

FINAL - Meeting Summary Notes
Lewis River License Implementation
Engineering Subgroup
August 18, 2009
Fish Passage Meeting Notes

Subgroup Participants Present: (12)

Arnold Adams, PacifiCorp
Frank Shrier, PacifiCorp
Bryan Nordlund, NOAA Fisheries (NMFS)
Eric Kinne, WDFW
Curt Leigh, WDFW (via phone and web conference)
Monty Nigus, Black & Veatch (via phone and web conference)
Brian Friesz, Black & Veatch
Dennis Anderson, Black & Veatch (via phone and web conference)
Alex Bjelica, Black & Veatch (via phone and web conference)
Dana Postlewait, R2 Resource Consultants
Peter Christensen, R2 Resource Consultants
Suzanne Picard, R2 Resource Consultants
David Stelzer, Black & Veatch (via phone and web conference –for Merwin lighting discussion)

ADMINISTRATIVE

Welcomed attendees and reviewed agenda.

General Meeting Handouts:

Distributed via email on 08/13/09 by Kim McCune:

- Meeting agenda for 8/18/2009 subgroup meeting
- Copies of the draft 7/01/2009 subgroup meeting notes

Distributed at meeting 8/18/2009 (paper copies):

- Meeting agenda for 8/18/2009 subgroup meeting
- Copies of the draft 7/01/2009 subgroup meeting notes

FUTURE MEETING DATES

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

- September 29th, 2009

- November 5th, 2009
- December 17th, 2009 (last meeting before 100% Submittal Deadline)

OTHER ADMINISTRATIVE ITEMS

- No other general administrative items.

o **MERWIN TRAP PROJECT**

Handouts

- o Updated Merwin Trap Closure Procedures, ES Discussion Draft
- o Merwin Trap & Haul List of Proposed Adjustments, Draft
- o Merwin Trap List of Possible System Failures for Planning and Discussion Purposes

Presentations

- o No PowerPoint presentations.

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

No.	SUMMARY OF PENDING MERWIN ACTION ITEMS (remaining from previous Meetings)	STATUS
M118	PacifiCorp (Adams) Complete Failure Analysis to identify which emergency situations are most worth formulating contingency plans for.	Done, to be covered today.
M128	WDFW (Kinne) Visit Cowlitz Salmon Hatchery to observe the EA system, note current settings, and provide information to Frank Shrier for summary table. Also take photos of system, and provide any other notes on performance or recommended design details to the ES.	Done via email to D. Postlewait, input to be worked into design.
M129	PacifiCorp (Shrier) Prepare summary table with history of EA system settings for the Bonneville Hatchery, Cowlitz Salmon Hatchery, Smith-Root recommendations, and any other available data.	Done, 7/6/09 email. See note 1.
M130	PacifiCorp/WDFW (Adams/Shrier/Kinne) Research status of the Settlement Agreement Merwin Trap Upgrades and identify which of the listed trap upgrades are still relevant in view of the current design.	Pending, Arnold to coordinate with Eric on valve actuator
M131	R2 (Postlewait) Send a copy of the hydraulic ladder analysis to Bryan Nordlund for review.	Done via email.
M132	R2 (Postlewait) Forward Dan Turner's memo on fish flume velocities to Eric Kinne and Bryan Nordlund.	Done, 7/8/09 email.
M133	WDFW (Turner/Kinne) Review the crowding and Electro-Anesthesia loading system shown in the drawings and provide feedback at the next subgroup meeting.	Today's agenda item.

Note 1 – Frank Shrier was able to get feedback from four other facilities using an EA system similar to the one under consideration for Merwin Trap, including: Carson Hatchery, Bonneville Dam, and Cowlitz Hatchery. Species covered at these facilities include fall chinook, spring chinook, coho, summer and winter steelhead, and sea-run cutthroat. Eric Kinne asked him to also look into facilities at the Cole Rivers Hatchery, in Oregon for spring chinook experience.

Additional Comments on Last Meeting’s Merwin Notes:

There were no comments on the Merwin portion of last meeting’s notes. More time is needed to provide comments. Notes will not yet be finalized to allow additional time.

