conditions, this study would be used to document presence (whether raptors, corvids and prairie grouse are found within or adjacent to the transmission corridor). A literature review will also be completed to specifically identify potential effects on raptors and prairie grouse.

Page 8

Transmission Line Wildlife and Botanical Study Wells Project No. 2149 Deleted: a range Comment [DT1]: SD2 identifies electrocution as an issue, so it will need to be addressed. That said, you can still conclude that no additional study is needed for the reasons cited.

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Issue Statement (PAD Section 6.2.3.3)

Maintenance of the transmission corridor could affect wildlife and/or botanical species (e.g. weed control and road maintenance).

Issue Determination Statement (PAD Section 6.2.3.3)

The Wells Project license includes two 230 kV single-circuit transmission lines. The lines run 41 miles in length from the switchyard at Wells Dam to the Douglas Switchyard operated by Douglas PUD. The lines run parallel to each other on 45-85 foot steel towers along a common 235-foot wide corridor.

Maintenance activities along the transmission corridor could have an impact on wildlife and botanical resources. Wildlife and botanical species inventories have not been completed along the transmission corridor.

The resource work group agrees that a study is needed during the two-year ILP study period and is proposing to complete baseline wildlife, botanical and RTE inventories along the transmission corridor.

There is some existing information on botanical and avian resources in the study area as described below.

5.0 **PROJECT NEXUS**

The two Wells 230 kV transmission lines were included in the FERC order issuing the Wells Project license (issued: July 12, 1962). Exhibit K maps of the transmission line corridor transmitted copies of as build Exhibits J and K showing the route of the transmission line of the Wells Project 2149. FERC approved the Exhibit J and K drawings and amended the license by order (issued: January 5, 1979).

The results of the RTE botanical and wildlife surveys will be used for Section 7 consultation under the ESA. Direct effects of the transmission corridor and/or maintenance of the corridor on RTE species or habitats are unknown. Ongoing maintenance of the transmission corridor could adversely affect RTE plants or wildlife, if any are present. The avian and botanical surveys will also be used to help guide future corridor management activities and to determine whether additional measures are needed to reduce the spread of noxious weeds and bird collisions.

6.0 METHODOLOGY

The methods for conducting the botanical and terrestrial surveys described in the goals and objectives are each described below.

Page 9

6.1 Botanical

6.1.1 RTE Plant Surveys

The surveys for RTE plants will comprise the following tasks: (1) pre-field review; (2) field surveys; and (3) documentation and mapping of results. Each task is described below.

The pre-field review task consists of developing a "target" list of RTE plant species to guide field surveys. The pre-field review task will be initiated by sending letters to the FWS and WNHP requesting the latest information on RTE plant species known to occur or potentially occurring in or near the Wells Project area. The target list of RTE species potentially occurring in the Wells Project area will be developed based on input from the FWS and WNHP. Information on habitat requirements, such as elevation, soils, and associated vegetation community, will be used to refine the list to those species most likely to be found in or near the Project area. This information will also be used to identify the habitats to be surveyed, with an emphasis on those that support RTE species with federal or state status as threatened or endangered. Botanists from the WNHP will also be asked for any additional information related to RTE species that may occur in the area.

Prior to beginning field surveys, project botanists will review the morphological characteristics of target RTE plant species to develop a search image, which improves detection and recognition abilities. This process will include reviewing herbarium specimens and collecting information on vegetative, floral, and fruit characteristics for each target species and other species that are closely related or otherwise difficult to distinguish from the target RTE species.

Surveys for RTE plants in the transmission line corridor will involve visually searching suitable habitat. RTE plant surveys will be conducted on foot using a random meander approach described in Nelson (1985). Surveys will be conducted by botanists experienced in conducting RTE plant surveys.

The habitat requirements of RTE species will be used to refine survey efforts. Habitats with a high probability of supporting one or more RTE plants will receive thorough coverage. Habitats with a lower likelihood of supporting these species will be surveyed less intensively. Actively cultivated fields will not be surveyed. RTE species will be recorded and mapped when encountered and habitats will be described.

The timing of RTE plant surveys is critical to the success and validity of the survey. The number of surveys to be conducted in 2008 will be determined by the blooming period of each RTE plant species. Surveys are expected to be conducted in early May, mid to late June and early August.

RTE plants will be identified in the field using the Flora of the Pacific Northwest (Hitchcock and Cronquist 1973) and the Field Guide to Selected Rare Plants of Washington (WNHP 2004). A variety of sources will be utilized to verify tentative species identification including other floras, published papers, herbarium specimens, and consultation with appropriate taxonomic specialists. A list of all plant species identified during field surveys will be compiled and provided in the final report.

Page 10

WNHP sighting forms will be completed for each RTE plant population found in the transmission line corridor. Data collected will include population size and area, phenology, habitat, slope, aspect, elevation, soils, and associated species. Factors affecting survival of RTE species (e.g., deer browse, disturbance, etc.) will be noted if applicable. The population locations will be mapped on survey maps and Global Positioning System (GPS) coordinates will be collected to verify the mapped location. Photographs will be taken of the RTE plants and habitats where they are growing.

Population size for RTE species will be visually estimated (for large populations) or counted (for small populations). For large RTE plant populations (and with agency permission), a voucher specimen will be collected, pressed, and dried for deposition at the University of Washington Herbarium. Where collection poses a risk to the population, photographs will aid in verification by taxonomic specialists.

6.1.2 Invasive Species Surveys

The surveys for invasive plants will comprise the following tasks: (1) pre-field review; (2) field surveys; and (3) documentation and mapping of results. Each task is described below.

Invasive species surveys will be focused on plants listed in Washington State as Class A and Class B Designate weeds. Class A weeds are non-native species with a limited distribution in the state; eradication of all Class A weeds is required by state law. Class B weeds are non-native species whose distribution is limited to portions of Washington State and control requirements vary between counties. A list of weed species will be developed of all Class A and B weeds found in Douglas County. Prior to beginning field season surveys, botanists will review the morphological characteristics of Class A and B weeds to develop a search image, which improves detection and recognition abilities.

Surveys for invasive plant species will be conducted in the transmission line corridor. These surveys will be conducted in conjunction with RTE plant surveys and field verification of the Vegetation Cover Type Map. Since many invasive species are easiest to see and identify later in the growing season, these surveys will be conducted in the <u>late</u> June to <u>early</u> August time period. All class A or B species will be mapped.

Infestations of invasive species will be mapped on project maps and GPS coordinates will be collected to verify the mapped location. Each infestation will be mapped as accurately as possible, to a resolution of 0.1 acre. Data gathered for each infestation will include the estimated total number of plants and the aerial cover and density by cover by class, as developed by the North American Weed Management Association (NAWMA 2003): trace (T=<1%), low (L=1-5%), moderate (M=5.1-25%), and high (H=25.1-100%).

6.1.3 Cover Type Mapping

The vegetation mapping study will involve three phases of work. The first two phases will identify general cover types through photo interpretation and field verification. The third phase will be the production of the final cover type map.

Page 11

Douglas PUD received digitized color aerial photography of Douglas County from Natural Resources Conservation Service. The color digital orthophotos have a pixel resolution of one meter. Using these digital orthophotos, general vegetation types will be delineated by heads-up digitizing in ArcView Geographic Information System (GIS). Vegetation types and land use classifications will also be assigned.

ArcView GIS will be used to generate field maps containing the color orthophotography and the cover type polygons. Preliminary maps of vegetation cover types will be verified in the field by a botanist. This work will be completed while conducting RTE and invasive plant surveys. Field verification will involve checking a subset of the boundaries of the cover type polygons and correcting the assigned cover type classification and reassigning correct classifications as needed. Corrections to the boundaries and cover type designations will be made directly on field copies of the maps.

Additional data will be collected during the field verification to describe the characteristics of each mapped cover type including species composition, stand structure, habitat quality and land use. Information collected will include:

- Plant species composition, including the dominate and more prominent associated species in each vegetation layer (tree, shrub and herbaceous layers);
- Structural data, including estimates of average heights and aerial cover of each vegetation layer;
- Predominant land use(s) associated with each cover type;
- Rare, unique and particularly high quality vegetation/habitat will be noted.

The contractor will use ArcView GIS to change any cover type polygons found to be in error during the field verification of the cover type map. The contractor will provide Douglas PUD with copies of all map products.

The contractor will be responsible for all equipment necessary to complete the field verification work.

6.2 Wildlife

Assessments to be conducted include avian point counts, prairie grouse <u>surveys</u>, and raptor and corvid nesting surveys. In addition, surveys will be conducted for reptiles and mammals. Incidental to all wildlife and botanical surveys, avian mortalities will be located, recorded and collected. Special emphasis will be made to documenting the presence of RTE species and their habitat during these surveys.

6.2.1 Avian Surveys

6.2.1.1 Point Counts

Avian surveys will be conducted to gather data on bird species that use various habitat types in the vicinity of the Wells Project 230 kV transmission line corridor. Surveys will be conducted four times from the first of May through the end of June, which is considered the peak of

breeding season in North Central Washington. Four fall surveys will be conducted from September to October to capture the variability of the fall avian migration.

Assessing avian use during the breeding season will involve the use of point count stations (Bibby et al. 1992, Ralph et al. 1995) and transects (Leukering et al. 2000, Altman and Bart 2001). Because of the high degree of ecological variability associated with "special species" which are those species that: (1) are in habitats that are not well monitored, (2) are too rare or erratic to be sampled effectively, or (3) have an ecology that is not conducive to standard methodologies (e.g., inconspicuous, colonial, nocturnal, low densities), Altman and Bart (2001) recommend using a combination of monitoring methods to gather occurrence and relative abundance data. Thus, a combination of point count stations and transects distributed throughout the study area will be sampled to maximize the probability of detecting the less common species as well as collecting adequate data on all species. This approach is termed a "point transect" (Altman and Bart 2001) and involves conducting standard 5-minute point count surveys at stations (Bibby et al. 1992, Ralph et al. 1995) and recording all detections of special species while walking routes between point count stations (Altman and Bart 2001). Point count stations will be a minimum of 820 ft (250 m) apart to avoid double-counting individual birds.

Avian surveys during the breeding season will take place between sunrise and 10:00 am (Altman and Bart 2001) and fall surveys will also start at sunrise and be completed by noon. Each bird detected via visual sighting or auditory call will be recorded, as well as the primary habitat type and the estimated distance from station center in 16 ft. (5 m) increments. All mammals or reptiles seen will also be recorded. Data will also be recorded to gather information on likely nesting or foraging behaviors or signs. Detections at point count stations will be divided into two time periods: 0-3 minutes and 3-5 minutes. For each detection made along survey transects, biologists will record species, number of individuals, habitat, and behavior. GPS will be used to document the point count and transect locations and to estimate the linear length of the transect survey. All biologists conducting the avian surveys will have expertise in auditory as well as visual identification of birds.

To provide a general description of the land surveyed, biologists will record habitat data at each survey station/transect. Habitat parameters will be estimated qualitatively and will include:

- Tree layer cover, height, and average diameter at breast height (DBH),
- Shrub layer height and cover,
- Herbaceous layer height and canopy cover,
- Snag and Large Woody Debris (LWD) abundance, and
- Dominant species. •

Locations of avian survey stations and transects will be stratified based on: (1) study area zone, (2) vegetation cover type, and (3) adjacent land use immediately outside of the study area. The actual number of point-transects and point count stations will be determined following further review of aerial photography. However, based on study area size, it is anticipated that approximately 50-70 stations will be established along the point-transects, which will be distributed among the five study area zones in proportion to their relative land base and river length.

Page 13

All data will be entered into and stored in a database. Analysis of avian data will involve calculation of species richness and species relative abundance (number per station per survey period) for each of the five habitats and for the five study area zones. Data collected during the walking and boat transect portions of the surveys will be analyzed independently from the point count stations. ArcView GIS will be used to develop report maps that display survey locations and significant findings.

6.2.1.2 Prairie Grouse Surveys

Field surveys will be conducted during two time periods (late winter after snow melts and in September). Grouse transects will be placed randomly within large continuous blocks of native habitat in the study area along the transmission line corridor. A biologist will walk the transect looking for evidence of sage grouse or sharp-tailed grouse. All evidence of grouse use will be recorded and feathers collected for verification. Geographic coordinates of the location of any grouse observations will be established with a GPS receiver and recorded for later mapping.

All data will be stored in a database and mapped using ArcVeiw GIS.

6.2.1.3 Raptor and Corvid Nest Surveys

The raptor and corvid nest surveys will be conducted along the length of the transmission line corridor. A helicopter will be used during the surveys to search the transmission line lattice towers and the surrounding large conifer and deciduous trees, within 1/4 mile, for nests. The helicopter will travel at a speed that allows the observer to scan each tower and all the likely trees. The helicopters will remain far enough away from the nest to prevent the adults from flushing. A biologist familiar with raptor and corvids nesting will accompany the pilot and conduct the nest surveys and record data. The survey will be conducted in late May.

6.2.1.4 <u>Avian Collision Surveys</u>

Douglas PUD developed a draft vegetation cover type map using digital air photos and ArcViewTM. With the aid of the cover type map, topographic maps, local knowledge of bird behavior, and biological and line-related factors influencing collision risk, Douglas PUD identified two areas where birds¹ have a higher probability of colliding with the transmission lines—the portion of the 230 kV transmission line near Cornehl Lake and where it crosses the Columbia River. Consequently, surveys for dead birds will be conducted from the Wells Fish Hatchery on the west side of the 230 KV transmission line river crossing to the Columbia River

Page 14

Transmission Line Wildlife and Botanical Study Wells Project No. 2149 **Comment [DT2]:** Most of the new information serves more as analysis than a description of the survey methods. Thus, it would fit better in the issue descriptions to set the stage for the scope of the study. Focus here on what you are going to do and where.

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lines (Chelan PUD, 2005) Speciesrelated factors include habitat use, body size, flight behavior, age, sex, and flocking behavior. Heavy-bodied, less agile birds or birds within large flocks may lack the ability to quickly negotiate obstacles, making them more likely to collide with overhead lines. Likewise, inexperienced birds as well as those distracted by territorial, hunting, or courtship activities may collide with lines Environmental factors influencing collision risk include the effects of weather and time of day on line visibility, surrounding land use practices that may attract birds and human activities that may flush birds into lines. Line-related factors influencing collision risk include the configuration and location of the line and line placement with respect to other structures or topographic features. Collisions are more likely to occur with the overhead static wire, which may be less visible than the other wires due to its smaller diameter

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¹ Most of the 230 kV transmission line is oriented in a north to south direction. The orientation of the lines is therefore less conducive to waterfowl collision with the ground wires, conductors and towers, except where it is near Cornehl Lake and the Columbia River (See Figure 1.1-1). The most vulnerable raptors are young birds during their first migration in the fall. Fall migrating raptor use the North Cascades flyway, using the lift from thermal and wind caused updrafts ridges in Chelan County (Smith and Neal, 2007). Few raptors migrate through Douglas County and thus the orientation of the 230 kV transmission line presents little hazard.

and for one half mile on the east side river crossing. A second survey, approximately one mile in length, will be conducted in the Boulder Park Area approximately two miles west of Cornehl Lake. One or more observer(s) will search these sections of the 230 foot wide transmission corridor to determine the presence of dead birds

If a dead bird is located during surveys, the following data will be recorded:

- <u>Species</u>
- <u>Sex</u>
- <u>Age (adult or juvenile) if possible</u>
- Physical condition (including broken bones, lacerations, abrasions, blood, discolorations, gunshot wounds, decomposition, feeding damage by scavengers.
- <u>Probable cause of death</u>
- <u>GPS location.</u>

Surveys will be conducted over five days during the spring bird migration and five days during the fall bird migration. Survey days will be spread through each migration seasons.

The observers will also record data for any bird found dead in the Wells 230 Kv transmission line corridor during other phases of the study.

6.2.1.5 <u>Literature Review</u>

A literature review will be conducted to identify potential effects of the 230 Kv transmission lines and towers on raptors and prairie grouse. Refereed journal articles and gray literature will be reviewed. The literature review will be summarized in the study report.

6.2.2 Mammal Surveys

Mammals using the project area will be documented by recording visual observations or sign, including scats, tracks and calls incidental to all field surveys (Call 1986). All observations of RTEs mammals will be recorded, habitat characteristics identified and locations mapped.

6.2.3 Reptile Surveys

The use of the study area by striped whipsnake and other reptiles will be documented by visual encounter surveys (VES). Surveys will be conducted in representative native habitat, within the study area. Surveys will be conducted only during warm weather. The VES method involves searching habitat in a defined area, examining ground vegetation and under large objects (large rocks and woody debris) that may provide cover. All cover objects will be returned to their original position to avoid degradation of habitat. All reptiles will be identified without capturing them, if possible. If necessary, attempts will be made to capture individuals for identification, which will be followed by immediate release. All observations of RTEs reptiles will be recorded, habitat characteristics identified and locations mapped.

Page 15

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6.3 **Documentation**

Results of the botanical and wildlife surveys will be documented in a single report. The report will also summarize the methods used for each of the surveys. The results section of the report will include botanical information and wildlife species documented in the Project area. It will also include a matrix of wildlife species by habitat type and results of analyses of species abundance and distribution. Maps of survey locations and the distribution of RTE species will also be part of the report. A draft report will be produced for review prior to preparing the final report.

The report will also include a description of the transmission corridor maintenance program. Potential impacts of the maintenance program to native habitat and RTE wildlife will be identified and summarized in the report.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

The botanical and wildlife studies will require botanists and biologists with requisite experience to conduct all surveys described above.

The contractors will be responsible to provide a helicopter for the raptor surveys.

The contractors will be responsible for all field data sheets, notebooks, binoculars, flora and other personal field equipment.

The contractors will be responsible for obtaining any permits required for the study.

8.0 **BUDGET**

The estimate for total person hours required to complete the study is approximately 1756 hours. The botanical portion of the study is estimated at 848 person hours and the wildlife portion of the study at 908 person hours. Estimated hours include pre-field preparation, all field work, data analysis and report writing. The study is estimated to cost \$165,000.

9.0 **SCHEDULE**

Planning for plant surveys will begin shortly after the issuance of FERC's Study Plan Determination in October 2007, with a pre-field research to refine a list of potential RTE plants and invasive species. Applications for permits that may be required for the botanical studies will be sent in during late 2007. Plant collections in the University of Washington herbarium will be studied to develop a sight picture of the RTE plants. Botanical field work is scheduled between May and the end of August 2008 and is dependent on the time RTE species bloom.

Planning for the wildlife surveys will begin in late 2007 with the application for a Scientific Collection Permit from WDFW. The wildlife field studies will begin in May 2008 and continue through the end of October 2008.

Page 16

An Initial Study Report will be provided to the Terrestrial RWG, stakeholders and FERC in October 2008 with a final report summarizing the study results provided by October 2009.

10.0 REFERENCES

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Page 17

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Email to FERC from Douglas PUD regarding Updated 230 kV Transmission Line Study Plan From: Shane Bickford Sent: Tuesday, July 03, 2007 5:44 PM To: 'David Turner' Subject: RE: Updated 230 kV transmission line study plan

David,

Thanks for the comments and edits. Regarding your questions below, I will get together with Scott and Jim and have a response for you sometime next week.

Have a great 4th of July holiday!

Cheers,

Shane Bickford Supervisor of Relicensing Public Utility District No. 1 of Douglas County 1151 Valley Mall Parkway East Wenatchee, Washington 98802-4497 509.881.2208
Phone Conversation with FERC regarding 230 kV Transmission Line Study Plan



Wells Project Relicensing Phone Conversation Summary

Call To:	David Turner, FERC	
Call From:	Shane Bickford, Douglas PUD	
Date:	July 9, 2007	
Time:	11:35 am	
Subject:	Transmission Line Study Plan	

Summary:

Jim McGee and Shane Bickford called David Turner to discuss his comments to the 230 kV transmission study plan.

The study plan in question was the version filed with FERC, in the PSP, on May 15, 2007. This same study plan was also discussed at the Study Plan Meeting on June 14, 2007. During the study plan meeting, FERC staff provided several comments to Douglas PUD in an effort to improve the comprehensive scope of several study plans, including the 230 kV study plan.

This call in particular was arranged to determine whether Douglas PUD had accurately captured FERC's comments and suggested language changes to the proposed study plan. Based upon the conversation and the exchange of edited drafts of the study plan, it appears that David Turner's cencerns related to the scope and methods contained within the 230 kV study plan have been addressed.

The status of several other study plans was also discussed including the revised scope of the Recreation Needs Analysis and revisions to the juvenile lamprey study plan proposed by WDFW.

Letter to DAHP and CCT from Douglas PUD regarding Triennial Archaeological Monitoring nofficial FERC-Generated PDF of 20070719-0061 Received by FERC OSEC 07/16/2007 in Docket#: P-2149-007



July 9, 2007

Mr. Rob Whitlam, State Archaeologist Ms. Allyson Brooks, State Historic Preservation Officer Wash. State Dept. of Archaeology & Historic Preservation 1063 South Capitol Way, Suite 106 Olympia, WA 98501

Ms. Camille Pleasants, Tribal Historic Preservation Officer Colville Confederated Tribes P.O. Box 150 Nespelem, WA 99155

Re: Wells Hydroelectric Project, FERC No. 2149 - 2007 Triennial Archaeological Monitoring

Dear Sir or Madam,

Douglas PUD is required to conduct triennial archaeological monitoring of the Wells Reservoir as part of the 1983 Memorandum of Agreement with the Washington State Department of Archaeology and Historic Preservation (DAHP), and the Confederated Tribes of the Colville Reservation (CCT). Douglas PUD is scheduled to conduct this monitoring in 2007.

As part of the Wells relicensing process, the Cultural Resources Work Group, comprised of the CCT, SHPO, FERC, and Douglas PUD, identified a need to conduct an archaeological reconnaissance study (enclosed) of the Wells Reservoir, which will begin in 2007 and conclude in 2008. Because of the overlap in schedule and scope between these two efforts, the Work Group members proposed to consolidate the monitoring and the relicensing study into a single effort.

Consequently, Douglas PUD is requesting formal concurrence from the CCT and DAHP to conduct the 2007 triennial monitoring as part of the proposed relicensing study. Douglas PUD has contracted with the CCT History/Archaeology Program to conduct this study, which is scheduled to be completed by August, 2008. Therefore, a monitoring report will not be prepared in 2008.

If you would like to discuss this further, please contact me at 509-881-2242 or at gbrett@dcpud.org.

Sincerely,

Lordon Brett

Gordon Brett Property Supervisor

The Honorable Kimberly D. Bose, FERC c: Mr. Frank Winchell, FERC Appendiznelosure

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CULTURAL RESOURCES INVESTIGATION

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

May 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington Unofficial FERC-Generated PDF of 20070719-0061 Received by FERC OSEC 07/16/2007 in Docket#: P-2149-007

For copies of this study plan, contact:

Public Utility District No. 1 of Douglas County Attention: Relicensing 1151 Valley Mall Parkway East Wenatchee, WA 98802-4497 Phone: (509)884-7191 E-Mail: <u>relicensing@dcpud.org</u>

ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5).

The Cultural Resources Work Group (CRWG), which is composed of stakeholders (resource agencies, tribes and FERC) and Douglas PUD staff, was formed for the purpose of identifying issues and information gaps that may require study during the relicensing of the Wells Project. The CRWG, through a series of technical meetings, is proposing to conduct a Cultural Resources Investigation to resolve existing gaps in knowledge of cultural resources in the Area of Potential Effect (APE).

The Cultural Resource Investigation will identify and revisit all previously recorded historic properties within the APE, update the current location and condition of each site, update the site forms for each site, develop a prioritized list of sites and evaluate whether they are eligible for the National Register of Historic Places (NRHP), and evaluate the Project's effects on historic properties identified within the FERC Project boundary.

The results of this study will be used to develop protection, mitigation, and enhancement (PME) measures for historic properties in the Wells Project APE. The PME measures will be incorporated into the Historic Properties Management Plan (HPMP) which will be filed with FERC along with the final license application in May, 2010.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.8 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides of the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1 Location Map of the Wells Project

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The goal of this study is to establish sound baseline information about cultural resources within the Wells Project boundary for the development of a Historic Properties Management Plan (HPMP).

Specific objectives for meeting this goal are as follows:

- Update the current location and condition of all known cultural resource locations within the Area of Potential Effects (APE);
- Update site forms for all sites identified within the APE;
- Conduct archaeological survey within high priority portions of the APE;

- Develop a list of priority sites for Determinations of Eligibility (DOE);
- Complete DOEs for priority sites; and
- Evaluate the Project's effects on historic properties identified within the APE.

The results of the Confederated Tribes of the Colville Reservation Traditional Cultural Property (TCP) study will be incorporated into the above goals and objectives.

3.0 STUDY AREA

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The Wells Project APE was defined by the CRWG as follows:

The Wells Project area of potential effect (APE) includes all lands within the FERC Project boundary. The APE also includes any lands outside of the Project boundary where cultural resources may be affected by Project-related activities that are conducted in compliance with the FERC license (e.g. the Wells HCP Tributary Conservation Program).

For the purposes of this study, the APE includes those lands within the FERC Project boundary. The Wells Project boundary extends from the tailrace of Wells Dam (River Mile [RM] 514.7) upstream to the tailrace of Chief Joseph Dam (RM 544.5). The boundary also extends to RM 15.5 on the Okanogan River and RM 1.5 on the Methow River (Figure 1.1-1). The Wells Project also includes a 41 mile 230kV transmission right of way which will be included as part of the APE in this study (Figure 3.0-1).





4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Cultural Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established a Cultural Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues and to develop preliminary study plans to be included into the Wells Pre-Application Document (PAD).

Through a series of seven meetings, the Cultural RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWGs' efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Cultural RWG is proposing to conduct a study to evaluate potential project related impacts on cultural resources. The need for this study was agreed to by all of the members of the Cultural RWG, including Douglas PUD. This study will help to inform future relicensing decisions and will fill data gaps that have been identified by the Cultural RWG.

4.2 Issue Statement

Issue Statement (PAD Section 6.2.4.1)

Continued operation of the Wells Project affects cultural resources that are listed or considered eligible for inclusion in the National Register of Historic Places.

Issue Determination Statement (PAD Section 6.2.4.1)

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies having the authority to license any undertaking to take into account the effect of the undertaking on historic properties. Because the Wells Project is licensed by FERC, the relicensing process is considered a federal undertaking and the NHPA and its implementing regulations are applicable.

There are a number of Project effects that might harm cultural resources. Erosion of the shoreline caused by Project operation could expose buried cultural resources or damage traditional cultural properties (TCPs). Other ground disturbing activities related to ongoing Project license compliance activities could also impact cultural resources.

Starting in early 2006, a cultural resource data review was implemented in an effort to understand what archeological and historical property information is currently available for the Wells Project. This effort is being conducted jointly by Douglas PUD, the Confederated Tribes

of the Colville Reservation and Western Shore Heritage Services. Douglas PUD has also agreed to fund the Confederate Tribes of the Colville Reservation to conduct a TCP study starting in 2006.

The resource work group agrees that a study is needed during the two-year ILP study period to evaluate potential project related impacts to cultural resources. Most, if not all, of the Wells Project has been surveyed for cultural resources. Archaeological monitoring is conducted every three years. Additional archeological surveys may not be required. However, site forms need to be updated for existing sites, and some sites may need to be evaluated for National Register Eligibility.

4.3 Wells Cultural Resources Data Review (2006)

Over the last 50 years, numerous archaeological investigations have been carried out within and adjacent to the Wells Project area. A total of 171 archaeological sites have been identified in the APE. One hundred sixty are pre contact sites, nine are historic, and two have historic and pre contact components. Because of the volume of information on cultural resources within the Wells Project, Douglas PUD hired Western Shore Heritage Services (WSHS) to conduct a cultural resources data review. With the assistance and guidance of the Cultural RWG, WSHS reviewed archaeological site forms, reports of cultural resources investigations, ethnographic literature, and Indian Allotment data within and adjacent to the Wells Project area¹. The draft report is currently being reviewed by the Cultural RWG (WSHS, 2006 draft).

5.0 **PROJECT NEXUS**

Section 106 of the National Historic Preservation Act requires federal agencies having the authority to license any undertaking to take into account the effect of the undertaking on historic properties. Because the Wells Project is licensed by FERC, the relicensing process is considered a federal undertaking and the NHPA and its implementing regulations are applicable.

There are a number of Project related activities that affect cultural resources. Erosion of the shoreline caused by Project operation could expose buried cultural resources or damage TCPs. Other ground disturbing activities related to ongoing Project license compliance activities may include issuance of permits for developments within Project boundary; construction of docks, parks, or roads; recreation; vandalism; and inundation and saturation of sites.

6.0 METHODOLOGY

Step 1: Identify historic properties within the APE

The Wells Project has been the subject of repeated cultural resources surveys, extensive testing and data recovery at several sites. Shoreline monitoring has taken place at many archaeological sites every three years since 1989. Monitoring of archeological site protection measures occurs annually. Monitoring surveys also examined new shoreline exposures for archaeological

¹ The term "Wells Project area" or "project area" refers to locations both within and adjacent to the FERC Project boundary (APE).

deposits. Therefore, the nature and geographic distribution of archaeological sites within the Project is well documented; and, it is not probable that an archaeological inventory of the entire Project would identify many new, previously unrecorded sites. However, because the quality of site inventory information within the Project APE is variable, sites in the APE where information is lacking will be revisited to update locational information, to assess site condition, and to identify project impacts.

Step 2: Conduct archaeological survey within high priority portions of the APE

The Cultural RWG has evaluated previously conducted cultural resource surveys and monitoring efforts to determine the need for additional inventory within portions of the APE. Based upon this evaluation, the Cultural RWG recommended a re-survey for 15.5 miles of the Okanogan River, from the north end of the project boundary to the confluence with the Columbia River at Cassimer Bar, as well as for all active erosion sites and known Indian allotments identified within the project APE. A survey of the 41-mile, 235 ft-wide, 230 kV transmission-lines corridor will also be conducted.

Step 3: Update Site Forms, Site Condition and Locations

Consistent baseline data are not currently available for each archaeological site in the APE. For example, information for 68 sites has not been updated since the sites were first recorded in the 1950s and 1960s. It is possible not all previously recorded sites in the APE (approximately 171) are still extant; some sites have been inundated or may have lost integrity. In addition, comprehensive up-to-date data about the kinds and degree of effects of the Wells Project on archaeological sites is not currently available. Site revisits will provide a comprehensive data set to document site conditions and location. Locations will be updated using Global Positioning System (GPS) as well as orthophotographic field maps, and will be incorporated into a revised Geographical Information System (GIS) database. The updated data set will be used to update the site forms.

Step 4: Development of a Prioritized List of Sites

Based on the results of Steps 1 and 2, the contractor will propose and the Cultural RWG will refine and recommend a list of priority sites that will be evaluated further to determine their potential eligibility for the NRHP or whether they are contributing elements to the Wells Archaeological District. Priority sites will be those that are near areas of erosion, recreation sites, or other locations that have a high probability of being adversely impacted.

Step 5: Site Evaluations and Determinations of Eligibility

The identification effort will assemble currently available data for each site in the APE and identify which sites could be recommended as NRHP–eligible based on existing information. Sufficient information for a portion of the known sites may exist to develop DOEs, or to determine if they are contributing elements to the Lake Pateros Archaeological District. The PUD will develop DOEs for those sites for which sufficient information is available to support

the determination. This effort would follow site revisits and probably could be accomplished during the remainder of the 2008 field season or during the spring of 2009.

Accurate site boundaries presently are not available for most archaeological sites. And, most of the sites in the APE have not been formally evaluated for NRHP eligibility. The Cultural RWG will develop a prioritized list of sites that will require additional work in order to prepare DOEs. This effort would follow site revisits and might be accomplished during the remainder of the 2008 field season or during the spring of 2009.

Step 6: Evaluate Project Effects

Once all sites have been revisited and a determination of eligibility developed, it will be possible to identify project effects on historic properties determined to be eligible. The nature and degree of effects will be consistently documented using a series of protocols developed in concert with the Wells Cultural RWG. Information regarding project effects on historic properties would be used in developing PMEs. The information collected from the above steps will be used in developing a Historic Properties Management Plan that will be issued with the Draft License Application which will be filed in December of 2009.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

Cultural resources investigations for this study will be conducted by professional archaeologists who meet the standards issued by the U. S. Department of the Interior through the National Park Service (Code of Federal Regulations, 36 CFR Part 61; Secretary of the Interior's Standards and Guidelines, Federal Register, Vol. 48, No. 190, Thursday, Sept. 29, 1983, pp. 44738-39).

The field component of this study will require a small survey crew and a boat. This study requires no other specialized equipment.

8.0 BUDGET

Based on presently available information, this study is estimated to cost about \$250,000. This budget includes field time to visit all existing sites, assumes some minimal field survey, time to prepare DOE assessments and documentation for all sites, and participation in the Cultural RWG.

9.0 SCHEDULE

<u>May 2007 – July 2007:</u> Conduct pre-field research (Steps 1 and 2).

October 2007 – November 2007: Visit priority sites, conduct survey, and update site forms (Step 3).

<u>December 2007 – March 2008:</u> Develop list of priority sites for NRHP evaluation (Step 4). January 2008: Traditional Cultural Properties Study complete.

<u>April 2008 – July 2008:</u>

Complete any additional site testing, DOEs, and determine Project effects (Step 5 and 6).

<u>August 15, 2008:</u>

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Cultural Resource Field Reconnaissance and Survey complete.

October 15, 2008: ILP deadline for Initial Study Report.

<u>August 2009:</u> Draft Historic Properties Management Plan due to be incorporated into the Preliminary License Proposal or draft License Application.

October 15, 2009: ILP deadline for Final Study Report.

10.0 REFERENCES

Berger, M and G. Hartmann. 2006. Cultural Resources Data Review for the Wells Relicensing Project, Douglas and Okanogan Counties, Washington. Western Shore Heritage Services, Inc.

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Email to Stakeholders from Douglas PUD regarding Final Study Plan Meeting Notes From: Mary Mayo Wednesday, July 11, 2007 2:30 PM Sent: To: Gar Jeffers (garj@jdsalaw.com); 'nickc@okpud.org'; 'dan b@okpud.org'; 'paulnelson11@yahoo.com'; 'm.mazzola@usa.net', Art Viola; Bill Towey; Bob Clubb; Bob Dach; Bob Heinith; Bob Jateff; Bob Rose; Brad Hawkins; Brad James; Bryan Nordlund; Carl Merkle; Carmen Andonaegui; David Turner (david.turner@ferc.gov); Dennis Beich; Joe Miller; Joe Peone; John Devine; Jonathan Merz; Keith Kirkendall; Mark Miller; Mary Mayo; Molly Hallock; Pat Irle; Robert Easton; Sally Sovey; Shane Bickford; Steve Lewis; Steve Parker; Tony Eldred (eldredte@dfw.wa.gov); Bob Clubb; Camille Pleasants; Chuck James; Frank Winchell; Glenn Hartmann (glenn@wshsinc.com); Gordon Brett; Guy Moura; Margaret Berger; Mary Mayo; Richard Bailey; Rob Whitlam; Scott Kreiter; Shane Bickford; Timothy Bachelder; Andy Lampe; Bill Fraser; Bob Fateley; Brenda Crowell; Chris Parsons; Diane Priebe; Gail Howe; George Brady; Jean Hardie; Jim Eychaner; Jim Harris; Lee Webster; Mary Hunt; Mike Nickerson; Mike Palmer; Neal Hedges; Pat Haley; Patricia Leppert; Susan Rosebrough; Beau Patterson; Dan Trochta; Dinah Demers; Jim McGee; Marc Hallett; Matt Monda

Subject: Final Meeting Minutes 6-14-07

Attachments: Final_Study_Plan_Meeting_Summary_06-14-07.pdf

Please find attached the final meeting minutes for the Wells Relicensing Study Plan Meeting on June 14, 2007.

Please note that the final meeting minutes are also located on the Wells Relicensing website at http://relicensing.douglaspud.org/

Should you have any comments or questions, please feel free to contact Shane Bickford, Supervisor of Relicensing at (509) 881-2208 or sbickford@dcpud.org.

Thank you.

Mary E. Mayo Douglas County PUD 1151 Valley Mall Parkway East Wenatchee, WA 98802 Direct: (509) 881-2488 Fax: (509) 884-0553



Study Plan Meeting

Meeting Summary

Wells Hydroelectric Project Relicensing Douglas County PUD Auditorium 1151 Valley Mall Parkway East Wenatchee, Washington

> June 14, 2007 9:00 am –12:00 pm

ATTENDEES:

Please see attached Sign-In Sheet for attendees.

Shane Bickford, Douglas PUD, welcomed everyone to the meeting. He gave an overview of the Proposed Study Plan (PSP) meeting goals and objectives and the materials handed out prior to the meeting (agenda, baseline study list, resource chronology and power point presentation). All of the studies contained within the PSP were based on FERC's seven study criteria, which is located within the pages of the PSP document, in the CFR, on FERC's website and on Douglas PUD's website.

In 2005, Douglas PUD began the Resource Work Group (RWG) meetings. The goals of the RWG meetings were to engage the stakeholders and to learn about FERC's Integrated Licensing Process (ILP), identify and evaluate issues against FERC's Study Criteria, develop the study plans, and ultimately file the study plans in the Pre-Application Document (PAD). Douglas PUD wanted to get information out early to assist in the decision making process. Shane reviewed the list of Baseline Studies and FERC's seven study request criteria.

The 12 issues identified by the RWGs, that met FERC's seven study criteria, were collaboratively developed by the RWGs into "Agreed Upon" Study Plans and were included into the PAD and filed with FERC on December 1, 2006. An updated version of the 12 study plans were included in the PSP that was filed with FERC on May 16, 2007.

Scott Kreiter, Douglas PUD, discussed the objectives of the Cultural, Recreation and Land Use, and Terrestrial study plans contained within the PSP. The list of the study plans for these resource areas are as follows:

- Cultural Cultural Resources Investigation
- Recreation and Land Use Public Access Study, Recreational Needs Analysis
- Terrestrial Nuisance Wildlife Control Study, Transmission Line Wildlife and Botanical Study

Bao Le, Douglas PUD, discussed the objectives of the Aquatic study plans contained within the PSP. The list of the study plans for this resource area is as follows:

• Aquatic – Juvenile Lamprey Study, Lamprey Spawning Assessment, Adult Lamprey Passage Study, Total Dissolved Gas Investigation, Water Temperature Study, DO, pH and Turbidity Study, Okanogan Toxins Study

Shane Bickford gave a summary of the stakeholder's study requests filed with FERC by the April 2nd deadline. He also reviewed the criteria that Douglas PUD used to identify a study request and reviewed the criteria used to categorize study requests as either formal or informal study requests.

Eleven comment/study request letters were filed with FERC by the April 2nd deadline for study requests. Douglas PUD categorized each study request as either a formal or informal study request. Douglas PUD counted only one formal study request. The other ten study requests were considered informal due to their lack of information. All of the 11 study requests (formal and informal) were categorized further as being: 1) Appropriate for Study, 2) Appropriate for Study with Alternative Methodology, or 3) Not Appropriate for Study. None of the 11 study requests were grouped into the first category, four (4) were grouped into the second category and seven (7) were grouped into the third category.

Summary of Stakeholder Study Requests

Recreation and Socioeconomic Issues – Study Requests deemed Appropriate with Alternative Study Methodology

Cities of Brewster & Pateros – Visitor Information Center Cities of Brewster & Pateros – Need for Public Use Facilities and Access Cities of Brewster & Pateros – Boat Storage

Scott Kreiter provided Douglas PUD's view of the Visitor Information Center, Boat Storage and Public Use study requests. Douglas PUD viewed all three of these requests as informal study requests as they did not attempt to address FERC's seven study criteria. Scott indicated that rather than studying whether a new visitor information center, boat storage or any new public use facilites would increase visitor use of the project area that it would be more appropriate to first study whether there is an identified need for various recreational improvements and then, if a need has been identified and that need is closely related to project purposes, Douglas PUD will work with stakeholders to determine how best to meet those needs.

George Brady, City of Pateros, informed the meeting participants that the Visitor Center at Wells Dam was closed in 2001. He did not view this study request as a request for a new facility but as a reminder that Douglas PUD needs to either open or replace the existing center. David Turner and Bob Easton, FERC, asked how Douglas PUD would assess the number of people using the visitor center given that it is now closed and did the PUD have any available data on visitor use? Scott Kreiter indicated that the PUD had conducted a Visitor Use Assessment in 2005-2006 and that the data from that study would be used during the development of the Needs Assessment. Shane Bickford added that the Wells Dam Visitor Center has a visitor log that includes the number of visits observed both before and after September 2001. Jim Eychaner, IAC, mentioned that Washington State has available information and that data may be helpful during the development of the Needs Assessment.

Recreation and Socioeconomic Issues - Study Requests Not Appropriate for Study

Betty Wagoner – Access to Wells Reservoir

Scott Kreiter indicated that this issue was also categorized as an informal study requests as it did not attempt to address FERC's seven study criteria. Douglas PUD does not believe a study is needed for the requested information as this issue will be addressed in the Shoreline Management Plan. This management plan will balance the needs for fish and wildlife habitat protection versus the desire by local stakeholders to have private docks located on Douglas PUD property within the Wells Project boundary.

City of Pateros – Impacts of Wells Project on Local Communities

Scott Kreiter indicated that this was the only study request that attempted to address FERC's seven study criteria. He also indicated that Douglas PUD was not proposing to conduct this study because the information would not be of use during the development of license requirements and because the study was focused on original project impacts that were already mitigated during the term of the first license. He also indicated that there are a lot of factors that impact the economy and that socio-economic studies can be very subjective. The issues raised are not appropriate for study but may be better suited to a one-on-one discussion between Douglas PUD and the City of Pateros. George Brady stated that he thinks that Wells Dam has had a negative impact on all three cities and in particular on Pateros during project construction. George indicated that the entire downtown business corridor was displaced by the Project and that these impacts have not been properly mitigated.

Bob Easton, FERC, pointed out that FERC has historically not required licensees to compensate adjacent communities for original project impacts during relicensing. He asked George Brady what he would do with the information collected from the proposed socio-economics study. He encouraged Pateros to look for the nexus to ongoing project operations. David Turner, FERC, said that this meeting and the upcoming filing deadline provide an opportunity for the City of Pateros to present additional information to bolster their study request. As written, the current socio-economics study request is not expected to be recommended given FERC's prior precedence. They added that based on their experience, they have not seen the Commission require improvements to a city's infrastructure, such as roads, water and sewer, in a relicensing case. Usually these improvements are the responsibility of the city.

City of Brewster – Sewer Treatment Plant Expansion

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott also indicated that this is not a project related issue and has no nexus to project operations. Lee Webster, City of Brewster, indicated that this was not a study request but rather a placeholder for future discussions related to expansion of the sewer treatment plant. Lee Webster said that the city is undergoing its third phase of updating the sewer. The next phase will have to last for the next 15-20 years and will be cost prohibitive for the city. There is no room for expansion at the existing site.

City of Pateros – Maintenance and Operation of Recreation Facilities

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott also indicated that costs for Operation & Maintenance could not accurately be developed until the Needs Assessment has developed an accurate picture of future needs and proposed facilities.

Terrestrial Wildlife and Botanical Issues - Study Requests Not Appropriate for Study

Bureau of Indian Affairs – Pre-Project Habitat Evaluation

Scott Kreiter indicated that Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Scott noted that BIA recently toured the Wells Project and the BIA representatives indicated that they were comfortable with the wetland and riparian mitigation measures currently in place and expected to be in place during the next license term. However, BIA indicated that they still may file comments in the future should other issues arise.

Transmission Line Surveys

David Turner, FERC, pointed out that avian electrocution and collision with project transmission line was identified as an issue at scoping based on our understanding of the issue statement. The transmission study proposes to look at habitat types and for evidence of dead birds, but does not explain how a risk assessment would be conducted. David Turner recommended that Douglas PUD and the resource work group consider and develop a risk assessment protocol that clearly describes how the assessment of project impacts will be conducted. David Turner pointed to the example of a risk assessment protocol used by PacifiCorp that is described in AVIAN PROTECTION PLAN (APP) GUIDELINES issued by the Edison Electric Institute and Fish and Wildlife Service.

Shane Bickford, Douglas PUD, indicated that the study plans contained within the PSP were developed through active negotiations and that the intent was to agree on the goals and objectives for each study and that each of the documents was rigorously reviewed and collaboratively developed by the RWGs. The methods sections are as specific as each RWG choose to make them and varies from being very general for the cultural resource study plan to very specific in the adult lamprey spawning assessment and adult lamprey telemetry study plans.

As a general matter, David Turner, FERC, wanted to stress a couple of points with regard to studies. Specific methods should be identified or spelled out in each study plan to the greatest extent possible. For example, make sure the timeframes for searching for noxious weeds or protected plants within the transmission line corridor are clearly defined. He would like to avoid criticisms of study methods later in the process that may lead to recommendations for further study.

Douglas PUD agreed to update the 230 kV transmission line study to increase the level of specificity related to methods and survey techniques and to update the Recreation Needs Assessment to include several of the issues discussed during today's meeting.

Aquatic and Water Quality Issues – Study Requests deemed Appropriate for Study with Alternative Study Methodology

WDFW - Toxins Study

Bao Le, Douglas PUD, informed the group that Douglas PUD met with WDFW on May 26, 2007 to discuss their proposed alterations to the existing toxins study plan. After clarifying the study design, it was agreed that there was no need to expand the scope of the existing (PSP proposed) toxins study to include the sampling sites on the mainstem Columbia River. Bob Heinith, Columbia Inter-Tribal Fish Commission, asked if the toxins study would be sampling any anadromous fish species. Bao Le, Douglas PUD, indicated that the study will sample toxins in the tissue of three species of resident fish. The fish selected for sampling are of recreational interest, live within or adjacent to the Wells Project their entire life and are the same species sampled by WDOE during past surveys.

Carmen Andonaegui, WDFW, asked whether there has been a toxin study conducted on the mainstem Columbia River. Bao indicated that he was not aware of any sampling and that there was no indication that there has been a toxins problem along the mainstem Columbia River, within the Wells Reservoir.

Lee Webster, City of Brewster, wanted to know why large mouth bass were not included in the toxins study. Shane Bickford, Douglas PUD, indicated that the intent of the study was to followup on recommendations made within the WDOE's Detailed Implementation Plan (DIP). The DIP recommended that future monitoring be conducted to track the levels of toxins found in fish and sediment over time to determine whether toxin levels are being diluted by new, cleaner material entering the river or whether the prevalence of DDT and PCBs are increasing. Therefore the toxin study plan is based around sampling the same fish that where sampled during prior studies conducted by WDOE. Bob Heinith, CRITFC, asked about whether the study would also be looking at the percentage of toxins in the sediment of the Okanogan River. Shane Bickford, Douglas PUD, indicated that several past studies have collected and analyzed sediments sampling for toxins and that the study proposed by Douglas PUD, in the PSP, will also include sediment sampling using the same or similar sampling protocol. Bao Le indicated that indeed the study will look at sediment cores and that sampling sites were identified based upon their tie to human health concerns (recreation sites). The results of the study will be used to educate and inform recreational user of the Okanogan River, within Project Boundary.

