Request for Proposal

RFP#SR001-2012a

Lillooet River Sediment Removal 2013

Issued: December 5st, 2012
Closing Time: 4:00pm, December 20th, 2012
Closing Location: Pemberton Valley Dyking District Office
1381 Aster St, Pemberton BC, V0N 1B0
Contact Person: Steve Flynn
604 894-5360, Cell 604 698-6634
Email: steve@pvdd.ca

DESCRIPTION OF REQUIRED SERVICES

1. PROJECT OVERVIEW

The Pemberton Valley Dyking District (PVDD) invites Requests for Proposals for removal of sediment from 3 bar locations, Voyageur Bar, Beem Bar and Belkin Bar in the Lillooet River for flood protection purposes – map attached. The work will be done between January 1 and April 30, 2013 and will be done in accordance with the plans (attached) produced by Kerr Wood Leidal Consulting Engineers, the Environmental Management Plan produced by Ecofish Research (attached), and under the direction of the PVDD Operations and Maintenance Manager.

This RFP is expected to be beneficial to any proponent requiring fill material. The RFP asks for a price per cubic metre of sediment removed, and this rate is to include the equipment, materials, and labour required to carry out the scope of work. It is also expected that the PVDD Hitachi 225 excavator with operator be used on the project at no cost to the contractor to keep the costs as low as possible.

If permits for this work are not received from the senior government agencies, this project will not proceed.

2. SPECIFIC PROJECT REQUIREMENTS

2.1. SCOPE OF WORK

The PVDD is required to carry out sediment removals in the Lillooet River for flood protection maintenance. The estimated quantity of work for 2013 is removal of up to a total of 36,800 cubic metres of sediment from three general locations in the Lillooet River. Access from Pemberton Meadows Road through to the Voyageur Bar across the Menzel property will need to be developed. This work will consist of stripping the top 8 inches of organic layer off the access route (approx 420m), laying down fibre cloth and then placing and compacting material from the Voyageur Bar to make a suitable surface for accessing the bar with the required trucks. This cost should be submitted as a separate item. The ramps from the dykes to the bars will also need maintenance to be suitable for hauling on as it has been some years since they have been used for sediment removal purposes. All other access routes to the other locations already exist. Where access crosses private lands and is on the dyke the contractor must ensure that the surfaces are left in as good or better condition than before the project is started. The sediment will be deposited at the contractor's location and will become the property of the contractor.

The selected contractor will be responsible for all traffic control and any other measures that MOTI may require to protect the roads and safely transport the sediment from the Lillooet River to its destination. The contractor will be responsible to contact Jesse Morwood, the area Manager of MOTI at 604 898-5786 to discuss and work out the transportation plan well in advance of the project start date and shall deliver this plan to the PVDD once completed.

The quantity of work for this contract is only an estimated maximum, and the PVDD does not guarantee the target quantities will be achieved. Adverse weather, other environmental factors, or changes to the permits may result in a reduction in the total quantity of sediment removed.

Exact location and timing of the work will be confirmed with the PVDD maintenance manager before any work proceeds, all work will be done under the supervision of the environmental monitor (contracted separately by the PVDD), and all work must be done in accordance with permits from the Federal Fisheries and Oceans Canada (DFO), Provincial Forests, Lands and Natural Resource Operations (FLNRO), and the Environmental Management Plan by Ecofish Research. The PVDD expects to have permits for this work from DFO and MOE for the period of December 1st, 2012 to April 30th, 2013, but the permits have not been received at the time of tender. The timing of the removal will be based on the discharge rate of the Lillooet River being at or close to 25m3/sec, and will be at the sole discretion of the PVDD. This discharge rate

historically occurs during the months of January through April. The PVDD will take all measures to try and avoid removals at a time when road restrictions are in force but will not guarantee that this will be possible.

2.2. Construction Requirements

All equipment and trucks used for this project must be free of leaks and be pressure washed prior to starting the work. All excavators and earth moving equipment used for this project must use Environ hydraulic oil (or an approved equal) and must have a spill kit and staff trained on the use of these spill kits. Any equipment found not meeting these requirements will be immediately removed from the jobsite by the contractor and replaced with equipment that does meet the requirements, at the contractor's expense.

It is preferred but not mandatory that the successful contractor have past in-stream work experience. Please list the Contractors relevant experience in Schedule B.

Any proposed sub-contractors must be identified in Schedule B.

Table of Estimated Quantities

	Plan Location	Est. Quantity (m^3)
Gravel Removal Locations		
Voyageur Bar	Area 1	19,500
Beem Bar	Area 2	8,800
Belkin Bar	Area 3	8,500
Total		**36,800**

2.3 Items for Pricing

Items for pricing are listed in Schedule A – Quantities and Prices at the end of the tender document. The Province has waived royalties on any materials removed on this project. It is the sole responsibility of the Proponent to analyze the material and make a determination as to the appropriate use for this material. The PVDD is aware of parties interested in this material and the Proponent is welcome to contact Steve Flynn regarding these contacts. The following provides clarification on pricing items:

1) Remove Sediment from Lillooet River and haul to the contractor's choice of location.
This item is to include all equipment, equipment mobilization and demobilization, labor and material required to excavate and haul sediment from the Lillooet River to a deposit location. The contractor can choose the number and size of the pieces of equipment to be used for excavation and hauling but must ensure and prove to the PVDD that this equipment will be balanced to maximize efficiencies so the project can be completed in the most timely, efficient and cost effective

manner possible. The PVDD Excavator is a 2009, Hitachi 225, TSN 1350hrs with a rock and cleanup bucket (quick change) and thumb and must be used and taken into account in this pricing.
Access ramps / roads from the dykes to the work sites will require upgrading and the portion of access from the high water mark on the river bank to the bar will need to be removed at the end of the project by the excavators. This work is to be included in this price. Determining the sediment deposit location is the responsibility of the contractor.

2) Traffic Control Person
The contractor is required to provide all traffic control required to safely move the sediment from the Lillooet River locations to the deposit locations. This unit rate is to include all costs per traffic control person required and must take into account all requirements agreed to by the contractor and MOTI.
3) Voyageur Bar Access
This will include an all in price to construct approximately 420 meters of access across the Menzel property that will support the hauling of material. This work will include removing the top 8 inches of organic material, laying down fiber cloth and then placing and compacting material from the Voyageur Bar to form a suitable road bed. This access will be permanent in nature and must be left in good condition when the removal is complete.

2.4. Project Schedule

The work for this project must be done with authorization from Fisheries and Oceans Canada and the Provincial FLNRO. The PVDD has not yet received authorization from DFO, but it is anticipated that the permitted schedule for the work will be from December 15th, 2012 to April 30th, 2013. The exact timing of the project start date will be based on the discharge rate of the Lillooet River and long range weather forecast. The optimum discharge rate for removal is 25m^3/second and this rate historically occurs between the months of January and April. The start date for the project will be at the sole discretion of the PVDD.

3. Evaluation Criteria

The PVDD reserves the right to select the RFP best suited for this project and may evaluate RFPs on the criteria listed below.

The PVDD has disclaimed any intention to assume contractual or other obligations to RFPs during the RFP process partly to ensure that it retains maximum flexibility in regard to whether it proceeds, whether it proceeds with one of the RFPs, or how it will evaluate RFPs. While the PVDD intends to evaluate RFPs as fairly as possible, RFP submitters should be aware the PVDD may evaluate RFPs on any basis whatsoever, whether specifically identified in this document or not. RFP submitters should be aware that various matters may be considered by the PVDD when evaluating RFPs, including, for example:

- Whether, or to what extent, a proposal has complied with the RFP requirements set out in this document
- The PVDD's assessment of the ability of the Proponent to successfully perform the work
- The Proponent's past experience with working in and around a stream
- Total costs for the work program based on the estimated quantities
- The nature of any previous dealings the PVDD has had with a Proponent

The PVDD intends to award the contract to the preferred Proponent by January 4th, 2013.

