Request for Bids for the Engineering and Design of the Baker Creek Culvert Removal Project



Requested by: Coquille Watershed Association 223 N. Alder St. Suite D Coquille, OR 97423

August 3, 2017

# Request for Bids for the Engineering and Design for the Baker Creek Culvert Removal Project

# A MANDATORY PRE-PROPOSAL SITE CONFERENCE will begin at August 15, 2017 at 9:00AM

Meet at the project site at the intersection of Baker Creek Ln. and the Powers Hwy. From Hwy 42, head south on the Powers Hwy (Hwy 542) 15.5 miles to Baker Creek Ln. on the right.

Statements made by association's representatives at the conference will not be binding on association unless confirmed by written addendum. Bidders shall submit their proposal pursuant to the provisions of this solicitation to:

Coquille Watershed Association (CoqWA)

c/o Caleb Mentzer 223 N. Alder St., Suite D Coquille, OR 97423

# SOLICITATION CLOSING August 25, 2017, at 4:30 PM (LATE BIDS WILL NOT BE ACCEPTED)

Bidders are solely responsible for ensuring that the CoqWA receives the proposal.

This Bid Document and plan sets are available online (coquillewatershed.org), by phone (541-396-2541), and by email (programmanager@coquillewatershed.org)

Bidders shall familiarize themselves with this entire Bid Document.

All questions and comments about this solicitation shall be directed IN WRITING to Caleb Mentzer, CoqWA-Project Manager Email to: programmanager@coquillewatershed.org

# **INVITATION TO BID**

Notice is hereby given pursuant to this Request for Bids ("RFB") that sealed bids (a "Bid") for the Baker Creek Culvert Removal Project ("Project"), which is described in more detail in Exhibit A Bid Prospectus, will be received by The Coquille Watershed Association ("CoqWA"), an Oregon non-profit corporation, up to the deadline indicated in this Bid Document. Specifically, CoqWA intends to contract the design and permitting of a culvert removal, removal of fill associated with the culvert, and channel realignment on Baker Creek, located near Powers, OR ("Site"). This design and engineering phase will occur from September 15, 2017 to April 30, 2018. A 30% design meeting by November 30, 2017, 60% design meeting by February 1, 2018, and a 90% design meeting by March 15, 2018 are required. A draft permit application should be sent to CoqWA by February 1, 2018 for internal review and the permit should be submitted to DSL/USACE by April 30, 2018. The contract documents (including special provisions and specifications) are available at the CoqWA office, 223 N. Alder St., Suite D. Coquille, OR 97423, online (coquillewatershed.org), or requested via email: programmanager@coquillewatershed.org

Those receiving this RFB who wish to submit a Bid (in each case, a "Bidder") shall furnish labor, materials and equipment necessary for completion of the design in accordance with the specifications provided in the Bid Prospectus. The project will consist of designs with cost and quantity including but not limited to: (i) a series of options for the removal of the culvert and fill and channel realignment potentially including large wood/boulder placement, in order to improve fish passage and habitat in Baker Creek; (ii) identifying the extent and impact of the gravel bedload export after culvert removal under the options identified in the Bid Prospectus (iii) preparation and submittal of permit application(s). Project Design Criteria should reflect those set forth in the U.S. Army Corps of Engineers' Standard Local Operating Procedures for Endangered Species (SLOPES Transportation & SLOPES Restoration). Note: CoqWA and technical partners will provide an outline at the bid tour for a couple of potential options, of perhaps many, for the consultant team to fully flesh out; specifically with emphasis on managing the large quantity of existing bedload upstream of the culvert

See Exhibit A: Bid Prospectus to obtain information on project goals, site history, current knowledge of the site hydrology and geomorphology, proposal instructions and required forms. See Attachment 1: McGee Engineering Report to obtain specific results from the most recent engineering efforts. Lastly, also reference the supplemental additional literature in the Bid Prospectus for additional information on the goals of the CoqWA restoration program, South Fork Coquille River geomorphology and hydrology, and additional engineering reports.

Deadline, no later than 4:30 p.m., August 25, 2017. Bids received after this date and time will not be considered. Bid shall be post marked or hand delivered to the CoqWA office at 223 N. Alder St., Suite D. Coquille, OR 97423; Attention: Caleb Mentzer.

Included in this Request for Bids (RFB) is: Exhibit A: Bid Prospectus that includes project background, requirements for Bidders, proposal instructions, and required forms Exhibit B: Project maps Attachment 1: McGee Engineering report Exhibit A:

#### **BID PROSPECTUS**

LOCATION: Baker Creek, See Exhibit B map for specific project location.

#### SITE TOUR: August 15, 2017 at 9:00AM

BID DEADLINE: August 25, 2017 at 4:30pm.

APROXIMATE START: September 15th, 2017 or as soon as all documents are in order.

#### COMPLETE: April 30, 2018.

**PROJECT BACKGROUND:** This project represents a significant opportunity to restore habitat connectivity to a crucial cold-water tributary of the South Fork Coquille River and improve adult salmonid access to spawning areas upstream of the project site. Elevated water temperature (and limited cold water refugia) has been identified as a key limiting factor for coho salmon populations in the Coquille River watershed (Coquille River Sub-basin Plan, Coquille Indian Tribe, 2007).

During the early 1900's South Pacific Railroad extended the rail line to Powers, Oregon. Wooden trestles were installed over Baker Creek. During the early 1950's a 12 foot in diameter by 255 foot long plate pipe was installed through a section of the trestle and fill was dumped from the trestle by rail cars burring the culvert to replace the failing trestles (see historic trestle designs included in Attachment 2). It is also noted that a 24" culvert was installed beside the larger culvert and was subsequently crushed and/or plugged. 1985-1990, Georgia Pacific (GP) built a bridge 600' upstream of the culvert structure for improved crossing access and began the process to remove the fill and culverts. After approximately 60,000+ cubic yards of fill were removed, bank stability became an issue and the access roads were at risk of being lost, removal was halted. In 1994, GP built a 25 foot wooden Denil fish ladder with baffles. Extensive repairs (\$25,000) were completed after the winter floods of 1996/1997 with maintenance throughout the ongoing years. In 2010, Weyerhaeuser, CoqWA and other partners began the process to remove the culvert and restore fish passage in Baker Creek. In October 2011, a grant from OWEB was awarded with match from partners for technical assistance to conduct a feasibility and geotechnical analysis to the site. GHD completed the Baker Creek Culvert Passage Barrier Preliminary Concept Study that includes Geotechnical Analysis, Topographic Analysis and Hydrologic Analysis along with four (4) proposed options.

