BAKER RIVER PROJECT RELICENSE

Economics/Operations Working Group

April 9, 2003

9:00 a.m. – 1:00 p.m.
PSE Office Building
Mt. Vernon, WA

FINAL MEETING NOTES

[For initials of author of italicized-corrections, see superscript]

The Economics Working Group Mission Statement:

"To ensure that alternative project proposals, operations and emergency plans for the Baker River Project and its components provide for: (1) Public health and safety; and (2) Thorough analysis and evaluation of the economic costs and benefits (including non-market and economic impacts.)"

Team Leader: Lloyd Pernela (PSE), 425-462-3507; lloyd.pernela@pse.com

Note: Please let the team leader know if you are unable to attend a meeting. If something comes up at the last minute, please call Lyn prior to the meeting. Lyn's cell phone is 425-890-3613.

PRESENT

Lloyd Pernela and Paul Wetherbee (PSE), Linda Lehman and Keith Brooks (FERC) by phone, Mark Kilgore (Louis Berger Group), Bob Helton (interested citizen), Ken Brettmann (USACE), Jerry Louthain (EES for City of Anacortes, Skagit Co. PUD, and Town Concrete), Stan Walsh (Skagit Systems Cooperative), Dave Brookings (Skagit County Public Works Department), Gary Sprague (WA Dept. Fish & Wildlife) on phone, Chuck Howard, (Water Resources Systems, consultant), Margaret Beilharz (USFS) on phone, Stuart Beck, (R2), Mary Jean Bullock -note-taker - and Lyn Wiltse – facilitator -(PDSA Consulting Inc.)

The next CROSS RESOURCE WORKSHOP MEETING will be MAY 14, 8:00 – 5:00 at the EMBASSY SUITES in LYNNWOOD. Stay tuned for details.

DATES OF FUTURE MEETING DATES/LOCATION
Note: Our next meeting will be held on May 7 (instead of the previously scheduled May 14th). The location will be at the Cottontree Inn, 2300 Riverside, Mt. Vernon.

Other future dates: June 11, July 9, August 13, September 10, October 8, November 12, December 10, 2003 at PSE Office, 1700 East College Way, Mt. Vernon.

AGENDA
April 9, 2003 at PSE Office, Mt. Vernon, WA
9:00 to 2:00 PM

9:00 - 9:05 Introductions
9:05 – 9:10 Review/revise minutes and agenda
9:10 – 9:15 Review Action Items
9:15 - 10:45 Debrief of cross Resource Workshop and review of Econ/Ops activities:
Status of PMEs
- Status of 5.01: CZMA, 5.02: Instream Flows and Water Rights, 5.03: Submerged Lands,
- Status of Flood control including an update on CORPS flood control process
- Skagit's County preliminary flood control at Baker study

10:45 – 11:05 Modeling process HYDROPS and R2 models
Technical Studies Committee (TSC) to address modeling effort
11:05 – 11:30 Sample HYDROPS model outputs
11:30 – 11:45 Economic Criteria
11:45 – noon Project Dependability Capacity (PME to recognize PNCA agreement?)
12:00 – 12:15 LUNCH
12:15 – 12:30 Status of R-E03
12:30 – 12:45 Set Agenda for May 7 meeting
12:45 – 12:55 Study Summary and Meeting evaluation

NEW ACTION ITEMS
- Lloyd: Distribute PIE flood control report to Working Group members.
- Lloyd: Let Working Group members know the deadline for getting feedback to Sue Madsen (R2) on A24 Draft Study Report. ***PROVIDE FEEDBACK BY APRIL 30TH TO SUE MADSEN.*** smadsen@r2usa.com. ***LP***
- Lloyd: Set up presentations on how PSE operates/traders, etc for June/July timeframe.
- Lloyd/Mark: Draft drought PME and distribute to Working Group members to review.
- Paul: Email out handout on Aquatics Working Group Run Requests to team members.
- Lyn: Add timeframes to May 7 agenda.

INTRODUCTIONS
We welcomed Stuart Beck of R2 Resource Consultants.

REPORT ON OLD ACTION ITEMS
- ALL: Sent Lloyd feedback by February 28, on Mark's draft economic considerations list.

- ALL: Reviewed R-01 (*Low flow augmentation from Baker Project*) **JL** for discussion at our March 12 meeting – Gave feedback to Jerry.
- ALL: Reviewed R-02 (flood control storage) for discussion with our March meeting. Gave feedback to Dave.
- Dave: Got with Mark K., Ken, and others to work on study plan for R02.
- Keith: Issued on February 19th FERC's interpretation of the legal interpretation (preliminary analysis) on flood control, and how FERC would respond if the settlement agreement included a request to change the existing amount of flood storage [e.g. through Flood Control Act or amount in addition to Congressional authorization]. Also commented on which Acts trump FCA, etc.
- Lloyd: Sent Keith distribution list of working group participants so he could send out his paper on Feb. 19.
- Lyn: Added estimated time frames to March agenda.

PME STATUS

5.01 – CZMA Consistency

This is a checklist of what needs to be accomplished for the license. (It is not moving forward as a study or PME.)

5.02 Additional Flows

Jerry reported that EES met with the City of Anacortes and Skagit County PUD to discuss how this problem (domestic water supply) might be addressed. They hope to take their proposed solution (in the form of a MOA) to Ecology with the hope that DOE would sign it and administer it. Jerry will keep us posted. (The PME is not moving forward *at this time until some other issues are resolved, such as working toward resolution through a MOA with DOE, and awaiting the results of the R2 instream flow study for fisheries resources.)* **JL** *It was clarified that minimum instream flows (MIFs) are based on the Mount Vernon gage and releases for domestic water supply are requested to be in addition to MIFs.* ***MK***

5.03 Submerged Lands

For the FERC license, PSE has to control (own or have easement for lands within the FERC boundary.) Currently, PSE's control of submerged lands is 99% documented. There are a few small areas of question. DNR claims all lands beneath navigable waterways. PSE hopes to resolve this issue directly with DNR.

5.06 Flood Control

The USACE proposed a study plan to examine this issue. ~~Skagit County disagreed about the scope~~. *Skagit County and the Corps mutually agreed at the Executive Committee to initiate a* ~~The County initiated~~**DB** a 30-day technical study to identify potential benefits from additional flood control. Dave reported that this reconnaissance level study is now complete. Lloyd will send out copies of the study to members. Skagit County is inviting representatives from the USACE and PSE to walk through the findings of this study on April 15. They will then review this study also with the executive committee May 1 and determine the next steps.

PSE expressed concern that folding an additional flood control study with its aquatic resource impacts into the re-licensing process might cause delays. They feel that Baker flood control is a Corps issue.

Keith said we could put a placeholder in the license (as a specific license re-opener) for the planning of storage after study or USACE process complete. *For purposes of the EA it would be sufficient to look at flood control options between 74 KAF and 100 KAF*[MK].

Skagit County's interest is to *see that the issue of public health and safety is given adequate consid*eration ~~have this study done as soon as possible~~[DB] and would like to see it folded into the re-licensing process.

Ken Brettmann suggested that the Corp's proposal to use existing license article language, stating "…up to 100K acre feet is good as it allows for flexibility as to the optimal level of flood storage." If, at the May 2nd Skagit Flood Executive Committee Meeting, it is determined that more detailed study is warranted, he is doubtful that the Corps could come up with anything substantive by July, 2003 for inclusion in the PDEA (if it stays within the Corp's process.)

TECHNICAL SCENARIOS TEAMLET AND REVIEW OF HYDROPS OUTPUTS

Paul walked us through the draft paper he put together describing the integration of hydropower operations and habitat assessment models. There are two models: HYDROPS and R2's Habitat Analysis Model. These models will be working together to produce simulation results. HYDROPS runs with a set of operational conditions imposed (can be posed as hard or soft constraints) on it. R2's model considers potential environmental effects associated with simulated Project operations. *Additional post processing of output data may occur in Excel*[MK]. Note: ~~Natural~~[MK] unregulated flows are used as basic inputs from the Baker River.

Paul will be heading up a newly formed group: the Technical Scenarios Teamlet (TST). The role of this teamlet will include technical definitions, defining scenarios, tracking runs, QA, QC, and defining I/O formats. Their first meeting (by conference call) will be today at 1:00. Jerry, Dave, Bob, and Chuck indicated interest in attending the first meeting of the TST and possibly joining the group.

Paul projected sample model output charts and asked for feedback. A standardized output package will be one of the early deliverables of the TST.

ECONOMIC CRITERIA

We reviewed the Draft Economic Considerations in evaluating PME costs that Mark put together last November. These include *costs*[MK] ~~money~~[MK] (e.g., studies, future capital expenses, O&M, construction, etc.), megawatts of dependable capacity, and reduction in benefits and increased costs associated with shifting energy from peak windows to off-peak windows. This list was developed ~~based on~~ *to support*[MK] the Developmental Analysis portion of the PDEA. The PDEA will show the incremental costs and benefits of each alternative.

PROJECT DEPENDABILITY DROUGHT PME CAPACITY

Mark shared with us information about something that is resulting in our coming up with an additional ~~PME for~~ *analysis for Baker Project operations under drought conditions*[MK]. The Pacific Northwest Coordination Agreement was signed in 1964 by USACE, BPA and many NW utilities (including PSE) *and renewed in 1997*. The agreement formed an important component of regional plans to ~~maximize~~ *optimize*[MK] hydro capability. The terms of this agreement extend through 2024.

Agreement stipulates that parties agree to coordinate the operations of their respective systems to make available to each systems its optimum Firm Energy Load Carrying Capacity, provide FELCC for the coordinated systems, improve regional power production as a whole, annual planning period, set refill requirements for whole reservoir systems, guidance on shifting and shaping FLCC, reliability standards, integration of resources incl. maintenance, coordinate outages, and improve flexibility.

Critical period refers to the portion of historical stream flow record, which, when combined with the drafting of all storage reservoirs from full to empty, would produce the least amount of energy shaped to seasonal load patterns.

PSE's role: As one of the signatories of the agreement, PSE sends to the Power Pool outage forecasts and capacity estimates each winter. PSE's dependable capacity at Baker is affected by *Corps-BPA*[MK] agreement *for Replacement Power for Upper Baker Flood Control*[MK] (1750 MWh per month for November through February and *not to exceed 7 MW per hour*)[MK].

We are talking with the Powel Group about taking this Dependable Capacity PME into consideration.

Call 1-800-622-4520 to request copy of document: Power System Coordination: "A Guide to the Pacific Northwest Coordination Agreement." *This document explains in great detail how the hydro systems in the Northwest are integrated under PNCA*[MK].

STUDY REQUESTS

- R-E01- Low Flow Augmentation from Baker Project – Continuing Discussion
- R-E03- Examination of spawning and Incubation Flows in the Skagit River below the Baker confluence during Brood year 2000 – Stan reported that he re-drafted this Study Request to examine all years from 1991 forward (since the Seattle City Light settlement went into effect) and re-submitted the request. We will discuss this at our May 7th meeting.

HANDOUTS (bolded handouts will be posted on the website)

- Preliminary Review Draft of *Integration of Hydropower Operations and Habitat Assessment Models*, April 2003.
- List of Aquatics Requests for HYDROPS runs

PARKING LOT

- New Baker EAP Inundation maps are available at end October 2002
- Consider who will be the number cruncher for this team: PSE? Other?
- Presentations:
  - USFS Baker Watershed Analysis
  - Wild and scenic river 101 Jon Vanderheyden
  - Fisheries/Hydraulics 102
  - FEMA
- How will we define and share economic analysis (methods, assumptions re: unit costs, etc.) across Working Groups?

EVALUATION OF THE MEETING

Well Done
- Facilitation moved us along
- M.J. serving coffee
- Stan was "walking wounded" and still participated

Change for Next Time
- Need notes to accompany presentations
- Ran out of coffee

What's Hot?
- Flood Control
- Will there be a draught PME?
- Need to discuss priorities of elements that will roll into models.

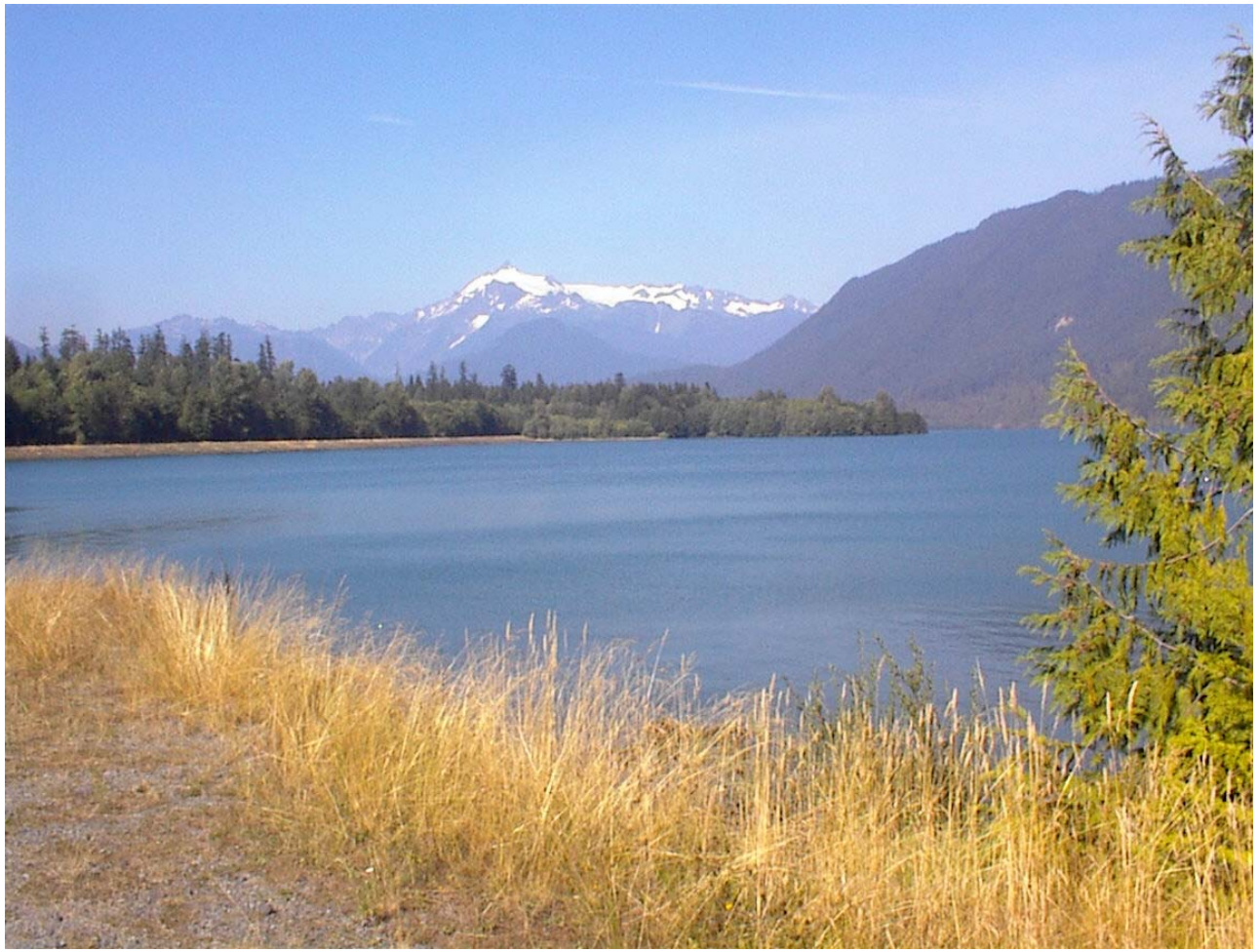
TENTATIVE AGENDA FOR NEXT MEETING
May 7, 2003 at Mt. Vernon, WA
9:00 to 2:00 PM