MERWIN TRAP AGENDA TOPICS

Discuss General Topics

- o In association with action item M118, Arnold Adams handed out a preliminary list of possible operational failure modes, and presented an overview of the format to show a proposed solution for each failure mode. The list is under development to identify procedures for dealing with various equipment failures while simultaneously minimizing trap outages. The team is to review the list and provide feedback on possible omissions and to brainstorm solutions to each failure. Arnold will continue with the development of solutions with the proposed Excel format. **A copy of the lists was emailed to Curt Leigh following the meeting.**
- o Discuss Agency Comments to 90% Design Submittal – Written comments were received from WDFW and NMFS. The team stepped through the Agency comments to the 90% submittal and the corresponding team responses one by one following a numerical format that will be used in PacifiCorp’s formal written response at a later date. Highlights of the comments, responses, and related discussions follow:

WDFW Comments:

1. It was noted that sheet 950 was not included in the 90% submittal. This Flume Water Supply (FWS) Piping & Instrumentation Diagram sheet will be provided with the Final Design submittal.

With regard to the water supply source for the sorting facility, the FWS system, which provides the water for the sorting facility, will utilize the existing plant’s service water system as its source of water. The existing service water system sources its water directly from the reservoir. Its main supply intake is located at elevation 105. This intake elevation is significantly below the surface of the reservoir (el 238 at full pool), and the team agrees that water temperatures at this depth will not pose a problem. Frank estimates that the thermocline is at about elevation 189. Additionally, the existing service water supply system is connected to each penstock, providing redundancy at a depth that should not pose a temperature problem.

2. Concerns about fish flopping out of the 250 gallon fish truck’s extendable chute will be discussed with WDFW outside of this meeting.
3. Eric Kinne suggested adding mechanical louvers to the false weir to help direct flow. The Team agrees that this is a good idea and louvers will be added to the false weir design.
4. Dedicated office space is planned for the sorting facility; however, this space was not indicated on the 90% drawings. The current intent is to locate a desk and the operator interface computer inside the break/conference room. The Design Team will continue to evaluate the optimal location for this space relative to other space allocation requirements required for the sorting facility’s ground floor plan, and office space will be fully shown on the Final drawings.

5. Comments relative to the ladder water supply pumping system were discussed later in the meeting under the Fishways topic.
6. Comments relative to fish counters were also discussed later in the meeting under the Fishway topic.

NMFS Comments:

7. Arnold Adams handed out a list defining possible design adjustments relating to the phased approach for consideration and discussion. Comments are requested for the next ES meeting.
8. Frank Shrier found that the USFWS is currently using a DC current electro-anesthesia setup for lab type work and surgeries. Fish are apparently immobilized when they are inside a water tub with the DC current, while still aspirating normally. Surgeries are being performed on the fish without side-effect to the biologists or reaction from the fish. When the current is removed, the fish appear to recover immediately. This setup is not expected to be feasibly adaptable to mass-anesthesia, but provides an interesting point of reference. The team will research this further for potential modifications to the electro-anesthesia (EA) system if problems are found in the future.

Bryan Nordlund also quoted injury rates for EA and MS-222 in his 90% comments. The numbers are surprisingly high and are inconsistent with the program's low-injury goals. Bryan will re-check his references to determine if the quoted injury rates are typos.

In the event that electro-anesthesia proves to be problematic in terms of fish survivability and their ability to spawn after implementation at the Merwin Trap, it will be necessary to either switch to a different form of anesthesia or avoid anesthetizing wild fish in the first place. Tests can be done using fish that have not been anesthetized as a control group. The current design needs to be made flexible to changes in sorting protocol (i.e. automatically routing wild fish away from anesthesia, or similar) or changing the form of anesthesia used. The goal of this comment is for the design team to plan ahead to make the anesthetic area flexible for possible future changes to layout and plumbing to the extent reasonably possible.

The group discussed the manual sorting gate idea upstream of the electro-anesthesia system offered by NMFS in their review comments. Bryan noted that this was just one idea, and that NMFS was open to other concepts to address the EA flexibility issue. Based on the discussion, it was apparent that adding a sorting gate upstream would result in additional fish collection and tagging needs, and would not be very practical from a biological standpoint for this application.

