

FINAL - Meeting Summary Notes
Lewis River License Implementation
Engineering Subgroup
November 2, 2007
Fish Passage Meeting Notes

Subgroup Participants Present: (14)

Will Shallenberger, PacifiCorp
Todd Olson, PacifiCorp
Arnold Adams, PacifiCorp
Frank Shrier, PacifiCorp
Bryan Nordlund, NOAA Fisheries (NMFS)
Jim Stow, USFWS
Eric Kinne, WDFW
Dana Postlewait, R2 Resource Consultants
Suzanne Picard, R2 Resource Consultants
Ken Bates, Kozmo (Via phone & Net Meeting)
Monty Nigus, Black & Veatch
Dennis Anderson, Black & Veatch (Via phone & Net Meeting)
Lisa Larson, Northwest Hydraulic Consultants (Via phone & Net Meeting)
Brian Hughes, Northwest Hydraulic Consultants (Via phone & Net Meeting)

ADMINISTRATIVE

Welcomed attendees and reviewed agenda. Todd Olson updated the group on the status of the FERC license. Discussions with FERC indicated that a license issuance date before the first quarter of 2008 was unlikely. The new tentative license issuance date is now assumed to be April 2008.

General Meeting Handouts:

Distributed via email on 10/31/2007 by Kim McCune:

- Meeting agenda for 11/02/2007 subgroup meeting
- Copies of the draft 9/27/2007 subgroup meeting notes

Distributed at meeting 11/02/2007 (paper copies):

- Meeting Agenda for 11/02/2007 meeting
- Copies of the 9/27/2007 subgroup meeting notes

FUTURE MEETING DATES

Future meeting dates were presented to the group for review, as follows:

- December 19, 2007
- January 30, 2008
- March 14, 2008
- April 23, 2008
- June 4, 2008
- July 16, 2008
- August 27, 2008

Group members are to check their schedules and inform the group of meeting conflicts. The December 19th date for the next meeting was confirmed by all attendees.

OTHER ADMINISTRATIVE ITEMS

Comments on Last Meetings' Swift Meeting Notes

There was no scheduled Swift session or topic for this meeting; however, there was a 45-minute discussion regarding the Swift project at the beginning of this meeting to relay the NMFS and USFWS comments on the draft net layout drawings. The following points were noted, which will be discussed further by the full Swift design team at the next scheduled subgroup meeting in December.

- To clarify the draft design plan as described in the last meeting notes, the idea is to incorporate a maximum reasonable amount of net flexibility into the Swift design. The design shall include provisions for full-depth exclusionary nets, to be added in case partial-depth nets prove insufficient. Debris handling is a major concern as well, and a debris boom is still being considered. It is understood that adjustments may need to be made post-construction, hence the phased approach to the net design. The subgroup members agreed that a more complete discussion of the criteria and issues surrounding the net design will take place at the next subgroup meeting. Areas of discussion will include: depth, orientation and length, material (impervious vs. net, durability), anchorage, full vs. partial depth nets, spill and debris handling, etc.
- Some of the discussion was centered on the net development history at the Baker Gulper, where it went from a partial depth net to a full depth net. Frank Shrier noted that the primary target species at Baker is sockeye, where most fish migrate downstream as fry, which is not the case at Swift. This history may not be fully applicable at Swift, so the team and PacifiCorp recommend a “learn as you go process”, with the intent to identify and design all reasonable options for facility adjustments in the early stages of the project, and to modify the design as necessary to meet passage performance standards as the experience base grows at the Swift project.
- The CFD model is still available; thus, additional model runs using alternate FSC orientations are possible. The Design Team believes the general location of the FSC is correct based on the bathymetry and reservoir pool design elevation constraints. As such, the Design Team recommends fixing the general location, and limiting any future runs to

only adjusting the angle of the FSC relative to the reservoir. This will also be discussed at the next meeting, but Will noted that up to a 30-degree angle rotation could likely be accommodated.

- Locating the FSC further upstream was discussed to help accommodate a revised net alignment, but Frank Shrier noted that the ACC team's biologists have already eliminated this as an option based on concerns that it would isolate the bull trout habitat located in Swift Creek.