9:00 - 9:05 Introductions
9:05 – 9:10 Review/revise minutes and agenda
9:10 – 9:15 Review Action Items
9:15 – 9:30 Prep for May 14 Cross Resource Workshop
9:30 – 9:35 PDEA Update
9:35 – 10:00 Status of PMEs
- Status of 5.01: CZMA, 5.02: Instream Flows and Water Rights, 5.03: Submerged Lands, 5.07 Drought conditions

10:00 – 11:00 5.06: Flood control (management)
11:00 – 11:15 Break
11:15 – 11:30 Role of Econ/Ops Working Group
11:30 – 12:00 Review Study Requests:
- R-01 –Low Flow Augmentation from Baker Project – Continuing discussion
- R-03 –Examination of Spawning and Incubation Flows in the Skagit River below the Baker Confluence during Brood year 2000

Noon – 12:20 Lunch
12:20 – 12:45 TST Report
12:45 – 12:50 Set June 11, 2003 agenda (at PSE Office in Mt. Vernon at USFS)
12:50 – 1:00 Evaluate Meeting
- What's hot?
- Studies report for Baker Solution Team

Overview of the Pacific Northwest Coordination Agreement and Puget's Dependable Capacity at Baker - April 9, 2003



Briefing Purpose

- Summarize the History of the PNCA
- Describe how it Functions
- Describe the Role of the Baker Project

References

- **POWER SYSTEM COORDINATION: A Guide to the Pacific Northwest Coordination Agreement**
- **Published October 1993. This Document was published for the Columbia River System Operation Review, a joint project of the U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, and Bonneville Power Administration.**

  To request a copy of this document, call: 1-800-622-4520

References

- **http://www.nwd-wc.usace.army.mil/PB/oper_planning/pnca.html**

History

- Signed on September 15, 1964 by the Corps, Bonneville Power Administration, the Bureau of Reclamation, and the major generating utilities in the Pacific Northwest including Puget
- PNCA was executed in 1964
- Related the development of three storage projects on the Columbia River in Canada and one in USA (Columbia River Treaty)
- Forms an important component of regional plans to maximize the Northwest's hydro resource capability

History

- 1997 PNCA, which revises the 1964 PNCA, extends through 2024

More History

- The Northwest Power Pool, in the form of the Operating Committee, was established in 1942 to serve as a forum for the Northwest's electric utilities to more effectively coordinate operations and ensure reliability.
- In 1964 formation of its Coordination Contract Committee, the Pool's staff was given the responsibility of conducting the studies necessary to put together an annual plan for operating the NW's coordinated hydro system, and for facilitating the planning process.

Purpose

- The Agreement stipulates that "the parties agree to coordinate the operation of their respective Systems ... so as to make available to each System its optimum Firm Load Carrying Capacity,
- to provide optimum Firm Load Carrying Capability for the Coordinated Systems, and, consistent with these objectives,
- to produce the optimum amount of usable secondary energy for each System".
- It also outlines water storage and power transfer rights and obligations to all the participants to the Agreement.

Single Owner Concept

- Improves regional power production
- Annual Planning period
- Firm Energy Load Carrying Capability
- Refill requirements
- Shifting and Shaping FELCC
- Reliability Standards
- Integration of Resources including maintenance
- Outage Coordination
- Improve Flexibility

Definitions

- **Critical period:** That portion of the historical streamflow record which, when combined with the drafting of all storage reservoirs from full to empty, would produce the least amount of energy shaped to seasonal load patterns.
- **Firm energy load carrying capability (FELCC)**
  In planning, the total amount of firm energy that can be produced and shaped to load (load shaping) under critical streamflow conditions
- **Energy content curves (ECC)** -- A set of curves that establishes limits on the amount of reservoir draw-down permitted to produce energy in excess of FELCC

Definitions

- **Variable energy content curve (VECC):** The January through July portion of the energy content curve. The VECC is based on the expected amount of spring runoff

Puget's Role

- **Is a party to the PNCA**
- **Sends Power Pool outage forecast and capacity estimates each winter (in February)**
- **Commits to provide capacity and other obligations under agreement**

Puget's Dependable Capacity at Baker

- **Based on a morning and afternoon block of energy (four hours each block) Monday-Friday**
- **Includes both Upper and Lower Baker**
- **Can be computed by HYDROPS**
- **Would be impacted by environmental constraints**
- **Puget may need to replace lost capacity with thermal resources (i.e. combustion turbines)**

Puget's Dependable Capacity at Baker

- **Positively affected by Corp-BPA compensation agreement**
- **1750 MWh per month for four months (Nov-Feb)**
- **Compensates for the loss of head and water otherwise available for winter loads in the absence of flood control**
- **Would permit additional water to be carried over into March and April portion of critical period.**

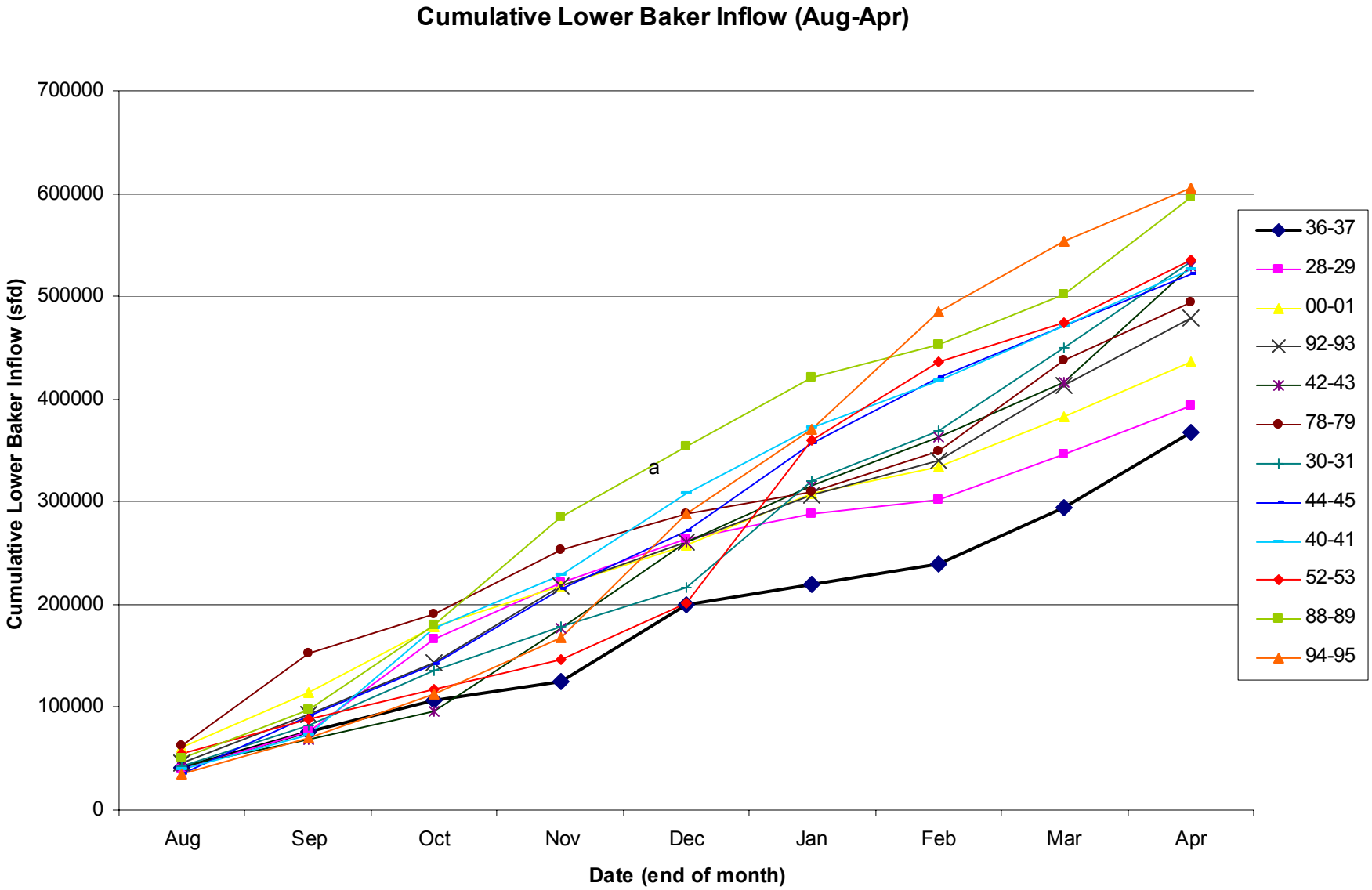
This table contains

Unregulated Flow Lower Baker

Source: LatestBakerNaturalQ.XLS

Cumulative Flow Volumes in sfd

	Water Year	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
1	36-37	41,539	76,037	106,728	125,326	199,417	219,566	239,447	294,629	367,228
2	28-29	39,988	76,580	166,792	220,792	263,882	288,064	302,060	345,768	393,468
3	00-01	61,340	114,311	177,965	217,665	256,998	308,000	333,692	382,522	435,621
4	92-93	46,319	93,496	143,560	218,126	260,461	306,659	340,624	413,909	478,848
5	42-43	42,162	68,263	96,474	176,576	260,896	315,148	362,750	416,073	528,871
6	78-79	62,095	151,881	190,969	253,758	288,526	309,909	349,509	437,519	493,361
7	30-31	42,159	81,762	136,322	178,024	216,775	320,627	369,349	449,948	533,647
8	44-45	34,907	91,637	141,889	215,361	270,727	356,379	421,563	471,381	521,750
9	40-41	39,057	73,556	177,095	228,997	308,052	371,602	418,359	471,681	526,579
10	52-53	54,993	88,175	116,761	145,742	201,105	359,296	435,485	474,577	535,114
11	88-89	49,866	96,853	180,686	284,801	353,800	420,181	453,522	500,987	596,857
12	94-95	35,411	70,214	112,891	167,681	288,053	371,002	484,422	553,696	605,449


Cumulative Lower Baker Inflow (Aug-Apr)
Cumulative Lower Baker Inflow (sfd)
700000
600000
500000
400000
300000
200000
100000
0
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
Date (end of month)
a
36-37
28-29
00-01
92-93
42-43
78-79
30-31
44-45
40-41
52-53
88-89
94-95

Puget's Dependable Capacity at Lower Baker*

- Worst was 1936-37 (Aug**-Apr)
- 3rd Worst was 2001 (Aug**-Apr)
- We may be able to use a partially drawn-down Reservoir system to provide the energy equivalent of 1936-37 with 2000-01 operations.
- FERC currently values capacity at about $100 per kW per year
- * Upper Baker may further influence
- ** Technically begins in Sept. but we may already be drawing down by then

Draft Technical Memorandum

Assessment of Additional Flood Control Storage at Baker River Project

Introduction

This Technical Memorandum, as prepared by Pacific International Engineering (PI Engineering), presents a preliminary assessment of whether or not potential flood reduction benefits could be realized on the lower Skagit River floodplain if additional flood control storages at Baker Lake and Lake Shannon of the Baker River Project were made available beyond the existing flood control storage of 74,000 acre-feet provided at Baker Lake.

The Baker River Project (FERC project number 2150) is owned and operated by Puget Sound Energy (PSE) and is currently involved in a FERC relicensing proceeding. This provides an opportunity for downstream floodplain communities to seek an optimum use of the storages at both lakes to benefit Skagit River flood reductions. Skagit County (County), as the local sponsor of the Skagit River Flood Reduction Project presently being studied by the U.S. Army Corps of Engineers – Seattle District (Corps), has requested that PSE conduct an analysis of their storage operation for downstream flood reduction as part of their re-licensing efforts.

During a March 18, 2003 meeting between the County and the Corps, PI Engineering was directed to perform this preliminary assessment and to recommend a study scope for work that needs to be performed in order to optimize the future flood control operation and storages at the Baker River Project.

Background

The Baker River drainage area at the Baker River streamflow gage, located at river mile (RM) 0.7 upstream from its confluence with the Skagit River, is 297 square miles, approximately 11 percent of the drainage area (2,737 square miles) at the Skagit River streamflow gage near Concrete. The annual average flow recorded at the Baker River gage is 17 percent of that recorded at the Skagit River gage near Concrete, a runoff contribution proportionately higher than any other major subbasin of the Skagit River on a unit drainage area basis.

Average annual precipitation in the Baker River basin ranges from about 70 inches at Concrete to greater than 150 inches at some of the higher elevations. The average annual runoff is approximately 120 inches from the Baker River basin and 75 inches from the Skagit River basin above the

Concrete gage. Between Concrete and Mount Vernon, the Skagit River drainage area increases by 356 square miles. The average annual runoff from this intermediate drainage area is approximately 50 inches.

Baker Lake, above the Upper Baker Dam (at RM 9.35), is about 9 miles long and covers a surface area of about 4,800 acres at normal full pool (El. 724.0). Roughly 285,000 acre-feet of water are stored in Baker Lake at normal full pool. Lake Shannon above the Lower Baker Dam (at RM 1.2) is approximately 7 miles long and covers a surface area of about 2,190 acres at normal full pool (El. 438.6). About 160,000 acre-feet of water are stored in Lake Shannon at normal full pool.

Operation for flood control storage is provided only at Baker Lake, under an agreement between the Corps and PSE. This agreement, in place since 1980, was extended in 2000 and expires in 2003. It limits the pool level of Baker Lake to El. 720.75 from November 1 to March 1 for 16,000 acre-feet of flood control storage, and to El. 707.9 under normal operation conditions from November 15 to March 1 to provide a total of 74,000 acre-feet of flood control storage.

This agreement stipulates that outflows from Baker Lake be maintained as equal to inflows until eight hours before Skagit River flow at the Concrete gage is forecasted to reach 90,000 cubic feet per second (cfs). The outflows are then dropped to 5,000 cfs at Baker Lake.

The 16,000 acre-feet of storage is intended to make up for lost valley storage from the original construction of the Baker River Project. In addition to the agreed upon total of 74,000 acre-feet, the existing FERC license states that PSE shall provide for flood control in Baker Lake up to a maximum of 26,000 additional acre-feet as may be requested by the Corps, under the condition that PSE is compensated for the reservation of flood control storage beyond the 16,000 acre-feet. Therefore, up to a total maximum of 100,000 acre-feet of flood control storage at Baker Lake would be provided, if justified and requested.

There is no formal agreement in place to limit the pool level of Lake Shannon in order to provide flood control storage operation. The Lower Baker Dam has a drainage area 38 percent larger than the area above Upper Baker Dam, and passes approximately 35 percent more water in an average year than does the Upper Baker Dam. Lake Shannon could be operated in coordination with Baker Lake to provide additional flood control protection.

Because of high runoff from the Baker River basin and the locations of Baker Lake and Lake Shannon, operation of the Baker River Project for flood control purposes has historically provided and will continue to provide a significant public benefit to the communities in the lower Skagit River valley.

Under the current FERC relicensing, PSE is required to develop a Baker River Project relicense application that is best adapted to a comprehensive plan for beneficial public uses including flood control and other purposes. The Federal Power Act requires that FERC balance hydropower and non-power resources when reviewing a relicense application and considering a new license issuance. Flood control at the Baker River Project is an important factor to be included in the FERC balancing decision, and should be optimized for both Baker Lake and Lake Shannon, and not be limited by the current flood control agreement between the Corps and PSE.

Approach and Assumptions

For this preliminary assessment, available historical and synthetic flood hydrographs, as well as Baker River Project operation data, were obtained from USGS, the Corps, and PSE. Selected flood hydrographs and reservoir operation data were reviewed and analyzed to determine the need for, and quantify approximately, the additional flood control storage required to maximize downstream protection at the Baker River Project during each flood event. The synthetic flood hydrographs were then adjusted to reflect the regulating effects of the quantified additional flood control storages and routed through the UNET model developed by the Corps to assess the downstream reduction in flood levels.

Three historical flood events selected for this assessment are the two November 1990 floods and the November 1995 flood. These three events are the largest floods occurring since 1981 after the current Baker Lake flood control operation of 74,000 acre-feet became effective. Each of these floods caused significant damage in the Skagit River floodplain downstream. The recurrence intervals for these three floods are estimated to be between 22 and 29 years.

