FINAL - Meeting Summary Notes
Lewis River License Implementation
September 25, 2006
Fish Passage Meeting Notes

Subgroup Participants Present: (18)
Sean Flak, PacifiCorp (Merwin Trap portion of meeting only)
Frank Shrier, PacifiCorp
Todd Olson, PacifiCorp
Arnold Adams, PacifiCorp
Will Shallenberger, PacifiCorp (late arrival during Merwin portion of meeting)
Eric Kinne, WDFW
Pat Klavas, WDFW
John Weinheimer, WDFW
Jim Stow, USFWS
Monty Nigus, Black & Veatch
Ken Bates, Kozmo
Dana Postlewait, R2 Resource Consultants
Peter Christensen, R2 Resource Consultants (late arrival during Merwin portion of meeting)
Suzanne Picard, R2 Resource Consultants
Curt Leigh, WDFW (via phone/web conference, late arrival during Merwin portion of mtg)
Bryan Nordlund, NOAA Fisheries (NMFS) (via phone conference)
Lisa Larson, NW Hydraulics (via phone/web, Swift Downstream portion of meeting only)
Brian Friesz, Black & Veatch (via phone/web, Swift Downstream portion of meeting only)

ADMINISTRATIVE

Welcome of attendees and review agenda.

FERC License Schedule Update - Frank Shrier received the U.S. Fish and Wildlife Service Biological Opinion (BiOp) on Friday, 9/22/2006, which has been forwarded to the Federal Energy Regulatory Commission (FERC). The NOAA Fisheries BiOp should be ready and transmitted to FERC very soon. The Washington Department of Ecology (DOE) 401 certificate for the projects should be signed within the next week, and it will also be forwarded to FERC once it's signed. The license schedule will be updated after the signed 401 has been submitted. Assuming FERC will need 60 days to process everything, the license could be completed by December 1st or shortly thereafter.

NEXT MEETING

- The next meeting is scheduled for 9:00 am - 4:00 pm, October 31st, at the Merwin Hydro Facility.

FUTURE MEETING DATES

As a reminder, future meeting dates to be held at the Merwin Hydro Facility were set for:

- Tuesday, December 12, 2006 – 9:00 AM to 4:00 PM
- Tuesday, January 23, 2007 – 9:00 AM to 4:00 PM
- Tuesday, March 6, 2007 – 9:00 AM to 4:00 PM
- Tuesday, April 17, 2007 – 9:30 AM to 4:30 PM (note late start)
- Tuesday, May 29, 2007 – 9:00 AM to 4:00 PM

MERWIN TRAP PROJECT

Merwin Handouts

Distributed via email on 9/20/2006 from Kim McCune:

- Draft review version of 8/8/06 meeting notes with comments received prior to this meeting incorporated and email notes attached.
- Meeting agenda for 9/25/06 subgroup meeting.
- Merwin Sorting Facility Scope Definition Document

Distributed at meeting 9/25/2006 (paper copies):

- Merwin Fish Trap Improvements, site plan drawing showing fish location zones from the tailrace behavior study. 1 page, 11x17 dated 9/22/06.
- Facility Design Criteria – Final, Revision 2 dated 9/22/06, selected inserts only. 7 pages, 8 ½ x 11.
- Merwin Fish Trap Improvements, Existing Plan drawings dated 9/22/06. 8 pages, 11x17.
- Merwin Fish Trap Improvements, Presort Tank Schematic Layout and Sorting Facility Schematic Layout drawings dated 9/23/06. 2 pages, 11x17.

Presentations

- PowerPoint presentation by Frank Shrier on the results of the tailrace fish behavior study.

Review of Previous Meetings' Merwin Project Action Items: See status summary table below.

Merwin: Meeting Action Item Summary

No.	SUMMARY OF PENDING MERWIN ACTION ITEMS (remaining from May 17th, June 17th , and Aug 8th Meetings	STATUS
M1	PacifiCorp/B&V/WDFW: Upper Release and Constructed Channel Design Input and Details. See information in review of the April 12th meeting's action items. Waiting for final flow distribution and clarification of goals for the constructed channel.	Design info is now available and design has been restarted. Update next meeting.
M2	PacifiCorp (Shrier/Flak): Investigate the need for a minor amendment to the SA to address interim safety improvements to the fish trap. PacifiCorp will address in the future, in coordination with the ACC.	Pending – future item. Plan is to wait and compile any other SA amendments if applicable.
M3	R2 (Postlewait): Prepare draft calc showing size needed for recovery pond, for discussion at next meeting.	Done. Discussed at Sept 25th meeting.
M4	PacifiCorp (Shrier): Coordinate to address Bryan's comments regarding needing both biology and engineering support for development of the ATE Standards. Bryan wants input from Michelle Day and ACC biologists with this task, in addition to the engineers. Still pending – Results from Chinook data are needed to develop ATE Standards.	Done. Frank presented at ACC meeting on Sept 14th and at Sept 25th subgroup meeting.
M5	PacifiCorp (Shrier): Draft recommendation to the ACC to present the tank configuration recommended by the Engineering Subgroup (four 3,000 gallon tanks, four 250 gallon tanks, and one 400 gallon fish trailer for the sorting facility). Note that design is OK to move ahead while Frank updates the ACC.	Pending
M6	PacifiCorp (Flak): Notify Curt Leigh of any hatchery planning meetings related to criteria and SA terms. Sean plans to set up repeating meetings.	Done
M7	R2 (Postlewait): Call Mark LaRiviere at Tacoma Power to request an updated brief on the Cowlitz Salmon Hatchery sorting facility redesign.	Done