Aquatic and Water Quality Issues - Study Requests Not Appropriate for Study

WDFW – Aquatic Invasive Species (AIS)

Bao Le described Douglas PUD's rationale for not proposing to conduct WDFW's AIS study request. Douglas PUD categorized this study request as an informal study request as it did not attempt to address FERC's seven study criteria. Bao Le, indicated that Douglas PUD did not consider this study request appropriate for study because the request information is already being collecting through coordinated activities with Portland State and WDFW Nuisance Species program. Current efforts include annual quagga mussel and zebra mussel monitoring and the completion of a base studies on aquatic weeds, including milfoil, and exotic macroinvertebrates. Therefore

These issues were discussed with WDFW and they agreed that because the information was already being collected that there was no additional need to conduct a separate relicensing study on Aquatic Invasive Species.

WDFW – Pikeminnow Removal Program on Resident Fish

Bao Le discussed that Douglas PUD is already doing a number of things to address this issue on a yearly basis and have discussed this issue with WDFW. It was decided that no additional RWG meetings were needed to discuss this issue as Douglas PUD had previously met with WDFW, on May 26th, and that at that meeting WDFW agreed that there was no need to conduct this study during the ILP study period.

This concluded the discussion of the stakeholder study requests.

Shane Bickford asked for additional comments related to the studies discussed during today's meeting.

There was a discussion on the Shoreline Management Plan and how this management plan will address a variety of issues that are common to all of the resource areas. Lamprey predation was discussed at length. Bao Le said no one knows how to quantify population abundance for juvenile Pacific lamprey. Sampling technology is still being developed and little is known about the behavior of juvenile lamprey in the substrate. George Brady was concerned about the effects of low water on juvenile lamprey. Bao Le mentioned that 98% of the time, Wells Dam operates within 2 feet of the normal elevation (781). It is difficult to quantify the impact of operations on juvenile lamprey given that lamprey collection techniques are still rather crude and unable to accurately count the number of lamprey in a given area of reservoir strata.

Susan Rosebrough, National Park Service, and Lee Webster, Brewster, asked whether issues related to the Recreational Use Assessment had been resolved. In particular Susan and Lee wanted to know if prior questions related to the conduct of the Visitor Use Assessments had been addressed. Specifically, questions related to counts of people participating during festivals, "after-hours" counting and collection of data from minority user groups that did not speak English. Scott Kreiter, Douglas PUD, mentioned that he would follow up with Lee and Susan to address their questions about how Douglas PUD had addressed prior questions related to the Visitor Use Assessment.

Shane Bickford went over the ILP timeline and talked about when the next round of comments are due. Douglas PUD will get together with folks who have raised issues today in an effort to understand and hopefully resolve their issues. Shane Bickford asked if there were any other issues to be covered during today's meeting.

Steve Lewis, FWS, raised questions about scientific validity for certain studies and that there may be a need for 2 years of studies for specific issues. Shane Bickford indicated that the second year of ILP studies is intended to answer questions from the first year, if there are any. Bao agreed that if the data are insufficient, then a second year will need to be done. David Turner and Robert Easton, FERC, indicated that the regulation was developed to address the need for a second year of study. The regulations indicate that a second year of study shall be based upon the failure to achieve the goals identified in the first year study plan. A second year of study might also be required in the instance that the field season, for the first year study, was not representative of average conditions (e.g. high water or dry year). Scenarios were discussed including what would happen if sample size targets for a study were not met or what would happen if the study year was unusually dry or wet. FERC staff reviewed their criteria for determining whether there is a need for a second year.

Meeting adjourned at 12:05 pm. Appendix A - 160

SIGN IN SHEET

STUDY PLAN MEETING

June 14, 2007 Douglas County PUD 1151 Valley Mall Parkway East Wenatchee, WA

	NAME	ORGANIZATION	TELEPHONE NO.	EMAIL ADDRESS	
	MIKENICKERSO	N WA. STATE PARKS	923-2473	ALTALAKE @ PARKST	NA, GOV
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	Michelle Mazzok	Resource Solutions	\$669.4442	m.mazzola@usa.net	
I C	Juckylle	BLM	665-2100	ssovey@br.blm.gov	
	DavidFurner	FERC	202-502-6091	David Turver CFERC. Gov	
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/	Bob Easton	11	202 502 6045	robert. easton@ferc.gov	
	George Bord	y PAYEses	509.923-2319	checkleb@Herman	Ciz
	Lee hlebster	City of Brewskr	509-689-3464	brewster mayor @ hotmail.com	
	Gar 1/2/100	atta-Douglus	667-366.	5	
	Bob Heinith	CRITEC	503-731-12-89	heibecritfc.org	
	JIM EYCHANR	1AC 30	609023011	jine @ jac. wa.gov	
	Steve Lewis	FWS	509/665-3508	· Stephen Kenis atws: gol	\sim
	Brad Hawkins	Douglas PUD	509 8847191	bhawkins@dcpud.org	
	Nick Christoph	Of Co. PUD	422-8472	Nick C& okpup.org	
4	Dan Boettger	OK CO PUD	422-8425	dan_bookfud.org	
	Maye Billford	ACPNIS	881-2208	spickpordadeprovier	7
	Stan Kojam	NB	0220-4121	SUDCIM RESERVEDANDE	
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SIGN IN SHEET STUDY PLAN MEETING

June 14, 2007 Douglas County PUD 1151 Valley Mall Parkway East Wenatchee, WA

NAME	ORGANIZATION	TELEPHONE NO.	EMAIL ADDRESS
Gordon Brett Bob Clubb	DCPUD	884-7191	gordonbedcpud.org bobcedcpud.org
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Appendix A - 162			

Email to NPS, City of Brewster, and IAC from Douglas PUD regarding Recreation Needs Analysis

Attachments: Wells_Reservoir_Recreational_Needs_Aanalysis[2].DOC

From: Scott Kreiter
Sent: Wednesday, July 11, 2007 11:15 AM
To: jime@iac.wa.gov; 'Lee Webster'; 'Susan_Rosebrough@nps.gov'
Subject: Wells Reservoir Rec Needs Analysis

Susan, Lee, and Jim,

Please find attached the reviesed Rec Needs Analysis for the Wells Project. I hope these edits address your concerns regarding Hispanic use of the reservoir. Please feel free to provide any feedback you may have. This was your issue, so i want to be sure that you are comfortable with the changes before sending out to the rest of the work group. All of the changes are highlighted in yellow.

You will also see that we added some additional detail to the methods section on estimating future recreation use. This was in response to a suggestion by FERC that we be sure that everyone in the RWG has an understanding of the protocol we plan to use. Jim and Susan - you are the experts on this, so your feedback on this added methodology would be helpful.

Thanks much for your input. -Scott

AN EVALUATION OF RECREATIONAL NEEDS WITHIN THE WELLS PROJECT (Recreational Needs Analysis)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007 Comment [SDK1]: Date to be filed with Revised Study Plan

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington

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ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5).

The Recreation and Land Use Resource Work Group (RWG), which is composed of stakeholders (resource agencies and tribes) and Douglas PUD staff, was formed for the purpose of identifying issues and information gaps that may require study during the relicensing of the Wells Project. The Recreation RWG, through a series of technical meetings, is proposing an analysis of future recreation needs associated with operation of the Wells Project.

The purpose of the Recreation Needs Analysis is to evaluate recreational use information and identify current and future recreation needs within the Wells Project boundary. The needs analysis will identify recreation needs within the Project that recreation resource managers should strive to address during the term of the new license.

The needs analysis will evaluate existing recreation use data, assess the current condition of existing facilities, and identify potential enhancements to meet current and future recreation needs. The results of this study will be used to help Douglas PUD identify existing and future recreation needs so that protection, mitigation, and enhancement measures can be developed for the new license term.

Page 1

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.8 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides of the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet.

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;
 (2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

Page 2

(5) Explain any nexus between project operation 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;

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

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The goal of this study is to research, describe, and quantify recreation and access needs in the Wells Project that should be addressed over the term of the next 50-year FERC license. Specific objectives include:

- Summarize study findings to evaluate recreational use and demand within the Wells Project. This summary will be based on results of the 2005 Wells Project Recreation Visitor Use Assessment and existing information from FERC Form 80s for the Wells Project, Interagency Committee for Outdoor Recreation outdoor recreation participation survey, WDFW fisherman surveys, WDFW hunter surveys, City of Bridgeport's Marina Park information and other relevant recreational survey information.
- Assess the needs of Hispanic use of recreational facilities and resource areas.
- Assess the adequacy of existing Wells Project recreation facilities to accommodate current and future recreation demand.
- Assess the adequacy of public access and safety at Wells Project recreation facilities.
- Assess the adequacy of operations and maintenance at Wells Project recreation facilities.
- Develop a prioritized list of potential actions to address Wells Project recreation issues. The list should include criteria such as demand, effectiveness, feasibility and cost.

The needs analysis should provide information to Douglas PUD, as well as recreation resource managers, for making decisions regarding recreation planning in the Wells Project.

3.0 STUDY AREA

The study area includes recreation and access facilities within and adjacent to the Wells Project boundary. The Wells Project boundary extends from the tailrace of Wells Dam (River Mile [RM] 514.7) upstream to the tailrace of Chief Joseph Dam (RM 544.5). The boundary also extends to RM 15.5 on the Okanogan River and RM 1.5 on the Methow River. Recreation and access facilities within the Project boundary include parks, boat launches, trails, parking areas, fishing access sites, and wildlife lands access sites (Figure 3.0-1).

Page 3



Figure 3.0-1 Location Map of the Wells Project

Page 4
4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Recreation and Land Use Resource Work Group

As part of the Wells Project relicensing, Douglas PUD established a Recreation and Land Use Resource Work Group (RWG) which began meeting in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to identify potential resource issues and to develop preliminary study plans to be included into the Wells Pre-Application Document (PAD).

Through a series of meetings, the RWG identified a set of resource issues that, in their judgment, matched with FERC's ILP study request criteria. The RWG then reviewed the existing project information and determined that several of these issues require additional information.

Based upon these discussions, the RWG is proposing to conduct two studies. These two studies will help to inform future relicensing decisions and will fill data gaps identified by the RWG. The two studies proposed by the RWG include: 1) An Evaluation of Access to the Wells Reservoir as it Relates to Reservoir Fluctuations, Aquatic Plants and Sedimentation and 2) An Evaluation of Recreation Needs within the Wells Project. The proposed Recreation Needs Assessment will focus on collecting information pertinent to Recreation Issues, PAD Section 6.2.2.4, 6.2.2.5, 6.2.2.6 and 6.2.2.7 identified by the RWG.

4.2 Issue Statements

Issue Statement (PAD Section 6.2.2.4)

Recreation proposals under the license need to consider Endangered Species Act (ESA), Americans with Disabilities Act (ADA), Electric Consumers' Protection Act (ECPA), State Comprehensive Outdoor Recreation Plan (SCORP), County Shoreline Master Programs as well as local ordinances, laws, regulations and comprehensive plans.

Issue Determination Statement (PAD Section 6.2.2.4)

Douglas PUD agrees that proposals under the new license need to consider all of the abovementioned laws, plans and regulations. These should be applied at existing and future recreation sites. The resource work group agrees that additional information is needed and a study is recommended during the two-year ILP study period. An evaluation of ADA compliance and other regulations will be considered in the Recreation Needs Assessment.

Issue Statement (PAD Section 6.2.2.5)

Existing recreation facilities may not meet future recreation needs through the duration of the next license term. Recreation plans under the new license should consider recreation trends and an analysis of the condition and capacity at recreation facilities.

Page 5

Issue Determination Statement (PAD Section 6.2.2.5)

Douglas PUD completed a Recreation Visitor Use Assessment for the Wells Project conducted in 2005. This assessment will be useful in answering questions related to the current use of existing recreation facilities.

The existing Wells Project recreation sites were developed under the original license to provide safe and efficient access to Project lands and waters. Safe and efficient access to Project land and waters is a requirement of the original FERC license and is expected to be a requirement under the new long-term FERC license. Enhancements to existing facilities or the installation of new sites/facilities will be considered based upon projected use and capacity ratings, consistent with FERC recreation policies.

The current condition of existing recreation facilities and their ability to meet future needs is unknown. The resource work group agrees that additional information is needed and that a Recreational Needs Assessment should be conducted during the two-year ILP study period. This study should assess the condition of existing facilities and evaluate the ability of existing facilities to meet future recreation demands within the Wells Project. The Recreation Needs Assessment should also consider results from the Interagency Committee for Outdoor Recreation's (IAC) statewide outdoor recreation participation survey and the WDFW fishermen survey and additional recreation information from the Project area.

Issue Statement (PAD Section 6.2.2.6)

The new license should consider new facilities or enhancements to existing facilities (e.g. Chief Joe Hatchery, Fort Okanogan State Park and Interpretive Center, Fort Okanogan Overlook Site, Wells Visitor Center, Pateros Visitor Center, Alta Lake State Park and Wells Tracts off Pit Road) and should consider trails and trail linkages between communities.

Issue Determination Statement (PAD Section 6.2.2.6)

The resource work group agrees that a Recreational Needs Assessment is considered necessary during the two-year ILP study period. The results of this study will help identify potential enhancements to meet current, future and potential recreation needs within the Project, including the possibility of trails and trail linkages between communities. The study will help to determine whether adequate demand exists to justify the construction of new recreation facilities and will consider existing and future plans for recreation sites in the Project vicinity. Enhancements to existing facilities outside the Project will be considered if recreation needs cannot be met within the Project boundary.

Page 6

Issue Statement (PAD Section 6.2.2.7)

Wells Dam may be a hindrance to river travel.

Issue Determination Statement (PAD Section 6.2.2.7)

Douglas PUD is not aware of an ongoing need for human river travel past Wells Dam. Wells Dam operators have identified only three instances where the public has requested portage either upstream or downstream of the dam in the past five years. In each instance, Douglas PUD has been able to adequately accommodate these individuals and transport their equipment. This issue may have a tie to the Project if a significant need is identified in the future.

The resource work group agrees that a study is not needed during the two-year ILP study period. An evaluation of portage options to address this issue should be considered in the Recreation Needs Assessment.

4.3 Recreation Visitor Use Assessment (2005)

Douglas PUD completed a Recreation Visitor Use Assessment during May to December of 2005 in an effort to collect information related to visitor use at Wells Project recreation sites (DTA, 2006). The primary goals of this study were to assist in the preparation of the PAD and to describe use levels, preferences, attitudes and characteristics of the Wells Project's primary recreation user groups. Specific objectives included:

- Describing recreation respondents' characteristics;
- Describing user preferences for recreation settings and facilities;
- Identifying possible recreation conflicts, crowding, or personal safety issues;
- Describing users' attitudes toward management actions;
- Describing recreation respondents' activities; and
- Identifying the amount, activity type and spatial and temporal distribution of existing recreation use.

A stratified systematic sampling strategy was chosen for the Recreation Visitor Use Assessment. To ensure that diversity in types of recreation users and variation in type of days visited, sampling was conducted at designated recreation sites and on the Wells Reservoir from May 24, 2005 through December 13, 2005, months that together account for the majority of use.

4.4 Recreation Action Plan

Ongoing recreation needs within the Wells Project are addressed through the Wells Recreation Action Planning process. The Wells Recreation Plan (1967), Wells Recreation Plan Supplement (1974), Public Use Plan (1982) and Recreation Action Plans (1987, 1992, 1997 and 2002) were established as part of compliance with Article 44 of the original FERC license. This long-term and ongoing planning and implementation process has helped in the development and maintenance of the sites previously described.

Page 7

Following a two-foot pool raise amendment in 1982, Douglas PUD developed a Public Use Plan for the Wells Project. The plan analyzed the types of public recreation facilities that the Wells Reservoir can reasonably accommodate and discussed how those facilities can be developed and maintained. The information presented in the 1982 Public Use Plan included an analysis of recreation facilities within a 100-mile radius of the Wells Project.

In response to the 1982 Public Use Plan, the National Park Service (NPS) and State Parks recommended periodic updates (every five years) to the 1982 Public Use Plan. By FERC Order dated August 12, 1987, 40 FERC 62,157, this recommendation was made part of the Wells Project license resulting in updates to the 1982 Public Use Plan every five years. Douglas PUD's 1987 Recreation Action Plan, which is a supplement to the 1982 Public Use Plan, was supported by the NPS, Washington State Parks and Recreation Commission and the cities of Pateros, Brewster and Bridgeport. Douglas PUD has also published subsequent updates to the 1982 Public Use Plan in 1992, 1997 and 2002. The next update is scheduled to be completed in 2007.

4.5 FERC Form 80

The FERC Form 80, "Licensed Hydropower Development Recreation Report" is a brief summary of the existing recreation conditions and facilities associated with the Wells Project. Based on FERC regulations, the forms were submitted every two years from 1967 – 1984, every four years from 1984 – 1996 and every six years since 1996. The most recent Form 80 was submitted to FERC in 2002.

FERC's Form No. 80 is used to gather information necessary for the Commission and other agencies to know what recreational facilities are located at licensed projects, whether public recreational needs are being accommodated by the facilities, and where additional efforts could be made to meet future needs.

5.0 **PROJECT NEXUS**

The Wells Project has direct and indirect effects on recreation activities within the Project boundary. The effects include providing public access to Project lands and waters, and the potential effects of Wells Project operations on recreational activities.

Douglas PUD has developed and provides major maintenance at numerous public recreation facilities along the Wells Reservoir. These facilities were developed to provide safe and reasonable access to Project lands and waters. Access to the Project will continue to be needed under the new license and this proposed study will help to determine whether additional facilities are needed to meet the demand in recreational use. In addition, Project recreation facilities may not currently be ADA compliant which could limit access for public use. It is unknown whether the existing facilities, in their current condition, can continue to adequately fulfill the expected level of recreation demand during the next license term.

Page 8

The results of this study will be used to help identify existing and future recreation needs and will be useful during the development of protection, mitigation, and enhancement measures for the new long-term FERC license to operate Wells Dam.

6.0 METHODOLOGY

Assess Existing Unmet Demand

Existing recreation use does not always represent the total existing recreation demand because there may be constraints that limit participation. While there are many potential constraints on recreation use (e.g., lack of free time, cost, geographic distance, lack of skills or equipment), a subset of participation constraints may be closely associated with site-specific management (e.g., limited access to lands or water, use limits or full occupancies at facilities, Project operations that diminish the quality of opportunities, or the lack of information about available recreation opportunities). To assess the general level of unmet demand for Project recreation resources, Douglas PUD will perform the steps described below:

Step 1:Assess statewide and regional unmet recreation demand information
Review and summarize relevant information from the 2002-2007 SCORP
and other relevant local recreation data. In addition, a review of the
SCORP Local Government Survey results, Interagency Committee for
Outdoor Recreation's (IAC) statewide outdoor recreation participation
survey, which include regionalized recreation issues and needs from local
agencies involved in outdoor recreation management, will be reviewed.

If available, other sources of Project area and region information will be reviewed. The focus of this assessment will be to identify possible recreation activities with substantial unmet demand with a qualitative discussion of participation constraints and whether these constraints are likely affected by Project operations.

Step 2:Collect unmet Project Area recreation demand information from visitor
surveys, Hispanic community leaders, and current research
Douglas PUD will utilize additional unmet demand information from the
Recreation Visitor Use Assessment survey, conducted in 2005. These
surveys asked visitors if there are any reservoir or river recreation
activities they are interested in participating in, but cannot because of
some form of barrier.

To further understand the recreation needs of a growing Hispanic population in the region, Douglas PUD will conduct interviews with local Hispanic community leaders (e.g., social organizations, churches) and Fish and Game officers to understand recreation use and behavior during daytime and evening hours. Douglas will also summarize current research on the specific needs of Hispanic recreation users.

Page 9

Step 3:Identify potential activities with high unmet demand within the Project
area
Based on the review of unmet demand information derived from the
Washington SCORP, the 2005 Recreation Use Assessment, and Project
monitoring data, Interagency Committee for Outdoor Recreation's (IAC)
statewide outdoor recreation participation survey, and the summary of
Hispanic recreation needs, potential activities with high unmet demand at
the Project will be identified. The analysis will also attempt to identify
likely barriers or constraints on participation, and whether those are
related to Project operations or recreation management decisions.

Assess Future Recreation Demand

This element of the study will project future recreation use at the Project over the estimated period of the new license (30 to 50 years). Obviously, projecting the future is a speculative activity, especially over a 30 to 50 year period. These projections, though, can be useful for general planning purposes to identify potential management issues that may occur in the future. This approach will include the following steps:

Step 1:	Review existing recreation use trends Past use often helps predict future use. Douglas PUD will review trends of actual Project recreation use from Project monitoring reports for Wells Reservoir, Interagency Committee for Outdoor Recreation's (IAC) statewide outdoor recreation participation survey, WDFW fishermen survey, Washington fishing license sales, ORV green stickers and boating
	vessel registrations for the counties where the majority of Project visitors originate from; local fishing guide activity; and recreation equipment sales.
Step 2:	Review existing population and recreation activity participation projections Douglas PUD will summarize existing information on future projections from the Washington Office of Financial Management on population growth rates for the counties where the majority of the Project visitors originate; U. S. Census statistics for growth within and adjacent to the Project and other appropriate state sources on existing and future population growth.
Step 3:	Review reasonably foreseeable events that may influence future use Reasonably foreseeable events in the watershed may be expected to influence recreation use in the watershed over the license period. If an event is determined to be reasonably foreseeable, a qualitative assessment will be made of its potential affect on future recreation use.

Page 10

- Step 4:Estimate future recreation use over the License PeriodBased on historical trends, future growth projections, and likely
foreseeable actions in the watershed, professional judgment will be used to
estimate recreation use and facility utilization over the expected term of
the new license (i.e. 30 to 50 years). These estimates must be considered
very speculative and will only provide a general indication of how
recreation use is expected to change over the license period. The
following steps will be utilized to estimate recreation activity for the
Okanogan, Douglas and Chelan County populations (16 years and older):
 - a. The calculation of participation estimates will be based on the projection indices created from Bowker et al., (1999), who utilized the National Survey on Recreation and the Environment (NSRE) descriptive findings for populations 16 years and older, not institutionalized (Cordell et al.1996) to develop participation by millions 2000-2050 on ten year increments.
 - b. The county projections will be presented in a range derived from national and regional participation projection estimates. These are calculated based on the indices created for the nation and region, utilizing the same rate of increase index created by Bowker et al. (1999). To obtain the county level estimated activity participation rates, the following individuals will be contacted and steps applied:
 - By county, the indexes from national and regional participation rates will be multiplied by the base number of participants (represented in millions) then divided by the base population used in national and regional calculations (Bowker et al., 1999, pp. 323-349). This will yield a national and regional participation rate for each activity by decade.
 - Next, the national and regional participation rates will be multiplied by the estimated Okanogan, Douglas and Chelan county populations of individuals non-institutionalized and over the age of 16, consistent with the estimate parameters developed by Bowker et al. (1999). The population estimates will come from the Washington Office of Financial Management, extracting estimates of institutionalized individuals from the Department of Corrections.
 - 3. This calculation will result in a range of participation by activity for Okanogan, Douglas and Chelan counties.

Regional Uniqueness and Significance Assessment

Page 11

The following steps are focused on an assessment of regional uniqueness of the Project's primary recreation opportunities in three steps.

Step 1:	<u>Review results of visitor questionnaires</u> Douglas PUD will review the results of the recreation visitor use assessment to confirm the Project's primary recreation activities. It is anticipated that fishing, boating, hiking, picnicking and swimming will likely be among the top water-related recreation activities in the Project area.
Step 2:	<u>Identify regional recreational opportunities</u> Douglas PUD will identify the geographic draw of the Project's top primary recreation opportunities. This will be done by assessing the geographic extent of visitors' origins and location of the alternative recreation resource areas where visitors participate in their primary recreation activities.
Step 3:	<u>Assess uniqueness of the Project-related recreation opportunities</u> For the Project's most popular primary recreation activities, Douglas PUD will identify if these recreation opportunities are of local, regional or state significance. In addition, text will describe what is unique and special about the most popular recreation opportunities based on information from regional resource information.

Public Access Analysis

Access to public use areas within the Project by both land and water will be assessed. Existing access features will be rated as high, medium, or low quality. Opportunities and constraints within the Project will also be identified, including compatibility with ADA. Public access (land and water) in the Project area will be identified and assessed by:

- Reviewing ownership maps, topographic maps, and aerial photography;
- Boating to dispersed sites and use sites along the shoreline, driving roads to access sites, and walking formal and informal user trails on lands designated as Project access sites or wildlife areas;
- Defining existing water trail routes along the reservoir, current shoreline watercraft launch sites, constraints to watercraft access along the reservoir, and overnight stop-over sites, and;
- Displaying public access sites and routes within the Project on GIS maps.

The final analysis will include tables and maps summarizing locations where: 1) current facilities for access to the Project are safe and efficient; 2) access is highly constrained; 3) future improvements could be implemented. Viable options for potential new or enhanced public access will be identified for further consideration.

Page 12

Needs Assessment

The needs assessment will provide a qualitative assessment, utilizing professional judgment, of the recreation needs based on integrating the findings from the other recreation components of this study and other related studies. The assessment will involve a four-step process in which relevant Project recreation opportunities are described, relevant Project recreation issues are identified, potential actions to address Project-related issues identified, and PME measures are proposed, if appropriate. These steps are discussed below.

Step 1:	Summarize Project-related recreation opportunities at recreation resource		
-	areas		
	The first step in the needs assessment is to integrate recreation study		
	findings into a summary of Project-related recreation opportunities at		
	recreation resource areas. The existing condition of the recreation		
	opportunity as well as the likely condition of the opportunity over the		
	license term will be described. Parameters likely discussed include such		
	items as activity participation rates, satisfaction levels, facility needs,		
	regional significance, resource impacts, and existing and likely future capacity availability.		
Step 2:	Summarize major recreation issues for each recreation resource area		
	Based on the projected license term and the conditions of recreation		
	opportunities within recreation resource areas, the recreation issues within		
	the recreation resource area will be confirmed. This may include such		
	items such as crowding, conflicts between user groups, likely facility		
	needs over the license term, or various types of impacts resulting from		
	recreation use. Recreation needs issues will be assessed by comparing		
	recreation supply and demand study results.		

- Step 3:Develop a list of actions to address Project-related issues
A list of prioritized actions that address Project-related recreation issues
will be developed for consideration. In some cases, several alternative
actions are likely to be developed to address the same issue.
Effectiveness, feasibility and costs will be used to identify actions and to
prioritize these actions.
- Step 4: <u>Identify appropriate additional recreation measures for the Project</u> The last step of the process is to consult with relicensing participants to review study results and to identify Project mitigation and enhancement measures to be included with the new FERC license.

Assessing existing recreation use through a combination of observation and questionnaire surveys is a common practice for large geographic areas that contain multiple accesses to desired recreation use areas (Malvestuto 1996, Pollock et. al. 1994). In addition, assessing future recreation demand through an evaluation of existing use, demographic data and participation trends and projections in the region is common practice (Kelly & Warnick, 1999).

Page 13

Integrating study results, comparing supply and demand study findings, and identifying resource impacts is standard practice on many relicensing processes. The proposed methods are also consistent with assessing needs approaches utilizing visitor frameworks such as the Visitor Impact Management (Graefe, Kuss, & Vaske, 1990) and Limits of Acceptable Change processes. In addition, the proposed methods incorporate concepts from the Recreation Opportunity Spectrum (ROS) (Clark and Stankey, 1979), and subsequent Water Recreation Opportunity Spectrum (WROS) frameworks (Haas, Aukerman, Lovejoy, & Welch, 2004).

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

No special equipment is needed to conduct this study. Staff time required to complete this study is estimated to be approximately 612 person hours.

The consultants hired to conduct this study must have prior experience in conducting Recreation Needs Assessments and should be well versed in recreation issues and planning.

Several trips to the Project area will be required.

8.0 BUDGET

The total estimated hours for conducting the Evaluation of Recreational Needs within the Wells Project (needs assessment) study is approximately 612 person hours with a total estimated cost of \$83,000. The needs assessment includes two phases. The first phase is estimated to require 412 person hours, which includes travel, site visits and data collection. The estimated cost of this phase is \$53,000. The second phase of the needs assessment is estimated to require 200 person hours. The estimated cost of this phase is \$30,000, which includes data analysis and reporting, a data summary visit, and one presentation visit.

9.0 SCHEDULE

The proposed study plan will take into account data collected during 2005 and 2006 during baseline studies.

Planning for the recreation needs analysis will begin in late 2007, shortly after the issuance of FERC's Study Plan Determination in October 2007. Field efforts will take place during the spring and summer of 2008 with an Initial Study Report due to stakeholders by October 2008. An initial study report will be filed with FERC in October 2008.

Data analysis and a draft report for the study will be completed by January 2008. A final report will be provided to FERC and the stakeholders by October 2009.

Page 14

10.0 REFERENCES

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Page 15

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Phone conversation with WDFW regarding Nuisance Wildlife Control Study



Wells Project Relicensing Phone Conversation Summary

Call to:	Scott Kreiter
Call From:	Carmen Andonaegui – Washington Department of Fish and Wildlife
Date:	July 11, 2007
Time:	3:20 PM
Subject:	Nuisance Wildlife Control Study

Summary:

Carmen called to pass on comments from Matt Monda (WDFW) regarding the "Evaluation of the Effects of and Alternatives to the Existing Bird and Mammal Control Programs" study plan. Matt felt that the study plan should have a component which evaluates whether or not the control program is having negative effects on mammals and/or birds, especially if the species is sensitive.

In a follow-up conversation with Matt Monda (July 12), Scott Kreiter and Jim McGee explained that this issue was discussed in detail by the Terrestrial Resource Work Group (RWG), and that the group concluded that due to the many confounding factors that affect wildlife populations, during any given year, that it would be difficult to design a defensible study that would identify the effects of the control measures on statewide populations of piscivorous wildlife.

However, if it is suspected that a control measure potentially has population level effects, the work group could identify PME measures to either: A) develop alternative control measures for that species, or B) propose further studies on population effects. Douglas PUD agreed to modify the Piscivorous Wildlife Study Plan by adding a sentence into Section 6 (Methods) stating that the Terrestrial RWG will develop reasonable and effective control measures based on the results of this study and any other relevant local knowledge on each species.

Matt also expressed a concern about the phrase "nuisance wildlife" in the study plan. Douglas PUD agreed to modify the study plan by replacing the phrase "nuisance wildlife" with "piscivorous wildlife".

Letter to Douglas PUD from DAHP regarding Triennial Archaeological Monitoring



STATE OF WASHINGTON

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501 Mailing address: PO Box 48343 • Olympia, Washington 98504-8343 (360) 586-3065 • Fax Number (360) 586-3067 • Website: www.dahp.wa.gov

July 12, 2007

Mr. Gordon Brett PUD No. 1 of Douglas County 1151 Valley Mall Parkway East Wenatchee, Washington 98802-7191

> Log No.: 071107-06-FERC Re: Triennial Monitoring FERC # Wells Hydroelectric Project No. 2149

Dear Mr. Brett:

Thank you for contacting our department. We have reviewed the material you provide for the proposed Triennial Archaeological Monitoring Wells Hydroelectric Project No. 2149 in Douglas, Chelan and Okanogan Counties, Washington.

We concur with your request to incorporate that effort with the relicensing study efforts. We look forward to participating in your cultural resources protection efforts.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4) and the reports when they are available.

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36CFR800. Should additional information become available, our assessment may be revised.

Sincerely, Robert G. Whitlam, Ph.D. State Archaeologist (360)586-3080 email: rob.whitlam@dahp.wa.gov cc: C. Pleasants RECEIVED JUL 1 6 2007 DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION Appendix A - 186 DOUGLAS PUD Protect the Past, Shape the Future

Letter to Douglas PUD from WDFW regarding White Sturgeon Supplementation Efforts



State of Washington DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207 Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

July 16, 2007

NOTED JUL 172007 S.A.B. DOUGLAS PUD

Mr. Shane Bickford Supervisor of Relicensing Douglas PUD 1151 Valley Mall Parkway East Wenatchee, Washington 98802-4497

SUBJECT: White sturgeon supplementation efforts in the mid-Columbia River Smare Dear Mr. Bickford:

As an active participant in the Wells Project relicensing process, the Washington Department of Fish and Wildlife (WDFW) looks forward to Douglas PUD's (District) implementation of a white sturgeon supplementation program to be captured in the District's White Sturgeon Management Plan (Plan). As such, WDFW is committed to working closely with the District in the development of the Plan. Of particular interest to WDFW is the development of the Broodstock Collection and Breeding Plan component of this Management Plan.

Prior to hydropower development on the Columbia River, sturgeon moved unimpeded from the estuary to the upper reaches of the mainstem, as well as into the Snake River. WDFW looks to accomplish sturgeon management in the Columbia River Basin in a manner that essentially makes the physical partitioning imperceptible to overall population management. Therefore, the supplementation program must be coordinated at a minimum through the mid-Columbia River region for the supplementation effort to be biologically successful.

WDFW is excited about the future opportunities that exist to coordinate and collaborate for white sturgeon conservation and recovery across the region, as well as across the Basin. We wanted to ensure clear communication in the initiating phase to optimize efforts by the three mid-Columbia PUDs. WDFW believes such coordination and collaboration will serve both the interests of Douglas PUD and the broader interests of the people of Washington State by reducing or avoiding duplication of facilities, time, and effort.

Specifically, WDFW is proposing the formation of a "Mid-Columbia Sturgeon Working Group." The function of this group would be to coordinate program development and information exchange with membership from the three PUDs, WDFW, the Yakama Nation, the U.S. Fish and Wildlife Service, and the Colville Confederated Tribes. WDFW is offering to plan the first meeting. Mr. Shane Bickford July 16, 2007 Page 2

During WDFW's work with Douglas PUD and other entities on development of a White Sturgeon Management Plan and a White Sturgeon Broodstock Collection and Breeding Plan for the Wells Project, we intend to provide consistent guidance on all aspects of sturgeon management and supplementation grounded in the best available information. Please contact Joe Miller, Regional Fish Program Manager, at 509.754.6066, ext. 24, (<u>millejlm@dfw.wa.gov</u>) or Carmen Andonaegui, Columbia River Policy Coordinator, at 509.754.6066, ext. 25, (<u>andonca@dfw.wa.gov</u>) if we can be of additional assistance in these matters.

Sincerely,

Vm Tent

Bill Tweit, Columbia River Policy Lead Intergovernmental Resource Management

cc: Jeff Koenings Phil Anderson Lew Atkins Dennis Beich Heather Bartlett Craig Burley Carmen Andonaegui Tony Eldred Brad James Joe Miller Bill Frymire **BLANK PAGE**

Email to Douglas PUD from IAC regarding Recreation Needs Analysis From: Eychaner, Jim [mailto:jime@rco.wa.gov]
Sent: Monday, July 23, 2007 12:06 PM
To: Scott Kreiter; Lee Webster; Susan_Rosebrough@nps.gov
Subject: RE: Wells Reservoir Rec Needs Analysis

Scott, I am OK with the changes. Regarding the added text on estimating future recreation, I have new statewide participation data that is of interest to a regional level. I have attached a draft of the narrative report for your use. Note that I am working with my contractor to revise the narrative; that means that the introduction and other text will change, but the data itself will not. Let me know if you have questions.

Jim

The email attachment can be found on the Wells Project Relicensing website at: <u>www.douglaspud.org/relicensing</u>.

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Email to Douglas PUD from NPS regarding Recreation Needs Analysis

----Original Message-----From: Michael_Linde@nps.gov [mailto:Michael_Linde@nps.gov] Sent: Tuesday, July 24, 2007 3:45 PM To: Scott Kreiter Subject: Re: FW: Wells Reservoir Rec Needs Analysis

thx, Scott, Susan is doing well;

I'm ok with what Jim is recommending & the changes that have been made;

Michael

Michael Linde Leader, Partnership Programs NPS/Pacific West Region - Seattle (206) 220-4113/FAX (206) 220-4161

From: Scott Kreiter Sent: Tuesday, July 24, 2007 1:51 PM To: 'michael_linde@nps.gov' Subject: FW: Wells Reservoir Rec Needs Analysis

Michael,

Below is a message I sent to Susan Rosebrough regarding comments that she and Jim Eychaner had on our Recreation Needs Analysis study plan for Wells Relicensing. I realize that Susan is on maternity leave, so I wanted to send this on to you for your information.

I've also attached a message from Jim Eychaner with his concurrence on the changes.

If you have any questions, please feel free to contact me at any time. I hope Susan is doing well.

Thanks!

Scott Kreiter Douglas County PUD 509-881-2327

From: Scott Kreiter Sent: Wednesday, July 11, 2007 11:15 AM To: jime@iac.wa.gov; 'Lee Webster'; 'Susan_Rosebrough@nps.gov' Subject: Wells Reservoir Rec Needs Analysis

Susan, Lee, and Jim,

Please find attached the reviesed Rec Needs Analysis for the Wells Project. I hope these edits address your concerns regarding Hispanic use of the reservoir. Please feel free to provide any feedback you may have. This was your issue, so i want to be sure that you are comfortable with the changes before sending out to the rest of the work group. All of the changes are highlighted in yellow.

You will also see that we added some additional detail to the methods section on Appendix A - 196 1

estimating future recreation use. This was in response to a suggestion by FERC that we be sure that everyone in the RWG has an understanding of the protocol we plan to use. Jim and Susan - you are the experts on this, so your feedback on this added methodology would be helpful.

Thanks much for your input. -Scott

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Phone Conversation with USFWS regarding 230 kV Transmission Line Study Plan



Wells Project Relicensing Phone Conversation Summary

Call To:	Scott Kreiter
Call From:	Dan Trochta (USFWS)
Date:	07/26/2007
Time:	9:50 AM
Subject:	230kV Transmission Line Wildlife and Botanical Study Plan

Summary:

Dan Trochta (USFWS) called to discuss edits that were made to the 230 kV transmission line study following the June 15 study plan meeting. Dan had three questions/comments on the plan.

1. Dan asked about language on Page 8 referring to unlikely waterfowl collisions due to the north-south orientation of the transmission corridor. He asked whether this was taken from a citation or if it was an assumption. He also added that migrating waterfowl would be travelling higher than the transmission corridor, and collisions would be more likely if the birds were circling before landing. I pointed out that Corhnel Lake and the Columbia River were identified in the study plan as the most likely locations where waterfowl could be circling prior to landing. Because of the higher potential for waterfowl collision at these sites, the study would focus the collision surveys along these two sections of the transmission corridor.

It was agreed that no changes to the study plan are required to address this issue.

2. Dan noted that on Page 8 new language refers to the Washington ground squirrel and striped whipsnake. He asked if information could also be provided in the report for the pygmy rabbit, whose range does not overlap with the study area, but is near the study area.

Douglas PUD will include background information on pygmy rabbits including their status, current range and the fact that the range for this RTE species is outside but within 50 miles of the study area.

3. Dan asked about methodology on page 15 which states that collision surveys will be conducted over 5 days during the spring bird migration and 5 days during the fall bird migration. He asked why surveys would only be conducted during those times. I explained that the

Terrestrial Resources Work Group discussed this issue, and agreed that it would be difficult to identify evidence of collisions due to high scavenger rates. However, there is a sentence in the plan noting that collision evidence will be reported if observed during the other phases of the study (botanical surveys, mammal surveys, etc.).

It was agreed that no changes to the study plan are required for this issue.

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Phone Conversation with WDFW regarding Downstream Release Location for Tagged Lamprey



Wells Project Relicensing Phone Conversation Summary

Call To:	Molly Hallock, WDFW
Call From:	Bao Le, Douglas PUD
Date:	July 30, 2007
Time:	9:35am
Subject:	Downstream release location for tagged lamprey at Wells 2007

Summary:

I discussed with Molly the two options for downstream release of tagged Pacific lamprey adults during the 2007 study. Although the proposed release location within the collection gallery has some benefits of increasing the probability of data collected to develop within ladder passage metrics, Molly indicated that she cannot support this release location because a collection gallery release would bias passage performance given that these fish will not have had to negotiate the approach and entrance of the ladder. Furthermore, they are finding in the Lower Columbia River that approach and entrance seem to be a significant issue for lamprey passage and therefore, collecting this data would be very important. Molly can only support the original proposed release location which is in the alcove area. This area provides calm water allowing lamprey to re-orient themselves, reasonable proximity to the ladder.

An additional discussion topic was the refinement of a trapping schedule that would allow for lamprey trapped prior to tagging to be held over for no longer than 36 hours as opposed to the previously agreed upon 60 hour maximum holding time. Molly was supportive and in agreement that a reduction in hold over time would be a benefit to the study.

Email to Douglas PUD from City of Brewster regarding Recreation Needs Analysis ----Original Message----From: Lee Webster [mailto:brewstermayor@hotmail.com] Sent: Friday, August 10, 2007 1:53 PM To: Scott Kreiter Subject: RE: Wells Reservoir Rec Needs Analysis

Scott,

Thank you for the quick reply. Bob's comments were directly related to the proposed needs analysis, not the 2007 RAP. I felt obligated to pass those comments onto you. I realize some of these issues have been addressed, and will communicate that to Bob.

As you and I have spoken about, the City would like to focus more on working together with Douglas PUD. We are chasing some outside dollars to show we're serious on the RV Park at the Foyle property issue.

With regards to the Study Plans, I'd much rather see dollars spent on the ground than on paper in the form of a study. The one thing I have to bring up regarding the proposed economic study is the ongoing impact of Douglas PUD's focus on habitat versus recreation on the Wells pool has slowed down the influx of visitors to the area. I hope that the rest of the issues we've brought up can be addressed in the form of some kind of agreement and won't just be cast aside.

In a related issue, we at the City have just agreed to create a new salaried position as an Activities Director/Coordinator to help with the increased load.

Thanks

Lee

From: "Scott Kreiter" <scottk@dcpud.org To: "Lee Webster" <brewstermayor@hotmail.com Subject: RE: Wells Reservoir Rec Needs Analysis Date: Fri, 10 Aug 2007 11:08:50 -0700

Lee,

Thanks for the note.

The RAP you refer to is the 2007 Recreation Action Plan, which is not part of our relicensing process. You should be receiving a copy of the RAP early next week. If you have questions about the RAP, contact Darrin Sexton or Gordon Brett. With both processes taking place simultaneously, its easy to get the two confused.

The August 15 deadline you refer to in your email is the Relicensing deadline for comments on our Proposed Study Plan (PSP). Your comments should focus on studies that the City of Brewster feels are necessary to provide the information needed to make decisions about the new license. Based on our correspondence to date, my understanding is that you have two remaining study issues, 1) Recreation Needs Analysis Study Plan (Capturing information about evening recreation use); and 2) economic impacts.
In the Recreation Needs Analysis that is being proposed by Douglas PUD, you have expressed that there is a need to collect additional information on evening recreational use. As discussed in our correspondence below, the study plan has been modified to capture additional information on evening use, including Hispanic and non-Hispanic use. Please let me know if you feel further modifications are needed to address that issue.

Bob Fateley's comments refer to both recreation needs, and economic impacts. His comments on recreation needs (boat launch, RV parks, day use) will be addressed through the Recreation Needs Analysis study plan that we are submitting to FERC. The study plan, as it is written now, is designed to identify the types of needs that Bob Fateley refers to in his comments. Once the study is completed, we can then talk about specific measures that can be implemented in relation to the Wells Project license.

Bob Fateley also mentions negative impacts of the Wells Project on economic conditions of the City of Brewster. As discussed in the past, Douglas PUD is not proposing to conduct an economic impacts study.

Regarding the August 15th deadline, it appears that the issue of economic impacts is the only issue related to studies that remains unresolved. Again, the City of Brewster may have other issues related to future measures, but in regards to studies only and the August 15 deadline for comments, economics appears to be the only remaining issue that has been brought to our attention thus far.

I appreciate the ongoing communication on this. Please let me know if you would like to discuss further.

-Scott Scott Kreiter Douglas PUD 509-881-2327

----Original Message----From: Lee Webster [mailto:brewstermayor@hotmail.com] Sent: Friday, August 10, 2007 9:47 AM To: Scott Kreiter Subject: RE: Wells Reservoir Rec Needs Analysis

I received some comments from Bob Fateley. I have transferred them to a word document as he has written them.

Comments on the 2007 RAP are due by Aug 15th, right? Is there a date comments are due to FERC by? I am waiting for the Planning Commission to finish the current Park element and for Council approval. Do you think I should go ahead and send a draft or do I have enough time to wait to Send the adopted plan. This may take another two meetings - or two months.

Thanks

Lee

From: "Scott Kreiter" <scottk@dcpud.org To: "Lee Webster" <brewstermayor@hotmail.com Subject: RE: Wells Reservoir Rec Needs Analysis Date: Thu, 9 Aug 2007 14:11:00 -0700 Lee, Below is essentially our correspondence to date. Let me know if you have any additional issues on the study plan. Thanks. -Scott ----Original Message-----From: Scott Kreiter Sent: Monday, July 30, 2007 1:50 PM To: 'Lee Webster' Subject: RE: Wells Reservoir Rec Needs Analysis Lee, See the slight changes I made to Step 2 on Page 9. The changes are tracked. Let me know if this works for you. Thanks. -Scott ----Original Message-----From: Lee Webster [mailto:brewstermayor@hotmail.com] Sent: Monday, July 23, 2007 4:40 PM To: Scott Kreiter Subject: RE: Wells Reservoir Rec Needs Analysis Scott, One thing I noticed is that most of the changes refer directly to Hispanics. While that group of folks is pertinent to the issue raised, I think that the emphasis should be on any person who recreates around and on the pool. Thank you for the opportunity to comment. I hope this makes sense. Lee

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From: Scott Kreiter
Sent: Wednesday, July 11, 2007 11:15 AM
To: jime@iac.wa.gov; 'Lee Webster'; 'Susan_Rosebrough@nps.gov'
Subject: Wells Reservoir Rec Needs Analysis

Susan, Lee, and Jim,

Please find attached the reviesed Rec Needs Analysis for the Wells Project. I hope these edits address your concerns regarding Hispanic use of the reservoir. Please feel free to provide any feedback you may have. This was your issue, so i want to be sure that you are comfortable with the changes before sending out to the rest of the work group. All of the changes are highlighted in yellow.

You will also see that we added some additional detail to the methods section on estimating future recreation use. This was in response to a suggestion by FERC that we be sure that everyone in the RWG has an understanding of the protocol we plan to use. Jim and Susan - you are the experts on this, so your feedback on this added methodology would be helpful.

Thanks much for your input.

-Scott

Comments from Bob Fateley re: Wells relicensing, needs assessment, and the 2007 RAP

Issue Statement (PAD 6.2.2.6)

The new license should consider the impact on the Brewster Community, especially boat launch, RV Park, and day use areas because of the added fishing created by the (future) Chief Joe hatchery, Fort Okanogan and Overlook, Etc.

Most all of the (issues) mentioned will create demands for more City services which Douglas PUD needs to help finance and facilitate.