Three synthetic floods provided by the Corps and selected for UNET modeling are the 10-, 25-, and 50-year events. These synthetic flood hydrographs for the Skagit River at Concrete take into consideration the 74,000 acre-foot flood control operation at Baker Lake. Additional flood control storages for these synthetic floods were estimated by a projection of the quantified additional flood control storages for the above-described three major historical events. Floods smaller than the 10-year event were not evaluated in this assessment. Floods greater than the 50-year event would involve too much projection from the historical flood events to quantify the additional flood control storage and operation requirements at the Baker River Project, therefore, they were not included in this preliminary assessment.

All flood frequency return intervals estimated and mentioned in this Technical Memorandum are based on the Corps' August 9, 2001 "Draft Hydrology Investigation Report," prepared for the Skagit River Basin.

Assumptions used to quantify the additional flood control storage requirements above the currently agreed upon 74,000 acre-foot storage at Baker Lake are as follows:

- An optimum total flood control storage could be over the total maximum of 100,000 acre-feet that PSE currently could provide, if justified and requested by the Corps. The storage would be jointly provided at both Baker Lake and Lake Shannon, not just Baker Lake only, as currently agreed upon between the Corps and PSE.

- Primary flood reduction benefits from the additional flood control storage would be realized during floods less than the 50-year event or less than the Skagit River Channel hydraulic capacity in the existing levee system downstream.

- A breakdown of the estimated flood control storage requirements between Baker Lake and Lake Shannon was not defined.

- Potential operation modifications to the current 74,000 acre-foot flood control storage were not considered.

- Optimization of the additional flood control storage operation alone, or in conjunction with the current flood control storage operation, was not considered.

- Outflows from Lake Shannon were to be reduced to a minimum flow when Skagit River flow at the Concrete gage reaches 110,000 cfs.

- A minimum outflow of 100 cfs from Lake Shannon was to be maintained.

- The rate of change of outflow from Lake Shannon was set at 5,000 cfs per hour.

- A time lag for flows from Lake Shannon to reach the Concrete gage on the Skagit River was assumed to be one hour.

- To assess flood reductions in stage and discharge, the UNET modeling for the downstream Skagit River from Sedro Woolley to Skagit Bay assumed that debris would not restrict flow at the BNSF railroad bridge and that there would be no levee failures for both with and without additional flood control storage conditions.

Additional Flood Control Storage Requirements

Figures 1, 2, and 3 show plots of hourly water surface elevations at Baker Lake and Lake Shannon, and hourly flow hydrographs for Baker River and Skagit River at gages near Concrete, for the two November 1990 floods and the November 1995 flood. As shown on these figures, outflows from Lake

Shannon were still significant, exceeding 15,000 to 20,000 cfs at the Skagit River flood peaks observed at the Concrete gages during these three major events. Based on the above assumptions, additional flood control storage requirements at the Baker River Project to store these outflows from Lake Shannon during flood peaks were estimated. The estimated additional storages ranging from 30,000 to 35,500 acre-feet are provided in Table 1. Including the current 74,000 acre-feet provided at Baker Lake, the total flood control storage requirements at the Baker River Project could range between 104,000 and 109,500 acre-feet during these three major historical floods.

Also provided in Table 1 are estimated additional flood control storage requirements between 15,400 and 59,000 acre-feet for the 10-, 25-, and 50-year synthetic floods. These estimated storages were based on similar assumptions to those used for the historical flood events. Including the current 74,000 acre-feet storage provided at Baker Lake, the total flood control storage requirements at the Baker River Project could range between 89,400 and 133,000 acre-feet for the 10- to 50-year flood events.

Figure 4 shows a comparison of Skagit River flood hydrographs for the 10-, 25-, and 50-year events between with and without additional flood control storage conditions at the Baker River Project.

Skagit River Flood Reductions at Concrete

Table 2 shows potential reductions of the Skagit River flood stage and peak flow, as well as recurrence interval at the Concrete gage for the two November 1990, the November 1995, and the 10-, 25-, and 50-year floods if the estimated additional flood control storage during each of these events was provided at the Baker River Project. The flood stage reductions range from 1.21 to 1.57 feet on the Skagit River at the Concrete gage. The peak flow reductions are approximately 10 to 13 percent of the Skagit River flood peaks. The three major historical floods with recurrence intervals ranging from 22 to 29 years, would become 13- to 17-year medium flood events. The 10-, 25-, and 50-year synthetic events would be reduced to approximately 6-, 15-, and 30-year events, respectively.

Skagit River Flood Reductions from Sedro Woolley to Mt. Vernon

Hydrographs of the 10-, 25-, and 50-year synthetic floods for the current Baker Lake storage operation conditions, as well as conditions with the estimated additional flood control storages at the Baker River Project, were routed by use of the Corps-developed UNET model through the downstream Skagit River assuming no debris blocking at BNSF railroad bridge and no levee failure. Routing results were compared between conditions with and without the additional flood control storages. Figure 5 shows a comparison of Skagit River flood hydrographs at the Mount Vernon gage for the 10-, 25-, and 50-year events between with and without additional flood control storage conditions at the Baker River Project. Figures 6 and 7 show comparisons of

the Skagit River flood peak flow and maximum stage profiles between these two conditions for the three modeled flood events.

Table 3 provides potential reductions of the Skagit River flood peak flows and stages at selected locations. Flood stage reductions range from 0.55 to 1.05 feet on the main stem of the Skagit River between Sedro Woolley and Mount Vernon. Peak flow reductions are higher in Sedro Woolley (ranging from 8 to 11 percent) than in Mount Vernon (ranging from 5 to 7 percent) as flood peaks attenuated when moving downstream of Sedro Woolley through the Nookachamps Creek flood plain. Table 4 shows potential reductions of overbank flows in Sedro Woolley and Mount Vernon.

Conclusions and Recommendations

It is concluded from the above assessment that an additional flood control storage at the Baker River Project, above the currently provided 74,000 acre-foot storage at Baker Lake, could provide significant additional flood reduction benefits on the Skagit River floodplain below Concrete. The additional storage requirement was estimated to be 35,500 acre-feet in order to maximize downstream flood reductions for the three major events occurring in 1990 and 1995. With this additional storage provided, the downstream flood peaks during those events could have been within the channel hydraulic capacity of the existing levee system. This additional flood control storage requirement would increase to approximately 59,000 acre-feet to achieve the maximum flood reduction during a 50-year event. A breakdown of the estimated storage requirements between Baker Lake and Lake Shannon was not determined in this assessment. Optimization of the additional storage needs in conjunction with the current 74,000 acre-foot storage operation was not evaluated in this assessment. A more detailed study is required to determine an optimum use of the Baker River Project storages for flood control operation, including use of available surcharge storages.

It is therefore recommended that a detailed evaluation of the Baker River Project flood control operation be performed. A scope of the detailed evaluation is recommended as follows:

- Optimize the total flood control storage including the current 74,000 acre-foot and additional storage at the Baker River Project.
- Determine the optimum relationship of flood control storage between Baker Lake and Lake Shannon.
- Optimize the flood control storage operation and the drawdown-refill rule curve at each lake.
- Perform hydrologic study and hydrodynamic flood routing modeling of major historical floods and synthetic floods for this detailed evaluation.

- Estimate hydropower generation impacts based on the new flood control operation rule curves.

- Perform economic analysis for a study area including all downstream flood damage areas in order to maximize net benefits.

- Perform detailed topographic mapping and surveying for the area between Concrete and Sedro Woolley, as required for flood damage reduction analysis and for a better flood routing analysis.

- Perform an environmental analysis to assess potential impact and mitigation due to implementation of a future optimum flood control operation at the Baker River Project.

Table 1 Flood Control (FC) Storage Requirements at Baker River Project

Flood	Current FC Storage at Baker Lake (Ac-Ft)	Estimated Additional FC Storage at Baker Lake and Lake Shannon (Ac-Ft)	Total FC Storage at Baker River Project (Ac-Ft)
Historical Events			
Nov. 8 to Nov. 15, 1990	74,000	33,182	107,182
Nov. 21 to Nov. 28, 1990	74,000	29,953	103,953
Nov. 26 to Dec. 3, 1995	74,000	35,457	109,457
Synthetic Events			
10-year	74,000	15,400	89,400
25-year	74,000	24,600	98,600
50-year	74,000	59,000	133,000

Table 2 Potential Skagit River Flood Reductions at Concrete Gage

Flood	With Current FC Storage at Baker Lake			With Additional FC Storage at Baker Lake and Lake Shannon			Reductions		
	Max. Stage El. (ft)	Peak Flow (cfs)	Return Interval (year)	Max. Stage El. (ft)	Peak Flow (cfs)	Return Interval (year)	Max. Stage El. (ft)	Peak Flow (cfs)	Return Interval (year)
Historical Events									
Nov 8 to Nov 15, 1990	167.84*	149,000	25	166.62*	134,000	14	1.22	15,000	11
Nov 21 to Nov 28, 1990	167.61*	146,000	22	166.25*	129,900	13	1.36	16,100	9
Nov 26 to Dec 3, 1995	168.56*	159,000	29	166.99*	138,500	17	1.57	20,500	12
Synthetic Events									
10-year	165.72	123,804	10	164.49	110,804	6	1.23	13,000**	4
25-year	167.94	150,168	25	166.73	135,168	15	1.21	15,000**	10
50-year	170.43	185,392	50	168.88	162,392	30	1.55	23,000**	20

* Estimate based on projection of synthetic flood events, until further historical flood event data becomes available

** Estimate based on projection of historical flood events

Note: All stages are based on NGVD29. Concrete Gage datum is 130 ft above NGVD29.

Table 3 Downstream Skagit River Flood Reductions

Location	River Mile (RM)	Flood	With Current FC Storage at Baker Lake		With Additional FC Storage at Baker Lake and Lake Shannon		Reductions	
			Max. Stage (ft)	Peak Flow (cfs)	Max. Stage (ft)	Peak Flow (cfs)	Max. Stage (ft)	Peak Flow (cfs)
Downstream SR-9 Bridge	22.27	10-year	40.55	133,526	39.70	122,864	0.85	10,662
		25-year	41.85	159,682	41.27	145,155	0.58	14,527
		50-year	42.94	197,498	42.39	174,889	0.55	22,609
Mount Vernon Gage (Downstream Riverside Bridge)	17.05	10-year	37.35	124,704	36.30	115,917	1.05	8,787
		25-year	38.86	139,141	38.18	132,472	0.68	6,669
		50-year	40.09	153,592	39.47	145,872	0.62	7,720
North Fork	8.85	10-year	21.94	60,589	21.24	57,086	0.70	3,503
		25-year	23.11	66,209	22.61	63,616	0.50	2,593
		50-year	23.53	68,877	23.34	67,774	0.19	1,103
South Fork	8.75	10-year	21.32	64,048	20.65	58,885	0.67	5,163
		25-year	22.45	72,609	21.97	68,853	0.48	3,756
		50-year	22.85	76,014	22.67	74,478	0.18	1,536

Note: All stages are based on NGVD29

Table 4 Overbank Flow Reductions on Skagit River

Location	River Mile (RM)	Flood	With Current FC Storage at Baker Lake Peak Overflow (cfs)	With Additional FC Storage at Baker Lake and Lake Shannon Peak Overflow (cfs)	Reductions Peak Overflow (cfs)
Sedro Woolley	20.90 to 22.20	10-year	391	0	391
		25-year	15,982	7,220	8,762
		50-year	42,730	26,535	16,195
Mount Vernon	11.70 to 15.00	10-year	0	0	0
		25-year	353	0	353
		50-year	7,646	3,686	3,960

