Application Reviewer Report

City of Tacoma, Washington
Application for Low Impact Hydropower Certification
Nisqually River Hydroelectric Project


Alder Dam


LaGrande Dam

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Introduction

This report reviews the Application for Certification submitted by Tacoma Public Utilities (Tacoma) for Low Impact Hydropower Certification of the Nisqually Hydroelectric Project No. 1862 (project), located on the Nisqually River, in Pierce, Thurston, and Lewis Counties, Washington State. The project is partially located on lands of the Mount Baker-Snoqualmie National Forest.

The Federal Energy Regulatory Commission (FERC) issued a new license for the Nisqually River Hydroelectric Project in 1997. Interveners in the relicensing process included: the U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration Fisheries (NOAA Fisheries), the Nisqually Indian Tribe (Nisqually Tribe), the Washington State Parks and Recreation Commission (WSPRC), the Washington Department of Fisheries (reorganized as the Washington Department of Fish and Wildlife [WDFW]), American Rivers, the Federation of Fly Fishers, the Northwest Rivers Council, and the American Whitewater Affiliation (AWA) (FERC 1997). The license order contains articles that require additional studies and provide for various mitigation measures and operating conditions for the new license term. The license order also adopted instream flows that the parties had previously negotiated and FERC had approved in an earlier proceeding addressing both the Nisqually Project and the Yelm Project No. 10703, which is located approximately 14 miles downstream from the LaGrande powerhouse (FERC 1997a). A rehearing was granted by FERC in 1998 to address the concerns of the Nisqually Tribe and Tacoma Public Utilities regarding several license articles (FERC 1998).

In their Application for Certification (application), Tacoma submitted only one letter of recommendation (from the Nisqually Tribe regarding Chinook salmon status); the applicant filed no other letters of recommendation. In order to verify compliance with agency recommendations contained within the license articles, the application reviewer interviewed representatives of resource agencies and the Nisqually Tribe. Relevant documents provided by agencies and the applicant were also reviewed. Records of conversations (ROCs) between tribal and agency staff and the application reviewer are provided in Appendix A. No public comments were received by the Low Impact Hydropower Institute (LIHI) during the application comment period.

Facility Description

The mainstem Nisqually River contains two hydroelectric projects, the Yelm project (operated by the city of Centralia, Washington) and the Nisqually River Project (operated by the applicant). The Yelm project consists of a single diversion dam, canal, powerhouse, and fishway, which allows anadromous fish migrating upstream to pass through the Yelm project and continue to areas immediately downstream of the Nisqually project (FERC 1997a).

The Nisqually Hydroelectric Project consists of two hydroelectric facilities: the 50 MW LaGrande facility and the 64 MW Alder facility (Figure 1). Each facility includes a dam, reservoir, flowline, powerhouse, and an associated power transmission switchyard. Both switchyards lead to a single transmission system that extends 26.2 miles to the City of Tacoma. The Alder facility is operated in a peaking mode and LaGrande is operated as a run-of-river facility (FERC 1997, Tacoma 2003).

The Alder facility (river mile 44.2) includes a 285-foot-high concrete arch dam that impounds Alder Lake, a 7.4-mile-long storage reservoir with a maximum surface area of 3,065 acres and an operating storage capacity of 161,457 acre-feet at elevation 1,207 feet. Adjacent to the main dam structure is a reinforced

concrete spillway channel with a total discharge capacity of 80,000 cubic feet per second (cfs). The Alder powerhouse is located at the base of the dam. The powerhouse contains two generating units (FERC 1997).

The LaGrande facility (river mile 42.7) consists of a 192-foot-high concrete gravity dam impounding LaGrande reservoir. The LaGrande reservoir has a surface area of 45 acres and contains 2,700 acre-feet of total storage. The LaGrande reservoir is situated in a deep, precipitous canyon, extending a distance of 1.5 miles to the base of Alder dam. LaGrande Dam has a large reinforced concrete spillway with an 80,000-cfs capacity. The dam diverts flows into a 6,400-foot-long underground tunnel, which terminates at a steel penstock leading to a manifold structure serving five individual penstocks for each of five generating units in the LaGrande powerhouse. The 1.7-mile-long LaGrande bypassed reach is situated in a deep gorge between LaGrande Dam and the LaGrande powerhouse (FERC 1997).