If a RFP is determined to be unclear or deficient in some aspects, but these deficiencies are capable of being clarified or rectified, the PVDD may prepare a list of questions for the Proponent, to clarify or remedy the deficiencies. If, in the

opinion of the PVDD, these clarifications and rectifications do not overcome the deficiencies, the PVDD, at its sole and absolute discretion, may decide to reject the RFP.
The PVDD may contact any or all of the Proponents to seek further clarification and information before awarding the contract.

4. EXAMINATION OF RFP DOCUMENT

The Proponent shall inform itself as to all aspects of the Work. The Proponent agrees that it is the sole responsibility and risk of the Proponent to satisfy itself as to the practicability of executing the Work in accordance with the Agreement, and it shall be held responsible to have satisfied itself of every particular before submitting its RFP. Without limiting the above, the Proponent shall, before submitting its RFP, satisfy itself as to the nature of the Work, equipment necessary for the completion of the Work, and in general, shall obtain all relevant information as to risks, contingencies and other circumstances which may influence its proposal. In submitting its proposal, the Proponent agrees that it has satisfied itself as to the sufficiency of the RFP for the Work and the prices as stated on Schedule A. These prices shall cover all its obligations under the Agreement, and all matters necessary to the proper completion of the related Work, and shall include, without limiting the foregoing, the supply of all labour, equipment, materials, supervision, services, together with the Proponent's overhead and profit, except where otherwise expressly provided for by the PVDD. The PVDD is not liable for any expense, damage or loss incurred as a result of any misunderstanding or error by the Proponent regarding the Work and conditions affecting it.

TENDER REQUIREMENTS

1. INSTRUCTIONS TO PROPONENTS

Proponents must include a completed Schedule A and Schedule B, and are to be submitted in a sealed envelope marked "RFP – Lillooet River Sediment Removal 2012/13 by 4:00pm on December 20th, 2012.

Tenders are to be addressed to the Pemberton Valley Dyking District at:

RFP – Lillooet River Sediment Removal 2012/13
Attn: Steve Flynn
Pemberton Valley Dyking District
PO Box 235, 1381 Aster Street
Pemberton, BC. V0N 2L0

No faxed RFPs or amendments will be accepted.

The PVDD is committed to a fair and open process for all parties interested in this RFP. Please direct all queries and questions related to this RFP to Steve Flynn, Operations and Maintenance Manager at steve@pvdd.ca or Office 604 894-6632 or Cell 604 698-6634.

1.1. SIGNED RFPS

The RFP must be signed by the person(s) authorized on behalf of the Proponent or company and binds the Proponent to the statements made in the RFP.

1.2. IRREVOCABILITY OF PROPOSALS

At the appointed closing time, all Proposals become irrevocable for 60 days. By submission of a proposal, the Proponent agrees that should its proposal be selected, the Proponent will enter into a contract with the PVDD.

BID BOND

All Proponents are required to submit either a Cash Bond or a Performance bond of $250,000 or other security in a form acceptable to the PVDD.

2. SUMMARY OF RELATED PROJECT EXPERIENCE

Proponents must include a summary of the proposed equipment operators' past in-stream work experience in Schedule B.

GENERAL CONDITIONS

1. ADDITIONAL TERMS AND CONDITIONS

1.1. SAFETY

The successful Proponent will take responsibility as the prime contractor for the project as defined in Section 118 of the WCB act.

When working at the Belkin Bar, the contractor will be required to comply with BC Hydro's additional safety requirements for working in a BC Hydro Right of Way under a 500KV power line. (to be provided to the successful proponent).

The contractor will submit a safety plan to the PVDD.

An initial safety meeting including all personnel working on the project must be held prior to the start of the project to discuss all know hazards and the hazard mitigation and safety plans.

A person responsible for the overall safety of the project must be identified by the contractor as the "Safety Officer". The safety officer must be in a position to:

- Foresee potential safety issues and mitigate these issues immediately.
- Monitor the work areas to ensure all safety measures required by Work Safe BC, WCB and the Contractors Safety Plan are adhered to.

1.2. INSURANCE

The successful contractor must provide proof of the following insurance naming the PVDD and BC Hydro as additional insured:

1) COMMERCIAL GENERAL LIABILITY:
The insurance shall be in an amount of no less than TEN million dollars ($10,000,000) combined single limit for bodily/personal injury including death and/or property damage to or destruction of property (including loss of use) caused by an accident or an occurrence and shall include a) contingent employers liability, b) products and completed operations coverage, c) non-owned automobile liability, d) sudden and accidental pollution and e) a contractual liability endorsement specifically granting coverage for all liability assumed by the Licensee under this Agreement. This insurance policy must name the Pemberton Valley Dyking District as additionally insured and shall contain a cross liability clause.

2) AUTOMOBILE LIABILITY:
During the term of this agreement, the Contractor agrees to purchase and maintain, at its sole cost and expense, Automobile Liability insurance on all licensed vehicles for this project owned by, hired, leased to or on behalf of the

Contractor, its sub-contractors, servants or agents in an amount of no less than FIVE million dollars ($5,000,000) per occurrence.

3) WORKERS COMPENSATION:
During the term of this agreement, the Licensee agrees to purchase and maintain, at its sole cost and expense, Workers Compensation insurance in amounts no less than the statutory limits and employer's liability/contingent employer's liability in the amount of no less than TEN million ($10,000,000).

1.3. Changes to the Tender Wording and Content

The Proponent is entitled to amend its Proposal at any time before the deadline for submission of RFPs. After the closing date and time, the Proponent will not change the wording or content of the Proposal and no words will be added to the Proposal, including changing the intent or content of the presentation of the Proposal

1.4. Proponent Expenses

Proponents are solely responsible for their own expenses in preparing and submitting the Tender.

7.5. Acceptance of Proposals

The PVDD is not bound to accept the lowest priced or any of the submitted Proposals.

7.6. Subcontracting

Proposed subcontractors must be listed in Schedule B. A joint Proposal submission must indicate which Proponent has overall responsibility for the project.

7.7. Agreement with Terms

The Proponent, through the submission of a Proposal, agrees to all terms and conditions of this Proposal.

7.8. Addenda

Proponents are required to check the PVDD's website for any updated information and addenda issued before the closing date at www.PVDD.ca. Any changes to the RFP Documentation will be issued by means of written Addenda and posted on the PVDD's website and will form part of the RFP. No amendment of any kind to the RFP is effective unless it is posted in a formal written Addendum on the PVDD website. Upon submitting a Proposal, Proponents will be deemed to have received notice of all Addenda that are posted on the PVDD's website and deemed to have considered the information for inclusion in the RFP submitted.

7.9. Confidentiality of Information

Information pertaining to the PVDD obtained by the Proponent as a result of participation in this project is confidential and must not be disclosed without written permission from the PVDD.

7.10. Confidentiality of Tenders

The PVDD is subject to the British Columbia Freedom of Information and Protection of Privacy Act. That Act creates a right of access to records in the custody or under the control of the PVDD, subject to the specific exceptions in that right set out in the Act. The PVDD will receive all Proposals submitted in response to this RFP in confidence. Because of the right of access to information created by that Act, the PVDD does not guarantee that information contained in any proposals will remain confidential if a request for access in respect of any Proposal is made under the Act. Proponents are required to keep their Proposals confidential and must not disclose their Proposals, or information contained in them, to anyone

else without the prior written consent of the PVDD.

7.11. Payment

The Proponent's invoices for this contract will be payable, net 30 days, upon submission of monthly progress claims. The invoices must be submitted in a manner acceptable to the PVDD.

7.12. Responsibility

The Proponent shall not transfer responsibility to meet the obligations of this contract to a third party without the consent, in writing, of the PVDD project manager.

7.13. No Collusion

Proponents shall not directly or indirectly communicate with any other Proponent regarding the preparation or presentation of their proposals, or in connection with the RFP engage in any collusion, fraud or unfair competition.

7.14. Laws of the Jurisdiction

Any contract resulting from this RFP will be governed by and will be interpreted in accordance with the laws of the Province of British Columbia.