In 2017, McGee Engineering completed additional survey work to determine the site's subsurface conditions and evaluate the effect of culvert removal on Baker Creek Road and bridge (Attachment 1). The report indicates that fish passage would be greatly improved given the subsurface conditions on the project site. However, Baker Creek Road will need to be stabilized along the northern side of the road and at the bridge crossing. McGee engineering will be working on the designs for the stabilization of the road prism and bridge reinforcement.

This prospectus is focused on obtaining final designs, quantity and cost estimates, and permitting assistance to address the culvert and fine sediment fill removal to stream grade, channel realignment, and evaluate the export of gravel following the removal of the culvert. The Baker Creek channel will need to be engineered to naturally regrade through the bridge site and upstream. Although stream gravels are integral to high quality habitat for salmon, potential concerns about the impact of the

accumulated gravel export to the South Fork Coquille River channel and streambank stability have been identified by CoqWA staff and technical partners. Consequently, CoqWA would like to see multiple options for the removal of the accumulated gravel including

1) no gravel removed from the Site; allowing for full export to lower Baker Creek and the SFCR, 2) 1/3 or appropriate % of the gravel moved from Active Stream Channel and feathered into adjacent riparian area for long-term stream availability 3) 2/3 or appropriate % of the gravel moved from Active Stream Channel and feathered into adjacent riparian area/floodplain for long-term stream availability 4) 1/3 or appropriate % of the gravel removed from the Site; and deposited at an upland location, with the sum of substrates to remain in the channel for export, and 5) 2/3 or other appropriate amount of the gravel removed from the Site; and deposited at an upland site with sum of substrates to remain in channel for export.

CoqWA is currently seeking final designs (including channel realignment, streambed reconstruction), quantity and cost estimates, and permitting assistance to address the culvert and fine sediment fill removal, channel realignment, and export of gravel following the removal of the culvert. The designs of the channel realignment and estimate of gravel export to the South Fork Coquille River, will allow CoqWA staff and technical partners to choose the best option for fish habitat improvement while also considering downstream impacts to landowners in the South Fork Coquille River. This will ultimately bring the project to "shovel ready" design and then CoqWA staff can begin to seek funding for the implementation that will result in the restoration of natural bedload movement and hydrological connectivity while providing access to a major cold water stream for salmonids and other aquatic organisms.

**PROJECT OBJECTIVES:** The objectives for the Project are to remove the existing obsolete fish ladder, culverts and associated fine sediment/fill, export some or all accumulated gravels/streambed material that has accumulated since the 1950's downstream to Baker Creek and the South Fork Coquille River, place large wood/boulders in the stream channel to provide sufficient channel roughness for proper function, and rehabilitate disturbed areas with proper erosion control measures including replanting with native trees and shrubs. These objectives will achieve our goals to:

(1) maximize the quality and quantity of salmonid over wintering habitat through improved habitat connectivity and increased stream complexity, and

(2) improve the substrate for aquatic organisms by allowing as much gravel export as possible without causing harm to downstream river streambank stability and landowners

#### **SCOPE OF WORK:**

**Design.** The Bid will require the modeling and engineering analysis of the culvert and fill removal process, options for channel realignment, streambed reconstruction, roughened channel, and estimation of the gravel export when leaving all gravel in the stream, 2/3 of gravel in the stream, and 1/3 of gravel in the stream. Infrastructure related engineering regarding the road prism and bridge is being conducted by McGee Engineering. The work shall be designed to standards for which permits can be obtained.

Deliverables. The deliverables to be provided by the Contractor will consist of the following:

(1) soil, geologic or topographic surveys of the Site necessary to estimate the amount of fill including all fine sediment and the removal of no gravel, 1/3 of the gravel, and 2/3 of the stream gravel so as to evaluate the impact of the additional stream gravel on the hydrology in the South Fork Coquille River.

(2) designing drawings indicating tactics and sequencing for removing the existing fine sediment fill and culvert and implementation of channel realignment and restoration. The design drawings will need to include specifications for materials used and methodology for installation.

(3) determining all costs and quantities of materials needed for channel realignment, streambed reconstruction, and developing engineering design plans and drawings necessary to construct the design.

(4) determining all costs associated with removal of existing 12' culvert, 24" culvert, train trestles/ pilings and Denil fish ladder, associated concrete and steel beams; including disposal and/or repurpose of materials.

(5) developing an erosion control and planting plan, including costs and quantities of materials and plant species needed.

(6) attend meetings with the partners, including Coquille Watershed Association, US Fish and Wildlife Service, Weyerhaeuser, Bureau of Land Management, and Oregon Department of Fish and Wildlife at the 30%, 60% and 90% completion levels to present the draft restoration alternative, describing alternative, answer questions and receive input for consideration. Some members of the public may attend the meeting.

(7) Developing and submitting DSL/USACE 404 Fill and Removal permitting; to include a to be decided level of follow-up with the permitting agencies and process.

**Permitting.** The Contractor will also be responsible for working with and attending onsite meetings if necessary with the different permitting agencies to complete designs in accordance with and obtain the required permits and reviews for the project. Permits include but are not limited to DSL/ACOE, ODEQ, and Coos County Land Use.

## Existing Information to be Used.

The Contractor will be required to use the existing data and reports to develop the design alternatives. These investigations, reports, and information have been specifically developed to provide project foundation. They contain large quantities of highly pertinent information that are expected to reduce the development time and cost of the contractor project design/engineering. The following reports are available and will be provided (via electronic copy) to prospective Bidders upon request:

- GHD Baker Creek Culvert Passage Barrier Preliminary Concept Study, 2012
- McGee Engineering Baker Creek Culvert Removal Site Exploration Report, 2017
- Hartman/Parametrix Fisheries Passage at Baker Creek Preliminary Alternatives Evaluation, 1990
- ODFW Baker Creek Aquatic Inventory Report, 1992
- Georgia-Pacific Corporation Fishway Reference Drawings, 1994
- LiDAR information
- C.A. Smith Timber Company Trestle Drawings, 1912
- Georgia-Pacific Corporation Bridge Plans, 1986
- Coquille Watershed Association South Fork Action Plan, 2015
- Coquille River Sub-Basin Plan, Coquille Indian Tribe 2007
- Oregon Coast Coho Conservation Plan for the State of Oregon, ODFW, 2007
- GRI Geotechnical & Environmental Consultants Geotechnical Report, 2012
- Historic aerial photos of the Site;
- SLOPES Guidelines
- Preliminary Assessment of Channel Stability and Bed-Material Transport in the Coquille River Basin, Southwestern Oregon, USGS, 2012