Issue statement should also include new facilities and enhancements to existing facilities and new facilities needed to satisfy the needs for such in the Brewster community.

It is a documented belief that because of the way Douglas PUD manages the Wells Pool it has a severe negative impact on the economic condition of the City of Brewster. Examples are loss of property tax revenue because of (lost waterfront building construction – I had trouble reading the writing) and loss of sales tax revenue because of lack of RV and Day use facilities, etc. Letter to FERC from City of Brewster regarding Comments on Proposed Study Plan Honorable Kimberly D. Bose Federal Energy Regulatory Commission 888 First Street NE Washington DC 20426

Subject: Comment on Proposed Study Plan for Wells Hydroelectric Project No. 2149-131

August 10. 2007

Dear Secretary Bose:

The City of Brewster and the City of Pateros have requested a study on the economic impacts of the Wells project on neighboring communities. This has been deemed inappropriate for study by Douglas PUD. We understand FERC's reluctance historically to delve into economic affects, but respectfully disagree with Douglas PUD's decision. In addition, we would like to point out a fundamental difference in the way Douglas PUD manages its shoreline.

The City of Pateros was completely moved during the building of the Dam. City officials have loads of documents describing the decrease in business and population after the move. The City of Brewster has faced similar issues, though most are more subdued than moving our entire town.

In the past the Wells pool has been viewed and maintained by Douglas PUD, WDFW and others primarily for habitat conservation. These ongoing activities have limited the increase in recreational activities other than hunting. While the wildlife related opportunities have been good, access to and from the reservoir has been kept relatively low. This stifling of recreational opportunities has most certainly created a negative impact on our communities.

One has only to drive along highway 97 from Brewster to Wenatchee on any hot summer day and see the numbers of recreationists on the Columbia River. There are typically hundreds more people enjoying the water below Wells Dam than above, primarily because of the way these two reservoirs have been managed.

A shift is needed in the way the Wells pool is managed: from primarily habitat conservation to a multi faceted approach where both water-based recreation and habitat conservation co-exist. All of our local communities are working hard to increase our appeal to travelers of the Highway 97 corridor. We believe a partnership with Douglas PUD can only help achieve our economic development goals.

Thank you again for the opportunity to comment on the relicensing of the Wells Project.

Lee Webster, Mayor City of Brewster PO Box 340 Brewster, WA 98812 (509) 689-3464 brewstermayor@verizon.net Letter to Douglas PUD from Umatilla Tribes regarding Comments on Proposed Study Plan



GENERAL COUNCIL and BOARD OF TRUSTEES

CONFEDERATED TRIBES

Umatilla Indian Reservation

P.O. Box 638 PENDLETON, OREGON 97801 Area Code 541 Phone 276-3165 FAX 276-3095

August 14, 2007

Via E-mail, FAX, and U.S. Mail

Shane Bickford Supervisor of Relicensing Public Utility District No. 1 of Douglas County 1151 Valley Mall Parkway East Wenatchee, WA 98902 FAX: (509) 884-0553 E-mail: sbickford@dcpud.org

Re: Wells Hydroelectric Project (FERC No. 2149); Comments on Proposed Study Plans

Dear Mr. Bickford:

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) appreciates this opportunity to respond to the request by the Douglas County Public Utility District (Douglas) for comments on proposed studies for the Wells Hydroelectric Project (Project) relicensing under FERC's Integrated License Process (ILP). This request was made at the June 15, 2007, public meeting concerning Wells Hydroelectric Project relicensing.

The CTUIR has reviewed the May 2007 Study Plans (Plans) issued by Douglas. We believe that the scope of proposed studies may not fully and adequately assess and evaluate the full extent of Project impacts on natural resources. Therefore, we propose that Douglas fund and conduct the following studies, in consultation with the CTUIR, the Columbia River Inter-Tribal Fish Commission (CRITFC),¹ and other appropriate resource management agencies.

¹ CRITFC was established in 1977 by formal resolution of the governing bodies of the four Columbia River Treaty Tribes: the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Yakama Nation and the Nez Perce Tribe. The Commission is comprised of elected and appointed officials who are members of their respective tribal fish and wildlife commissions and committees. The Commission's technical and legal resources are employed to assist the tribes in protecting and enhancing our treatysecured trust resources.

Adult Salmon and Steelhead Passage Studies

Currently there are no adult salmon and steelhead passage studies in the Plans. The presence and operation of the Project negatively affects adult passage. Impacted salmonid species include two ESA-listed stocks (Upper Columbia Spring Chinook, Upper Columbia Steelhead) and several stocks not listed but in poor status, including Mid-Columbia Summer Chinook and Okanogan Sockeye.

A new Biological Opinion (BiOp) for the Federal Columbia River Power System (FCRPS) is currently being developed. It is important for Project studies to evaluate conditions in a manner that enables non-federal projects such as Wells Dam to operate consistently and in coordination with FCRPS operations, as the entire hydrosystem is linked and its impacts on salmonids are intertwined. The 2000 Biological Opinion (BiOp) for the Federal Columbia River Power System (FCRPS) has, as part of its Reasonable and Prudent Alternative (RPA) to avoid jeopardy, a perproject (dam and reservoir) adult survival standard for Upper Columbia Spring Chinook and Upper Columbia Steelhead of 98.1 % and 97.3%, respectively (NMFS 2000). The Habitat Conservation Plan for the Project assumes a 2% mortality rate for adult salmon and steelhead, but this has not been verified by any recent studies. There has not been an adult passage study at the Project since 2001 for steelhead (English et al. 2002), since 1992 for sockeye (Swan et al. 1994), and since 1993 for spring and summer Chinook (Stuehrenberg et al. 1994).

The goal of adult passage studies would be to evaluate current passage rates and timing, to establish a baseline for adult passage improvements. The ultimate goal is to achieve adult passage survival standards consistent with those established for the FCRPS, and to reduce adult passage duration through the Project. Reduction of passage times is important to reduce delayed mortality and to assure that salmon have adequate energy reserves for successful spawning in natal areas above the Project (Geist et al. 2000).

The objectives of adult steelhead and salmon passage studies are consistent with past studies at mainstem Columbia River hydroelectric projects, and include:

- Determine survival rates for adults passing through the dam and reservoir
- Determine passage times for adults passing through the dam and reservoir
- Identify problematic areas for adult passage through the dam that may cause delay and identify possible structural/operational improvements to improve passage
- Determine potential thermal barriers within the ladder that may delay and affect adults
- Determine gross adult behavior characteristics as they pass through existing dam fishways
- Determine the efficiency and passage rates and times of fishway entrances, fishway exits and tailraces
- Determine proportion, incidence and magnitude of adult fall backs and fall out from ladder entrances and compare these to rates at other Columbia Basin mainstem hydroelectric projects
- Determine the fate of adults that fall back over Wells Dam.
- Assess steelhead kelt timing, survival and passage rates through the project and compare these metrics to other Columbia mainstem hydroelectric projects

The results of these studies will assist in establishing a baseline for project effects on adult passage and inform decision-making about potential operational/structural changes to the Project that will reduce these effects, leading to achievement of survival and passage timing goals. The Columbia River Treaty Tribes' anadromous fish restoration plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit* (Nez Perce et al. 1995) calls for consideration of modifying adult fishways at all Mid-Columbia PUD dams. This plan, formally adopted by the CTUIR and the other three Treaty Tribes, states that the Mid-Columbia PUDs, in consultation with tribal, state and federal resource agencies, should finish ongoing structural analyses of all mainstem fishways and take corrective actions including:

- Improve existing fishway attraction flows, install additional pumps and gravity flow systems, and modify ladder exits to reduce occurrence of adult fallback
- Evaluate and implement new ladder designs including modifications to weirs, baffles and pools; emphasize designs that integrate fish swimming and leaping abilities with fluid dynamics and designs that are based on fish responses as recommended by Orsborn (1987)
- Implement hydraulic evaluations of all fishways, make operational and structural corrections and combine these evaluations with limited radio-telemetry studies that can provide focus on specific problem areas

These measures should increase the numbers of adult salmon successfully completing their upstream migration and reduce delay through the mainstem hydroelectric projects. The measures should also decrease pre-spawning mortality, contribute to increased spawning distribution with appropriate timing, and increase spawner success.

As stated above, existing adult passage studies and results of those studies related to the Project are very dated and may not represent current conditions. While the Project's fishways have PIT-Tag detectors, this methodology is very gross and cannot provide the data necessary to identify and improve specific areas in fishways and Project in general that are vital to reduce passage delay and increase passage success, such as radio-telemetry.

For example, Sturenberg et al. (1993) found that low negative net entrances were recorded for spring and summer Chinook attempting to enter the Wells fishway and that 21.2% of adult fall Chinook fell back over the dam. In comments on Sturenberg et al. (1993), Basham (1995) noted that the National Marine Fisheries Service recommended moving diffusers at the Wells ladder closer to the base of the ladder to create better hydraulic conditions for fish passage.

Swan et al. (1994) noted that the fallback rate for sockeye salmon was 13%. They concluded that additional radio-telemetry studies should be conducted at the Project focusing on fallback and its effects. They also recommended that more effort was needed to determine the extent of spawning, and that carcass counts for the area directly above the Project should be conducted.

English et al. (2002) noted that 11.9% of radio-tagged steelhead fell back over the dam and that this occurred during September-October when there was minimal to no spill for juvenile passage. Fallback has been demonstrated to result in fish death or injury, migration delays and reduction in spawner success through greater exposure to poor environmental conditions (Boggs et al.

2004). This is particularly true for the Project in that temperatures in the Wells reservoir are extreme in the summer and late fall, particularly in the backwaters to the Okanogan River. Fallback re-ascension and other delays at dams is energetically expensive and could result in reduction of spawner success (Boggs et al. 2004). English et al. (2004) noted that fishway entrance passage times accounted for the majority of delay, particularly for the right bank fishway. They reported that these extended passage times were likely the result of flow and head differential in the collection area as a result of aquatic buildup of vegetation blocking diffuser flow into these areas.

Radio-telemetry has been a standard tool for assessing adult passage success and survival in the Columbia Basin for almost two decades (Peery and Bjornn 2002; Keefer et al. 2004.). Tagging and tracking technology has improved since the time the last studies were conducted at the Project. We anticipate that tagging 50 to 75 adults for each salmon/steelhead stock at Rocky Reach Dam and/or Wells Dam at existing traps would provide detailed passage information. Temperature sensitive radio tagging techniques have been improved and should be used for summer and early fall adult migrants to determine migratory paths through the Project and potential areas in the fishways that may be thermal blocks (Peery and Bjornn 2002). Tracking adults would be accomplished by mobile means (boats, planes, foot) and fixed receivers in dam fishways, forebays and tailraces, tributary mouths and in spawning areas. Electromyogram telemetry is a recently developed tool that can be used to assess adult active swimming ability and with concurrent hydraulic evaluations in the fishways can be used to identify problem passage areas needing improvement (Brown et al. 2006). There is no existing data on migration temperatures or swimming ability for adults passing through the Project.

Ideally, these telemetry and concurrent hydraulic studies would be conducted for low, medium and high flow years for each adult salmon and steelhead stock to encompass the range of environmental variability around results. However, this would be costly in terms of Douglas' resources. Alternatively, we propose that a baseline telemetry and concurrent hydraulic study be conducted for one year for each salmon and steelhead stock, beginning in 2008, to describe baseline conditions necessary for structural and operational improvements for adult passage at the Project. Draft reports should be circulated to tribal, state and federal agencies and FERC in 2009 with a final report out in 2010. Comparative studies cost in the range of \$750,000-\$1,000,000.

Adult Pacific Lamprey Studies

The goals of Pacific lamprey studies are to 1) document baseline survival and passage success through the Project, and identify problem areas that need to be improved to increase survival and passage success, and 2) identify adult lamprey spawning and holding habitat within the Project area and upstream of the Project in tributaries.

Improvement of adult lamprey passage has been identified as a key need by the Columbia Basin Fish and Wildlife Authority's Lamprey Technical Working Group (2006). Lamprey is an imperiled species throughout the western U.S. and only 21 adults were recorded passing the Project in 2006.

Several radio tagging studies conducted at fish ladders on mainstem Columbia River dams found 38 to 82% passage efficiency for adult lamprey (Moser et al. 2002). These studies identified several features common to most dam fishways that appeared to hinder adult lamprey passage, including diffuser gratings, junction pools, counting windows, and fishway entrances. Laboratory bioenergetics studies have also concluded that lamprey must use significant energy reserves to successfully negotiate such fish ladders (Mesa et al. 1999). This loss of reserves could ultimately affect their spawning success, as adult lamprey are not known to feed during their freshwater migration, which can last for up to a year (Kostow 2002). Adult lamprey passage through the Project could be a serious concern, as it is with most other mainstem Columbia River hydroprojects.

Douglas should utilize existing radio-telemetry and/or PIT-Tag methods as appropriate for adult studies. Lamprey should be tracked into tributary areas and spawning success should be monitored if feasible. Douglas should evaluate delayed mortality or post-Project effects by monitoring lamprey after they leave the Project boundaries, particularly where they hold and spawn in tributary streams. Furthermore, Douglas should develop operations and maintenance procedures that would avoid lamprey impacts from dewatering fishways and other dam operations.

The CTUIR supports the proposed study of Pacific lamprey, but believe that study modifications are necessary. It is important to complete at least one year of a baseline study with at least 50 tagged lamprey to discern individual passage bottlenecks within the dam. Consistent with management plans for other recently relicensed FERC projects at Willamette Falls and Rocky Reach, a walk through the Project's fishways after winter dewatering with regional lamprey passage experts from the Columbia Basin Technical Lamprey Workgroup should occur in the winter of 2007-2008 to visually identify potential passage problem areas and develop recommendations for operational and/or structural modifications. In addition, a hydraulic analysis of the fishway at key areas (entrances, weirs and exits) should be conducted concurrently with the radio-telemetry assessment. While we understand the difficulty of trapping sufficient adults due to extremely low numbers passing the Project, we are concerned that studies will not be conducted in the relicensing time frame due to this problem. Indeed, in 2006 only 21 adults were recorded passing Wells Dam, and this year's adult lamprey count at Bonneville Dam is at a historical low. We recommend that adult lamprey from another source in the downstream Columbia River be obtained, transported and acclimated below the Project and released in order to attempt to discern passage metrics at the fishway. Adult lamprey should be tracked to spawning areas, and if possible, monitored for spawning success. This was recently accomplished by the University of Idaho for the Nez Perce Tribe in the Snake River Basin (Peery, pers. comm., 2007).

Douglas should also begin investigations in 2008 within upper Columbia tributary streams to enable you to identify more clearly where adult lamprey spawn and what habitat conditions are preferred. We recommend at least one year of baseline data for each tributary. Methods described in Stone (2006) should be used to accomplish this study. A report on the study results should be available to the tribal, state and federal fish agencies and FERC by 2009. Based on other lamprey studies in the Columbia Basin, the cost of this study should range between \$200,000 and \$400,000.

Juvenile Pacific Lamprey Studies

The goals for juvenile lamprey impacted by the Project include: 1) identifying passage routes and specific impacts through the dam; 2) assessing the impacts of project operations, such as pool drawdown, on juvenile lamprey survival and habitat; and 3) identifying juvenile lamprey presence and habitat in tributaries above the Project.

At the June 15, 2007, Project study public meeting, an incident was described where numerous juvenile lamprey, likely ammocetes, were dessicated after a drawdown of the Wells Pool. We believe this warrants further examination. A planned drawdown of the Wells Pool, particularly at the tributary mouths that are impounded by the Pool such as the Methow and Okanogan, should occur and monitoring of sediments for presence of lamprey, using electrofishing methods described by Luzier (2007), should be implemented and evaluated.

The success of downstream juvenile lamprey passage through the Project is an important piece of information that is currently missing. Douglas should: 1) implement a baseline study in 2008 or 2009 to examine juvenile passage through Project-specific routes; and 2) assess dam structures and operations to increase juvenile lamprey survival through the Project.

Specific tags to evaluate juvenile lamprey passage and survival are still under regional development; however, Douglas should move forward in assessing the indirect mortality and injury rates for the juvenile Pacific lamprey that pass through the Project by implementing route specific pilot passage and survival studies in coordination with the Lamprey Technical Working Group. Hi-Z balloon tagging coupled with radio-tag technology is available for juvenile salmon and could be used for juvenile lamprey for route specific dam passage studies (Scott Heppell, OSU, pers. comm.). Schreck et al. (2000) found that an external radio tag placed on juvenile lamprey remained on 75% of the lamprey for 3 days.

The U.S. Geological Survey is in the process of developing specific tags to evaluate juvenile lamprey passage (Mesa, pers. comm. 2005). The tagging protocols for release into turbines or screen systems only require that tags remain on fish for 20 minutes to one hour, as the fish are quickly recovered in the tailrace with the inflated balloon after passing through selected powerhouse routes. Using these tagging techniques and using microscopy to examine for internal injuries and holding subjects for examination for delayed mortality are important to fully assess the impacts of passage routes. Final decisions on improvements to or selection of passage routes necessary under the new license should take into account all mortality and passage information through the Project.

Finally, a study in 2008 or 2009 should be implemented by Douglas to enable you to identify where juvenile lamprey are located within the tributary streams above the Project and what habitat conditions are preferred. Methods identified by Claire (2000) and Luzier (2007) should be used for this work.

Conclusion

The Confederated Tribes of the Umatilla Indian Reservation thanks you for your request for comments on your proposed studies for the Wells Hydroelectric Project. We hope that the above comments will be helpful as you further modify and refine your study plan, and that you will take them into consideration. If you have any questions, please contact me, or Carl Merkle at (541) 276-3449.

Sincerely, Kathon

Yay Minthorn Chairman Fish and Wildlife Commission

JM: DNR: EP/RP: cm

Letter to FERC from City of Pateros regarding Comments on Proposed Study Plans



Phone: 509.923.2571 Fax: 509.923.2971 E-mail: pateros@nwi.net

113 Lakeshore Drive PO Box 8 Pateros, WA 98846

August 15, 2007

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

RE: Wells Hydroelectric Project No 2149-131 Comments on the Douglas PUD Study Plan

Dear Secretary Bose:

On behalf of the City of Pateros ("the City"), we submit the following comments on Douglas County PUD's ("Douglas PUD") Proposed Study Plan dated May 2007.

BACKGROUND

In our letter dated February 28, 2007 (and supplemented on April 2, 2007), the City requested that the Douglas PUD conduct the following studies:

1. <u>Socio-Economic Impacts</u>. The City made a formal request for a study of the socio-economic impacts of the Wells Project on Okanogan County and the cities of Pateros, Brewster and Bridgeport, all of which are located within the Project boundary.

2. <u>Operation and Maintenance of Recreation Facilities</u>. The City requested Douglas PUD to conduct a study of the specific costs for operation and maintenance of city parks.

3. <u>Visitor Information Center</u>. The City requested that Douglas PUD study the feasibility of a regional Visitor Information Center.

In its May 2007 Proposed Study Plan submission, Douglas PUD has indicated that it believes "none of these study requests are appropriate for study during the ILP study period." <u>See</u> p. 14. The City respectfully disagrees with Douglas PUD for the reasons set forth below.

I. <u>Comments on Douglas PUD's Denial of Study Request for Socio-</u> Economic Study

The City was very clear as to the nature of the requested study of the socio-economic impacts of the Wells Dam project on the surrounding cities, specifically identifying the following issues for review:

- Identify, describe and document factors that influence regional and local economics, including health care, agriculture, schools and other public entities, industry and tourism.
- Identify the socio-economic impacts of the Wells Project on Okanogan County and the cities of Pateros, Brewster and Bridgeport.
- Identify future growth opportunities and estimate the impact of Project operations on these resources.
- Specifically identify the socio-economic impacts resulting from the City of Pateros' relocation and displacement when Wells Dam was originally built in 1962 and the continuing effects of said relocation and displacement.

As will be discussed below, despite Douglas PUD's resistance, a socio-economic study is required under the laws and regulations governing the relicensing of Wells Dam.

A. The FPA and NEPA both require FERC to consider socioeconomic impacts of continued operation of a hydroelectric project.

Before granting a licensee a new license to operate a federal hydroelectric project, FERC must comply with the mandates of the Federal Power Act ("FPA") and the National Environmental Policy Act ("NEPA"). Both statutes required the socioeconomic study requested by the City of Pateros.

First, the FPA gives FERC broad guidelines to apply in its hydroelectric-licensing decisions:

In deciding whether to issue any license ... for any project, the Commission, in addition to the power and development purposes for which licenses are issued, shall give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of, fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality. 16 U.S.C. § 797(e).

The FPA also provides:

The project adopted ... shall be such as in the judgment the Commission will be best adapted to of а comprehensive plan for improving or developing а waterway ... for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses [.]

Id. § 803(a)(1).

These provisions recognize the numerous beneficial public uses of the waterways and courts have interpreted them as charging FERC with determining the "public interest" by balancing power and non-power values. See <u>Udall v. Fed. Power Comm'n, 387</u> <u>U.S. 428, 450, 87 S. Ct. 1712, 18 L. Ed. 2d 869 (1967)</u> ("The test is whether the project will be in the public interest."); see also <u>American Rivers v. FERC, 201 F.3d 1186, 1201 (9th Cir. 1999)</u> ("The [Act] establishes an elaborate regulatory regime which charges [FERC] with the responsibility to balance the interests of hydropower licenses and other participants in the licensing process.")

In Udall, the Supreme Court stated,

The question whether the proponents of a project "will be able to use" the power supplied is relevant to the issue of the public interest. So too is the regional need for the additional power. But the inquiry should not stop there. A license under the Act empowers the licensee to construct, for its own use and benefit, hydroelectric projects utilizing the flow of navigable waters and thus, in effect, to appropriate water resources from the public domain. The grant of authority to the Commission to alienate federal water resources does not, of course, turn simply on whether the project will be beneficial to the licensee. Nor is the test solely whether the region will be able to use the additional power. The test is whether the project will be in the public interest. And that determination can be made only after an exploration of all issues relevant to the "public interest," including future power demand and supply, alternate sources of power, the public interest in preserving reaches of wild rivers and wilderness areas, the preservation of

anadromous fish for commercial and recreational purposes, and the protection of wildlife.

Udall, 387 U.S. 428, 450 (U.S. 1967) (emphasis supplied).

The Electric Consumers Protection Act of 1986 ("ECPA") amended the relicensing provisions of Section 15 of the FPA. 16 U.S.C. §808. Subsection 15(a)(2), as amended, provides that any "new license issued under this section shall be issued to the applicant having the final proposal which the Commission determines is best adapted to serve the public interest."

In interpreting FPA and ECPA, FERC has consistently held that socioeconomic impacts must be studied to comply with the statute's mandates:

This subsection also specifies that, in making a relicensing determination, the Commission must consider the requirements of Section 10 of the FPA. The Commission must consider socio-economic impacts in making its licensing decisions, since it is required to consider all aspects of the public interest under Section 10(a)(1) of the FPA. See Udall v. FPC, 387 U.S. 428 (1987).

Elkem Metals, 45 FERC ¶61,044, at p. 61,148 (1988) (emphasis supplied). <u>See also</u>, Brookside Hydroelectric Co., 67 FERC ¶61,041, at p. 61,122 (1994) ("the socio-economic impact on the area involved, including [the intervenor's] business, is relevant in the Commission's consideration of the public interest in licensing a project.")

In addition to the public interest factor of the FPA, the relicensing process must also satisfy the environmental review requirements of NEPA. One of the primary purposes of NEPA is to estimate the effects of an action on the "human environment." See 42 U.S.C.A. § 4332(2)(C). As the implementing regulations adopted by the Council on Environmental Quality make clear, socio-economic impacts must be studied when a project has wide-ranging effects on the surrounding communities:

"Human Environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment. This means that economic or social effects are not intended by themselves to require preparation of an environmental impact statement. When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact

statement will discuss all of these effects on the human environment.

40 CFR § 1508.14 (emphasis added; internal parenthetical omitted).

This is also true in the relicensing context, as FERC made clear in *Elkem Metals Company*, 45 FERC ¶61,044 (1988):

NEPA's aims include protection of the quality of life for residents in the area of the project. Agencies administering that act accordingly should consider the full range of the project's effects on the affected community.

Elkem, at p. 61,048.

Accordingly, FERC itself has established that a request for renewal of an existing license cannot be evaluated without full consideration of the impact on the public interest and human environment, which necessarily includes an evaluation of the socio-economic effects on the surrounding communities. The City of Pateros has proposed a reasonable set of study criteria that would provide FERC with this critical information. Under FERC's own interpretation of the FPA and FERC, a socio-economic study of this nature must be conducted before FERC can issue its relicensing decision.

B. <u>Socio-economic Studies Have Commonly Been Conducted in</u> <u>Relicensing Applications, Including the Rocky Reach</u> <u>Project Involving the City of Entiat and Chelan PUD.</u>

FERC's onsite representatives have suggested that the City's request for a study of socio-economic impacts is unprecedented or impractical. However, it should not be surprising given the statutory requirements discussed above that such studies are commonplace and have been done on a number of other relicensing projects, including one virtually "next door" to Wells Dam.

1. Chelan PUD/City of Entiat/Rocky Reach Dam.

In its April 2nd submission, the City of Pateros made repeated references to the socio-economic study that was conducted by Chelan PUD on the Rocky Reach relicensing process. Rocky Reach Dam is located approximately 50 miles south of Wells Dam and is the next dam downstream on the Columbia River. Like the City of Pateros, the City of Entiat was displaced as part of the original construction of Rocky Reach Dam in the late 1950's. According to public records, Entiat received compensation for the condemnation of its land at the time of construction. However, when the Rocky Reach project came up for relicensing, Chelan PUD agreed to conduct a study of the socio-economic impacts of the project.

A comparison of Chelan PUD's approach to this issue is helpful by way of comparison to Douglas PUD's position. Section 1.10 of the Rocky Reach Study Plan (Exhibit A) states:

The need to assess existing socioeconomic resources of the area and project operations (low-cost power) on those resources was identified by stakeholders during the issue identification phase of relicensing the Rocky Reach Hydroelectric Project. The city of Entiat, located adjacent to the Columbia River within the Rocky Reach Project area, has also requested that the socioeconomic study identify potential opportunities for expansion of existing markets and potential for developing new markets.

Ex. A, p. 3.

Section 2 identifies the Study Goal as follows:

The purpose of the socioeconomic study is to: 1) identify, describe and document factors that affect Project economics, including long term debt, cost of power, and the cost of relicensing; 2) identify, describe and document factors that influence regional and local economics, including industry, agriculture, schools and other public entities, recreation and tourism, and estimate the impact of Project operations on these resources; and 3) identify the potential for expansion of existing markets and the potential for developing new markets.

Ex. A., p. 3.

Section 5: Task List identifies several tasks targeted by the working group. Most notably, the following specific issues are addressed:

Task 3 - Identify which facilities or activities are directly or indirectly impacted by project operations and evaluate them with respect to a number of variables such as type of use, environmental conditions, scope of services provided, revenues generated, etc. An inventory of relevant facilities and activities will be developed including, but not limited to:

-Industry -Agriculture -Schools and Other Public Entities -Recreation

-Tourism Task 4 - Identify recreation, tourism and businessrelated demands in the Entiat area and define current market status and potential market opportunities. Task 4(a) - The current status of local economy will be defined using following information: -Population and demographic characteristics -Income characteristics -Labor force characteristics -Employment and unemployment rates -New construction permits -Retail sales trends -Transportation indicators Task 4(b) - A general overview of the local economy The overview will will be developed. identify, describe and document factors that influence private and commercial development, agriculture, recreation, tourism in the Rocky Reach reservoir and Entiat areas, and:

--Gather population projections for analysis of potential growth in demand of various recreation activities. --Identify potential impacts of project operation on the city of Entiat. --Document privilege taxes (and others) paid by Chelan PUD. --Examine current allocations of privilege taxes by the state to the area of Entiat. (ie: Entiat School District and city of Entiat) --Assess historical impacts of the Rocky Reach Project on the Entiat economy.

Ex. A, p. 4-5.

Surprisingly, Douglas PUD did not even mention the Rocky Reach socio-economic study in its response to the City of Pateros' request for a similar study on the Wells Project. Rather than addressing this obvious precedent, Douglas PUD apparently believes that its best argument is to ignore the Rocky Reach study and simply claim that such studies are not required and/or not worthwhile.

2. SMUD/American River Project

However, the Rocky Reach project is not the only recent relicensing project where socio-economic studies were conducted. In approximately 2002, the Sacramento Municipal Utility District ("Sacramento MUD") was going through the relicensing process for the Upper American River Hydroelectric Project in California, FERC Project No. 2101. As part of the relicensing, Sacramento MUD sought to add the Iowa Hill Pumped Storage Development Project to enhance its hydropower assets. Sacramento MUD then conducted a socioeconomic study for the proposed operations.

The Study Plan (Exhibit B) states that its purpose is to:

identify the socioeconomic benefits, costs and other socioeconomic impacts of the Project to the region and to public services from the construction and operation of the Iowa Hill project. The Study will address those benefits and costs that are directly and indirectly affected by the project.

Ex. B.

3. Appalachian Power Company/Smith Mountain

Another recent example involved the Appalachian Power Company's application for a new license for the Smith Mountain Project in Virginia, FERC Project 2210. In February 2007, the Appalachian conducted a socioeconomic study as part of the relicensing process, (Exhibit C) stating:

A number of socioeconomic issues have been raised thus by participants in the relicensing process. far Participants have noted that operation of the project and implementation of enhancement measures that may be required under a new license may have direct and indirect effects on surrounding property values, the economy of the region, the fiscal condition of surrounding municipalities and counties, and overall growth in residential development. They have commented that establishment of the facility created the lakes, which in turn created certain recreational and housing opportunities, noting that ongoing operations of the facility directly affect these opportunities through management of lake water levels, access, maintenance, and other measures. The land use, population, fiscal, and economic analysis conducted in this study is intended to address these issues by providing the basis for understanding the project's effect on the local economy and community. The analysis may help relicensing participants identify enhancement measures that could address any adverse project effects and help ensure that the project continues to contribute to the long-term vitality of the region.

Exhibit C, p. iv.

As these three examples demonstrate, socio-economic studies are not only required under the FPA and NEPA, but more and more licensees are voluntarily agreeing to conduct such studies as part of the ILP process. Douglas PUD should follow the lead of Chelan PUD, Sacramento MUD and Appalachian Power and do the same here.

C. <u>Douglas PUD's Justifications for Denying the Study Request</u> Are Not Valid.

Douglas PUD appears to rely on four primary arguments for denying the City's request for a socio-economic study. However, none of these arguments provide a basis for FERC to excuse Douglas PUD from conducting this required study.

First, Douglas PUD points out the economic benefits the Wells facility has provided to the local economy, including the funding and development of parks and recreation facilities and low cost electricity. See Section 3.4.3 of the Douglas PUD Study Plan.

With all due respect to Douglas PUD, this response misses the point. The City does not dispute that there have been <u>some</u> economic (and even social) benefits as a result of the construction and operation of the Wells project. However, without question, there have also been a number of significant <u>negative</u> impacts to the social and economic health of these communities as a result of the operation of the Wells Dam. As was stated in the City's previous study request, the following are just some of the impacts that have already been identified:

- The construction of Wells Dam resulted in the flooding of the City of Pateros' downtown area and displacement of much of its business, civic and population centers.
- The continued operation of the Dam will continue to cause the loss of area businesses, the loss of revenue (property, sales, excise and hotel/motel tax), additional cost of providing services, increased maintenance costs of new park assets, damage to the City's civic and social fabric, the continued lack of valuable agricultural land and warehouse space, the continued loss of different kinds of recreation opportunities associated with a free-flowing river, and continuing environmental costs.

Douglas PUD does not dispute that these negative impacts have occurred, but apparently wants FERC (and the City) to be satisfied that the benefits outweigh the impacts without conducting any further study of the issue. This is an unreasonable approach that completely disregards the entire purpose of the public interest and human environment studies required under the FPA and NEPA. Douglas PUD is asking for another **50-year license** to continue operating the Wells Dam. For the reasons stated above, before FERC can issue a license, it must fully consider the impacts of the Wells project on the surrounding communities. Just as Douglas PUD cannot ask FERC (or the public) to assume that the operation of the dam will not have an adverse impact on fish or other wildlife, Douglas PUD cannot simply make the baldface assertion that the surrounding communities will be positively impacted by the continued operation of the project. The only way to determine and quantify these impacts is to conduct a socio-economic study.

Second, Douglas PUD goes on to claim that it is not aware of any case where "FERC has required a licensee to provide compensation or to develop civic or community facilities for the sole purpose of enhancing the economy of a community, or to mitigate for lost tax revenues." However, in Virginia Electric and Power Company, Project No. 2716, 57 FPC 24 (1976), the licensee was required to give financial assistance to a rural community to mitigate the impact from an influx of construction workers upon the community's expenditures for education, law enforcement, solid waste disposal, general government costs and welfare and other social services. See also Escondido Mutual Water Company, 6 FERC ¶61,189 at 61,1409 (1979) (Stating that the Commission can condition licenses pursuant to its statutory authority to minimize adverse socio-economic consequences of a project.)

In any event, the City of Pateros is not at this point asking FERC to require an award of compensation as mitigation for the project's negative impacts. The City is merely requesting that Douglas PUD be required to conduct a study of the socioeconomic impacts of the continued operation of the Wells Project on the surrounding communities, as is required by law.

The City of Pateros and Douglas PUD may also eventually reach an agreement for the provision of services or funds in compensation for project impacts, similar to the one reached between Entiat and Chelan PUD on the Rocky Reach project. The benefits provided to the City under the agreement would likely be tied to recreational-related improvements intended to offset the socio-economic impacts caused by continued operation of the Wells Dam facility.

It may be that the information contained in a socio-economic study would also be useful in determining the appropriate elements of such agreement. However, the **primary** purpose of the study would be to measure the impacts of continued project operations for FERC's consideration in determining whether the license should be renewed. A socio-economic study is required under the FPA and NEPA, regardless of whether FERC would ever require Douglas PUD to provide compensation as part of the license renewal,

Third, Douglas PUD objects to any study of the City's pre-1962 conditions, claiming that it is improper to study "preproject impacts" at relicensing because such impacts are not relevant for comparing the impact of relicensing on today's environment. However, FERC has recently ruled that the past environmental effects of a project should be considered:

Under our judicially-approved baseline policy, we use the existing environment as a starting point for our environmental analysis at relicensing. As a result, we to re-create or analyze the do not attempt environmental conditions that existed before a project was built. This does not mean, however, that we ignore past environmental effects. To the contrary, past environmental effects are relevant and may be taken into account in determining what environmental measures may be appropriate for the new license term. Therefore, the fact that the project is already constructed does not preclude us from considering measures that are related to the continuing effects of project operation during the term of the new license.

Public Utility District No. 1 of Pend Oreille County, Washington (Pend Oreille PUD), 117 F.E.R.C. ¶61,205 (2006) (emphasis supplied).

The City of Pateros has pointed out the dramatic decline in population and business activity it experienced upon construction of Wells dam, not to seek compensation for the original displacement in 1962, but to illustrate the continued impacts the Wells Dam project will have on the surrounding communities. As the *Pend Oreille PUD* case states, information about the project's historical negative impacts is relevant in determining future mitigation measures. Accordingly, the proposed study of the socio-economic impacts of the Wells Dam project should therefore include information about the City's pre-1962 population and business data.

Fourth, Douglas PUD alleges that "there are numerous confounding factors that would render the study subjective and irrelevant." It may be true that conducting a socio-economic study of the Wells Project's impact would involve some subjective elements. However, as demonstrated above, similar studies have been conducted in other hydroelectric relicensing projects, including the Rocky Reach study, and have produced information that is both reliable and relevant to FERC's evaluation of the public benefit and impact on human environment. There is no reason why a study of the Wells Dam project would be any different.

D. City of Brewster's Request

In addition to the City of Pateros' formal request, the City of Brewster also submitted a separate request for a similar socio-economic study. While Douglas PUD has characterized Brewster's submission as an "informal" request, we believe it is important for FERC to consider that two of the three municipalities situated on the Wells Dam reservoir have requested that Douglas PUD study the socio-economic impacts of extending the Wells Dam license for another 50-year period.

II. <u>Comments On Refusal To Study Operation and Maintenance Of</u> The City's Recreation Facilities.

The City requested Douglas PUD to conduct a study of the specific costs for operation and maintenance of city parks. Douglas PUD responds as follows:

Studying these costs before measures are identified for recreation is not a recommended strategy. Douglas PUD is proposing to first conduct the Recreational Needs Analysis and Public Access Study. Following completion of these studies, Douglas PUD will determine which of the identified needs are related to ongoing Wells and Project operations then develop measures appropriate for meeting those needs. Costs will be evaluated at that time.

Douglas PUD Proposed Study Plan, P. 19.

The City is very concerned about the long-term costs of operating and maintaining the City's recreation facilities relating to the Wells Dam Project and wants to assure that extent of these costs is adequately studied. The City believes a formal study plan conducted as part of the ILP process is the most appropriate method of determining these costs. However, the City is willing to accept Douglas PUD's proposal provided that the obligations of Douglas PUD as set forth above are incorporated in the revised ILP Study Plan document.

III. Comments On Refusal To Study Visitor Center.

The City requested a study of the feasibility of a regional Visitor Information Center. Douglas PUD responded by proposing an alternative methodology:

Douglas PUD is proposing to first conduct the Recreational Needs Analysis during the ILP study period. After completion of this study, Douglas PUD will evaluate the need, demand and project nexus related to reopening or relocating the existing Wells Visitor Information Center.

Proposed Study Plan, p. 14.

In subsequent discussions with Douglas PUD, the City has learned that Douglas PUD staff will recommend that a new Visitor Information Center be built at the current Wells Dam Overlook. Based on this representation, the City does not believe that a formal study of this issue is required. However, in the event Douglas PUD does not go forward as indicated, the City requests that FERC require a formal study of this issue.

CONCLUSION

For the reasons stated above, we believe that FERC should require Douglas PUD to conduct studies of (1) socio-economic impacts of the Wells Dam project, (2) the operation and maintenance of recreation facilities, and (3) a regional visitor center. We envision the results of these studies as guiding the PUD and City of Pateros to enhanced recreational facilities that would benefit both entities.

Please let me know if you need any additional information.

Sincerely,

Gail A. Howe

Gail A. Howe, Mayor City of Pateros

Attachments: Exhibit A Exhibit B Exhibit C

SOCIOECONOMIC STUDY PLAN

Final

ROCKY REACH HYDROELECTRIC PROJECT FERC Project No. 2145

January 15, 2000



Public Utility District No. 1 of Chelan County Wenatchee, Washington

EXHIBIT A

Appendix A - 235

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Socioeconomic Study Plan

TABLE OF CONTENTS

SECTION 1: INTRODUCTION	.1
1.1 Project Location	1
1.2 The Columbia River	1
1.3 Physical setting	1
1.4 Climate	1
1.5 Regional Economy	2
1.6 Regional Population	2
1.7 Current Land Use Concept	2
1.8 Current Recreational Development	3
1.9 General Description of the Relicensing Process	3
1.10 Needs Statement	3
SECTION 2. STUDY COAL	ົ
SECTION 2. STUDT GOAL	3
SECTION 3: STUDY AREA	4
SECTION 4: METHODOLOGY	4
SECTION 5: TASK LIST	4
SECTION 6: ANALYSIS AND REPORTING	5
	E
SECTION 7. STAFFING AND EQUIPMENT NEEDS	Ð
SECTION 8: SCHEDULE	5
	-
	_
SECTION 9: BUDGET	6

SECTION 1: INTRODUCTION

1.1 Project Location

The Rocky Reach Project is located approximately seven miles north of the city of Wenatchee on the Columbia River in mid-Washington State. The dam is 215 river miles below the Canadian border and 473 river miles above the mouth of the Columbia at Astoria, Oregon.

1.2 The Columbia River

Rocky Reach Dam is located in Chelan County in north central Washington. Lake Entiat, the Rocky Reach Project reservoir, extends upriver 43 miles (to Wells Dam) and has a surface area of approximately 9,100 acres. The reservoir contains 36,400 acre feet of usable storage.

The drainage area of the project at the dam is about 90,000 square miles. The watershed lies east of the Cascade Mountains and West of the Rocky Mountains, consisting of parts of Washington, Idaho, Montana, and British Columbia. The normal headwater elevation is 707 feet above sea level. The normal tailwater elevation is 614.7 feet above sea level. The average annual minimum water temperature of 34°F normally occurs during the month of February. The average annual maximum water temperature of 65°F occurs during the months of August and September.

1.3 Physical setting

The state of Washington encompasses a wide range of geographic diversity, from the marine influenced ocean shores and the Puget Sound, over the rugged Cascade Mountain Range to the rolling hills of central Washington, to the ancient mountain ranges of north central and eastern Washington. The Rocky Reach Project is located on the Columbia River between two significantly different physiographic areas. In the Cascade Mountains to the west, a metamorphosed sedimentary, volcanic, and granitic rock predominates. On the Columbia River Plateau to the east, bedrock is covered by vast, thick layers of basalt. The vegetation ranges from forest and alpine meadows in the Cascades, down to the fertile, irrigated valleys near the Columbia and back up to sparsely vegetated arid plateaus to the east.

<u>1.4 Climate</u>

The climate in the vicinity of the Rocky Reach Project is the semi-arid type, which is typical of eastern Washington. There is a seasonal range of temperatures in the area with winter averaging about 25°F and summer about 75°F. Spring and Fall temperatures average 50°F. Extreme temperatures can approach -30°F in winter and 110°F in summer. The precipitation is generally low with an annual average of about 10 inches, the bulk of which falls between October and March. There are usually no more than 8 to 15 inches of snow on the ground.

Socioeconomic Study Plan

1.5 Regional Economy

The economy of the north central Washington region encompassing Chelan and Douglas Counties is based primarily on agriculture. Chelan County provides 80 percent of the jobs in the two-county area and contains 75 percent of the total number of employers. Apples, pears, cherries, and other fruits are important crops in the Columbia River basin. The region's economy is also supported by other types of agriculture (wheat, hay, potatoes) retail trades, services, manufacturing, recreation and tourism.

<u>1.6 Regional Population</u>

The region is sparsely populated. In 1997, the population of Chelan County was 57,854 people; Douglas County, 31,054 people; and the population of the entire state of Washington, 5.4 million people. The largest community on the Rocky Reach reservoir is the city of Entiat, with a 1997 estimated population of 801. The cities of Wenatchee (1997 population estimate of 25,160) and East Wenatchee (1997 population estimate of 5,245) are located seven miles south of Rocky Reach Dam.

1.7 Current Land Use Concept

The Columbia River valley surrounding the Rocky Reach Reservoir is a wide canyon characterized by basalt cliffs and exposed rock outcroppings. The limited valley is generally rural in nature. The city of Entiat and the communities of Chelan Falls and Orondo are located along the reservoir. Project boundary encroachment includes two sanitary sewer outfalls, storm water outfalls, irrigation withdrawals, and recreational development that is part of Chelan PUD's existing recreation plan.

Within the project boundary, agricultural uses, recreational sites developed by Chelan PUD, and some residential lands surround approximately half the reservoir. Agricultural uses consist primarily of fruit orchards and some pasture lands. Irrigation pumps and pumphouses to withdraw water from the Columbia River are often located on agricultural lands. Recreation sites provide for swimming, boating, fishing, personal watercraft, camping, picnicking, water-skiing, and other recreational uses. Recreational use generated at these sites is intensive during the summer season, Memorial Day through Labor Day.

The remainder of the lands surrounding the reservoir is undeveloped. These lands can be characterized as dry lands. They include shrub steppe and grasslands vegetation with patches of exposed rock. Much of the undeveloped shoreline lies in areas where the reservoir is in close proximity to a small, private railroad on the westerly side and to State Routes 97 (westerly) and 97A (easterly). Narrow strips of riparian vegetation, including wetland areas, may be present along those areas of the reservoir where the shoreline slopes are relatively gentle.

Ownership of lands outside and/or adjacent to the project boundary include State Department of Natural Resources Land, State Department of Wildlife Land, State Park Land, USDA Forest Service Land, Bureau of Land Management Land, Chelan PUD, Railroad, State Department of Transportation, City of Entiat, and private lands.

Appendix A - 238

<u>1.8 Current Recreational Development</u>

Public access to Rocky Reach project lands and waters is widely available. Recreation facilities located within or immediately adjacent to the Rocky Reach Reservoir include the following: Rocky Reach Dam Recreation Facilities and Visitor Center, Lincoln Rock State Park, Orondo Park, Entiat Park, Daroga State Park, Beebe Bridge Park, Chelan Falls Park. A full description of park facilities is located in the Recreation Resources Inventory Study Plan.

1.9 General Description of the Relicensing Process

The Public Utility District No. 1 of Chelan County (Chelan PUD) owns and operates the Rocky Reach Hydroelectric Project (Project). Chelan PUD is permitted to operate the Project according to terms and conditions contained in an existing Federal Energy Regulatory Commission (FERC) license, No. 2145, that was issued on July 12, 1956. On September 1, 1966, the Chelan PUD filed an application with the Federal Power Commission (FPC) to amend the Project license for the addition of four generating units. The FPC, later FERC, issued the license amendment on May 23, 1968. The existing license expires on June 30, 2006.

Chelan PUD intends to seek a new federal license to operate the Rocky Reach Project and has begun preparation for the process referred to as "relicensing." The FERC relicensing process is based on laws and regulations that require years of extensive planning, including environmental studies, agency consensus and public involvement. The process to obtain a new license has changed considerably since the existing licensee was issued in 1956. The Federal Power Act (FPA) was amended in 1986 by the Electric Consumers Protection Act (ECPA). The amendment requires the FERC, in addition to power and development purposes, to give equal consideration to the purposes of enhancement of fish and wildlife, the protection of recreational opportunities, and the preservation of other aspects of environmental quality.

<u>1.10 Needs Statement</u>

The need to assess existing socioecomonic resources of the area and project operations (low-cost power) on those resources was identified by stakeholders during the issue identification phase of relicensing the Rocky Reach Hydroelectric Project. The city of Entiat, located adjacent to the Columbia River within the Rocky Reach Project area, has also requested that the socioeconomic study identify potential opportunities for expansion of existing markets and potential for developing new markets.

SECTION 2: STUDY GOAL

The purpose of the socioeconomic study is to: 1) identify, describe and document factors that affect Project economics, including long term debt, cost of power, and the cost of relicensing; 2) identify, describe and document factors that influence regional and local economics, including industry, agriculture, schools and other public entities, recreation and tourism, and estimate the impact of Project operations on these resources; and 3) identify the potential for expansion of existing markets and the potential for developing new markets.

Socioeconomic Study Plan

SECTION 3: STUDY AREA

The proposed study area is the Rocky Reach Project boundary and communities immediately adjacent to the boundary and/or likely to be directly impacted by project operations.

The Rocky Reach boundary is defined by contour lines on each side of the reservoir beginning at elevation 711 feet MSL at the Rocky Reach Dam upstream to the Wells Project tailrace. The boundary varies in elevation along the reservoir and corresponds to areas likely to be impacted by water surface elevation associated with the probably maximum flood (Rocky Reach Project Periodic Safety Inspection Report, 1997). The Rocky Reach Project contains a total of 1,345 acres of land, of which Chelan PUD owns approximately 100 acres, or seven percent.