APPENDICES

A	Schedule A - Quantities and Prices
B	Schedule B - Past Experience & Subcontractors
C	Layout Plans
D	Environmental Management Plan

Schedule A – Lillooet River Sediment Removal 2012/13

Company Name: **Officer of Company:**

Company Address: **Phone Number:**

Date: **Signature:**

Schedule of Quantities and Prices:

Item	Unit	Estimated Quantity	Unit Price	Extended Unit Price
1. Remover Sediment From Lillooet River and Transfer to Deposit Location	Cubic Meters	36,800		
2. Traffic Control				
3. Build Access at Menzel Property	Meters	420		

Notes:

1. Estimate quantity of sediment is only an estimated maximum, and the PVDD does not make any guaranty that the contractor will be able to remove this amount of sediment from the River.

2. Quantity of Sediment removed to be calculated by one or both of the following methods: a) truck counts, b) survey. Truck counts are to be verified by the PVDD Operations Manager at the end of each day. Contract payment will be based on these verified methods.

Schedule B - Lillooet River Sediment Removal

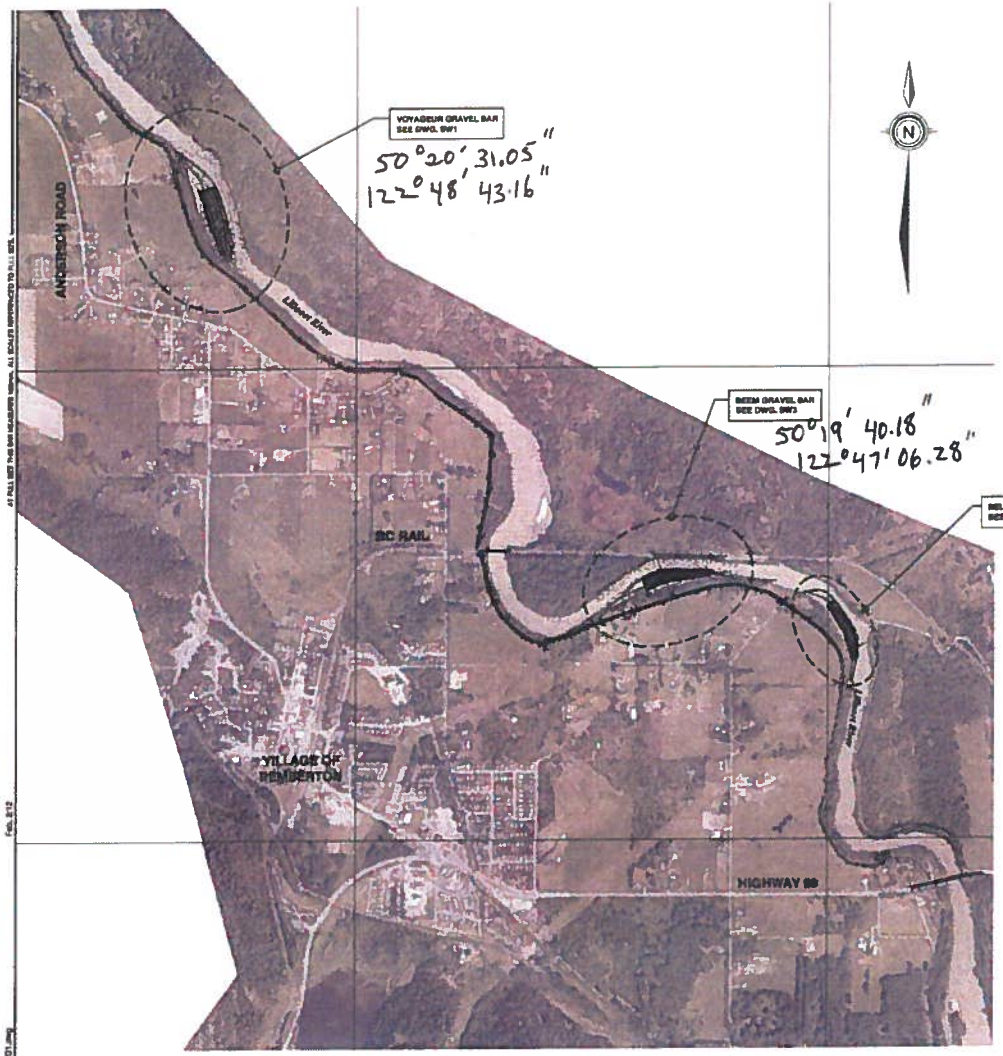
Company Name:

Company Experience Working In and Around a Stream:

Operators Experience Working In and Around a Stream:

List of Proposed Sub-contractors:

Schedule C - Layout



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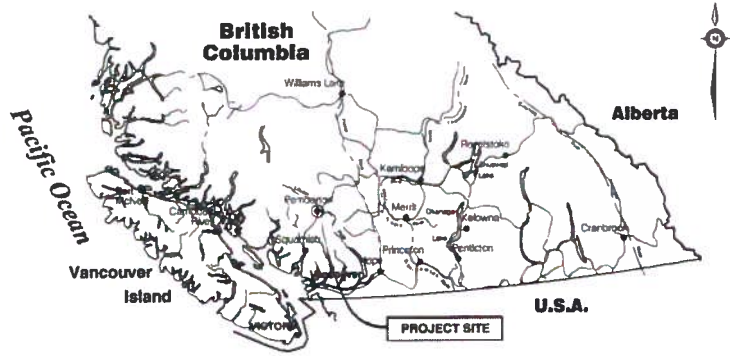


LOCATION PLAN
N.T.S.

		DRAWING LIST
SHT. NO.	DRAWING NO.	TITLE
1	G1	LOCATION PLAN, KEY PLAN AND DRAWING LIST
2	SW1	VOYAGEUR GRAVEL BAR - PLAN AND PROFILE
3	SW2	VOYAGEUR GRAVEL BAR - CROSS SECTIONS
4	SW3	SEEM GRAVEL BAR - PLAN AND PROFILE
5	SW4	SEEM GRAVEL BAR - CROSS SECTIONS
6	SW5A	BELKIN GRAVEL BAR - PLAN
7	SW5B	BELKIN GRAVEL BAR - PLAN (GOOGLE 2009)
8	SW6	BELKIN GRAVEL BAR - CROSS SECTION

PEMBERTON VALLEY DYKING DISTRICT
LILLOOET RIVER 2012 SEDIMENT REMOVAL
CONTRACT No. 713-062

NOTE:
DRAWING IS HALF SIZE WHEN PLOTTED

Issued for	Issue	Date	Issued By
Reference			
Approvals	A1	FEB.28/12	
Tender			
Permits			
Construction			
Record Drawings			