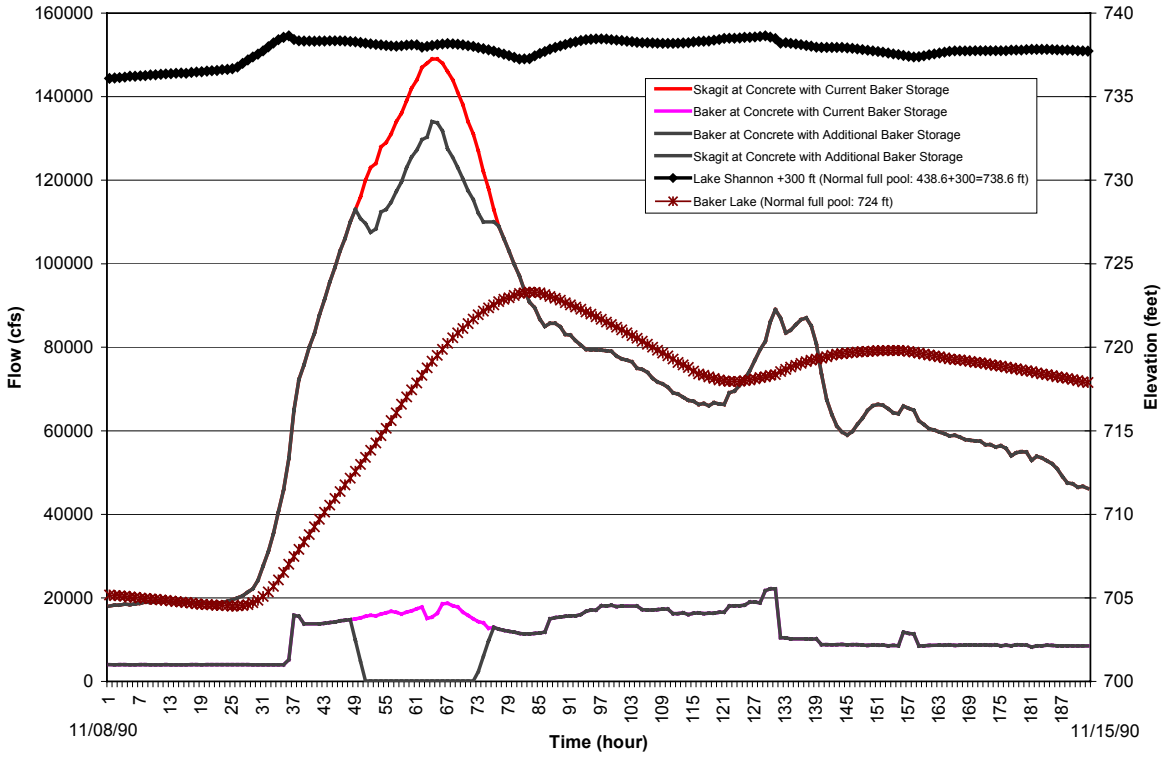


Figure 1 Hydrographs for November 8 to November 15, 1990 Flood

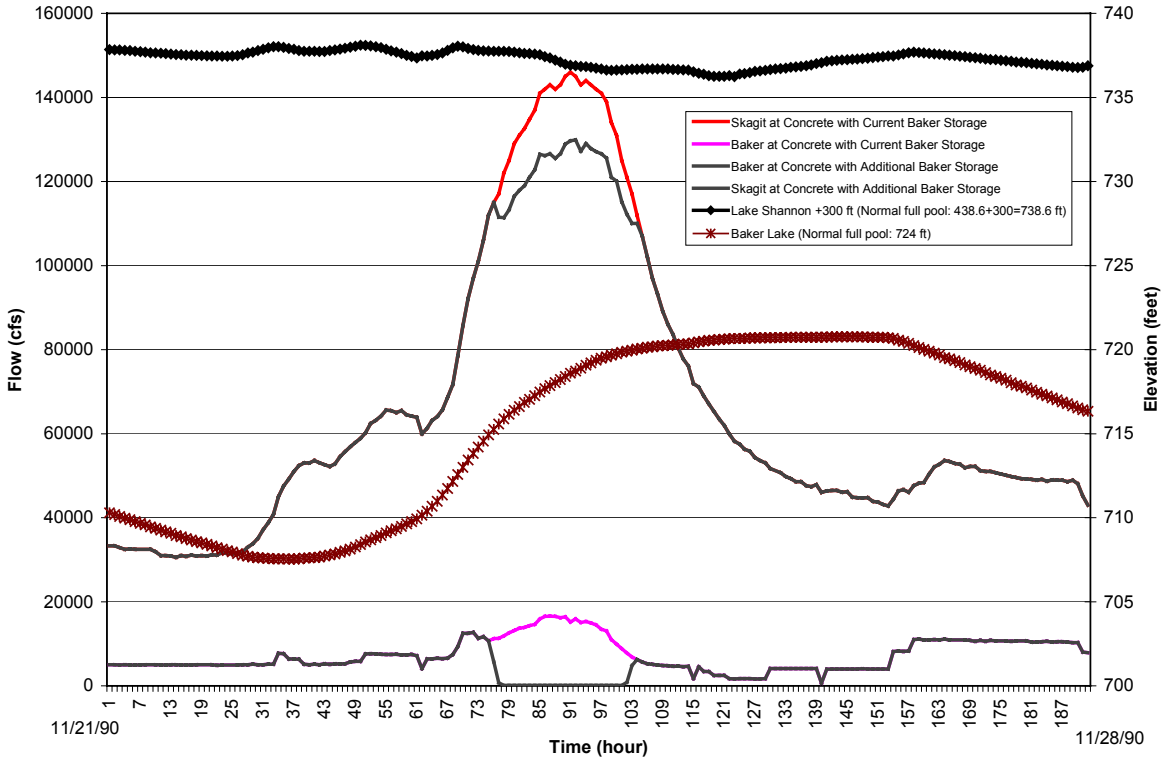


Figure 2 Hydrographs for November 21 to November 28, 1990 Flood

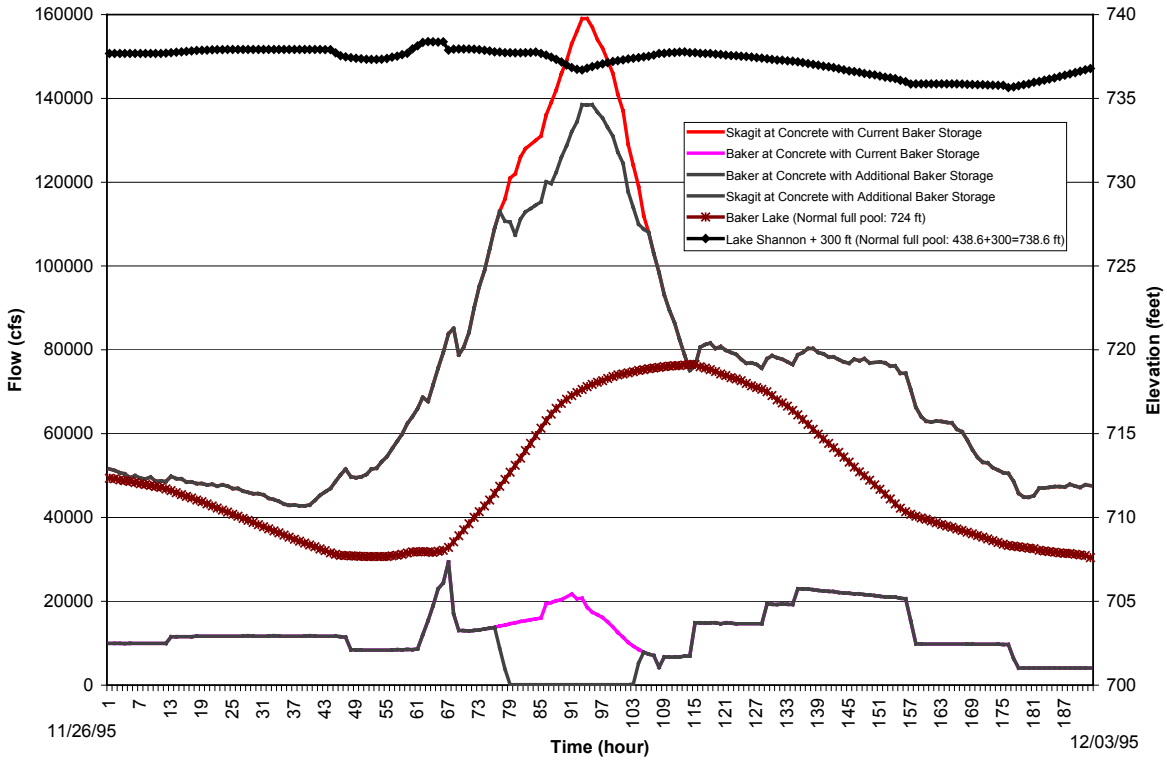


Figure 3 Hydrographs for November 26 to December 3, 1995 Flood

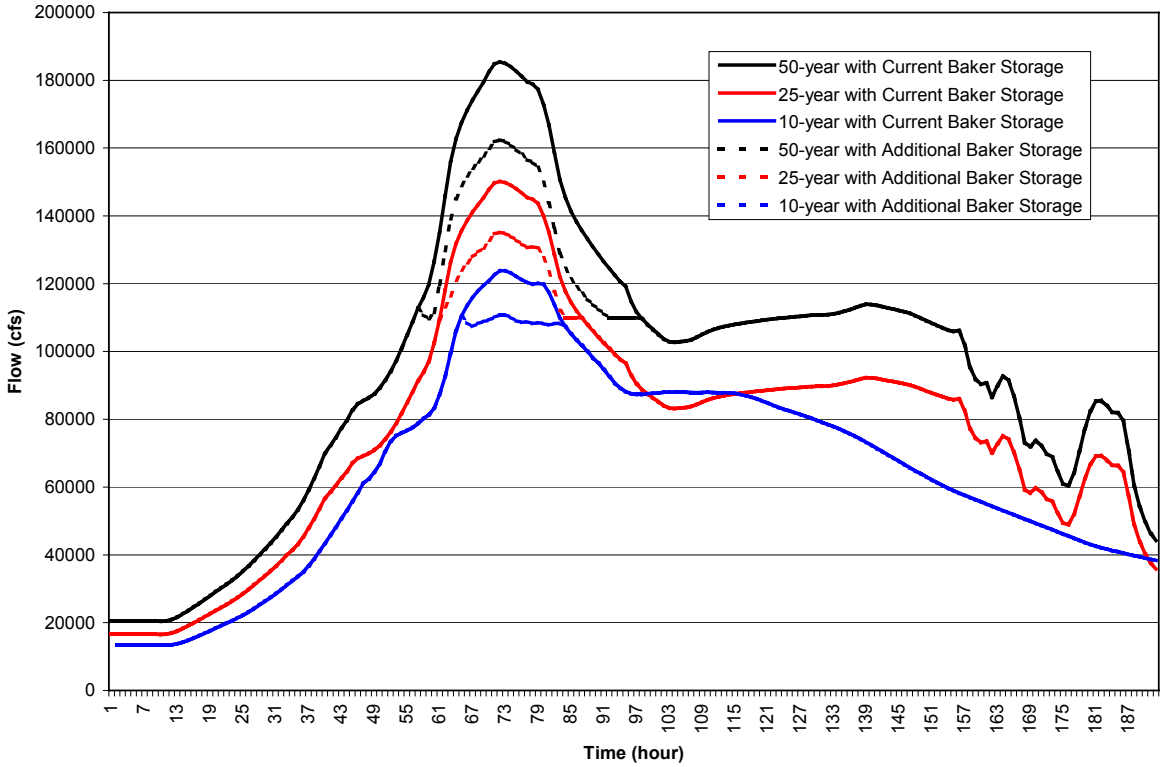


Figure 4 Synthetic Flood Hydrographs – Skagit River at Concrete Gage

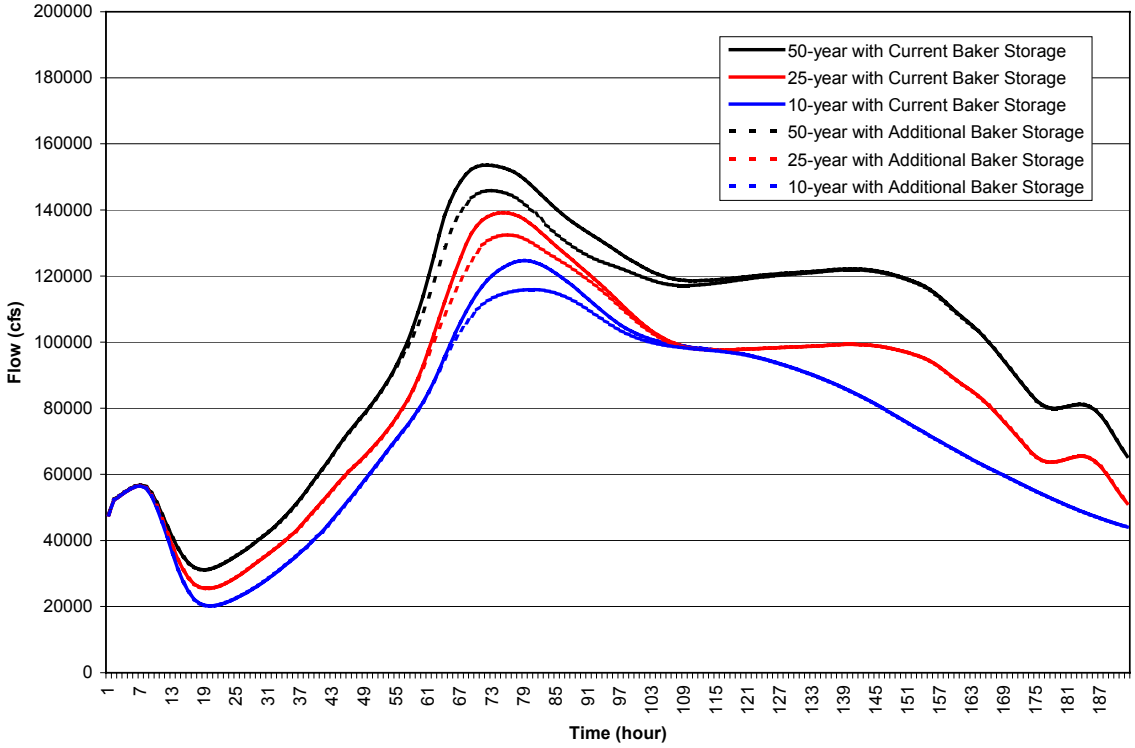


Figure 5 Synthetic Flood Hydrographs – Skagit River at Mount Vernon Gage

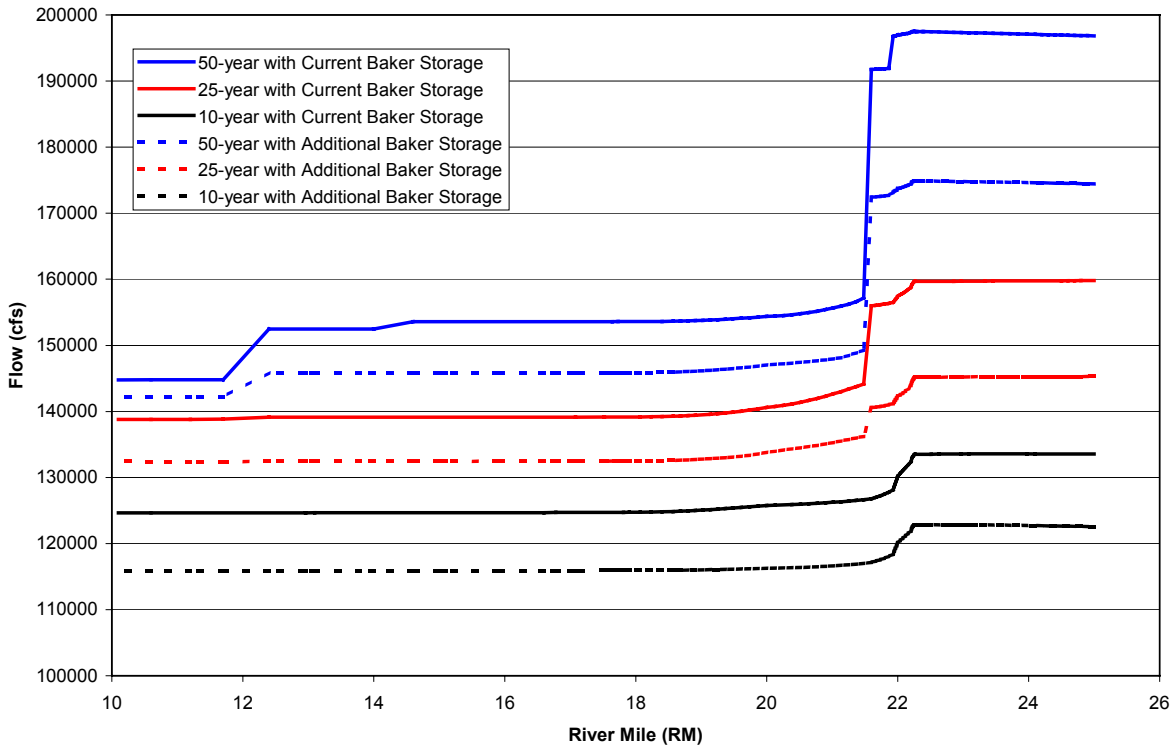


Figure 6 Peak Flood Flow Profiles on Skagit River

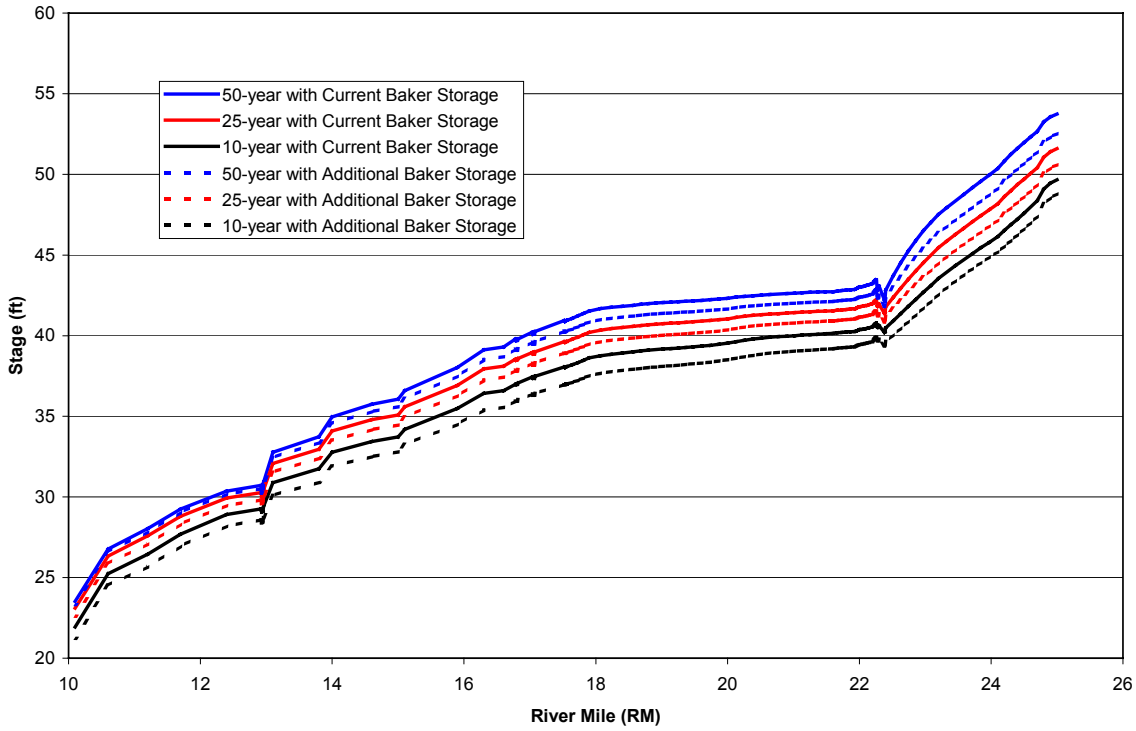


Figure 7 Maximum Flood Stage Profiles on Skagit River

Proposed PME Measure for the Relicense of the Baker River Hydroelectric FERC Project No. 2150

Date: February 4, 2003 **Version:** First Submittal Draft to Working Group

Proposed Action: 5.02

Project Title: Additional flow releases for mitigation of water use

Participant Priority: None Low Medium **High**

Working Group: Economics/Operations

Lead Person: Jerry Louthain (Economic and Engineering Services, Inc.), on behalf of Skagit County, Skagit County PUD No. 1, City of Anacortes, Town of Concrete

Interests:

- Protection of existing and future domestic water rights
- Non-interruptible supply of domestic water use in Skagit River Basin
- Improved flow regime of Baker River and Skagit River due to less daily variation in Baker River flows
- Improved water quality in Baker River, due to additional flow releases
- Higher minimum flows in Baker River
- Potential increased power generation

Issue: Release of additional flows from the Baker River Project as mitigation for water use, during times of low flows in the lower Skagit River.