SECTION 4: METHODOLOGY

A consultant specializing in socioeconomic analyses will conduct the study using commonly accepted economic practices. Methodologies proposed by the consultant will be presented to the Socioeconomic Working Group.

SECTION 5: TASK LIST

Task 1 - Introduction and kick-off meeting. The Socioeconomic Working Group will meet with the consultant to review the goal, objectives and methodologies proposed for the study. The group will decide the most appropriate ways to provide input during the study and will offer suggestions regarding who should be contacted. Members of the working group will provide relevant reports, surveys, contacts and other items that may be useful to the consultant.

Task 2 - Identify, describe and document factors that affect Project economics, including long term debt, cost of power, and the cost of relicensing.

Task 3 – Identify which facilities or activities are directly or indirectly impacted by project operations and evaluate them with respect to a number of variables such as type of use, environmental conditions, scope of services provided, revenues generated, etc. An inventory of relevant facilities and activities will be developed including, but not limited to:

- Industry
- Agriculture
- Schools and Other Public Entities
- Recreation
- Tourism

Task 4 – Identify recreation, tourism and business-related demands in the Entiat area and define current market status and potential market opportunities.

Task 4(a) - The current status of local economy will be defined using following information:

- Population and demographic characteristics
- Income characteristics
- Labor force characteristics
- Employment and unemployment rates
- New construction permits
- Retail sales trends
- Transportation indicators

Task 4(b) - A general overview of the local economy will be developed. The overview will identify, describe and document factors that influence private and commercial development, agriculture, recreation, tourism in the Rocky Reach reservoir and Entiat areas, and:

- Gather population projections for analysis of potential growth in demand of various recreation activities.
- Identify potential impacts of project operations on the city of Entiat.
- Document privilege taxes (and others) paid by Chelan PUD.
- Examine current allocations of privilege taxes by the state to the area of Entiat. (ie: Entiat School District and city of Entiat)
- Assess historical impacts of the Rocky Reach Project on the Entiat economy.

SECTION 6: ANALYSIS AND REPORTING

The final report will contain an executive summary section that can be directly imported into the Draft License Application. All data will be summarized in the most concise and clear format possible. Supporting information and hard data will be provided in the appendices. All reports will be provided in electronic format for importing into Chelan PUD's database and ultimately into the license application. All reports styles will be consistent with Chelan PUD's writing style guidelines (to be provided).

SECTION 7: STAFFING AND EQUIPMENT NEEDS

To be provided by consultant.

SECTION 8: SCHEDULE

The study will be completed by August 1, 2000. A detailed schedule will be provided by the consultant. Socioeconomic Study Plan

SECTION 9: BUDGET

The consultant will provide a detailed budget.

Rocky Reach Project No. 2145 SS/1739_2rr Appendix A - 242 Study Plan - Final January 15, 2000
11.16 Iowa Hill Socioeconomic Study Plan

The Socioeconomic Study for the proposed Iowa Hill Pumped Storage Development (Iowa Hill project or project) will consist of collecting labor and construction estimates (provided by SMUD) and other project-related data from existing sources.

The Study will identify the socioeconomic benefits, costs and other socioeconomic impacts of the Project to the region and to public services from the construction and operation of the Iowa Hill project. The Study will address those benefits and costs that are directly and indirectly affected by the project.

11.16.1 Pertinent Issue Questions

- 1. What would be the short-term effects on local services and infrastructure (e.g., police, fire, heath, schools, housing) from the construction workforce?
- 2. What would be the long-term effects on local services and infrastructure (e.g., police, fire, heath, schools, housing) from project operations?
- 3. What would be the growth-inducing impact of the project?
- 4. What are the overall benefits of the Iowa Hill pumped storage project?
- 5. Would construction traffic have any short-term impacts to Apple Hill tourism (e.g., traffic congestion from workers traveling to and from work sites and haul trucks transporting rock from the main access tunnel at Slab Creek Reservoir to the upper reservoir site)?
- 6. Would construction and operation activities have any short-term impacts to the "lifestyle" of the community of Camino?
- 7. What is the economic value of the long-term loss of harvestable timber at Iowa Hill?
- 8. In the event of a catastrophic failure, what would be the potential socioeconomic impacts of that failure?
- 9. Would construction and/or operations of the Iowa Hill Development affect whitewater boating downstream of Chili Bar Dam?
- 10. Would construction and/or operations of the Iowa Hill Development affect flat-water recreation on Slab Creek Reservoir? And if so, would there be any socioeconomic impacts (e.g., to the holder of the Special Use Permit for commercial flat-water boating on Slab Creek Reservoir recently issued by the Eldorado National Forest)?
- 11. Would construction and/or operations of the Iowa Hill Development affect flat-water recreation on Chili Bar Reservoir? And if so, would there be any socioeconomic impacts?
- 12. Would construction and/or operations of the Iowa Hill Development affect EDCWA/EID's ability to implement the 1957 (as modified) facilities use agreement with SMUD?
- 13. Would construction and/or operation affect public access for recreation?

The water balance model would assess how operations of Iowa Hill would affect recreational resources (in the 20-mile reach downstream of Chili Bar Dam, Chili Bar Reservoir, the 8-mile Slab Creek bypass reach, the upper reservoirs and on Slab Creek Reservoir) via likely water management and cycling scenarios, compared to existing UARP operations. In addition, the water balance model would assess whether operations of Iowa Hill would affect or hinder EDCWA/EID's ability to implement the 1957 facilities use agreement with SMUD.

11.16.3 Background

SMUD's existing Upper American River Project (UARP) is located in the rugged Sierra Nevada Mountains between the southern shores of Lake Tahoe and Sacramento. A majority of the UARP facilities are located within the Eldorado National Forest and the 85,000-acre Crystal Basin Recreation Area.

As part of the UARP relicensing process, SMUD seeks to add the Iowa Hill project to enhance its hydropower assets in the Upper American River. The pumped storage project would allow water to be pumped up to a holding pond on Iowa Hill when electricity is plentiful (generally during the night) and release it during peak electricity demand to generate peaking power. The pumped storage project would be located in El Dorado County, near the communities of Camino, Pollock Pines and Swansboro and the city of Placerville.

Page 1 of 4



11.16.4 <u>Study Objectives</u>

The objectives of the Socioeconomic Impact Study are:

- Identify the socioeconomic costs and benefits of the Iowa Hill pumped storage project on El Dorado and Sacramento Counties.
- Identify the overall benefits (to the extent known at this time, i.e., pre-filing and pre-PM&Es) of the proposed Iowa Hill pumped storage project.
- Identify the impacts construction traffic would have on Apple Hill tourism, including impacts from workers traveling to and from work sites and haul trucks transporting rock from the main access tunnel at Slab Creek Reservoir to the upper reservoir site.
- Identify the impacts construction and operational activities would have on the "lifestyle" of the community of Camino.
- Quantify the economic value of harvestable timber lost due to the change in land use at the Iowa Hill Development.
- Review the results of the water balance model runs for Issue Questions Nos. 9 through 13, and identify any associated socioeconomic impacts.

Once this study is complete, SMUD will consult with the relicensing participants and representatives of Apple Hill tourism industry concerning the effects construction traffic would have on the community and Apple Hill tourism. Measures necessary to mitigate or minimize the effects will be included in SMUD's application for new license. Before construction, SMUD would develop a **Traffic and Transportation Plan** that describes the level of planned road use and identifies measures to control impacts to social and environmental resources.

11.16.5 <u>Study Area</u>

Region of Influence – El Dorado County. The Region of Influence (ROI) from the project construction and operation is El Dorado County. The construction and operational impacts would primarily effect El Dorado County. The study area for project benefits includes Sacramento County.

11.16.6 <u>Study Methods</u>

Information for this study will be obtained through data provided by SMUD and existing secondary sources. Information to be obtained includes:

- Population and housing in El Dorado County.
- Employment by industry and employment by occupation in El Dorado County to determine sufficiency of local workforce.
- Local government revenues and expenditures over the past 3 years.
- Current use levels of public services, e.g., enrollment in schools, hospital use and available hospital resources in project vicinity, number of calls to police and fire stations.

Information to be provided by SMUD includes:

- Location of the project components.
- Duration of construction phase of the project.
- Expenditures on materials and supplies during construction.
- Estimate of the local portion (within El Dorado County) of expenditures on materials and supplies during construction.
- Number of construction workers including estimated split between local and non-local. Local is assumed to be those residing within El Dorado County. Construction workforce should include any subcontractor workforce so the total workforce reflects workforce required by project.

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- Construction personnel by month (if possible) or the peak construction workforce as well as when that peak occurs.
- Construction personnel by discipline (or craft).
- Total construction wages (including benefits) or the average construction pay (including benefits).
- Number of workers required for operation and maintenance (O&M) of the pumped-storage project in excess of the operational workforce currently used to maintain the UARP facilities. Total operational wages (including benefits).
- Expenditures on materials, supplies and service during operation including the estimated split between local and non-local.
- If using trucks, then estimate of number and size of trucks, and number of trips per day/week to and from work site. Also provide the travel route of the trucks.
- Number of acres of timber harvested.
- List of benefits to Sacramento County from the Iowa Hill pumped storage project.
- Results of water balance model runs sufficient to address Issue Questions 9 through 13.

11.16.7 <u>Study Analysis</u>

The primary focus of this effort is to provide an economic impact analysis of the costs and benefits derived from the construction and operation of SMUD's Iowa Hill pump-storage project. The analysis will focus on quantifying the direct, indirect and induced regional economic impacts arising from the construction and operation of the project in terms of income and employment, as well as economic value to SMUD ratepayers. This would involve in part, the use of Input/Output (I/O) economic modeling. The IMPLAN I/O model will be used for this purpose. Additional analysis will be performed as necessary. During the course of the study, SMUD will meet with the Socioeconomic TWG to review the study approach to confirm the appropriateness of study outputs.

In addition, the analysis will also identify the overall benefits (i.e., consistent with the benefits and economic information requirements of Exhibits D and H of the relicensing regulations) of the proposed Iowa Hill pumped storage project as well as the construction and/or operation traffic impacts on: (1) Apple Hill tourism; (2) recreation resources on Slab Creek and Chili Bar Reservoirs; and (3) the "lifestyle" of the community of Camino. The analysis will also quantify the economic value of harvestable timber lost due to the change in land use at the Iowa Hill Development. Finally, the results of the applicable water balance model runs will be used to determine if there are any impacts to the socioeconomic resources in the area as a result of operations or from a catastrophic failure event.

11.16.8 Affected Environment

Data collected will be presented as a baseline for comparison. This baseline will include a description of population growth and projected growth within the ROI from 1990 through 2015. Existing housing stock for El Dorado County will also be presented. Employment and the general economy will be reviewed to determine the industry sectors that have experience growth or reductions in jobs. This section will also examine the fiscal resources of the County over the past 3-year period, current and projected school enrollment figures, and existing levels of law enforcement, fire protection, emergency response, and hospitals.

11.16.9 Environmental Consequences

The potential impacts of the Iowa Hill project would then be assessed. Included are potential impacts from the construction workforce on the County's population, housing supply, and local economy. The IMPLAN model will be used to determine the indirect and induced economic impacts from construction. The short-term fiscal impacts to El Dorado County from the project's construction will be estimated along with potential short-term impacts to the County on education, public services and public facilities. Potential long-term impacts from the increased operational workforce will also be analyzed to determine their impacts on education, public services and public facilities. The IMPLAN model will be used to determine indirect and induced economic impacts from the increased operational workforce.

The expected overall benefits of the Iowa Hill project will be presented in a manner consistent with the benefits and economic data requirements of Exhibits D and H of the relicensing regulations. The potential impacts of construction and operation traffic on tourism in the Apple Hill area and upon the lifestyle of the community of Camino will be presented. Potential socioeconomic impacts from the construction and operational activities on recreation resources will also be presented.

11.16.10 <u>Study Output</u>

The study output will be a technical report with tables and text describing the existing environment and displaying the economic and socioeconomic impact results of the project pertaining to fiscal resources, education, public services and public facilities. The technical report will be distributed to the Socioeconomic TWG for review and approval. The report will be prepared in a format so that it can easily be incorporated into the Licensee's draft environmental assessment that will be submitted to FERC with the Licensee's application for a new license.

11.16.11 <u>TWG and Plenary Group Endorsement</u>

The Socioeconomic TWG approved the issue questions and the study objectives for this study plan on February 27, 2004. The Plenary Group approved the issue questions and study objectives for this study plan on March 3, 2004.

The Socioeconomic TWG approved the draft study plan on March 29, 2004. The participants at the meeting who said they could "live with" the plan were U.S. Forest Service, El Dorado County Water Agency, City of Sacramento and SMUD. None of the participants at the meeting said they could not "live with" this study plan. On April 7, 2004, the Plenary Group agreed that if the Socioeconomic TWG Subcommittee can resolve the issues of concern, the study plan can be deemed approved by the Plenary Group. The Socioeconomic TWG Subcommittee resolved the issues of concern and approved the draft study plan on May 10, 2004. The participants at the meeting, in person or via conference call, who said they could "live with" this study plan were U.S. Forest Service, El Dorado County Water Agency, City of Sacramento and SMUD.

1.0 INTRODUCTION

Appalachian Power Company (Appalachian) is making application to the Federal Energy Regulatory Commission (Commission) for a new license for the Smith Mountain Project (No. 2210), located on the Roanoke River in south-central Virginia. In preparing its application, Appalachian is following the Integrated Licensing Process (ILP), as defined under the rules and regulations of the Commission (18 CFR Part 5). As part of this licensing process, Appalachian has solicited input from various and numerous stakeholders including governmental agencies, local governments, non-governmental organizations, and the general public to identify and analyze potential project-related issues.

A number of socioeconomic issues have been raised thus far by participants in the relicensing process. Participants have noted that operation of the project and implementation of enhancement measures that may be required under a new license may have direct and indirect effects on surrounding property values, the economy of the region, the fiscal condition of surrounding municipalities and counties, and overall growth in residential development. They have commented that establishment of the facility created the lakes, which in turn created certain recreational and housing opportunities, noting that ongoing operations of the facility directly affect these opportunities through management of lake water levels, access, maintenance, and other measures. The land use, population, fiscal, and economic analysis conducted in this study is intended to address these issues by providing the basis for understanding the project's effect on the local economy and community. The analysis may help relicensing participants identify enhancement measures that could address any adverse project effects and help ensure that the project continues to contribute to the long-term vitality of the region.

1.1 Project Location and Study Region

The Smith Mountain Project is an existing two-dam, two-reservoir, combined conventional hydroelectric and pumped storage project located on the headwaters of the Roanoke River in Bedford, Campbell, Franklin, and Pittsylvania counties in Virginia, which are referred to in this report as the study region. The conventional hydroelectric development is identified as the Lower or Leesville Development, while the pumped storage development is identified as the Upper or Smith Mountain Development. The Smith Mountain Development has five generating units, with a combined generating capacity of 586 MW. The Leesville Development has two generating units, with a combined generating capacity of 50 MW.

Smith Mountain Dam has a maximum height of 235 feet above the streambed. The reservoir behind the dam has a surface area of 20,600 acres at an operating pool elevation of 795.0 (National Geodetic Vertical Datum (NGVD). Mean flow through the development is 1,211 cubic feet per second (cfs). Leesville Dam has a maximum height of 94 feet above the streambed. The reservoir surface area is 3,270 acres at an operating pool elevation of 613.0 NGVD.

1.2 Results of Previous Studies

A study based on 1995 data, *Smith Mountain Pumped Storage Project Economic and Fiscal Impacts* (Berger, 1996), provides an estimate of the economic importance of the Smith Mountain Project to the study region based solely on the estimated spending of recreational visitors to the project. Recreational activities at the project include boating, fishing, picnicking,

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EXHIBIT C

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Email to Douglas PUD from WDFW regarding Nuisance Wildlife Control Study -----Original Message-----From: Matt Monda [mailto:MONDAMJM@DFW.WA.GOV] Sent: Wednesday, August 15, 2007 9:09 AM To: Scott Kreiter; andonca@dfw.wa.gov; MONDAMJM@dfw.wa.gov Cc: eldredte@dfw.wa.gov Subject: RE: Predator control plan

Scott: The letter is fine with me. Thanks Matt

>>> "Scott Kreiter" <scottk@dcpud.org> 08/09/2007 9:41 AM >>>
Matt and Carmen,

It occurred to us today that we had not sent you our phone/discussion log regarding this issue. We feel the issue is resolved based on the minor changes to the study plan. Please take a look at the attached document and let us know if this accurately represents what took place.

Thanks. -Scott



Wells Project Relicensing Phone Conversation Summary

Call to:	Scott Kreiter
Call From:	Carmen Andonaegui – Washington Department of Fish and Wildlife
Date:	July 11, 2007
Time:	3:20 PM
Subject:	Nuisance Wildlife Control Study

Summary:

Carmen called to pass on comments from Matt Monda (WDFW) regarding the "Evaluation of the Effects of and Alternatives to the Existing Bird and Mammal Control Programs" study plan. Matt felt that the study plan should have a component which evaluates whether or not the control program is having negative effects on mammals and/or birds, especially if the species is sensitive.

In a follow-up conversation with Matt Monda (July 12), Scott Kreiter and Jim McGee explained that this issue was discussed in detail by the Terrestrial Resource Work Group (RWG), and that the group concluded that due to the many confounding factors that affect wildlife populations, during any given year, that it would be difficult to design a defensible study that would identify the effects of the control measures on statewide populations of piscivorous wildlife.

However, if it is suspected that a control measure potentially has population level effects, the work group could identify PME measures to either: A) develop alternative control measures for that species, or B) propose further studies on population effects. Douglas PUD agreed to modify the Piscivorous Wildlife Study Plan by adding a sentence into Section 6 (Methods) stating that the Terrestrial RWG will develop reasonable and effective control measures based on the results of this study and any other relevant local knowledge on each species.

Matt also expressed a concern about the phrase "nuisance wildlife" in the study plan. Douglas PUD agreed to modify the study plan by replacing the phrase "nuisance wildlife" with "piscivorous wildlife".

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Email to Douglas PUD from Oregon State University regarding Tag Technology for Lamprey From: Heppell, Scott [mailto:scott.heppell@oregonstate.edu]
Sent: Thursday, August 16, 2007 3:17 PM
To: Bao Le
Subject: RE: radio and balloon tag technology for Pacific lamprey macrophthalmia passage and survival

Hello Bao-

I'm not sure I'm going to be able to help you here, but I'll try. I'm not sure what a Hi-Z balloon tag is. Can you tell me in what document the Pers. Comm. appeared? I did do some work a few years ago investigating whether we could use harmonic resonance tags to detect movement of lamprey through dams, but they didn't quite have the range we wanted. We also tried externally affixed radio tags to lamprey outmigrants, but they kept tying themselves in knots and pulling the tags off. I have attached a draft of the report that we wrote, as I can't find the final copy. I'm sorry I can't be more encouraging than that right now, but please let me know if I can answer any other questions.

Cheers-Scott

From: Bao Le [mailto:baol@dcpud.org]
Sent: Wednesday, August 15, 2007 4:58 PM
To: Heppell, Scott
Subject: radio and balloon tag technology for Pacific lamprey macrophthalmia passage and survival

Hi Scott, I am currently engaged in the development of assessments for Pacific lamprey here at Wells Dam and had seen a pers. comm.. by you that said that Hi-Z balloon tagging coupled with radio-tag technology could be used for juvenile lamprey for route specific dam passage studies. I wanted to try to get more information regarding the available technology, it's feasibility towards implementation in the near future, and whether anyone has utilized it to assess route passage and survival for juvenile migrating Pacific lamprey. I was unaware that we have come this far with such radio-tag technology that would provide us with a tag that did not affect behavior or swimming capability. If this is the case, and the technology is available, this is very exciting. If you could please provide me with more information regarding my request, I would really appreciate it. Please feel free to give me a call if you have any questions.

Regards, Bao

Bao Le Sr. Aquatic Resource Biologist Douglas PUD 1151 Valley Mall Pkwy. East Wenatchee, WA 98802 509-881-2323 (Direct) 509-884-0553 (FAX) The email attachment can be found on the Wells Project Relicensing website at: <u>www.douglaspud.org/relicensing</u>.

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Email to Douglas PUD from USGS regarding Tags to Evaluate Juvenile Lamprey Passage ----Original Message----From: Matthew G Mesa [mailto:matt_mesa@usgs.gov] Sent: Friday, August 17, 2007 11:40 AM To: Bao Le Subject: Re: tags to evaluate juvenile lamprey passage?

Hi Bao

Well, I don't know where you got the pers. comm, but it's wrong. We had plans to develop "dummy" tags of different sizes and weights to see how small a tag would really have to be. Then, we were going to take the "winning" size and work with a manufacturer to assess the logistics of developing one. So, no, there is no tag currently available and we simply didn't have the resources to complete this work. Obviously, a tag suitable for use in juveniles would be a boon--but were not there yet.

Cheers

Matt

BTW--I don't know if you guys would be interested, but I sent a one page research summary to the COE for funding on the effects of dissolved gas supersaturation on lampreys. They were interested, but it didn't fly this year. I think it could be a big issue re: passage and fish health--what about you guys? Any interest in research along these lines (i.e., funding some work?)

(See attached file: lamprey 1-pager (DGS 3.1.07).doc)

"Bao Le" <baol@dcpud.org>

To <matt_mesa@usgs.gov> 08/15/2007 04:51 PM

Subject: tags to evaluate juvenile lamprey passage?

Matt, I am reading a letter hear that has a pers. comm. from you that says, "the USGS is in the process of developing specific tags to evaluate juvenile lamprey passage." I wanted to get more info regarding the availability of such technology to measure passage routes and survival. This letter implies that current technology is available and useful for macrophthalmia. I was unaware that we have produced a radio tag of such a size and weight that does not affect swimming ability, etc. If this is truly the case, this is very exciting. I have not seen any other assessments using such technology and wanted to try and get more information as to its development. Any feedback you have re: this is much appreciated. Cheers. Bao

Bao Le Sr. Aquatic Resource Biologist Douglas PUD 1151 Valley Mall Pkwy. East Wenatchee, WA 98802 509-881-2323 (Direct) 509-884-0553 (FAX) **Northwestern Division - Corps of Engineers**

ANADROMOUS FISH EVALUATION PROGRAM

RESEARCH SUMMARY

STUDY CODE: ADS-P-xxx

TITLE: Effects of Dissolved Gas Supersaturation on Adult Pacific Lampreys

FISH PROGRAM FEATURE: System - Adult Passage

PROBLEM STATEMENT: There is significant regional concern regarding lamprey populations in the Columbia Basin. In 1993, the Oregon Department of Fish and Wildlife designated Pacific lamprey at risk of being listed as threatened or endangered. The U.S. Fish and Wildlife Service designated Pacific lamprey as a Category 2 candidate species in 1994. The Northwest Power Planning Council's (NPPC) 1994 Fish and Wildlife Program acknowledged the apparent decline of Pacific lamprey and requested a status report to identify research needs. Columbia River treaty tribes have repeatedly voiced concern about the decline of Pacific lamprey, a culturally important species. Before lamprey population decline can be adequately addressed, fundamental biological questions must be answered, including identification of the biological and ecological factors affecting lamprey production in the Columbia River Basin. One limiting factor for lamprey production may be exposure to high levels of total dissolved gas (TDG) at dams as lampreys migrate up the Columbia River basin to their spawning grounds. The potential for lampreys to be exposed to high TDG levels at dams is high because these fish are known to reside at dams for several days or weeks, perhaps in relatively shallow water, prior to passage. Because lampreys encounter several dams during their upstream migration, cumulative effects are possible. However, nothing is known about the responses of lampreys to high levels of TDG.

BIOP MEASURES: Pacific lamprey are not listed under the Endangered Species Act.

OBJECTIVES:

1. Collect adult lampreys at Bonneville Dam and implant them with depth-sensitive radio tags.

2. Monitor fish location, depth, and TDG levels at Bonneville Dam during the spring-summer migration of lampreys. Derive field-based TDG exposure histories from the telemetry data.

2. Assess the effects of exposure to high levels of TDG on lamprey physiology and survival in laboratory bioassays based on results of field studies.

SCHEDULE: 2007-2009

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Phone Conversation with USFWS regarding Citation Letter from Umatilla Tribes



Wells Project Relicensing Phone Conversation Summary

Call to:	Scott Kreiter
Call From:	Christina Luzier – U.S. Fish and Wildlife Service
Date:	August 22, 2007
Time:	9:05 AM
Subject:	Umatilla letter (8/14/2007) citation

Summary:

Christina Luzier (USFWS) returned our call regarding clarification on the following citation in the letter to Douglas PUD from the Umatilla Tribes:

"... monitoring of sediments for presence of lamprey, using electrofishing methods described by Luzier (2007) should be implemented and evaluated."

Christina said that no such publication exists. However, the Umatilla's letter may have been referring to presentations that Christina Luzier had made at one of the recent Lamprey Technical Work Group meetings.

Appendix B Proposed Cultural Study Plan

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CULTURAL RESOURCES INVESTIGATION

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington For copies of this study plan, contact:

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ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5).

The Cultural Resources Work Group (CRWG), which is composed of stakeholders (resource agencies, tribes and FERC) and Douglas PUD staff, was formed for the purpose of identifying issues and information gaps that may require study during the relicensing of the Wells Project. The CRWG, through a series of technical meetings, is proposing to conduct a Cultural Resources Investigation to resolve existing gaps in knowledge of cultural resources in the Area of Potential Effect (APE).

The Cultural Resource Investigation will identify and revisit all previously recorded historic properties within the APE, update the current location and condition of each site, update the site forms for each site, develop a prioritized list of sites and evaluate whether they are eligible for the National Register of Historic Places (NRHP), and evaluate the Project's effects on historic properties identified within the FERC Project boundary.

The results of this study will be used to develop protection, mitigation, and enhancement (PME) measures for historic properties in the Wells Project APE. The PME measures will be incorporated into the Historic Properties Management Plan (HPMP) which will be filed with FERC along with the final license application in May, 2010.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides of the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1Location Map of the Wells Project

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The goal of this study is to establish sound baseline information about cultural resources within the Wells Project boundary for the development of a Historic Properties Management Plan (HPMP).

Specific objectives for meeting this goal are as follows:

- Update the current location and condition of all known cultural resource locations within the Area of Potential Effects (APE);
- Update site forms for all sites identified within the APE;
- Conduct archaeological survey within high priority portions of the APE;

- Develop a list of priority sites for Determinations of Eligibility (DOE);
- Complete DOEs for priority sites; and
- Evaluate the Project's effects on historic properties identified within the APE.

The results of the Confederated Tribes of the Colville Reservation Traditional Cultural Property (TCP) study will be incorporated into the above goals and objectives.

3.0 STUDY AREA

The Wells Project APE was defined by the CRWG as follows:

The Wells Project area of potential effect (APE) includes all lands within the FERC Project boundary. The APE also includes any lands outside of the Project boundary where cultural resources may be affected by Project-related activities that are conducted in compliance with the FERC license (e.g. the Wells HCP Tributary Conservation Program).

For the purposes of this study, the APE includes those lands within the FERC Project boundary. The Wells Project boundary extends from the tailrace of Wells Dam (River Mile [RM] 514.7) upstream to the tailrace of Chief Joseph Dam (RM 544.5). The boundary also extends to RM 15.5 on the Okanogan River and RM 1.5 on the Methow River (Figure 1.1-1). The Wells Project also includes a 41 mile 230kV transmission right of way which will be included as part of the APE in this study (Figure 3.0-1).



Figure 3.0-1 Location Map of the 230kV Transmission Corridor

4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Cultural Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established a Cultural Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues and to develop preliminary study plans to be included into the Wells Pre-Application Document (PAD).

Through a series of seven meetings, the Cultural RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWGs' efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Cultural RWG is proposing to conduct a study to evaluate potential project related impacts on cultural resources. The need for this study was agreed to by all of the members of the Cultural RWG, including Douglas PUD. This study will help to inform future relicensing decisions and will fill data gaps that have been identified by the Cultural RWG.

4.2 Issue Statement

Issue Statement (PAD Section 6.2.4.1)

Continued operation of the Wells Project affects cultural resources that are listed or considered eligible for inclusion in the National Register of Historic Places.

Issue Determination Statement (PAD Section 6.2.4.1)

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies having the authority to license any undertaking to take into account the effect of the undertaking on historic properties. Because the Wells Project is licensed by FERC, the relicensing process is considered a federal undertaking and the NHPA and its implementing regulations are applicable.

There are a number of Project effects that might harm cultural resources. Erosion of the shoreline caused by Project operation could expose buried cultural resources or damage traditional cultural properties (TCPs). Other ground disturbing activities related to ongoing Project license compliance activities could also impact cultural resources.

Starting in early 2006, a cultural resource data review was implemented in an effort to understand what archeological and historical property information is currently available for the Wells Project. This effort is being conducted jointly by Douglas PUD, the Confederated Tribes

of the Colville Reservation and Western Shore Heritage Services. Douglas PUD has also agreed to fund the Confederate Tribes of the Colville Reservation to conduct a TCP study starting in 2006.

The resource work group agrees that a study is needed during the two-year ILP study period to evaluate potential project related impacts to cultural resources. Most, if not all, of the Wells Project has been surveyed for cultural resources. Archaeological monitoring is conducted every three years. Additional archeological surveys may not be required. However, site forms need to be updated for existing sites, and some sites may need to be evaluated for National Register Eligibility.

4.3 Wells Cultural Resources Data Review (2006)

Over the last 50 years, numerous archaeological investigations have been carried out within and adjacent to the Wells Project area. A total of 171 archaeological sites have been identified in the APE. One hundred sixty are pre contact sites, nine are historic, and two have historic and pre contact components. Because of the volume of information on cultural resources within the Wells Project, Douglas PUD hired Western Shore Heritage Services (WSHS) to conduct a cultural resources data review. With the assistance and guidance of the Cultural RWG, WSHS reviewed archaeological site forms, reports of cultural resources investigations, ethnographic literature, and Indian Allotment data within and adjacent to the Wells Project area¹. The draft report is currently being reviewed by the Cultural RWG (WSHS, 2006 draft).

5.0 **PROJECT NEXUS**

Section 106 of the National Historic Preservation Act requires federal agencies having the authority to license any undertaking to take into account the effect of the undertaking on historic properties. Because the Wells Project is licensed by FERC, the relicensing process is considered a federal undertaking and the NHPA and its implementing regulations are applicable.

There are a number of Project related activities that affect cultural resources. Erosion of the shoreline caused by Project operation could expose buried cultural resources or damage TCPs. Other ground disturbing activities related to ongoing Project license compliance activities may include issuance of permits for developments within Project boundary; construction of docks, parks, or roads; recreation; vandalism; and inundation and saturation of sites.

6.0 METHODOLOGY

Step 1: Identify historic properties within the APE

The Wells Project has been the subject of repeated cultural resources surveys, extensive testing and data recovery at several sites. Shoreline monitoring has taken place at many archaeological sites every three years since 1989. Monitoring of archeological site protection measures occurs annually. Monitoring surveys also examined new shoreline exposures for archaeological

¹ The term "Wells Project area" or "project area" refers to locations both within and adjacent to the FERC Project boundary (APE).

deposits. Therefore, the nature and geographic distribution of archaeological sites within the Project is well documented; and, it is not probable that an archaeological inventory of the entire Project would identify many new, previously unrecorded sites. However, because the quality of site inventory information within the Project APE is variable, sites in the APE where information is lacking will be revisited to update location information, to assess site condition, and to identify project impacts.

Step 2: Conduct archaeological survey within high priority portions of the APE

The Cultural RWG has evaluated previously conducted cultural resource surveys and monitoring efforts to determine the need for additional inventory within portions of the APE. Based upon this evaluation, the Cultural RWG recommended a re-survey for 15.5 miles of the Okanogan River, from the north end of the project boundary to the confluence with the Columbia River at Cassimer Bar, as well as for all active erosion sites and known Indian allotments identified within the project APE. A survey of the 41-mile, 235 ft-wide, 230 kV transmission-lines corridor will also be conducted.

Step 3: Update Site Forms, Site Condition and Locations

Consistent baseline data are not currently available for each archaeological site in the APE. For example, information for 68 sites has not been updated since the sites were first recorded in the 1950s and 1960s. It is possible not all previously recorded sites in the APE (approximately 171) are still extant; some sites have been inundated or may have lost integrity. In addition, comprehensive up-to-date data about the kinds and degree of effects of the Wells Project on archaeological sites is not currently available. Site revisits will provide a comprehensive data set to document site conditions and location. Locations will be updated using Global Positioning System (GPS) as well as orthophotographic field maps, and will be incorporated into a revised Geographical Information System (GIS) database. The updated data set will be used to update the site forms.

Step 4: Development of a Prioritized List of Sites

Based on the results of Steps 1 and 2, the contractor will propose and the Cultural RWG will refine and recommend a list of priority sites that will be evaluated further to determine their potential eligibility for the NRHP or whether they are contributing elements to the Wells Archaeological District. Priority sites will be those that are near areas of erosion, recreation sites, or other locations that have a high probability of being adversely impacted.

Step 5: Site Evaluations and Determinations of Eligibility

The identification effort will assemble currently available data for each site in the APE and identify which sites could be recommended as NRHP–eligible based on existing information. Sufficient information for a portion of the known sites may exist to develop DOEs, or to determine if they are contributing elements to the Lake Pateros Archaeological District. The PUD will develop DOEs for those sites for which sufficient information is available to support

the determination. This effort would follow site revisits and probably could be accomplished during the remainder of the 2008 field season or during the spring of 2009.

Accurate site boundaries presently are not available for most archaeological sites. And, most of the sites in the APE have not been formally evaluated for NRHP eligibility. The Cultural RWG will develop a prioritized list of sites that will require additional work in order to prepare DOEs. This effort would follow site revisits and might be accomplished during the remainder of the 2008 field season or during the spring of 2009.

Step 6: Evaluate Project Effects

Once all sites have been revisited and a determination of eligibility developed, it will be possible to identify project effects on historic properties determined to be eligible. The nature and degree of effects will be consistently documented using a series of protocols developed in concert with the Wells Cultural RWG. Information regarding project effects on historic properties would be used in developing PMEs. The information collected from the above steps will be used in developing a Historic Properties Management Plan that will be issued with the Draft License Application which will be filed in December of 2009.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

Cultural resources investigations for this study will be conducted by professional archaeologists who meet the standards issued by the U. S. Department of the Interior through the National Park Service (Code of Federal Regulations, 36 CFR Part 61; Secretary of the Interior's Standards and Guidelines, Federal Register, Vol. 48, No. 190, Thursday, Sept. 29, 1983, pp. 44738-39).

The field component of this study will require a small survey crew and a boat. This study requires no other specialized equipment.

8.0 BUDGET

Based on presently available information, this study is estimated to cost about \$250,000. This budget includes field time to visit all existing sites, assumes some minimal field survey, time to prepare DOE assessments and documentation for all sites, and participation in the Cultural RWG.

9.0 SCHEDULE

<u>May 2007 – July 2007:</u> Conduct pre-field research (Steps 1 and 2).

<u>October 2007 – November 2007:</u> Visit priority sites, conduct survey, and update site forms (Step 3).

<u>December 2007 – March 2008:</u> Develop list of priority sites for NRHP evaluation (Step 4). January 2008: Traditional Cultural Properties Study complete.

<u>April 2008 – July 2008:</u> Complete any additional site testing, DOEs, and determine Project effects (Step 5 and 6).

<u>August 15, 2008:</u> Cultural Resource Field Reconnaissance and Survey complete.

October 15, 2008: ILP deadline for Initial Study Report.

August 2009:

Draft Historic Properties Management Plan due to be incorporated into the Preliminary License Proposal or draft License Application.

October 15, 2009: ILP deadline for Final Study Report.

10.0 REFERENCES

Berger, M and G. Hartmann. 2006. Cultural Resources Data Review for the Wells Relicensing Project, Douglas and Okanogan Counties, Washington. Western Shore Heritage Services, Inc.

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Appendix C Revised Recreation Study Plans

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EVALUATION OF PUBLIC ACCESS TO AND USE OF THE WELLS RESERVOIR AS IT RELATES TO RESERVOIR FLUCTUATIONS, AQUATIC PLANTS AND SUBSTRATE BUILDUP (Public Access Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington For copies of this study plan, contact:

Public Utility District No. 1 of Douglas County Attention: Relicensing 1151 Valley Mall Parkway East Wenatchee, WA 98802-4497 Phone: (509)884-7191 E-Mail: relicensing@dcpud.org

ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5).

The Recreation and Land Use Resource Work Group (RWG), which is composed of stakeholders (resource agencies and tribes) and Douglas PUD staff, was formed for the purpose of identifying issues and information gaps that may require study during the relicensing of the Wells Project. The RWG, through a series of technical meetings, is proposing a study intended to evaluate whether the Wells Project recreation facilities such as docks, boat launches and swimming areas, can be reasonably accessed under various reservoir operating scenarios. The study will analyze accessibility to boat docks and launches during low reservoir elevations, evaluate how reservoir elevations affect on-water boating experiences and will evaluate whether aquatic plant growth and substrate buildup at public access sites are restricting public use of Project waters.

The results of this study will be used to help Douglas PUD and recreation management entities identify existing access issues that should be addressed during the development of protection, mitigation and enhancement measures.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides of the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet.

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

<u>18 CFR § 5.9(b) Content of study request</u>. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The goal of this study is to evaluate whether Wells Project recreation facilities (public access facilities) such as docks, boat launches and swimming areas, can be reasonably utilized under various reservoir operating scenarios and conditions. Specific objectives include:

- Evaluate accessibility to boat docks and launches during low reservoir elevations.
- Evaluate how reservoir elevations affect on-water boating experiences.
- Evaluate the effect of aquatic plant growth on accessibility to boat docks, launches and designated swimming areas within the Wells Project (reservoir and tailrace).
- Evaluate whether river substrate is restricting access to boat docks, boat launches and designated swimming areas within the Wells Project (reservoir and tailrace).
- Develop a map showing general types of aquatic plants and where they occur.
- Develop a map showing areas of the reservoir that may be inaccessible during low reservoir elevations.
- Identify measures to improve boat docks and launches and swimming areas as they relate to reservoir fluctuations, aquatic plants and substrate buildup.

3.0 STUDY AREA

The study area includes water oriented access facilities and areas within the Wells Project boundary. This includes the Wells Reservoir which extends from Wells Dam (River Mile [RM] 515.6) upstream to the tailrace of Chief Joseph Dam (RM 544.5) and includes the lower 1.5 miles of the Methow River and the lower 15.5 miles of the Okanogan River. This also includes the Wells tailrace which extends from the base of Wells Dam to a point 1.2 miles downstream (RM 515.6 – 514.6). Public recreation and access areas include boat launches and boat docks along the Wells Reservoir and Wells tailrace (Figure 3.0-1).



Figure 3.0-1 Wells Reservoir access sites

4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Recreation and Land Use Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established a Recreation and Land Use Resource Work Group (RWG) which began meeting in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included into the Wells Pre-Application Document (PAD).

Through a series of meetings, the Recreation and Land Use RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decision. Agreed Upon Study Plans are the finished projects of the informal RWG process.

Based upon these meetings and discussions, the Recreation and Land Use RWG is proposing to conduct a study to evaluate whether reservoir fluctuations, aquatic plant growth or substrate buildup limits access and recreational use of the waters contained within the Wells Project. This study will also help to identify whether site specific measures are needed to improve public access to the Wells Reservoir and Douglas PUD-funded recreation facilities.

4.2 Issue Statements

Issue Statement (PAD Section 6.2.2.1)

Reservoir fluctuations during high recreation use days may limit access and use of the reservoir and recreation facilities.

Issue Determination Statement (PAD Section 6.2.2.1)

There may be some scenarios where Project operations, notably reservoir fluctuations, affect access to and use of public boat launches and docks. The work group recommends that a site evaluation study be completed to determine which recreation facilities are rendered inaccessible at various reservoir elevations. The study should provide options for improving access to public boat launches and docks. The study should also evaluate how reservoir elevations affect on-water boating experiences (e.g. motorboats vs. man-powered boats).

The resource work group agrees that a site evaluation study should be completed during the twoyear ILP study period. This study will help to determine whether new measures are needed to address this issue for the term of the next license.

Issue Statement (PAD Section 6.2.2.2)

The reservoir may have resulted in the growth of aquatic vegetation at recreation sites, which may restrict access and use of the reservoir.

Issue Determination Statement (PAD Section 6.2.2.2)

The Wells Project may have enhanced the growth of aquatic vegetation in the Wells Reservoir. Douglas PUD has completed baseline assessments of macrophyte distribution in the reservoir. Results of the baseline assessments indicated that most of the aquatic vegetation in the reservoir is native vegetation which may provide important fish habitat and waterfowl forage.

The resource work group agrees that a site evaluation study should be completed during the twoyear ILP study period to determine where and to what degree public access to and use of the reservoir is restricted by aquatic vegetation. The proposed site evaluation study should include a map showing where macrophytes occur and focus on identifying where macrophytes restrict or discourage access to public recreation facilities. The study should also include options to address the issue should it be determined that aquatic vegetation is impacting access to and use of the reservoir. The study will help identify measures to address this issue for the term of the next license.

Issue Statement (PAD Section 6.2.2.3)

The reservoir and Project operations may affect sediment transport and deposition, which may restrict access to and use of the reservoir.

Issue Determination Statement (PAD Section 6.2.2.3)

The resource work group agrees that a study is not needed during the ILP two-year study period. Sediment conditions at public recreation sites will be considered during the site evaluation study discussed in issues above. The resource work group agrees that it is important to continue monitoring the sediment conditions at Wells Project access sites along the Methow and Okanogan rivers.

4.3 Recreation Visitor Use Assessment

Douglas PUD conducted a Recreation Visitor Use Assessment during May to December of 2005 in an effort to collect information related to visitor use at Wells Project recreation sites (DTA, 2006). The primary goals of this study were to assist in the preparation of the PAD and to describe use levels, preferences, attitudes and characteristics of the Wells Project's primary recreation user groups. Specific objectives included:

- Describing recreation respondents' characteristics;
- Describing user preferences for recreation settings and facilities;
- Identifying possible recreation conflicts, crowding, or personal safety issues;
- Describing users' attitudes toward management actions;

- Describing recreation respondents' activities; and
- Identifying the amount, activity type and spatial and temporal distribution of existing recreation use.

A stratified systematic sampling strategy was chosen for the Recreation Visitor Use Assessment. To ensure diversity in types of recreation users and variation in type of days visited, sampling was conducted at designated recreation sites and on the Wells Reservoir from May 24, 2005 through December 13, 2005; months that together account for the majority of use.

4.4 Recreation Action Plan

Ongoing recreation needs within the Wells Project are addressed through the Wells Recreation Action Planning process. The Wells Recreation Plan (1967), Wells Recreation Plan Supplement (1974), Public Use Plan (1982) and Recreation Action Plans (1987, 1992, 1997 and 2002) were established as part of compliance with Article 44 of the FERC license. This long-term and ongoing planning and implementation process has helped in the development and maintenance of the recreation sites along the Wells Reservoir.

Following a two-foot pool raise amendment in 1982, Douglas PUD developed a Public Use Plan for the Wells Project. The plan analyzed the types of public recreation facilities that the Wells Reservoir can reasonably accommodate and discusses how those facilities can be developed and maintained. The information presented in the 1982 Public Use Plan included an analysis of recreation facilities within a 100-mile radius of the Wells Project.

In response to the 1982 Public Use Plan, the National Park Service (NPS) and State Parks recommended periodic updates (every five years) to the 1982 Public Use Plan. By FERC Order dated August 12, 1987, 40 FERC 62,157, this recommendation was made part of the Wells Project license resulting in updates to the 1982 Public Use Plan every five years. Douglas PUD's 1987 Recreation Action Plan, which is a supplement to the 1982 Public Use Plan, was supported by the NPS, Washington State Parks and Recreation Commission and the cities of Pateros, Brewster and Bridgeport. Douglas PUD has published subsequent updates to the 1982 Public Use Plan in 1992, 1997 and 2002. The next update is scheduled to be completed in 2007.

4.5 Aquatic Macrophyte Identification and Distribution Study

In August and September of 2005, Douglas PUD conducted a study to address the species composition, relative abundance and spatial distribution of macrophyte beds within the waters of the Wells Project (Lê and Kreiter, 2005). The estimated location of aquatic plant beds were mapped using a Geographic Information System (GIS). The study found that in general, macrophyte communities in the Wells Project were patchy and were distributed by depth.

In general, macrophyte communities did not recruit to depths of less than 4 feet in the Wells Project. Depths between 5 and 15 feet were characterized by a species composition where native species were dominant. In locations where Eurasian water milfoil was present, this species was most often sub-dominant and present at relatively low densities (less than 10% milfoil). From depths of 15 to 24 feet, species composition consisted exclusively of native species. From 24 feet to 30 feet, macrophyte communities were absent most likely due to the limited availability of light at these depths. Overall, the study identified a total of 2,379 acres of macrophyte beds out of a total surface area of 9,740 acres.

4.6 Bathymetric Mapping

In March of 2005, Douglas PUD contracted with GeoEngineers to conduct a detailed bathymetric survey of the Wells Reservoir and tailrace using multibeam sonar and (Global Positioning System) GPS technology. Contour maps of the reservoir bottom were produced at 1foot contour intervals. The bathymetry provides a seamless representation of the riverbed surface. The bathymetric mapping can be used to identify potential shallow areas within the Wells Reservoir when its elevation is lowered.

5.0 **PROJECT NEXUS**

The Wells Project and its operations may affect access to boat launches and boat docks located along the Wells Reservoir. Fluctuations of the Wells Reservoir may render portions of the reservoir and some of the public access sites along the reservoir inaccessible. Additionally, the Wells Project may enhance the growth of aquatic vegetation in the Wells Reservoir and also affect sediment transport and deposition. Aquatic vegetation growth and buildup of substrates near boat launches, boat docks and swimming areas could restrict access to and from the Wells Reservoir. The results of this study will help Douglas PUD and the RWG members determine whether new measures are needed to address this issue for the term of the next license.

6.0 METHODOLOGY

6.1 Evaluate Access Related to Reservoir Fluctuations

The Wells Project is a "run-of-the-river" hydroelectric project meaning that on average, daily inflow to the Wells Reservoir equals daily outflow. The limited active storage capacity of the Wells Project is only sufficient to regulate flow on a daily basis. Wells Reservoir fluctuations and power generation are largely driven by the discharge of water from Chief Joseph Dam and Grand Coulee Dam. The Wells Project is authorized to maintain its reservoir level between elevation 781 and 771 feet. It is important to determine whether reservoir elevations, specifically low elevations, affect access to the Wells Reservoir. To evaluate access related to reservoir fluctuations, Douglas PUD will perform the steps described below:

Step 1: <u>Analyze Wells Reservoir elevations from 2001 to 2005</u> Review and summarize hourly elevation data from the Wells forebay to determine how often fluctuations occur in the Wells Reservoir. Develop headwater duration curves for the years 2001-2005 to better understand the relationship between reservoir fluctuations and elapsed time.