- **EQUIPMENT CHOICE**: Heavy equipment will be commensurate with the project and operated in a manner that minimizes adverse effects to the environment (e.g., minimally-sized, low pressure tires, minimal hard turn paths for tracked vehicles). All Equipment will be cleaned and free from foreign materials and noxious weeds to prevent the introduction of invasive and/or damaging species. All equipment used for instream work will be cleaned for petroleum accumulations and leaks repaired prior to entering the project area. Equipment shall be inspected and approved by the Project Inspector prior to the start of operations.
- **CULTURAL RESOURCES:** Cultural clearances must be obtained prior to any ground disturbance associated with site exploration through all appropriate state and federal agencies. If, in connection with operations under this project, the Contractor, subcontractors, or the employees of any of them, discovers, encounters, or becomes aware of any objects or sites of cultural value on the project area, such as historical or prehistorical ruins, graves, grave markers, fossils, or artifacts, the contractor shall immediately suspend all operations in the vicinity of the cultural value and shall notify the CoqWA of the findings. Operations may resume at the discovery site upon receipt of written instructions. No objects of cultural resource value may be removed.
- **EXAMINATION OF SITE, BID DOCUMENTS, PERMITS, ETC.:** Before submitting a Bid, each Bidder shall be responsible for: (i) becoming fully acquainted with the Site and the conditions relating to the Work, in order to understand fully the facilities, difficulties, and restrictions attending the execution of the Work; (ii) carefully examining each component of the Bid Documents and any other available supporting data, in order to become thoroughly familiar with all of the requirements; and (iii) obtaining for itself, at its own cost and expense, copies of all agency and association guidelines and standards cited in the proposed Contract and necessary to perform the Work. No failure or omission of any Bidder to receive or examine any such information or to visit the Site and become acquainted with the conditions existing at the Site shall in any way relieve such Bidder from obligations with respect to its Bid, any Contract entered into with such Bidder, or the Work, and the submission of a Bid shall be taken as *prima facie* evidence of compliance by the submitting Bidder with the requirements of this paragraph.
- **SELECTION AND EVALUATION CRITERIA:** Proposals will be evaluated by a Selection Committee that, after a review of written proposals, may choose to also conduct a personal interview. Selection Committee will include at minimum BLM Fish Biologist, ODFW Fish Biologist, USFWS Biologist, Weyerhaeuser representative, and CoqWA Project Manager. Bid evaluation will be based on the ability of the Bidder to meet the specifications for the tasks described in this RFB in a timely fashion. Selection will also be based on the ability of the Bidder to work in a cooperative manner with CoqWA staff and project partners on the Project. CoqWA will generally not disclose the status of any award until the appropriate authority at CoqWA has approved the award of a Contract. Normally, the awarding of a Contract or Bid rejection will occur within 10 calendar days after Bid opening. If the selected Bidder and CoqWA agree, this deadline may be extended, but CoqWA reserves the right: (i) to award multiple Contracts for parts of the Work; (ii) to consider such criteria as it may deem appropriate with respect to the Project; (iii) to reject any or all Bids; and/or (iv) not to proceed with the Work and/or the Project (or any part thereof); all in the exercise of its sole and absolute discretion. CoqWA will provide a written notice of its intent to award a Contract to the successful Bidder(s) (in each case, a "Notice of Intent to Award Contract"), and any submittals required to be submitted to CoqWA within a certain number of days after award is made will count from the day that the Notice of Intent to Award

Contract is given. The actual award shall, however, be dependent on full execution of the Contract(s) and submission by the successful Bidder(s) of all other required documents.

- **EVIDENCE OF RESPONSIBILITY:** Upon the request of CoqWA, a Bidder whose Bid is under consideration for the award of a Contract shall submit promptly to CoqWA satisfactory evidence showing the Bidder's financial resources, construction experience, and organization available for the performance of the Work.
- **RIGHT TO AWARD OR REJECT:** This RFP does not obligate the Coquille Watershed Association to award a contract, the CoqWA reserves the right to reject any and all proposals and to further amend or refine a proposal and negotiate a contract with one of the proposers. The Coquille Watershed Association reserves the right to offer a contract to other than the lowest cost bidder based on other evaluation criteria.
- **CONTRACT REQUIREMENTS:** It is the desire of the Coquille Watershed Association to enter into a contract that includes all of the services necessary to achieve the goal of the project, whether or not those services are specifically outlined or described in this RFP. This project includes federal funds, therefore the selected firm must be able to comply with any specific federal provisions and regulations that may apply to such a federally funded contract and may be required to sign certain assurances related to applicable federal or state laws.
- **WAIVER OF INFORMALITIES:** The Coquille Watershed Association reserves the right to waive minor informalities contained in proposals, when in the Association's sole judgment; it is in the best interest of the Watershed Associations to do so. The CoqWA reserves the right to waive minor informalities in the Bids received. The CoqWA may also reject any Bid not in compliance with all prescribed requirements, including the requirement to demonstrate the Bidder's responsibility and may reject for good cause any or all Bids upon a finding by the CoqWA that it is in the public interest to do so, in accordance with OAR 137-049-0440
- **BID ERRORS AND WITHDRAW:** A Bidder may withdraw its Bid at any time prior to the date and time that Bids are due, by means of written notice which is given to CoqWA before the date and time that Bids are due, at the address for submission of Bids which is given above. A Bidder may also modify and/or resubmit its Bid at any time prior to the date and time that Bids are due.
- **BIDDERS INTERESTED IN MORE THAN ONE BID:** No person, firm, or corporation shall be allowed to make, file, or be interested in more than one Bid for the Work. However, a person, firm, or corporation which has submitted a sub-proposal to a Bidder, or which has quoted prices of materials to a Bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other Bidders or making its own Bid.
- **COSTS INCURRED:** The Coquille Watershed Association accepts no liability for any costs incurred by respondents in the preparation or presentation of proposals.

**INQUIRES:** Questions concerning this request for proposals should be directed in writing to: CoqWA Project Manager – Caleb Mentzer, Email: <u>programmanager@coquillewatershed.org</u>

Each Bidder shall promptly notify CoqWA of any discovered conflicts, ambiguities, or discrepancies in or between, or omissions from, the Bid Documents. Bidders should note that questions received less than two calendar days prior to the date scheduled for opening of the Bids may not be answered. Any interpretation or correction of the Bid Documents will be made only by Addendum, and a copy of such Addendum will be sent directly to each Bidder. No oral interpretations of any provision in the Bid Documents will be made to any Bidder.