M8	PacifiCorp (Shrier) Frank will coordinate with Bryan Nordlund (NMFS) about evaluating Cramer's population model in an attempt to discern whether an ATE of 98% (vs. an ATE of 92%) would have a significant impact on projected fish population.	Done – discussed at 9/25 meeting.
M9	PacifiCorp (Flak) Consider bringing Ken Bates into the conversation on ATE Standards at Merwin.	Pending
M10	PacifiCorp (Flak) Update Engineering Subgroup Meeting Schedule and Goals to reflect a 30-day turn-around for all steps involving the ACC.	Done. Design team will update schedule at each future meeting.
M11	PacifiCorp (Shrier, McCune) Post available trap entrance data on the web to make available to Subgroup.	Done
M12	Subgroup Members (All) Complete review of Merwin Fish Sorting Facility Scope Definition document and provide any edits to Sean Flak.	Done – discussed at 9/25 meeting. This will be a living document throughout the design.
M13	PacifiCorp (Flak/Adams) Develop scheduling contingency plan to coordinate fish trap access and routing powerhouse maintenance.	Take off action list – details will be provided with site plan layouts.

Additional Comments on Last Meeting's Merwin Meeting Notes:

1. Under ATE Standards, 4th bullet: Bryan would like to add "to meet the ATE standards" to the bullet.
2. Under ATE Standards, 5th bullet: Bryan asked that the sentence be revised to read : "The group agreed that it would be beneficial for Ken Bates to get involved with the discussions regarding the ATE standards for the Merwin Trap Project, and PacifiCorp will consider adding Ken to the team.
3. Under Tailrace Fish Study Summary, 2nd bullet: Bryan expressed additional concern that fallback may be due to the trap not being emptied with sufficient frequency. Fish may be reluctant to enter a crowded trap. The phrase "due to not emptying it frequently enough" will be added to the second sentence.

MERWIN TRAP AGENDA TOPICS

Tailrace/Entrance Goals

- Cramer's Population Model

  Frank Shrier presented an overview of the results of the Pop-Cycle model, with the following points highlighted:

  - The model simulates a projected population over 100 fish generations.
  - The sensitivity analysis model runs requested by the subgroup have been completed. Runs were made assuming ATE's of 95%, 80%, 70%, and 60% to estimate the impacts on a self-sustaining population.
  - The model predicted success at meeting population goals using a 95% passage efficiency at all three dams (representing the potential future build-out condition with upstream fish passage facilities at each dam). (Side note: 95% ATE at each dam results in an overall upstream ATE of 85.7% [$=0.95^3$]).
  - The model predicted failure to meet target self sustaining population goals using an 80% efficiency at all three dams (side note: $0.80^3 = 51.2\%$ overall system upstream ATE). The predicted populations were only half as large as the desired target populations with the 80% ATE assumption.

- Tailrace Behavior Study

  Frank Shrier presented an overview of the results of the fish behavior study. The complete overview was presented using the same PowerPoint presentation that was presented to the ACC on September 14th.

  The tailrace behavior study has been completed. The study went from Aug 2005 through June 2006, and looked at Summer Steelhead, Coho, Winter Steelhead, and Chinook. The study had 5 objectives:

  Objective 1: Count Fish.

  - The hydro acoustic and DIDSON methods were not able to provide a reliable count of the number of fish in the tailrace. The study was therefore completed using radio telemetry.

  Objective 2: Estimate the number of trap entry attempts made by fish at the tailrace.

  - Estimates were made by review time-lapse video of the trap entrance.

Objective 3: Estimate the number of adult fish that enter the trap and become captive.

- Radio tag data was used to compile these statistics.
- Bryan considers ATE to be 2-fold: ATE can either be looked at as the percentage of time a fish spends in the tailrace as a function of river flow or it can be looked at as the percentage of time a fish spends in the tailrace as a function of which generation units are in operation at the time. However, PacifiCorp's study was designed to develop ATE to best meet the definition in the SA stating, "[ATE is] the percentage of adult Chinook, coho, steelhead, bull trout, and sea-run cutthroat that are actively migrating to a location above the trap and that are collected by the trap"
- Frank pointed out that fish had much more success at entering the trap at higher tailwater elevations. At low tailwater elevations the jump to the trap entrance could be as much as 3-4 feet.