Will Shallenberger also briefed the group on progress that is currently underway with the Swift project design, including:

- Will is documenting existing debris handling practices, and the team will develop debris handling practices specific to the new Swift FSC. This will likely include some type of debris boom, and a debris removal area in the reservoir, likely at Swift Camp.
- The geotechnical borings for the trestle evaluation have been completed, and the site access evaluation is in progress to assess a south access or trestle access off the dam.
- Peter Christensen is currently developing a detailed hydraulic analysis spreadsheet model that will be used to confirm internal hydraulic design and FSC hydraulic layout optimization.
- A draft layout of the sorting/sampling area is being developed with 3D drawings
- PacifiCorp will provide paper copies of the net layouts to Jim Stow.

MERWIN TRAP PROJECT

Handouts

- Merwin Fish Trap Tailrace Physical Hydraulic Model Draft Plans, October 19, 2007
- Merwin Dam Adult Fish Trap Revised Physical Modeling Schedule, November 1, 2007
- Merwin Upstream Trap Draft Study Plan, September 2007
- Merwin Fish Trap and Handling Improvements, Sorting Facility Preliminary Design Drawings, November 2, 2007
- Merwin Sorting Facility Water Supply Water demand Analysis Spreadsheet, November 2, 2007

Presentations

- Review of work-in-progress bathymetric mapping based on the survey and at this point original construction drawings and photographs.
- Review of work-in-progress physical hydraulic model fabrication plans.
- Review of work-in-progress sorting facility preliminary design drawings.

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

No.	SUMMARY OF PENDING MERWIN ACTION ITEMS (remaining from previous Meetings)	STATUS
M40	PacifiCorp/B&V/R2 (Adams, Nigus, Postlewait) Continue development of trap and water supply options.	Pending, Ongoing, status report today.
M45	Black & Veatch/R2 (Nigus/Postlewait) Continue analysis of a construction staging schedule following further design development. Goal is to define necessary trap outage window.	Outage window has been defined, staging schedule work is ongoing.
M56	Agency representatives (Stow/Nordlund). Provide any comments to the physical hydraulic model study plan to PacifiCorp by October 5 th .	Done, all comments received at last meeting.
M57	Black & Veatch/R2 (Nigus/Postlewait) Provide updated flow diagram and water load analysis spreadsheet once this work task is complete.	Water load analysis done today, flow diagram still pending.

M58	Black & Veatch/R2 (Nigus/Postlewait) Provide update design concepts for attraction flow pump station intake and bar rack.	Pending, Ongoing.
M59	Agency members of subgroup (Nordlund/Stow/Kinne). Review and provide any comments on the Merwin Upstream Trap Draft Study Plan, dated September 2007, by the next meeting.	Today's topic. Note that ACC's comments are due on Nov. 12 th .

Additional Comments on Last Meeting's Merwin Notes:

- In reference to Action Item M56, Jim Stow would like to see the physical hydraulic model study plan to include an opportunity for the Agencies to review the results of the first few "big picture" model runs to help guide future physical model runs. This is accommodated in the study plan and shown in the revised schedule presented today.
- In reference to Action Item M59, ACC comments are due on November 12.
- Page 7, last bullet on page: Remove the phrase "at other facilities too easily..." and replace with "in stamina studies (Smith & Carpenter, 1987) to..."
- Page 8, 5th bullet down: change first sentence to read "Bryan Nordlund brought up the concern for handling debris at the face of the rack and potential accumulation of sediment behind the rack." Also, remove the final phrase of the last sentence, i.e. change the last sentence to read: "Experience will show the necessary frequency of cleaning."
- Page 8, last full paragraph, second sentence: change the sentence to read "He also presented this same outline to the ACC, who agreed with the Study approach and will provide further comments at the November 12, 2007 ACC meeting." Also, delete the last sentence in this paragraph.

With the above changes, the last meeting notes can be published as final.

MERWIN TRAP AGENDA TOPICS

Physical Hydraulic Model Update

Bathymetric Field Survey Results/Issues

- Finley Engineering surveyors collected bathymetric survey data using a survey grade GPS tracked boat and sonar equipment. The information has been used to build a 3-dimensional bathymetric map of the tailrace. The survey information reaches from the dam to a location well downstream of the bridge, to the obvious grade control (which is near the boat launch).
- There are a few gaps in the survey data where data collection was problematic due to water conditions (air bubbles and strong currents). These areas include the portion of the tailrace near the pump station intake at Unit 4, along the bank, an area in the immediate vicinity of the existing fish trap entrance at Unit 1, and a portion of the bathymetry

downstream of the proposed entrance, along the left bank downstream of the control room.