- Step 2:Document access sites at various Wells Reservoir elevationsDocument and evaluate accessibility to boat docks and launches. Measure
depths at boat launches and docks to determine at what elevations access
sites could become inaccessible due to low water or buildup of substrates.
- Step 3:Develop a map showing areas of the Wells Reservoir that may be
inaccessible during low reservoir elevations
Using GIS and the existing reservoir bathymetry data, identify potential
shallow areas during low reservoir operations. Utilize these maps to
evaluate how reservoir fluctuations may affect on-water boating
experiences.

6.2 Evaluate Access Related to Substrate Buildup

Active bed load movement, erosion and the deposition of suspended material can limit the usability of public access facilities located along the Methow and Okanogan rivers. The proposed reservoir access study will evaluate whether public access facilities around the Wells Reservoir are being impacted by the build up of substrate. Examples might include substrate filling in a boat launch or swimming area. The evaluation of the effects of substrate on access to the reservoir and water related public facilities in these areas will be conducted in connection with steps 1-3 found in Section 6.1 (above).

6.3 Evaluate Access Related to Aquatic Plants

Douglas PUD's Aquatic Macrophyte Identification and Distribution Study conducted in 2005 found a varying amount of aquatic macrophyte communities present near the boat launches and docks along the Wells Reservoir. Most of the aquatic macrophyte communities in the Wells Reservoir are comprised of native vegetation, which provides a source of important fish and waterfowl habitat. However, aquatic plant growth near boat launches and docks may affect accessibility to the Wells Reservoir for recreational purposes. To evaluate access related to aquatic plants, Douglas PUD will perform the steps described below:

- Step 1: <u>Review aquatic macrophyte communities and substrate near access areas</u> Conduct a field survey to evaluate the density and distribution of aquatic plants in relation to specific sites to determine if aquatic plants in these areas adversely impact access to the Wells Reservoir. Assess how aquatic plant growth impacts the use of public use sites.
- Step 2: <u>Identify measures for addressing plant growth at public access sites</u> If results from Step 1 indicate that aquatic plants in certain areas are restricting access to the Wells Reservoir, identify and describe potential options to improve access.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

The access study will be conducted by Douglas PUD staff with assistance at various stages by consultants. Measurements related to access at various reservoir elevations will be collected by professional surveyors.

Bathymetric maps and detailed macrophyte inventories, at public access sites, will be collected and analyzed by Douglas PUD staff utilizing a Douglas PUD boat.

No permits will be needed to conduct the study.

8.0 BUDGET

As discussed in Section 6.0, activities associated with this study involve evaluating access to the Wells Reservoir related to reservoir fluctuations, substrate buildup and aquatic plants. Total estimated hours for implementation of these activities is approximately 720 person hours. These hours are associated with conducting field work (240 hours), analyzing reservoir elevation data (80), creating GIS/bathymetric maps (80 hours), identifying possible options to improve access (160 hours) and drafting and formatting final report (160 hours). Staff costs are approximately \$50,000. Equipment costs and expenses related to field implementation (boat use, travel, etc.) are estimated to be \$30,000.

Total planning level cost for this effort is approximately \$80,000.

9.0 SCHEDULE

Planning for the access study will begin shortly after the issuance of FERC's Study Plan Determination in October 2007. Field measurements at boat launches and access sites will take place during the spring of 2008. An Initial Study Report will be filed in October 2008. The draft report for all three components of the access study will be completed by April 2009. The final report will be available by October 2009.

10.0 REFERENCES

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AN EVALUATION OF RECREATIONAL NEEDS WITHIN THE WELLS PROJECT (Recreational Needs Analysis)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington

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ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5).

The Recreation and Land Use Resource Work Group (RWG), which is composed of stakeholders (resource agencies and tribes) and Douglas PUD staff, was formed for the purpose of identifying issues and information gaps that may require study during the relicensing of the Wells Project. The Recreation RWG, through a series of technical meetings, is proposing an analysis of future recreation needs associated with operation of the Wells Project.

The purpose of the Recreation Needs Analysis is to evaluate recreational use information and identify current and future recreation needs within the Wells Project boundary. The needs analysis will identify recreation needs within the Project that recreation resource managers should strive to address during the term of the new license.

The needs analysis will evaluate existing recreation use data, assess the current condition of existing facilities, and identify potential enhancements to meet current and future recreation needs. The results of this study will be used to help Douglas PUD identify existing and future recreation needs so that protection, mitigation, and enhancement measures can be developed for the new license term.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides of the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet.

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The goal of this study is to research, describe, and quantify recreation and access needs in the Wells Project that should be addressed over the term of the next 50-year FERC license. Specific objectives include:

- Summarize study findings to evaluate recreational use and demand within the Wells Project. This summary will be based on results of the 2005 Wells Project Recreation Visitor Use Assessment and existing information from FERC Form 80s for the Wells Project, Interagency Committee for Outdoor Recreation outdoor recreation participation survey, WDFW fisherman surveys, WDFW hunter surveys, City of Bridgeport's Marina Park information and other relevant recreational survey information.
- Assess the needs of Hispanic use of recreational facilities and resource areas.
- Assess the adequacy of existing Wells Project recreation facilities to accommodate current and future recreation demand.
- Assess the adequacy of public access and safety at Wells Project recreation facilities.
- Assess the adequacy of operations and maintenance at Wells Project recreation facilities.
- Develop a prioritized list of potential actions to address Wells Project recreation issues. The list should include criteria such as demand, effectiveness, feasibility and cost.

The needs analysis should provide information to Douglas PUD, as well as recreation resource managers, for making decisions regarding recreation planning in the Wells Project.

3.0 STUDY AREA

The study area includes recreation and access facilities within and adjacent to the Wells Project boundary. The Wells Project boundary extends from the tailrace of Wells Dam (River Mile [RM] 514.7) upstream to the tailrace of Chief Joseph Dam (RM 544.5). The boundary also extends to RM 15.5 on the Okanogan River and RM 1.5 on the Methow River. Recreation and access facilities within the Project boundary include parks, boat launches, trails, parking areas, fishing access sites, and wildlife lands access sites (Figure 3.0-1).



Figure 3.0-1Location Map of the Wells Project

4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Recreation and Land Use Resource Work Group

As part of the Wells Project relicensing, Douglas PUD established a Recreation and Land Use Resource Work Group (RWG) which began meeting in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to identify potential resource issues and to develop preliminary study plans to be included into the Wells Pre-Application Document (PAD).

Through a series of meetings, the RWG identified a set of resource issues that, in their judgment, matched with FERC's ILP study request criteria. The RWG then reviewed the existing project information and determined that several of these issues require additional information.

Based upon these discussions, the RWG is proposing to conduct two studies. These two studies will help to inform future relicensing decisions and will fill data gaps identified by the RWG. The two studies proposed by the RWG include: 1) An Evaluation of Access to the Wells Reservoir as it Relates to Reservoir Fluctuations, Aquatic Plants and Sedimentation and 2) An Evaluation of Recreation Needs within the Wells Project. The proposed Recreation Needs Assessment will focus on collecting information pertinent to Recreation Issues, PAD Section 6.2.2.4, 6.2.2.5, 6.2.2.6 and 6.2.2.7 identified by the RWG.

4.2 Issue Statements

Issue Statement (PAD Section 6.2.2.4)

Recreation proposals under the license need to consider Endangered Species Act (ESA), Americans with Disabilities Act (ADA), Electric Consumers' Protection Act (ECPA), State Comprehensive Outdoor Recreation Plan (SCORP), County Shoreline Master Programs as well as local ordinances, laws, regulations and comprehensive plans.

Issue Determination Statement (PAD Section 6.2.2.4)

Douglas PUD agrees that proposals under the new license need to consider all of the abovementioned laws, plans and regulations. These should be applied at existing and future recreation sites. The resource work group agrees that additional information is needed and a study is recommended during the two-year ILP study period. An evaluation of ADA compliance and other regulations will be considered in the Recreation Needs Assessment.

Issue Statement (PAD Section 6.2.2.5)

Existing recreation facilities may not meet future recreation needs through the duration of the next license term. Recreation plans under the new license should consider recreation trends and an analysis of the condition and capacity at recreation facilities.

Issue Determination Statement (PAD Section 6.2.2.5)

Douglas PUD completed a Recreation Visitor Use Assessment for the Wells Project conducted in 2005. This assessment will be useful in answering questions related to the current use of existing recreation facilities.

The existing Wells Project recreation sites were developed under the original license to provide safe and efficient access to Project lands and waters. Safe and efficient access to Project land and waters is a requirement of the original FERC license and is expected to be a requirement under the new long-term FERC license. Enhancements to existing facilities or the installation of new sites/facilities will be considered based upon projected use and capacity ratings, consistent with FERC recreation policies.

The current condition of existing recreation facilities and their ability to meet future needs is unknown. The resource work group agrees that additional information is needed and that a Recreational Needs Assessment should be conducted during the two-year ILP study period. This study should assess the condition of existing facilities and evaluate the ability of existing facilities to meet future recreation demands within the Wells Project. The Recreation Needs Assessment should also consider results from the Interagency Committee for Outdoor Recreation's (IAC) statewide outdoor recreation participation survey and the WDFW fishermen survey and additional recreation information from the Project area.

Issue Statement (PAD Section 6.2.2.6)

The new license should consider new facilities or enhancements to existing facilities (e.g. Chief Joe Hatchery, Fort Okanogan State Park and Interpretive Center, Fort Okanogan Overlook Site, Wells Visitor Center, Pateros Visitor Center, Alta Lake State Park and Wells Tracts off Pit Road) and should consider trails and trail linkages between communities.

Issue Determination Statement (PAD Section 6.2.2.6)

The resource work group agrees that a Recreational Needs Assessment is considered necessary during the two-year ILP study period. The results of this study will help identify potential enhancements to meet current, future and potential recreation needs within the Project, including the possibility of trails and trail linkages between communities. The study will help to determine whether adequate demand exists to justify the construction of new recreation facilities and will consider existing and future plans for recreation sites in the Project vicinity. Enhancements to existing facilities outside the Project will be considered if recreation needs cannot be met within the Project boundary.

Issue Statement (PAD Section 6.2.2.7)

Wells Dam may be a hindrance to river travel.

Issue Determination Statement (PAD Section 6.2.2.7)

Douglas PUD is not aware of an ongoing need for human river travel past Wells Dam. Wells Dam operators have identified only three instances where the public has requested portage either upstream or downstream of the dam in the past five years. In each instance, Douglas PUD has been able to adequately accommodate these individuals and transport their equipment. This issue may have a tie to the Project if a significant need is identified in the future.

The resource work group agrees that a study is not needed during the two-year ILP study period. An evaluation of portage options to address this issue should be considered in the Recreation Needs Assessment.

4.3 Recreation Visitor Use Assessment (2005)

Douglas PUD completed a Recreation Visitor Use Assessment during May to December of 2005 in an effort to collect information related to visitor use at Wells Project recreation sites (DTA, 2006). The primary goals of this study were to assist in the preparation of the PAD and to describe use levels, preferences, attitudes and characteristics of the Wells Project's primary recreation user groups. Specific objectives included:

- Describing recreation respondents' characteristics;
- Describing user preferences for recreation settings and facilities;
- Identifying possible recreation conflicts, crowding, or personal safety issues;
- Describing users' attitudes toward management actions;
- Describing recreation respondents' activities; and
- Identifying the amount, activity type and spatial and temporal distribution of existing recreation use.

A stratified systematic sampling strategy was chosen for the Recreation Visitor Use Assessment. To ensure that diversity in types of recreation users and variation in type of days visited, sampling was conducted at designated recreation sites and on the Wells Reservoir from May 24, 2005 through December 13, 2005, months that together account for the majority of use.

4.4 Recreation Action Plan

Ongoing recreation needs within the Wells Project are addressed through the Wells Recreation Action Planning process. The Wells Recreation Plan (1967), Wells Recreation Plan Supplement (1974), Public Use Plan (1982) and Recreation Action Plans (1987, 1992, 1997 and 2002) were established as part of compliance with Article 44 of the original FERC license. This long-term and ongoing planning and implementation process has helped in the development and maintenance of the sites previously described.

Following a two-foot pool raise amendment in 1982, Douglas PUD developed a Public Use Plan for the Wells Project. The plan analyzed the types of public recreation facilities that the Wells Reservoir can reasonably accommodate and discussed how those facilities can be developed and maintained. The information presented in the 1982 Public Use Plan included an analysis of recreation facilities within a 100-mile radius of the Wells Project.

In response to the 1982 Public Use Plan, the National Park Service (NPS) and State Parks recommended periodic updates (every five years) to the 1982 Public Use Plan. By FERC Order dated August 12, 1987, 40 FERC 62,157, this recommendation was made part of the Wells Project license resulting in updates to the 1982 Public Use Plan every five years. Douglas PUD's 1987 Recreation Action Plan, which is a supplement to the 1982 Public Use Plan, was supported by the NPS, Washington State Parks and Recreation Commission and the cities of Pateros, Brewster and Bridgeport. Douglas PUD has also published subsequent updates to the 1982 Public Use Plan in 1992, 1997 and 2002. The next update is scheduled to be completed in 2007.

4.5 FERC Form 80

The FERC Form 80, "Licensed Hydropower Development Recreation Report" is a brief summary of the existing recreation conditions and facilities associated with the Wells Project. Based on FERC regulations, the forms were submitted every two years from 1967 – 1984, every four years from 1984 – 1996 and every six years since 1996. The most recent Form 80 was submitted to FERC in 2002.

FERC's Form No. 80 is used to gather information necessary for the Commission and other agencies to know what recreational facilities are located at licensed projects, whether public recreational needs are being accommodated by the facilities, and where additional efforts could be made to meet future needs.

5.0 **PROJECT NEXUS**

The Wells Project has direct and indirect effects on recreation activities within the Project boundary. The effects include providing public access to Project lands and waters, and the potential effects of Wells Project operations on recreational activities.

Douglas PUD has developed and provides major maintenance at numerous public recreation facilities along the Wells Reservoir. These facilities were developed to provide safe and reasonable access to Project lands and waters. Access to the Project will continue to be needed under the new license and this proposed study will help to determine whether additional facilities are needed to meet the demand in recreational use. In addition, Project recreation facilities may not currently be ADA compliant which could limit access for public use. It is unknown whether the existing facilities, in their current condition, can continue to adequately fulfill the expected level of recreation demand during the next license term.

The results of this study will be used to help identify existing and future recreation needs and will be useful during the development of protection, mitigation, and enhancement measures for the new long-term FERC license to operate Wells Dam.

6.0 METHODOLOGY

6.1 Assess Existing Unmet Demand

Existing recreation use does not always represent the total existing recreation demand because there may be constraints that limit participation. While there are many potential constraints on recreation use (e.g., lack of free time, cost, geographic distance, lack of skills or equipment), a subset of participation constraints may be closely associated with site-specific management (e.g., limited access to lands or water, use limits or full occupancies at facilities, Project operations that diminish the quality of opportunities, or the lack of information about available recreation opportunities). To assess the general level of unmet demand for Project recreation resources, Douglas PUD will perform the steps described below:

Step 1: <u>Assess statewide and regional unmet recreation demand information</u> Review and summarize relevant information from the 2002-2007 SCORP and other relevant local recreation data. In addition, a review of the SCORP Local Government Survey results, Interagency Committee for Outdoor Recreation's (IAC) statewide outdoor recreation participation survey, which include regionalized recreation issues and needs from local agencies involved in outdoor recreation management, will be reviewed.

> If available, other sources of Project area and region information will be reviewed. The focus of this assessment will be to identify possible recreation activities with substantial unmet demand with a qualitative discussion of participation constraints and whether these constraints are likely affected by Project operations.

Step 2: <u>Collect unmet Project Area recreation demand information from visitor</u> <u>surveys, community leaders, and current research</u> Douglas PUD will utilize additional unmet demand information from the Recreation Visitor Use Assessment survey, conducted in 2005. These surveys asked visitors if there are any reservoir or river recreation activities they are interested in participating in, but cannot because of some form of barrier.

To further understand the recreation needs of evening users as well as the growing Hispanic population in the region, Douglas PUD will conduct interviews with local community leaders (e.g., social organizations, churches) and Fish and Game officers to understand recreation use and behavior during daytime and evening hours. Douglas will also summarize current research on the specific needs of Hispanic recreation users.

Step 3: Identify potential activities with high unmet demand within the Project area Based on the review of unmet demand information derived from the Washington SCORP, the 2005 Recreation Use Assessment, and Project monitoring data, Interagency Committee for Outdoor Recreation's (IAC) statewide outdoor recreation participation survey, and the summary of Hispanic recreation needs, potential activities with high unmet demand at the Project will be identified. The analysis will also attempt to identify likely barriers or constraints on participation, and whether those are related to Project operations or recreation management decisions.

6.2 Assess Future Recreation Demand

This element of the study will project future recreation use at the Project over the estimated period of the new license (30 to 50 years). Obviously, projecting the future is a speculative activity, especially over a 30 to 50 year period. These projections, though, can be useful for general planning purposes to identify potential management issues that may occur in the future. This approach will include the following steps:

- Step 1: <u>Review existing recreation use trends</u> Past use often helps predict future use. Douglas PUD will review trends of actual Project recreation use from Project monitoring reports for Wells Reservoir, Interagency Committee for Outdoor Recreation's (IAC) statewide outdoor recreation participation survey, WDFW fishermen survey, Washington fishing license sales, ORV green stickers and boating vessel registrations for the counties where the majority of Project visitors originate from; local fishing guide activity; and recreation equipment sales.
- Step 2: <u>Review existing population and recreation activity participation</u> <u>projections</u> Douglas PUD will summarize existing information on future projections from the Washington Office of Financial Management on population growth rates for the counties where the majority of the Project visitors originate; U. S. Census statistics for growth within and adjacent to the Project and other appropriate state sources on existing and future population growth.
- Step 3: <u>Review reasonably foreseeable events that may influence future use</u> Reasonably foreseeable events in the watershed may be expected to influence recreation use in the watershed over the license period. If an event is determined to be reasonably foreseeable, a qualitative assessment will be made of its potential affect on future recreation use.

- Step 4: <u>Estimate future recreation use over the License Period</u> Based on historical trends, future growth projections, and likely foreseeable actions in the watershed, professional judgment will be used to estimate recreation use and facility utilization over the expected term of the new license (i.e. 30 to 50 years). These estimates must be considered very speculative and will only provide a general indication of how recreation use is expected to change over the license period. The following steps will be utilized to estimate recreation activity for the Okanogan, Douglas and Chelan County populations (16 years and older):
 - a. The calculation of participation estimates will be based on the projection indices created from Bowker et al., (1999), who utilized the National Survey on Recreation and the Environment (NSRE) descriptive findings for populations 16 years and older, not institutionalized (Cordell et al.1996) to develop participation by millions 2000-2050 on ten year increments.
 - b. The county projections will be presented in a range derived from national and regional participation projection estimates. These are calculated based on the indices created for the nation and region, utilizing the same rate of increase index created by Bowker et al. (1999). To obtain the county level estimated activity participation rates, the following individuals will be contacted and steps applied:
 - By county, the indexes from national and regional participation rates will be multiplied by the base number of participants (represented in millions) then divided by the base population used in national and regional calculations (Bowker et al., 1999, pp. 323-349). This will yield a national and regional participation rate for each activity by decade.
 - Next, the national and regional participation rates will be multiplied by the estimated Okanogan, Douglas and Chelan county populations of individuals non-institutionalized and over the age of 16, consistent with the estimate parameters developed by Bowker et al. (1999). The population estimates will come from the Washington Office of Financial Management, extracting estimates of institutionalized individuals from the Department of Corrections.
 - 3. This calculation will result in a range of participation by activity for Okanogan, Douglas and Chelan counties.

6.3 Regional Uniqueness and Significance Assessment

The following steps are focused on an assessment of regional uniqueness of the Project's primary recreation opportunities in three steps:

- Step 1: <u>Review results of visitor questionnaires</u> Douglas PUD will review the results of the recreation visitor use assessment to confirm the Project's primary recreation activities. It is anticipated that fishing, boating, hiking, picnicking and swimming will likely be among the top water-related recreation activities in the Project area.
- Step 2: <u>Identify regional recreational opportunities</u> Douglas PUD will identify the geographic draw of the Project's top primary recreation opportunities. This will be done by assessing the geographic extent of visitors' origins and location of the alternative recreation resource areas where visitors participate in their primary recreation activities.
- Step 3: <u>Assess uniqueness of the Project-related recreation opportunities</u> For the Project's most popular primary recreation activities, Douglas PUD will identify if these recreation opportunities are of local, regional or state significance. In addition, text will describe what is unique and special about the most popular recreation opportunities based on information from regional resource information.

6.4 Public Access Analysis

Access to public use areas within the Project by both land and water will be assessed. Existing access features will be rated as high, medium, or low quality. Opportunities and constraints within the Project will also be identified, including compatibility with ADA. Public access (land and water) in the Project area will be identified and assessed by:

- Reviewing ownership maps, topographic maps, and aerial photography;
- Boating to dispersed sites and use sites along the shoreline, driving roads to access sites, and walking formal and informal user trails on lands designated as Project access sites or wildlife areas;
- Defining existing water trail routes along the reservoir, current shoreline watercraft launch sites, constraints to watercraft access along the reservoir, and overnight stop-over sites; and
- Displaying public access sites and routes within the Project on GIS maps.

The final analysis will include tables and maps summarizing locations where: 1) current facilities for access to the Project are safe and efficient; 2) access is highly constrained; 3) future improvements could be implemented. Viable options for potential new or enhanced public access will be identified for further consideration.

6.5 Needs Assessment

The needs assessment will provide a qualitative assessment, utilizing professional judgment, of the recreation needs based on integrating the findings from the other recreation components of this study and other related studies. The assessment will involve a four-step process in which relevant Project recreation opportunities are described, relevant Project recreation issues are identified, potential actions to address Project-related issues identified, and PME measures are proposed, if appropriate. These steps are discussed below:

- Step 1: <u>Summarize Project-related recreation opportunities at recreation resource areas</u> The first step in the needs assessment is to integrate recreation study findings into a summary of Project-related recreation opportunities at recreation resource areas. The existing condition of the recreation opportunity as well as the likely condition of the opportunity over the license term will be described. Parameters likely discussed include such items as activity participation rates, satisfaction levels, facility needs, regional significance, resource impacts, and existing and likely future capacity availability.
- Step 2: <u>Summarize major recreation issues for each recreation resource area</u> Based on the projected license term and the conditions of recreation opportunities within recreation resource areas, the recreation issues within the recreation resource area will be confirmed. This may include such items such as crowding, conflicts between user groups, likely facility needs over the license term, or various types of impacts resulting from recreation use. Recreation needs issues will be assessed by comparing recreation supply and demand study results.
- Step 3: Develop a list of actions to address Project-related issues
 A list of prioritized actions that address Project-related recreation issues
 will be developed for consideration. In some cases, several alternative
 actions are likely to be developed to address the same issue.
 Effectiveness, feasibility and costs will be used to identify actions and to
 prioritize these actions.
- Step 4: <u>Identify appropriate additional recreation measures for the Project</u> The last step of the process is to consult with relicensing participants to review study results and to identify Project mitigation and enhancement measures to be included with the new FERC license.

Assessing existing recreation use through a combination of observation and questionnaire surveys is a common practice for large geographic areas that contain multiple accesses to desired recreation use areas (Malvestuto 1996, Pollock et. al. 1994). In addition, assessing future recreation demand through an evaluation of existing use, demographic data and participation trends and projections in the region is common practice (Kelly & Warnick, 1999).

Integrating study results, comparing supply and demand study findings, and identifying resource impacts is standard practice on many relicensing processes. The proposed methods are also consistent with assessing needs approaches utilizing visitor frameworks such as the Visitor Impact Management (Graefe, Kuss, & Vaske, 1990) and Limits of Acceptable Change processes. In addition, the proposed methods incorporate concepts from the Recreation Opportunity Spectrum (ROS) (Clark and Stankey, 1979), and subsequent Water Recreation Opportunity Spectrum (WROS) frameworks (Haas, Aukerman, Lovejoy, & Welch, 2004).

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

No special equipment is needed to conduct this study. Staff time required to complete this study is estimated to be approximately 612 person hours.

The consultants hired to conduct this study must have prior experience in conducting Recreation Needs Assessments and should be well versed in recreation issues and planning.

Several trips to the Project area will be required.

8.0 BUDGET

The total estimated hours for conducting the Evaluation of Recreational Needs within the Wells Project (needs assessment) study is approximately 612 person hours with a total estimated cost of \$83,000. The needs assessment includes two phases. The first phase is estimated to require 412 person hours, which includes travel, site visits and data collection. The estimated cost of this phase is \$53,000. The second phase of the needs assessment is estimated to require 200 person hours. The estimated cost of this phase is \$30,000, which includes data analysis and reporting, a data summary visit, and one presentation visit.

9.0 SCHEDULE

The proposed study plan will take into account data collected during 2005 and 2006 during baseline studies.

Planning for the recreation needs analysis will begin in late 2007, shortly after the issuance of FERC's Study Plan Determination in October 2007. Field efforts will take place during the spring and summer of 2008 with an Initial Study Report due to stakeholders by October 2008. An initial study report will be filed with FERC in October 2008.

Data analysis and a draft report for the study will be completed by January 2008. A final report will be provided to FERC and the stakeholders by October 2009.

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Appendix D Revised Terrestrial Study Plans

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AN EVALUATION OF THE EFFECTS OF AND ALTERNATIVES TO THE EXISTING BIRD AND MAMMAL CONTROL PROGRAMS (Piscivorous Wildlife Control Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington

Appendix D - 1

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For copies of this study plan, contact:

Public Utility District No. 1 of Douglas County Attention: Relicensing 1151 Valley Mall Parkway East Wenatchee, WA 98802-4497 Phone: (509)884-7191 E-Mail: relicensing@dcpud.org

ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5).

The Terrestrial Resource Work Group (RWG), which is composed of stakeholders (resource agencies and tribes) and Douglas PUD staff, was formed for the purpose of identifying issues and information gaps that may require study during the relicensing of the Wells Project. The Terrestrial RWG, through a series of technical meetings, is proposing a study intended to evaluate the effects and develop alternatives to the existing bird and mammal control programs.

Douglas PUD currently implements several bird and mammal control programs that are primarily related to fish survival goals within the Wells Habitat Conservation Plan (HCP).

The Wells HCP requires Douglas PUD to implement a predator control program. The goal of the predator control program is to reduce the number of juvenile salmon and steelhead that are consumed by predators. Both the hatchery and predator control programs are important in meeting the No Net Impact (NNI) survival goals in the Wells HCP.

The primary objectives of the study are:

- Identify and count the current and historic number and species of birds and mammals feeding on fish at the Project hatcheries and in the Wells Tailrace;
- Assess the potential impacts of mortality caused by piscivorous birds and mammals to ESA listed, sensitive and recreationally important species;
- Describe each of the existing piscivorous wildlife control measures, including species targeted, reason for control, frequency of control and effectiveness of the control method;
- Evaluate alternatives, including the costs and benefit of each measure recommended. The study will provide alternative methods of preventing predation of fish at the Wells Project and in hatchery rearing ponds.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.8 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1 Location Map of the Wells Project

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The goal of the study is to evaluate the effectiveness of the ongoing predator control programs and identify potential alternatives where appropriate.

The objectives of the study include the following:

- Identify and count the current and historic number and species of birds and mammals feeding at the Project hatcheries and in the Wells tailrace.
- Assess the potential impacts of mortality caused by piscivorous birds and mammals to ESA listed, sensitive and recreationally important species.

- Describe each of the existing piscivorous wildlife control measures, including species targeted, reason for control, frequency of control, and effectiveness of the control method.
- Evaluate alternatives, including the costs and benefit of each measure recommended. The study will provide alternative methods of preventing predation of fish at the Wells Project and in hatchery rearing ponds.

3.0 STUDY AREA

The study area includes the Wells Reservoir and Wells tailrace and adjacent Project related lands (Figure 1.1-1), the approximately 15 acre Wells Hatchery in Chelan County (Figure 3.0-1) and the 19 acre Methow Hatchery, including the Twisp (2.6 acres) and Chewuch (0.7 acres) acclimation pond sites, located in Okanogan County (Figure 3.0-2). The Methow Hatchery and associated acclimation ponds are located outside of the Wells Project boundary. The Wells Hatchery is located on the west bank of the Columbia River immediately downstream of the Wells Dam and is entirely contained within the boundary of the Wells Project.



Figure 3.0-1Air Photo of Wells Hatchery



Figure 3.0-2 Location map for the Methow Hatchery and associated off-site acclimation ponds

4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Past and Current Activities to Reduce Fish Predation

The Wells and Methow hatcheries raise steelhead (*Oncorhynchus mykiss*) and spring Chinook (*Oncorhynchus tshawytscha*) that are listed as threatened and endangered, respectively, under the federal Endangered Species Act (ESA). The Washington Department of Fish and Wildlife (WDFW) estimates that 7 to 14 percent (depending on rearing pond) of the steelhead and summer Chinook reared at Wells Dam in 2005 were eaten by birds and mammals. The hatcheries have a goal for the number of yearling steelhead and Chinook smolts released each spring. To reach these goals, additional brood stock must be trapped to compensate for the mortality due to predation, thereby impacting the number of ESA listed fish left to spawn naturally.

Methods of controlling avian predation at Wells Hatchery have changed over the years. Until the mid-1980s, Washington State hatchery policy encouraged hatchery employees to kill piscivorous birds feeding on fish reared in its hatcheries along with hazing to reduce fish mortality. More recently, hatchery staff has relied solely on hazing, pyrotechnic shotgun shells (cracker shells) and exploding rockets along with propane cannons, to reduce bird predation. Hazing efforts were marginally successful.

In 1993, Douglas PUD hired the U. S. Department of Agriculture (USDA) Wildlife Services to reduce the bird predation at Wells Tailrace. The USDA installed bird exclusion wires to reduce access by flying birds in the tailrace. In 1994, USDA installed bird exclusion wires over the hatchery rearing ponds. They also used hazing methods listed above and shot a few birds as a dispersal technique to reduce bird densities, enforcing hazing techniques.

Information that can be used in the study can be found from two sources. WDFW has information that estimates the number of fish consumed by piscivorous birds and mammals at each of the hatcheries. USDA has information on the number of birds hazed and/or shot at Wells Hatchery and in the Wells Tailrace.

4.2 Terrestrial Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established a Terrestrial Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD)

Through a series of meetings, the Terrestrial RWG cooperatively identified a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria (see Section 1.2) and would be useful in

making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Terrestrial RWG is proposing to conduct a study to evaluate the effects of and alternatives to the piscivorous bird and mammal control programs (PAD Section 6.2.3.1). The need for this study was agreed to by all of the members of the Terrestrial RWG, including Douglas PUD. This study will help inform future relicensing, wildlife and fisheries management decisions and will fill data gaps that have been identified by the Terrestrial RWG.

4.3 Issue Statements

Issue Statement (PAD Section 6.2.3.1)

Ongoing control of piscivorous wildlife may influence wildlife species abundance and diversity.

Issue Determination Statement (PAD Section 6.2.3.1)

Douglas PUD conducts a piscivorous wildlife control program to reduce predation on fish. The effect of this program on wildlife populations found within the Wells Project is unknown.

Removal of bird and mammal predators is an important part of reducing predation on ESA listed steelhead and spring Chinook at the Wells Project and associated hatchery facilities. In 2005, WDFW estimated loss due to predation at the Wells Hatchery at 7-14 percent. Douglas PUD, through the U.S. Department of Agriculture and WDFW's piscivorous species trapping program, has developed and continues to employ many alternatives to lethal removal and only uses removal actions when non-lethal measures have failed. Hazing consists of noise makers, propane cannons, decoy predators, electric fence, tailrace and hatchery wires, fencing, hatchery covers and the hiring of hazing personnel. As a last resort, removal techniques, including the use of traps and shot guns, would be utilized.

Project operations related to wildlife control, specifically lethal removal, may have an effect on terrestrial resources and additional information is needed to determine which species may be significantly affected under this program and if there is a significant impact on sensitive or recreationally important species.

The resource work group agrees that a study is needed during the two-year ILP study period to evaluate existing practices, evaluate alternatives and inform future management decisions.

5.0 **PROJECT NEXUS**

Douglas PUD owns and pays for the operation of the Wells and Methow hatcheries and acclimation ponds as mitigation for unavoidable losses of juvenile anadromous salmonids resulting from the existence and operation of the Wells Hydroelectric Project. The fish raised at these facilities are an important component in meeting the No Net Impact (NNI) survival requirements contained within the Wells HCP. The hatcheries raise spring Chinook, summer/fall

Chinook, steelhead, and rainbow trout. Spring Chinook and steelhead are listed as endangered and threatened under the federal Endangered Species Act.

Section 4.3.3 of the Wells HCP includes the requirement that Douglas PUD implement a control program to reduce the level of predation at Douglas PUD's two salmon hatcheries and in the tailrace and reservoir surrounding Wells Dam. Douglas PUD hires the USDA to employ various techniques to harass piscivorous birds at hatcheries and in the tailrace below Wells Dam. In the past, USDA has also conducted limited control activities on the Wells Reservoir.

Existing avian harassment techniques include aerial pyrotechnics, propane cannons, and the physical presence of humans in the area. The USDA has also installed wires over the hatchery ponds and over the Wells tailrace to deter piscivorous birds from feeding, and has installed electric fencing around the hatchery ponds to reduce the level of mammalian predation on hatchery fish. The Methow Hatchery rearing ponds are enclosed with canvas covers. The Methow Basin acclimation ponds are surrounded by cyclone fencing and are protected from avian predators through the installation of overhead wires.

6.0 METHODOLOGY

A random, stratified sampling protocol will be implemented throughout the study period. Observations of bird and mammal predation will be documented. Each bird or group of birds recorded will be identified by species, number, type of activity, time of observation and weather condition. Bird feeding information will be collected for one year. All evidence of piscivorous mammals near the ponds will also be noted. The bird sighting data will be compiled in a database.

To make control methods more effective it must be determined which bird species cause the highest predation loss and when those losses occur. A sufficient number of birds, as recommended by permitting agencies, of each species known to feed at the hatchery ponds and in the Wells tailrace will be collected. The esophagous, proventriculus and gizzard will be excised from the collected birds and food items removed. All identifiable food items will be collected, counted, weighed and recorded. Reproductive organs will be removed and examined to determine breeding status of birds sampled. Brood patches will also be used to varify breeding status. Due to their special status, raptors will be excluded from this portion of the study.

A literature review of life histories of all bird species known to feed at the hatcheries and in the tailrace, during the year, will be conducted. The life history information will include information on the number, size and weight of prey items identified at other salmon and trout hatcheries. Information on regional species population levels will also be compiled. The literature review will also be conducted on the current technology for hazing birds and excluding birds and mammals from hatchery raceways and ponds.

The report will quantify the impact of specific bird and mammal predation on several species of fish within the Wells Project and associated hatcheries. The report will also detail the control methods used, effectiveness of each method and literature reviewed. It will provide

recommendations (with estimated cost) to reduce bird and mammal predation at the hatcheries, reservoir and tailrace. The Terrestrial RWG will develop reasonable and effective control measures based on the results of this study and any other relevant local knowledge on each species.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

A contractor will be hired to do the literature search for life histories and predation control methods. The contractor will also be responsible for determining the population status of known predators found throughout the Wells Project and associated hatchery facilities.

A contractor will conduct bird counts and will document the presence of known piscivorous mammals. The contractor will work toward the collection of bird diet samples.

The report summarizing the results of the study will be written by the contractor.

8.0 BUDGET

The estimate for total person hours required to complete the study is approximately 1,620 hours. The field work will require approximately 1,320 person hours and study coordination, data analysis and report writing will require approximately 300 person hours. The study is estimated to cost \$46,614.

9.0 SCHEDULE

The field work related to this proposed study will be initiated after FERC's issuance of the Study Plan Determination in October 2007. An Initial Study Report will be provided to the Terrestrial RWG, stakeholders and FERC in October 2008 with a final report summarizing the processes of model development, analyses, and results by October 2009.

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PLANT AND WILDLIFE SURVEYS AND COVER TYPE MAPPING FOR THE WELLS HYDROELECTRIC PROJECT 230 kV TRANSMISSION CORRIDOR (Transmission Line Wildlife and Botanical Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington For copies of this study plan, contact:

Public Utility District No. 1 of Douglas County Attention: Relicensing 1151 Valley Mall Parkway East Wenatchee, WA 98802-4497 Phone: (509)884-7191 E-Mail: relicensing@dcpud.org

ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5). A Terrestrial Resource Work Group (RWG), which is composed of stakeholders and Douglas PUD staff, was formed for the purposes of identifying issues and information gaps that may require study during the relicensing of the Wells Hydroelectric Project. The Terrestrial RWG, through a series of technical meetings, has identified the need for a study to assess the effects of the Project's 230 kV transmission line corridor on wildlife.

This proposed study is intended to fill the gaps in local knowledge of botanical resources, including rare, threatened and endangered (RTE) plants, invasive plant species, and vegetation communities within the 235-foot Wells Project 230 kV transmission line corridor. The study will also provide bird species presence, identify if bird collision with the line and structures is a potential problem, and provide information on the extent of use and dependency on the transmission corridor by sage grouse (*Centrocercus urophasianus*) and sharp-tailed grouse (*Tympanuchus phasianellus*), both RTE species. A literature review will be conducted to identify potential effects of the 230 kV transmission lines and towers on raptors and prairie grouse. Surveys will also be conducted for RTE mammals and reptiles. The study plan outlines methods that will be used to collect information on these plants and animals.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project, owned, and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1 Location Map – Wells Dam 230 kV Transmission Line Corridor

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The overall goal of the wildlife and botanical surveys along the Project transmission lines is to provide information needed to guide land management decisions, avoid damage to valuable habitat during future transmission corridor management activities and minimize the spread of invasive weeds. The study will provide baseline data on birds found near the corridor and information on the presence of rare, threatened and endangered (RTE) plant or animal species in the corridor. In addition, this study will provide information needed to meet the FERC requirements during the Wells ILP. The study objectives are divided into botanical and wildlife resource categories.

Pursuant to CFR 18.5(vii), RTE species in this study plan include:

- Federally listed as threatened, endangered, proposed or candidates under the ESA;
- State listed as threatened or endangered;
- State listed as candidate (wildlife only);
- State listed as sensitive (plants only); or
- State listed as Review List 1 (plants only).

2.1 Botanical Resources

The main objectives of the botanical study are:

- (1) Identify and document the location of RTE plant species that occur within the transmission line corridor.
- (2) Identify and classify the specific vegetation cover types in the study area.
- (3) Generate detailed information on the species composition and classification of these plant communities and their structures.
- (4) Create a detailed Geographic Information System (GIS) cover type map of the study area showing the locations of these plant communities, their distribution, areas of coverage (acres), and note locations of habitats of special concern or unique areas observed.
- (5) Identify any invasive plant species in the transmission corridor. For this transmission line corridor study, invasive species are Washington State Class A and B-designate noxious weeds.

2.2 Wildlife Resources

2.2.1 Avian

The main objectives of the avian study are:

- (1) Identify and document the location of any federal and state RTE avian species that use the study area.
- (2) Describe the habitat features used by RTE avian species observed within the corridor.
- (3) Document the presence of other avian species and provide relative abundance for birds using the study area.
- (4) Document raptor and corvid nesting and sharp-tailed and sage grouse use within the study area.

(5) Document any evidence under the transmission line of avian collisions.

2.2.2 Mammal

The main objectives of the mammal study are:

- (1) Identify and document the location of federal and state RTE mammal species that use the study area.
- (2) Describe the habitat features used by RTE mammals observed within the corridor.
- (3) Document the presence of other mammal species in the study area.

2.2.3 Reptile

The main objectives of the reptile study are:

- (1) Identify and document the location of federal and state RTE reptile species that use the study area.
- (2) Describe the habitat features used by RTE reptiles observed within the corridor.
- (3) Document the presence of other reptile species in the study area.

3.0 STUDY AREA

Two 230 kV transmission lines connect Wells Dam with the Douglas switchyard next to Rocky Reach Dam (Figure 1.1-1). The transmission lines occupy a 235-foot corridor that is 41 miles long. The transmission lines begin at Wells Dam, cross the Columbia River from Carpenter Island in Chelan County to Douglas County. The transmission lines travel southeast to the Boulder Park area then turn southwest across wheat fields, past the town of Waterville and over Badger Mountain. The lines descend the west slope of Badger Mountain and end at Douglas Switchyard. The study area is the 235-foot transmission line corridor, excluding all actively cultivated fields.

4.0 BACKGROUND AND EXISTING INFORMATION

4.1 Botanical Resources

The US Fish and Wildlife Service (FWS) maintains a list of all plants that are listed or proposed as threatened or endangered under the Endangered Species Act. In addition to the federal list, Washington Department of Natural Resource's Natural Heritage Program (WNHP) maintains a database on the known locations of federally listed and proposed, as well as state listed threatened, endangered, sensitive and Review List 1 plants in Washington. Historic rare plant information is also available at both Washington State University and University of Washington. Invasive plant species potentially occurring in the study transmission line corridor are available from the Washington State Weed Board and Washington State Extension Service.

4.2 Wildlife Resources

The FWS maintains a list of all wildlife listed or proposed as threatened or endangered under the Endangered Species Act. The Washington Department of Fish and Wildlife (WDFW) maintains a list of all wildlife species listed or proposed for listing under the WAC-232-12-297. WDFW also maintains a list of RTE species and a database with locations of all recorded sightings. Cassidy et.al. (1997) also provides species range information for all wildlife that may be found in the transmission line corridor.

4.3 Transmission Corridor Maintenance

Douglas PUD conducts an ongoing maintenance program on the 230 kV transmission corridor. Maintenance activities include noxious weed control at transmission corridor structures and along access roads in the spring and fall. Target weed species are primarily diffuse knapweed (*Centaurea diffusa*) and Dalmatian toadflax (*Linaria dalmatica*). Transline[®] herbicide is applied in the spring as a contact herbicide with a limited residual and is also used for spot applications in the fall. Transline[®] is used because it has minimal impacts on native grass species and sagebrush shrub species. Douglas PUD releases the biological control insect *Calophasia lunula* to control Dalmatian toadflax. Weedar-64[®] and Curtail[®] are also used to control broadleaf weeds.

The maintenance program also includes an overall inspection for damaged roads or structures. Tower structures are inspected on foot or using a four-wheeled all terrain vehicles (ATV) with low pressure tires. At the request of land owners, maintenance roads were not constructed across approximately 25 miles of wheat fields, on the Waterville Plateau, when the transmission lines were built. Existing roads require periodic maintenance if there is damage to the road from storms or rock falls or if the road requires grading for repairs to the 230 kV lines.

4.4 Avian Interactions With Transmission Lines

Factors that influence collision risk can be divided into three categories: 1) those related to avian species, 2) those related to the environment, and 3) those related to the configuration and location of lines. Species-related factors include habitat use, body size, flight behavior, age, sex, and flocking behavior. Heavy-bodied, less agile birds or birds within large flocks may lack the ability to quickly negotiate obstacles, making them more likely to collide with overhead lines. Likewise, birds distracted by territorial, hunting, or courtship activities may collide with lines. Environmental factors influencing collision risk include the effects of weather and time of day on line visibility, surrounding land use practices that may attract birds and human activities that may flush birds into lines. Line-related factors influencing collision risk include the configuration and location of the line and line placement with respect to other structures or topographic features. Collisions are more likely to occur with the smaller diameter overhead static wire, which may be less visible than the wires used to transmit electricity (Chelan PUD, 2005).

Most of the 230 kV transmission line is oriented in a north to south direction. The orientation of the lines is therefore less conducive to waterfowl collision with the ground wires, conductors and towers, except where it is near Cornehl Lake and the Columbia River (See Figure 1.1-1). The most vulnerable raptors are young birds during their first migration in the fall. Fall migrating raptor use the North Cascades flyway, using the lift from thermal and wind caused updraft ridges in Chelan County (Smith and Neal, 2007). Few raptors migrate through Douglas County and thus the orientation of the 230 kV transmission line presents little hazard.

4.5 Terrestrial Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established a Terrestrial Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Terrestrial RWG collaboratively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Terrestrial RWG is proposing to conduct a study to collect baseline botanical information for the existing 230 kV transmission line running from Wells Dam to Douglas Switchyard.

This proposed study is intended to fill data gaps in local knowledge of botanical resources including RTE and invasive plant species. This study will also provide information on bird species presence, identify if bird collision is a problem and provide information on the possible use of the transmission corridor by sharp-tailed or sage grouse. The study will also provide information on Washington ground squirrel and striped whipsnake, both RTE species, which have ranges that overlap with the study area.

Electrocution of birds using the 230 kV line for perch and nest sites does not need additional data for the analysis of potential project effects. Insulators suspend each conductor eight or more feet from each lattice tower structure and approximately 24 feet between phases. The 230 kV transmission line exceeds the phase to phase and phase to ground separation of 60 inches recommended by the Avian Power Line Interaction Committee (APLIC) (2006) for the protection of raptors found in the vicinity of the transmission line corridor.

4.6 Issue Statements

Issue Statement (PAD Section 6.2.3.2)

Presence of the transmission lines could kill or injure birds and the presence of the transmission towers could affect wildlife behavior and use of adjacent habitat.

Issue Determination Statement (PAD Section 6.2.3.2)

The Wells Project license includes two 230 kV single-circuit transmission lines. The lines run 41 miles in length from the switchyard at Wells Dam to the Douglas Switchyard operated by Douglas PUD. The lines run parallel to each other on 45-85 foot steel towers along a common 235-foot wide corridor.

The transmission lines and towers could have impacts on wildlife, including bird collisions and raptor nesting. Baseline studies have not been completed to assess these potential impacts. Wildlife and botanical species inventories have not been completed along the transmission corridor.

The RWG agrees that a study is needed during the two-year ILP study period and is proposing to complete baseline wildlife and RTE inventories along the transmission corridor. In addition to documenting baseline conditions, this study would be used to document presence (whether raptors, corvids and prairie grouse are found within or adjacent to the transmission corridor). A literature review will also be completed to specifically identify potential effects on raptors and prairie grouse.

Issue Statement (PAD Section 6.2.3.3)

Maintenance of the transmission corridor could affect wildlife and/or botanical species (e.g. weed control and road maintenance).

Issue Determination Statement (PAD Section 6.2.3.3)

The Wells Project license includes two 230 kV single-circuit transmission lines. The lines run 41 miles in length from the switchyard at Wells Dam to the Douglas Switchyard operated by Douglas PUD. The lines run parallel to each other on 45-85 foot steel towers along a common 235-foot wide corridor.

Maintenance activities along the transmission corridor could have an impact on wildlife and botanical resources. Wildlife and botanical species inventories have not been completed along the transmission corridor.

The resource work group agrees that a study is needed during the two-year ILP study period and is proposing to complete baseline wildlife, botanical and RTE inventories along the transmission corridor.