# **PROJECT DESIGN MILESTONES**

Pre-bid meeting and Site visit:	August 15, 2017
Deadline for submitting requests for information:	August 23, 2017
Bid due date:	August 25, 2017
Anticipated opening of Bids:	August 28, 2017
Successful Bidder(s) to provide contract/all paperwork to CoqWA:	September 4, 2017
Deadline for commencing the Work:	September 15, 2017
Anticipated final completion of entire Project:	April 30, 2017

**PROPOSAL INSTRUCTIONS:** Bids must be received on or before 4:30 pm, on Friday, August 25<sup>-</sup> Bids shall be mailed or hand delivered to;

Coquille Watershed Association c/o Caleb Mentzer 223 N. Alder St. Suite D Coquille, OR. 97423

Bidders must clearly show the following information on the envelope in which their Bid is sent:

Name of Bidder RE: Engineering Bid for Baker Creek Culvert Project Bidder's Address

Proposals shall include, at a minimum, the following items:

## A. Bid Form with Schedules 1-4 completed.

- B. Please provide a work plan to accomplish the Project goals as described in the RFB, including a description of the work product, time estimates for each task, personnel to be assigned (where possible, individual staff members and titles should be provided), and costs, taking into account the proposed timeline for completion of the Work indicated in the RFB.
- C. A list of equipment with size expected to be on the project (Including proposed fire safety).
- D. A written statement affirming your ability to undertake and complete specific phases of this work in a timely fashion from roughly September 15, 2017 through on or before April 30, 2018.
- E. A signed statement that you can and shall provide the Insurance requirement as listed.

Bids must not contain any erasures, interlineations, or other corrections unless each such correction is suitably authenticated by affixing in the margin immediately opposite the correction the surname or surnames of the person or persons signing the Bid, in the named person's own handwriting. In order for a Bid to be considered responsive, it must contain all of the documents and information which are required by this RFB, with signatures and notarization as indicated, and it must: (i) cover the complete scope of work as defined in the RFB; (ii) not include any exclusions or qualifications and (iii) include additive, alternate, unit and lump sum costs as listed on the bid forms. Bid prices must (where applicable) be F.O.B. at the Site, with all transportation and handling charges paid by the Bidder.

#### **Bid Form**

#### Engineering for Baker Creek Culvert Removal and Channel Realignment

Coquille Watershed Association Attn: Caleb Mentzer 223 N. Alder St., Suite D Coquille OR 97423

This Bid is being made to The Coquille Watershed Association, a State of Oregon non-profit corporation ("CoqWA" or "Owner") in the form of a sealed bid (the "Bid") with respect to the project known as "Baker Creek Culvert Removal Project" (the "Project"), located immediately west of the town of Powers, in Coos County, Oregon (the "Site"). The undersigned ("Bidder") is making this Bid pursuant to the terms of the Request for Bids for the Project, dated August 3, 2017 (the "RFB"), a copy of which was supplied to Bidder by or on behalf of CoqWA and has been reviewed in its entirety by Bidder. The RFB and all of the documentation required of a proposed bidder on the Project under the terms of the RFB are sometimes hereinafter referred to collectively as the "Bid Documents".

Name of Bidder:	
Business License Number:	Federal Tax Id No:
Contact Person(s):	
Place of Residence (if individual):	
State of Incorporation/Formation (for entities):	
Business Mailing Address:	
Shipping Address (if different):	
Telephone Number: Fax Nu	ımber:
Email:	

Pursuant to and in compliance with the RFB, the undersigned Bidder, having become familiar with the conditions at the Site and otherwise affecting the performance of the Project; the cost of the work to be done in carrying out the Project (collectively, the "Work"); the terms of the Bid Documents; and the form of the Contract to be awarded to the successful bidder (the "Contract"); hereby proposes and agrees to perform the Work within the time stipulated in the Bid Documents and to provide and furnish any and all labor, materials, equipment, transportation, utilities, and services necessary to perform and complete the Work in a workmanlike manner and in strict conformity with the requirements contained in the Bid Documents, including any addenda referenced below, for the amount(s) and/or at the rates indicated below (collectively, the "Bid Price").

By signing and submitting this Bid to CoqWA, Bidder hereby represents, warrants, acknowledges, and agrees to and with CoqWA, or certifies to CoqWA (as applicable), as follows:

1. <u>Bid</u>. Bidder hereby offers to carry out and complete the Work for the Bid Price, made up of the price(s) and/or rates, and according to the budget, which are more particularly described in Schedule 1 to this Bid, and Bidder has checked all of the figures contained in this Bid carefully and understands that CoqWA will not be responsible for any errors or omissions on the part of Bidder in making this Bid.

2. <u>Quantities</u>. Bidder understands that the quantities mentioned in the RFB are approximate only and are subject to increase or decrease, and hereby proposes to perform all quantities of work as either increased or decreased in accordance with the terms of the Contract.

3. <u>Bid to Remain Open</u>. This Bid, unless withdrawn <u>prior</u> to the scheduled closing time for receipt of Bids, or thereafter when permitted under the terms of the RFB, shall remain valid and will not be withdrawn by the undersigned Bidder for a period of thirty (30) days after the scheduled closing time for receipt of Bids.

4. <u>Responses to CoqWA Concerns.</u> Bidder hereby responds to CoqWA's concerns about the following issues as indicated below, with such responses being continued/contained on attached schedules to the extent indicated below in each case:

(a) <u>Minority- and Women- Owned Business Enterprises</u>. Is the Bidder's firm at least 51% minorityor women-owned, controlled and operated: \_\_\_\_ Yes \_\_\_\_ No

If the answer is "yes", identify the % of minority- or women-ownership, control and operation:

(b) <u>Additional Information</u>. Please provide any other information you feel would help CoqWA's selection committee evaluate your firm for this Work.

5. <u>License(s)</u>. By execution of this Bid, the undersigned Bidder declares that Bidder holds the following license(s) relevant to the Work, in accordance with the applicable licensing laws where the Project is to take place, as follows:

6. Interested Persons. The names of all persons interested in this Bid as principals are as follows:

If Bidder or another interested person is a corporation, state the legal name of the corporation, its state of incorporation, and the names of the president, secretary, treasurer, and manager thereof.

If Bidder or another interested person is a partnership or other form of legal entity, state the name and form of the entity, its state of formation, and the names of all the individual partners, members, joint venturers or others with an interest in the entity.

If Bidder or another interested person is an individual, the person's sate of legal residence, and the first and last names in full, and give all fictitious names under which the individual does business.

7. <u>Notices</u>. Bidder understands that, except as noted below, notice of acceptance of this Bid, any requests for additional information, and any other notices to Bidder with respect to this Bid shall be given in writing and addressed to Bidder at the business address for Bidder which is set out above. Each such notice or request shall be deemed given either upon actual delivery (or attempted delivery) to such address

(whether personally or via courier), or three calendar days after being placed in the US mail, postage prepaid, addressed to Bidder at such address. However, Bidder understands that CoqWA may, if it chooses, elect to respond by email to questions from Bidder, at the email address provided in this Bid.