Objective 4: Determine which tailwater conditions impede passage.

- Radio tag data was used to determine where fish were located within the tailwater. The study defined 7 zones, or specific areas in the tailwater, as shown on the site plan handout.
- Generally speaking, having Unit 1 on brings fish closer to the dam, and influences where they were observed within the tailrace. Summer Steelhead, Coho, and Chinook are more likely to be found in Zone 4 (at the face of the dam) when Unit 1 is on, as compared to when Unit 1 is off.
- Fish only spend a few hours in the tailrace, on average.
- The team discussed the potential study bias due to using fish which had already experienced the trap, expressing concern that the fish may have memories of the trap which could skew the data. Efforts were made to catch fish downstream of the trap, but neither hook and line nor gill netting was successful. Consequently, all fish used in the study had previous experience with the trap. Frank reported his and the study biologists belief that the data is reliable, and no types of expected bias were observed.

Objective 5: If tailrace conditions preclude trap entry or cause migration delay, what locations would be preferred for a new trap entrance?

- The tailrace behavior study indicated that the fish trap entrance location along the face of the powerhouse seems to be appropriate to provide fish an opportunity to find an entrance, as fish were observed along the length of the powerhouse at various flows.

Tailrace Behavior Study Conclusions:

- There was no evidence that operation treatment caused any delay in fish passage.

- All stocks changed their use pattern depending on whether Unit 1 was on or off. The changes in use patterns were not the same for all species, as reported in the presentation.
- The current trap has limitations with respect to capture for Coho and Chinook.

General Discussion:

- Jim Stow expressed concern that the reverse eddy that occurs during spill near the trap entrance may be a deterrent to fish. PacifiCorp has made reasonable effort to measure velocities in that eddy, but the water is too bubbly for their instruments. The study indicated some fish in this area, but also noted that fish are found along the face of the powerhouse.
- Bryan Nordlund expressed concern that the fish which never made it back to the trap were removed from the study. It would be helpful to know what happened to them. Frank stated that a ~50% recovery rate is normal for this type of study and there is no practical way to recover the missing fish. He related information on several of the fish that were recovered from other fisheries downstream of the release point.
- The ACC recommended a 95% ATE based on Cramer's model and the fish behavior study analysis and discussion at the September 14th meeting. The Engineering Subgroup is to determine the best course of action toward achieving 95% ATE, and provide the ACC an opinion on how likely it is that we can achieve the desired 95% ATE goal. The finalization of a final ATE goal for the project will be decided once the subgroup reports back to the full ACC with entrance options and an opinion on likelihood of success.
- Dr. MaryLouise Keefe (R2), who completed the tailrace behavior study, feels very strongly that the design team is on the right track in locating fish entrances near Units 2 and 3.

(Break 10:45 – 11:00)
(Curt Leigh joins the group by phone/web conference)

Fishway Entrance Design

- Dana Postlewait reviewed and discussed the changes in the Design Criteria document. Handout, Revision 2 dated 9/22/06. The key changes included the datum adjustment to the tailwater rating curve, and identification of proposed design elevations/flows for the upstream trap entrance. The flow criteria for the fish trap holding facility was also revised due to the recent email from Bryan Nordlund which noted a change to the latest draft NMFS criteria.
- Frank noted that the highest flood of record occurred in 1933 and was 129,000 cfs. The 1996 flood was 109,000 cfs.
- The design goal is to have the trap operating at the low observed tailwater condition, and at the high tailwater elevation corresponding to the 5% exceedance flow. This flow

would represent an elevation of 55.7 ft, at a flow of approximately 21,000 cfs. Given the 11,470 cfs capacity, this design elevation would correspond to a 9,530 cfs spill, which is currently at the approximate flow that bridge access is closed due to excessive spray at a spill of approximately 9,000 to 10,000 cfs.

- It may be necessary to shut the trap down during flood events to protect it from damage by debris. The conceptual design will identify the highest feasible intake elevation in the existing concrete fishway limits.
- The flow velocities in the reach just below the bridge may a velocity barrier at high flows. Frank Shrier has a depth profile of the river below the bridge; the team should check the hydraulics under the bridge at high flow.
- Bryan Nordlund verified the 0.69 gpm/adult fish criteria change in the criteria document revision.