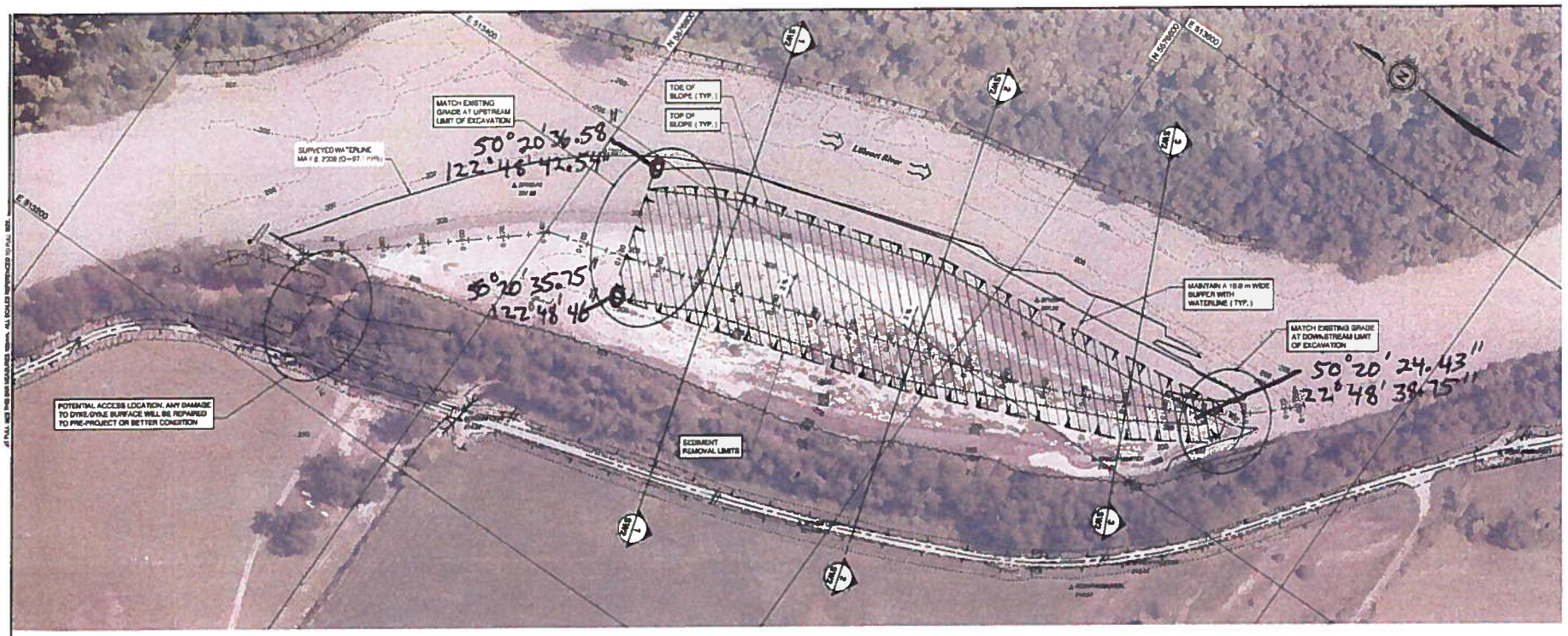
Rev. No.	Date	Designed	Drawn	Checked	Description of Revision
0	JAN.31/12	EE	MP	EFJ	
1	FEB.28/12	EE	MP		COMMENTS FROM P.V.D.D. AND ECORSH

Rev. No.	Date	Designed	Drawn	Checked	Description of Revision

KERR WOOD LEIDAL
consulting engineers

PEMBERTON VALLEY DYKING DISTRICT
LILLOOET RIVER 2012 SEDIMENT REMOVAL
LOCATION PLAN, KEY PLAN AND DRAWING

KWL Project No. 713-062 Scale AS SHOWN
Sheet 1 of 8 Rev. No. 1
Client: Pemberton Valley Dyking District



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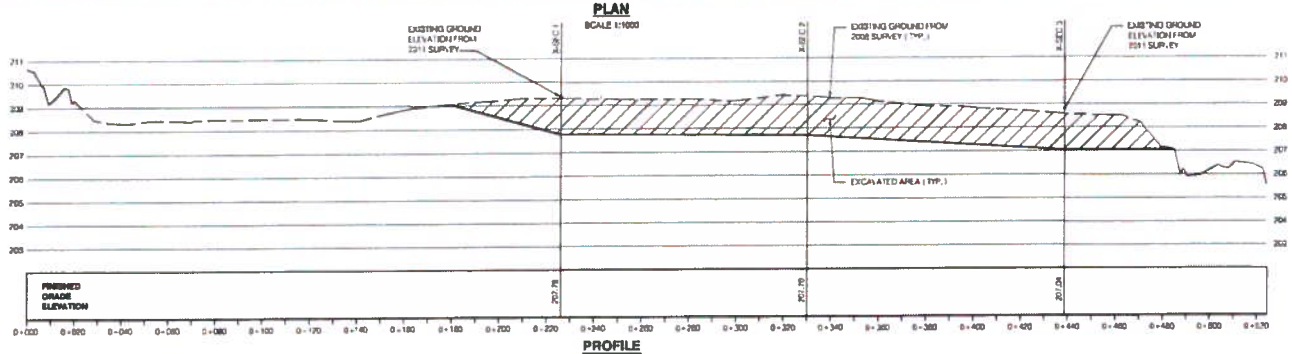

PROFILE
SCALE H. 1:1000 V. 1:100

NOTE:
1. SURVEY DATA FROM KWL (MAY & 2008) A ATEK HYDROGRAPHIC SERVICES (MAY 2
2. AERIAL PHOTO MAY 31, 2009 (© 234 mm
3. EXPECTED FLOWS DURING REMOVAL "D THE RANGE OF 20-100 m³/s

NOTE:
DRAWING IS HALF SIZE WHEN PLOTTED

Issued for	Issue	Date	Issued By
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Approvals	A1	FEB. 09/12	
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Permits			
Construction			
Record Drawings			

Rev. No.	Date	Designed	Drawn	Checked	Description of Revision
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1	FEB. 09/12	CE	MP		COMMENTS FROM P.V.D.D. AND ECOFISH

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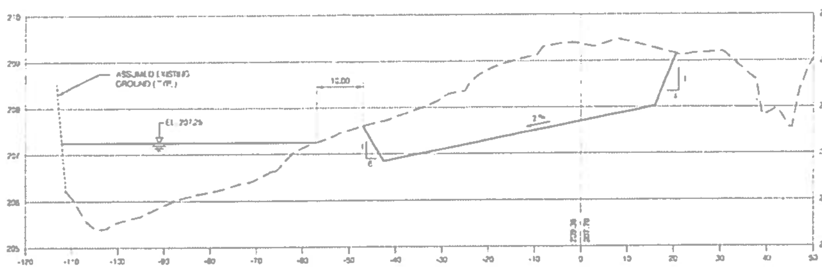
PEMBERTON VALLEY DYKING DISTRICT
LILLOOET RIVER 2012 SEDIMENT REMOVAL
VOYAGEUR GRAVEL BAR
PLAN AND PROFILE

KWL Project No. 713-003 | Scale AS SHOWN | SW
Sheet 3 of 6 | Rev. No. 1
Client: Pemberton Valley Dyking District



SECTION 2 / SW1
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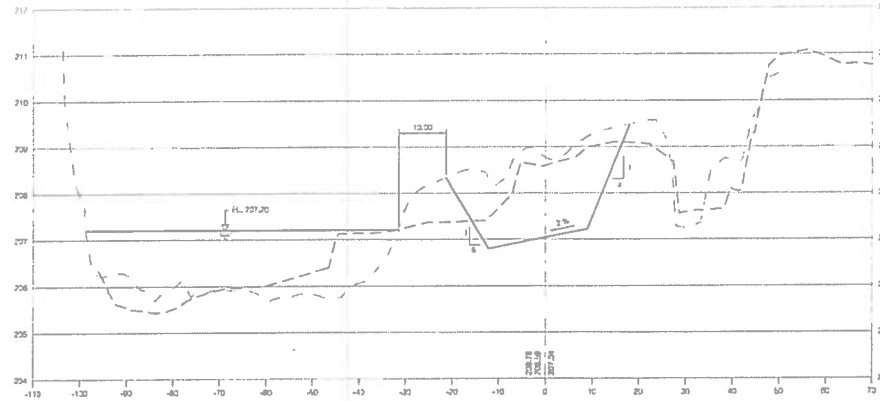

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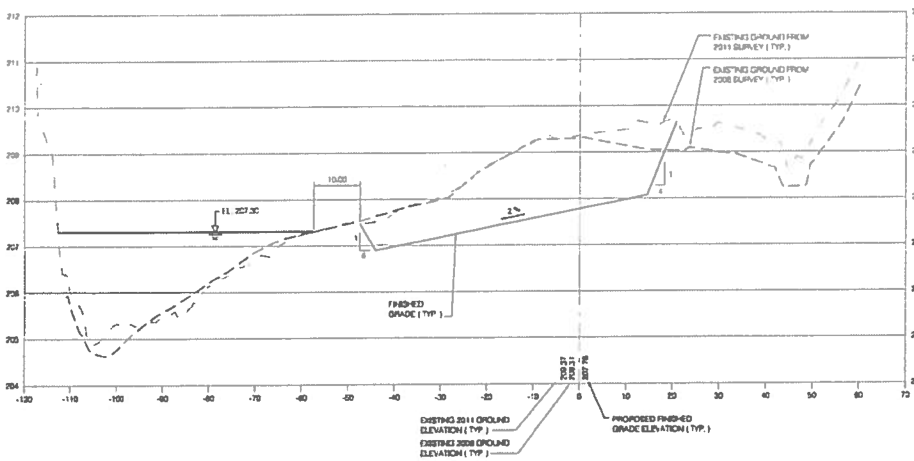
NOTE: SECTION 3 CORRESPONDS TO XS-22 IN 2011 LILLOOET RIVER SURVEY