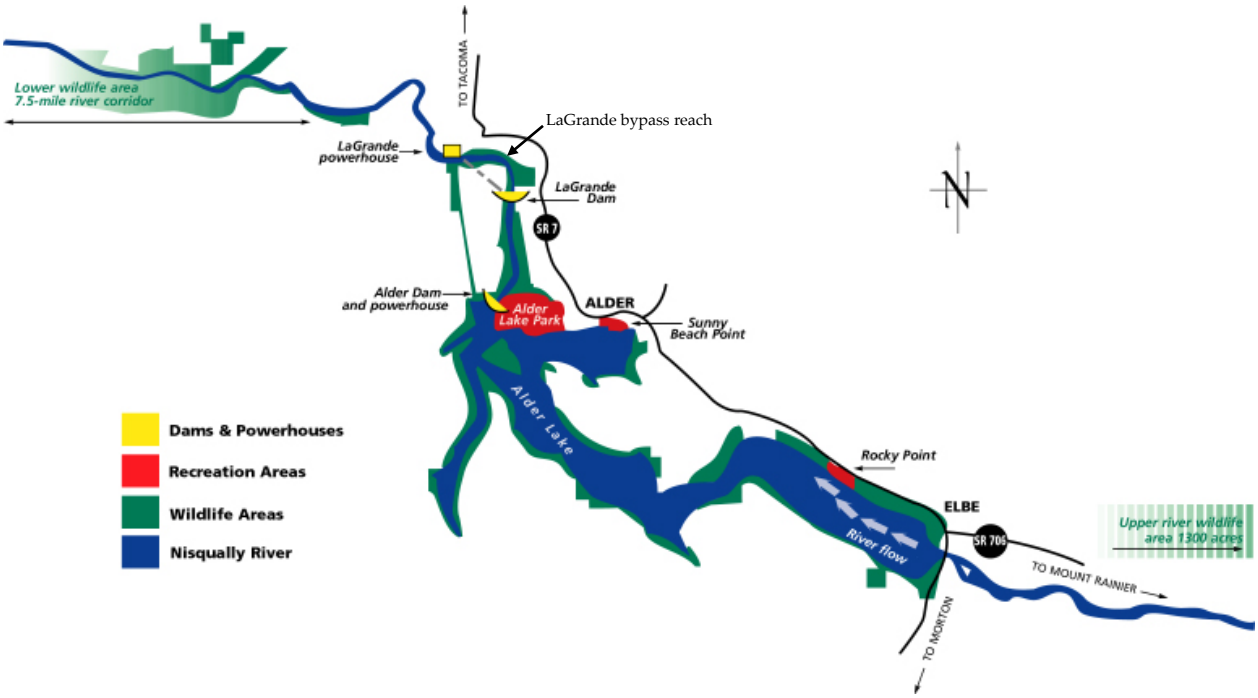

Figure 1. Map of the Nisqually Hydroelectric Project (from Tacoma Public Utilities website).

Tacoma maintains about 1,113 acres of project land around Alder and LaGrande reservoirs for project operations and related recreation facilities. Most of Alder Lake's shoreline is contiguous with lands of the Mt. Baker-Snoqualmie National Forest, the Washington Department of Natural Resources (WDNR), and Weyerhaeuser Timber Company. About 177 acres of project lands are dedicated to developed recreation. Recreational use at the project is confined to the lands and waters of Alder Lake, which includes about 28 miles of shoreline. Tacoma operates and maintains three recreation facilities on the northern shores of Alder Lake: Alder Lake Park, Sunny Beach Point Day-use Area, and Rocky Point Day-use Area. The WDNR also operates and maintains a campground with a boat launch on the south shoreline of Alder Lake (FERC 1997).

The Low Impact Hydropower Institute (LIHI) defines a facility as the combination of a dam, powerhouse, and reservoir. Under the FERC license however, the two Nisqually facilities are referred to as a single

project (FERC No. 1862), and are operated by Tacoma Public Utilities as one unit. In our evaluation of the project, we applied the criteria against each of the facilities to comply with the LIHI definition.

Summary of Findings

The application reviewer finds that the project meets the Low Impact Hydro Criteria as defined by LIHI and therefore recommends that the LIHI Board issue a Low Impact Hydropower Certificate for the project with additional conditions described below.

Annotated Low Impact Certification Criteria

A. FLOWS:

Criteria

1. **Is the facility in Compliance with Resource Agency Recommendations issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking conditions, and seasonal and episodic instream flow variations) for both the reach below the tailrace and all bypassed reaches?**

YES
According to Tacoma's Annual Minimum Instream Flow Report for 2002 (as reviewed in FERC 2002a) and information gleaned from interviews with agency representatives, the applicant has met in-stream flow requirements (Article 403) for the LaGrande bypass reach and the river reach below LaGrande powerhouse. Instream flow requirements for the project only apply to the LaGrande bypass reach and the reach downstream of LaGrande powerhouse (FERC 1997). Occasional disruptions in minimum flows have occurred (the most recent occurring from June 21-23, 2003 in the LaGrande bypass reach) and have been reported to FERC and relevant agencies (Leigh pers. comm., Ging pers. comm.). Most of the disruptions have been due to mechanical or software failures (FERC 2003, Leigh pers. comm.).

According to Tacoma's Annual Natural Resources Report for 2002, Tacoma has met ramping rate conditions for the LaGrande bypass reach and reaches below LaGrande powerhouse, as well as reservoir level requirements (Articles 404, 405, 406, and 407) (Tacoma 2003). Agency and tribal representatives we spoke with believed Tacoma has met ramping rate conditions as required in the license (Walter pers. comm., Leigh pers. comm., Ging pers. comm., Fransen pers. comm.).

YES = PASS. Go to B (Water Quality).

B. WATER QUALITY:

Criteria

1. **Is the Facility either:**

a. **In compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the facility after December 31, 1986? Or**

b. **In compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?**

YES (Conditional*)
A Section 401 Water Quality Certification was issued for the Nisqually project by the Washington Department of Ecology (WDOE) in 1992 (see Appendix B). The majority of the conditions contained within the certification pertain to oil and hazardous materials spill prevention and control. The certificate also contains a minimum instream flow condition (5 cfs) for the LaGrande bypass reach and a condition requiring compliance with state water quality criteria for Class A waters (FERC 1997). The state has classified the Nisqually River as follows: Nisqually River from mouth to Alder Dam – Class A (excellent), Nisqually River from Alder Dam to headwaters – Class AA (extraordinary) (WDOE 1997).

According to various documents submitted to FERC by Tacoma, the project appears to be in compliance with the oil/hazardous materials conditions and the instream flow condition (instream flows of 30 cfs are required by FERC in the license for the bypass reach) (FERC 2003, FERC 1997). The project appears to be in compliance with state water quality criteria, although there have been some questions raised by WDFW regarding potentially high levels of total dissolved gas (TDG) below the LaGrande powerhouse (see discussion below).