8. <u>Attachments</u>. Attached to these Bid cover pages and incorporated into this Bid by this reference are the following required items, in the forms required under the RFB:

(a) Schedule 1 – Bid Price sheet with the details of the Bid Price (an Excel spread sheet may be used instead of the form provided);

- (b) Schedule 2 List of references for similar projects completed;
- (c) Schedule 3 List of proposed subcontractors and suppliers;
- (d) Schedule 4 Insurance requirements

9. <u>Requirements Upon Award</u>. If this Bid is accepted by CoqWA and notice of such acceptance is timely delivered to the undersigned, then the undersigned shall, within ten (10) days after receipt of such notice, execute and deliver to CoqWA:

- (a) the Contract, in the form required under the RFB, as prepared by CoqWA;
- (b) the insurance certificates required under the RFB and the Contract; and
- (c) such other documentation as may be required under the Contract.

Thereafter, the undersigned will commence and complete the Work within the time required by the Contract.

10. <u>Bidder's Acknowledgment, Certification, and Agreement as to its Bid</u>. By submitting this Bid, Bidder shall be deemed to acknowledge, certify, and agree to and with CoqWA that Bidder:

- (a) has taken steps reasonably necessary to ascertain the nature of and location of the Work;
- (b) has investigated and satisfied itself as to the general and local conditions that can affect the Work or its cost, including but not limited to:
  - (1) conditions bearing upon acquisitions, transportation, disposal, handling, and storage of materials;
  - (2) the availability of labor, materials, water, electric power, and access via roads or waterway;
  - (3) uncertainties of weather, river stages, tides, or similar physical conditions at the Site;
  - (4) the conformation and condition of the ground and any shoreline or riparian area;(5) the character of equipment and facilities needed preliminary to and during Work
  - (5) the character of equipment and facilities needed preliminary to and during Work performance; and
  - (5) the Site's biological, chemical, and associated physical hazards;

(c) has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered, insofar as this information is reasonably ascertainable from an inspection of the Site as well as from the Bid Documents and other information made a part of the RFB; and

(d) has satisfied itself as to the adequacy of time allowed for the completion of the Work.

11. <u>Addenda</u>. Bidder has received, reviewed, and understands, the following Addenda to the original Bid Documents (list all Addendums associated with this Bid packet):

Addendum Number	Date of Addendum	

# In witness whereof, this Bid is being executed and delivered by Bidder as of the date(s) set forth below

If Bidder consists of or includes one or more corporations, partnerships, or other forms of legal entity, the full legal name of the entity shall be set forth in the signature block below, together with the signature(s) of the officers, partners, or other individuals authorized to sign contracts on behalf of and to bind the entity.

By:	
	(Signature)
Print Name:	
Print Title:	
Print Date:	

If Bidder consists of or includes one or more individuals, the following form of signature block is to be used for <u>each</u> of such individuals:

Signature:	
Print Name:	
Print Date:	

# **Bid Price Sheet**

Bid Item	Units	Contract Quantity	Unit Price	Extended Cost
Develop any soils, geologic or topographic surveys of the Site necessary to design the removal of the culvert				
Develop a designfor channel realignment and streambed reconstruction				
Estimate amount of fine sediment removal and estimate the amount gravel export and impacts to the South Fork Coquille River given the following options: 1) leaving all gravel in the stream, 2) 1/3 of the gravel moved from Active Stream Channel and feathered into adjacent riparian area for long-term stream availability 3) 2/3 of the gravel moved from Active Stream Channel and feathered into adjacent riparian area/floodplain for long- term stream availability 4) leaving 2/3 gravel in stream, 5) leaving 1/3 gravel in stream.				
Determine all costs associated with removal of existing 12 foot, 24 inch culverts, associated concrete and steel I- beams, and Denil fish ladder, including disposal and/or repurpose of materials.				
Develop an erosion control and planting plan, including costs and quantities of materials and plant species needed.				
Complete and obtain the required permits and reviews for the restoration work. County, State & Federal including but not limited to ACOE/DSL, ODEQ, Coos County				
Travel to Coquille Oregon and present the restoration alternative at each the 30%, 60% and 90% design levels to the primary partners of the project to describe the alternative, answer questions and receive input.				
Other: Please line item and justify additional expenses for the completion of the design and engineering of the Project				
Total:				

# Bidder's References for Similar Projects Completed

Please list references, including name, address, and telephone number of those who have personal knowledge of Bidder's abilities to undertake and complete projects of similar scope and complexity.

Project Name	Reference	Address	Telephone Number

References will be contacted. If possible, provide a brief description of each project.

#### List of Proposed Subcontractors and Suppliers

Please list the name and the location of the place of business of each proposed subcontractor or supplier who will perform work or labor or render service or materials to the prime contractor as part of the Work. List only one subcontractor for each such portion as is defined by the prime contractor in this bid. Bidder understands and agrees that, if its Bid is accepted, Bidder shall not: (i) substitute any subcontractor for one that was listed in its Bid; (b) permit any subcontract to be voluntarily assigned or transferred by the original subcontractor or allow it to be performed by anyone other than the original subcontractor listed here; or (c) subcontract any portion of the Work to any subcontractor except as listed here, except as authorized by CoqWA in writing.

Portion of Work Name of Subcontracto		Address of Subcontractor

Check this box if no subcontractors will be used.

Material Supplied	Name of Supplier	Address of Supplier

#### **Insurance and Security**

\*Contractor is responsible to comply with all federal, state, county and local laws, ordinances and regulations applicable to this contract. At the time or request for bid the information listed below was know additional coverages may be required or change.

**INSURANCE:** The CoqWA shall have no obligation to CONTRACTOR until CONTRACTOR has fully complied with the following requirements. CONTRACTOR must carry insurance policies offering the following minimum coverage levels and provide Certificates of Coverage to the CoqWA and New Growth Olympus, LLC before work commences.

Commercial General Liability	\$1,000,000 Each Occurrence \$2,000,000 Policy Aggregate			
	\$10,000 Premise Medical			
Automobile –Liability covering owned, hired and non-owned vehicles. (Including the " <b>pollution from autos endorsement," 1S0 Form No. CA 99 48</b> )				
State or private accident insuran	ce- Workers Compensation			

The above polices as shall reference as additional insured as follows and copies be provided to:

Coquille Watershed Association 223 N Alder St. Suite D Coquille, OR 97423 Exhibit B:



Map of the overall project location.



LiDAR image of project site.