SECTION 1 / SW1
SCALE H. 1:500 V. 1:50

NOTE: SECTION 1 CORRESPONDS TO XS-22.1 IN 2011 LILLOOET RIVER SURVEY

NOTE:
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Tender															
Permits															
Construction															
Record Drawings															

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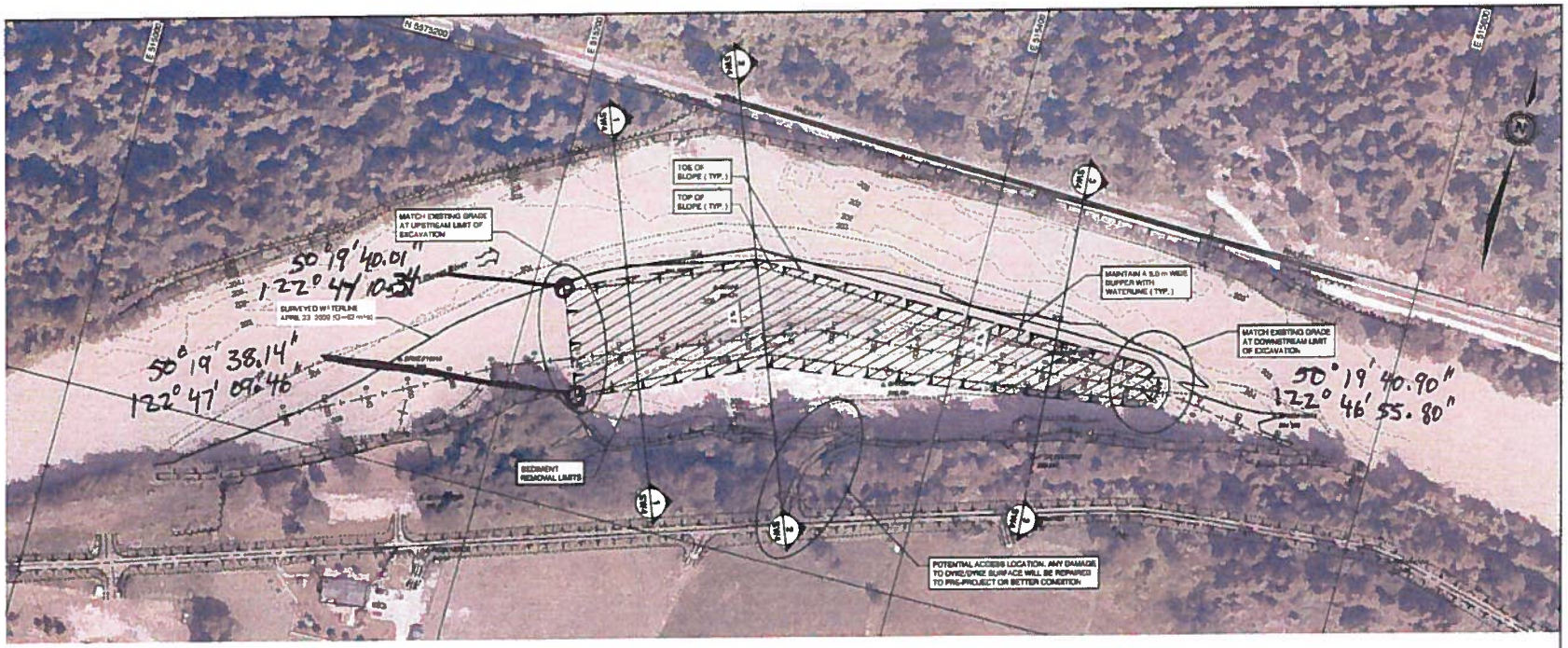
PEMBERTON VALLEY DYKING DISTRICT
LILLOOET RIVER 2012 SEDIMENT REMOVAL
VOYAGEUR GRAVEL BAR
CROSS SECTIONS

KWL Project No. 719-062 | Scale H. 1:500 V. 1:50 | **SW2**
Sheet 3 of 8 | Rev. No. 1
Client: Pemberton Valley Dyking District



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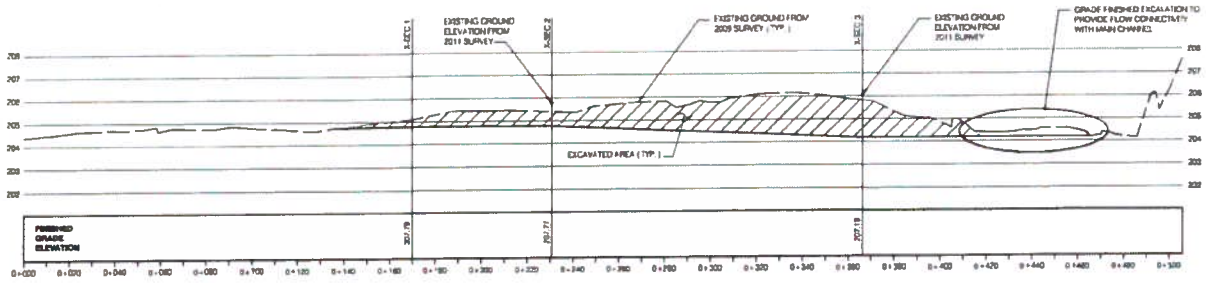

PROFILE
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NOTE:
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2. AERIAL PHOTO (MAY 3rd, 2009 (Q= 284 m³/s)
3. EXPECTED FLOWS DURING REMOVAL TO BE IN THE RANGE OF (Q=100 m³/s

NOTE:
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PEMBERTON VALLEY DYKING DISTRICT
LILLOOET RIVER 2012 SEDIMENT REMOVAL
BEEM GRAVEL BAR
PLAN AND PROFILE

KWL Project No. 713-002 | Scale AS SHOWN | SW3
Sheet 4 of 8 | Rev. No. 1
Client: Pemberton Valley Dyking District
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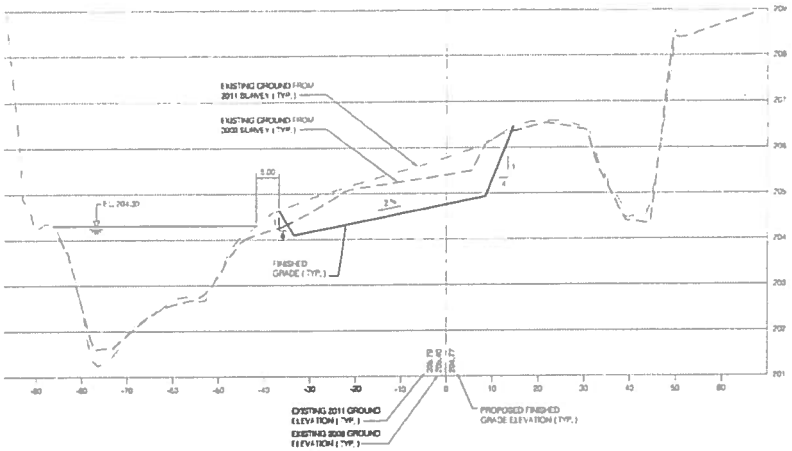

SECTION 2 SW3
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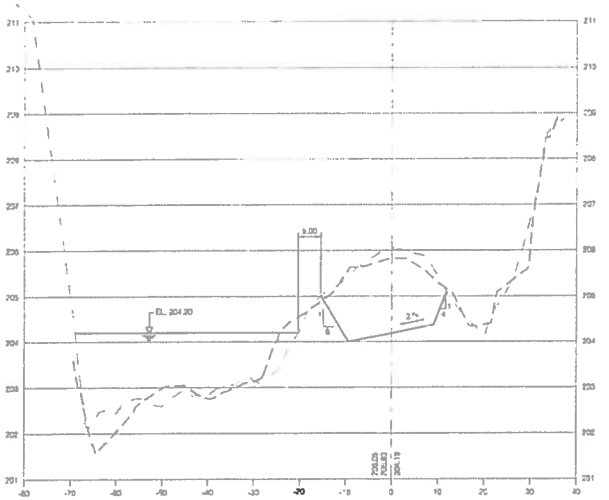