According to the Nisqually River Level I Watershed Assessment completed in 2002, the Nisqually Tribe performed water quality monitoring near the town of LaGrande (RM 39.7 – approximately 1.3 river miles downstream of the LaGrande powerhouse) from 1991 to 1999. The Tribe monitored a number of parameters including temperature, DO, and turbidity, all of which were found to be within state standards. WDOE is not aware of any water quality issues arising from the project, including the potential issue discussed below; however the agency does not maintain a permanent water quality monitoring station near the project (Craig pers. comm., WDOE 2003).

A draft Nisqually Watershed (WRIA 11) Water Quality Monitoring Plan was completed in June 2003 (Golder Associates 2003). The plan evaluates existing water quality monitoring programs in the basin and provides recommendations for expanding monitoring where necessary. No recommendations were provided for water quality monitoring related to the Nisqually project.

Discussion: Dissolved Oxygen/Total Dissolved Gas Issue (related to Article 420)

Under Article 420, Tacoma was required to develop a 1-year dissolved oxygen (DO) monitoring plan in order to determine if discharges from the LaGrande powerhouse were meeting the minimum standards for DO concentrations (8.0 mg/l for Class A waters) as established by WDOE. Monitoring was conducted from September 2001 to October 2002, and DO concentrations were found to range from 8.4 to 14.8 mg/l, indicating compliance with the state minimum standard. Neither the license nor the WDOE water quality certification requires any additional water quality monitoring beyond the Article 420 requirement. A report of the findings was submitted to FERC in January 2003 (Tacoma 2003a).

After reviewing the monitoring report, the Washington Department of Fish and Wildlife (WDFW) noted in a letter to FERC and Tacoma that DO was supersaturated, according to their analysis of Tacoma's data, from May 1 through July 11, 2002 and that the highest DO levels in the powerhouse tailrace reached 134%. The agency noted that supersaturation of DO in the LaGrande powerhouse discharge might indicate supersaturation of total dissolved gases (TDG) which could lead to gas bubble trauma (GBT) in fish, a known effect of supersaturated TDG (FERC 2003a). WDFW noted that the timing of the high TDG levels might also coincide with the presence of juvenile salmonids near the project. As a result of its analysis, WDFW recommended that Tacoma establish a monitoring program for TDG to determine if

saturation standards are being exceeded at the powerhouse. The state water quality standard for Class A waters specifies that TDG not exceed 110% of saturation in any sampling location (WDOE 1997).

Tacoma responded by stating that it is inappropriate to assume that supersaturation of DO is correlated to supersaturation of TDG, since high levels of DO can come from a number of sources including reservoir and/or upstream photosynthetic biological productivity and entrainment of air within powerhouse turbines. According to Tacoma, the monitoring results showed that DO is supersaturated both above LaGrande Dam and at the LaGrande powerhouse; Tacoma concluded that the high DO readings were due primarily to biological productivity in the reservoir and upstream reaches (Tacoma 2003a). WDFW pointed out that only 3 of 9 samples upstream of LaGrande Dam showed supersaturated DO conditions and 7 of 9 samples downstream showed supersaturated DO (WDFW 2003). In response to WDFW and USFWS concerns regarding TDG, Tacoma subsequently conducted TDG sampling on April 4, 2003 in the LaGrande powerhouse tailrace and found the highest TDG reading to be 105% saturation (Beach pers. comm.).

In a final letter on the matter, FERC concluded that, while there appears to be some uncertainty regarding the source of DO and its correlation to supersaturated TDG, there have been no reports of gas bubble trauma in fish below LaGrande powerhouse, and therefore Tacoma should not be required to conduct further DO or TDG monitoring. The FERC letter concludes that, should fish kills occur in the tailwaters of the LaGrande powerhouse, Tacoma may be required to implement minimization measures for TDG (FERC 2003a).

WDFW has indicated that it does not consider the issue resolved, however the department does not have the staff resources to appeal the FERC decision and will not pursue the issue (Leigh pers. comm.). NOAA Fisheries staff have not taken a position on the matter, but noted that the agency is interested in the question of DO/TDG correlation at the project (Fransen pers. comm.). The Nisqually Tribe, which has performed the bulk of water quality monitoring in the Nisqually River, has not identified any water quality issues with the project, and does not believe TDG is a problem (Walter pers. comm.). WDOE personnel are not aware of any water quality issues related to the project (Craig pers. comm., Barreca pers. comm.). It does not appear that the Nisqually Tribe, WDOE, Tacoma or any other organization has performed meaningful TDG monitoring near the LaGrande powerhouse in recent years (Walter pers. comm., Craig pers. comm.).

Supersaturation of DO may indeed result from a variety of conditions as stated by Tacoma, including upstream photosynthetic productivity during summer months and entrainment of air within powerhouse turbines or when exiting the turbines (Hume pers. comm.). Supersaturation of TDG (composed of all atmospheric gases, but primarily nitrogen) in a hydropower setting typically occurs through entrainment of air at high pressure within powerhouse turbines or when exiting the turbines. The correlation between DO and TDG at the LaGrande facility might only be understood through a well-designed monitoring study continuously measuring both parameters upstream (in LaGrande reservoir) and downstream of the LaGrande powerhouse for at least one year (Hume pers. comm., Barreca pers. comm.).