Existing Trap Entrance:

- Dana presented photos, the drawing handouts, and explained the existing trap configuration. Though there are currently 3 trap entrances, entrances 2 and 3 have been closed since the 1970's. Possible reasons for the closure include maintenance logistics due to debris and inconvenient access. The pumps accompanying entrances 2 and 3 were last exercised in 1999. Electrical modifications have since rendered the pumps inoperable. The screens on the existing pump intakes are perforated plate, and it is not likely that they meet current criteria. The original trap entrance operated as an overflow weir with a finger weir, rather than the current fyke configuration.
- Previously, there was also an overflow weir used to attract the fish into the fish elevator. Chinook were reportedly deterred by this weir, although other species were reported to enter it well. Frank Shrier will see if he can find any other anecdotal information on the elevator entrance. Currently fish are manually crowded into the elevator after turning the trap off and pumping the fish channel water surface down to allow access into trap area.
- Fish have an easier time entering the trap at higher tailwater elevations. Total head over the weir was measured at 3 to 4 feet during the fish behavior study at low tailwater elevations. It would be beneficial to operate the fyke entrance lower than it is currently being operated.
- The pickets in the approach gallery designed to be porous, consequently, the water slows down a lot between entrances. Making the barriers solid would improve flow through the gallery to enhance guidance to the trap.
- Limiting Factor: Currently, it is necessary to close the fish entrance to empty the trap.

Proposed Configuration #1:

- Add an adjustable false weir at the entrance.
- Add a second adjustable false weir leading from the entrance to a new, solid fish transport channel leading to the fish elevator.

- Replace the pickets inside the gallery with solid walls and floors in the transport channel to create a uniform attraction flow towards the trap.
- The ceilings in the gallery are too low to accommodate the high flow entrance elevation goals. The conceptual design will show the highest feasible elevation.
- Change entrance gate to work as a weir at lower flows and possibly as an orifice at higher flows to maximize the "fishing" elevation. A second gate closing from the top of the entrance will be examined to protect the fishway from debris and turbulence associated with high flows.
- Jim Stow suggested punching in to the well to the pump room instead of trying to retrofit the existing entrance for low flows.
- Ken Bates suggested trying to use the old pump bays as fish entrances for low tailwater elevations.
- The group also discussed using a mix of entrances for varying depths (i.e., entrances 2 and 3 could operate as a separate system for higher flows, and any of the pump bays could be used for a low entrance.
- Another possibility includes putting a fourth entrance on the far side of the dam.

General Discussion:

- Curt Leigh and Ken Bates discussed that it may be worthwhile to design a new entrance from scratch in order to meet the 95% target ATE goal.
- Frank Shrier noted that he can ask MaryLou Keefe to correlate tailwater elevations relative to her observed ATE. The data is available, but was not examined to this level as part of the study.
- The study shows that fish are spending the majority of their time in the 7 zones, and not elsewhere in the tailrace. Frank explained that, although the 7 zones did not cover the entire tailrace area, the team felt they had tracked all of the radio tagged fish, so they were known not to be holding outside of these zones for the most part.
- The idea of installing a fishway entrance below the bridge was discussed before this meeting. There are concerns that spill would be aimed directly at the fishway location, that would be at risk of damage.
- The design team will continue with development of the above ideas, and an interim review will be held to identify the best alternatives to proceed.

Sorting Facility

Dana handed out conceptual drawings, and discussed preliminary concepts for the sorting facility.

- The pre-sorting pond would receive fish from the fish elevator, via a flume/pipe, that would empty into the pre-sort pond following a coarse graded flume dryer to reduce the energy dissipation and size needs of the pond.

- Jim Stow expressed concerns about the length of the flume and asked that the ACC biologists should confirm this idea. Dana responded that the overall site plan and evaluation of other sorting facility sites and transport options was completed early last year, with no comments received on the flume. The current site provides the best overall compromise given all of the site constraints. The design team will provide more specific details on the transport flume, and this will be discussed at a future meeting. It was noted that the exposure time will be relatively short given the fish transport velocity of approximately 8 ft/sec.
- The pre-sorting pond would be divided into two sections. The first section would have a volume sufficient to hold half of the peak daily run, such that the trap could be fishing overnight, and sorting begun in the morning. The second section has initially been sized to holds 1/3 of the peak daily run, as this section will be actively used to route fish through the anesthetic tanks and sorting processes.
- The exit from the pre-sorting pond is envisioned as a false weir, with multiple crowder leaves to help route fish through the facility in the order they enter.
- The sorting facility includes an electro-anesthesia system similar to the Bonneville dam sorting facility.
- In general the subgroup agreed with the concept, and felt that design could continue. Dana asked WDFW and others to review this concept closely, and provide comments to him ASAP as he and Monty Nigus plan on developing the sorting facility further for the next meeting.

(Lunch 1:00 – 1:15)
(Sean Flak leaves the meeting)

PENDING ACTION ITEMS
The following table provides a summary of all pending action items for the Merwin project.