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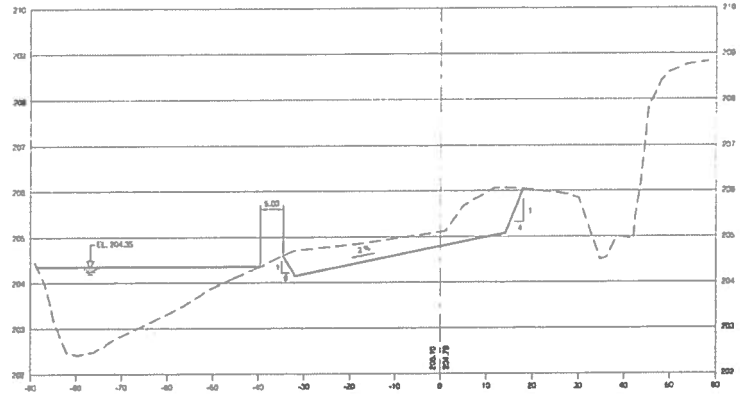
NOTE: SECTION 3 CORRESPONDS TO KS-18 IN 2011 LILLOOET RIVER SURVEY



SECTION 1 SW3
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NOTE:
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	2												
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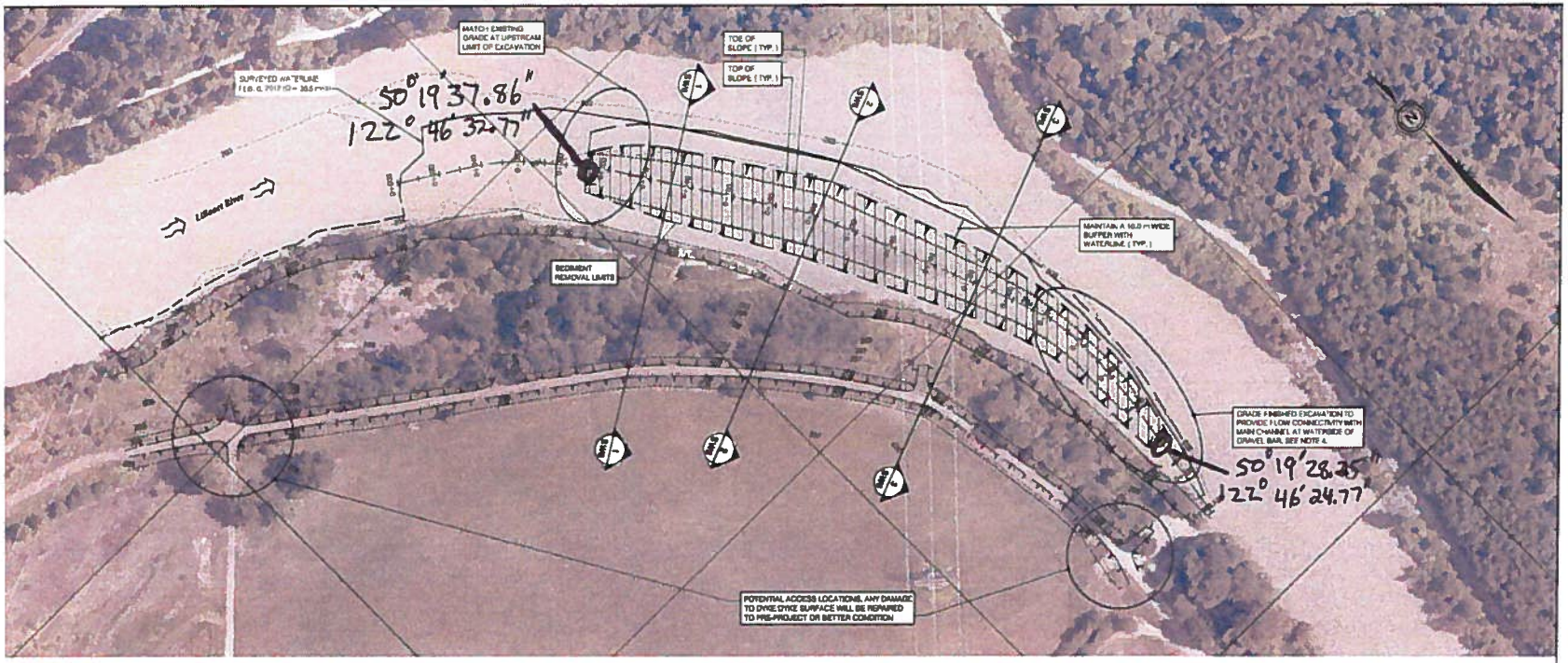
KERR WOOD LEIDAL
consulting engineers

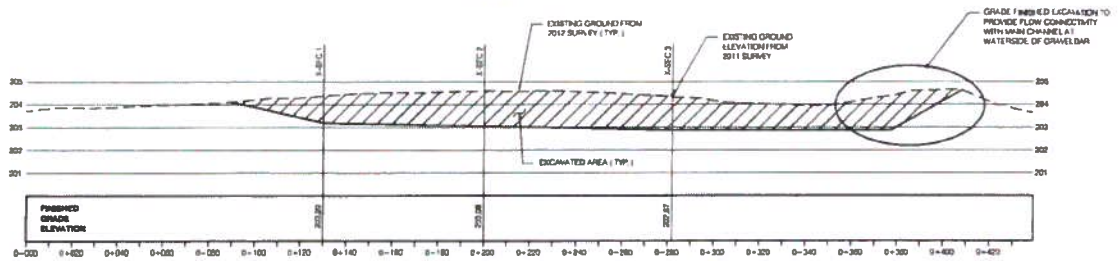
PEMBERTON VALLEY DYKING DISTRICT
LILLOOET RIVER 2012 SEDIMENT REMOVAL
BEEM GRAVEL BAR
CROSS SECTIONS

KWL Project No. 713-002 | Scale H. 1:500 V. 1:50 | SW4
Sheet 5 of 8 | Rev. No. 1
Client: Pemberton Valley Dyking District



PLAN

SCALE 1:1000



PROFILE

SCALE H: 1:1000 V: 1:100

NOTE:

1. SURVEY DATA FROM ATEK HYDROGRAPHIC SERVICES (MAY 2011)
2. AERIAL PHOTO MAY 31, 2009 (Q= 794 m³/s)
3. EXPECTED FLOWS DURING REMOVAL TO BE IN THE RANGE OF 30-100 m³/s
4. MAINTAIN 10 m BUFFER TO RIVER UNTIL END OF CONSTRUCTION, THEN CONNECT EXCAVATION TO RIVER

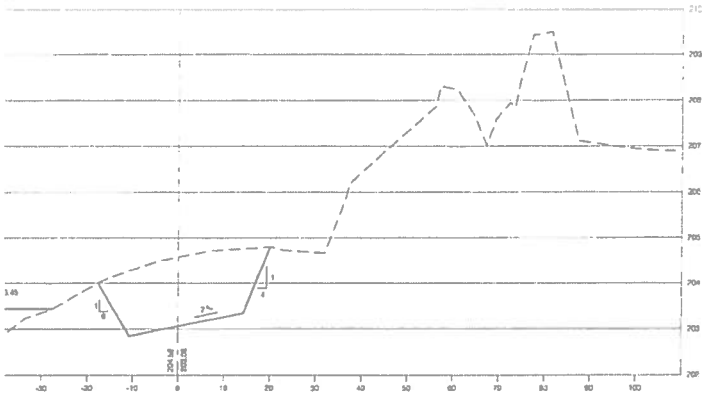
NOTE:
DRAWING IS HALF SIZE WHEN PLOTTED TO 11x17