***Condition:** The LIHI criterion for water quality requires that the applicant demonstrate "…compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification…" LIHI also requires that applicants seek letters from relevant agencies confirming compliance with agency recommendations. Tacoma did not submit letters supporting water quality conditions at the project from the relevant water quality agency (WDOE). The WDOE staff person listed as a water quality contact by Tacoma (Steve Craig) stated that he was not directly involved in Nisqually project water quality issues,

and the application reviewer could not locate another individual within WDOE who was familiar with the project. While TDG may or may not be an issue for the project, we were unable to locate any meaningful data that confirms or discredits WDFW's concerns. There are no known plans for conducting TDG monitoring in the future. **Given our current understanding of the issue and because WDOE is the regulatory agency responsible for enforcing water quality regulations on the Nisqually River, we recommend that LIHI require Tacoma to provide a letter from WDOE confirming continued compliance with the project's state water quality certification (including TDG compliance). Tacoma should provide the results of the DO monitoring study and WDFW's analysis of the data to WDOE. The letter should be provided to LIHI within one year of Low Impact Hydropower certification.**

YES = Go to B2.

2. **Is the facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?**

NO.
None of the project or nearby waters (including the mainstem Nisqually River and the project lakes) are listed on the most recent 303(d) list published by the Washington State Department of Ecology (WDOE 1998).

NO = PASS. Go to C (Fish Passage and Protection).

C. FISH PASSAGE AND PROTECTION:

Criteria

1. **Is the Facility in compliance with Mandatory Fish Passage Prescriptions for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?**

N/A
Resource agencies have not issued Mandatory Fish Passage Prescriptions for the project (FERC 1997).

N/A = Go to C2.

2. **Are there historic records of anadromous and/or catadromous fish movement through the Facility area, but anadromous and/or catadromous fish do not presently move through the Facility area (e.g., because passage is blocked at a downstream dam or the fish run is extinct)?**

NO
The historical range of anadromous fish in the Nisqually River appears to have been limited by a set of falls situated between the present-day locations of LaGrande and Alder dams (Fransen pers. comm., Leigh pers. comm., Ging pers. comm., Tacoma 1991). The bypass reach below LaGrande Dam may have also presented a significant obstacle to upstream migration for anadromous fish (Tacoma 1991). According to the applicant, resource agencies, and tribal representatives, there are no known historical records or scientific surveys indicating anadromous fish presence upstream of LaGrande Dam, and few if any records exist for the bypass reach immediately downstream of LaGrande Dam (Leigh pers. comm.,

Ging pers. comm.). Given the available information, it appears unlikely that anadromous fish regularly utilized the area upstream of LaGrande Dam under pre-project conditions.

NO = Go to C3.

3. If, since December 31, 1986:
a. Resource Agencies have had the opportunity to issue, and considered issuing, a Mandatory Fish Passage Prescription for upstream and/or downstream passage of anadromous or catadromous fish (including delayed installation as described in C2a above), and
b. The Resource Agencies declined to issue a Mandatory Fish Passage Prescription,
c. Was a reason for the Resource Agencies' declining to issue a Mandatory Fish Passage Prescription one of the following: (1) the technological infeasibility of passage, (2) the absence of habitat upstream of the Facility due at least in part to inundation by the Facility impoundment, or (3) the anadromous or catadromous fish are no longer present in the Facility area and/or downstream reach due in whole or part to the presence of the Facility?

NO
Resource agencies had the opportunity to issue fish passage prescriptions during relicensing of the project but declined due to the presence of historical natural barriers located between the present-day sites of LaGrande and Alder dams.

NO = Go to C5

5 Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of riverine fish?

N/A = Go to C6
Resource agencies have not issued Mandatory Fish Passage Prescriptions for the passage of riverine fish at the project dams (FERC 1997). USFWS is not currently considering consultation with Tacoma regarding bull trout due to the low numbers of bull trout likely present in the Nisqually River (Ging pers. comm.).

6 Is the Facility in compliance with Resource Agency Recommendations for riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?

YES
The Nisqually FERC license Article 417 required Tacoma to prepare a plan to evaluate tailrace attraction and injury or mortality to fish at the LaGrande powerhouse tailrace within 6 months of license issuance. A study plan was written by Tacoma, the Nisqually Tribe, and resource agencies and was submitted to FERC in September 1997. After a series of delays, FERC modified Article 417 in 1998 to require the plan to be submitted after installation of a flow continuation valve, which was installed in April 2000 (FERC 2001).

In October 2000, Tacoma requested, and FERC approved, a delay in performing the tailrace study until steelhead and salmon become reestablished in the bypass reach below LaGrande Dam. According to FERC documentation, the delay request was the result of discussions between Tacoma, resource agencies, and the Nisqually Tribe. Barrier removal and gravel augmentation in the LaGrande bypass reach is anticipated to improve habitat for salmonids, thereby attracting fish past the powerhouse and into the

bypass reach. Currently, few if any anadromous salmonids utilize the bypass reach for spawning. FERC ordered that Tacoma file a final study plan by October 2005, and required Tacoma to monitor fish use of the bypass reach in the meantime. If significant spawning activity is noted prior to 2005, FERC will require Tacoma to expedite submission of a plan and schedule for implementation (FERC 2001).

YES = PASS. Go to D (Watershed Protection)

D. WATERSHED PROTECTION:

Criteria:

1. **Is the Facility in compliance with Resource Agency Recommendations, or, if none, with license conditions, regarding protection, mitigation or enhancement of lands inundated by the Facility or otherwise occupied by the Facility, or regarding other watershed protection, mitigation and enhancement activities?**

YES
The project appears to be in compliance with license conditions relating to watershed protection and management (Leigh pers. comm., Walter pers. comm., Leigh pers. comm.). The primary vehicle of watershed protection in the license is the Wildlife Management Plan (required in Article 423) and the development of erosion control plans (Article 401) for major ground-disturbing activities (FERC 1997). WDFW is currently working with Tacoma to ensure continued implementation of the provisions of the Wildlife Management Plan (Leigh pers. comm.).

