BROWNSVILLE DAM PROJECT UPDATE

Prepared by: Denise Hoffert-Hay, Project Manager
Prepared for: Calapooia Watershed Council June 2007 monthly meeting
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Technical Team Meeting – Pump Design Alternatives

A small sub-set of the Council's Technical Team met with Cascade Earth Sciences (CES) on Wednesday, May 30th from 10 am to 2 pm at CES headquarters in Albany on Pacific Blvd. Technical Team members discussed options for the pump design prepared by CES.

Team members in attendance were:

Bud Baumgartner (Council Chair)	Denise Hoffert-Hay (Project Manager)
Tara Putney (Council Coordinator)	Douglass Fitting (OWEB)
Tim Otis (Council Vice Chair)	Kerry Griffin (NOAA/NMFS)
Melissa Jundt (NOAA/NMFS)	Mike Lambert (OR Dept Fish and Wildlife
Joel Watts (OR Dept Fish and Wildlife)	

CES Staff in Attendance:

Steel Maloney (Hydrologist/CES President)	Greg Thurman (Project Engineer)
John Martin (Project Manager)	

Discussion on Pump Alternatives

Greg Thurman presented 3 pump design options including:

- End of pipe screen
- Horizontal Screen
- Inclined Screen

Each of these options is described in detail in the attached document. Conceptual engineered drawings are available upon request.

End of pipe screen discussion (Downstream location)
This alternative was presented at the April Tech Team 60% design meeting as the best option. However, when the design was taken further to completion, it was discovered that when the summer low flows drop below 20 cfs, the pump is no longer receiving water. This meant that the installation at this location would require bedrock excavation in addition to all of the other issues with using this location (SHPO for the canal impacts, potential wetland impacts for pump vault construction). This downstream location is no longer under consideration.

The end of pipe screen is also no longer under consideration. NOAA guidelines for installation require a certain radius of clearance on each side of the pipe screen. Creating the appropriate "box" in the river for installing this requires significant bedrock excavation. In addition, it is the most difficult of the alternatives to maintain flow to the pump during summer low flow conditions.

Horizontal Screen Discussion
This system installation would again require significant bedrock installation. An inverted weir would be installed in the River where the fish screen rests on the channel bottom and would be covered with bed material. The weir would span approximately 1/3 of the channel width (wetted width during summer flow conditions). This system is also known or described as an infiltration gallery.

This design guarantees water delivery to the canal since it is buried in the actual channel. It is virtually vandal proof since there is nothing visible to attack. However, NOAA had many concerns about this design and therefore it is no longer under consideration.

NOAA concerns:

- Design is considered experimental for installation on anadramous fish bearing channels
- Other systems similar to this have a very bad track record in Oregon
- Flows across the screen potentially confusing to juvenile salmonids
- Screen potentially clogs with debris and is difficult to maintain
- Expensive to service if failure occurs
- Removing flow from beneath fish to divert water has unknown impacts on salmonids, especially juveniles

Inclined Screen Discussion (PREFERRED ALTERNATIVE)
Install an inclined weir over a sump. The screen would be positioned parallel to the riverbank. Water would fill a sump vault. The pump would be installed in a pump vault on the bank.

This design is proven, familiar technology for the permitting agencies. No bedrock excavation in the active channel is required, only bank bedrock excavation. Least amount of instream work required.

The drawbacks to this design include: screen must be seasonally installed and removed (or else risk damage to the screen during winter flow events), screen requires a cleaning system (active screen), screen must be inspected once a week to ensure it is functioning properly, screen potentially vulnerable to vandalism, access to service the screen is problematic.

Design issues for inclined screen that need further consideration:

- Size of screen
- Type of screen cleaning system that will be installed
- Access to site for future maintenance of screen and screen cleaning system
- Angle of screen to bank
- Potential need for instream water deflectors to push flow toward the intake during summer low flow
- Sediment trap and how it will function and how it will be installed

Location for pump installation discussion
There are 3 potential locations the pump system can be installed. The site we were discussing in April, downstream from the dam approximately 120 feet is no longer under consideration. The

site would require a DSL wetland delineation, State Historic Preservation Office Section 106 permit to impact the sidewall of the canal and significant bedrock disturbance. The combination of these factors rules out this location.

There are potentially two upstream locations. One right at the dam, the other upstream approximately 100 feet. These locations are both under consideration by the project engineer. Not only does the pump vault have to be installed in the appropriate location, but the intake also has conditions that must be met. CES engineer Greg Thurman is visiting the site and making a determination about the best location for the system.