Merwin: Meeting Action Item Summary

No.	SUMMARY OF PENDING MERWIN ACTION ITEMS (remaining from previous meetings)	STATUS
M1	PacifiCorp/B&V/WDFW: Upper Release and Constructed Channel Design Input and Details. See information in review of the April 12th meeting's action items. Waiting for final flow distribution and clarification of goals for the constructed channel.	Design info is now available and design has been restarted. Update next meeting.

M2	PacifiCorp (Shrier/Flak): Investigate the need for a minor amendment to the SA to address interim safety improvements to the fish trap. PacifiCorp will address in the future, in coordination with the ACC.	Pending – future item. Plan is to wait and compile any other SA amendments if applicable.
M5	PacifiCorp (Shrier): Draft recommendation to the ACC to present the tank configuration recommended by the Engineering Subgroup (four 3,000 gallon tanks, four 250 gallon tanks, and one 400 gallon fish trailer for the sorting facility). Note that design is OK to move ahead while Frank updates the ACC.	Pending
M9	PacifiCorp (Flak) Consider bringing Ken Bates into the conversation on ATE Standards at Merwin.	Pending
	NEW ACTION ITEMS (From September 25th Meeting):	**STATUS:**
M14	PacifiCorp (Shrier). Send depth profile below the bridge to design team.	Done. McCune emailed to Subgroup on 10/4/06
M15	Design team (Postlewait/Nigus). Review hydraulics under bridge at 21,000 cfs to determine if velocity is a barrier to upstream migrants.	Pending
M16	PacifiCorp (Shrier). Try to track down more anecdotal information on the weir that used to be at the entrance to the fish elevator.	Pending
M17	R2 (Postlewait). Provide sketches of alternate fishway entrance designs.	Pending
M18	R2/BV (Postlewait/Nigus) Provide more detail on the fish sorting facility design concepts. Examine options for pump bay control room, pump inlets along powerhouse, and maybe at the blockouts for Unit 4, in addition to the existing fishway channel options.	Pending

SWIFT DOWNSTREAM PASSAGE PROJECT

Handouts

Distributed via email on 9/24/2006:

- Agenda and meeting notes as described for Merwin.

Distributed at meeting 9/25/2006:

- Table 1: Biological Criteria for Swift Sorting and Transport Design, 1 page, 11 x 17.
- Swift Downstream Passage - Fish Handling Process Diagram, 1 page, 8 ½ x 11.
- Swift Downstream Passage FSC Alternative Drawings, 7 pages, 11 x 17.
- Updated Criteria Tables and Figures on FSC operating water levels, reservoir water levels, FSC entrance criteria, FSC screen criteria, FSC fish transport criteria, and fish holding criteria, 6 pages, 8 ½ x 11.

Presentations

- PowerPoint presentation by Will Shallenberger providing an overview on the Swift project to brief new subgroup participants.
- PowerPoint presentation on the CFD model update.

SUMMARY OF PENDING SWIFT ACTION ITEMS (Remaining from August 8th Meetings):		**STATUS:**
S1	PacifiCorp (Shrier) Develop more formal presentation of fish study results (AQU 14A and AQU 14B) for presentation to the ACC (Sept 14th) and the Engineering Subgroup (Sept 25th). Frank will distribute the figures prior to the next meeting.	Done. McCune email website link to ACC & Subgroup on 10/4/06
S2	PacifiCorp (Shrier) Look into means to test passive separator concept.	Pending. Frank is in discussion with ACC and is developing biological test plan.
S3	PacifiCorp (Shrier) Provide input for Release Pond protocol to define holding period and type of fish release (volitional vs. active). Frank will seek input from Michelle Day on this matter.	Done. M. Day will write a 24-hr holding period with volitional release into the NMFS BIOP.

S4	PacifiCorp (Shrier) Discuss desired fry separation goal with Michelle Day (i.e. what percentage of fry separation is acceptable).	Pending
S5	PacifiCorp (Shrier) Determine whether it's acceptable to dipnet bull trout from the sorter.	Done. Dipnet OK per ACC. Anticipate peak of 2 to 4 fish per day.
S6	R2 (Postlewait) Dana to update Fish Process diagram by Thursday (Aug 10)	Done
S7	R2 (Christensen) Need to develop operation plan for the FSC below minimum reservoir water level of 915'.	Done. 915' is no longer under consideration. The low design elevation will be as low as possible given siting and CFD model results.
S8	R2/PacifiCorp (Shrier/Christensen) Use results from CFD model to evaluate FSC entrance geometry and entrance flow rate. Completion of model expected in early October. Verify that 300 cfs will create a "hydraulic footprint".	Pending. CFD is not yet complete.
S9	PacifiCorp (Shrier) Begin work on FSC M&E Plan and begin discussion on how to evaluate the FSC capture efficiency.	Pending. In progress.
S10	NMFS (Nordlund, Christensen) Provide sketches and information from the Rocky Reach Bypass System geometry.	Pending. Will, Frank, and Peter visited the site last week and drawings have been requested from Chelan.
S11	PacifiCorp (Shallenberger/Christensen) Consider site visit to Rocky Reach dam	Done.