Goal: Domestic water users utilizing surface water or ground water sources in the Skagit River basin having a non-interruptible water supply.

Description of the Proposed Action:

Present Condition:

Impacts on stream flow of the Skagit River near Mount Vernon

The purpose of this section is to describe the impacts of the current operation of the Baker River Project and the impacts of other factors, on the stream flow at the Skagit River near Mount Vernon stream-gaging station.

Baker River Project

Puget Sound Energy (PSE) generally attempts to operate the Baker River Project to meet the power needs of its customers by varying the times for generation of power based on when the highest power demands occur. This typically results in a daily flow variation downstream of Lower Baker depending on whether or not power is being generated. Flows typically vary during each day from a maximum of 4,100 cubic feet per second (cfs) during power generation, based on the maximum

hydraulic capacity of the single turbine generator at Lower Baker, to a minimum of 80 cfs when power is not being generated. A minimum flow of 80 cfs is released continuously from Lower Baker to allow operation of the adult trap-and-haul facility.

These daily flow variations and the rate of flow reduction can be observed graphically from the gaging records of the U.S. Geological Survey gage for the Baker River at Concrete. A copy of the gaging records for the time period from January 15-22, 2003 is attached.

Other impacts on flows at Skagit River near Mount Vernon gage

In addition to the Baker River Project, Seattle City Light operates power generating facilities on the Skagit River upstream of the mouth of the Baker River. The method of operation of these facilities is similar to the Baker River Project, and also typically results in daily variations in Skagit River flows depending on whether or not power is being generated. Flows at the Skagit River at Newhalem gage show this daily variation in flows typically ranging from approximately 3,000 cfs to 7,000 cfs, due to the Seattle City Light operational procedures. A copy of the gaging records for the time period from January 15-22, 2003 is also attached.

Another impact on the stream flow of the Skagit River near Mount Vernon, is the flow from the Sauk River, which enters the Skagit River upstream of the Baker River. The Sauk River is not regulated, so the flows from the Sauk River are based entirely on natural flows and runoff into the Sauk River and its tributaries. A copy of the gaging records for the Sauk River near Sauk gage for the period from January 15-22 is attached, which shows the flows dropping steadily from 3,000 to 2,000 cfs from January 15-21, and then increasing again to nearly 3,000 cfs on January 22.

Another gage on the Skagit River is located just downstream of the mouth of the Baker River. This gage shows the impacts of the Baker River Project, the Seattle City Light projects, and the Sauk River. A copy of the gaging records for the Skagit River near Concrete gage for the period from January 15-22 is attached, which shows the flows typically ranging on a daily basis from approximately 8,000 to 15,000 cfs. These flows reflect the daily variation in flow releases caused by the operation of the Baker River Project and the Seattle City Light projects.

The stream-gaging station located near Mount Vernon also shows the impacts of the operation of the Baker River Project and the Seattle City Light projects, with daily variations in the flows. The impacts of these two projects on the flows at Mount Vernon are dampened to some degree, and the high and low flows are delayed by several hours, due to the distance from these projects. A copy is also attached of the gaging records for the Skagit River near Mount Vernon gage for the period from January 15-22. These records show the flow ranging from a high of

approximately 20,000 cfs to a low of approximately 9,800 cfs. A typical daily range in flows is from approximately 11,500 cfs to 16,500 cfs.

During this time period from January 15-22, the gaging records for the Skagit River near Mount Vernon showed the lower values for the daily flows reducing on a daily basis to a low of approximately 9,800 cfs on January 20, as the flows steadily decreased for the Sauk River and other natural flow tributaries. High daily flows during this time period ranged from approximately 20,000 cfs to 14,000 cfs and were generally dropping from January 15-21. On January 22, the flows at the Mount Vernon gage began to increase in response to increases in flows of the Sauk River and other natural flow tributaries.

It is clear from the stream gaging records discussed above, and as shown in the attachments, that the existing operation of the Baker River Project has an impact on the flow of the Skagit River near Mount Vernon. This impact in some instances can result in the flow of the Skagit River near Mount Vernon being lower than the instream flows specified in Chapter 173-503 WAC. The required instream flow under Chapter 173-503 WAC during the time period from January 15-22 discussed above is 10,000 cfs at the Skagit River near Mount Vernon stream-gaging station. A brief description of Chapter 173-503 WAC follows.

Chapter 173-503 WAC Instream Resources Protection Program: Lower and Upper Skagit Water Resources Inventory Area (WRIA 3 and 4)

This existing Washington Department of Ecology (Ecology) regulation, contains language that can result in the regulation of certain surface water and ground water uses, including domestic supply, during the times that the flows in the Skagit River are less than the established minimum instream flows. This regulation has an effective date of April 14, 2001, which means that Ecology decisions on water use issues, particularly related to applications for water rights, in the Skagit River Basin, after this date are subject to the provisions contained in this regulation. Water rights existing prior to the effective date of the regulation are not subject to the provisions of the regulation. A copy of this regulation is attached.

The provisions in WAC 173-503-060 and 070 state that any consumptive water use, either from a domestic supply, from a surface water source, or from a ground water source (i.e., hydraulic continuity with surface water), which has a decision made after the effective date of the regulation, is subject to the instream flow rules established in the regulation. This means that even a domestic water use must be considered as an interruptible water supply since water use is not authorized during the times that the actual flows in the river are less than the specified instream flow in the regulation.

The provisions in WAC 173-503-060 and 070 do not address the situation of individual domestic water users using ground water in amounts less than 5,000 gallons per day, which is exempt from the requirements to obtain a water right.

Even though the regulation doesn't specifically address this, it is conceivable that water use from an individual domestic exempt well that began after the effective date of the regulation, and is determined to be in hydraulic continuity with a surface water source, could also be subject to the instream flows and be considered as an interruptible water supply.

The present wording in the regulation is that any of the water uses discussed above are to cease, or are subject to being regulated by Ecology, when the measured flows at the Skagit River near Mount Vernon stream-gaging station are below the amounts shown in WAC 173-503-040. The specified instream flows vary throughout the year and range from 10,000 to 13,000 cfs.

Desired Future Condition:

Release of additional flows from the Baker River Project during low flow periods as mitigation to avoid curtailment of future ground and surface water uses in the Skagit River basin, particularly those utilizing water for domestic supply.

Ability of future ground and surface water users in the Skagit River basin, particularly those utilizing water for domestic supply, to be assured of a non-interruptible water supply.

Description of Proposed Action:

Baker River Project Operational Procedures

To satisfy the Desired Future Condition, it may be necessary to modify the Baker River operational procedures. This could be accomplished in conjunction with amendments in Chapter 173-503 WAC, through one of the following options or combination of options.

- Modify operational procedures so that the existing daily fluctuation of approximately 4,000 cfs be reduced or eliminated
- Increase minimum releases from the Baker River Project from the present 80 cfs to _____ cfs
- Modify operational procedures so that additional flow releases are made from Lower Baker during the times that the flow in the Skagit River at Mount Vernon is less than the instream flows specified in Chapter 173-503 WAC
- The additional flow releases in the previous bullet shall be equal to the total water use that is subject to the instream flow provision, (estimated maximum of 200-250 cfs), and be considered as mitigation for the reduced stream flow due to this water use.

Chapter 173-503 WAC Instream Resources Protection Program: Lower and Upper Skagit Water Resources Inventory Area (WRIA 3 and 4)

Amend Chapter 173-503 WAC so that any provisions in this regulation do not cause an interruptible water supply, particularly for domestic use, for future users of surface or ground water during the periods of time that the flows in the Skagit River are lower than the flows specified in this regulation.

Measurable Objective:

Implementation: In conjunction with the appropriate amendments to Chapter 173-503 WAC, and as necessary to meet the Desired Outcomes, PSE will operate the Baker River Project in such a manner to provide additional flow releases from Lower Baker, in the amounts necessary to mitigate for the amount of water use subject to Chapter 173-503 WAC, during the times that the flow of the Skagit River near Mount Vernon is below the instream flows established in Chapter 173-503 WAC.

Effectiveness: Water users, particularly those using water for domestic supply, will have a secure water supply, since they will not be subject to having their water use terminated, due to instream flow requirements in Chapter 173-503 WAC.

Advantages/Benefits:

Citizens of the Skagit River watershed can be assured of a long-term non-interruptible water supply from surface or ground water sources.

The flow regime of the Baker River downstream of the Baker River Project, and the Skagit River downstream of the mouth of the Baker River, would be improved and subject to less variation in flows. This would improve water quality in the Lower Baker River and benefit the fishery resource.

Power production would be increased if the additional flow releases were passed through the turbines at the Baker River Project.

Disadvantages/Considerations:

A consideration for evaluation is that the Ecology will need to amend Chapter 173-503 WAC to allow this mitigation of future water uses to be an acceptable means of allowing uninterrupted water use. The amendment of this regulation would be subject to Ecology's standard public involvement and review process.

There is a potential economic cost due to reduced power production from the Baker River Project, if the additional flow releases were not passed through the turbines at the Baker River Project.

Justification/Rationale:

The current operational procedure for the Baker River Project results in a highly regulated daily fluctuation of the flows from 4,100 to 80 cfs, in the Baker River downstream of the project. As stated above in ***Present Condition:*** **Baker River Project Operational**

Procedures, these daily flow variations impact the flow in the Skagit River as far downstream as the Skagit River near Mount Vernon stream-gaging station.

In Section 3.3 WATER QUANTITY of the Initial Consultation Document, dated March 2002, a summary is made showing what the calculated unregulated flows would be for the Baker River at Concrete, without the Baker River Project. These calculations are based on records from several stream-gaging stations in the vicinity of the Baker River. A copy of Table 3.3-2 is attached which shows the calculated unregulated monthly stream flow data for the period from 1928-1999. This shows the mean monthly unregulated flow varying from a low of 1,612 cfs in September, to a high of 4,243 cfs in June, with the mean annual flow of 2,621 cfs. Figure 3.3-3, which is also attached, is a graphical representation of the calculated mean monthly unregulated flow data shown in Table 3.3-2.

This Table and Figure, when compared to the current actual daily regulated flow condition which has a flow of 80 cfs during the daily non-generation periods, shows the differences between the calculated mean monthly unregulated flows and the existing regulated flows, during the non-generation period, as follows:

- June 4,243 - 80 = 4,163 cfs maximum reduction in mean monthly stream flow
- September 1,612 - 80 = 1,532 cfs minimum reduction in mean monthly stream flow
- Annual 2,621 – 80 = 2,541 cfs average reduction in mean monthly stream flow

The above information shows sufficient rationale to demonstrate the existing impacts on the flow in the Baker River, and Skagit River downstream of the Baker River, during the daily non-generation periods.

Reducing these impacts by increasing the flow releases from the Baker River Project, when determined to be necessary, based on the requirements in Chapter 173-503 WAC, as a means of mitigation for future water uses, would appear to be justified.

Remaining Information Needs: n/a

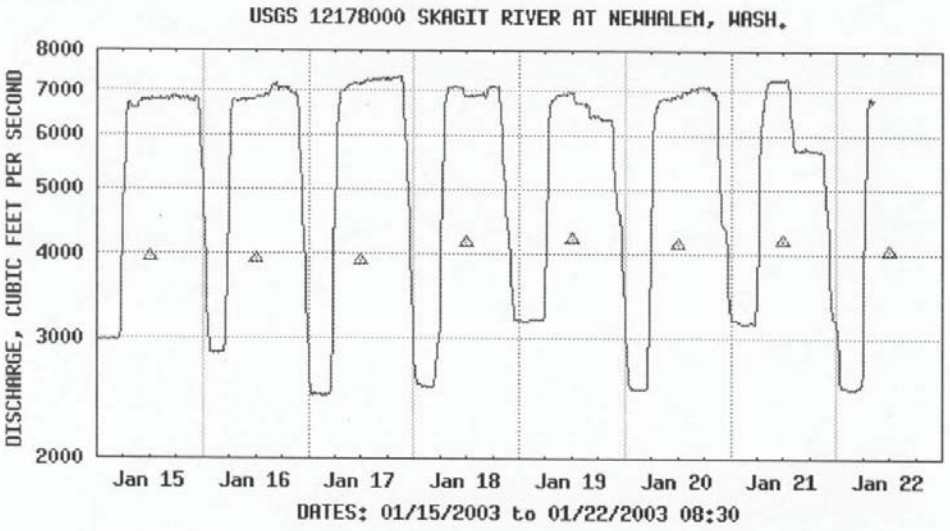
Conflicting Interests or Unresolved Issues: n/a

Responsibility for PME Implementation: n/a

Potential Partnerships: n/a

Timing/Phasing and/or Scheduling of Proposed Action(s): n/a

Estimated Range of Costs: n/a.



Download a presentation-quality graph

Parameter Code 00060; DD 01

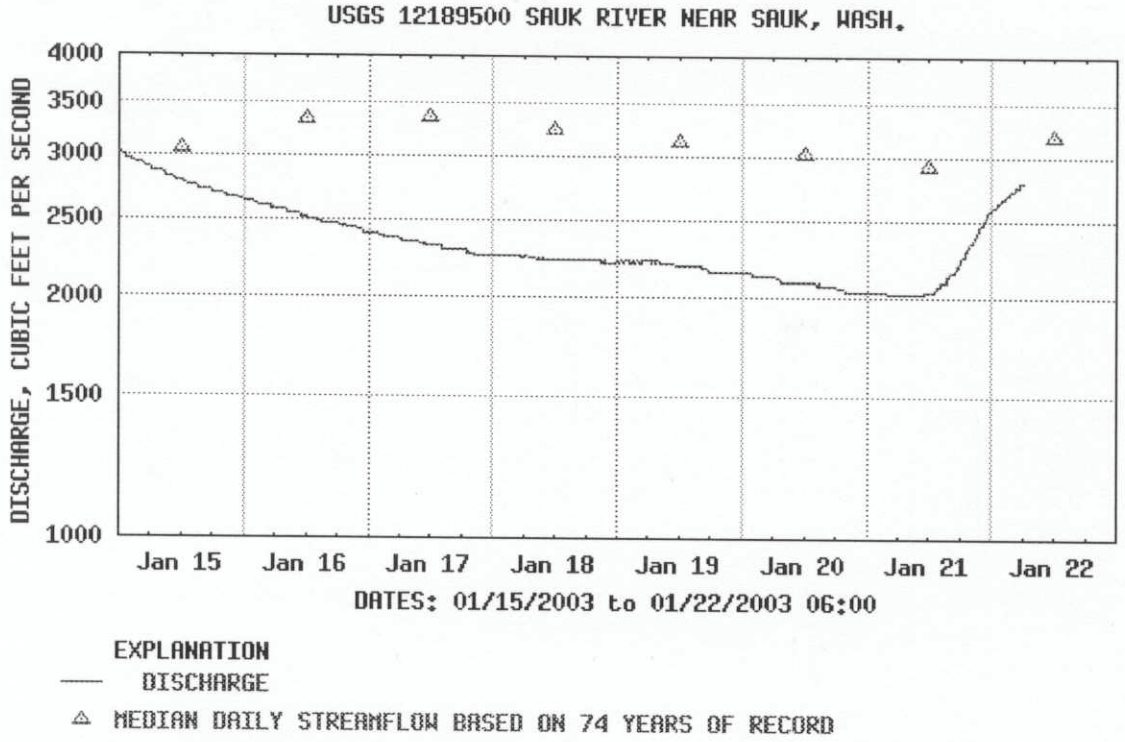
Daily mean flow statistics for 1/22 based on 87 years of record in ft^3/sec

Current Flow	Minimum	Mean	Maximum	80 percent exceedence	50 percent exceedence	20 percent exceedence
6,770	490	3,978	8,960	1,892	4,050	5,820

Percent exceedance means that 80, 50, or 20 percent of all daily mean flows for 1/22 have been greater than the value shown.