YES = PASS. Go to E (Threatened and Endangered Species Protection)

E. THREATENED AND ENDANGERED SPECIES PROTECTION:

Criteria:

1. **Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?**

YES.
The following special threatened and endangered species occur within the project area (FERC 1996, NOAA Fisheries 2003, Ging pers. comm., Fransen pers. comm.):

Chinook salmon – Federal Threatened (Puget Sound ESU)
Coho salmon – Federal candidate (Puget Sound/Straight of Georgia ESU)
Gray wolf – Federal Endangered, State Endangered
Grizzly bear – Federal Threatened, State Endangered
Northern spotted owl - Federal Threatened, State Endangered
Bald eagle – Federal Threatened, State Threatened
Marbled Murrelet – Federal Threatened, State Candidate

Chinook salmon were listed under the federal ESA in 1999, after the FERC license for the project was issued. Both Chinook and Coho salmon are present downstream of the project (Fransen pers. comm., NMFS 2003). The Chinook salmon population in the Nisqually River is heavily supported by tribal hatchery production but the hatchery fish are not considered critical to recovery of the species (Barr pers. comm.). Bull trout (Federally Threatened – Puget Sound ESU) are thought to use some areas of the lower

Nisqually River for feeding, but are generally not known to be present in significant numbers in the river (Ging pers. comm.).

YES = Go to E2

2. If a recovery plan has been adopted for the threatened or endangered species pursuant to Section 4(f) of the Endangered Species Act or similar state provision, is the Facility in compliance with all recommendations in the plan relevant to the Facility?

N/A.
None of the existing recovery plans for species within the project area contain recommendations specific to the project (USFWS 2003, NOAA Fisheries 2003).

N/A = Go to E3

3. If the Facility has received authority to Incidentally Take a listed species through: (i) Having a relevant agency complete consultation pursuant to ESA Section 7 resulting in a biological opinion, a habitat recovery plan, and/or (if needed) an incidental take statement; (ii) Obtaining an incidental take permit pursuant to ESA Section 10; or (iii) For species listed by a state and not by the federal government, obtaining authority pursuant to similar state procedures; is the Facility in compliance with conditions pursuant to that authority?

N/A.
The project has not received authority to incidentally take listed species. NOAA Fisheries does not currently consider the Nisqually project a high priority for Section 7 consultation for Chinook salmon (Fransen pers comm.).

N/A = Go to E5

5. If E2 and E3 are not applicable, has the Applicant demonstrated that the Facility and Facility operations do not negatively affect listed species?

YES.
USFWS personnel have indicated that the project and project operations are not likely to negatively affect listed wildlife species (Ging pers. comm.). NOAA Fisheries personnel do not know of any current issues or negative impacts to Chinook salmon resulting from the project or project operations, but referred the application reviewer to the Nisqually Tribe for information on Chinook salmon status in the river (Fransen pers. comm.). A supporting letter from the Nisqually Tribe states that it is unlikely that the project has adverse impacts on Chinook salmon (Walter 2003a). In addition, the Tribe believes that, based on ongoing fisheries studies, that the current project operations are actually beneficial to Chinook salmon and other salmonids in the river. Tribal monitoring indicates that Chinook salmon escapements are increasing; however the extent of "natural" production resulting from spawning hatchery fish is unknown (Barr pers. comm.).

YES = PASS. Go to F (Cultural Resource Protection)

F. CULTURAL RESOURCE PROTECTION:

Criteria:

1. **If FERC-regulated, is the Facility in compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?**

YES
The applicant appears to have met all cultural resource protection requirements of the FERC license. According to a May 2000 FERC inspection report, there are no sites listed in the National Register of Historic Places that are located within the project boundary, and no sites are known to be impacted by the project. The cultural resource assessment conducted as part of the relicensing process concluded that no known historic or archaeological sites exist in the project area (FERC 2000). FERC license Article 429 requires Tacoma to consult a state Historic Preservation Officer before starting ground-disturbing activities.

YES = PASS. Go to G (Recreation).

G. RECREATION:

Criteria:

1. **If FERC-regulated, is the Facility in compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?**

YES.
The Nisqually project appears to be in compliance with the recreation-related conditions in the FERC license (Articles 427, 428, and 413) (FERC 2000). Article 428 required Tacoma to study the feasibility of recreational flow releases in the LaGrande bypass reach, the results of which are discussed below. A recent issue related to the stocking of kokanee salmon for the Alder Lake fishery (Article 413) is also discussed below.

Discussion: Recreational flow releases in the LaGrande bypass reach (Article 428)

During the relicensing of the Nisqually project, a major issue was whether Tacoma should be required to provide whitewater recreational flows from LaGrande Dam into the 1.7 mile long bypass reach. Issues of concern included potential impacts to aquatic resources, reservoir recreation upstream of the dam, public safety concerns, and costs associated with lost power generation, river access, and potential whitewater rescue operations. Resource agencies were particularly concerned that major recreational releases would negatively affect fisheries. After considering these issues, FERC (in license Article 428) required Tacoma to file a 3-year plan for evaluating whitewater boating opportunities in the LaGrande bypass reach. The plan was to include flow releases, during each year of the three-year period, on two weekends in mid-to-late November or December. Tacoma was also required to file an annual report with the Commission for its approval. License Article 421 required an additional study to assess the impacts of whitewater releases on fishery resources in the bypass reach (FERC 2002).