Land owners in the Baker Creek and South Fork drainages.

# Baker Creek Culvert Removal

Site Exploration Report

July 11, 2017



Prepared by: Alex Dunn & Anna Vesper



804 D NW Buchanan Ave., Corvallis, OR 97330 P.O. Box 1067, Corvallis, OR 97339 Phone: (541)757-1270 Fax: (541)758-6585

# Table of Contents

١.	Introduction & Objectives	1
II.	Site History	2
III.	Fieldwork & Data Collection	4
IV.	Site Conditions & Concerns	6
V.	Conclusion	15

#### Appendices

- A) 2017 McGee Engineering Plans
- B) 2017 Boring Data
- C) 2012 GRI Geotechnical Report
- D) 1912 Railroad Trestle Drawings
- E) 1951 Culvert Plans & Cross Sections
- F) 1986 Bridge Plans
- G) 2012 GHD Drawings

## Introduction & Objectives

The Baker Creek drainage is located approximately 2 miles northwest of Powers, Oregon in Coos County. Both private and public land owners are present in the drainage, with the primary land cover being second-growth forests. The drainage is a tributary to the South Fork of the Coquille River and has been designated by Oregon Department of Fish and Wildlife (ODFW) as a high priority fish passage stream reach.

Approximately 200 feet upstream from Baker Creek's confluence with the South Fork of the Coquille, fish passage is being hampered by a historic culvert stream crossing, now located on Weyerhaeuser property. In the past 30 years, efforts have been made to remove this culvert to allow fish passage but have thus far only resulted in a timber fish ladder retrofit to the existing culvert. This fish ladder, while providing some fish passage still does not provide fish passage for all stages of life during the year and remains a high priority project with both ODFW and the Coquille Watershed Association.

The objectives for this report include:

- summarize the site's history
- gather data to describe the existing surface conditions
- gather data on the site's subsurface conditions
- propose a creek alignment and grade through the existing culvert crossing
- evaluate excavation magnitudes for removing the culvert
- identify and describe areas of concern going forward with this project.

This report has been written with the intent that the reader has the 2017 McGee Engineering plans in hand (Appendix A).



Figure 1: Timeline of site projects and investigative efforts.

In 1912, the project site was owned by the C.A. Smith Timber Company and had an 85' tall timber railroad trestle constructed across the drainage. By 1951 the trestle was beginning to show signs of deterioration and was replaced with a 12' diameter corrugated metal pipe (CMP). According to the 1951 plans there was to be about 58,000 cubic yards of material placed as fill around and over the culvert so the finished grade matched the previous railroad grade. It is presumed there was an outfall similar to existing conditions at this time resulting in a complete fish passage barrier.

In 1986 efforts began to remove the 12' culvert to restore fish passage. A 65' prestressed concrete bridge was designed and installed approximately 600' upstream of the culvert to provide a stream crossing for the road after the fill was removed. The bridge is supported by 20' long steel H-piles with concrete abutments according to the 1986 plans.

Fill material was removed from the site from 1986 to 1990, when excavation stopped due to slope instability concerns. The specific slope of concern appears to have been the northern slope at the inlet of the existing culvert. At this time the site was owned by Georgia Pacific, who contracted Hartman Associates, Inc. and Parametrix, Inc. to evaluate the fish passage alternatives for the site. Their 1990 report offered the idea of a fish ladder to restore seasonal fish passage, which was installed in 1994 from James D. Caulfield's designs and is still present at the site.

In 2010, efforts were renewed by the site landowner, Plum Creek Timber, to evaluate options and concerns for removing the culvert, and the Coquille Watershed Association was approached for assistance on the project. GHD began investigative efforts in 2011 on behalf of the Coquille Watershed Association leading to their 2012 report, which included three geotechnical borings and resulted in the concern of creek level degradation at the bridge site.

In 2016, Plum Creek Timber was purchased by Weyerhaeuser, who requested time to familiarize themselves with the project before proceeding with further design decisions. As part of this, McGee Engineering was contacted to conduct further site explorations and provide this report.

#### Fieldwork & Data Collection

For this report effort was primarily spent gaining a better understanding of subsurface bedrock conditions and historic channel features. To accomplish this multiple site visits were made to visually assess the site and assist in the data collection efforts.

Ground topography was primarily produced using public LiDAR collected between 2007 and 2009 by the Oregon Department of Geology & Mineral Industries (OR DOGAMI). The LiDAR data was downloaded as point files with references to NAVD 88 and NAD 83 State Plane Coordinates 3602 (Oregon South). The LiDAR data from 2007 was checked for accuracy both by visual observations and through survey data collected in May 2017 by Estabrook Land Surveying. The Estabrook survey also was used to supplement the LiDAR data around the bridge and creek margins upstream of the inlet, due to limited LiDAR returns in these locations, and to update the topography at the culvert site due to excavation work done prior to subsurface exploration.

Subsurface exploration was conducted on May 22<sup>nd</sup>, 2017 using a Caterpiller MD5075 rock drill. Areas of particular interest were determined prior to drilling so that a rock boring layout could be roughly established prior to equipment arrival. At each boring, bedrock depth below the existing ground surface could be estimated to the nearest foot by relating the depth of each drill rod in the ground before hitting a significantly stiffer subsurface material. Subsurface material properties were not collected, apart from qualitative observations made by the drill operator based on prior drilling experience. The Estabrook survey captured the location and elevation at each bore hole allowing for bedrock elevations to be estimated across the site.



Figure 2: Caterpiller MD5075 rock drill, drilling at bore hole 19, taken May 2017.

Our final source of data were the historical plans and drawings provided by the landowner. In particular the culvert plans dated 1951 were valuable due to the inclusion of cross sections along the old railroad trestle, a ground profile at the railroad centerline, and a plan view of their stationing method. The latter providing crucial information that the stationing for ground profiles in the 1951 and 1912 plans was reversed from the interpretation in the 2012 GHD report. They instead indicate the north side of the drainage historically did have the steeper slopes, which was corroborated by the subsurface explorations on the northern slope. In addition, the 1951 cross sections offer an elevation at creek centerline and the plan view suggests that the current creek alignment is not the same as it historically had been.

#### Site Conditions & Concerns

Upstream of Bridge (Creek Station -32+50 to 2+00)



Figure 3: Looking upstream from the bridge crossings, taken April 2016.

Beginning upstream of the site, a long profile of Baker Creek was modeled using the OR DOGAMI LiDAR to provide an idea of natural stream gradient in the drainage. Using a stream reach approximately 2500' upstream of the project site, an average stream gradient of 2.5% was estimated over a 1000' section which appeared visually consistent. There is then a 300' long stretch with approximately 7.0% gradient before the stream gradient drops to less than 1% which continues down to the culvert location.