- Black & Veatch researched existing project information in this area, including a 1958 bathymetry drawing indicating a proposed rock cut downstream of Unit 1, and original project construction photos. Based on interpretations and extrapolations of this data, B&V prepared a 3-D model and presented several views of the tailrace to illustrate how these data gaps may be filled in. Based on historical construction photos, Nordlund commented that it appeared that data gaps had not been correctly extrapolated by the computer methodology.
- The subgroup agreed that these survey gaps are in critical areas, and recommended that additional survey work be performed (flows permitting this season), to fill in these gaps. PacifiCorp will coordinate with Finley Engineering to schedule equipment and a second survey session to fill in these gaps if possible in the next few weeks. Nordlund and Stow empathized that bathymetry accuracy this area is critical for model analysis.
- Eric Kinne noted that WDFW will work with the surveyor to turn off the trap for a couple hours to eliminate the air bubbles from the water spilling over the fyke weir.
- Construction on the physical model of the tailrace can begin with the available information; however, it would be best to obtain actual bathymetric data for these areas. To meet the current modeling schedule for the bathymetric fabrication, any additional bathymetric data needs to be provided to NHC within the next 4 weeks. If this is not possible, the team will talk and agree on an interim plan.
- NHC would prefer a single, updated bathymetric survey file to be provided to assist with fabricating the bathymetric features of the tailrace. They plan on utilizing plywood templates at specified cross sections, and using a relatively thin concrete layer over packed sand.

Review Draft Design Drawings for Model

- The group reviewed the current design drawings for the 1:24 scale physical model, stepping through each sheet.
- The headbox portion of the model needs to be modular and adjustable to accommodate different entrance angles. Currently, the entrance is shown at about 22 degrees, based on the latest conceptual trap entrance drawings (Alt PR-3). It may be of interest to look at angles from 0–45 degrees. The exact maximum angle depends on the pool layout and physical constraints within the pump room chambers. The range of possible angles will be determined by R2/Black&Veatch. The model will be made with maximum flexibility for these features.
- The entrance gate will be modeled as an upward-closing weir that can be easily adjusted. The current model plans show a (scaled) 5-foot wide entrance gate. The group decided that the gate needs to be modular so that it can be used to evaluate (scaled) 4-foot and 6-foot widths as well. The group also discussed wing type gates (that would open sideways), and on other gates that would maximize the impact of the attraction flow into the tailrace (such as an hourglass shaped gate). At this point the group agreed to only focus on the overflow weir entrance, and confirmed it was preferred to a wing type gate, but to allow flexibility in the model to explore other gate shapes if necessary.

- Ken Bates asked about the baffle upstream of the weir entrance at the pump room. Brian Hughes confirmed that the baffle would be porous, and that the drawings would be revised to show the baffle extending above the water surface.
- Jim voiced concerns about the proximity of the first ladder step to the entrance gate, and as to how the velocity profile will look given the side diffusers. R2/B&V will provide a hydraulic profile through the entrance pool to Jim to address these concerns.
- Not only will the entrance angle need to be adjustable, but the shape of the entrance should be flexible as well. A curved entrance channel or diverter wall is worth examining to evaluate its ability to penetrate the tailrace.
- Lisa and Brian at NHC will incorporate changes to the drawings and provide updated drawings for review by next Thursday (Nov 6, 2007). Dana and Monty will check the model dimensions and provide any further feedback to NHC.
- Regarding bathymetry, the floor of the model should be constructed to accommodate the hole near the bridge.
- The model will be set up to evaluate flow capacities of up to 1,000 cfs at the corner entrance, and up to about 500 cfs at the pump bay entrance alternatives. A total flow capacity of 1,000 cfs capacity will be provided by the model pump, which will also simulate the attraction pump station (flow in equals flow out). Nordlund noted that the ACC had expressed their desire to model the entire range of NMFS criterion for attraction flow, which includes flows up to 1200 cfs, and recommended that the models pump station be sized accordingly.

Updated Modeling Program Schedule

- Dana handed out and discussed the draft physical modeling schedule. The schedule shows model construction to be complete by the end of the year, Phase I testing to be done by February 12, and testing to be complete by March 25, 2008 for use in the 60% design. The group reviewed the schedule and had no comments.

Merwin Upstream Trap – Draft Study Plan

Bryan Nordlund has discussed the draft plan with Michelle Day, and he provided the following initial comments. The draft study plan is also scheduled to be reviewed by the ACC, with comments due by November 12th.