9. *Curt Leigh noted that Bullet 9 discusses information that was not actually presented at the meeting. He suggested that this be removed, or handled separately. It was decided that the paragraph would be appended to the end of these meeting notes as **Attachment A.***

10. Comments concerning the Auxiliary Water Supply (AWS) pumping system were discussed later in the meeting under the AWS Pump Station & Pipeline Design Update topic.
11. The Attraction Water Supply (AWS) intake rack is currently shown as a vertical perforated-plate rack with 7/8-inch diameter openings. The team is still considering options for cleaning. It may be feasible to manually rake some of the top of the rack, and clean the bottom of the rack with an air-burst system. It may be possible to rake enough of the top of the rack for Phase I to meet the 1 fps approach velocity criteria for this project. B&V interviewed Frank Nicholson at the Walla Walla intake, who owns an intake with a vertical face screen cleaned with an air burst system. They report it works very well, and Dana has witnessed the cleaning cycle which provides an abundance of air. Additional work will be done on the cleaning system. Based on the general discussion, the Design Team will move forward with the design of the AWS intake rack as currently proposed.
12. It was noted that the rack for the Unit 4 intake structure in the reservoir will be similar to the intake racks for Units 1, 2, and 3 (i.e. bar spacings of 4 inches on center). However, the turbine water supply pipe coming off the Unit 4 penstock stubout will be equipped with a strainer basket to prevent small debris from passing through the AWS system and clogging the AWS baffle panels in the fish entrance pool. Currently, this strainer basket is of the type that is cleaned manually. Means to access the strainer for cleaning, and keep the system operating will be required. The Design Team will consider options for retrofitting an automated strainer system, or a dual basket system with the design. The Design Team will include instrumentation in the Final Design to indicate when the strainer needs to be cleaned.
13. The Design Team confirmed that detailed structural analyses will be performed relative to AWS header pipe supports.
- 14/15. Energy Dissipation – The hydraulic calculations for the fish ladder have been completed and will be sent to Bryan Nordlund for review. The hydraulic conditions inside the ladder are complex and precise water surface predictions are not possible. The team is confident, though, that the assumptions are conservative and appropriate. The energy dissipation occurs in 3 steps: the drop pipe and expansion, Baffle 1, and Baffle 2. The charts in the 90% report provide specific estimates of energy dissipation at each step. In so far as addressing Bryan's comments regarding uniform flow over the entire diffusers gets quite involved, Dana offered to discuss the fishway hydraulics and energy dissipation with him separately to this meeting. Bryan Nordlund intends to take additional time to review the specific information concerning this subject in the 90% report.
16. It is desirable to maintain dissolved oxygen (DO) levels in the attraction water supply at or above 9.5 ppm to meet permit needs, preserve fish health, and avoid potential fish rejection at the entrance if low DO water were used for attraction. Use of a siphon or partial siphon-recovery supply system may cause oxygen to come out of solution, which could reduce the DO levels from ambient. This

condition is most difficult to meet when temperatures are high and the water surface differential between the tailrace and the auxiliary water is greatest, as localized pressures inside the water supply system will be lowest then. Negative pressures, or siphon-conditions, exacerbate this condition, but recent changes to the water supply system design to provide a fully vented system will eliminate this concern. These design changes include increasing the horsepower on the water supply pumps to create a positive-pressure system and adding an air vent on the supply pipe to introduce atmospheric pressure. Adjustments will likely be necessary to fine-tune the system once it is in operation, but the system is expected to successfully prevent low-DO conditions, and provide much flexibility to fine-tune relative to energy consumption and DO levels throughout the year.

- 17/18. Comments concerning the 250 gallon fish tank design and fish lift hopper design were to be discussed later in the meeting; however, due to meeting time constraints, these items were not specifically discussed.
19. Lighting inside the ladder will need to be consistent and ambient. Overhead lighting is preferred, though it is difficult to provide light fixtures that perform well in both dry and submerged conditions. LED-type lights have been identified as a possible solution. It is not necessary to vary the lighting inside the ladder to reflect changes in weather conditions outside of the ladder (i.e. overcast vs. sunny). Additional lighting will be needed for maintenance personnel.
20. PacifiCorp is reviewing comments concerning the project's phased implementation and will discuss their response with NMFS in conjunction with preparing a formal response such that there is a clear understanding of Adult Trap Efficiency (ATE) standards for the project and how adjustments to the project will be triggered if ATE goals are not met.
 - o Due to meeting time constraints, an update of the project's 3D model was not viewed.