Issued By	Rev. No.	Date	Designed	Drawn	Checked	Description of Revision	Rev. No.	Date	Designed	Drawn	Checked	Description of Revision
	0	JAN.31/13	CE	MP	SFJ							
	1	FEB.08/13	LE	MP	SFJ	COMMENTS FROM P.V.D.D. AND ECOFISH						
	2	FEB.27/13	LE	MP		ADDED 2012 SURVEY AND REVISED DESIGN						

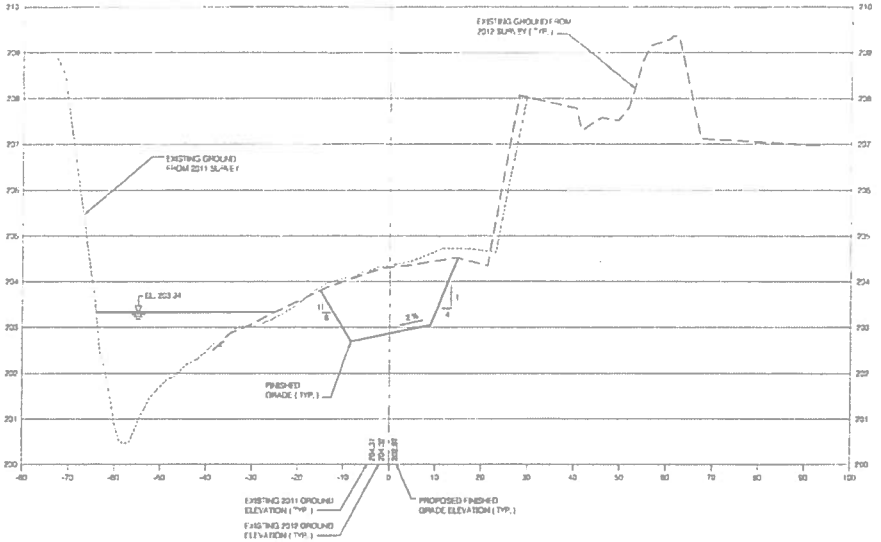
KERR WOOD LEIDAL
consulting engineers

PEMBERTON VALLEY DYKING DISTRICT
LILLOOET RIVER 2012 SEDIMENT REMOVAL
BELKIN GRAVEL BAR
PLAN

KWL Project No. 713-002 | Scale AS SHOWN | SW5A
Sheet 6 of 8 | Rev. No. 2
Client: Pemberton Valley Dyking District
PRINTED ON 100% RECYCLED BOND

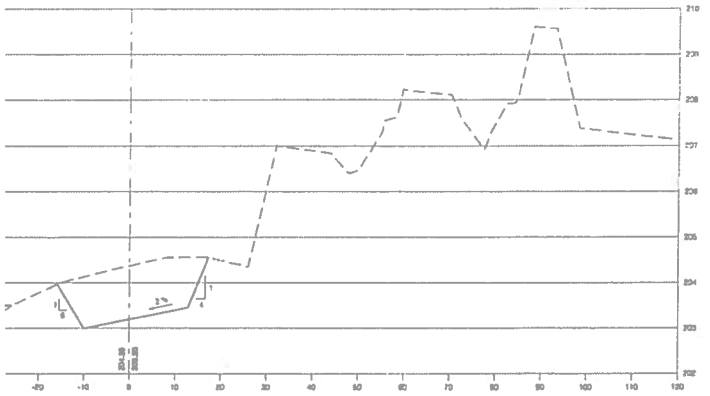


SECTION 2
SCALE H. 1:500 V. 1:50
SW6



SECTION 3
SCALE H. 1:500 V. 1:50
SW6

NOTE: SECTION 3 CORRESPONDS TO XS-17 IN 2011 LILLOOET RIVER SURVEY



SECTION 1
SCALE H. 1:500 V. 1:50
SW6

NOTE:
DRAWING IS HALF SIZE WHEN PLOTTED TO 11x17

Issued By	Rev. No.	Date	Designed	Drawn	Checked	Description of Revision	Rev. No.	Date	Designed	Drawn	Checked	Description of Revision
	0	JAN.31/13	EZ	MP	SFJ							
	1	FEB.08/13	EZ	MP	SFJ	COMMENTS FROM P.V.D.D. AND ECOFISH						
	2	FEB.27/13	EZ	MP		ADDED 2012 SURVEY						

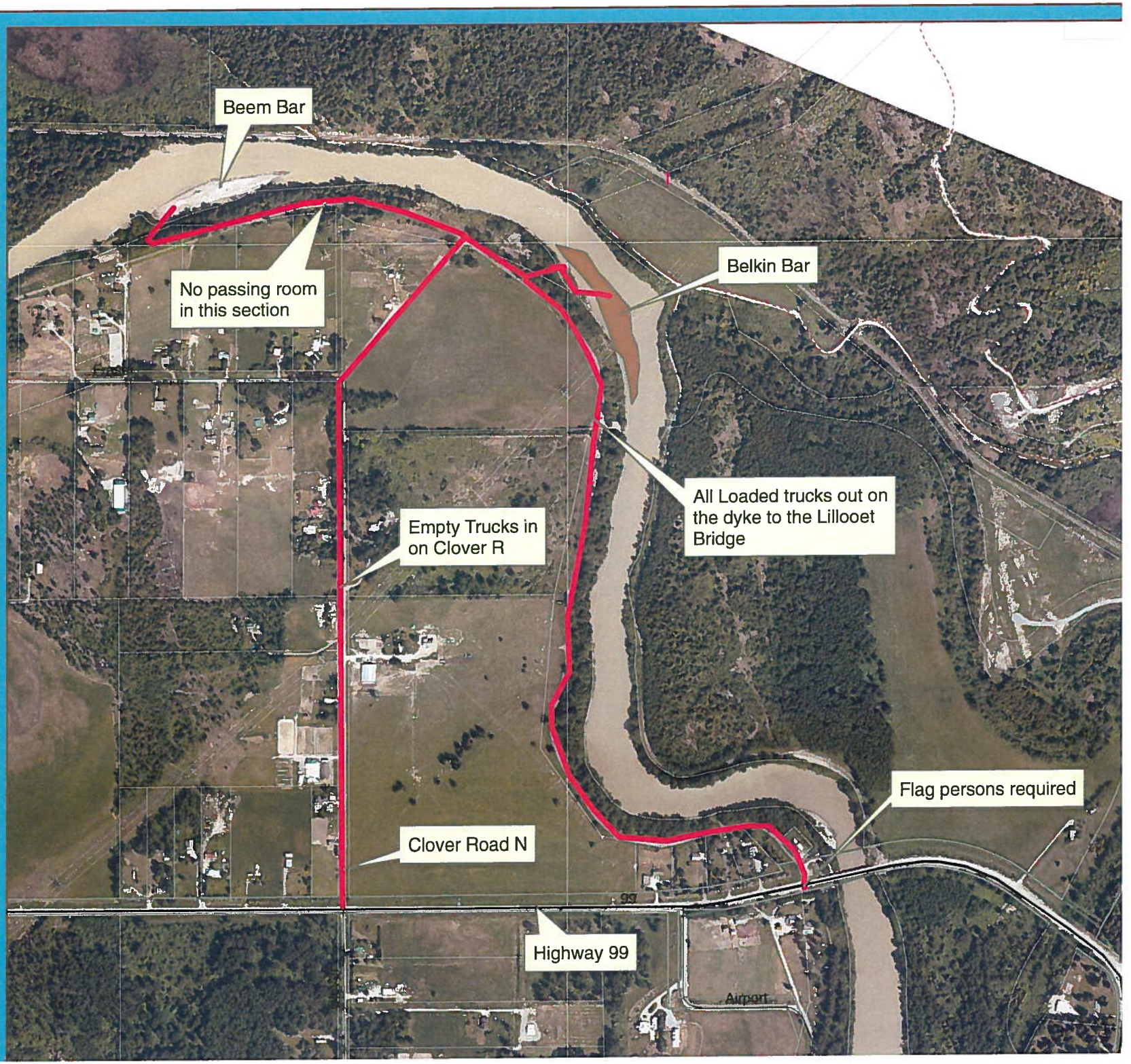
KERR WOOD LEIDAL
consulting engineers

PEMBERTON VALLEY DYKING DISTRICT
LILLOOET RIVER 2012 SEDIMENT REMOVAL
BELKIN GRAVEL BAR
CROSS SECTIONS

KWL Project No. 713-029 Scale H. 1:500 V. 1:50 SW6
Sheet 6 of 6 Rev. No. 2
Client: Pemberton Valley Dyking District