(Lisa Larson of NW Hydraulics and Brian Friesz of Black and Veatch joined the group via telephone/web conference at the beginning of the Swift Downstream Passage portion of this meeting.)

Additional Comments on Last Meeting's Swift Meeting Notes:

1) Bryan Nordlund would like the CFD model to determine which FSC entrance flow is most appropriate. He pointed out that the 300, 600, 900 cfs entrance flow values were preliminary. Under FSC Entrance Criteria, 2nd bullet, add: "to intercept the fish tracks" to the end of the 1st sentence.
2) Under FSC Entrance Criteria, 9th bullet, Bryan clarified his previous point. He would like the team to consider provisions to over-design the system. For example, if the CFD model indicates that 900 cfs creates a sufficient hydraulic shadow, the team should consider a design of about 1,000 cfs with the flexibility to operate at 900 cfs. The text in the notes is OK as is.
3) Under FSC Entrance Criteria, 10th bullet, Bryan clarified his previous point to state that criteria in excess of the normal 0.4 fps would be considered if biological data from the FSC after installation indicated that fry are not present. Otherwise, he recommends we target the 0.4 fps as a maximum.

SWIFT DOWNSTREAM AGENDA TOPICS

Will Shallenberger presented an overview PowerPoint of the Swift Downstream project to familiarize Jim Stow and John Weinheimer with the design.

Fish Number and Sorting Protocol Input/Approval from ACC

- Todd Olson outlined the three main comments from the ACC based on their review at the September 14th meeting:
  - WDFW would like to see provisions for a PIT tag detector in addition to the CWT detector.
  - The Forest Service was interested in how the team intended to separate fry from smolts.
  - WDFW was also interested in how the team intended to deal with hatchery rainbow trout.

- The ACC approved the design fish numbers as presented at the last meeting. The 30-day review period has ended.
- Hatchery rainbow trout are a concern because they are a harvestable stock, and there are restrictions on releasing previously anesthetized harvestable fish. This issue is further incentive to prevent anesthetizing all fish which enter the FSC fish sorter. The team will seek a method of passive separation that can successfully separate the rainbow trout and route them back to the reservoir without anesthesia.
- Hatchery rainbow trout can be harvested from the last week of April through October. This overlaps with the smolt season.
- Erik Kinne and John Weinheimer will research available size (especially girth) of hatchery rainbows and possible outmigration or collection numbers likely to be seen at

Swift to assist in designing the passive sorting mechanism. They will research available information at Cowlitz Falls and Mayfield.

- Peter Christensen will research whether PGE captures hatchery rainbow trout in their collector at North Fork Dam on the Clackamas River.
- Ken Bates pointed out the benefit of being able to track fish movements at key locations within the FSC. He suggested maintaining provisions for PIT tag detectors or radio tag equipment, and to coordinate closely with development of the M&E plan during the facility design.

CFD Model Update

Lisa Larson and Will Shallenberger walked through the PowerPoint presentation of the CFD summary.

- The CFD model will be tested by comparing the computer simulation generated by the model to actual velocity data collected in the reservoir using an acoustic Doppler velocimeter. This portion of the modeling is currently under way. The comparison will be done at a reservoir elevation of 1,000 ft.
- The basic geometry and mesh for the model have been completed. Lisa Larson will provide additional updates on the modeling progress at the October 31st, 2006 subgroup meeting.
- There will be 3 baseline tests once the model is completed per the CFD testing plan, with reservoir elevations of 1,000 ft, 960 ft, and 900 ft. In all three cases the powerhouse discharge will be the maximum for that elevation.
- After the baseline tests have been completed, Phases II – IV will commence:
    - Phase II – Modeling the 2 different collector locations with varying collector flows.
    - Phase III – Completing any additional modeling that may be needed, depending on the results of the previous model runs.
    - Phase IV – Documenting the final collector location.
- Jim Stow voiced concern that the upper end of the velocity scale in the model graphic may be too low. Above 0.25 ft/s the area is entirely red and you can not differentiate higher velocities. Lisa Larson agreed to look into the scaling issue and to provide better differentiation.
- The CFD model is expected to be complete enough by November to provide a relatively reliable forebay flow profile.

Preliminary FSC Layouts

Peter Christensen handed out FSC preliminary layout drawings, and presented the design concept to the subgroup for 4 operating conditions, and one alternate layout involving an additional pair of primary dewatering pumps. The following points were documented in the discussion.