The stream reach upstream of the bridge site is a wide winding channel with gravel bars located along the banks. During a site visit in May 2017 no bedrock was visible in the channel up to 1000' upstream of the bridge, however a profile completed the summer of 2012 by Plum Creek, noted a bedrock pool 700' upstream from the bridge. Despite not seeing bedrock in the channel on the most recent observations, it was visible in the slopes dropping into the creek basin.

Potential concerns for this segment of Baker Creek revolve around the increased bedload from Baker Creek into the S. Fork of the Coquille River as this long stretch is regraded to a gradient closer to 2% which is observed downstream of the culvert and well beyond the inlet of the culvert.

#### Bridge Crossing (Creek Station 2+50)



Figure 4: Profile at the bridge crossing looking downstream, taken April 2016.

The bridge site represented the upper extents of the most recent surface and subsurface survey. Baker Creek is a 23' wide active channel at this 65' long concrete bridge, with riprap channel slopes up to concrete abutments. According to plans for the bridge dated 1986, these concrete abutments are within a foot of the elevation of the current streambed which is at 172.7'. Additionally, the plans depict that the bridge is supported on 20' H-piles, which would place their tips at approximately elevation 166'. Rock drilling done in the road near both ends of the bridge and just downstream of the bridge suggest that there is a bedrock knob on the town side of the bridge while a more gradual bedrock slope going up the woods end. It is estimate that the bedrock is located at elevation 153' in the channel under the bridge.

Using a projected channel regrade of approximately 2% up from the excavation limits for the project, the streambed elevation at the bridge site would be approximately 160', which is 13' below the current streambed. With this amount of degradation, the streambed would be below the elevation of the pile tips as shown on the 1986 plans and would create issues for the road fill stability behind the existing concrete abutments. Unfortunately, no information has been found yet to support that piles were driven farther than 20'; however it is suspect that they would have stopped at 20' down rather than driving until they hit bedrock. A significant concern at this location will be ensuring that the bridge and road fill will be stabilized to support the expected of streambed degradation.



Figure 5: Elevation view at the bridge site with bridge geometries per 1986 plans, anticipated bedrock depth, and anticipated channel depth.

#### Beginning of Channel Realignment (Creek Station 4+50)



Figure 6: Plan view of existing Baker Creek alignment and the proposed alignment.

After a 200' long section of Baker Creek with very low gradients, the creek takes a sharp turn to the left, where an unnamed tributary feeds into Baker Creek. Instead of turning to the left as it currently does, the 1951 plans, and data from the bedrock borings suggest that the creek has historically traveled further into the current bank before turning due north. A line of rock borings were specifically located to look at this option after seeing a rock outcrop opposite the confluence with the unnamed creek and looking at the overall alignment of Baker Creek at this location. By scaling off of the 1951 drawings it appears that their sketch of Baker Creek supports this idea that the creek traveled through this bench area before the culvert was installed. The 1951 plans also state the elevation of the creek in this area was approximately 154.5', when converted into NAVD 88. This elevation and scaled location was used as

an upstream control point for the proposed creek since it provided a reference for Baker Creek prior to culvert influence.

In addition to using the control point from the 1951 plans, the projected creek alignment was loosely based on the low points in the bedrock model going down the culvert length and checked for reasonability by scaling off the 1951 creek plan sketch. As described above it was estimated that a bulk of Baker Creek would naturally regrade to a 2% grade as that matches grades seen below the culvert and then in a long reach above the area of culvert influence.

Potential concerns at this location include: how to transition from the proposed excavated channel to existing streambed to allow for natural degradation upstream while permitting the removal and realignment of Baker Creek, what will be the impacts to the unnamed tributary and how will its confluence location change, and the amount of earthwork required to create a channel through this bench which previously was not anticipated to be removed.



#### Creek Station 6+00

Figure 7: Looking upstream from the culvert inlet at creek station 6+00, taken May 2017.

This location represents the current channel immediately after the confluence with the unnamed creek. The channel has visible bedrock on the northern banks for a majority of the length down to the culvert inlet with steep slopes that go up to the road. After the channel turns, the creek and culvert loosely parallel the road with the narrowest location only having 75' between the road edge and creek channel. The elevation change between the creek and road at this location is at least 40' with the magnitude increasing further downstream as the creek drops in elevation and Baker Creek Road climbs out of the drainage.

With this vertical elevation change and limited horizontal distance, ensuring the road stability after project excavation is a concern. Bedrock was found approximately 5' below the road surface at the road edge and continues to run under the road between 5' and 10' so there is a base that can be relied on for stability, however how to effectively change the road and its southern slope will need to be investigated further.

This location also is in the stream reach that is proposed to be realigned during this project. Based on the bedrock and scaled 1951 plan, the proposed creek is approximately 65' east of the existing creek centerline. It is also proposed that the new streambed will be approximately 13' lower than the elevation in its current location which will facilitate stream gradients closer to those outside of the culvert's influence. Further design efforts will be required from hydraulic engineering and fish biologists to determine a final stream design for the project.

#### Inlet of Culvert (Creek Station 7+00)

The subsurface exploration was primarily concentrated along the length of the culvert with the inlet being the westernmost side of a boring grid system. The grid was laid out so that a boring was done at approximately 10' and 30' offsets from the culvert centerline every 25' down the culvert length. This allowed for data to be gathered through the bulk of the area of creek realignment without significant earth removal. As stated above it was determined that the creek alignment historically did not pass through the location of the current inlet, which is supported by the boring data collected near the inlet. It is proposed that the centerline of the creek actually be constructed approximately 35' southeast of the current inlet near the modeled low location in the bedrock. The creek then is proposed to meet up at the existing culvert centerline near existing creek station 7+50 and meander along the northern side of the culvert to the outlet. This alignment is primarily based on following the low points in the bedrock profiles.

When efforts were first made to remove this crossing in the late 1980s activities were stopped due to slope stability concerns, which according to the 1990 Georgia Pacific report, were located on the northern slopes near the inlet. During the May 2017 activities, water was encountered at and near the surface along the northern slopes near the inlet, which could largely explain slope failures seen in the 1980s. The slope instability issues likely were further exacerbated by the road drainage along northern Baker Creek Road. Almost directly above the existing inlet is an 18" cross-drain to pass ditch water to the downhill side of the road. It was recently replaced (circa 2015) with a flume off the outlet, but it still directs the ditch water into an over-steepened area near the inlet with significant outfall energy.

Future concerns around the inlet for the project will include: how to manage both the surface and subsurface water on the northern slopes to prevent slope instability issues, how the northern slopes

should be finished to mitigate road stability concerns, and how to decommission the existing channel and culvert location once the finished channel is constructed.