Fishways

- o Monty presented recent updates to the Ladder Water Supply (LWS) system. The LWS system will include 2-30 cfs pumps in Pump Bay 1. The LWS pumps intake will utilize an existing 5-foot diameter conduit that runs upstream through the existing powerhouse foundation that daylight in the pool upstream of the powerhouse. This pool is directly connected to the tailrace. Using this pool for the LWS system intake will provide calm, quiescent water for the pumps that will be free of debris in lieu of using turbulent water that may contain debris if the LWS system directly uses the tailrace for its water source. It was noted that the upstream end of the 5-foot diameter conduit will include an intake rack with 7/8" minimum openings and an area to provide an approach velocity of less than 1 fps. Most likely, the rack characteristics will be similar to that proposed for the AWS pump station intake rack. Although debris on the LWS intake rack is not anticipated due to its location upstream of the powerhouse, the rack could be manually cleaned from the powerhouse platform located above the LWS intake rack area. Thus, an automated rack cleaning system is not warranted at this location.

- o Dana Postlewait handed out an updated trap closure memo for team review. This version added a gate actuator for the slide gate at Slot 1-2, and added language to cover a second ladder at Phase 3. This supersedes the version provided in the 90% report. Comments to the updated trap closure memo were requested.
- o Fish Counters – Vaki Riverwatcher fish counters are under consideration for use inside the ladder. These counters provide detailed information on the size of fish and the direction of their movement through the counter. The team agrees that it would be most beneficial to place one counter at the end of the entrance pool (Slot 1-2), instead of the entrance weir, to prevent possible fish rejection at the entrance. The preferred location of a second counter is at Slot 1-4. The team will look into stacking multiple counters on top of each other vertically to provide a larger opening through the pool slots. Dana will look into custom fish counters from Vaki.

AWS Pump Station & Pipeline Design Update

- o The AWS intake screen layout was previously discussed as part of the Agency comments to the 90% design submittal (i.e. Item 11 above). However, discussion came back around to the air burst system retrofit and manual cleaning procedures for the top portion of the intake racks. The racks are made of perforated plate, so brushes or squeegees would be preferred to rakes. Perforated plate is not commonly used in applications like this, but since the objective is to prevent debris from entering the system that could potentially clog downstream perforated plate baffles at the entrance pool and diffuser system, it makes sense here. A bar rack could potentially let long, thin debris through that perforated plate would not. It was also noted that there is not enough room at the AWS intake racks for an Atlas-Polar type cleaner.
- o Dennis Anderson presented updated pump system head curves and hydraulic profile relative to the AWS pumping system. These curves are used to predict the performance of the pump system under the full variety of operating conditions. Bryan Nordlund was satisfied that the system hydraulics, including DO considerations, have been given due consideration and felt reassured that the system will be able to perform under the full variety of hydraulic conditions expected at the trap.

Sorting Facility

- o Crowder: Dana Postlewait quickly provided an overview of updated crowder concepts for the pre-sort pond. It was agreed that a recessed area in the pond, to allow for a vertical crowder plate with sloped sides (acting similar to a funnel), would be preferred to the design shown. Dana will update the concept for the next meeting.
- o False Weir: Dana explained how the switch gate downstream of the false weir would be replaced by a second weir, to minimize space requirements and provide a more direct route for fish. Two false weirs will be provided at the end of the pond. The 15-inches shown on the drawings will be increased to 18-inches, to minimize the chance of fish entering the wrong weir. A small, hand operated gate will also be provided to block the “off” weir that could be used if experience shows it is necessary.