There is some existing information on botanical and avian resources in the study area as described below.

5.0 **PROJECT NEXUS**

The two Wells 230 kV transmission lines were included in the FERC order issuing the Wells Project license (issued: July 12, 1962). Exhibit K maps of the transmission line corridor transmitted copies of as build Exhibits J and K showing the route of the transmission line of the Wells Project 2149. FERC approved the Exhibit J and K drawings and amended the license by order (issued: January 5, 1979).

The results of the RTE botanical and wildlife surveys will be used for Section 7 consultation under the ESA. Direct effects of the transmission corridor and/or maintenance of the corridor on RTE species or habitats are unknown. Ongoing maintenance of the transmission corridor could adversely affect RTE plants or wildlife, if any are present. The avian and botanical surveys will also be used to help guide future corridor management activities and to determine whether additional measures are needed to reduce the spread of noxious weeds and bird collisions.

6.0 METHODOLOGY

The methods for conducting the botanical and terrestrial surveys described in the goals and objectives are each described below.

6.1 Botanical

6.1.1 RTE Plant Surveys

The surveys for RTE plants will comprise the following tasks: (1) pre-field review; (2) field surveys; and (3) documentation and mapping of results. Each task is described below.

The pre-field review task consists of developing a "target" list of RTE plant species to guide field surveys. The pre-field review task will be initiated by sending letters to the FWS and WNHP requesting the latest information on RTE plant species known to occur or potentially occurring in or near the Wells Project area. The target list of RTE species potentially occurring in the Wells Project area will be developed based on input from the FWS and WNHP. Information on habitat requirements, such as elevation, soils, and associated vegetation community, will be used to refine the list to those species most likely to be found in or near the Project area. This information will also be used to identify the habitats to be surveyed, with an emphasis on those that support RTE species with federal or state status as threatened or endangered. Botanists from the WNHP will also be asked for any additional information related to RTE species that may occur in the area.

Prior to beginning field surveys, project botanists will review the morphological characteristics of target RTE plant species to develop a search image, which improves detection and recognition abilities. This process will include reviewing herbarium specimens and collecting information

on vegetative, floral, and fruit characteristics for each target species and other species that are closely related or otherwise difficult to distinguish from the target RTE species.

Surveys for RTE plants in the transmission line corridor will involve visually searching suitable habitat. RTE plant surveys will be conducted on foot using a random meander approach described in Nelson (1985). Surveys will be conducted by botanists experienced in conducting RTE plant surveys.

The habitat requirements of RTE species will be used to refine survey efforts. Habitats with a high probability of supporting one or more RTE plants will receive thorough coverage. Habitats with a lower likelihood of supporting these species will be surveyed less intensively. Actively cultivated fields will not be surveyed. RTE species will be recorded and mapped when encountered and habitats will be described.

The timing of RTE plant surveys is critical to the success and validity of the survey. The number of surveys to be conducted in 2008 will be determined by the blooming period of each RTE plant species. Surveys are expected to be conducted in early May, mid to late June and early August.

RTE plants will be identified in the field using the Flora of the Pacific Northwest (Hitchcock and Cronquist 1973) and the Field Guide to Selected Rare Plants of Washington (WNHP 2004). A variety of sources will be utilized to verify tentative species identification including other floras, published papers, herbarium specimens, and consultation with appropriate taxonomic specialists. A list of all plant species identified during field surveys will be compiled and provided in the final report.

WNHP sighting forms will be completed for each RTE plant population found in the transmission line corridor. Data collected will include population size and area, phenology, habitat, slope, aspect, elevation, soils, and associated species. Factors affecting survival of RTE species (e.g., deer browse, disturbance, etc.) will be noted if applicable. The population locations will be mapped on survey maps and Global Positioning System (GPS) coordinates will be collected to verify the mapped location. Photographs will be taken of the RTE plants and habitats where they are growing.

Population size for RTE species will be visually estimated (for large populations) or counted (for small populations). For large RTE plant populations (and with agency permission), a voucher specimen will be collected, pressed, and dried for deposition at the University of Washington Herbarium. Where collection poses a risk to the population, photographs will aid in verification by taxonomic specialists.

6.1.2 Invasive Species Surveys

The surveys for invasive plants will comprise the following tasks: (1) pre-field review; (2) field surveys; and (3) documentation and mapping of results. Each task is described below.

Invasive species surveys will be focused on plants listed in Washington State as Class A and Class B Designate weeds. Class A weeds are non-native species with a limited distribution in the state; eradication of all Class A weeds is required by state law. Class B weeds are non-native

species whose distribution is limited to portions of Washington State and control requirements vary between counties. A list of weed species will be developed of all Class A and B weeds found in Douglas County. Prior to beginning field season surveys, botanists will review the morphological characteristics of Class A and B weeds to develop a search image, which improves detection and recognition abilities.

Surveys for invasive plant species will be conducted in the transmission line corridor. These surveys will be conducted in conjunction with RTE plant surveys and field verification of the Vegetation Cover Type Map. Since many invasive species are easiest to see and identify later in the growing season, these surveys will be conducted in the late June to early August time period. All class A or B species will be mapped.

Infestations of invasive species will be mapped on project maps and GPS coordinates will be collected to verify the mapped location. Each infestation will be mapped as accurately as possible, to a resolution of 0.1 acre. Data gathered for each infestation will include the estimated total number of plants and the aerial cover and density by cover by class, as developed by the North American Weed Management Association (NAWMA 2003): trace (T=<1%), low (L=1-5%), moderate (M=5.1-25%), and high (H=25.1-100%).

6.1.3 Cover Type Mapping

The vegetation mapping study will involve three phases of work. The first two phases will identify general cover types through photo interpretation and field verification. The third phase will be the production of the final cover type map.

Douglas PUD received digitized color aerial photography of Douglas County from Natural Resources Conservation Service. The color digital orthophotos have a pixel resolution of one meter. Using these digital orthophotos, general vegetation types will be delineated by heads-up digitizing in ArcView Geographic Information System (GIS). Vegetation types and land use classifications will also be assigned.

ArcView GIS will be used to generate field maps containing the color orthophotography and the cover type polygons. Preliminary maps of vegetation cover types will be verified in the field by a botanist. This work will be completed while conducting RTE and invasive plant surveys. Field verification will involve checking a subset of the boundaries of the cover type polygons and correcting the assigned cover type classification and reassigning correct classifications as needed. Corrections to the boundaries and cover type designations will be made directly on field copies of the maps.

Additional data will be collected during the field verification to describe the characteristics of each mapped cover type including species composition, stand structure, habitat quality and land use. Information collected will include:

- Plant species composition, including the dominate and more prominent associated species in each vegetation layer (tree, shrub and herbaceous layers);
- Structural data, including estimates of average heights and aerial cover of each vegetation layer;

- Predominant land use(s) associated with each cover type;
- Rare, unique and particularly high quality vegetation/habitat will be noted.

The contractor will use ArcView GIS to change any cover type polygons found to be in error during the field verification of the cover type map. The contractor will provide Douglas PUD with copies of all map products.

The contractor will be responsible for all equipment necessary to complete the field verification work.

6.2 Wildlife

Assessments to be conducted include avian point counts, prairie grouse surveys, and raptor and corvid nesting surveys. In addition, surveys will be conducted for reptiles and mammals. Incidental to all wildlife and botanical surveys, avian mortalities will be located, recorded and collected. Special emphasis will be made to documenting the presence of RTE species and their habitat during these surveys.

6.2.1 Avian Surveys

6.2.1.1 Point Counts

Avian surveys will be conducted to gather data on bird species that use various habitat types in the vicinity of the Wells Project 230 kV transmission line corridor. Surveys will be conducted four times from the first of May through the end of June, which is considered the peak of breeding season in North Central Washington. Four fall surveys will be conducted from September to October to capture the variability of the fall avian migration.

Assessing avian use during the breeding season will involve the use of point count stations (Bibby et al. 1992, Ralph et al. 1995) and transects (Leukering et al. 2000, Altman and Bart 2001). Because of the high degree of ecological variability associated with "special species" which are those species that: (1) are in habitats that are not well monitored, (2) are too rare or erratic to be sampled effectively, or (3) have an ecology that is not conducive to standard methodologies (e.g., inconspicuous, colonial, nocturnal, low densities), Altman and Bart (2001) recommend using a combination of monitoring methods to gather occurrence and relative abundance data. Thus, a combination of point count stations and transects distributed throughout the study area will be sampled to maximize the probability of detecting the less common species as well as collecting adequate data on all species. This approach is termed a "point transect" (Altman and Bart 2001) and involves conducting standard 5-minute point count surveys at stations (Bibby et al. 1992, Ralph et al. 1995) and recording all detections of special species while walking routes between point count stations (Altman and Bart 2001). Point count stations will be a minimum of 820 ft (250 m) apart to avoid double-counting individual birds.

Avian surveys during the breeding season will take place between sunrise and 10:00 am (Altman and Bart 2001) and fall surveys will also start at sunrise and be completed by noon. Each bird detected via visual sighting or auditory call will be recorded, as well as the primary habitat type and the estimated distance from station center in 16 ft. (5 m) increments. All mammals or

reptiles seen will also be recorded. Data will also be recorded to gather information on likely nesting or foraging behaviors or signs. Detections at point count stations will be divided into two time periods: 0-3 minutes and 3-5 minutes. For each detection made along survey transects, biologists will record species, number of individuals, habitat, and behavior. GPS will be used to document the point count and transect locations and to estimate the linear length of the transect survey. All biologists conducting the avian surveys will have expertise in auditory as well as visual identification of birds.

To provide a general description of the land surveyed, biologists will record habitat data at each survey station/transect. Habitat parameters will be estimated qualitatively and will include:

- Tree layer cover, height, and average diameter at breast height (DBH),
- Shrub layer height and cover,
- Herbaceous layer height and canopy cover,
- Snag and Large Woody Debris (LWD) abundance, and
- Dominant species.

Locations of avian survey stations and transects will be stratified based on: (1) study area zone, (2) vegetation cover type, and (3) adjacent land use immediately outside of the study area. The actual number of point-transects and point count stations will be determined following further review of aerial photography. However, based on study area size, it is anticipated that approximately 50-70 stations will be established along the point-transects, which will be distributed among the five study area zones in proportion to their relative land base and river length.

All data will be entered into and stored in a database. Analysis of avian data will involve calculation of species richness and species relative abundance (number per station per survey period) for each of the five habitats and for the five study area zones. ArcView GIS will be used to develop report maps that display survey locations and significant findings.

6.2.1.2 Prairie Grouse Surveys

The wildlife biologist and botanists will be trained to differentiate field sign (grouse, scat, tracks, and feathers) from sage-grouse and sharp-tailed grouse, understand the seasonal differences and estimate age of scat encountered. Field surveys will be conducted during two time periods (late winter after snow melts but before the breeding season and in September). Grouse transects will be placed randomly within large continuous blocks of native habitat in the study area along the transmission line corridor. A biologist will walk the transect looking for evidence (grouse, scat, tracks, and feathers) of sage grouse or sharp-tailed grouse. All evidence of grouse use will be recorded and feathers collected for verification. Geographic coordinates of the location of any grouse observations will be established with a GPS receiver and recorded for later mapping.

Leks of either sharp-tailed or sage grouse can be found from field sign alone. If a lek is suspected, direct observation at dawn of the suspected locations will confirm if the lek is active. Observation will be made on three consecutive weeks during the breeding season. The number of birds visiting the active lek will be recorded.

All data will be stored in a database and mapped using ArcVeiw GIS.

6.2.1.3 Raptor and Corvid Nest Surveys

The raptor and corvid nest surveys will be conducted along the length of the transmission line corridor. A helicopter will be used during the surveys to search the transmission line lattice towers and the surrounding large conifer and deciduous trees, within 1/4 mile, for nests. The helicopter will travel at a speed that allows the observer to scan each tower and all the likely trees. The helicopters will remain far enough away from the nest to prevent the adults from flushing. A biologist familiar with raptor and corvids nesting will accompany the pilot and conduct the nest surveys and record data. The survey will be conducted in late May.

6.2.1.4 Avian Collision Surveys

Douglas PUD developed a draft vegetation cover type map using digital air photos and ArcViewTM. With the aid of the cover type map, topographic maps, local knowledge of bird behavior, and biological and line-related factors influencing collision risk, Douglas PUD identified two areas where birds have a higher probability of colliding with the transmission lines—the portion of the 230 kV transmission line near Cornehl Lake and where it crosses the Columbia River. Consequently, surveys for dead birds will be conducted from the Wells Fish Hatchery on the west side of the 230 kV transmission line river crossing to the Columbia River and for one half mile on the east side river crossing. A second survey, approximately one mile in length, will be conducted in the Boulder Park Area approximately two miles west of Cornehl Lake. One or more observer(s) will search these sections of the 230 foot wide transmission corridor to determine the presence of dead birds.

If a dead bird is located during any of the surveys, the following data will be recorded:

- Species,
- Sex,
- Age (adult or juvenile) if possible,
- Physical condition (including broken bones, lacerations, abrasions, blood, discolorations, gunshot wounds, decomposition, feeding damage by scavengers,
- Probable cause of death, and
- GPS location.

Surveys will be conducted over five days during the spring bird migration and five days during the fall bird migration. Survey days will be spread through each migration season.

The observers will also record data for any bird found dead in the Wells 230 kV transmission line corridor during other phases of the study.

6.2.1.5 Literature Review

A literature review will be conducted to identify potential effects of the 230 kV transmission lines and towers on raptors and prairie grouse. Refereed journal articles and gray literature will be reviewed. The literature review will be summarized in the study report.

6.2.2 Mammal Surveys

Mammals using the project area will be documented by recording visual observations or sign, including scats, tracks and calls incidental to all field surveys (Call 1986). All observations of RTEs mammals will be recorded, habitat characteristics identified and locations mapped.

6.2.3 Reptile Surveys

The use of the study area by striped whipsnake and other reptiles will be documented by visual encounter surveys (VES). Surveys will be conducted in representative native habitat, within the study area. Surveys will be conducted only during warm weather. The VES method involves searching habitat in a defined area, examining ground vegetation and under large objects (large rocks and woody debris) that may provide cover. All cover objects will be returned to their original position to avoid degradation of habitat. All reptiles will be identified without capturing them, if possible. If necessary, attempts will be made to capture individuals for identification, which will be followed by immediate release. All observations of RTEs reptiles will be recorded, habitat characteristics identified and locations mapped.

6.3 Documentation

Results of the botanical and wildlife surveys will be documented in a single report. The report will also summarize the methods used for each of the surveys. The results section of the report will include botanical information and wildlife species documented in the Project area. It will also include a matrix of wildlife species by habitat type and results of analyses of species abundance and distribution. Maps of survey locations and the distribution of RTE species will also be part of the report. A draft report will be produced for review prior to preparing the final report.

The report will also include a description of the transmission corridor maintenance program. Potential impacts of the maintenance program to native habitat and RTE wildlife will be identified and summarized in the report.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

The botanical and wildlife studies will require botanists and biologists with requisite experience to conduct all surveys described above.

The contractors will be responsible to provide a helicopter for the raptor surveys.

The contractors will be responsible for all field data sheets, notebooks, binoculars, flora and other personal field equipment.

The contractors will be responsible for obtaining any permits required for the study.

8.0 BUDGET

The estimate for total person hours required to complete the study is approximately 1756 hours. The botanical portion of the study is estimated at 848 person hours and the wildlife portion of the study at 908 person hours. Estimated hours include pre-field preparation, all field work, data analysis and report writing. The study is estimated to cost \$165,000.

9.0 SCHEDULE

Planning for plant surveys will begin shortly after the issuance of FERC's Study Plan Determination in October 2007, with a pre-field research to refine a list of potential RTE plants and invasive species. Applications for permits that may be required for the botanical studies will be sent in during late 2007. Plant collections in the University of Washington herbarium will be studied to develop a sight picture of the RTE plants. Botanical field work is scheduled between May and the end of August 2008 and is dependent on the time RTE species bloom.

Planning for the wildlife surveys will begin in late 2007. The wildlife field studies will begin in May 2008 and continue through the end of October 2008.

Page 17

An Initial Study Report will be provided to the Terrestrial RWG, stakeholders and FERC in October 2008 with a final report summarizing the study results provided by October 2009.

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SURVIVAL AND RATES OF PREDATION FOR JUVENILE PACIFIC LAMPREY MIGRATING THROUGH THE WELLS HYDROELECTRIC PROJECT (Juvenile Lamprey Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington For copies of this study plan, contact:

Public Utility District No. 1 of Douglas County Attention: Relicensing 1151 Valley Mall Parkway East Wenatchee, WA 98802-4497 Phone: (509)884-7191 E-Mail: relicensing@dcpud.org

ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5).

The Aquatic Resource Work Group (RWG), which is composed of stakeholders (resource agencies and tribes) and Douglas PUD staff, was formed for the purpose of identifying issues and information gaps that may require study during the relicensing of the Wells Project. The Aquatic RWG, through a series of technical meetings, is proposing a study intended to fill gaps in the local knowledge of juvenile Pacific lamprey (*Lampetra tridentata*) survival migrating through the Wells Project.

Although there is a growing body of information on adult Pacific lamprey and their interactions at hydroelectric projects, relatively little information exists related to the survival of outmigrating juvenile lamprey (macrophalmia) at hydroelectric projects. A review of the recent body of literature related to juvenile lamprey survival passing through hydroelectric projects reveals that there is currently a lack of methodologies and technologies to effectively quantify the level of survival of juvenile lamprey migrating through a hydroelectric facility. In other words, no studies currently exist that document the level of survival attributed to a project's operations, nor does an accepted technology currently exist that would achieve this level of assessment for juvenile lamprey.

The Juvenile Lamprey Study will conduct an updated literature review which will compile all of the available information regarding juvenile lamprey survival at hydroelectric projects in the Columbia River Basin. Additionally, a field study will be implemented during the 2-year ILP study period to assess the occurrence of juvenile lamprey in the diets of predatory fishes and birds present in the Wells forebay and tailrace. Stomach samples of both predatory fishes and birds will be obtained and an effort will be made to coordinate with pre-existing activities that may already be collecting such specimens (An evaluation of the effects and alternatives to the existing piscivorous bird and mammal control program (Terrestrial Issue, PAD Section 6.2.3.1)).

A technical report summarizing the results of this study will be produced to provide a current state-of-the-science assessment of juvenile lamprey survival to address the issues raised by the Aquatic RWG. Furthermore, the results of the study will inform future Wells Project relicensing decisions by assessing the effectiveness of existing predator control programs (which have traditionally targeted salmonid predators) for juvenile lamprey.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project, owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for the Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1 Location Map of the Wells Project

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The goal of this study is to collect up-to-date information on the survival and the rates of predation of juvenile Pacific lamprey macrophalmia migrating through Columbia River hydroelectric Projects and to collect site specific information on rates of predation on juvenile lamprey in the waters immediately upstream and downstream of Wells Dam. This information will be used to inform existing predator control programs in the reduction of predation on juvenile lamprey macrophalmia.

The specific work needed to accomplish this goal is:

- Conduct a literature review on juvenile lamprey macrophalmia survival and predation studies conducted at Columbia River hydroelectric projects.
- Conduct an analysis on the stomach contents of predatory fish and birds (if feasible) to assess the location (only applicable to fish) and level of predation that may be occurring on juvenile Pacific lamprey macropthalmia in the Wells forebay and tailrace.

3.0 STUDY AREA

The study area for field activities will consist of the Wells forebay and tailrace. The Wells tailrace is defined, for this study, as the waters immediately below Wells Dam downstream to a distance of 3000 feet. The definition of the Wells forebay, for this study, extends 1,000 feet upstream from the face of the dam (Figure 1.1-1).

4.0 BACKGROUND AND EXISTING INFORMATION

Pacific lamprey (*Lampetra tridentata*) are present in most tributaries of the Columbia River and in the mainstem Columbia River during their migration stages. They have cultural, utilitarian and ecological significance including the ceremonial, subsistence and medicinal use of adult lamprey by Native Americans (Close et al. 2002). As an anadromous species, they also contribute marine-derived nutrients to the aquatic and terrestrial ecosystem found in the interior Columbia Basin. Little specific information is available on the life history or status of lamprey in the mid-Columbia River watersheds. They are known to occur in the Methow, Wenatchee and Entiat rivers (NMFS, 2002) and recently have been captured during juvenile trapping operations in the Okanogan River.

In general, adults are parasitic on fish in the Pacific Ocean while ammocoetes (larvae) are filter feeders that inhabit the fine silt deposits in backwaters and quiet eddies of streams (Wydoski and Whitney, 2003). Adults generally spawn in low-gradient stream reaches in the tail areas of pools and in riffles, over gravel substrates (Jackson et al. 1997). Adults die after spawning. After hatching, the ammocoetes burrow into soft substrate for an extended larval period filtering particulate matter from the water column (Meeuwig et al. 2002). The ammocoetes undergo a metamorphosis to macropthalmia between 3 and 7 years after hatching, and migrate from their parent streams to the ocean from October to April (Close et al., 2002). Adults typically spend 1-4 years in the ocean before returning to freshwater tributaries to spawn.

Pacific lamprey populations of the Columbia River have declined in abundance over the last 40 years according to counts at dams on the lower Columbia and Snake rivers (Close et al. 2002). Starke and Dalen (1995) reported that adult lamprey counts at Bonneville Dam that regularly exceeded 100,000 fish in the 1960s. More recently lamprey counts have ranged between 20,000 and 120,000 for the period 2000-2004 (DART - www.cqs.washington.edu/dart/adult.html).

Close et al. (1995, 2002) identified several factors that may account for the decline in lamprey counts in the Columbia River Basin. This includes reduction in suitable spawning and rearing habitat from flow regulation and channelization, pollution and chemical eradication, reductions of prey in the ocean, and juvenile and adult passage problems at dams (Nass et al., 2005).

Although there is a growing body of information on adult Pacific lamprey and their interactions at hydroelectric projects, relatively little information exists describing the effects of hydroelectric plant operations on outmigrating juvenile lamprey (macrophalmia). Recent juvenile lamprey studies at hydroelectric projects have addressed testing for lamprey macrophalmia survival through juvenile bypass facilities (Bleich and Moursund, 2006), impingement by intake diversion screens (Moursund et al., 2000 and 2003), validation of existing screening criteria (Ostrand, 2005), and responses of juvenile Pacific lamprey to simulated turbine passage environments (Moursund et al., 2001; INL, 2006). Results of other studies targeting predaceous birds and fish suggest that juvenile lamprey may compose a significant proportion of the diets of these predators (Poe et al., 1991; Merrell, 1959).

A review of the recent body of work addressing juvenile lamprey at hydroelectric facilities concludes that there is a current lack of methods and tools to effectively quantify the level of survival for juvenile lamprey migrating through hydroelectric facilities. Furthermore, no studies exist that assign a level of survival attributed to a project's operations. This is due to the lack of miniaturized active tag technologies to overcome two study limitations. Macrophalmia (juvenile outmigrating lamprey) are relatively small in size and unique in body shape and they tend to migrate low in the water column resulting in the rapid attenuation of active tag signal strength. In an effort to develop a tagging protocol, the Bonneville Power Administration (BPA) annually funds Oregon State University (OSU) to identify and develop tag technologies for lamprey macropthalmia. Recent reports on this developmental effort have concluded that the smallest currently available radio-tag was still too large for implantation in the body cavity of a juvenile lamprey (Schreck et al., 2000). Additionally, external application was not effective as animals removed tags within the first week and fish performance was affected. This report also concluded that internal implantation of Passive Integrated Transponder (PIT) tags was the most viable option for tagging juvenile lamprey although this method included severe limitations such as the limited range of detection systems and the ability to tag only the largest outmigrating juvenile lamprey (Schreck et al., 2000).

4.1 Aquatic Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established an Aquatic Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Aquatic RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Aquatic RWG is proposing to conduct a study to collect and summarize the existing literature related to juvenile lamprey survival at hydroelectric projects and to assess the level of juvenile lamprey predation taking place within the Wells tailrace. The need for this study was agreed to by all of the members of the Aquatic RWG, including Douglas PUD. This study will help to inform future relicensing decisions and will fill data gaps that have been identified by the Aquatic RWG.

4.2 Issue Statement

Issue Statement (PAD Section 6.2.1.1)

Operations of the Project may affect juvenile Pacific lamprey dam passage and reservoir survival (survival, route of passage and timing) during their downstream migration.

Issue Determination Statement (PAD Section 6.2.1.1)

It is unknown whether there is a Project effect on juvenile lamprey. At this time, there are no studies documenting Project effects on juvenile lamprey. However, dam passage survival can be broken down into 4 specific areas of concern; survival, route of passage, timing and predation. Currently, there are two limitations to the implementation of a field study for dam passage survival: 1) tag technology for juvenile macropthalmia is currently being developed; and 2) obtaining macropthalmia in sufficient numbers within the Project to meet sample size requirements for a statistically rigorous study is not practicable. Reservoir predation on juvenile lamprey is unknown. A review of existing data and literature on predation, including bird predation in the tailrace, would be beneficial.

The resource work group agrees that a study is needed during the two-year ILP study period. This study will include an updated literature review on juvenile lamprey survival and predation on juvenile lamprey and will examine the stomach contents of fish. If permits can be obtained, the study will also examine the stomach contents of birds.

5.0 **PROJECT NEXUS**

Anadromous lamprey actively migrate from estuarine and marine waters to freshwater spawning areas as adults. Upon metamorphosis, juveniles participate in both active and passive emigration from freshwater rearing areas. In the Columbia River Basin, lamprey may migrate hundreds of kilometers through both mainstem and tributary habitats. Consequently, they encounter a variety of obstacles to passage that could affect their populations. Recent research has indicated that large hydropower dams delay and obstruct adult passage (LTWG, 2005). These facilities may also affect the downstream passage of juvenile lamprey during their outmigration. Specifically, areas of turbulence in the Wells tailrace could increase the susceptibility of juvenile lamprey macropthalmia to predation.

Currently, little information exists as to the types and levels of impact that may occur to outmigrating juvenile lamprey through hydroelectric facilities. Given the current limitations in technology and methods capable of accurately quantifying impacts to juvenile lamprey migrating

through hydroelectric facilities, the proposed study will review and condense the most accurate and scientifically available information related to juvenile lamprey passage through Columbia River dams.

In addition to the literature review, stomach content analysis will be conducted from predatory birds and fish found within the Wells tailrace and predatory fish found in the Wells forebay. Stomach contents will be used to determine whether juvenile Pacific lamprey are being consumed by predators and the location where they are being consumed while migrating through the Wells Reservoir and following passage through Wells Dam. Given the difficulty in assessing the location of predation activity by birds, location information will only be applicable to predatory fish. This study plan is not proposing to develop new technologies. The information collected from this study will help to inform the development of license requirements (18 CFR § 5.9(b)(5)) by assessing the effectiveness of existing predator control programs (traditionally aimed at targeting salmonid predators) with regards to predation on juvenile Pacific lamprey. Based upon the results of the study, predator control programs may be modified to maximize protection for outmigrating juvenile lamprey while continuing to ensure high levels of protection for juvenile salmonids.

6.0 METHODOLOGY

The literature review will consist of a search of all existing information currently available on juvenile lamprey survival and predation at hydroelectric projects in the Columbia River Basin. This search will examine the availability of information from peer-reviewed journals, federal and state publications, academia, private industry, and grey literature. References cited from the initial literature search that are of relevance to the subject matter will also be collected and added to the literature database. An annotated bibliography will be produced from the results of the literature search.

The field collection and analysis of stomach contents will consist of the collection of various predators known to be present in the Wells forebay and tailrace. Fish species that will be collected are northern pikeminnow (*Ptychochelius oregonensis*), smallmouth bass (*Micropterus dolomieu*), and walleye (*Stizostedion vitreum*). Fish will be collected via angling and through coordination with other programs that are already capturing such species; i.e., northern pikeminnow removal program in the Wells Project and Chelan PUD predation study in the Wells tailrace. An effort will be made to collect 20 samples of both smallmouth bass and walleye from the Wells tailrace. Stomach contents from 500 northern pikeminnow in both the Wells tailrace and above Wells Dam in the reservoir will be collected from the existing predator control program. These data will assist in a comparative analysis of rates of predation upon juvenile lamprey before and after passage through Wells Dam.

In addition to fish species collection, the stomach contents of avian species that are present in the Wells tailrace will also be analyzed pending the ability to secure the appropriate permits. There may be opportunities to coordinate with existing or proposed programs that collect avian predators in the Wells tailrace or Wells Hatchery. Currently, the United States Department of Agriculture (USDA) oversees a piscivorous bird damage management program for the protection of juvenile salmonids on the Mid-Columbia River (USDA, 2003). This program is a potential

source of avian predator samples for the study. Furthermore, the Terrestrial RWG has submitted a proposed study to evaluate the effects and alternatives to the existing piscivorous bird and mammal control program. Provided that FERC approves the study plan for the piscivorous bird control study, then there may be an opportunity to secure samples through the implementation of this study. The number of samples and the species of birds to be sampled will be dependent upon the availability of samples from these other studies.

Both predatory fish and bird collection will occur from May through July, 2008 to coincide with the juvenile Pacific lamprey outmigration in the mid-Columbia River. Sampling effort during the study will also be segregated in an effort to collect samples throughout the entire outmigration period. General information such as location, date, and time of capture will be recorded in addition to biological information (length, weight, species, sex) of samples collected independently or through coordinated efforts. All samples collected by Douglas PUD will be analyzed on-site by trained field staff and data recorded. Samples will also be preserved according to Quality Assurance/Quality Control standards in case future evaluation is necessary. Data acquired from the stomach content analysis will consist of qualitative observations of prey species diversity, prey species percent composition, and a comparative analysis of the levels of predation observed by location (applicable only to predatory fish) and by predator species.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

Based upon discussions with the Aquatic RWG regarding specific study design and study needs, Douglas PUD will secure the assistance of a qualified consultant(s) to conduct the literature review and if necessary, coordinate the field sampling and field analysis of stomach samples.

No special equipment will be necessary to complete this study with the notable exception of a boat capable of safely accessing the Wells tailrace and permits for the collection of stomach samples from birds and fish found within the Wells tailrace. Should the applicable permits be secured prior to the study, the existing USDA contractor will use shotguns to collect stomach samples from birds collected from the Wells tailrace. Stomach samples from predatory fish will be collected through the existing long-line predator control program and may be augmented through other sampling efforts.

The technical skills necessary to complete the literature review portion of the study are knowledge of data acquisition and management.

8.0 BUDGET

Study implementation will require approximately 1,400 person hours. The allocation of these hours is approximately 64 hours for project management and coordination; 568 hours for the literature review; 392 hours for the predator stomach analysis; and 376 hours for data analysis and reporting. Labor costs are estimated to be \$116,000. Equipment costs and expenses related to implementation (travel, miscellaneous supplies, boat use) are estimated to be \$12,000. Total planning level cost for this effort is approximately \$128,000.

9.0 SCHEDULE

The literature review will begin shortly after FERC's issuance of the Study Plan Determination in October 2007. The results of the literature review will be detailed in a brief report and annotated bibliography.

Sampling associated with the field portion of the study will occur from May to July of 2008. An Initial Study Report will be provided in October 2008. The Initial Study Report will detail the results of the field study and literature review. A final report will be available by October 2009 for use by FERC, the Aquatic RWG and stakeholders in discussions related to the Wells Project relicensing.

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AN ASSESSMENT OF ADULT PACIFIC LAMPREY SPAWNING WITHIN THE WELLS PROJECT (Lamprey Spawning Assessment)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington

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ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5).

The Aquatic Resource Work Group (RWG), which is composed of stakeholders (resource agencies and tribes) and Douglas PUD staff, was formed for the purpose of identifying issues and information gaps that may require study during the relicensing of the Wells Project. The Aquatic RWG, through a series of technical meetings, is proposing a study intended to examine the effects of Wells Project operations on adult Pacific lamprey (*Lampetra tridentata*) habitat, specifically spawning habitat.

Currently, the information available in the mid-Columbia River on adult Pacific lamprey addresses only their migration through hydroelectric projects. No studies have been conducted to examine the presence of spawning within a Project area and further whether Project operations impact lamprey spawning.

The study proposes to identify sites within the Wells Project where suitable spawning habitat may be available through an analysis using Geographic Information Systems (GIS). These sites will be field verified for suitability prior to the implementation of a field study. The field study will consist of spawning surveys throughout the lamprey spawning period (typically May to July) in 2008. If spawning activity is observed, an analysis will be conducted to examine whether Wells Dam operations have an effect on lamprey spawning habitat.

A technical report summarizing the results of this study will be produced to help fill the information gap identified by the Aquatic RWG. The results of the study will assist the Aquatic RWG in future Wells Project relicensing decisions.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project, owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1 Location Map of the Wells Project

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The primary objective of this study is to assess the level of spawning activity by adult Pacific lamprey in the Wells Project and whether Wells Dam operations are affecting this activity.

Specific objectives of the study include:

- Identify areas within the Wells Project where suitable spawning habitat may exist for adult Pacific lamprey,
- Survey these areas of spawning habitat for use by lamprey to confirm suitability, and
- Assess whether the operations of Wells Dam are having adverse effects on these spawning areas (i.e., dewatering, flow alterations, scour, etc.).

3.0 STUDY AREA

The study area is defined as the waters within the Wells Reservoir and Wells Tailrace. The Wells Reservoir consists of the mainstem Columbia River upstream of Wells Dam to the tailrace of Chief Joseph Dam, and the Okanogan (to RM 15.5) and Methow (to RM 1.5) rivers within Project boundary. The Wells tailrace consists of the Columbia River downstream of Wells Dam within Project boundary (approximately 1.2 miles) (Figure 1.1-1).

4.0 BACKGROUND AND EXISTING INFORMATION

Pacific lamprey are present in most tributaries of the Columbia River and in the mainstem Columbia River during their migration stages. They have cultural, utilitarian and ecological significance in the basin since Native Americans have historically harvested them for subsistence, ceremonial and medicinal purposes (Close et al., 2002).

Pacific lamprey are cartilaginous, jawless, anadromous fish that develop morphologically and physiologically in three primary stages. First, lamprey begin as larvae that hatch after approximately 19 days at 15°C (Close et al., 2002). After hatching, they remain a larvae (also known as ammocoete) for 4 to 6 years (10-200 mm body length). Ammocoetes reside burrowed in fine sediment (Close et al. 2002) during this time filter feeding on diatoms, algae, and detritus by pumping water through their branchial chamber (Beamish and Levings, 1991). Lamprey then enter a transformation phase (ocean-migrating macrophthalmia) and migrate from their parent streams to the ocean. Pacific lamprey transform from ammocoetes to macrophthalmia from July to November (Hammond, 1979 and Close et al., 2002). During transformation, the shape and angle of the head and mouth changes, and the gut develops to allow consumption of flesh and fluids (Hart, 1973). The macrophthalmia migrate to the ocean between late fall and spring and are physiologically capable of handling life in salt water. They spend 1 to 4 years as adults feeding as external parasites on marine fish and mammals before returning to freshwater to spawn (Beamish, 1980 and Close et al., 2002).

Upstream migrating Pacific lamprey are likely heading to tributaries or mainstem holding and/or spawning areas to over-winter. Though their exact timing likely varies among locations, upstream migration has been documented to cease in mid-September (Beamish, 1980), and resume in mid-March of the following spring if the final spawning destination has not been reached (Bayer et al., 2001). Somewhat like salmon, adult lamprey dig depressions in the gravel of freshwater streams. Spawning occurs in the spring and early summer (May to July) following the upstream migration year (Lê et al., 2004). Lamprey prefer low-gradient reaches, with gravel-pebble-sand substrate for spawning (Mattson, 1949 and Close, 1995). Adults generally spawn in low-gradient stream reaches in the tail areas of pools and in riffles, over gravel substrates (Jackson et al., 1997). Lamprey die after spawning (Hart, 1973).

Pacific lamprey populations of the Columbia River have declined in abundance over the last 40 years according to counts at dams on the lower Columbia and Snake rivers (Close et al., 2002). Starke and Dalen (1995) reported that adult lamprey counts at Bonneville Dam that regularly exceeded 100,000 fish in the 1960s and more recently have ranged between 20,000 and 120,000 for the period 2000-2004 (DART - www.cqs.washington.edu/dart/adult.html).

Close et al. (1995, 2002) identified several factors that may account for the decline in lamprey counts in the Columbia River Basin. This includes reduction in suitable spawning and rearing habitat from flow regulation and channelization, pollution and chemical eradication, reductions of prey in the ocean, and juvenile and adult passage problems at dams.

Little specific information is available on the life history or status of lamprey in the mid-Columbia River watersheds. They are known to occur in the Methow, Wenatchee and Entiat rivers (NMFS, 2002) and recently have been captured during juvenile trapping operations in the Okanogan River above Project boundary. In the mid-Columbia River basin, available information exclusively addresses adult lamprey passage and behavior through hydroelectric projects via radio-telemetry studies and dam counts (Nass et al., 2003 and 2005; Stevenson et al., 2005). Similarly in the Wells Project, adult passage information is available through a preliminary radio-telemetry study (Nass et al., 2003) and counts at Wells Dam (since 1998). Currently, no studies have been conducted on adult Pacific lamprey related to spawning within the Wells Project.

4.1 Aquatic Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established an Aquatic Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Aquatic RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these discussions, the Aquatic RWG is proposing to conduct a study to determine whether adult Pacific lamprey are spawning within the Wells Project and if so, whether the operation of Wells Dam is affecting this habitat. The need for this study was agreed to by all of the members of the Aquatic RWG, including Douglas PUD. This study will help to inform future relicensing decisions and will fill data gaps that have been identified by the Aquatic RWG.

4.2 Issue Statement

Issue Statement (PAD Section 6.2.1.2)

The Wells Project may affect adult Pacific lamprey habitat use.

Issue Determination Statement (PAD Section 6.2.1.2)

There were two types of habitat identified by the group (spawning and overwintering habitat). It is unlikely that there is a Project effect on adult lamprey overwintering habitat. Literature suggests that overwintering habitat for adult Pacific lamprey consists of deep pools. In the Wells Reservoir deepwater habitat is plentiful and undisturbed by Project operations.

There is no information currently available related to adult lamprey spawning habitat within the Wells Project. Existing literature (Beamish, 1980) suggests that adult lamprey prefer smaller tributaries that are characterized by suitable spawning substrate and velocities (pool-tailouts, large gravel to small cobble substrate, depth of 1 meter). This type of habitat is generally not available within the Wells Project.

Adult Pacific lamprey spawning has not been documented within the Wells Project; however, there may be areas within the Wells Project that may have marginal spawning habitat for adult Pacific lamprey.

The resource work group agrees that a study is needed to determine whether adult lamprey are spawning within the Wells Project and if so, whether the operation of Wells Dam is affecting this habitat. This study should be conducted during the two-year ILP study period.

5.0 **PROJECT NEXUS**

Two recent reviews of Pacific lamprey (Hillman and Miller, 2000 and Golder Associates Ltd., 2003) in the mid-Columbia River have indicated that little specific information is known on their status. Within the Wells Project waters, no studies have been conducted to address the level of spawning that may be occurring and whether Project operations affect lamprey spawning habitat. Pacific lamprey spawning has been observed in the Lower Columbia River from May to July (Lê et al., 2004)) and habitat preferences consist of the tail-outs of pools and riffles over gravel substrate (Jackson et al., 1997). This type of habitat is characteristic of the upper reaches of tributary streams in the mid-Columbia River system, however within the Wells Project boundary, there may be patches of habitat meeting these criteria. If adult lamprey are utilizing these areas of suitable habitat, it is important to assess whether Wells Project operations have any adverse effects on these areas during periods of lamprey spawning. Potential adverse effects attributed to Project operations may include flow fluctuations or dewatering of lamprey nests. The proposed lamprey spawning study will assist in filling the information gap identified by the Aquatic RWG and in the development of licensing requirements for the Wells relicensing process.

6.0 METHODOLOGY

Implementation of the study will consist of three separate components:

• The use of detailed bathymetry, high resolution orthophotographic information, and knowledge of Douglas PUD staff to identify areas within the Wells Project that are consistent with spawning habitat requirements of Pacific lamprey (Beamish, 1980),

- Conduct spawning surveys of these identified potential spawning areas when the probability of adult lamprey spawning is highest (May to July), and
- If spawning is observed, assess whether Wells Dam operations affect habitat in such a way to adversely impact spawning or spawning success.

In order to develop a map of sites that may be suitable for lamprey spawning, an analysis utilizing a Geographic Information System (GIS) will be conducted. A GIS will be used to integrate bathymetric data and high resolution orthophotography to better refine potentially suitable spawning areas within the Wells Project. This information will be coupled with the knowledge of Douglas PUD staff to identify suitable spawning habitat. A map will be produced identifying the areas within the Wells Project that consist of depths (approximately 1 meter), habitat type (low gradient riffles and pool-tailouts), and substrate (large gravel) typical of lamprey spawning habitat. Sites on this map will be field verified prior to field surveys to ensure that the identified habitat is consistent with the spawning requirements of adult lamprey.

Foot and boat surveys of the potential spawning areas will occur, beginning in May, 2008 or when flows allow. All field sites will be visited once a week by two field biologists with training in Pacific lamprey nest identification. Physical characteristics of nests will be measured, including: habitat type (riffle, pool-tailout, run, pool), nest dimensions, substrate (dominant, sub-dominant and % fines), and flow. If applicable, presence of adults on the nest will be noted as well as number and sex of fish. When possible, locations of each nest will be recorded with global positioning system (GPS) technology. Nests will be marked with weighted flagging to determine nest longevity and to avoid counting nests twice upon subsequent surveys. Weighted flags will be removed on subsequent surveys if the nest no longer appears viable. Lamprey in the lower Columbia River basin typically spawn from May to July and as such, spawning ground surveys will be conducted in the Wells Project during this time period. If activity continues to be observed past this period of time, spawning surveys will continue at the identified reaches until no activity is observed.

If spawning is observed in any of the identified reaches, an assessment of the Wells Project operations and its potential effects on these areas will need to be conducted. This portion of the study will be integrated into the spawning surveys and will likely be conducted between May and July 2008 with analysis and report preparation taking place prior to October 2008. A combination of GPS locations of observed lamprey nests, detailed bathymetry of the spawning reach, historical river flow information and typical Wells Project operations during this time period can be used to develop a backwater curve to assess the likelihood of nest dewatering or scour events induced by Project operations and the magnitude of this effect to spawning lamprey.

Facilities and equipment necessary to complete the habitat assessment portion of the study will consist of a computer with GIS software and the associated data sets. Field equipment consisting of flow meters, staff gauges, waders, GPS unit, camera, flagging, and weights will be required to conduct the spawning surveys. Use of vehicles and possibly motorboats will also be necessary to access possible survey sites. If an assessment of Project effects is required, access to current and historical databases of river flow, Project operations, and data collected during the field surveys will be necessary to assess whether Wells Project operations affect spawning lamprey.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

Douglas PUD will provide the necessary equipment and staff to conduct all phases of the study based upon discussions with the Aquatic RWG regarding specific study design and study needs.

The technical skills necessary to complete the study are knowledge of Pacific lamprey life history and general biology, biological sampling methods including nest identification, data acquisition and management, GPS and GIS technology, hydrologic modeling (if necessary), and motor boat operation and safety.

No permits are required to complete the study.

8.0 BUDGET

The total estimated hours for the implementation of a Wells Project Pacific lamprey spawning assessment is approximately 1,024 person hours. The allocation of these hours is approximately 144 hours for GIS and habitat suitability analysis; 256 hours for on-the-ground field verification of GIS analysis output; 384 hours for field spawning surveys; and 240 hours for data analysis and reporting. Labor costs are estimated to be \$84,000. Equipment costs and expenses related to implementation (travel, miscellaneous supplies, software, boat use, etc.) are estimated to be \$22,000. Total planning level cost for this effort is approximately \$106,000.

9.0 SCHEDULE

Planning for this study will begin shortly after the issuance of FERC's Study Plan Determination in October 2007, with an initial analysis of potential spawning areas in the Wells Project. Results of this analysis will be used to develop the field survey portion of the study which is scheduled to take place between May and July 2008. Results of the 2008 spawning survey will be provided to the Aquatic RWG and filed with FERC in the form of an Initial Study Report due in October 2008. A final report will be provided to FERC and stakeholders by October 2009.

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ADULT PACIFIC LAMPREY PASSAGE AND BEHAVIOR STUDY (Adult Lamprey Passage Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington For copies of this study plan, contact:

Public Utility District No. 1 of Douglas County Attention: Relicensing 1151 Valley Mall Parkway East Wenatchee, WA 98802-4497 Phone: (509)884-7191 E-Mail: relicensing@dcpud.org

ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5).

The Aquatic Resource Work Group (RWG), which is composed of stakeholders (resource agencies and tribes) and Douglas PUD staff, was formed for the purpose of identifying issues and information gaps that may require study during the relicensing of the Wells Project. The Aquatic RWG, through a series of technical meetings, is proposing a study to examine the effects of the Wells Project and its operations on the migration of adult Pacific lamprey (*Lampetra tridentata*).

To perform this study, Douglas PUD will undertake a radio-telemetry study to assess migration and passage characteristics of adult lamprey migrating through Wells Dam. Adult lamprey will be captured in the fishways at Wells Dam during August and September 2007. All captured lamprey meeting specific size criteria will be tagged and released at or below Wells Dam. A combination of fixed-station monitoring at Wells Dam will be used to determine migration and passage characteristics of these tagged fish.

A technical report summarizing the results of this study will provide the resource information needed to inform relicensing decisions related to adult lamprey passage through Wells Dam.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1 Location Map of the Wells Project

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The goal of this study is to evaluate the effect of the Wells Project and its operations on adult Pacific lamprey behavior related to ladder passage, timing, downstream passage through the dam, and upstream migration. This information will be used to help identify potential areas of passage impediment within the Wells ladders.

Specific objectives of the study include:

- Conduct a literature review of existing adult Pacific lamprey passage studies at Columbia and Snake river dams;
- Identify methods for capturing adult Pacific lamprey at Wells Dam;

- Document the timing and abundance of radio-tagged lamprey passage through Wells Dam;
- Determine whether adult lamprey are bypassing the adult counting windows at Wells Dam;
- Where sample size is adequate, estimate passage metrics including fishway passage times and efficiencies, residence time between detection zones and downstream passage events and drop back; and
- If necessary, identify potential areas of improvement to existing upstream fish passage facilities for the protection and enhancement of adult lamprey at the Wells Project.

3.0 STUDY AREA

The study area includes Wells Dam, the Wells Dam tailrace, and the Wells Dam forebay (Figure 1.1-1).

4.0 BACKGROUND AND EXISTING INFORMATION

Pacific lamprey are present in most tributaries of the Columbia River and in the mainstem Columbia River during their migration stages. They have cultural, utilitarian and ecological significance in the basin since Native Americans have historically harvested them for subsistence, ceremonial and medicinal purposes (Close et al. 2002). As an anadromous species, they also contribute marine-derived nutrients to the basin. Little specific information is available on the life history or status of lamprey in the mid-Columbia River watersheds. They are known to occur in the Methow, Wenatchee and Entiat rivers (NMFS, 2002) and recently have been captured during juvenile trapping operations in the Okanogan River.