GAGE HEIGHT, FEET

Most recent value: 84.92 01-22-2003 08:30



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Parameter Code 00060; DD 04

Daily mean flow statistics for 1/22 based on 74 years of record in ft^3/sec

Current Flow	Minimum	Mean	Maximum	80 percent exceedence	50 percent exceedence	20 percent exceedence
2,790	820	3,746	13,100	1,950	3,180	4,990

Percent exceedance means that 80, 50, or 20 percent of all daily mean flows for 1/22 have been greater than the value shown.

GAGE HEIGHT, FEET

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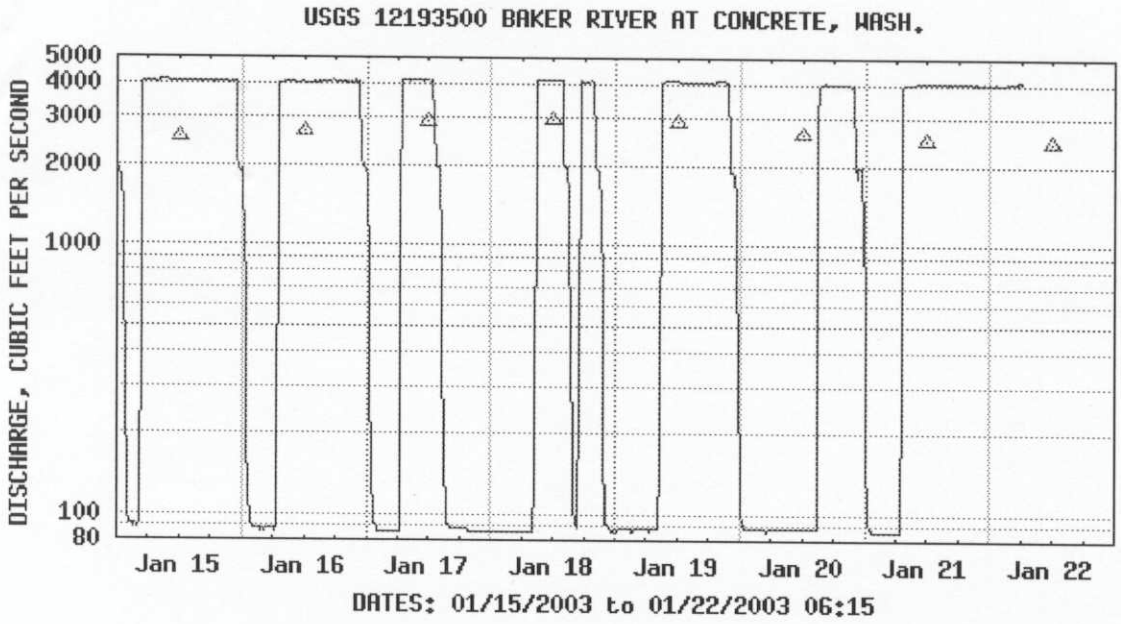

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Parameter Code 00060; DD 01

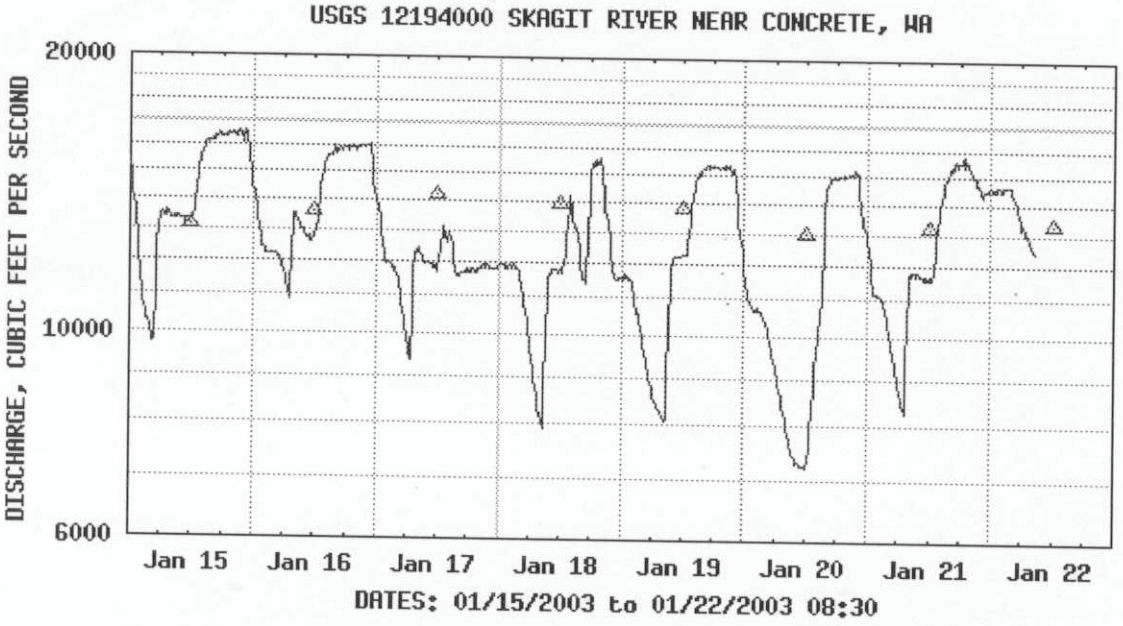
Daily mean flow statistics for 1/22 based on 63 years of record in ft^3/sec

Current Flow	Minimum	Mean	Maximum	80 percent exceedence	50 percent exceedence	20 percent exceedence
4,080	75	2,582	6,680	1,436	2,450	3,772

Percent exceedance means that 80, 50, or 20 percent of all daily mean flows for 1/22 have been greater than the value shown.

GAGE HEIGHT, FEET

Most recent value: 4.93 01-22-2003 06:15



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Parameter Code 00060; DD 01

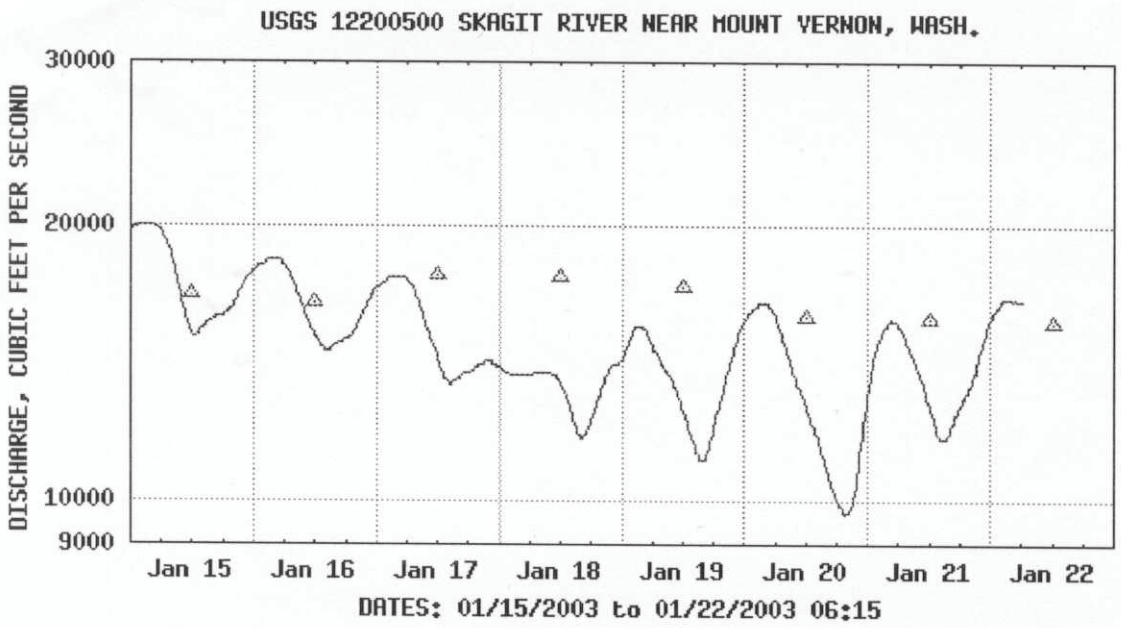
Daily mean flow statistics for 1/22 based on 77 years of record in ft^3/sec

Current Flow	Minimum	Mean	Maximum	80 percent exceedence	50 percent exceedence	20 percent exceedence
12,400	3,200	13,800	37,000	8,676	13,300	17,540

Percent exceedance means that 80, 50, or 20 percent of all daily mean flows for 1/22 have been greater than the value shown.

GAGE HEIGHT, FEET

Most recent value: 17.29 01-22-2003 08:30



Download a presentation-quality graph

Parameter Code 00060; DD 01

Daily mean flow statistics for 1/22 based on 61 years of record in ft^3/sec

Current Flow	Minimum	Mean	Maximum	80 percent exceedence	50 percent exceedence	20 percent exceedence
16,500	7,010	16,930	50,200	11,420	15,600	21,340

Percent exceedance means that 80, 50, or 20 percent of all daily mean flows for 1/22 have been greater than the value shown.

GAGE HEIGHT, FEET

Most recent value: 13.98 01-22-2003 06:15

Proposed PME Measure for the
Relicense of the Baker River Hydroelectric
FERC Project No. 2150

Chapter 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM - LOWER AND UPPER SKAGIT WATER RESOURCES INVENTORY AREA (WRIA 3 AND 4)

NEW SECTION

WAC 173-503-010GENERAL PROVISION. These rules apply to waters within the Lower and Upper Skagit water resources inventory area (WRIA 3 and 4), as defined in WAC 173-500-040, excluding the Samish River subbasin, Fidalgo, Guemes, Cypress, Hope and Goat islands. This chapter is promulgated pursuant to chapter 90.54 (Water Resources Act of 1971), chapter 90.22 RCW (Minimum water flows and levels), and chapter 173-500 WAC (Water resources management program).

NEW SECTION

WAC 173-503-020PURPOSE. The purpose of this chapter is to retain perennial rivers, streams, and lakes in the Lower and Upper Skagit water resources inventory area and Cultus Mt. Tributaries with instream flows and levels necessary to provide for the protection and preservation of wildlife, fish,
scenic, aesthetic, and other environmental values, and navigational values, as well as recreation and water quality.

Chapter 90.54 RCW (Water Resources Act of 1971) requires that utilization and management of waters of the state be guided by a number of fundamentals, including:

Uses of water for domestic, stock watering, industrial, commercial, agricultural, irrigation, hydroelectric power production, mining, fish and wildlife maintenance and enhancement, recreational, and thermal power production purposes, and preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state, are declared to be beneficial. (RCW 90.54.020(1))

The quality of the natural environment shall be protected and, where possible, enhanced, as

follows:

Perennial rivers and streams of the state shall be retained with base flows necessary to provide for the protection and preservation of wildlife, fish, scenic, aesthetic and other environmental values, and navigational values. Lakes and ponds shall be retained substantially in their natural condition. Withdrawals of water which would conflict therewith shall be authorized only in those situations where it is clear that overriding considerations of the public interest will be served. (RCW 90.54.020 (3) (a))

Waters of the state shall be of high quality. Regardless of the quality of the waters of the state, all wastes and other materials and substances proposed for entry into said waters shall be provided with all known, available, and reasonable methods of treatment prior to entry. Notwithstanding that standards of quality established for the waters of the state would not be violated, wastes and other materials and substances shall not be allowed to enter such waters which will reduce the existing quality thereof, except in those

situations where it is clear that overriding considerations of the public interest will be served. (RCW 90.54.020 (3)(b))

In administering and enforcing this regulation, the department's actions shall be consistent with the provisions of chapter 90.54 RCW.

NEW SECTION

WAC 173-503-030FINDINGS. Ecology finds that (1) The magnitude or variability of flows are important in maintaining the aquatic ecosystem that sustains both fish and other valuable resources. Criteria to limit total withdrawals of water from the Lower Skagit River were developed to protect the aquatic ecosystem in the region covered by this rule.

(2) To protect the estuary area below River Mile 8.1 the duration of flow inundation of at least one foot of depth, in selected estuary habitat, can be reduced no more than 10% from existing conditions from the date of enactment of this regulation. This criterion applies to the period of February through August to withdrawals from the Skagit River. Total withdrawals greater than 836 cubic feet per second during that period will result in a greater than 10% deviation from existing conditions and therefore would result in harm to the fisheries resources and aquatic ecosystem in the region covered by this rule.

(3) Protection of the aquatic ecosystem of the estuary in the months of September through January requires that the total withdrawals of water from the Skagit River not exceed 1/10 of the 50% exceedence flow for each month, based on the period of record (1/1/41 - 12/31/95) for the US Geological Survey
(USGS) stream gage on the Skagit River near Mt. Vernon, WA (Sta. #12-2005-00) in order to maintain channel morphology and other estuarine and riverine functions. This equates to a low point of 830 cubic feet per second during the month of September. Total withdrawals greater than 830 cubic feet per second during the month of September will not protect and preserve fish , wildlife and other environmental values and therefore would be harmful to fisheries resources and the aquatic ecosystem in the region covered by this rule in violation of chapter 90.54 RCW.

(4) The rules setting minimum flows in the Lower and Upper Skagit River (WRIA 3 and 4) (WAC 173-503-040) and finding certain waters available (WAC 173-503-050) are necessary to protect and preserve wildlife, fish, scenic, aesthetic and other environmental values.

NEW SECTION

WAC 173-503-040ESTABLISHMENT OF INSTREAM FLOWS. (1) Stream management units and associated control stations are established as follows:

Stream Management Unit Information

Stream Management Unit Name Control Station No.	Control Station by River Mile and Section, Township and Range; Latitude Reach and Longitude	Stream Management
Skagit Mainstem:		
Skagit River near Mt. WA USGS Sta. #12-2005-00	River Mile (RM) 15.7	From mouth of Skagit including tidal headwaters.*
Cultus Mountain Tributaries:		
Mundt Creek	Stream gage will be installed at (Sec/Twn/Rng; Lat/Long)	From mouth to headwaters. RM 3.4
Turner Creek	Stream gage will be installed at (Sec/Twn/Rng; Lat/Long)	From mouth to headwaters. RM 4.2
Gilligan Creek	Stream gage will be installed at (Sec/Twn/Rng; Lat/Long)	From mouth to headwaters. RM 3.2
Salmon Creek	Staff gage periodically recorded will be installed at (Sec/Twn/Rng; Lat/Long)	From mouth to headwaters. RM 4.3

* Other additional control stations and instream flows may be established in WRIAs 3 & 4 to improve water management.