#### Railroad Centerline (Creek Station 8+40)

Figure 8: Profile along historic railroad centerline showing existing ground, 1951 historic ground, projected excavation and anticipated bedrock.

The historic railroad centerline is estimated to have crossed Baker Creek near creek station 8+40 which was determined after finding a bent from the wood trestle during preliminary excavation and relating the railroad grades on either side of the Baker Creek drainage. While this location does not represent a key location for future design features, it was a location that had profiles surveyed in 1912 and 1951. So it provided a reference to observe how the existing topography compared with the profiles surveyed in each of these pre-fill conditions.

The 1951 profile was primarily used for comparison since it was the more recent of the profiles and appeared to show more ground details than the 1912 plans. It was the 1951 drawings that suggested that these profiles were reversed from the prior interpretations, which thought the south slopes were steeper than the north slopes. The data collected from rock borings BH-49 through BH-54 supported that the northern slopes were steeper and likely have a very steep rock bluff somewhere under the surface. A bluff-like feature is also seen on the 1951 ground profile which substantiates the reversal of how these historic profiles are viewed.

In addition to the bluff feature, the 1951 drawings also provide information for the creek profile. The drawings indicate the streambed wasn't quite at bedrock elevations observed in the 2017 rock borings, although the centerline of the creek corresponds closely where the anticipated low point is in the bedrock through this profile. This provided a check on the creek alignment that is proposed to ensure it was similar in magnitude to the creek in 1951.

The concerns at this location include those previously listed about ensuring road stability and conducting streambed engineering, however this location primarily provides more confidence in the proposed creek and bedrock profile developed from the 2017 data. It supports that: historically Baker Creek wasn't at bedrock level although is aligned with the low point in the developed bedrock profile, the channel was just slightly wider than 25', there was a bluff like feature stabilizing over-steepened slopes on the north side, and that the south side slopes were very similar to 1.5H:1.0V.



# Outlet of Culvert (Creek Station 9+50)

Figure 9: Looking upstream at the fish ladder and outlet of the existing culvert, taken May 2017.

The outlet has been the primary focus for fish passage efforts due to the existing outfall. The culvert at the outlet also has significant deterioration, with the corrugated pipe being supported by cable tie-backs and a concrete support beam on piles at the outlet. As stated in the site history, a fish ladder was constructed off the outlet in 1994 and remains there to date.

As seen in the photo above, bedrock was visible on the channel margins very close to the outlet providing a horizontal boundary for the channel and marking the end of the Baker Creek realignment for

this project. Bedrock however wasn't visible in the plunge pool at the outlet so the vertical control for the creek was taken just downstream from the outlet's plunge pool, outside of the culvert's impacts.

During the May 2017 observations, a recent slope failure was observed on the northern side of the outlet. While the conditions of the failure limited any exploration of that area, it is anticipated that like the instability issues seen in the late 1980s near the inlet, this failure was largely due to subsurface water. The 2016-2017 winter saw record rain levels, which likely increased the subsurface water levels throughout the area and resulted in this failure as the historic fill material met its saturation threshold.

So like the inlet the concerns for the project at the outlet include the management of subsurface water on the northern slope and to ensure that the road drainage from Baker Creek Road does not magnify future slope stability issues. In addition, the road stability will need to be addressed north of the outlet due to the horizontal and vertical distances between the channel and road margins. Finally the channel transition and demolition of the existing culvert and fish ladder will need to be considered to ensure that impacts from these structures are mitigated by the final project design.



## Creek Station 11+70

Figure 10: Channel near bedrock pool downstream of outlet, taken May 2017.

At this location bedrock was noticed in the channel during the one of the May 2017 site visits, providing another outlet control confidence point. Bedrock was also visible in the slopes from this point down to the confluence. The creek channel also had larger cobbles scattered around and there was obvious signs of backwatering from the S. Fork of the Coquille River which had presumably occurred during high flows the previous winter. Baker Creek Road finally begins to turn away from the creek at this point however,

at this location there is only 110' feet horizontally between the road and channel with 85' of vertical change. These slopes will be outside of the area impacted by the projected and currently do not show signs of failure, despite being over-steepened from the typical 1.5H:1.0V design slope.

Potential concerns for this location are minimal because there is no anticipated changes, however still could require some efforts to evaluate the long-term stability of Baker Creek Road above.

#### Confluence with S. Fork of the Coquille River (Creek Station 13+50)

The confluence of Baker Creek and the South Fork of the Coquille River is approximately 400' downstream of the culvert's outlet and has bedrock visible just upstream in Baker Creek and in the S. Fork Coquille River. There are also gravel bars at the confluence and upstream in the S. Fork Coquille River. The northern corner of Baker Creek has a large bedrock knob visible that appears to be directing Baker Creek into a perpendicular confluence with the river. Channel grades from the outlet to the confluence are approximately 2% with minimal grade breaks in this reach and as stated above showed signs of backwatering from the S. Fork Coquille River. As of this time no changes would be planned for this far downstream from the site so the only concerns would be the bedload that would be passing from Baker Creek to the S. Fork Coquille River with the degradation upstream from the culvert location.

#### Conclusions

By removing the culvert and remaining fill at Baker Creek, fish habitat would undoubtedly be opened up for improved fish passage, however this is not a simple earthwork removal problem. In order to ensure the long term stability of Baker Creek Road, stabilization issues would need to be addressed on the road at the bridge site and along the northern side of the drainage. These stabilization efforts will need to include surface and subsurface water management considerations, which appears to be the cause of slope failures in the past at the project. In addition, the Baker Creek channel will need to be engineered so that it can naturally regrade through the bridge site and upstream without being detrimental to the bedload levels in the South Fork of the Coquille River.

It is proposed that Baker Creek should be realigned and regraded through the excavation process for the culvert to create a finished channel similar to its historic location prior to culvert installation. This has been conceptually shown as a 25' wide channel at approximately 2% grade, with 1.5H:1.0V finished slopes. Using the extent of horizontal realignment for Baker Creek to define the upstream limits of excavation, it is estimated that the remaining volume of material to be removed is approximately 41,000 cubic yards. This creates another area of concern, in how to remove this large amount of material from the site in the most efficient manner.

Looking forward at this project, it seems logical to invest the time and resources to address the questions and concerns listed in this report next before continuing the excavation process. Specifically this would include working with hydraulic engineers and fish biologists, to develop a creek design and transition between the excavated channel and existing channel, and with the surrounding landowners and bridge engineers, to ensure the stability of the bridge site and along the northern stretch of Baker Creek Road.