	SUMMARY OF PENDING MERWIN ACTION ITEMS (remaining from previous Meetings)	STATUS
M130	PacifiCorp (Adams/Shrier) Research status of the Settlement Agreement Merwin Trap Upgrades and identify which of the listed trap upgrades are still relevant in view of the current design.	Pending
No.	SUMMARY OF NEW MERWIN ACTION ITEMS (from August 18th, 2009 Meeting)	STATUS
M134	NMFS (Nordlund) Verify quoted injury numbers for electro-anesthesia and MS-222.	Pending
M135	B&V/R2 (Nigus/Postlewait) Identify ways to the extent feasible to add flexibility to the sorting and anesthesia systems in the event that electro-anesthesia proves to be detrimental to fish survivability and fecundity.	Pending
M136	B&V/R2 (Nigus/Postlewait) Add mechanical louvers to the false weir design and widen the space between the two baskets. Adjust the crowder as per meeting discussion.	Pending
M137	B&V/R2 (Nigus/Postlewait) Share the energy dissipation calculation package for the fish ladder with Bryan Nordlund for review.	Pending
M138	R2 (Postlewait) Contact Riverwatcher to research the possibility of stacking multiple counters on top of one another vertically, or preferably fabricate a custom counter with full height sensor plates.	Pending
M139	Team provide feedback on list of possible equipment failures handed out by Arnold Adams. Look for possible omissions in the list and consider solutions to each that would minimize trap outages.	Pending
M140	Team provide feedback on the trap closure memo.	Pending
M141	Team provide feedback on list of adjustments proposed for the project handed out by Arnold Adams. Feedback should consider if the listed adjustments are relative and any additional adjustments that should be considered.	Pending

o **SWIFT DOWNSTREAM PASSAGE PROJECT**

Handouts

- o None.

Presentations

- o PowerPoint presentation by Peter Christensen highlighting Swift Project design updates and Agency comments and responses.
- o Power Point presentation by Brian Friesz providing the proposed layout for the Eagle Cliffs adult release pipe.

See discussion summaries below.

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

No.	SUMMARY OF PENDING SWIFT ACTION ITEMS (remaining from previous Meetings)	STATUS
S68	PacifiCorp (Shrier) Share ACC feedback on adult release concepts at the next subgroup meeting in written form.	Pending
S69	PacifiCorp (Shrier) Identify the size and number of small smolt recovery tanks required with Kevin Malone and report back to the team as soon as possible.	Done
S70	R2 (Christensen) Contact John Serl to get his opinion on the truncated length of the smolt separator.	Done
S71	B&V (Friesz) Provide anticipated fish truck drain rates to the team at the next meeting.	Done today
S72	Black & Veatch (Friesz) Write a design memo describing the anticipated flume velocities at Eagle Cliffs. Include design details.	Done today
S73	Black & Veatch (Friesz) Create a flowchart or decision matrix for adult release sites describing which sites would be used for adult release and under what conditions. Present this plan at the next subgroup meeting.	Done today

Additional Comments on Last Meeting's Swift Notes:

There were no comments on the Swift portion of last meeting's notes. More time is needed to provide comments. Notes will not yet be finalized to allow additional time.

SWIFT DOWNSTREAM AGENDA TOPICS

General Discussion Topics

- o Fish Transfer Truck
 - Prior to the meeting the design team witnessed the filling and draining of the new PacifiCorp fish transfer truck. Based on this it is estimated that the transfer of fish from the 1800-gallon hopper should take about 4 minutes or less.
 - The truck drain line at the dam will have a diameter of 8 inches.
 - To assist in the water-to-water transfer, it may be beneficial to add a small hole to the bellows to act as a water-level indicator and indicate when flow is done.
- o Agency Comments on the 90% Design Submittal – Comments on the 90% Design Submittal were received from NMFS. WDFW has not yet had the chance to submit comments, but intends to do so soon. Highlights of the discussion surrounding the NMFS comments follow. Formal responses to each of the NMFS comments will be provided at a later date.
 - **Exclusion Nets:** The comment was correct that the reference to the exclusion nets as guide nets was a typographical error and has been corrected.
 - **Optional Lead Net:** Once the decision is made to install a lead net it can be designed in less than one year. Inspection, operation and maintenance plans for the exclusion nets will be included with the 100% design.
 - **Primary Dewatering Screens:** The cleaner brush will only be in the water during the cleaning cycle. The operation of the cleaner was described, and it was noted that it is essentially identical to the cleaner operation on the primary screens at the Upper Baker FSC. Debris brushed off the screens will travel downstream to the fish sorting areas, and will be manually removed from the holding tanks or separators. It is unclear how much debris is expected, but experience at Cowlitz Falls would indicate that debris removed could be carried in buckets to a dumpster on board. As part of the debris handling plan, PacifiCorp will be more proactive about removing floating debris from the reservoir after the construction of the FSC.
 - **General Comments:** The design specifications will include that all screen surfaces be smooth to the touch and meet the applicable NMFS criteria. The smaller transport tanks used for adults and fry will all be equipped with removable covers. The main 1800 gallon hopper used for smolt will not have a cover, but include 2.5-foot-high screens above the water line.
 - **Adult Fish Release Structure:** The design team agrees that it is not known for sure how far fish could be dropped from the adult release pipe at the dam and experience will dictate the limit, but the team believes that about 10 to 12 feet should be acceptable. Bryan stated that his main concern was that this release pipe not be used when the reservoir is significantly down below that.
 - **Secondary Dewatering Screens:** Peter presented the results of a hydraulic model of the backwash screen cleaners to depict how the screen area will be effectively cleaned by the jets, without dead zones between the jet centers. The jets are compact and