(2) Instream flows are established for the stream management units in WAC 173-503-040 (1) as follows (See Figures 1 through 3):

Instream Flows as measured at USGS Sta. #12-2005-00
(Instantaneous cubic feet per second)

Month	Day	USGS Sta. #12-2005-00 Skagit River
Jan.	1-31	10,000
Feb.	1-29	10,000
Mar.	1-31	10,000

Apr.	1-30	12,000
May	1-31	12,000
Jun.	1-30	12,000
Jul.	1-31	10,000
Aug.	1-31	10,000
Sep.	1-30	10,000
Oct.	1-31	13,000
Nov.	1-15	13,000
	16-30	11,000
Dec.	1-15	11,000
	16-31	10,000

Instream Flows for Cultus Mountain Tributaries, WRIA 3

(Instantaneous cubic feet per second)

Month	Day	RM 3.4 Mundt Creek	RM 4.2 Turner Creek	RM 3.2 Gilligan Creek	RM 4.3 Salmon Creek
Jan.	1-31	6.4	7.9	19.8	4.0
Feb.	1-29	6.4	5.4	19.8	4.0
Mar.	1-15	6.4	5.4	19.8	4.0
	16-31	9.4	5.4	27.7	4.0
Apr.	1-30	9.4	7.9	31.7	4.0
May	1-31	9.4	7.9	31.7	1.4
Jun.	1-30	9.4	4.9	31.7	1.4
Jul.	1-31	7.6	4.9	39.6	1.4
Aug.	1-31	7.6	4.9	39.6	1.4
Sep.	1-30	7.6	4.9	39.6	4.0
Oct.	1-31	7.6	7.9	23.8	4.0
Nov.	1-30	9.4	7.9	27.7	4.0
Dec.	1-31	9.4	7.9	27.7	4.0

(3) Instream Flow Hydrograph. Figure 1

Proposed PME Measure for the
Relicense of the Baker River Hydroelectric
FERC Project No. 2150

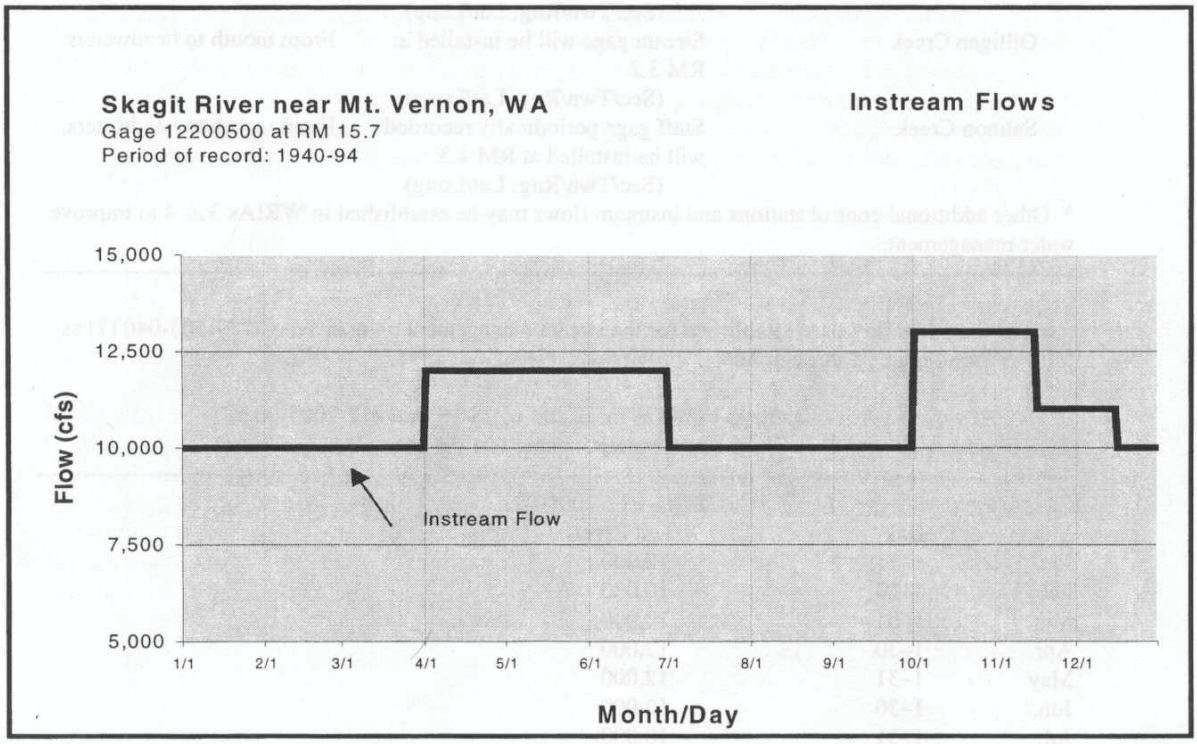


Figure 2

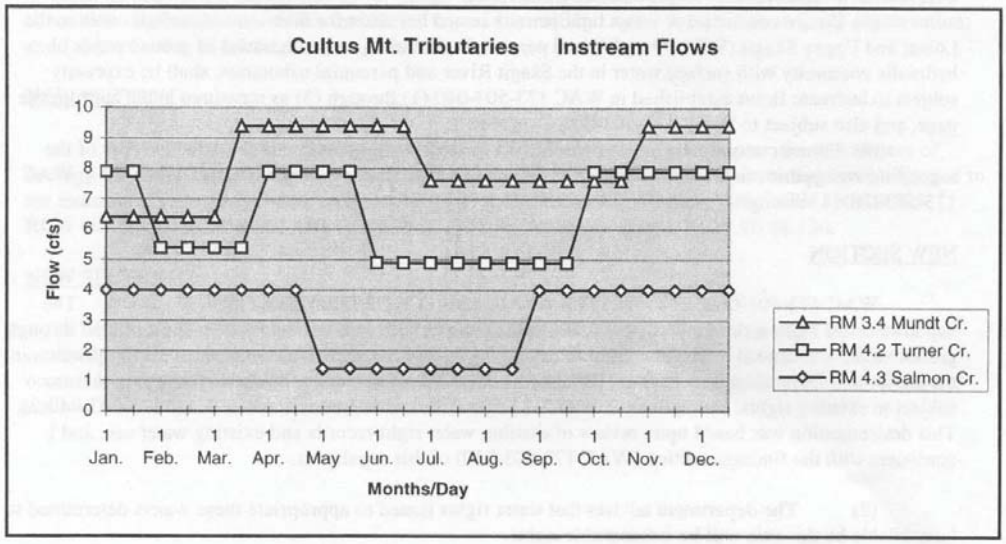
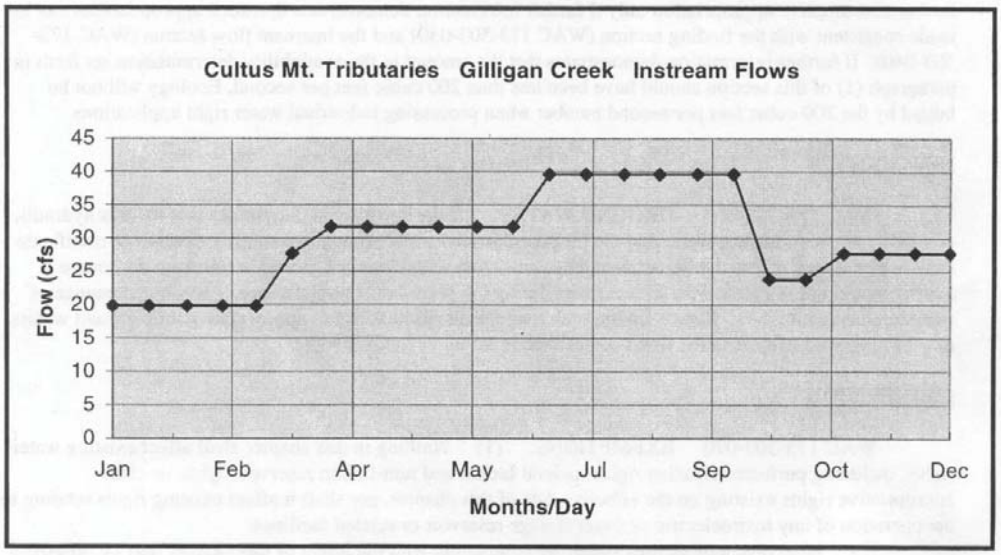


Figure 3



(4) The instream flow hydrographs, as represented in Figures 1 through 3 in WAC 173-503040(3) shall be used for identification of instream flows.

(5) Future consumptive water right permits issued hereafter for diversion of surface water in the Lower and Upper Skagit (WRIA 3 and 4) and perennial tributaries, and withdrawal of ground water in hydraulic continuity with surface water in the Skagit River and perennial tributaries, shall be expressly subject to instream flows established in WAC 173-503-040 (1) through (3) as measured at the appropriate gage, and also subject to WAC 173-503-060.

(6) Future consumptive water rights issued to applications pending at the effective date of the regulation are superior in priority date but shall be conditioned on the instream flows established in WAC 173-503-040 (1) through (3). (RCW 90.03.247)

NEW SECTION

WAC 173-503-050 WATER AVAILABILITY DETERMINATION (1) The department has made a determination that 200 cubic feet per second is available to be appropriated through ground water withdrawal or surface water diversion for further instantaneous consumptive appropriation in the Lower and Upper Skagit watershed (WRIA 3 and 4). These waters are available for appropriation, subject to existing rights, exemptions in WAC 173-503-070, and instream flows in WAC 173-503-040(2). This determination was based upon review of existing water right records and existing water use, and is consistent with the findings section (WAC 173-503-030) of this regulation.

(2) The department advises that water rights issued to appropriate these waters determined to be available by this rule will be interruptible rights.

(3) After these instantaneous diversion or withdrawal of the 200 cfs quantities identified in paragraph (1) of this section have been allocated by Ecology, the Lower and Upper Skagit Watershed WRIA 3 and 4) shall be withdrawn from further consumptive appropriations. This rule may be reopened to further consumptive appropriation only if further information demonstrates that such appropriations can be made consistent with the finding section (WAC 173-503-030) and the instream flow section (WAC 173503-040). If further information demonstrates that the amount in the availability determination set forth in paragraph (1) of this section should have been less than 200 cubic feet per second, Ecology will not be bound by the 200 cubic feet per second number when processing individual water right applications.

NEW SECTION

WAC 173-503-060GROUNDWATER. If the department determines that there is hydraulic continuity between surface water and the proposed ground water source, a water right permit or certificate shall not be issued unless the department determines that withdrawal of ground water from the source
aquifer would not interfere with stream flows during the period of stream closure or with maintenance of minimum instream flows. If such findings are made, then applications to appropriate public ground waters may be approved subject to the flows established in WAC 173-503-040(2).

NEW SECTION

WAC 173-503-070EXEMPTIONS.(1) Nothing in this chapter shall affect existing water rights, including perfected riparian rights, federal Indian and non-Indian reserved rights, or other appropriative rights existing on the effective date of this chapter, nor shall it affect existing rights relating to the operation of any hydroelectric or water storage reservoir or related facilities.

(2) Nonconsumptive uses which are compatible with the intent of this chapter may be approved.

NEW SECTION

WAC 173-503-080POLICY STATEMENT FOR FUTURE PERMITTING ACTIONS. (1) No rights to divert or store public surface waters of WRIA 3 and 4 which would conflict with the provisions of this chapter shall hereafter be granted, except as provided in RCW 90.54.020 (3)(a).

(2) Consistent with the provisions of chapter 90.54 RCW, it is the policy of the department to preserve an appropriate minimum instream flow in all perennial streams and rivers as well as the water levels in all lakes in the Lower and Upper Skagit watershed (WRIA 3 and 4) by encouraging the use of alternative sources of water which include (a) reuse; (b) artificial recharge and recovery; (c) conservation; and (d) acquisition of existing water rights.

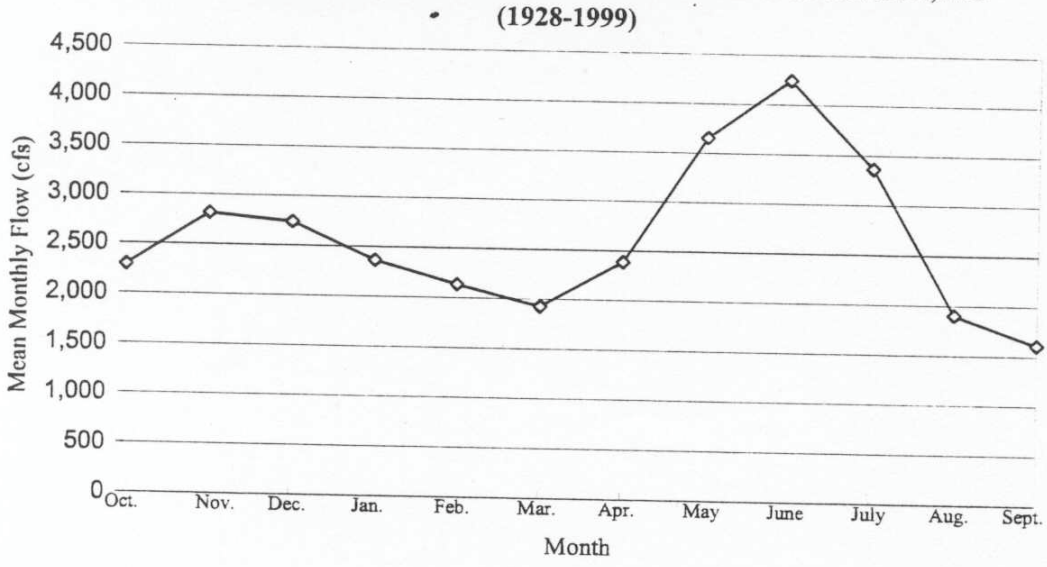
NEW SECTION

WAC 173-503-090ENFORCEMENT. In enforcement of this chapter, the department of ecology may impose such sanctions as appropriate under authorities vested in it, including but not limited to the issuance of regulatory orders under RCW 43.27A.190 and civil penalties under RCW 43.83B.335,
RCW 90.03.400, RCW 90.03.4 10, RCW 90.03.600, RCW 90.44.120 and RCW 90.44.130.

NEW SECTION

WAC 173-503-100REGULATION REVIEW. Review of the rules in this chapter maybe initiated by the department of ecology whenever new information is available, a change in conditions occurs, or statutory modifications are enacted that are determined by the department of ecology to require review.

Figure 3.3-3
Mean Monthly Unregulated Flow in the Baker River at Concrete,WA (1928-1999)



Puget Sound Energy: Initial Consultation Document, Baker River Project, FERC No.2150, page 3-15, Existing Conditions March 2002

**Table 3.3-2
Monthly Streamflow Data, Baker River at
Concrete,WA (1928-1999)**

Month	Mean Monthly Flow (cfs)	Median Monthly Flow (cfs)	Standard Deviation of Mean Monthly Flow (cfs)	Minimum Mean Monthly Flow (cfs)	Maximum Mean Monthly Flow (cfs)
Januar	2,363	2,123	1,026	650	5,103
February	2,135	1,930	1,011	500	4,831
March	1,928	1,764	694	831	4,569
April	2,386	2,419	630	1,224	3,780
May	3,651	3,568	740	2,381	5,469
June	4,243	4,043	1,103	2,450	7,964
July	3,361	2,989	1,167	1,606	6,442
August	1,904	1,745	633	1,126	4,072
September	1,612	1,539	516	864	3,037
October	2,289	2,192	967	690	5,190
November	2,818	2,660	1,413	500	7,983
December	2,739	2,530	1,151	928	5,834
Annual	2,621	2,532	418	1,709	3,541

Values represent gaged or calculated flow in the Baker River at Concrete (1928 to 1999) corrected for changes in storage in Baker Lake and Lake Shannon.

Puget Sound Energy: Initial Consultation Document, Baker River Project, FERC No.2150, page 3-14, Existing Conditions March 2002

Proposed PME Measure for the
Relicense of the Baker River Hydroelectric Project
FERC Project No. 2150

Date: February 17, 2003 **Version**: First Submittal to Working Group

Proposed Action: 5.03

Project Title: Submerged Lands

Participant Priority: Medium

Working Group: Economics and Operations Working Group

Lead Person: Lloyd Pernela

Interests:

Washington Department of Natural Resources (DNR) regulates the State's riverbeds and lakes. In that regard, DNR charges for the use of the waterway by imposing a fee based on upland activity.