- "CES" = Collection Enhancement Structure. This refers to the structure at the entrance of the FSC which widens and deepens the collection area and produces collection velocities which more closely match the ambient velocities in the area. This is similar in concept to the "Net Transition Structure" used in the Baker FSC design, and would be called that if the Swift FSC design had nets like the Baker facility.
- The holding pools shown on the FSC Alternative Drawings are only schematic placeholders at this time. Additional work will be done on the sorting and transport facility to better define the required space.
- Jim Stow – Pelton Round Butte has a good example of a passive fish separator. Peter will call PGE for more information.
- Bryan Nordlund noted that a more detailed hydraulic modeling and design effort will be necessary to determine whether the FSC's dewatering pumps need to be isolated in separate pump chambers.
- The fish screen baffles will likely be sliding perforated plate type.
- The approach velocities shown on the FSC alternative drawings are based on the conservative assumption that only 87.5% of the gross screen area will be functional. Actual approach velocities may be slightly lower based on this conservative assumption.
- Given the current FSC geometry, capture velocities of 7 ft/s and 8 ft/s are achievable. A velocity of 9 ft/s may not be achievable without significant modification to the layout.
- There is a drop in sweeping velocity after the capture point in the current concepts for the FSC. Rocky Reach had some issues with fish escape in their previous prototype collector, and also had a velocity dip. The difference, however, is that at Rocky Reach the drop in sweeping velocity occurred before the capture point. It is not certain whether the velocity drop in the FSC would result in a problem with fish escape. Bryan noted that biological testing would likely be required before he's convinced that 7 ft/s is an adequate velocity for fish capture. Bryan agreed that if it can be shown that fish truly are captured then a subsequent velocity drop would be acceptable.
- Ken Bates noted that you can not define the flow, velocity, depth and width of a channel if values do not work together. We will need to prioritize the design criteria for the likely event that we will not be able to meet all of them.
- The fish screen and floor slope angles vary by less than 4 degrees in order to discourage flow separation and achieve a flow cross-section as close to laminar as is reasonably possible. This is to prevent the creation of potential fish holding areas.
- Bryan is concerned that the location of the pumps may have a significant impact on the flow cross-section and that the calculated average screen approach velocity may not be representative of actual flow conditions.

(10 minute break)

- The impellers on the currently selected dewatering pumps could be switched out for a different trim in order to increase the FSC flow capacity by approximately 100 cfs. This may be helpful in testing the attraction characteristics of a higher collection flow after

construction. Alternatively, Peter showed a layout that includes an extra pair of primary pumps that could be used to add 100 cfs to the overall collector flow, although the primary screen approach velocity would exceed 0.4 ft/s.

- A flexible baffle system would be desirable to help fine-tune the screen hydraulics.

Peter noted that two other design concepts were considered resulting in the following conclusions:

- The first alternate layout involved allowing the dewatering screen approach velocity to exceed 0.4 ft/s whenever the sweeping velocity exceeds 4 ft/s, with the limit that the approach velocities not exceed 10% of the sweeping velocity at that location. The analysis found that this did not affect the length of the secondary (pre-capture) screen section since the length of that section is dictated by the velocity increase criterion of 0.2 ft/s/ft, and not by how fast you can get the water out through the screens. There is a small benefit in the tertiary (post-capture) section of the channel in that if the velocity change criterion no longer applies in this section then the length is dictated by how fast you can get the water out, and increasing the screen approach velocity can reduce the length of this section by about 10 feet. Will noted that PacifiCorp is unlikely to pursue this modification any further.
- The second alternate layout involved eliminating the tertiary (post-capture) screen section and dropping the fish over a capture weir into an energy-dissipating holding/dewatering pool earlier in the system. The consensus of the design team was that the magnitude of flow that would be required to ensure that the fish move over this capture weir without rejection would result in a very high energy level and turbulence in the holding pool, complicating the ability to mildly dewater the flow from the pool and to safely hold the fish over extended periods. Additionally, the size requirements of this pool would likely exceed the length of the tertiary screening channel in the current layout, resulting in a higher cost.

Criteria Discussion

Peter handed out and led a discussion on the updated tables and figures on FSC operating water levels, reservoir water levels, FSC entrance criteria, FSC screen criteria, FSC fish transport criteria, and fish holding criteria.

- 915' is no longer considered the minimum design operating water surface for the FSC. The team will identify the lowest possible operation level (likely below Elev 915) based on physical constraints, and on CFD model results on sediment suspension, etc.
- The calculated screen exposure time is shown on each of the FSC velocity profile drawings.
- The minimum depth of flow through the fish capture section of the channel is determined by the Froude number required to prevent supercritical flow. The maximum corresponding Froude number target is 0.8.