In general, adults are parasitic on fish in the Pacific Ocean while ammocoetes (larvae) are filter feeders that inhabit the fine silt deposits in backwaters and quiet eddies of streams (Wydoski and Whitney, 2003). Adults generally spawn in low-gradient stream reaches in the tail areas of pools and in riffles, over gravel substrates (Jackson et al. 1997). Adults die after spawning. After hatching, the ammocoetes burrow into soft substrate for an extended larval period filtering particulate matter from the water column (Meeuwig et al. 2002). The ammocoetes undergo a metamorphosis, between 3 and 7 years after hatching, and migrate from their parent streams to the ocean from October to April (Close et al., 2002). Adults typically spend 1-4 years in the ocean before returning to freshwater tributaries to spawn.

Pacific lamprey populations of the Columbia River have declined in abundance over the last 40 years according to counts at dams on the lower Columbia and Snake rivers (Close et al. 2002). Starke and Dalen (1995) reported that adult lamprey counts at Bonneville Dam that regularly exceeded 100,000 fish in the 1960s and more recently have ranged between 20,000 and 120,000 for the period 2000-2004 (DART - www.cqs.washington.edu/dart/adult.html).

Close et al. (1995, 2002) identified several factors that may account for the decline in lamprey counts in the Columbia River Basin. This includes reduction in suitable spawning and rearing

habitat from flow regulation and channelization, pollution and chemical eradication, reductions of prey in the ocean, and juvenile and adult passage problems at dams.

Returning adult Pacific lamprey have been counted at Wells Dam since 1998. Between the years of 1998 and 2005, the numbers of lamprey passing Wells Dam annually has averaged 401 fish and ranged from 73 fish in 1999 to 1,417 fish in 2003 (Table 4.0-1). The relatively small number of adult lamprey observed at Wells Dam can be attributed to fact that the Wells Project is the last passable dam on the mainstem Columbia River and the fact that the Wells Project is over 500 miles upstream from the Pacific Ocean.

Lamprey pass Wells Dam from early July until late November with peak passage times between mid-August and late October (Figures 4.0-1 and 4.0-2). In all years since counting was initiated, Pacific lamprey counts at the east fish ladder are greater than at the west fish ladder. It is important to note that historically, counting protocols were designed to assess adult salmonids and did not necessarily conform to lamprey migration behavior (Moser and Close 2003). Traditional counting times for salmon did not coincide with lamprey passage activity which occurs primarily at night; the erratic swimming behavior of adult lamprey also makes them inherently difficult to count (Moser and Close, 2003). Furthermore, Beamish (1980) noted that lamprey overwinter in freshwater for one year prior to spawning. Consequently, lamprey counted in one year may actually have entered the system in the previous year (Moser and Close, 2003) which confounds annual returns back into the Columbia River Basin. It is unknown to what degree these concerns are reflected in Columbia River lamprey passage data. However, it is important to consider such caveats when examining historic lamprey count data at Columbia River dams including Wells Dam.

	ladders, 1998-2005							
	1998	1999	2000	2001	2002	2003	2004	2005
East Fish Ladder	173	47	96	153	226	723	263	148
West Fish Ladder	170	26	59	106	117	694	140	64
Total	343	73	155	259	343	1417	403	212

Table 4 0-1 Adult Pacific lamprey counts at Wells Dam for east and west fish


Figure 4.0-1 Daily counts of Pacific lamprey at Wells Dam during the fish counting season, 1998-2001.



Figure 4.0-2 Daily counts of Pacific lamprey at Wells Dam during the fish counting season, 2002-2005.

Until recently, relatively little information was available on Pacific lamprey in the mid-Columbia River Basin. However, with increased interest in the species coupled with a petition for listing under the ESA, the mid-Columbia PUDs have started to initiate studies to address Pacific lamprey passage and migratory behavior in their respective project areas.

The study of adult Pacific lamprey migration patterns past dams and through reservoirs in the lower Columbia River has provided the first data sets on lamprey passage timing, travel times, and passage success at hydroelectric projects (Vella et al. 2001, Ocker et al. 2001, Moser et al. 2002a, Moser et al. 2002b). These studies have shown that approximately 90% of the radio-tagged lamprey released downstream of Bonneville Dam, migrated back to the tailrace below Bonneville Dam; however, less than 50% of the lamprey which encountered a fishway entrance actually passed through the ladder exit at the dam (Nass et al., 2005).

Similar collection and passage efficiency results were observed at Rocky Reach, Wanapum and Priest Rapids dams during tagging studies conducted at those projects (Nass et al., 2003; Stevenson et al., 2005).

Of the 125 radio-tagged lampreys released approximately 7 kilometers downstream of Rocky Reach Dam, 93.6% were detected at the project, and of those fish, 94.0% entered the fishway. Of the fish that entered the Rocky Reach fishway, 55.5% exited the ladder.

During studies at Wanapum and Priest Rapids dams in 2001 and 2002, a total of 51 and 74 lamprey were radio-tagged and released downstream of Priest Rapid Dam, respectively. Over the two years of study, the proportion of fish that approached the fishway that exited the ladders was 30% and 70% at Priest Rapids and 100% and 51% at Wanapum Dam in 2001 and 2002, respectively.

Two recent reviews of Pacific lamprey (Hillman and Miller 2000; Golder Associates Ltd. 2003) in the mid-Columbia River have indicated that little specific information is known on their status (Stevenson et. al., 2005).

In 2004, Douglas PUD contracted with LGL Limited to conduct a lamprey radio-telemetry study at Wells Dam in coordination with the Chelan PUD who was conducting a similar study at Rocky Reach Dam. A total of 150 lampreys were radio-tagged and released at or below Rocky Reach Dam. The radio-tags used in this study had an expected operational life of 45 days (Nass et al., 2005). It is important to note that because of the release site of the fish was over 50 miles downstream of Wells Dam the value of the study was limited by the relatively small numbers of tagged fish observed at Wells (n=18) and the fact that many of the radio-tags detected at Wells Dam were within days of exceeding their expected battery life.

With that stated, the 2004 study at Wells was implemented through a combination of fixedstation monitoring at Wells Dam and fixed-stations at tributary mouths. Collectively, these monitoring sites were used to determine migration and passage characteristics of lamprey entering the Wells Project area. Of the 150 adult lamprey released at or below Rocky Reach in 2004, 18 (12% of 150) were detected in the Wells Dam tailrace, and ten (56% of 18) of these were observed at an entrance to the fishways at Wells Dam. Two of the 10 lamprey approached both fishways to produce 12 total entry events. A total of 3 radio-tagged lamprey passed Wells Dam prior to expiration of the tags, resulting in a Fishway Efficiency estimate of 30% (3 of 10) for the study period. A single lamprey was detected upstream of Wells Dam at the mouth of the Methow River (Nass et al., 2005).

For lamprey that passed the dam, the majority (92%) of Project Passage time was spent in the tailrace. Median time required to pass through the fishway was 0.3 d and accounted for 8% of the Project Passage time (Nass et al., 2005).

Although the 2004 study at Wells provided preliminary passage and behavioral information for migrating adult lamprey, the limited observations due to the small sample size (n=18) is insufficient in addressing the objectives set forth in Section 2.0 with statistical confidence.

4.1 Aquatic Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established an Aquatic Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Aquatic RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWGs' efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Aquatic RWG is proposing to conduct a study to assess lamprey behavior as it relates to passage, timing, downstream passage, and upstream migration. The need for this study was agreed to by all of the members of the Aquatic RWG, including Douglas PUD. This study will help to inform future relicensing decisions and will fill data gaps that have been identified by the Aquatic RWG.

4.2 Issue Statement

Issue Statement (PAD Section 6.2.1.3)

The Wells Project may affect adult Pacific lamprey behavior related to ladder passage, timing, downstream passage, and upstream migration.

Issue Determination Statement (PAD Section 6.2.1.3)

Work group members have determined that this issue has a tie to the Project as it relates to lamprey migration through Wells Dam. Preliminary passage information has been collected at Wells Dam; however, the sample size of the study was limited and additional information is needed. A radio-telemetry study would be feasible to address passage, timing, downstream passage, and upstream migration. The results of an adult lamprey passage study would be useful during the development of PME measures.

The resource work group agrees that a radio-telemetry study to assess lamprey behavior as it relates to passage, timing, downstream passage, and upstream migration should be conducted at Wells Dam during the two-year ILP study period.

5.0 **PROJECT NEXUS**

The Wells Project may affect adult Pacific lamprey behavior related to ladder passage, timing, downstream passage and upstream migration. This issue has a tie to the Project as it relates to lamprey migration through Wells Dam. Potential problems facing successful passage of adult Pacific lamprey at dams may be related to their unique method of movement and specific areas within fishways. Specifically, adult Pacific lamprey at other projects have experienced difficulty passing over diffusion gratings and through areas of high velocity, bright light and through orifices with squared, un-rounded edges. Typically, lamprey move through an adult fishway in a repeated series of motions consisting of attaching to the ladder floor with their mouths, surging forward, and re-attaching. The physiological response of adult Pacific lamprey to exhaustive exercise may be immediate, sometimes severe, but short-lived (Mesa el al. 2003). This may suggest that lamprey have difficulty negotiating fishways with high current velocities.

Two recent reviews of Pacific lamprey (Hillman and Miller, 2000; Golder Associates Ltd. 2003) in the Mid-Columbia River have indicated that little specific information is known on their status. The 2004 study at Wells Dam provided preliminary information into the migration characteristics of adult Pacific lamprey through Wells Dam. However, it is important to note that the study was compromised by the relatively small numbers of tagged fish observed at the Project (n=18) and the fact that many of the radio-tags detected at Wells Dam were within days of exceeding their expected battery life. Combined, these factors suggest that additional lamprey passage information is needed at Wells Dam.

The proposed lamprey radio-telemetry study will assist in providing the information needed as identified by the Aquatic RWG and will inform the development of future license requirements.

6.0 METHODOLOGY

6.1 Literature Review

The literature review will consist of a search of all existing information currently available on adult Pacific lamprey passage studies at Columbia and Snake river dams. This search will examine the availability of information from peer-reviewed journals, federal and state

publications, academia, private industry, and grey literature. References cited from the initial literature search that are of relevance to the subject matter will also be collected and added to literature database. An annotated bibliography will be produced from the results of the literature search.

6.2 Telemetry Study Period

Adult Pacific lamprey will be collected, sampled and tagged at Wells Dam. Historically, peak migration through Wells Dam typically occurs between August and September. However, in order to efficiently utilize available resources, the start of trapping activities will be flexible and based upon real-time fish count data at Wells Dam. To address lamprey passage characteristics, fixed station telemetry monitoring in the Wells Project will occur from August through November 2007.

6.3 Capture, Tagging, and Release of Lamprey

Radio transmitters that will be used during the study are Lotek NTC-4-2L and are similar to those used by NOAA Fisheries, the Public Utility District No. 2 of Grant County (Grant PUD) and Chelan PUD in recent years. The tags are designed for an 87-day operational life at a 5 second burst rate.

From August to September 2007, trapping at Wells Dam will target a total of 40 lampreys which upon capture will be held no longer than 36 hours prior tagging. Lamprey will be tagged and released post-surgery directly into the Columbia River at two locations. Distribution of tagged lamprey will generally adhere to the following:

- 10 will be released in the Wells Dam fishways; and
- 30 will be released below Wells Dam in an area of reduced flow (alcove near ladder entrance).

6.4 Telemetry Array

6.4.1 Fixed Stations

The movement and passage of radio-tagged lamprey will be determined by combining detection data collected using underwater and aerial antenna arrays (dipoles and yagi antennas) at Wells Dam. The arrays are designed to monitor movements of radio-tagged lamprey from the Columbia River into the fishway entrances and through the exits at Wells Dam, and are also designed to detect downstream passage movements. Aerial antennas will be used in the tailrace, at remote stations on tributary mouths, and during mobile tracking. Underwater antennas will be used in the fishways. A total of 11 Lotek telemetry receivers, monitoring multiple antennas will be used during the study. Stations will include:

Gateway – one receiver located 3 miles downstream of Wells Dam and monitoring three aerial antennas covering the mainstem Columbia River.

Tailrace – two receivers, one on each of the left and right banks, monitoring two aerial antennas each covering the mainstem Columbia River and located approximately 100 m downstream of Wells Dam.

Wells Fishway Entrances – two receivers with DSP's, one on each of the left and right banks, monitoring 7 underwater antennas each, and covering the entrances through the lower fishway.

Wells Upper Fishway – two receivers with DSP's, one on each of the left and right banks, monitoring 7 underwater antennas each, covering from the adult collection facilities to the fishway exits.

Wells Spillway – one receiver with DSP monitoring 7 underwater antennas and covering spill gates 2, 4, 6, 8 and 10.

Wells Forebay – one receiver monitoring 5 aerial antennas mounted along the forebay monolith.

Methow River – one receiver monitoring 2 aerial antennas covering the main channel.

Okanogan River - one receiver monitoring 2 aerial antennas covering the main channel.

6.4.2 Mobile Tracking

Mobile tracking will be conducted by boat in a 3 mile reach of the river below Wells Dam. Tracking will be recorded using Global Positioning System (GPS) with a built-in data logger. Twin three-element aerial antennas will be mounted to a post and secured in the boat. Surveys will be conducted by transects running upstream and downstream in the river with the aerials pointed in opposite directions, and usually at each bank.

6.4.3 Data Analysis

The data will be analyzed using *Telemetry Manager*, *Ascent* and other computer programs developed in Visual Foxpro by LGL Limited. In order to differentiate detection locations and streamline analyses, individual antennas will be grouped into "zones" that define pivotal areas of interest, such as individual fishway entrances and exits (Nass et al., 2005).

Telemetry Manager imports raw ASCII data files downloaded from the Lotek SRX receivers. After importing the raw files, *Telemetry Manager* constructs an initial database containing records for each logged data transmission from the tagged fish. *Telemetry Manager* then edits the database to remove records that do not meet the criteria identified for valid data records. Examples of invalid data include background noise at the Project, records with a signal strength that are below a given threshold, single records for a given fish-location combination, and records that were recorded before the official release time and date. After filtering the invalid records, *Telemetry Manager* constructs an operational database that summarizes the time of arrival and departure from each zone of interest ("benchmark times").

6.4.4 Definition of Passage and Residence Times

Strategic deployment of receivers and antennas will make it possible to determine the amount of time that lamprey will be present in the tailrace, fishway entrances, and fishways. Passage times will be calculated from benchmark dates and times corresponding to the first and last detection of a given radio-tagged lamprey at specific locations. At Wells Dam, the benchmark times for lamprey that pass the Project will be:

- 1) time of release or first detection in the tailrace,
- 2) first and last detection outside the fishway entrance of passage,
- 3) first and last detection inside the fishway entrance of passage,
- 4) first and last detection at weir 1,
- 5) first and last detection at weir 3,
- 6) first and last detection at weir 7,
- 7) first and last at weir 39 (Below Trap),
- 8) first and last in the Adult Salmon Trap,
- 9) first and last at weir 47 (Above Trap),
- 10) first and last Below Video,
- 11) first and last Above Video,
- 12) first and last at Video Bypass,
- 13) first and last detection at the fishway exit.

From these benchmark times, passage times will be calculated for each passage segment and will include (where adequate samples exist):

Segment	Time	Name
A)	1 to 2	Tailrace Passage time
B)	2 to 3	Entrance Passage time
C)	3 to 13	Fishway Passage time
D)	1 to 13	Project Passage time

From the benchmark times at each of the monitored locations, the passage times and passage efficiencies (proportions) will be calculated for each radio-tagged lamprey where,

Passage Efficiency for a section of the fishway = No. tags at a fishway detection zone (above)/ No. tags at the fishway zone (below), or No. tags at a fishway detection zone / No. tags at an outside entrance.
It then follows that: Fishway Efficiency = No. of tags at an exit / No. of tags at an outside entrance.

The metrics described above provide a method to evaluate the extent of upstream movement in the fishways. New in 2007, the telemetry array at Wells Dam now includes underwater antennas outside of the fishway entrances to determine when lamprey approach the fishway. This is an important aspect that now makes all of the analyses consistent with other studies (e.g., Moser et al. 2002b and Nass et al. 2003) where detections on antennas external to the fishway (approaches) are used as a basis to calculate overall passage efficiency at the dam. Therefore,

the metrics presented above are consistent with those of other studies and can be used for comparative purposes.

In addition to the above standard passage segments, a detailed analysis of the time lamprey spent in and between detection zones (i.e., residence time) in the Wells Dam fishways will be conducted.

The primary residence time analysis includes:

- Approach outside the entrance (first to last detection on fishway of passage),
- Entrance inside the entrance (first to last detection on fishway of passage),
- Gallery Between the inside Entrance and Weir 1 (last detection to first detection),
- Weir 1 first to last detection,
- Fishway Transition 1 Weir 1 to Weir 3 (last detection to first detection),
- Weir 3 first to last detection,
- Fishway Transition 2 Weir 3 to Weir 7 (last detection to first detection),
- Weir 7 first to last detection,
- Lower Fishway Weir 7 to Below Trap (last detection to first detection),
- Below Trap just downstream of the adult trapping facility (first to last detection),
- Adult Salmon Trap first to last,
- Mid Fishway Between Below Trap and Above Trap (last detection to first detection),
- Above Trap mid-point in series of orifice weirs between the trap and the video station (first to last detection),
- Mid-Upper Fishway Between Above Trap and Below Video (last detection to first detection),
- Below Video just downstream of the video station (first to last detection),
- Video Between Below Video and Above Video (last detection to first detection),
- Video Bypass first to last detection,
- Above Video just upstream of the video station (first to last detection),
- Upper Fishway Between Above Video and Exit (last detection to first detection), and
- Exit- fishway exit to forebay (first to last detection).

The residence and passage times for each radio-tagged lamprey will be determined by working backwards through a sequence of detections. The fishway of ultimate passage and the respective passage time is determined by identifying a sequence of detections in the ascent of a fishway, starting with detections in a fishway exit zone.

6.4.5 Definition of Downstream Passage Events and Drop Back

For the purpose of analysis, a downstream passage event is defined as a tag that is detected at a fishway exit and subsequently detected in the tailrace or a fishway entrance without any detections at antennas monitoring the inside fishway zones. Drop back fish will be defined as those tags in a fishway detection zone that are subsequently detected in zones directly downstream in the fishway.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

LGL Limited, a consulting firm located in Ellensburg, WA has been identified as the most likely contractor to conduct the proposed study. LGL Limited has expertise in all phases of radio-telemetry studies (design, implementation, data collection and analysis, equipment maintenance and reporting) for various fish species at mid-Columbia River hydroelectric projects. From implementation of past studies at Wells Dam, LGL is familiar with the Wells Project including the Wells Dam fishway structures, operations, and staff. LGL is currently conducting a radio-telemetry study at Wells Dam as part of the 2005-2008 Wells Bull Trout Monitoring and Management Plan and was the firm responsible for conducting the 2004 Wells Dam Lamprey Study and the 2002-2004 Wells Bull Trout Radio-telemetry Study.

Due to ongoing radio-telemetry studies at Wells Dam, the monitoring equipment necessary to complete the study will already be in place and operational for the 2007 study. Tags will be purchased by the contractor prior to the study. The level of effort and necessary staff time to conduct all phases of the study will be identified by LGL in consultation with the Aquatic RWG.

Incidental take consultation for ESA-listed steelhead and bull trout will need to take place prior to the study. This can be expedited through consultation with the HCP Coordinating Committee and associated agency representatives for the USFWS and NMFS. HCP Coordinating Committee members will be provided an opportunity to comment on draft trap designs and on the operation of the lamprey traps which will need to be installed prior to the study.

A Washington State Collector's Permit will be required to collect adult lamprey for the proposed study. LGL Limited will be responsible for securing this permit prior to study implementation.

8.0 BUDGET

Total estimated hours for the implementation of an adult Pacific lamprey passage and behavior study is approximately 1,034 person hours. The allocation of these hours is approximately 16 hours for project management; 664 hours for field work (includes lamprey trapping and tagging, radio-telemetry system set-up and maintenance, receiver downloading, and mobile tracking); 58 hours for data processing and management; and 296 hours for data analysis and reporting. Labor costs are estimated to be \$84,000. Equipment costs and expenses related to field implementation (travel, tagging and miscellaneous telemetry supplies, boat use, computer use, etc.) are estimated to be \$41,000. Total planning level cost for this effort is approximately \$117,204.

9.0 SCHEDULE

The study will be conducted from August to November 2007. During this time period, an Initial Study Report detailing the progress of the ongoing study will be provided to FERC, stakeholders, and members of the Aquatic RWG in October 2008. Additionally, Douglas PUD will provide the initial study results to regional lamprey passage experts from the Columbia Basin Lamprey Technical Work Group as a precursor to a Wells fishway walk through. The walk through will

occur during winter maintenance of the Wells fishways and is in support of the objective to identify potential areas of improvement to existing upstream fish passage facilities for the protection and enhancement of adult lamprey at the Wells Project.

All data collected during the field portion of the study will be analyzed and detailed in a technical report provided by the contractor to Douglas PUD. A draft report will be available for review by the Aquatic RWG by March 31, 2008. A final report will be provided to stakeholders and FERC by October 2008.

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AN INVESTIGATION INTO THE TOTAL DISSOLVED GAS DYNAMICS OF THE WELLS PROJECT (Total Dissolved Gas Investigation)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

May 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington For copies of this study plan, contact:

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ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5). As part of the Wells relicensing process, Douglas PUD is required to obtain a water quality certificate in accordance with section 401 of the Clean Water Act. The Washington State Department of Ecology (WDOE) is responsible for the issuance of a 401 certificate as well as administering the state's Water Quality Standards. As part of the 401 certification process, WDOE must determine that the Wells Project is in compliance with state water quality standards for total dissolved gas (TDG).

The Aquatic Resource Work Group (RWG), which is composed of stakeholders (including WDOE) and Douglas PUD staff, was formed for the purposes of identifying issues and information gaps that may require study during the relicensing of the Wells Project. The Aquatic RWG, through a series of technical meetings, is proposing a study intended to further examine the TDG production dynamics at the Wells Project. The specific objectives of this study are contingent upon the results from TDG studies scheduled for 2006 and 2007.

TDG may become a water quality concern when gases supersaturate a river, lake or stream. The plunging water caused by spill at hydroelectric facilities may elevate TDG to levels that result in impaired health or even death for aquatic life residing or migrating within the affected area. Since 2003, Douglas PUD has been engaged in the assessment of TDG production dynamics at Wells Dam.

In spring of 2006, Douglas PUD examined whether or not operational scenarios (i.e. spill shaping) were able to minimize TDG production to a level that is capable of meeting the Washington State water quality standard for TDG production at Wells Dam during high flows up to 7Q10 flows (246 kcfs at Wells Dam). The 7Q10 flow is defined as the highest average flow which occurs for seven consecutive days in a once-in-ten-year period. At 7Q10 flows and above, water quality standards for TDG do not apply. Results of the 2006 study (EES et al., 2006) suggest that, at 7Q10 flows, specific operating scenarios that concentrate spill flows (crowned spill and full gate shapes) produce significantly lower levels of TDG in the Wells Dam tailrace. Further analysis of the 2006 data, including additional data collection in 2007, will provide a logical framework for decisions about the scope of continued TDG activities (i.e., more spill studies, modeling) at Wells Dam during the 2-year ILP study period. Contingent upon the results of the 2006 and 2007 TDG studies, additional research into TDG at Wells Dam may or may not be needed.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam (Figure 1.1-1).

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1 Location Map of the Wells Project

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The goal of the study is to better define the relationship between spill operations at Wells Dam and resultant downstream total dissolved gas pressures and, if needed, identify possible measures to improve operational performance related to TDG.

The Washington State Department of Ecology (WDOE) is the agency responsible for administering the State Water Quality Standards and for the issuance of 401 water quality certificates for hydroelectric relicensing processes in Washington. The information gathered from this study will assist WDOE in determining the extent to which a Project's spill operations affect TDG in excess of the specified numeric criteria. This determination will also assist WDOE in the development of an implementation schedule as it applies to the 401 certification process.

3.0 STUDY AREA

The study area will consist of Wells Dam (RM 515.6) including the Wells Dam forebay and tailrace area. Additional TDG information may be collected in the Rocky Reach forebay (Figure 1.1-1).

4.0 BACKGROUND AND EXISTING INFORMATION

WDOE has established water quality standards in an effort to protect the beneficial uses of State water and water bodies. The Washington standards include both numeric and narrative criteria. The narrative standards address beneficial uses that include, but are not limited to, the ecological significance of water quality to aquatic biota. The importance of water quality to the health of rare, threatened, and endangered populations is also described in the narrative standards.

Dissolved gasses in water occur when gases in the atmosphere come into contact with water and when biological activity, such as photosynthesis or respiration, place metabolized gases into solution. Optimal water quality conditions of dissolved gas for fish are considered to be close to the barometric pressure seen at the air-water interface. Dissolved gas may become a water quality issue when gasses supersaturate a river, lake or stream (Klinge 2005). Plunging water may cause an increase in total dissolved gas of a body of water as air bubbles become entrained, pushed to depth and forced into solution due to increased pressure. This phenomenon occurs naturally at waterfalls or artificially at dams. Spill at hydroelectric projects occur when river flows exceed the hydraulic capacity of the dam due to limited generation capacity or a lack of demand for power. Hydroelectric dams on the Columbia River also provide safe passage routes for migrating juvenile salmonids through spill. High levels of TDG have been shown to cause air embolisms (gas bubble trauma) in fish that result in impaired health or even death. Many variables contribute to dissolved gas supersaturation, including existing forebay gas concentrations, spill flow rates, tailwater bathymetry, air entrainment, spill plunge depths, entrainment flows, and temperature of the water (Klinge 2005).

Based upon the Washington state water quality standards developed by WDOE, TDG measurements shall not exceed 110 percent at any point of measurement in any state water body. However, water quality standards for TDG do not apply during natural flood flow conditions. Natural flood conditions are defined as any event which exceeds the highest flow that occurs for seven consecutive days in a ten-year period. These natural flood condition flows are termed 7Q10 flows.

In addition to allowances for natural flood flows, dams on the Columbia and Snake rivers, have an exception to the 110 percent TDG standard to allow for passage of juvenile fish downstream over the dams rather than through the turbines through the submittal and approval of a gas abatement plan by WDOE. On the Columbia and Snake rivers there are three separate standards. First, in the tailrace of a dam, TDG shall not exceed 125 percent as measured in any one-hour period. Further, TDG shall not exceed 120 percent in the tailrace of a dam and shall not exceed 115 percent in the forebay of the next dam downstream as measured as an average of the 12 highest consecutive hourly readings in any one day (24-hour period). This exception is based on a risk analysis study conducted by National Marine Fisheries Service (NMFS). The study weighed the benefits of spilling water to assist juvenile salmon in avoiding turbine mortalities against the mortalities of fish exposed to harmful levels of dissolved gas.

Starting in 1998 Douglas PUD initiated a rigorous TDG monitoring program at Wells Dam including the installation of forebay and tailrace fixed station sensors and regular maintenance and calibration of the two stations. Since initiating the monitoring program, a more accurate description of the TDG dynamic at Wells Dam has been developed. During normal fish bypass operations (7-11% spill of total discharge), TDG values in the immediate Wells tailrace are only elevated above ambient levels by 1-2%. The fish bypass spill equation for Wells Dam indicates that for every 4% of water spilled, TDG values are elevated above ambient conditions by one percent (Klinge, 2001, 2002, 2003, 2004 and 2005).

In order to gain a better understanding of the TDG generation dynamic at Wells Dam, Douglas PUD has recently initiated a series of assessments aimed at gaining a better understanding of TDG production dynamics resulting from spill operations at Wells Dam. The District undertook studies to evaluate spill at Wells Dam during the 2003 and 2004 fish passage seasons (CBE 2003 and 2004). Both studies employed an array of data loggers arranged in a grid throughout the Wells Dam tailrace. The studies indicated that the tailrace fixed monitoring stations exhibited a delayed response to operational changes by Wells Dam when compared to mid- and upstream locations. Despite this delay, averages of the twelve highest daily TDG saturations (the compliance measure used by the State of Washington) varied little between stations.

The 2003 study also attempted to determine the fate of powerhouse released water by comparing upstream and downstream volume weighted TDG saturations. The results of these efforts were limited by the range of tested flow conditions, but implied that the TDG pressures of powerhouse released water may have been influenced by spillway operation. The 2004 study generally supported previous findings, indicating that Wells Powerhouse released water was gassed by spilled water.

In 2005, Douglas PUD initiated several spill tests to examine the relationship between water spilled over the dam and the production of TDG (CBE, 2006). The two objectives of the study were to determine the degree to which Wells powerhouse released water is influenced by spillway operation (i.e., dilution or absorption) and to explore ameliorative operational scenarios to reduce TDG production. A variety of scenarios were examined during this spill study, including spill over loaded and unloaded units and flat versus crowned spill configurations. Due to the low snow pack experienced during the 2005 water-year, only low and medium spill volumes were examined (spill Q was between 34 and 50 kcfs with total river Q between 106 and 178 kcfs).

In spring of 2006, Douglas PUD examined TDG production at Wells Dam during high flows up to 7Q10 flows (246 kcfs at Wells Dam) and whether or not operational scenarios (i.e., spill shaping) were able to minimize TDG production to a level that is capable of meeting the

Washington state water quality standard for TDG. Results of the study (EES et al., 2006) suggest that at 7Q10 flows, specific operating scenarios that concentrate spill flows (crowned spill and full gate shapes) produce significantly lower levels of TDG in the Wells Dam tailrace. Further analysis of the data including additional data collection in 2007 will provide a logical framework in which to base decisions focusing on the scope of continued TDG activities (i.e., more spill studies, physical modeling, computational fluid dynamics model, etc.) at Wells Dam.

4.1 Aquatic Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established an Aquatic Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Aquatic RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWGs' efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Aquatic RWG is proposing to conduct studies which address the expected need for continued investigations into the TDG dynamics of the Wells Project. These studies will help to inform future relicensing decisions through the 401 water quality certification process and will fill data gaps that have been identified by the Aquatic RWG.

4.2 Issue Statement

Issue Statement (PAD Section 6.2.1.5)

Wells Dam may affect compliance with Total Dissolved Gas (TDG) standards in the Wells tailrace and Rocky Reach forebay.

Issue Determination Statement (PAD Section 6.2.1.5)

Wells Dam can have an effect on compliance with the TDG standard. The resource work group believes that additional information is necessary in the form of continued monitoring and that these data will be meaningful with respect to 401 Water Quality Certification. Douglas PUD has been implementing studies at Wells Dam to address TDG production dynamics. The need for future studies during the two-year ILP study period (2008-2009) is dependent upon TDG studies scheduled for 2006 and 2007.

5.0 **PROJECT NEXUS**

TDG may become a water quality concern when gases supersaturate a river, lake or stream. The plunging water caused by spill at hydroelectric facilities may elevate TDG to levels that result in impaired health or even death for aquatic life residing or migrating within the affected area.

The WDOE is responsible for the protection and restoration of the state's waters. WDOE has adopted water quality standards that set limits on pollution in lakes, rivers, and marine waters in order to protect water quality. On July 1, 2003, WDOE completed the first major overhaul of the state's water quality standards in a decade. A significant revision presented in the 2003 water quality standards classifies fresh water by actual use, rather than by class as was done in the 1997 standards. These revisions were adopted in order to make the 2003 standards less complicated to interpret and provide future flexibility as the uses of a water body evolve.

Congress passed the Clean Water Act in 1972, and designated the US Environmental Protection Agency (EPA) as the administering federal agency. This federal law requires that a state's water quality standards protect the surface waters of the US for beneficial uses, such as recreation, agriculture, domestic and industrial use, and habitat for aquatic life. State water quality standards, or amendments to these standards, do not take regulatory effect for the purposes of the Clean Water Act until they have been approved by EPA. EPA is currently reviewing the water quality standards adopted by the State of Washington in 2003 and partial approval has occurred. Full approval is expected before Douglas PUD files its license application (2010) and Section 401 certification is issued (2012). Due to this, the 2003 standards, as they apply to TDG in the Wells Project, will be used.

The new water quality standard for TDG for the Columbia River at a hydroelectric project is:

• Total dissolved gas shall not exceed 110 percent of saturation at any point of sample collection.

However, as discussed in Section 4.0, an exception to the above standard is allowed through the approval of a gas abatement plan by WDOE. The information resulting from continued activities associated with TDG at Wells Dam will assist the Aquatic RWG in the development of licensing requirements through the 401 water certification process.

6.0 METHODOLOGY

Given that TDG assessments at hydroelectric projects are often a multi-year, stepwise approach where future actions are based upon knowledge gained from past studies, Douglas PUD's future actions with regards to TDG production at Wells Dam will be dependent upon the information collected during the 2006 and 2007 spill studies. Based upon the results of these studies and based upon discussions with the Aquatic RWG, Douglas PUD will implement one or more of the following predetermined studies. Currently, there are several different studies that may be implemented pending the results of the 2006 and 2007 studies:

Option 1 If results of the 2006 and 2007 studies show that Wells Dam can maintain TDG levels below the levels allowed under an approved gas abatement plan during flow levels that are at or below the 7Q10 flow of 246 kcfs during the fish spill season (120% in the Wells tailrace and 115% in the Rocky Reach forebay), given that incoming TDG levels are also at or below 115%, Douglas PUD will include this information in its 401 water quality certification application to demonstrate that it is able to meet the state water quality standard for TDG. In this case, it is expected that no additional TDG studies are needed to inform the development and approval of the 401 water quality certification (based on information presented elsewhere that it can meet the 110% standard during non-fish spill).

Option 2 If results of the 2006 and 2007 studies show that Wells Dam cannot maintain TDG levels below the levels allowed under an approved gas abatement plan during flow levels that are at or below the 7Q10 flow of 246 kcfs (120% in the Wells tailrace and 115% in the Rocky Reach forebay), provided that incoming TDG levels are also at or below 115%, Douglas PUD, in cooperation with WDOE, will begin working on strategies, within an adaptive management framework, towards compliance of the TDG state standard. These adaptive management strategies will begin during the 2008-2009 relicensing study period and are expected to include:

2a. If results of the 2006 and 2007 studies show that during the fish spill season, specific Wells Dam operations at or below 7Q10 flows produce TDG levels within a reasonable deviation (120% + 2%) in the Wells tailrace and 115% in the Rocky Reach forebay) from levels allowed under an approved gas abatement plan, Douglas PUD, in cooperation with the Aquatic RWG and FERC, may conduct the following studies:

1. Develop a TDG model for the Wells Project. The model will be used to determine whether compliance with the water quality standard can be achieved through strictly operational means.

If the model shows that compliance can be achieved through operational means, Douglas PUD will initiate additional spill tests at the Project, utilizing lessons learned from the model, toward verifying compliance with the TDG standard.

If the model shows that compliance cannot be achieved through operational means, Douglas PUD will initiate activities specified in 2b.

2b. If results of the 2006 and 2007 studies show that specific Wells Dam operations at or below 7Q10 flows produce TDG levels that are above levels allowed under an approved gas abatement plan by more than 2%, then Douglas PUD, in cooperation with the Aquatic RWG and FERC, is expected to conduct the following studies:

1. Develop and implement a hydraulic model(s) to address possible operational and/or structural solutions toward compliance with the TDG standard.

If the hydraulic model shows that compliance can be achieved through operational and/or structural solutions, Douglas PUD will conduct a feasibility analysis to evaluate the cost of the measures and the potential negative impact on existing fish passage and survival. If a reasonable and feasible measure is identified from this exercise, Douglas PUD will implement and test this measure toward compliance with meeting the standard.

If WDOE, in consultation with the other members of the Aquatic RWG, determines that there are no reasonable and feasible operational and/or structural modifications that can improve or meet TDG levels allowed under an approved gas abatement plan, Douglas PUD may, in consultation with the Aquatic RWG and EPA, initiate work toward a Use Attainability Analysis (UAA) or site-specific study.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

Based upon results of the 2006 and 2007 TDG studies and based upon discussions with the Aquatic RWG regarding study design and study needs, Douglas PUD will begin acquiring the necessary field equipment and/or the assistance of consultant services to complete the study. Existing Wells Dam infrastructure and planned operational scenarios will also be necessary for study implementation and will be coordinated between consultants and Wells Project staff.

The technical skills necessary to complete the study are knowledge of water quality monitoring instrumentation, field techniques consistent with WDOE's preliminary guidance manual, motor boat operation and safety, TDG data acquisition and management, and the Washington State water quality standards and 401 certification process.

If biological monitoring is required, a take permit to sample and examine ESA listed species may be required. In this event, the consultants selected to implement the biological monitoring will work with Douglas PUD staff toward obtaining the necessary permits, in a timely manner.

8.0 BUDGET

Study cost will be contingent upon which of the two adaptive management strategies is selected based upon the results of the 2006 study. Following the selection of the most appropriate strategy, a qualified consulting firm will be selected. This consultant will work with Douglas PUD to better refine the specific scope of work and budget for the 2007-2009 TDG study. Preliminary planning level costs for the three potential TDG study options can be found below:

Option 1:

Should the results of the 2006 and 2007 study indicate that Option 1 is the preferred study option toward the development of information for the 401 certification, then Douglas PUD will focus on implementing its annual TDG compliance monitoring program at Wells Dam as described in Section 4.0. The total estimated hours for the implementation of the 2007-2009 TDG compliance monitoring is 420 person hours. These hours are specifically dedicated to the

deployment and maintenance of TDG monitoring equipment and data management. Total planning level cost for Option 1, including equipment costs, is \$48,000.

Option 2a:

Should the results of the 2006 and 2007 study indicate that Option 2a is the preferred study option, then Douglas PUD will develop a TDG Model, conduct a one-year TDG Dynamics Study and conduct three years of the annual TDG compliance monitoring program. Preliminary planning level cost for the development of a TDG model is \$240,000. The development of a TDG model is expected to take one full year to develop, run and prepare a summary report. Planning level cost for the one-year TDG dynamics study is \$340,000 assuming that the scope of this study is similar to the study conducted in 2006 at Wells Dam. This study would take place after the results of the TDG Model were available and the operations suggested by the model were implemented at the Project. The cost associated with continuing the three year annual TDG compliance monitoring program remains as estimated above, is \$48,000. Total planning level cost associated with Option 2a is \$628,000.

Option 2b:

Should the results of the 2006 and 2007 study indicate that Option 2b is the preferred study option, then Douglas PUD will focus on the development of a Hydraulic Model and will implement a Feasibility Analysis to evaluate the cost of the measures and the potential negative impact on existing fish passage and fish survival. The planning level cost for the development of a Hydraulic Model for TDG at Wells is expected to range from \$244,000 to \$350,000 depending upon whether the model is numeric or whether the model includes both numeric and physical modeling components. The planning level cost to complete the Feasibility Analysis is \$125,000. The cost associated with continuing the three year annual TDG compliance monitoring program remains as estimated above, \$48,000. Total planning level cost associated with Option 2b ranges from \$417,000 to \$523,000 depending upon the scope and scale of the Hydraulic Model.

9.0 SCHEDULE

The need for this study and the study scope, objectives, and timing are entirely dependent upon the results of the 2006 and 2007 TDG studies. Should Wells Dam be capable of meeting the standard then Option 1, Section 6.0 will be implemented (no additional studies needed for TDG).

However, should Wells Dam remain out of compliance with the standard, then one of the two study paths identified by Option 2, Section 6.0 will be implemented following FERC's issuance of the Study Plan Determination in October 2007. Results from the 2008 study will be provided in the form of an Initial Study Report in October 2008. A final report of all of the TDG related studies will be provided to FERC and the Aquatic RWG by October 2009.

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DEVELOPMENT OF A WATER TEMPERATURE MODEL RELATING PROJECT OPERATIONS TO COMPLIANCE WITH THE WASHINGTON STATE AND EPA WATER QUALITY STANDARDS (Water Temperature Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington For copies of this study plan, contact:

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ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5). As part of the Wells Project relicensing process, Douglas PUD is required to obtain a water quality certificate in accordance with section 401 of the Clean Water Act. The Washington State Department of Ecology (WDOE) is responsible for the issuance of a 401 certificate as well as administering the state's Water Quality Standards. As part of the 401 certification process, WDOE must determine that the Wells Project is in compliance with state water quality standards for temperature.

The Aquatic Resource Work Group (RWG), which is composed of stakeholders (including WDOE) and Douglas PUD staff, was formed for the purposes of identifying issues that may require study during Wells Project relicensing. The RWG has identified the need to develop a water temperature model relating project operations to compliance with the Washington State water quality standards.

The development of a water temperature model has been WDOE's preferred method for assessing project effects on water quality. In 2005, Douglas PUD began the initial steps for the development of a water quality model through the collection of detailed bathymetric, meteorological and water temperature data. With guidance from consultants with expertise in water quality modeling, Douglas PUD identified the CE-QUAL-W2 (W2 model) model as being appropriate for assessing temperature effects of the operation of the Wells Project. The W2 model is widely used to support the establishment of TMDLs for Washington waters and is the generally accepted model for evaluating the effects of hydroelectric projects on state waters. Therefore, the W2 model was considered the basis for making decisions regarding data needs and data archiving.

Starting in 2005, Douglas PUD conducted a data review and data gap analysis which resulted in the implementation of a data collection program to ensure that the appropriate model-specific parameters were being collected from within and adjacent to the Wells Project. Data collected during the new monitoring program are being archived in a format that is complementary to future water quality modeling efforts. This data collection program was initiated in 2006 and will continue through 2007 for use in model development during the ILP study period.

Methodologies for W2 model development consist of a data collection component and a model development/implementation component. The data collection component in W2 model development consists of activities such as site review and field reconnaissance, data gap analyses, preliminary data collection design and implementation of data collection programs. The model development/implementation component consists of model input data preparation, model development, hydrodynamic and temperature calibration, sensitivity analyses and hypothesis testing. Douglas PUD is currently (2005-2007) implementing the data collection component.

W2 model development and implementation will proceed in consultation with the Aquatic RWG. Model results will clarify the effects of Project operations as they relate to the state's narrative and/or numeric standards for temperature and will produce model output that will be important to the Wells Project 401 certification process.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1 Location Map of the Wells Project

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The objective of the study is to develop a temperature model (e.g., CE-QUAL-W2) to assess the effects of Wells Project operations on water temperatures at Wells Dam and within the Wells Reservoir as they relate to compliance with the Washington State Water Quality Standards and the 401 certification process.

The Washington State Department of Ecology (WDOE) is the agency responsible for administering the State Water Quality Standards and for the issuance of 401 water quality certificates for hydroelectric relicensing processes in Washington. The information gathered from this modeling effort will assist WDOE in determining the extent to which a Project's operations affect water temperature in excess of the narrative and/or numeric criteria. This determination will also assist WDOE in the development of an implementation schedule as it applies to the 401 certification process.

3.0 STUDY AREA

The study area is defined as the waters within the Wells Reservoir. This consists of the mainstem Columbia River upstream of Wells Dam to the tailrace of Chief Joseph Dam, and the Okanogan (to RM 15.5) and Methow (to RM 1.5) rivers within Project boundary (Figure 1.1-1).

4.0 BACKGROUND AND EXISTING INFORMATION

In preparation for the development of a temperature model, Douglas PUD assessed the suite of models available. The CE-QUAL-W2 (W2 model) model is widely used to support the establishment of TMDLs for Washington waters and is a generally accepted model for evaluating the effects of hydroelectric projects. Therefore, the W2 model was considered the basis for making decisions regarding data needs and data archiving. With guidance from consultants having expertise in water quality modeling, Douglas PUD conducted a review on the types of information being collected within the Wells Project and whether the data currently collected was sufficient and in a complimentary format to support W2 model development. In response to the data review, Douglas PUD modified existing monitoring programs and in some cases initiated new programs in order to collect the necessary types of information for the W2 model.

Flow Data

Water flowing into the Wells Project originates from Chief Joseph Dam, on the Columbia River, and from the Okanogan and Methow rivers. Continuous hourly flow data from Chief Joseph Dam, located upstream of Wells Dam, are available from the Columbia River Operational Hydromet Management System (CROHMS) database. A stream gauge station located near the town of Malott, WA, measures flow in the Okanogan River (USGS Gauge No. 12447200) several miles upstream of the location where the Okanogan River enters the Wells Project. A stream gage station located near Pateros measures flow in the Methow River (USGS Gauge No. 12449950) at the point where the river enters the Wells Project. All three of the boundary water monitoring stations provide Douglas PUD with hourly flow data.

Water flowing out of the Wells Project must first pass through Wells Dam. Douglas PUD collects and records hourly flow data for the water passing through the turbines, spillways and adult fish ladders at Wells Dam. Additionally, there is a United States Geological Survey (USGS) gauging station downstream of Wells Dam that also collects river flow information and is reflective of water passing through Wells Dam.

Temperature Data

Beginning in 2001, an extensive water temperature monitoring effort was initiated in order to better understand the temperature dynamics throughout the Wells Reservoir. Temperature data were collected at four locations (RM 544, RM 532, RM 530, RM 516) in the Columbia River

and at one location in both the Methow (RM 1.5) and Okanogan rivers (RM 13). Data were collected hourly using Onset tidbit temperature loggers. Monitoring start and end dates varied from year to year but generally began in the spring and ended in late fall. Quality assurance and control prior to deploying and upon retrieving temperature loggers were implemented to ensure that data collected were accurate (Douglas PUD, 2005). Due to sensor loss or sensor malfunction in some years, the availability of data at some of these monitoring locations is sporadic.

An additional component of the water temperature monitoring effort launched in 2001 was to profile vertical temperatures at the RM 516 location in the Columbia River at the Wells Dam forebay. The temperature station was located along the east portion of the forebay, in what had been the original channel of the Columbia River prior to the construction of the Wells Project. Each year between 2001-2005, temperature loggers were deployed at 3 different depths between 5 and 90 feet and approximately 30 feet apart from one another. Results reflected the limited storage capacity of the Wells Reservoir and showed no measurable thermal stratification.

Starting in 2006 and following the completion of the data review and data gap analysis, Douglas PUD expanded the Wells Reservoir temperature monitoring season to cover the entire year and implemented a more frequent downloading schedule to avoid temperature data gaps. Douglas PUD also added additional monitoring stations at the mouths of the Okanogan (RM 0.5) and Methow (RM 0.1) rivers. This collective data, which documents incoming water temperatures to the Wells Project (boundary conditions), as well as other sites throughout the Wells Reservoir including the Wells Dam forebay, will be integral in the development of a W2 temperature model.

Meteorological Data Collection

Site specific weather information is an integral component for the development of water temperature models which can be used to support 401 water quality certification. Weather information characteristic of the entire Wells Reservoir was unavailable up until 2005 when Douglas PUD began collecting site specific meteorological data. Douglas PUD identified three sites that would most effectively characterize weather trends in the Wells Reservoir.