located close together at 1 ½ inches on center. This same type of system was recently installed at the new River Mill fish ladder attraction water supply screen and reports indicate that it works very well. The screen cleaners will be able to effectively clean all but about 11% of the screen area, due to blockage by the support column flanges. This is better than the original 12.5% assumption that went into the FSC's hydraulic screen model.

- **Separator Design:** John Serl at the Cowlitz Falls Facility reviewed the new shortened separator concept and agreed with the design. Peter noted that the smolt separator is submerged so the smolts are swimming, not sliding over the separator, and there is no water passing off the downstream end. Therefore, the reduced length should not cause them to pass over the separator into the adult pool. If a small number of smolt do end up in the adult pool they would be crowded into the adult handling brail and could easily be netted out and placed into the smolt hopper. Concerning the stated ambiguity about the required size of openings in the fry separator, it would be possible to provide a couple of different racks with different sized bar spacings if this is deemed necessary. Operators would be able to swap out the racks to optimize performance based on the size of fish coming into the FSC and the performance of the separators.
- **Net Transition Structure (NTS) Trash Rack:** PacifiCorp agrees with the comment that a reduced spacing on the trashrack would result in less debris handling inside the FSC. However, they are concerned that reducing the spacing may result in some level of rejection by the target fish. Bryan Nordlund recalled reading a study about trashrack bar spacing and fish rejection done in California. He believes that the study showed that smolt didn't start rejecting bar racks until the spacing got down to 3 inches (open). He will find the study and share it with the subgroup. The NTS is being designed with the provision for adding an automated raking system if that is deemed necessary after operation of the FSC.
- **MS-222 Disposal:** PacifiCorp is investigating the use of activated carbon filters on the MS-222 waste stream. However, since there are no standard testing methods and no criteria exist relating to the allowed concentrations of MS-222 byproducts in the effluent, no water quality testing protocol will be implemented.
- o Holding and Transfer of Biological Evaluation Fish
 - Fish tagged for biological effectiveness testing of the FSC will be placed in a 60-gallon tank for recovery and transfer to a 250-gallon truck transport tank. The transfer will be accomplished by the same method described in the 90% design report for the transfer of fry from the fry hopper to a 250-gallon transport tank.
 - Tagged control fish held for observation will be held in dedicated troughs with 6 different 20-gallon compartments. The fish will be held for 6 weeks of observation.
- o Adult Release Presentation
 - Brian Friesz presented the proposed approach for the release of adult fish. When the reservoir is near full the release would be at the dam using the adult release pipe shown in the 90% report. For the purposes of estimating the time that this release site would be available it was assumed that this site could be used whenever the reservoir

was above elevation 990. When the reservoir was between elevation 972 and 990, and snow and ice conditions permit, the release location would be the boat ramp at Swift Forest Camp. Below elevation 972, or if snow and ice conditions at Swift Forest Camp do not permit its use, the adult release site will be at Eagle Cliffs. Snow and ice must be removed to permit use of the Eagle Cliffs site. Snow removal from the US Forest Service road is currently done by private property owners. There are discussions between the Forest Service and Skamania County about snow removal, but there is no assurance PacifiCorp can rely on this.