Next Steps

- CES will prepare the 80% design for the inclined screen.
- Tech Team will meet June 18th to review the design and provide input prior to the 100% design.
- Denise and CES will work on addressing BMPs for the 404 permit as required by the NOAA Habitat Restoration Center BiOp process.
- NOAA Habitat Restoration Center (Kerry Griffin) will provide BMPs and guidance to Denise and any assistance with preparing the document.
- Erika and Denise will work with landowners on south side of the dam in reviewing CES's MOU to access their property for the dam removal.
- Denise and Douglass will continue to work with WRD and OWEB on water rights POD concerns.
- Denise will work with Kerry Griffin (NOAA/NMFS) on preparing paperwork for the Open Rivers Initiative grant. Tentative award in processing.
- Tara and CPRCD will continue to work with OSU on monitoring SOW and contract.
- OSU monitoring (pre-removal) to take place in June, July 2007.
- Denise will continue to work with Oregon Office of Sustainability on state permit streamlining.

NEXT MEETING: June 18th, 2007 10 am to 1 pm at ODFW Headquarters Office in Salem.
MEETING TOPIC: 80% Design for Pump Design for Brownsville Canal.

PLEASE NOTE NEW MEETING LOCATION. We are working to accommodate our NOAA representatives who have done all of the driving to Albany to meet with us. Thank you Mike Lambert for arranging the use of a meeting room in Salem. Thank you to NOAA for all of your meeting attendance at Albany and Brownsville!!!!!!

Pump Design Options for Providing 2.5 cfs to Brownsville Canal

The lists below must be satisfied to meet the needs of each stakeholder group and the engineering realities. These are the points we will have to compromise on in order to find a solution that meets as many needs as possible.

Design Criteria

- Inlet must be in water during low flow conditions (Design must operate when flows are as low 20 cfs. If the River drops below this threshold, the existing instream water right is senior to the Canal water rights and the Canal is shut off.)
    - Meeting this requirement may necessitate instream modifications
- Site must provide scouring flows to prevent the intake from clogging with silt and debris
- Must be in a location that works for obtaining POD transfers for the 9 existing water rights from Water Resources Department
- Must be in a location serviceable to the City
- Must fall into an existing permitting category (see guidance document provided by Melissa at NOAA – May 22, 2007)

Community Criteria

- Easy to maintain
    - One person can manage the maintenance alone
    - No more than 1 or 2 visits to the site per month required during the season of use
    - Select the least trouble-prone pump that is also the easiest to maintain
- Inexpensive to operate
- Must be vandal-proof as possible
- Reliable flow to the site during summer low-flow conditions

Table below was prepared by Denise with input from Steel Maloney and Greg Thurman of CES.

Pump option explored	Benefits	Drawbacks
A. Gravity feed system	• Low maintenance • No utility bill	• 8,000 ft of pipeline necessary to access appropriate intake location • Requires easement for pipeline • Very high initial cost to install • Installation might require bedrock excavation • Point of diversion change needed for water rights
B. End-of-Pipe Screen – originally conceived to avoid needing to excavate bedrock. Self-cleaning Clemons screen intake would be installed along the bank. Water would gravity feed to the pump vault installed on the bank.	• Low maintenance • No bedrock excavation	• Design requires in-channel structure(s) to guarantee flow to the intake when flows drop below 30 cfs. • Structure vulnerable to vandalism

Pump option explored	Benefits	Drawbacks
C. Horizontal Screen – install an inverted weir on the bottom of the River where the fish screen rests on the channel bottom and would be covered with bed material. The weir would span approximately 1/3 of the channel. Water would gravity feed to a sediment sand trap that would flush out sediment and return excess flow to the River. The pump vault would be completely buried in the bank and would be accessible from the top.	• Most vandal proof • Least visually obtrusive • Low maintenance in low sediment stream	• Installation requires excavating bedrock in the channel – which may make obtaining permits difficult • Design requires some in-channel structure(s) to guarantee flow to the intake when flows drop below 30 cfs. • NOAA has concerns about the design being experimental in Oregon • NOAA has concerns about the flows across the screen confusing out-migrating juvenile salmon • NOAA has concerns about the screen clogging with sediment and being difficult to maintain over time (experience on projects where this occurred). • Significant maintenance required if failure occurs.
D. Inclined Screen – install an inclined weir over a sump. The screen would be positioned parallel to the riverbank. Water would fill a sump vault. The pump would be installed in a pump vault on the bank.	• Proven technology that NOAA is familiar with. • No bedrock excavation in the River (bank area only). • Least amount of instream work required.	• Structure vulnerable to vandalism • Active Screen probably required. • Screen must be seasonally installed and removed to prevent damage during winter flows or a substantial screen guard installed.
E. Downstream Location – Water would be piped to the pump vault installed on the bank. Requires 660 cy of fill to create the appropriate bank configuration for installation of the pump vault.	• Less visible from parking area	• Using 660 cy of fill necessitates a wetland evaluation for the site. • Diverting water from the pump vault to the canal requires a Section 106 Linear Features permit from SHPO because of the impacts to the Canal.
F. Upstream Location – Water would be piped to the pump vault installed on the bank. Does not require as much fill to create the appropriate bank configuration for installation of the pump vault.	• Less instream structural requirements than downstream location to control channel configuration. • Pump vault can be placed in river bank without fill	• Most accessible location from parking area may increase risk of vandalism