The 3-year plan was filed by the utility and whitewater releases were subsequently conducted. Test runs of the reach were conducted by members of the American Whitewater Affiliation (AWA) and other whitewater boating groups. The initial test runs were successful, however during one of the last runs in December 2000 one boater drowned. On March 30, 2001, Tacoma filed its final report evaluating recreational flows and recommended that whitewater releases be discontinued permanently, due to

safety, cost, and fisheries concerns. In November 2001, FERC found that the fisheries study was inconclusive, but agreed to not require further recreational releases in the bypass reach due to safety and cost concerns (FERC 2002).

Discussion: Kokanee stocking in Alder Lake (Article 413)

The license for the Nisqually project requires that Tacoma annually stock 500,000 kokanee salmon fry in Alder Lake to enhance the reservoir's resident kokanee fishery and requires monitoring of the fishery to assess the effectiveness of the stocking program, in consultation with WDFW, USFWS, and the Nisqually Tribe (FERC 1997). In Tacoma's 2002 kokanee stocking report, the utility proposes reducing the stocking rate to 200,000 fry per year for 5 years, starting in 2004 (FERC 2003b). Tacoma reports that anglers are failing to return to fish Alder Lake due to the small size of kokanee caught in the reservoir and believes that lowering the stocking rate will increase the average size and catch rate of kokanee in the reservoir, due to the density-dependence of body size in kokanee populations. WDFW does not concur with Tacoma's assessment and proposal, and has called for a "data-driven, science basis" for any changes to the stocking program (Leigh pers. comm., FERC 2003b). FERC has called for more information and analysis from Tacoma to justify the stocking rate drop, citing the lack of support from WDFW and concerns that factors other than stocking rate may be affecting the catch rate and growth of kokanee in Alder Lake (FERC 2003b). Tacoma's response to FERC's request is due in August.

YES = Go to G3

3. **Does the Facility allow access to the reservoir and downstream reaches without fees or charges?**

YES.
Access to Alder Lake is provided without charge, although fees are required for use of certain camping and boat launching facilities (FERC 2000). LaGrande Lake and the bypass reach are not easily accessible due to cliffs and steep, rocky terrain.

YES = PASS. Go to H (Facilities Recommended for Removal).

H. FACILITIES RECOMMENDED FOR REMOVAL:

Criteria:

1. **Is there a Resource Agency recommendation for removal of the dam associated with the Facility?**

NO.
There are no resource agency recommendations for removal of either LaGrande or Alder dam, or any other project feature. During the relicensing process, WDFW and the USFWS recommended that a decommissioning fund be established to pay for the eventual removal of the project when it is no longer viable. Tacoma was not in favor of establishing the fund, and FERC rejected the recommendation citing the financial soundness of Tacoma and the projected 50-year lifespan of project (Leigh pers. comm., FERC 1997).

NO = PASS. End.

THE ALDER AND LAGRANDE FACILITIES ARE LOW IMPACT

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Appendix A

Report of Contacts (ROCs)

Report of Contact / Personal Communication
Nisqually River Hydroelectric Project

Date of Initial Contact:	July 7, 2003
Application Reviewer:	Bill Sears/Stillwater Sciences
Person Contacted:	Steve Fransen/NOAA Fisheries
Telephone Number:	360-753-6038
Email:	steven.m.fransen@noaa.gov

Substance of Discussion

General: Mr. Fransen was not involved in the relicensing of the Nisqually Project. According to Mr. Fransen, NOAA Fisheries staff involved in the relicensing are now retired.

Flows: Mr. Fransen believed that Tacoma has complied with flow requirements in the license agreement. Tacoma occasionally contacts NOAA Fisheries to consult on flows issues during critical drought conditions according to Mr. Fransen, and has been responsive in drought years to protect fisheries.

Fish passage: Mr. Fransen stated that he thought the reach below LaGrande Dam was similar to the Skagit Gorge bypass reach, in that passage would have been difficult, but not impossible. However, Mr. Fransen thought less was known about historical passage at LaGrande. If fish passed through the reach, they would probably have been steelhead or Chinook salmon. Very few anadromous fish utilize the bypass reach now. Regarding fish passage, Mr. Fransen stated that he knew less about historical fish passage on the Nisqually than of the Skagit gorge bypass.

TES: Regarding TES (specifically Chinook salmon), consultation between Tacoma and NOAA Fisheries is presently informal in nature. Formal consultation may occur in the future, under section 7 of the ESA to provide take protection to both Tacoma and FERC. No decision has been made at this time. Mr. Fransen did not know of any current TES issues or impacts to Chinook salmon resulting from the project and referred me to Mr. Walter of the Nisqually Tribe for information on Chinook salmon status in the river.

Water quality: Mr. Fransen has not been directly involved in the DO monitoring at LaGrande powerhouse. I explained the latest FERC determination regarding WDFW's request for TDG monitoring at the powerhouse – Mr. Fransen thought TDG monitoring would be preferred rather than waiting for fish kills to demonstrate that TDG was or was not an issue. He explained that many utilities regularly go beyond license requirements to protect fisheries and the environment. In a subsequent email, Mr. Fransen stated that NOAA Fisheries had not taken a position on this issue, but was interested in the question of DO/TDG correlation.

Report of Contact / Personal Communication
Nisqually River Hydroelectric Project

Date of Conversation: July 7, 2003
Application Reviewer: Bill Sears/Stillwater Sciences
Person Contacted: George Walter/Nisqually Tribe
Telephone Number: 360-438-8687
Email:

Substance of conversation

General: Overall, Mr. Walter believes that Tacoma has been cooperative in funding worthwhile studies and environmental projects. He stated that he is satisfied overall with Tacoma. Through a settlement agreement with the Tribe, Tacoma provides funding for a fish hatchery downstream of the project.