- The radio telemetry plan is sound, in that the detection array is in the right location and the methods are proven..
- There is some confusion as to whether the group had agreed to pursue a 95% or 98% Adult Trap Efficiency goal. Shrier mentioned that the ACC had agreed on an interim ATE of 95% provided the engineering design team could give them reasonable assurance that they could design a trap that could achieve that ATE. Nordlund was not aware that any ATE performance standard had been agreed to in the ACC, and pointed out that per the Settlement Agreement, NMFS passage design criteria is the default for facility design until ATE is agreed to and defined. This is important because the phased approach proposed in the draft upstream study plan contains attraction flows that do not meet NMFS criteria, and it has not been demonstrated that lower attraction flows are suitable for the Merwin site. Frank will review past meeting notes to find the agreed-upon figure.

- The draft study plan identifies valid metrics to define the Adult Trap Efficiency (ATE), however, Bryan felt it needs to be clearer about how the metrics will be combined to define the ATE. There was some discussion that this is defined in the plan, and the team will review it more prior to the ACC review deadline.
- The draft study plan would benefit from a list of definitions for terms used in the plan. For example, the distinction between “fallback” and “dropback” is unclear on page 6, point E.
- Bryan suggested that the following parameters be included in defining ATE, and measured in the study:
 - Measure capture entry rate as the number of fish that are successfully trapped divided by the total number of fish migrating upstream. For ATE, trap entry rate should be more than (95?, 98?)%.
 - Measure the passage time as the temporal difference between tailrace entry (i.e. through the bridge array) for fish entering the tailrace and collection for passage upstream; For ATE the mean delay should be less than 24 hrs (24 hours is a general rule of thumb for passage success and has been achieved at many passage facilities).
 - Measure the number of statistical outliers (% of fish that take more than 1-week to pass); For ATE, the number of fish that take more than 1 week to be successfully trapped should be less than (5?)%
 - These points will be discussed further during a more detailed review with the ACC.
- Since the facility will be very different after improvements are completed, the 2005 radiotag study would no longer seem to be relevant. Comparing future studies to the 2005 study may therefore have limited value. Nordlund noted that the comparison standard needs to be the yet to be defined ATE standard, not any comparison to the 2005 study.
- The Draft Study Plan needs to clearly define which fish stocks will be involved in the study.
- Trapping is only considered successful if the fish are trapped without injury. This includes the Electro-Anesthesia Units and fish handling. Fish will need to be monitored for some amount of time after electro-anesthesia to verify that they were not injured. The plan needs to clarify the length of time fish will be monitored before transport. To address electro-anesthesia effects, the Monitoring and Evaluation Plan should consider including a discrete evaluation component injury due to the EA system.
- Bryan noted that no one has yet agreed to the two-phase attraction flow development of the trap, yet the study was written in support of this approach. The Design Team discussed their understanding that both the physical model and development of a draft evaluation plan at this phase are intended to provide justification to support a two-phase approach. If the subgroup and ACC agree with these actions, they can support approval of the two-phase flow approach. The model results will be key to this approval, in order to select the correct attraction flows to be tested in each phase.

- Nordlund stated that he and Michelle Day would further coordinate NMFS comments on the draft study plan, and provide them in written form to Pacificorp to distribute to the ACC (completed 11-9-07), and to attach to these meeting notes as Attachment A.

Sorting Facility Updates

General Arrangement Drawings

Monty Nigus distributed copies of the current sorting facility preliminary design drawings. The group stepped through the drawings, discussing highlights and identifying design issues.

- Truck disinfection – Eric Kinne has received preliminary guidance from WDFW's pathologists based on the Cowlitz Falls protocol.
 - The Cowlitz Falls facility uses a double-rinse of their trucks with water after hauling adults upstream and before loading downstream migrants.
 - Additionally, they disinfect the trucks with PVP iodine solution once a week.
 - A possible alternative to double-rinsing the tanks by filling them twice would be to install high-pressure nozzles inside the fish tanks. Rinsing would be faster and less water-intensive.
 - It is anticipated that the Merwin & Swift facilities should follow the same or similar procedure. Eric Kinne will provide a summary of Cowlitz' truck disinfection practices to the group at the next meeting, when his discussions with the WDFW pathologists are complete.
- Eric Kinne also noted that WDFW will recommend that fish be hauled in a 0.5% salt solution to minimize stress.
 - To minimize corrosion issues from the salt solution, the team noted that fiberglass hauling tanks would likely be preferred over stainless steel tanks.
- The general site plan looks good. B&V will further develop the parking and truck turning areas.
- The location of the pre-sorting pond relative to the Electro Anesthetic (EA) tanks is acceptable.
- Eric Kinne requested a brail (or foot) be included on the pre-sorting pond crowder to supplement fish removal from the pre-sorting pond via the false weir.
- The fish transport tubes leading to the electro-anesthesia tanks need to be open flumes to allow the operator to see approaching fish.
- It is acceptable for the fish transport tubes to enter the large sorting tanks at slightly different elevations, depending on the tank's distance from the sorting table.
- Fish will be inoculated immediately after electro-anesthesia, identify this function and equipment at this part of the sorting table.
- The sorting table was based on the layout at Pond 15, which is nearly complete. Eric Kinne will review the sorting table layout and provide feedback on the location of the vee-detectors. Initial discussion indicated that the vee-detectors should be portable and located upstream of the sorting flumes, and that they would need to be mounted on a non-metallic area of the table. Fish will be waved vertically against the vee-detector.