These sites were Chief Joseph Dam (upper reservoir area), Bridgeport Bar (mid-reservoir area) and the Wells Project forebay (lower reservoir area). Since reliable meteorological information was already available near Chief Joseph Dam, NRG systems weather stations were erected at the other two identified sites in order to collect the suite of parameters that are required in support of water temperature modeling. The parameters collected were air temperature, relative humidity, dew point temperature, solar incidence, cloud cover, wind speed, and wind direction.

Bathymetric Data Collection

In March 2005, Douglas PUD contracted with GeoEngineers to conduct a detailed bathymetric survey of the Wells Reservoir and tailrace using multibeam sonar and (Global Positioning System) GPS technology. Contour maps of the reservoir bottom were produced at 1-foot

contour intervals, and a digital elevation model (DEM) was produced at a pixel resolution of 10-feet. The DEM provides a seamless representation of the riverbed surface.

4.1 Aquatic Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established an Aquatic Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Aquatic RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meetings and discussions, the Aquatic RWG is proposing to conduct a study to evaluate the effect of Project operations on compliance with temperature standards in the Wells Project (6.2.1.6). The need for this study was agreed to by all of the members of the Aquatic RWG, including Douglas PUD. This study will help to inform future relicensing decisions and will fill data gaps that have been identified by the Aquatic RWG.

4.2 Issue Statement

Issue Statement (PAD Section 6.2.1.6)

Project operations may affect compliance with temperature standards in the Wells Project.

Issue Determination Statement (PAD Section 6.2.1.6)

The Wells Project can have an effect on compliance with the water temperature standard. The Aquatic Resource Work Group members agree that studies to address this issue are feasible and the results will be meaningful for the 401 Water Quality Certification Process. Douglas PUD is currently collecting temperature data throughout the Wells Project. Furthermore, Douglas PUD has established weather stations to collect meteorological data in key locations of the Wells Reservoir. These data sets will be utilized to develop a temperature model (i.e., CE-QUAL-W2) to assess the Wells Project's effect on water temperatures.

The Resource Work Group believes that a study to develop a temperature model is necessary to determine compliance with the state's water quality standards. The resource work group agrees that this study (development of specific water temperature models) should be implemented during the two-year ILP study period.
Toward this goal, Douglas PUD will continue to collect water temperature and meteorological data during 2006 and 2007 for use in the development of a temperature model to be used in 2008 and/or 2009. Data may continue to be collected in 2008 and 2009, if necessary.

5.0 **PROJECT NEXUS**

The WDOE is responsible for the protection and restoration of the state's waters. WDOE has adopted standards that set water quality criteria for lakes, rivers, and marine waters in order to protect water quality and dependent uses. On July 1, 2003, WDOE completed the first major review and modification of the state's water quality standards in a decade. A significant revision presented in the 2003 water quality standards classifies fresh water by use, rather than by class as was done in the 1997 standards. These revisions were adopted in order to make the 2003 standards less complicated to interpret and provide greater flexibility as the uses of a water body evolve.

Congress passed the Clean Water Act in 1972, and designated the US Environmental Protection Agency (EPA) as the administering federal agency. This federal law requires that a state's water quality standards protect the surface waters of the U.S. for beneficial uses, such as recreation, agriculture, domestic and industrial use, and habitat for aquatic life. State water quality standards, or amendments to these standards, do not take regulatory effect for the purposes of the Clean Water Act until they have been approved by EPA. EPA has completed an initial review of the water quality standards (WQS) adopted by the State of Washington in 2003 and has requested that WDOE revise some of the proposed WQS. Currently, WDOE is in the process of addressing EPA's comments and approval of the 2003 WQS is expected before Douglas PUD files its license application (2010) and Section 401 certification is issued (2012). Due to this, the 2003 standards as they apply to temperature in the Wells Project will be used.

The new WQS for water temperature within the Wells Project includes a number of numerical and narrative criteria. Those most pertinent to the Project are:

For the tributary reaches that are within the Wells Project boundary (Okanogan River from RM 0 to RM 15.5 and the Methow River from RM 0 to RM 1.5),

- Water temperature shall not exceed 17.5°C (63.5°F), where water temperature is measured by the 7-day average of the daily maximum temperatures (7-DADMax);
- When a water body's temperature is warmer than 17.5°C (or within 0.3°C (0.54°F) of 17.5°C) and that condition is due to natural conditions, then human actions considered cumulatively may not cause the 7-DADMax temperature of that water body to increase more than 0.3°C (0.54°F);
- When the natural condition of the water is cooler than 17.5°C the allowable rate of warming up to, but not exceeding, the numeric criteria (17.5°C) from human actions is restricted as follows:
 - Incremental temperature increases resulting from individual point source

activities must not, at any time, exceed 28/(T.+7) as measured at the edge of a mixing zone boundary (where "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge);

 Incremental temperature increases resulting from the combined effect of all nonpoint source activities in the water body must not, at any time, exceed 2.8°C (5.04°F).

For the mainstem Columbia River that is within the Wells Project boundary,

- Water temperature shall not exceed 18.0°C (63.5°F), where water temperature is measured by the 7-day average of the daily maximum temperatures (7-DADMax);
- When a water body's temperature is warmer than 18.0°C (or within 0.3°C (0.54°F) of 18.0°C) and that condition is due to natural conditions, then human actions considered cumulatively may not cause the 7-DADMax temperature of that water body to increase more than 0.3°C (0.54°F);
- When the natural condition of the water is cooler than 18.0°C the allowable rate of warming up to, but not exceeding, the numeric criteria (18.0°C) from human actions is restricted as follows:
 - Incremental temperature increases resulting from individual point source activities must not, at any time, exceed 28/(T.+5) as measured at the edge of a mixing zone boundary (where "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge);
 - Incremental temperature increases resulting from the combined effect of all nonpoint source activities in the water body must not, at any time, exceed 2.8°C (5.04°F).

The temperature of water flowing into and through the Wells Reservoir typically begins warming in March while reaching peak annual temperatures in August through early September. During this time period, incoming water into the Wells Project can exceed both the 7-DADMax numeric criteria of 17.5°C and 18.0°C. A portion of the mainstem Columbia River encompassing Wells Dam is on the 2004 303(d) list as an impaired waterbody for temperature.

Water temperature is one of a multitude of environmental factors that may affect salmonid populations in the mid-Columbia River basin. Concerns have been raised that increasing temperature levels above a given threshold can begin to cause upstream migration delays, promote disease, and increase the probability of mortality for salmonids at all life history stages. Natural ambient water temperatures often exceed lethal tolerance levels for salmonids in the Lower Okanogan River (NMFS, 2002). Yet, the Okanogan watershed currently supports healthy runs of anadromous summer/fall Chinook salmon and sockeye salmon, and smaller runs of steelhead (NMFS, 2002).

Currently, sufficient information is not available to examine the contribution of Wells Project operations to the warming of water temperatures above the conditions which would occur without the Project in place or with regard to the state's numeric criteria. The information resulting from a temperature model will assist the Aquatic RWG in the understanding of temperature effects due to Project operations as required by FERC's study criteria (18 CFR §5.9(b)(5)).

6.0 METHODOLOGY

The W2 model is widely used to support the establishment of TMDLs for Washington waters and is a generally accepted model for evaluating the effects of hydroelectric projects on various water quality parameters (EES Consulting, 2006).

The development of a W2 model consists of two major components; data collection for model input and model development/implementation. The data collection component in W2 model development consists of activities such as site review and field reconnaissance, data gap analyses, preliminary data collection design and implementation of data collection programs. The model development/implementation component consists of model input data preparation, model development, hydrodynamic and temperature calibration, sensitivity analyses and hypothesis testing.

Douglas PUD has already begun and will continue activities associated with the data collection component as described in Section 4.0 in preparation for the development of a W2 model. The information collected by these activities was developed through guidance from consultants specializing in water quality modeling and with extensive W2 modeling experience. There are a suite of consulting firms that specialize in water quality model development and application within Washington State. Prior to the start of the 2-year ILP study period (2008-2009), Douglas PUD will secure the services of a qualified consultant to develop a W2 model for Wells Dam and the Wells Reservoir. Model development will generally not require access to Wells Project facilities; however, it may be necessary to grant access in order to clarify specific components of the modeling process. The W2 model will provide insight into whether the Wells Project is in compliance with the temperature criteria as specified in the Washington State water quality standards and provide useful information for the Wells Project 401 certification process.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

The equipment necessary to complete the data collection component of the W2 model has already been acquired by Douglas PUD. Cost and level of effort associated with the implementation and maintenance of data collection programs currently being implemented to support future W2 model development has been absorbed by Douglas PUD.

The technical skills necessary to complete the study are a strong knowledge of W2 model development, experimental design, and quantitative analyses and their applicability to the

Washington State water quality standards, 401 water quality certification, and hydroelectric relicensing processes.

Douglas PUD is currently engaged in the data collection component of the study. However, a contractor will be hired to conduct the model development/implementation component of the study. The persons or firms responsible for analysis are yet to be determined.

No permits will be required in order to complete this study.

8.0 BUDGET

As mentioned in Section 4.0, field activities to begin collecting the necessary parameter data to develop a W2 temperature model are currently in progress. Total estimated hours for the implementation of these activities is approximately 250 person hours. These hours are all associated with deployment and maintenance of data logging equipment and is estimated to be \$12,500. Equipment costs and expenses related to field implementation (weather stations, temperature loggers, boat use, travel, etc.) is estimated to be \$15,000. Total costs for the data collection effort is approximately \$27,500.

The total estimated hours for the development of a W2 temperature model is approximately 1,021 person hours. The allocation of these hours is approximately 25 hours for study planning and site visit; 182 hours for preparation of model input data; 630 hours for model development, analysis, and compliance assessment; and 184 hours for reporting, meetings, and quality assurance/control processes. Total costs for model development are estimated to be \$100,000.

Total planning level cost for this effort is approximately \$127,500.

9.0 SCHEDULE

Data collection of all the necessary parameters for the development of a W2 model began in 2006 and will continue through 2007. The development of a model integrating the information collected from 2006-2007 will take place after the issuance of FERC's Study Plan Determination in October 2007. It is expected that this effort will take most of 2008 and/or 2009 to complete. An Initial Study Report will be provided to the Aquatic RWG, stakeholders and FERC in October 2008 with a final report summarizing the processes of model development, analyses, and results by October 2009. The information provided in the final report will be useful in discussions related to the Wells Project relicensing and 401 certification process.

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CONTINUED MONITORING OF DO, pH, AND TURBIDITY IN THE WELLS FOREBAY AND LOWER OKANOGAN RIVER (DO, pH and Turbidity Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington For copies of this study plan, contact:

Public Utility District No. 1 of Douglas County Attention: Relicensing 1151 Valley Mall Parkway East Wenatchee, WA 98802-4497 Phone: (509)884-7191 E-Mail: relicensing@dcpud.org

ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5). As part of the Wells Project relicensing process, Douglas PUD is required to obtain a water quality certificate pertinent to section 401 of the Clean Water Act. The Washington State Department of Ecology (WDOE) is responsible for the issuance of a 401 certificate as well as administering the state's Water Quality Standards. As part of the 401 certification process, WDOE must determine that the Wells Project is in compliance with state water quality standards for dissolved oxygen (DO), pH, and turbidity.

The Aquatic Resource Work Group (RWG), which is composed of stakeholders (including WDOE) and Douglas PUD staff, was formed for the purposes of identifying issues and information gaps that may require study during the relicensing of the Wells Hydroelectric Project. The Aquatic RWG, through a series of technical meetings, is proposing a study to collect additional DO, pH, and turbidity data from within the Wells Project.

Douglas PUD and other state and federal agencies have monitoring programs in place that collect water quality information related to these parameters at various scopes and frequencies. This study will augment the established sampling regimes and will provide additional information related to DO, pH and turbidity from within the Wells Project.

Sampling locations for the study are the Lower Okanogan River within Project boundary and the Wells Dam forebay. Study implementation is planned for 2008 with sampling occurring during periods where the probability of exceedance with the water quality standard is highest (between mid-July and mid-September).

A technical summary of the monitoring study will be produced to assist the Aquatic RWG in determining whether the Wells Project is in compliance with the state's water quality standards for these parameters which are a necessary component of the 401 water quality certification process.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1 Location Map of the Wells Project

1.2 Relicensing Process

The current Wells Project license will expire on May 31, 2012. Douglas PUD is using the Integrated Licensing Process (ILP) as promulgated by FERC regulations issued July 23, 2003 (18 CFR Part 5). Various state and federal agencies, tribes, local governments, non-governmental organizations and the general public will participate in the Wells Project ILP. During the ILP, information needs related to the relicensing of the Wells Project will be identified. All study plans intended to meet these information needs will be prepared in a manner that addresses each of the required seven FERC criteria described in 18 CFR § 5.9(b).

18 CFR § 5.9(b) Content of study request. Any information or study request must:

(1) Describe the goals and objectives of each study and the information to be obtained;

(2) If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied;

(3) If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study;

(4) Describe existing information concerning the subject of the study proposal, and the need for additional information;

(5) Explain any nexus between project operation 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;

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

(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The objective of the study is to continue monitoring dissolved oxygen (DO), pH, and turbidity in the Wells Dam forebay and Lower Okanogan River within the Wells Project boundary.

The Washington State Department of Ecology (WDOE) is the agency responsible for administering the state Water Quality Standards and for the issuance of 401 water quality certificates for hydroelectric relicensing processes in Washington. The information gathered from this monitoring effort will assist WDOE in determining the extent to which Project operations have an affect on compliance with the specified numeric criteria for DO, pH and turbidity. This determination will also assist WDOE in the development of an implementation schedule as it applies to the 401 certification process.

3.0 STUDY AREA

The study area consists of waters within the Wells Project with a particular emphasis on the Wells Forebay and the Lower Okanogan River from its confluence with the Columbia River up to river mile (RM) 15.5 (Figure 1.1-1).

4.0 BACKGROUND AND EXISTING INFORMATION

WDOE has established water quality standards in an effort to protect the beneficial uses of state water and water bodies. The Washington standards include both numeric and narrative criteria. The narrative standards address beneficial uses that include, but are not limited to, the ecological significance of water quality to aquatic biota. The importance of water quality to the health of rare, threatened, and endangered populations is also described in the narrative standards.

DO levels are an extremely important variable for aquatic life and govern the chemical dynamics of a water body. DO levels are influenced by a suite of factors including the level of biological activity in the water, turbulence, and temperature (EES Consulting, 2006).

Turbidity is the measure of the light scattering from suspended particles in water. After light enters water, it is absorbed, reflected or refracted by dissolved organic substances, pigmented (phytoplankton) and colored particulates and by the water itself. Light is scattered by inorganic particulates. Turbidity is a good indicator of a waterbody's trophic status when combined with nutrient and chlorophyll data. Transparency also regulates primary productivity and trophic dynamics which ultimately can affect fish populations. There is a direct relationship between turbidity, water transparency and the depth at which macrophytes grow (EES Consulting, 2006).

The term pH is used to describe the acidity or hydrogen ion level of a liquid. Factors influencing the pH of a water body include the chemical composition of soils in the watershed, photosynthetic activity, pollutants, and respiration of organisms (EES Consulting, 2006). pH levels which are extremely acidic or basic can adversely impact aquatic life and may be representative of metals and other pollutants present within a watershed.

Factors and activities affecting water quality in the Wells Project include: 1) nonpoint source pollution from agricultural runoff and irrigation return flow, 2) point source pollution from mines, municipal and industrial sources upstream and outside of the Wells Project boundary, 3) depletion of instream flows from water diversions and consumptive uses, 4) watershed management in the tributaries and Upper Columbia River above Wells Dam, 5) the operation of large water storage facilities located upstream of Wells Dam on the mainstem Columbia and in the Okanogan watershed, and 6) effects related to operations of the Wells Project.

Under section 303(d) of the 1972 Clean Water Act, states are required to list all water body segments that do not meet the state water quality standards. Within the Wells Project boundary, specific water reaches have been put on the state's 303(d) list in the past for various parameters. However, the lower Okanogan River within Project boundary as well as all other areas within the Wells Project is not on the 2002/2004 303(d) list with respects to the parameters of interest.

Douglas PUD and state and federal agencies have implemented monitoring programs to collect information within or adjacent to the Wells Project at various scopes and frequencies. The programs collect a variety of biological, chemical, and physical water quality parameters and typically include the three parameters of interest (DO, pH, and turbidity). Data collected from these monitoring activities suggest that waters within the Wells Project are generally in compliance with the state standards. During times when Wells Project waters are in exceedance of the stated numeric criteria for these parameters, waters entering the Wells Project are also out of compliance.

Douglas PUD Monitoring Activities

In August, 2005, Douglas PUD began monitoring DO and pH in the Wells Dam forebay when the probability of low DO levels was highest. The results of this monitoring effort indicated that DO levels were not below 8.0 mg/L and pH levels were not outside of the specified range of 6.5 to 8.5, which are the state water quality numeric criteria (WAC 173-201A as amended July 1, 2003). In response to requests made by WDOE, Douglas PUD has continued implementing seasonal monitoring, for the summer months of 2006, for these parameters at the Wells Dam forebay. At Wells Dam, Secchi disk readings are taken to measure water transparency which is inversely correlated to turbidity. Sampling occurs daily during the adult fish passage assessment period of May 1st to November 15th. Measurements are recorded in feet of visibility and reliable information adhering to a standard protocol has been collected since 1998. During the monitoring period, Secchi disk readings ranged from 2 feet during spring run-off to 16 feet by late summer (Douglas PUD, 2006).

In 2005, Douglas PUD contracted with EES Consulting to conduct a comprehensive limnological investigation of Wells Project waters (EES Consulting, 2006). The year long study was conducted at nine sites (7 sites in the Columbia River and 1 site in the Methow and Okanogan rivers) in order to characterize water quality and seasonal trends in the Wells Project. Water quality sampling was scheduled seasonally with one sample event scheduled for each season. Spring sampling was conducted in May, fall monitoring was conducted in October, and winter sampling occurred in February (2006). Summer sampling was conducted more frequently when water quality exceedances were more likely and temporal changes more dynamic (July, August and September). Results of the study found DO levels at 1m depth in Wells Project waters increased from upriver to downriver at the sites sampled; the average difference (May through October) was 1.07 mg/L. All surface water measurements had DO values greater than 8.0 mg/L. pH for Wells Project waters generally varied between 7.5 and 8.25, which is slightly above neutral. There were no measured exceedances of the water quality standard for pH. Turbidity in the Wells Reservoir showed relatively little seasonal variation with an annual average of 0.98 Nephelometric Turbidity Units (NTU). Longitudinal variation in turbidity was also minimal. Low turbidity in the reservoir is partially due to the large upstream storage reservoir capacity that allows fines to settle out. Turbidity in the Okanogan River was consistently higher than in the Wells Reservoir. Turbidity in the Methow River was higher than in the Wells Reservoir in May (due to sediment load) and in August due to phytoplankton growth. The only turbidity reading over 5 NTU was in the Methow River during May (EES Consulting, 2006).

WDOE Monitoring Activities

WDOE has conducted monthly water quality monitoring at locations on the Okanogan River near Malott (station 49A070) upstream of the Wells Project boundary at approximately RM 17 and on the Methow River near Pateros (station 48A070) upstream of the Wells Project boundary at approximately RM 5. Both stations are considered "long-term" stations by WDOE and provide the most reliable information for the quality of water entering the Wells Reservoir from tributary inflow. It is important to note that data collected from these stations are representative of water quality conditions outside of the Wells Project boundary. Data are typically collected as grab samples on a monthly basis. A variety of water quality parameters including DO, pH, and turbidity information as well as site compliance are available at

<u>http://www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html</u>. Table 4.0-1 provides the range of values for the parameters of interest observed at these two long-term monitoring stations since 2001.

Table 4.0-1. The range of DO, pH and turbidity values observed from monthly grab samples
collected upstream of the Wells Project on the Okanogan (RM 17) and Methow rivers (RM 5).
Data from WDOE long-term monitoring stations 2001-2005.

Okanogan	2001	2002	2003	2004	2005
River (RM 17)					
DO (mg/L)	7.32-13.87	8.8-13.63	8.32-13.3	8.16-14.08	7.24-14.11
pН	7.87-8.45	7.83-8.39	7.81-8.35	7.48-8.55	7.85-8.44
Turbidity	0.8-5.5	1.0-19.0	0.8-22.0	0.9-75.0	0.8-7.8
(NTU)					
Methow River					
(RM 5)					
DO (mg/L)	9.56-14.48	9.8-13.8	9.34-14.2	9.18-14.69	9.28-14.36
pН	8.04-8.74	7.46-8.53	7.71-8.48	7.73-8.58	7.78-8.38
Turbidity	0.5-2.9	0.5-3.8	0.5-6.0	0.5-8.8	0.9-5.7
(NTU)					

United States Geological Survey (USGS) Monitoring Activities

The USGS studies surface-water quality in cooperation with local and state governments and with other federal agencies. Monitoring programs consist of collection, analysis and data archiving and dissemination of data and information describing the quality of surface water resources. Similar to WDOE, the USGS has monitoring stations on both the Okanogan (12447200) and Methow (122449950) rivers near Malott and Pateros, respectively; however, the data collected at these stations appear to be incomplete and therefore less reliable in providing representative data for tributary water quality than data furnished by WDOE (Douglas PUD, 2006). Data can be accessed via the Internet at: http://nwis.waterdata.usgs.gov/wa/nwis/qwdata

4.1 Aquatic Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established an Aquatic Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Aquatic RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these discussions, the Aquatic RWG is proposing to conduct a study to continue monitoring DO, pH, and turbidity in the Wells Forebay and inundated portion of the Okanogan River. The need for this study was agreed to by all of the members of the Aquatic RWG, including Douglas PUD. This study will help to inform future relicensing decisions through the 401 water quality certification process and will fill data gaps that have been identified by the Aquatic RWG.

4.2 Issue Statement

Issue Statement (PAD Section 6.2.1.7)

Project operations may affect compliance with DO, pH and turbidity standards in the Wells Project.

Issue Determination Statement (PAD Section 6.2.1.7)

The Wells Project may have an effect on compliance with the standards for DO, pH and turbidity. Currently, Douglas PUD has collected water quality data toward the evaluation of meeting the numeric criteria for these parameters. Initial data collected during the 2005 baseline limnological assessment indicates that Douglas PUD is in compliance with the Washington State Standard for these parameters. However, additional monitoring is required to make a final determination.

The resource work group agrees that a study during the two-year ILP study period is necessary. The study will focus on the collection of DO, pH and turbidity in the Wells Project especially focusing on data collection from the Okanogan River and at Wells Dam.

5.0 **PROJECT NEXUS**

The WDOE is responsible for the protection and restoration of the state's waters. WDOE has adopted water quality standards that set limits on pollution in lakes, rivers, and marine waters in order to protect water quality. On July 1, 2003, WDOE completed the first major overhaul of the state's water quality standards in a decade. A significant revision presented in the 2003 water quality standards classifies fresh water by actual use, rather than by class as was done in the 1997 standards. These revisions were adopted in order to make the 2003 standards less complicated to interpret and provide future flexibility as the uses of a water body evolve.

Congress passed the Clean Water Act in 1972, and designated the U.S. Environmental Protection Agency (EPA) as the administering federal agency. This federal law requires that a state's water quality standards protect the surface waters of the U.S. for beneficial uses, such as recreation, agriculture, domestic and industrial use, and habitat for aquatic life. State water quality standards, or amendments to these standards, do not take regulatory effect for the purposes of the Clean Water Act until they have been approved by EPA. EPA is currently reviewing the water quality standards adopted by the State of Washington in 2003 and partial approval has occurred. Full approval is expected before Douglas PUD files its license application (2010) and Section 401 certification is issued (2012). Due to this, the 2003 standards will be used for the purposes of this study.

The new water quality standards for DO, pH, and turbidity include a number of numerical and narrative criteria. Those most pertinent to the Wells Project are:

- Freshwater dissolved oxygen shall exceed 8.0 mg/L in waters that have a designated aquatic life use of salmonid spawning, rearing and migration. Dissolved oxygen shall exceed 6.5 mg/L in waters that have a designated aquatic life use of salmonid rearing and migration only.
- pH shall be within the range of 6.5 to 8.5 (freshwater with human-caused variation within the above range of less than 0.5 units).
- Turbidity shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.

Whether it is by the reduction in the level of oxygen available for aquatic life, low pH levels indicative of heavily polluted waters, or increased sediment transport, which can reduce transparency and affect productivity at varying trophic levels, DO, pH, and turbidity are environmental variables critical to the health of a waterbody and therefore the aquatic life that live there.

The information resulting from continued monitoring of DO, pH, and turbidity will assist the Aquatic RWG in the development of licensing requirements through the 401 water certification process.

6.0 METHODOLOGY

In order to collect information that will be informative of the effects of Wells Project operations on the water quality parameters of interest and whether these parameters are in compliance with the Washington State water quality standards, sampling stations will be located in the following locations:

- Okanogan River at Project boundary (RM 15.5),
- Okanogan River near Monse (RM 5.0),
- Okanogan River upstream of the confluence with the Columbia River (RM 0.5),
- Wells Dam forebay (RM 516).

Data will also be available from the WDOE monitoring station (station 49A070) located near Malott on the Okanogan River (RM 17) to supplement the collected information. A review of the current Wells Forebay monitoring program will be conducted for its suitability to the study objectives. Any agreed upon modifications to this existing Wells Forebay monitoring program will be implemented during the first year of the 2-year ILP study period (2008).

Currently, WDOE is proposing to conduct continued DO monitoring in the Lower Okanogan River in 2008. Although study methodology is currently being developed, Douglas PUD will coordinate with WDOE in order to maintain consistent sampling practices so that DO information collected during this time period will be comparable between all sites where information is collected. Monitoring will occur between mid-July and mid-September when the probability of exceedances for these parameters is highest. Although WDOE is not proposing to monitor pH and turbidity during this time period, Douglas PUD will continue to monitor these parameters to meet Washington State's credible data criteria.

At each of the three stations located in the Lower Okanogan River and at the station in the Wells Dam forebay, dissolved oxygen, pH, and turbidity will be measured continuously using a Hydrolab minisonde or other appropriate instrumentation. Instruments will be calibrated prior to each field visit according to the manufacturer's specifications. Winkler titrations will be performed at appropriate intervals to ensure the dissolved oxygen probe is functioning properly. The probe will be re-calibrated if the result of the Winkler titration and probe reading differed by more than 0.2 mg/L. At each monitoring site, instrumentation will be placed so as to best represent the overall river condition.

Quality assurance plans will meet state and Federal guidelines. Based upon the data collected and discussions with the Aquatic RWG, a determination will be made as to whether the information collected in 2008 is sufficient or whether a second year of data collection is necessary.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

Based upon discussions with the Aquatic RWG regarding study design and study needs, Douglas PUD will begin acquiring the necessary field equipment and/or the assistance of consultant services to complete the study.

The technical skills necessary to complete the study are knowledge of water quality monitoring instrumentation, field techniques consistent with WDOE's preliminary guidance manual, motor boat operation and safety, data acquisition and management, and Washington State water quality standards.

No permits will be required in order to complete this study.

8.0 BUDGET

The total estimated hours for the implementation of the DO, pH, and turbidity monitoring study for 2008 is approximately 360 person hours. The allocation of these hours is approximately 20 hours for study plan development; 280 hours for field activities (deployment, servicing, retrieval); and 60 hours for data management, data analysis and reporting. Labor costs are estimated to be \$40,000. Equipment costs and expenses related to field implementation (travel, sensor rental, boat use, etc.) are estimated to be \$35,000. Total planning level cost for this effort is approximately \$75,000.

9.0 SCHEDULE

Planning for this study will begin shortly after the issuance of FERC's Study Plan Determination in October 2007. Equipment will be purchased during 2007 depending upon FERC's Study Plan Determination. Preliminary results of monitoring in late 2007 and 2008 will be provided in an Initial Study Report and will be filed with FERC along with the Initial Study Report due in October 2008. A technical summary of the processes, data collected, and results will be produced for use by the Aquatic RWG in discussions related to the Wells Project relicensing and 401 certification process. A final study report detailing the results of the study will be provided by October 2009.

10.0 REFERENCES

EES Consulting (EES Consulting, Inc.). 2006. Comprehensive Limnological Investigation, Wells Hydroelectric Project, FERC NO. 2149. Prepared by EES Consulting Inc., Kirkland, WA for Public Utility District No. 1 of Douglas County, East Wenatchee, WA.

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ASSESSMENT OF DDT AND PCB IN FISH TISSUE AND SEDIMENT IN THE LOWER OKANOGAN RIVER (Okanogan Toxins Study)

WELLS HYDROELECTRIC PROJECT

FERC NO. 2149

September 2007

Prepared by: Public Utility District No. 1 of Douglas County East Wenatchee, Washington For copies of this study plan, contact:

Public Utility District No. 1 of Douglas County Attention: Relicensing 1151 Valley Mall Parkway East Wenatchee, WA 98802-4497 Phone: (509)884-7191 E-Mail: relicensing@dcpud.org

ABSTRACT:

The current Wells Hydroelectric Project (Wells Project) license will expire on May 31, 2012. The Public Utility District No. 1 of Douglas County (Douglas PUD) owns and operates the Wells Project and is using the Integrated Licensing Process (ILP) for relicensing as promulgated by Federal Energy Regulatory Commission (FERC) regulations issued July 23, 2003 (18 CFR Part 5). As part of the Wells Project relicensing process, Douglas PUD is required to obtain a water quality certificate pertinent to section 401 of the Clean Water Act. The Washington State Department of Ecology (WDOE) is responsible for the issuance of a 401 certificate as well as administering the state's Water Quality Standards. As part of the 401 certification process, Ecology must assess the effect of a hydroelectric project's operations on the transport and accumulation of toxins within the sediment as they apply to the numeric and narrative criteria of the state standard.

The Aquatic RWG identified the need to collect more information regarding DDT and PCB in the lower Okanogan River within the Wells Project Boundary and its potential human health effects related to recreational activities. In order to satisfy this need, the Aquatic RWG proposes a study that will collect fish and analyze fish tissue for the presence of toxins at specific recreation sites located on the lower Okanogan River. These samples will be collected and analyzed in an effort to identify human health concerns that may be related to DDT and PCB in fish in the Project area.

In 2001-2002, WDOE conducted a technical assessment in support of the development of a Total Maximum Daily Load (TMDL) for 1,1,1-trichloro-2,2-*bis*[*p*-chlorophenyl]ethane (DDT) and polychlorinated biphenyls (PCBs) in the Lower Okanogan River. For the purposes of the 2001-2002 assessment, the Lower Okanogan River was defined as the portion of the river from the U.S./Canadian border at Lake Osooyos (RM 80.2) downstream to the town of Monse (RM 5.0). During this assessment, various mediums (water, sediment, and fish tissue) at various locations in the Okanogan River were assessed for concentrations of DDT and PCB. This study will augment the prior information collected during the development of the TMDL consistent with the recommendations of the Water Quality Implementation Plan (WDOE, 2006) submitted by WDOE which provides recommendations to assure that DDT and PCB concentrations in the waters and fish tissues from the Okanogan River and its tributaries continue to improve with the goal of meeting the regulatory standards for these persistent bioaccumulative toxins.

Sampling locations for fish during the study will include all accessible reaches of the lower Okanogan River within Project boundary (RM 15.5 to RM 0.0). Sampling sites for sediment will include recreational sites of concern (e.g. swimming areas and boat launches) from the mouth of the Okanogan River upstream to RM 15.5. Study implementation is planned for the 2-year ILP study period (2008-2009) with sampling occurring in May 2008. Sampling frequency, timing, and methodology as well as sample analysis will be consistent with the 2001-2002 WDOE TMDL Technical Assessment as outlined in Serdar (2003) and WDOE's "Water Quality Certification for Existing Hydropower Dams: Preliminary Guidance Manual (September 2004)." A technical report of the study will be produced to assist the Aquatic RWG in determining the concentration of DDT and PCBs in recreational fish species and in swimming areas of the lower Okanogan River within Project boundary. The information may inform the development of an appropriate information and education program to address the human health risks towards recreational use by the public in the lower Okanogan River.

1.0 INTRODUCTION

1.1 General Description of the Wells Hydroelectric Project

The Wells Hydroelectric Project (Wells Project) is located at river mile (RM) 515.6 on the Columbia River in the State of Washington. Wells Dam is located approximately 30 river miles downstream from the Chief Joseph Hydroelectric Project, owned and operated by the United States Army Corps of Engineers (COE), and 42 miles upstream from the Rocky Reach Hydroelectric Project, owned and operated by Public Utility District No. 1 of Chelan County (Chelan PUD). The nearest town is Pateros, Washington, which is located approximately 8 miles upstream from the Wells Dam.

The Wells Project is the chief generating resource for Public Utility District No. 1 of Douglas County (Douglas PUD). It includes ten generating units with a nameplate rating of 774,300 kW and a peaking capacity of approximately 840,000 kW. The design of the Wells Project is unique in that the generating units, spillways, switchyard, and fish passage facilities were combined into a single structure referred to as the hydrocombine. Fish passage facilities reside on both sides of the hydrocombine, which is 1,130 feet long, 168 feet wide, with a crest elevation of 795 feet in height.

The Wells Reservoir is approximately 30 miles long. The Methow and Okanogan rivers are tributaries of the Columbia River within the Wells Reservoir. The Wells Project boundary extends approximately 1.5 miles up the Methow River and approximately 15.5 miles up the Okanogan River. The normal maximum surface area of the reservoir is 9,740 acres with a gross storage capacity of 331,200 acre-feet and usable storage of 97,985 acre feet at elevation of 781. The normal maximum water surface elevation of the reservoir is 781 feet (Figure 1.1-1).



Figure 1.1-1 Location Map of the Wells Project

1.2 Relicensing Process

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18 CFR § 5.9(b) Content of study request. Any information or study request must:

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(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.

All study plans submitted to FERC will be reviewed by Douglas PUD and the applicable Resource Work Group(s) to determine if studies proposed will fill the information needs related to the Wells Project Relicensing. Any dispute over alternative study methods, that cannot be reconciled with stakeholders, will be decided by FERC.

2.0 GOALS AND OBJECTIVES

The objective of the study is to determine the concentration of the insecticide 1,1,1-trichloro-2,2*bis*[*p*-chlorophenyl]ethane (DDT) and polychlorinated biphenyl (PCB) in recreational fish species and in swimming areas of the lower Okanogan River (up to RM 15.5) within the Wells Project boundary.

Tasks to be completed toward the achievement of the goal include:

• Collect and analyze sediment samples for DDT and PCBs from specific recreational sites (i.e., swim areas and boat launches) in the lower Okanogan River up to RM 15.5.

• Collect and analyze fish tissue for DDT and PCBs from recreational fish species of interest consumed by tribal and recreational anglers.

The information gathered from this monitoring effort will assist the Aquatic RWG in determining the concentration of DDT and PCBs in recreational fish species and in swimming areas of the lower Okanogan River within the Wells Project boundary. The information may inform the development of an appropriate information and education program to address the human health risks towards recreational use by the public in the lower Okanogan River.

3.0 STUDY AREA

The study area consists of waters within the Okanogan River from its confluence with the Columbia River up to RM 15.5.

4.0 BACKGROUND AND EXISTING INFORMATION

The Okanogan River originates in the Cascade Mountains north of the international border in British Columbia. The Okanogan River is characterized by a series of lakes north of international boundary and a free flowing river flowing out of Osoyoos Lake, which straddles the boundary; 78 miles to its confluence with the Columbia River (WDOE, 2004). The lower 15.5 miles of the Okanogan River before it joins with the Columbia River is considered within the Wells Project boundary.

Beginning in the early 1970s, Canadian investigators began documenting high levels of DDT in fish collected from British Columbia lakes along the mainstem Okanogan River (Northcote et al., 1972). In 1983, WDOE collected data which revealed DDT and PCB contamination in fish from the Okanogan River below the Canada border (Hopkins et al., 1985). Since then a number of WDOE surveys have verified DDT and PCB contamination in the basin (Johnson and Norton, 1990; Davis and Serdar, 1996; Johnson et al., 1997; Serdar et al., 1998, Serdar, 2003).

The WDOE Environmental Assessment Program prepared an assessment of total maximum daily loads (TMDLs) of DDT and PCBs in the lower Okanogan River basin, including Osoyoos Lake. For the purposes of the WDOE assessment, the Lower Okanogan River was defined as the portion of the river from the U.S./Canadian border at Lake Osooyos (RM 80.2) downstream to the town of Monse (RM 5.0). Sampling conducted during 2001-2002 examined DDT and PCB concentrations in the water column of the mainstem Okanogan River, water in tributary streams, sewage treatment plant (STP) effluent and sludge, and cores of bottom sediments. Composite samples of three species of fish – carp (*Cyprinus carpio*), mountain whitefish (*Prosopium williamsoni*), and smallmouth bass (*Micropterus dolomieui*) also were analyzed for DDT and PCBs. Data from these samples were used in conjunction with historical data to develop the TMDLs (Serdar, 2003).

Results of the 2001-2002 sampling (Serdar, 2003) suggest that:

- 1. DDT concentrations in the mainstem water column typically decreased from upstream sites (Okanogan River at Zosel Dam) to downstream sites (Okanogan River at Malott). PCBs were not detected in the mainstem.
- 2. Only small loads of DDT and PCBs are delivered to Osoyoos Lake and the lower Okanogan River through tributary streams and STPs.
- 3. Generally, lipid-normalized t-DDT and t-PCB concentrations in fish tissue decreased from sites upstream to downstream (Oroville, Riverside-Omak, Monse) with the exception of large-sized smallmouth bass which had higher concentrations downstream at the Monse site.
- 4. t-DDT and t-PCB concentration trends decreased in the 1980s followed by steady concentrations in the last decade in the lower Okanogan system.
- 5. DDT concentrations in the Osoyoos Lake core sediments were an order of magnitude higher than core sediments of approximately equal age from the Okanogan River near the mouth (Monse).
- 6. PCB concentrations in core samples were low, with concentrations around 1 ng/g t-PCB. Concentrations from both sites (Osoyoos Lake and lower Okanogan River: Monse) were similar suggesting that low-level PCB sources such as STPs between the lake and the river mouth keep depositional areas enriched with low levels of PCBs. Little is known about sources of PCB contamination in the lower Okanogan River basin, except that no major sources appear evident. It is notable that while PCBs in edible fish tissues may be a human health concern at the levels reported, it is not uncommon to find similar levels in other Washington waters where no discernible sources of PCB exist (Davis and Johnson, 1994).
- 7. Re-suspended Osoyoos Lake sediments account for nearly all of the measured DDT loads in the lower Okanogan River which may explain the disparity between DDT load delivery and measured loads in the water column of the lower mainstem Okanogan River.
- 8. The Colville Tribes conducted a longitudinal transect of DDT in 40 lower Okanogan River sediments from Osoyoos Lake outlet to the mouth in 2001 (Hurst and Stone 2002). Aside from two locations, little DDT was found. 60% of sites had t-DDT less than the detection limit (0.5 ng/g) and another 35% had a concentration of 1-10 ng/g (mostly less than 2 ng/g). Two sites with significant concentrations were found just below the Osoyoos Lake outlet and just downstream of Elgin Creek (RM 28.4).
- 9. Acute toxicity is not considered to be a concern at concentrations in the lower Okanogan River basin.
- 10. According to the report, there are few realistic options for obtaining meaningful reductions in DDT and PCB loading to Osoyoos Lake and the lower Okanogan River. It appears that most loading to fish occurs internally through direct or indirect exposure to sediments. Natural attenuation will eventually reduce levels through dilution and capping, especially downstream of the Similkameen River confluence.

In conjunction with the TMDL technical assessment (2003) and TMDL (2004), WDOE submitted a Detailed Implementation Plan (WDOE, 2006) to EPA as required by the Clean Water Act in July 2006. This report provides direction to assure that DDT and PCB concentrations in the waters and fish tissues from the Okanogan River and its tributaries continue

to improve with the goal of meeting the regulatory standards. The report's main recommendations are the continued monitoring of fish tissues at 5 year intervals and preventative measures that would minimize the amount of contaminants entering the river from the surrounding watershed.

Currently, WDOE is planning a two-year monitoring program (2007-2008) for toxins in the lower Okanogan River as part of a larger statewide aquatic toxins assessment. WDOE's long-term monitoring station, located near Malott (RM 17) just upstream of the Wells Project boundary, also samples monthly for conventional parameters and metals; however, water samples, fish tissue and sediment cores are not collected for analysis of toxins.

4.1 Aquatic Resource Work Group

As part of the preparation for the relicensing of the Wells Project, Douglas PUD established an Aquatic Resource Work Group (RWG) which began meeting informally in November, 2005. This voluntary effort was initiated to provide stakeholders with information about the Wells Project, to collaboratively identify potential resource issues related to Project operations and relevant to relicensing, and to develop preliminary study plans to be included in the Wells Pre-Application Document (PAD).

Through a series of meetings, the Aquatic RWG cooperatively developed a list of Issue Statements, Issue Determination Statements and Agreed Upon Study Plans. An Issue Statement is an agreed upon definition of a resource issue raised by a stakeholder. An Issue Determination Statement reflects the RWG's efforts to review the existing project information and to determine whether an issue matches with FERC's seven criteria and would be useful in making future relicensing decisions. Agreed Upon Study Plans are the finished products of the informal RWG process.

Based upon these meeting and discussions, the Aquatic RWG is proposing to conduct a study to determine the concentration of DDT and PCBs in recreational fish species and in swimming areas of the lower Okanogan River within the Wells Project boundary. This study will help to inform future relicensing decisions through the 401 water quality certification process and will fill data gaps that have been identified by the Aquatic RWG.

4.2 Issue Statement

Issue Statement (PAD Section 6.2.1.4)

Project operations may affect the input, movement, accumulation and retention of toxins (sediment dynamics and water column) originating from the Okanogan River subbasin and their potential effects on aquatic organisms and humans.

Issue Determination Statement (PAD Section 6.2.1.4)

The Okanogan River likely contains toxins within the sediment and in the water column. These pollutants are discharged into the river from mining, industrial and agricultural activities

upstream of the Project boundary. There are numerous reports by the Washington State Department of Ecology and the Colville Tribes documenting the presence and levels of toxins within the Okanogan Basin. Of the five assessments conducted on toxins in the Okanogan River most have focused on the presence of toxins within the water column, sediment and within the fish found in the Okanogan River.

The lower Okanogan DDT PCB Detailed Implementation Plan (WDOE, 2006) submitted to and approved by the Environmental Protection Agency for the purpose of providing direction to assure that DDT and PCB concentrations are reduced to a level that meet regulatory standards recommends continued monitoring of fish tissues from the lower Okanogan River.

The resource work group agrees that a study is needed during the two-year ILP study period. The study would assess the concentration of DDT and PCBs found within fish tissues collected from the lower Okanogan River. This study would also collect sediment samples from specific recreation areas located from the mouth of the Okanogan River upstream to RM 15.5.

5.0 **PROJECT NEXUS**

The WDOE is responsible for the protection and restoration of the state's waters. WDOE has adopted water quality standards that set limits on pollution in lakes, rivers, and marine waters in order to protect water quality. WDOE's water quality assessment of the state's water bodies lists the status of water quality for a particular location in one of 5 categories (Category 1-5) recommended by the Environmental Protection Agency (EPA). This assessment represents the integrated report for Sections 303(d) and 305(b) of the Clean Water Act. Categories 1-4 represent the status of waters for the 305(b) report, while Category 5 represents those waters placed on the 303(d) list. Waters placed on Category 5 require the preparation of TMDLs, which are an integral tool in the work to clean up polluted waters.

The lower Okanogan River within the Project boundary was 303(d) listed for high levels of total PCB's, 4,4'-DDE and 4,4'-DDD in fish tissues in 1998. As a result of this listing, a TMDL (WDOE, 2004) was developed to address these impaired parameters in this location. Currently, the EPA-approved 303(d) list submitted in 2004 no longer includes these parameters for the lower Okanogan River as they have been re-assessed as Category 4a (impaired waters with a TMDL) waters in the Washington State Water Quality Assessment 305(b) report. The information resulting from an assessment of fish tissue and sediments in the lower Okanogan River will assist the Aquatic RWG in the development of licensing requirements through the 401 water quality certification process.

6.0 METHODOLOGY

In order to collect information that will be informative of the health risks from recreational activities within the lower Okanogan River sampling stations for fish tissue will be located throughout the lower 15.5 miles of the river. Field sampling will consist of one sampling event in May of 2008 during the spring run-off to be consistent with the 2001-2002 WDOE assessment (sampling during high water).

All methods implemented will be consistent with the 2001-2002 WDOE TMDL Technical Assessment as outlined in Serdar (2003) if appropriate in addressing the objectives of this study. Additionally, any components of the study not clearly specified in Serdar (2003) will be consistent with WDOE's "Water Quality Certification for Existing Hydropower Dams: Preliminary Guidance Manual (September 2004)." Quality assurance plans will meet State and Federal guidelines.

Sediment samples will be collected using standard aquatic toxicology protocol. Fish for fish tissue analysis will be collected either via electrofishing or angling, when appropriate. Fish species of interest will be determined by the Aquatic RWG but should be fish normally consumed by either tribal or local recreational anglers and consistent with WDOE's Detailed Implementation Plan (2006). Biological data (species, length, weight and age) will be collected for all fish samples.

All sediments samples and fish tissue samples will be stored to meet quality specifications prior to transport and delivery to a qualified laboratory for analysis. Parameter analysis will also be consistent with Serdar (2003) and will consist of tests to determine the concentrations of all DDT analogs and PCBs per each sample.

7.0 STAFFING AND EQUIPMENT REQUIREMENTS

Based upon discussions with the Aquatic RWG regarding specific study design and study needs, Douglas PUD will secure the assistance of a qualified consultant to conduct the field portion of the study in addition to a qualified water quality and toxicology laboratory to analyze samples.

The technical skills necessary to complete the study are knowledge of aquatic toxicology with an emphasis on transport and accumulation, water quality sampling equipment and protocol consistent with WDOE's preliminary guidance manual, motor boat operation and safety, data acquisition and management, and Washington State water quality standards.

A Washington State Collection Permit will be required for fish sampling. The consulting firm contracted to implement the field sampling portion of the study will be responsible for obtaining this permit prior to the start of the study.

8.0 BUDGET

The total estimated hours for the Lower Okanogan River DDT/PCB assessment is approximately 185 person hours. The allocation of these hours is approximately 25 hours for study plan development; 36 hours for coordination and permitting; 76 hours for field activities; and 48 hours for data analysis and reporting. Labor costs are estimated to be \$25,000. Equipment costs and expenses related to field activities (sediment sampling equipment, boat use, travel, shipping, etc.) are estimated to be \$6,000. Laboratory costs for the analysis of fish tissue and sediments are estimated to be \$20,000. Total planning level costs for this effort are approximately \$51,000.

9.0 SCHEDULE

Planning for this study will begin in late 2007, shortly after the issuance of FERC's Study Plan Determination in October 2007. Activities to obtain a Washington State Scientific Collectors Permit will be implemented during late 2007. Field sampling will take place during the spring of 2008 with an Initial Study Report due to stakeholders by October 2008. A final report will be provided to FERC and the stakeholders by October 2009.

10.0 REFERENCES

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