- Brian provided the highlights of a technical memo estimating the seasons and overall time that each of these three locations would likely be available based on historic reservoir elevation data. It was noted these estimated times do not account for the presence of snow or ice, which could affect the times shown for use of the boat ramp at Swift Forest Camp. The memo will be distributed to the subgroup.
- The current design for the Eagle Cliffs release proposes the use of a 15-inch double-walled HDPE pipe on concrete saddles. The pipe and saddles would be removed from the location during times of year when they are not in use to protect them from flood flows. The pipe and saddles will be re-assembled and the saddles placed back in the river every year at the beginning of the adult release season. Brian brought a sample of the pipe and joint connector straps with him to the meeting for demonstration. Water velocities inside the pipe would be on order of 5-8 ft/s. Bryan Nordlund noted that the joints in the HDPE pipe will need to be smooth to prevent fish injury, and expressed some concern over the potential for leakage at the joints. Supplemental water will need to be brought to the site to help evacuate fish from the pipe after the truck is empty. Current ideas for the supplemental water issue are to either bring in a water truck or to permanently install a pumped source of water at the site. The second of those options may require a non-consumptive water right.

No.	SUMMARY OF PENDING SWIFT ACTION ITEMS (remaining from previous Meetings)	STATUS
S68	PacifiCorp (Shrier) Share ACC feedback on adult release concepts at the next subgroup meeting in written form.	Pending write-up
No.	SUMMARY OF NEW SWIFT ACTION ITEMS (from August, 18th, 2009 Meeting)	STATUS
S74	NMFS (Nordlund) Find the California study done on smolt rejection at different trash rack spacings and share it with the subgroup.	Pending

Adjourn 3:35 PM.

Attachment A

Bryan Nordlund expressed concern that some of the bends and turns in the conveyance flume may cause the fish to resist or swim against the current. Though the bends as shown have a radius/diameter ratio of 5 or more (the criteria for juveniles), it is his experience that bends of any kind are the most likely sticking points in a fish conveyance system. As a result, it is important to optimize the conveyance flume design by avoiding bends wherever possible, and to lengthen the curves (r/d ratio as great as possible) where site constraints allow. Brian's proposal to eliminate the curve immediately downstream of the hopper would take the flume directly over a generator maintenance lay-down area. Because of this maintenance area, the group concurred that the flume alignment shown on the 90% drawings should remain as is. The design team will examine the feasibility of lengthening the curves.

Different materials and coating systems for the conveyance flume need to be compared based on their operational benefits and costs. Steel pipe with an epoxy coating may be the most cost-effective installation initially, though inspection and maintenance of the coating may, in the long run, end up being more expensive. Shop-applied coatings are superior to field-applied coatings, but the inspection requirements would still need to be feasible and inspections conducted regularly. In contrast, stainless steel or aluminum pipe would be more expensive to install initially, but would have lower inspection requirements because it can be relied upon to provide a smooth, fish-friendly interior surface for a longer duration without maintenance. PacifiCorp may consider allowing the contractor to propose alternative pipe materials and coating systems for the flume for their consideration during the construction phase of the project. The agency concerns are to provide a smooth surface in the conveyance flume for the entire life of the project, and to provide a means and procedure to inspect and repair the flume if necessary.

Although not discussed or mentioned during the meeting, it should be noted that the subject of conveyance flume pipe materials and coating systems was presented in PacifiCorp's responses to Agency comments to the 60% design submittal and further discussed at the May 21, 2009, ES meeting. This response and discussion clarified that the flume would consist of a steel pipe lined with either an epoxy or other non-corrosive material. In addition, pipe joints (bolted or victaulic couplings) will be provided to enable easy replacement if sections exhibit any degradation. The flume will be inspected using a small number of ports in the pipe, accessible by bucket truck, and located near the flume's vertical supports. The team intends to use a camera to inspect the full length of the pipe, similar to the way crews would inspect a buried sewer line. A regular inspection plan for flume would be a part of the O&M procedures.