- Eric Kinne also noted that he'd prefer a more direct route of fish to the tubes leading to the small tanks. The Design Team will further brainstorm possible means to accommodate this comment, and provide any interim drawings prior to the next meeting to keep the design process moving as this is a critical path item.
- The small tank configuration and loading mechanism is acceptable.
- The biological sampling area is acceptable.
- Provide a stand-up table area for record keeping.
- Additional equipment (i.e., fish counters) will be defined for next meeting.
- Additional development will continue defining other building components. Remaining space to accommodate includes:
 - electrical/mechanical room
 - chemical storage area
 - locker/drying area

Updated Water Demand Analysis Spreadsheet

Dana handed out an updated water demand spreadsheet, which was last reviewed at the February meeting.

- The recovery tank water demand has been eliminated, as a recovery tank is no longer needed with the removal of the fish return tube. Recovery and observation from the EA system will occur in the holding tanks.
- The flow-through capacity for the EA has been changed to 50 gpm. This will also be confirmed with Smith-Root and the WDFW personnel at the Bonneville Hatchery.
- The fish return pipe has been eliminated.
- The 400 gallon fish trailer has been eliminated, and replaced with two additional 250 gallon tanks.

No.	SUMMARY OF PENDING MERWIN ACTION ITEMS (remaining from previous Meetings)	STATUS
M40	PacifiCorp/B&V/R2 (Adams, Nigus, Postlewait) Continue development of trap and water supply options.	Ongoing.
M45	Black & Veatch/R2 (Nigus/Postlewait) Continue analysis of a construction staging schedule following further design development. The outage window has been defined.	Pending, ongoing.
M57	Black & Veatch/R2 (Nigus/Postlewait) Provide updated flow diagram based on completed water analysis spreadsheet.	Pending.
M58	Black & Veatch/R2 (Nigus/Postlewait) Provide update design concepts for attraction flow pump station intake and bar rack.	Pending, Ongoing.

No.	SUMMARY OF NEW MERWIN ACTION ITEMS (from November 2, 2007 Meeting)	STATUS
M60	NMFS (Nordlund) Provide a copy of “Smith & Carpenter, 1987” to Frank and Dana.	Pending.
M61	PacifiCorp (Adams) Coordinate a second survey effort to fill in the gaps in the bathymetry.	Pending.
M62	R2 (Postlewait) Determine the range of entrance angles to be evaluated by the physical model. Provide this information to Northwest Hydraulic Consultants.	Pending.
M63	R2 (Postlewait) Provide hydraulic velocity profile through entrance pool to Jim Stow and team to address concerns about how flow will enter through diffusers into the entrance pool.	Pending.
M64	R2/Black&Veatch (Postlewait/Nigus) Review model dimensions and provide feedback to NHC by Thursday, November 6, 2007.	Pending.
M65	NHC (Hughes/Larson) Begin construction of the physical model.	Pending.
M66	PacifiCorp (Shrier) Review past meeting notes to clarify the agreed-to target Adult Trap Efficiency.	Pending.
M67	PacifiCorp (Shrier) Provide a copy of the Quinn report 2005 to Eric Kinne and Bryan Nordlund.	Complete – McCune provided link to purchase book.
M68	PacifiCorp/R2 (Shrier/Keefe) Add definition section to Draft Tailrace Study Plan.	Pending
M69	WDFW (Kinne) Eric will provide a summary of recommended truck disinfection protocols at the next subgroup meeting.	Pending.
M70	WDFW (Kinne) Provide input to the vee-detector location with the sorting table.	
M71	R2/B&V (Postlewait/Nigus) Brainstorm means to short cut the path of fish destined for the small tanks and coordinate with Eric Kinne.	Pending.

Meeting Adjourned at 1:05 PM.