Fish passage: Mr. Walter stated that the Nisqually Tribe conducted several in-depth studies of historical fish passage during the relicensing period and found evidence of 20 foot and 44 foot water fall within the river reach between LaGrande and Alder dams. Mr. Walter did not know of any historical records of fish passage within the project area, but thought that fish may have passed the area of LaGrande Dam. He did not think it was likely that fish passed waterfalls located between the dams.

TES: Mr. Walter is satisfied with Tacoma's Wildlife Management Plan and its implementation to date.

Water quality: Mr. Walter did not think TDG was an issue in the project area. He further stated that there are other issues of higher priority that should probably be addressed.

Cultural issues: Mr. Walter does not know of any outstanding cultural resource protection issues.

Report of Contact / Personal Communication
Nisqually River Hydroelectric Project

Date of Conversation:	July 14, 2003
Application Reviewer:	Bill Sears/Stillwater Sciences
Person Contacted:	Gwill Ging/U.S. Fish and Wildlife Service (USFWS)
Telephone Number:	360-753-6041
Email:	george_ging@fws.gov

Substance of conversation

General: Mr. Ging was involved in the Nisqually relicensing process on behalf of the USFWS. While overall implementation of the license articles has not been perfect, Tacoma and USFWS have a good working relationship.

Flows: Mr. Ging stated that minimum flow disruptions have occurred but are not frequent. Overall, Tacoma has complied with minimum and instream flow requirements set forth under the 1997 FERC license. Mr. Ging was generally satisfied with flows, ramping, and lake level maintenance by Tacoma, and thought Tacoma was responsive in making adjustments to flows.

Fish passage: Regarding fish passage in the bypass reach, Mr. Ging noted that there have been some problems, but that gravel enhancement studies are moving forward. Mr. Ging stated that the USFWS is waiting to assess the outcome of the gravel enhancement.

TES: Mr. Ging stated that bull trout are not well known in the Nisqually River and that there were no known breeding subpopulations there. The river is thought to be used by bull trout for feeding occasionally. USFWS did provide Section 7 consultation on the removal of a civil structure within the LaGrande bypass reach, and Mr. Ging expects that further consultation may occur if other projects are proposed. Consultation on bull trout passage is not currently planned due to the paucity of bull trout in the Nisqually River. Based on USFWS current understanding of the project operation and the occurrence of listed species in and near the project area, Mr. Ging stated that USFWS still concurs with the "may affect, not likely to adversely affect" determination made in the FEIS for the project.

Water quality: Mr. Ging stated that USFWS is concerned about the elevated DO readings found at the LaGrande powerhouse and their potential for indicating high TDG levels. According to Mr. Ging, USFWS is looking at DO and TDG data from other projects to assess the potential impacts of the high readings found at the Nisqually project. Mr. Ging stated that FERC's approach to the issue is not necessarily useful, since the bypass reach and reaches downstream of the powerhouse are not easily accessible, making discovery of fish kills resulting from high TDG unlikely. Tacoma is conducting some additional monitoring of DO in the bypass reach and LaGrande reservoir, however these measurements are not designed to address the powerhouse TDG issues.

Report of Contact / Personal Communication
Nisqually River Hydroelectric Project

Date of Conversation:	July 14, 2003
Application Reviewer:	Bill Sears/Stillwater Sciences
Person Contacted:	Curt Leigh/Washington Department of Fish and Game (WDFW)
Telephone Number:	360-902-2422
Email:	leighcsl@dfw.wa.gov

Substance of conversation

General: Mr. Leigh represented WDFW during the Nisqually relicensing process. In his emailed review of this ROC, Mr. Leigh stated the following:

"In general, the Nisqually Hydroelectric Project relicense process was relatively straight forward and proceeded as quickly as any in my experience. However, the project and the power it generates does not meet my expectations when I agree to pay my local utility higher than normal rates to receive 'green power'".

Flows: Mr. Leigh stated that Tacoma has at least one ramping and/or flow deviation per year, usually due to mechanical and/or computer issues. These deviations are reported to FERC and the agencies/tribes and are not necessarily outside the norm for hydro project operations.

In email correspondence, Mr. Leigh stated: "Yes, the project continues to have unplanned flow incidents that are reported to FERC. What needs to be clarified is that fish are killed each time we experience a flow incident. The number of fish killed is variable depending on the severity of the incident and the season, but some fish die every time. The full extent of the impact is impossible to quantify because the dead fish are washed away when the operators correct the flow conditions."

Fish passage: Regarding historical fish passage, Mr. Leigh stated that there are no records of anadromous fish upstream of LaGrande Dam prior to installation of the dam. Anadromous fish passage is not currently an issue for WDFW on the Nisqually project.

Regarding kokenee salmon stocking in the project reservoirs, Mr. Leigh stated that there is currently a proposal by Tacoma to reduce the number of fingerlings released annually from 500,000 (as stipulated in the license) to 200,000. Tacoma asserts that high densities of kokenee are causing small adult size and thus reduced interest by anglers.

Mr. Leigh stated that WDFW is opposed to the stocking rate reduction, since Tacoma has no data with which they can justify the reduction. According to Mr. Leigh, WDFW continues to ask for a "data-driven, science basis" for changes in fisheries management for the project. The WDFW has offered to work with Tacoma to assist in developing the necessary data as a basis for management decisions. FERC is currently considering the issue.

Water quality: Mr. Leigh stated that WDFW considers the DO/TDG issue at LaGrande powerhouse unresolved, however FERC agreed with Tacoma and determined that no further monitoring is necessary.