- The minimum width of the fish capture section of the channel is listed in the criteria as 1.5'. The current design shows a width of 2'-3" tapering to 2'-0" through the capture section. The Baker design is currently 2'-6" wide.
- In general, the fish capture section geometry will be determined by the group's best judgment due to the lack of pre-existing criteria and projects.
- Bryan attended a surface collector workshop put on by the Corps of Engineers. A presentation on the Cowlitz Falls collector suggested that a velocity of 7 ft/s may be insufficient to capture fish. Bryan will try to get a copy of the Cowlitz Falls presentation to share with the group. Peter and Lisa noted that they had seen a similar presentation on the Cowlitz Falls facility at HydroVision this summer and got the impression that the fish were rejecting the facility upstream of the capture location. Ken suggested we invite Tacoma Power representatives to provide an overview of what they've learned this year at the Cowlitz Falls project.
- The group agreed that it would be helpful to show project characteristics for other projects next to the current design values. Projects to show could initially include: the Baker FSC design, Rocky Reach, the Round Butte surface collector design, and Cowlitz Falls.

Upper Release Channel Update

- The regulatory side work has been completed.
- Additional updates will be provided during the next meeting.

PENDING ACTION ITEMS FOR SWIFT

The following table provides a summary of all pending action items for the Swift Project.

No.	SUMMARY OF PENDING ACTION ITEMS FOR SWIFT (remaining from May 17th and June 17th Meetings	STATUS
S1	PacifiCorp (Shrier) Develop more formal presentation of fish tracking study results (AQU 14A and AQU 14B) for presentation to the ACC (Sept 14th) and the Engineering Subgroup (Sept 25th). Frank will distribute the figures prior to the next meeting.	Pending. Kim to post figures with fish tracks on PacifiCorp web site.
S2	PacifiCorp (Shrier) Look into means to test passive separator concept.	Pending. Frank is in discussion with ACC and is developing biological test plan.
S4	PacifiCorp (Shrier) Discuss desired fry separation goal with Michelle Day (i.e. what percentage of fry separation is acceptable).	Pending
S8	R2/PacifiCorp (Shrier/Christensen) Use results from CFD model to evaluate FSC entrance geometry and entrance flow rate.	Pending. CFD is not yet complete.
S9	PacifiCorp (Shrier) Begin work on FSC M&E Plan and begin discussion on how to evaluate the FSC capture efficiency.	Pending. In progress.
S10	NMFS (Nordlund, Christensen) Provide sketches and information from the Rocky Reach Bypass System geometry.	Pending. Will, Frank, and Peter visited the site last week and drawings have been requested from Chelan.
	NEW ACTION ITEMS FOR SWIFT (From Sept 25th Meeting):	**STATUS:**
S12	R2 (Christensen) Put together a short summary memo on the Rocky Reach site visit. Include photos, any available drawings and key points relevant to Swift.	Pending
S13	WDFW (Kinne, Weinheimer) Provide available size and likely abundance information on the hatchery rainbow trout in the reservoir. Provide length, weight, and girth information. Also provide likely number of fish that may try to move out of the system by comparison to Cowlitz Falls and Mayfield.	Pending

S14	R2 (Christensen) Peter Christensen will research whether PGE captures hatchery rainbow trout in the collector at North Fork Dam on the Clackamas River.	Pending
S15	R2 (Christensen) Call PGE for more information on the passive fish separator at Pelton Round Butte, including the size of the fish they are designing to separate.	Pending
S16	NHC (Larson) Lisa to revise the CFD model output plots to more appropriately differentiate the higher velocities in the approach channel area.	Pending
S17	R2 (Christensen) Change the terminology for the "secondary" and "tertiary" screens to be "pre-capture" and "post-capture" screens.	Pending
S18	NMFS (Nordlund) Bryan will review his files on the Rocky Reach project, to see if he can determine what the velocity profiles were before and after modifications to the system. The goal is to determine where the velocity dip was observed in the system where fish rejected the entrance.	Pending
S19	R2 (Postlewait/Christensen) In the handout showing updated figures and tables of design criteria: Add new columns to Table 4. The first new column should show the existing proposed design value, and the other new columns should show the design values for similar projects (Baker, Rocky Reach, Round Butte, Cowlitz Falls, etc.) projects.	Pending
S20	WDFW and NMFS (Kinne, Nordlund) Review Table 5 from the handout providing holding, sorting, and handling design criteria and provide comments to the design team ASAP.	Pending
S21	WDFW/USFWS/Kozmo/R2 (Klavas, Weinheimer, Stow, Bates, Keefe) Review the holding pond sizing calculations by October 6, 2006. Provide comments to the design team.	Pending
S22	PacifiCorp/USFWS/NMFS (Shallenberger, Stow, Nordlund) Do additional research on capture velocity for the species in question. Issues around capture velocity need to be resolved for the FSC design to proceed.	Pending
S23	R2/PacifiCorp (Picard, Postlewait, Shallenberger) Finalize and complete meeting notes for September 25th meeting for distribution to subgroup by September 29th, 2006.	Done.

ADJOURN

Meeting was adjourned at ~4:00 pm.