Washington DNR owns property adjacent to Lake Shannon reservoir and within Town of Concrete. The correct land ownership needs to be determined:

- To define boundaries.
- To determine possible improvement sites.
- To determine proper fees, if any, for which Licensee is responsible.
- To define areas for possible resource enhancements.

Measurable Objectives:

Correct land maps and property descriptions.
Titles accurately recorded.
Determination of fees and term for which the Licensee is responsible.

Coordination with Local Government:

Work with Town of Concrete and DNR.

Present Condition:

The ownership of most of the riverbed is largely unknown and not documented. The Licensee is not paying for upland fees because the question of land ownership has not been settled to either DNR or Licensee satisfaction.

Desired Future Condition:

Settlement of land ownership and pending outcome DNR fees, if any.
Filing with title company's accurate title.

Advantages:

Removes uncertainty associated with ownership and fees.

Disadvantages:

None identified at this time.

Proposed PME Measure for the
Relicense of the Baker River Hydroelectric Project
FERC Project No. 2150

Actions Considered, But Not Moved Forward:

Rationale for the Proposed Action(s):

Settle questions of ownership and fees. Also provide ownership of lands when considering PME's, e.g. recreation, habitat.

Remaining Information Needs:

Title searches, research on old land documents.

Conflicting Interests or Unresolved Issues:

Legal ownership of riverbeds at project has not been resolved.

Responsibility for PME Implementation:

PSE under FERC guidelines must identify land ownership within the project boundary.

Potential Partnerships:

DNR and Licensee both have interests in settlement of the question of submerged land ownership.

Timing/Phasing and/or Scheduling of Proposed Action(s):

Research, legal review and negotiation of settlement. Specifics are not known at this time.

Estimated Range of Costs:

Additional title searches and legal review costs are not known at present.

Proposed PME Measure for the
Relicense of the Baker River Hydroelectric Project
FERC Project No. 2150

Date: January 31, 2003 **Version**: First Submittal to Working Group

Proposed Action: 5.01

Project Title: Coastal Zone Management Act Consistency

Participant Priority: High – denial could delay or block a new license from being issued by FERC.

Working Group: Economics and Operations Working Group

Lead Person: Rod Sakrison, Department of Ecology

Interests:

- Statutory responsibilities in floodplain management, shoreline and coastal zone management. Certification that project is consistent with Coastal Zone Management Act. (Ecology)
- Protect, restore and enhance fish and game habitat in the Baker Basin and Skagit Basin. (Tribes)
- Assure National Forest ecosystems that are sustainable, diverse and productive. (USFS)
- Protect, restore and showcase cultural and historical resources and sites associated with Baker River. (Town of Concrete)
- To educate and engage the public in protecting diverse anadromous salmon habitat in the Skagit watershed and to enhance, restore, and/or mitigate for the loss of habitat caused by human encroachment. (Skagit Fisheries Enhancement Group)
- Maintain and restore aquatic and terrestrial biological diversity and ecosystem productivity. Maintain and develop habitat connectivity to provide long-term plant and animal movement and dispersal. (WDFW)
- Maintain ability of the Baker Hydropower Project to provide life and property-saving flood protection; provide recreational and environmental benefits to the region. (Skagit County Public Works)
- Maintain and develop habitat connectivity to provide long-term plant and animal movement and dispersal. (NCCC)
- Preserve, maintain or restore, and manage the unique natural and cultural resources and associated values unimpaired and within their broader ecosystem and cultural context for the benefit, use and inspiration of present and future generations. (NPS)
- Maintain and restore aquatic and terrestrial biological diversity and ecosystem productivity. Provide for protection, mitigation and enhancement of aquatic and terrestrial species populations and habitats that would be affected by impacts from development, operation and management of the project. Maintain and develop

habitat connectivity to provide long-term plant and animal movement and dispersal. (WDFW)

- Seek to develop ecologically sustainable water management for the Skagit Watershed that protects the ecological integrity of affected ecosystems while maintaining inter-generational human needs for water and sustaining the full array of other products and services provided by natural freshwater ecosystems. (The Nature Conservancy)
- Conserve, protect and enhance fish, wildlife and plants and their habitats that continue to be affected by the Baker River Project. (USFWS)
- Others to be called out

Issue: Achieve Consistency with State's Coastal Zone Management Act, Local Shoreline Master Programs, and other applicable Ordinances.

Goals: Meet applicable Washington State Coastal Zone Management standards and local shoreline master programs and ordinances.

Proposed Actions and Measurable Objective(s):

5.01.A. Shoreline Management Act (SMA)

Puget Sound Energy (PSE) will submit a Shoreline Permit Application if there is new development within SMA jurisdiction.[1] (Begin consultation 4/04, submit Shoreline permit application and JARPA on 11/04). Review shoreline designation and project proposal with local governments. Determine if project features are compatible with designated uses in the relevant Shoreline Master Programs. Consult with local government whether new development is consistent with Critical Area Ordinances, including frequently flooded areas, geologically unstable areas, wildlife habitats, aquifer recharge areas, and wetlands. Obtain floodplain permit from local government, if required.

5.01.B. Coastal Zone Consistency Determination

PSE will submit to WDOE the Certification of Consistency with the Washington State Coastal Zone Management Program (CZMA) (begin 1/05). If Ecology objects to Certification of Consistency determination, Ecology will provide what conditions, if any, make project consistent with CZMA. Provide public notice for proposed project.

5.01.C State Air Quality Requirements

PSE will apply for and receive Air Quality permits, if required.

5.01.D State Environmental Policy Act (SEPA)

Local government will determine whom the SEPA lead agency is and if the project is exempt from SEPA (begin 1/05). PSE will submit a SEPA Environmental Checklist. PSE will assist the lead agency in deciding whether NEPA document adequate for SEPA and if NEPA scoping adequate for SEPA or

[1] Shoreline management jurisdiction is defined in Ch. 90.58 RCW. In general, it refers to streams over 20 cfs mean annual flow, within 200 feet of the Ordinary High Water Mark (OHWM), lakes, wetlands, within the 100 year floodplains, and shorelines of statewide significance.

must separate SEPA scoping occur. If SEPA document must be prepared, describe all potential impacts to characteristic uses of the waterbody, including fish and wildlife, water quality, water supply, recreation and aesthetics. Identify proposed actions to avoid and minimize detrimental impacts. Provide public notice.

Measurable Objectives:

The following permits and approvals may be required as part of this PME and will establish standards and requirements that the project will meet. Failure to provide adequate and timely applications for these permits and approvals could delay or invalidate the Determination of Consistency with the Coastal Zone Management Act.

I. Hydraulic Project Approval from Department of Fish and Wildlife under Ch. 77.55 RCW

II. Shoreline Substantial Development, Conditional Use, Variance Permit, or Exemption from local government (under the Shoreline Management Act, Ch. 90.58 RCW).

III. Floodplain Management Permits and/or Critical Areas Ordinances review by local government for work in frequently flooded areas, geologically unstable areas, wildlife habitats, aquifer recharge areas and wetlands.

IV. Section 401 Water Quality Certification from the Department of Ecology Regional office under 33 USC section 1341 of the Clean Water Act is needed when a federal approval is required for a project, including: Corps of Engineers 404 permit and FERC hydropower license. (Submit letter requesting 401 certification 4/04) Attach an applicant prepared Environmental Assessment when applying to the Department of Ecology.

V. Aquatic Resources Use Authorization Notification from Department of Natural Resources if the project is on, crosses, or impacts the bedlands, tidelands or shorelands of a navigable water.

VI. Section 404 Permit from the US Army Corps of Engineers under 33 USC section 1344 of the Clean Water Act if the project includes placement of dredged or fill material waterward of the ordinary high water mark, mechanized land clearing and sidecasting in waters of the United States, including wetlands.

VII. Section 10 Permit from the Corps of Engineers is required for and work in or affecting navigable waters of the United States.

VIII. General Bridge Act Permit from the US Coast Guard is required for construction of a new bridge or modification to an existing bridge over a navigable waterway.

Coordination with Local Government:

PSE will have to apply for and receive the required permits and approvals related to the Coastal Zone Management Act from the following local governments: Skagit County, Whatcom County and the Town of Concrete.

Present Condition:

Certification of Consistency with the state's Coastal Zone Management Act does not exist for the existing hydropower project and, if there is new construction as part of the relicensing proceeding, consistency is required before a new license can be issued by FERC. Under the current license there is currently no construction activity that requires shoreline management permits and the existing hydropower project is likely to be in compliance with the local shoreline master programs.

Desired Future Condition:

To achieve CZMA Consistency the project must be in compliance with applicable the Shoreline Management Act, state water quality requirements, state air quality requirements and the State Environmental Policy Act.

Compliance with local and state shorelands management programs and regulations will assure that modifications to the project are compatible with the policies of the local shoreline master programs and will protect characteristic uses of the waterbody, including fish and aquatic life, water quality, water supply, recreation and aesthetics. Local permitting will provide opportunities to identify proposed actions to avoid, minimize and mitigate detrimental impacts.

Advantages:

CZMA Consistency will assure that project modifications are consistent with the shoreline management policies and regulations of local and state governments. State and local permitting will also assure that new construction will occur within the requirements for health, safety and protection of the environment.

Disadvantages:

It is unknown at this time what potential actions will be undertaken as part of this and other PMEs during and following the relicensing proceeding, e.g., recreational facilities siting, wetland mitigation.

Actions Considered, But Not Moved Forward:

This PME includes the clear understanding that binds the project licensee to get the necessary state and local permits and approvals for future actions that can not be identified at present.

Rationale for the Proposed Action(s):

CZMA Consistency does not exist for this project and is required if there is new construction within the SMA jurisdiction.

Remaining Information Needs:

The location and extent of any new construction related to the relicensing needs to be identified as soon as is practicable. This will determine whether Consistency with the Coastal Zone Management Act will be required. As soon as project modifications are known, PSE shall meet with local government to determine if the modifications to the existing hydropower project as part of the relicensing proceeding constitute new construction pursuant to local government's shoreline master program and ordinances, and a shoreline permit is required. Local government will determine when a shoreline permit application is complete and will notify the Department of Ecology and FERC. For the purposes of the coordinating permits and approvals under the Federal Power Act, a complete shoreline management permit application constitutes consistency with the Coastal Zone Management Act, however denial of a shoreline management permit by local government could be grounds for the state to object to an applicant provided determination of consistency.

Information needs related to local permits and approvals will be identified through consultation with local government. Related to critical area ordinance review with local government, it is expected that a wetlands report will be required to identify any impacts to wetlands and propose appropriate mitigation and enhancement measures. The Lower Baker Powerhouse should be reviewed under the local critical areas ordinance since it is a geological unstable area and an area where future construction is expected.

Compliance with the State Environmental Policy Act is required. PSE must file a SEPA Environmental Checklist for the project. Local government will then decide whether the project is exempt; if not, local government will then make a determination of environmental significance. If there are significant adverse environmental impacts that cannot be avoided a SEPA environmental impact statement must be prepared. Local government will make a determination whether the final NEPA Environmental Assessment if adequate for SEPA. If not, local government will go through a SEPA Environmental Impact Statement scoping process.

Conflicting Interests or Unresolved Issues:

None have been identified at present.

Responsibility for PME Implementation:

PSE is responsible for PME implementation.

Potential Partnerships:

PSE is likely to enter partnerships with local and state governments, non-governmental entities, and private parties to carry out the objectives of this PME.

Timing/Phasing and/or Scheduling of Proposed Action(s):

Implementation of this PME will begin during the relicensing proceeding and continue after license issuance. A flowchart showing coordination between federal and state permits and approvals is attached to this PME. It shows scheduling and sequencing requirements for Consistency with the Coastal Zone Management Act.

Estimated Range of Costs:

Not known at present.

Proposed PME Measure for the
Relicense of the Baker River Hydroelectric Project
FERC Project No. 2150

Date: February 17, 2003 **Version**: First Submittal to Working Group

Proposed Action: 5.04

Project Title: Flood Control

Participant Priority: HIGH, determination of additional flood control storage may impact other resource values.

Working Group: Economics and Operations Working Group

Lead Person: Dave Brookings, Skagit County

Interests:

Protection and safety of people, property, farms, access and commerce in the Skagit River basin downstream of Baker River confluence.
Protection and enhancement of fisheries values in Skagit River.
Compensation for loss power generation value

Measurable Objectives:

Congress currently sets amount of storage at Baker at 72,000 acre-feet.
Another measure of flood protection is cubic second feet days, i.e., at flood flow.
Corps and Skagit County studies have developed stage damage curves for Lower Skagit. Given these it is possible to determine most desirable flood control storage at Baker.
.

Coordination with Local Government:

Communities and Skagit County have interests in securing additional flood control storage at Baker Project and Seattle City Light.

Present Condition:

Flood control is defined in current license Article 32 as

"The Licensee shall so operate the Upper Baker River reservoir as to provide each year 16,000 acre-feet of space for flood regulation between November 1 and March 1 as replacement for the valley storage eliminated by the development. Utilization of this storage space shall be as directed by the District Engineer, Corp of Engineers.

"In addition to the above-specified 16,000 acre-feet, the Licensee shall provide in the Upper Baker River reservoir space for flood control during the storage drawdown season (about September 1 to April 15) up to a maximum of 84,000 acre-feet as may be requested by the District Engineer, provided that suitable arrangement shall have been made to compensate the Licensee for the reservation of flood control space other than the 16,000 acre-feet specified herein.

Proposed PME Measure for the
Relicense of the Baker River Hydroelectric Project
FERC Project No. 2150

In 1977, Congress passed resolutions specifying the Corps should secure a total of 72,000 acre-feet of storage. Congress would have to amend. This specific resolution amount of storage and regime trumps Federal Power Act. Corps enters into a contract with Licensee to provide this storage and compensation.

Desired Future Condition:

To secure optimal additional flood control storage at Baker while meeting fisheries management (including ESA).

Advantages:

Additional flood storage would assist flood control management of Skagit River.

Baker project storage would positively mitigate damage by retaining water flowing into its reservoir(s) within a specific range of flows; i.e. Baker Project would not assist 100-year flow mitigation.

Disadvantages:

Additional flood control at Baker may interfere with Skagit River flow management for fish, i.e. releasing water to achieve storage plan and have inadequate water stored to supplement Skagit flows in lean water years.

Actions Considered, But Not Moved Forward:

Rationale for the Proposed Action(s):

This is an opportune time to review the values of increasing storage at Baker Project. Skagit County and Corps have extensive studies of floods and damage to Lower Skagit for different flood stages.

Remaining Information Needs:

A study plan is being prepared to analyze benefits and costs, if any, of increasing flood control storage at Baker Project.

Conflicting Interests or Unresolved Issues:

Management of the Skagit for fish may be impacted by this PME which would place more water into the Skagit during critical spawning and incubation periods and in addition would lessen the amount of water available to cover fish during the incubation and emergence periods.

The provision of more storage would lower the reservoir elevation, thus reducing the net effective head to the turbines for power generation. In addition, by shuffling water release into late fall, it would not be available in the winter, which is historically been the highest needs for power for Licensee's customers. Both of impact Licensee's value received for power and may require Licensee to purchase power on the open market (e.g. winter season).

Responsibility for PME Implementation:

Historically the Army Corps has been responsible for flood control at Baker Project. This is part of Flood Control Act of 1962. Until that time Congress changes their 1977 resolution the current amount, regime and compensation remains. And is the responsibility of the Corps. Skagit County has indicated they would submit a request to the Corps to amend the current congressional mandate.

Thru licensing, it appears (legal analysis forthcoming) additional flood control can be provided thru a settlement agreement with FERC's concurrence. If so, then PSE would be responsible for implementation. Compensation for power losses is an issue to be resolved.

Potential Partnerships:

Skagit County (and local communities) has real interests in mitigating for flood control.

Timing/Phasing and/or Scheduling of Proposed Action(s):

Estimated Range of Costs:

Not known at present.