WDFW continues to be concerned about TDG levels downstream of the project. Mr. Leigh indicated that WDFW is unable to expend the staff time necessary to appeal FERC's order.

Watershed protection: Mr. Leigh states that there have been some problems with implementation of the wildlife enhancement plan; however WDFW is committing staff time to ensure that "the outcome of the wildlife enhancement plan is consistent with the intent of the license language."

Dam decommissioning fund: During the relicensing process, Mr. Leigh proposed (on behalf of WDFW) that a dam decommissioning fund be established for the Nisqually project. The proposed fund was not a call for decommissioning of the dam but rather a preventive measure to avoid the abandonment of the dam once its economic utility had been exhausted. FERC did not support the establishment of the fund, citing Tacoma's financial stability and the 50 year projected life of the project.

Report of Contact / Personal Communication
Nisqually River Hydroelectric Project

Date of Conversation:	July 14, 2003
Application Reviewer:	Bill Sears/Stillwater Sciences
Person Contacted:	Steve Craig/Washington Department of Ecology (WDOE)
Telephone Number:	360-902-2422
Email:	SCRA461@ECY.WA.GOV

Substance of conversation

General: Mr. Craig is a watershed manager in the Nisqually Basin. Mr. Craig suggested I call Jeannette Barreca (360-407-6556) for more information on water quality issues, since Ms. Barreca is involved in local TMDL work on the Nisqually.

Water quality: Mr. Craig is not directly involved in water quality issues regarding the Nisqually project. Mr. Craig stated that WDOE is planning an expanded program of water quality monitoring in the near future for the Nisqually River.

Watershed protection: Mr. Craig stated that Tacoma is a good partner in management of the Nisqually watershed, and is active in protection watershed resources.

Date of Conversation:	July 17, 2003
Application Reviewer:	Bill Sears/Stillwater Sciences
Person Contacted:	Jeannette Barreca/Washington Department of Ecology (WDOE)
Telephone Number:	360-407-6556
Email:	JBAR461@ECY.WA.GOV

Substance of conversation

General: Ms. Barreca is the TMDL coordinator for the Nisqually River.

Water quality: Ms. Barreca was not familiar with the WDFW TDG issue and did not know of any water quality issues with the project. Ms. Barreca forwarded my TDG-related query to Mr. Paul Pickett who reviewed a summary of Tacoma's DO monitoring data and stated that it would probably take a detailed monitoring and engineering study to show that TDG was not an issue.

Report of Contact / Personal Communication
Nisqually River Hydroelectric Project

Date of Conversation:	July 30, 2003
Application Reviewer:	Bill Sears/Stillwater Sciences
Person Contacted:	John Barr/Nisqually Tribe
Telephone Number:	360-438-8687 x141
Email:	

Substance of conversation

TES: I asked Mr. Barr for information regarding Chinook salmon status and monitoring in the Nisqually River. Mr. Barr stated that Chinook salmon stocks in the river are heavily supported by tribal hatchery production (15,000 smolts/year), however hatchery production is not considered critical to recovery of the species. The Tribe is currently looking at the possibility of moving towards more natural production in the basin. The overall escapement numbers are *increasing*; however, it is unknown how many of these "naturally" produced smolts are the result of hatchery raised fish. The Tribe is developing methods to identify the percentage of hatchery fish spawners. Current monitoring of Chinook salmon escapement is based on a relative methodology that compares escapement from year to year.

Appendix B

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY WATER QUALITY CERTIFICATION CONDITIONS

STATE OF WASHINGTON DEPARTMENT OF ECOLOGY
WATER QUALITY CERTIFICATION CONDITIONS
(FERC 1997)

I. OIL AND HAZARDOUS MATERIALS SPILL PREVENTION AND CONTROL

1. An Oil and Hazardous Materials Spill Prevention, Containment, and Countermeasure Plan shall be made available to Ecology when FERC issues the license for the Nisqually Hydroelectric Project. The plan shall address all equipment and materials at the site used during operation of this project. Equipment includes the turbine/generator set and all oil filled transformers and capacitors to serve this project.

2. Extreme care shall be taken to prevent any toxic or deleterious materials from entering state waters or the soil.

3. Visible floating oils released from the project area shall be contained and removed from the water immediately. No emulsifiers or dispersants are to be used in waters of the state without approval from the Southwest Regional Office of the Department of Ecology.

4. All land based oil storage tanks shall be placed on an impervious surface. The petroleum storage area shall be diked to contain all the oil from the largest tank in the event of a catastrophic failure of the storage tank.

5. Fuel hoses, oil drums, etc., shall be maintained and stored properly to prevent discharges. Proper security shall be maintained to discourage vandalism.

6. In the event of a discharge of any oil or hazardous materials into state waters, or on land with a potential for entry into state waters, containment and cleanup efforts shall begin immediately and be completed as soon as possible. Cleanup shall include proper disposal of any spilled material and used cleanup materials. Ecology shall be notified immediately by telephone at (206) 753 2353 (24 hour number).

7. There shall be adequate employee training for spill prevention, containment, and cleanup and a clear chain of authority and reporting procedures in case of an accidental spill.

8. The Oil Spill Prevention and Control plan shall be on site at all times and shall be available for review by an Ecology inspector. Project employees will be familiar with procedures contained therein. Those measure identified in the plan concerning petroleum storage shall be in place.

II. INSTREAM FLOWS

1. The minimum instream flow in the Nisqually River between the LaGrande powerhouse and LaGrande dam shall be five cubic feet per second (cfs).

III. OTHER

1. There shall be no excursions beyond the water quality criteria described in Chapter 173 201 045 (2) (c).