PEMBERTON VALLEY DYKING DISTRICT

Beem/Belkin Bars Access

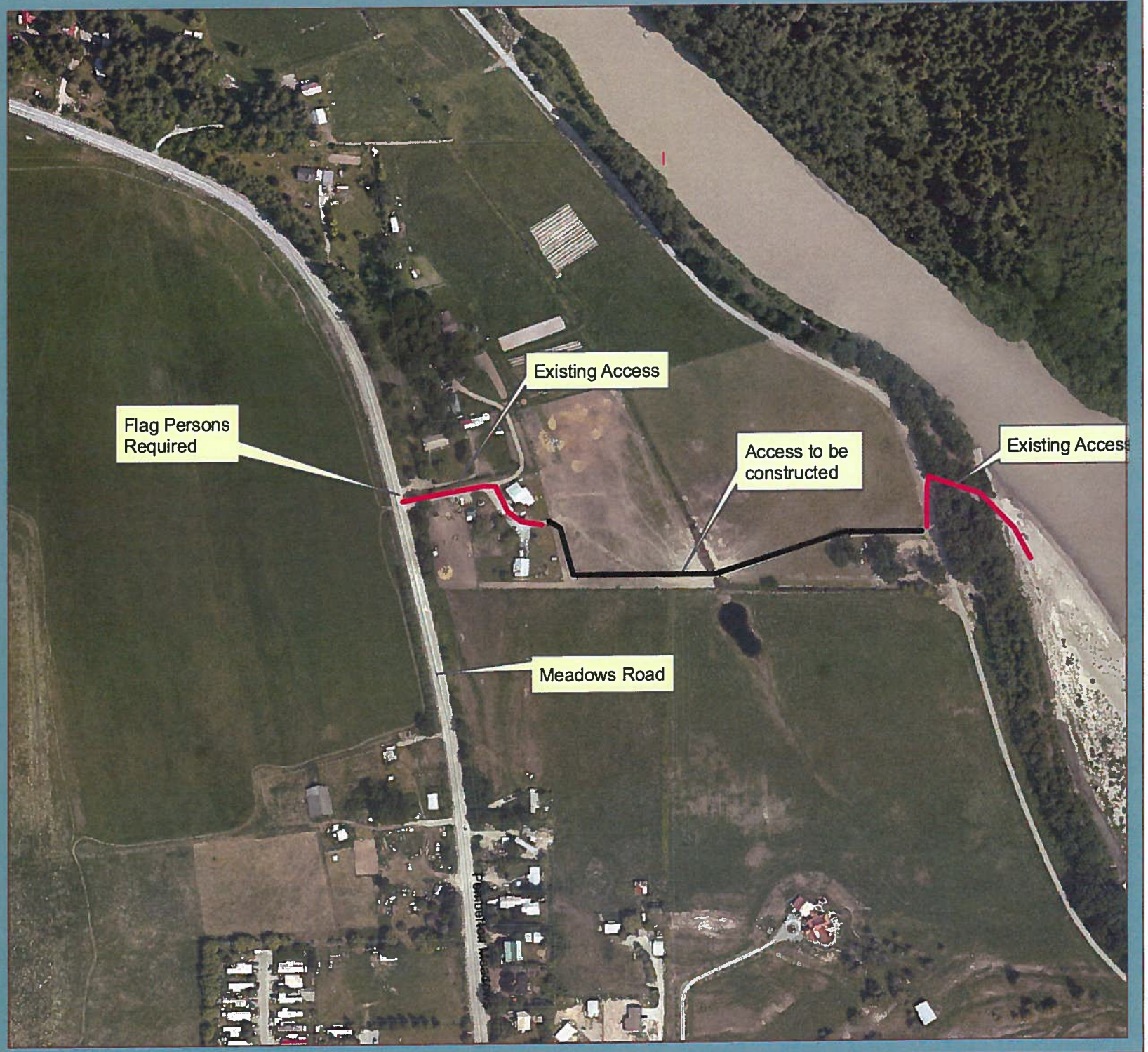


0 20 40 80
Meters

Data provided by the BC Provincial Government as well as the Village of Pemberton and Squamish Lillooet Regional District
This map is intended for information purposes only and is not to be used for navigation
Pemberton Valley Dyking District 2011

PEMBERTON VALLEY DYKING DISTRICT

Voyageur Bar Access



0 10 20 40
Meters

Data provided by the BC Provincial Government as well as the Village of Pemberton and Squamish Lillooet Regional District.
This map is intended for information purposes only and is not to be used for navigation.

Schedule D – Environmental Plan

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www.ecofishresearch.com

MEMORANDUM

TO: Steve Flynn, Operations Manager, Pemberton Valley Dyking District
FROM: Veronica Woodruff, Environmental Technician, Ecofish Research Ltd.
DATE: November 8, 2012
FILE: 1110-01.01
RE: Lillooet River Gravel Removal Environmental Monitoring Plan

This memo has been prepared in response to a request by the Ministry of Forest, Lands and Natural Resource Operations for further information to the Section 9 application under the Water Act prepared for the gravel removal project on the Lillooet River to be undertaken the Pemberton Valley Dyking District (PVDD) (C. Levesque pers. comm. 2012). Specifically, this memo addresses project timing, sediment and erosion control measures, species-at-risk, construction methodology, applicable best management practices and details regarding professional experience and qualifications of the environmental monitor(s).

Timing

The PVDD is proposing to undertake gravel removal during low water conditions in 2013, likely between February and April. This is outside the instream work window for the lower mainland region (MOE 2006) but will reduce instream impacts to fish and fish habitat as all excavation can be done outside the wetted width on exposed bars. Lillooet River discharge ranges from 25-50 m^3/sec during this period, comparative to the instream work window where discharge ranges from 150-325 m^3/sec (WSC 2012).

The timing is scheduled outside expected breeding periods for birds in this region and there are no anticipated impacts to nesting birds as detailed in the Wildlife Act.

Species at Risk

Species at risk that are known or potentially occur in the vicinity of the project area include coastal tailed frogs, cutthroat trout and bull trout. Species conservation status and life stages at time of the proposed works are outlined in Table 1.

Table 1 Species at risk that are known or potentially occur in the vicinity of the project area, British Columbia listed conservation status and life stage at proposed project time.

Species common name	Species scientific name	Conservation status as listed in British Columbia	Life Stage during proposed project
Coastal Tailed Frog	*Ascaphus truei*	Blue[1]	Juvenile larval stage Adults
Cutthroat trout	*Oncorhynchus clarkii clarkii*	Blue[1]	Pre-spawn or spawning in February to March
Bull trout	*Salvelinus confluentus*	Blue[1]	Egg incubation

[1]Blue Listed Species includes any ecological community, and indigenous species and subspecies considered to be of special concern (formerly vulnerable) in British Columbia.

Mitigation/avoidance measures for all fish species and for coastal tailed frogs in larval stage will include avoidance of wetted areas by conducting the work at low annual flow, on dry, exposed bars that are outside of the wetted width/interstitial flow.

Although it is unlikely that adult coastal tailed frogs would inhabit the area in question given their preference for small, steep streams in mature forests (Dupius et al 2000), it is possible that there could be an incidental sighting if the timing of construction commenced following spring melt. Mitigation/avoidance measures will depend on the weather at the time of project initiation. If the project commences during winter months where freezing temperatures will be encountered, it is unlikely that adult frogs would have emerged from hibernation and the area of excavation is unsuitable as hibernculum so no measures will be enacted. If the project commences during spring thaw (late March and April) following an appropriate period of frost-free days, a broad based visual ground search for adults will be initiated on project bars, prior to any equipment entering the site. If any adults are found, they will be hand collected and transported in a bucket and released outside of the project area following the most recent wildlife handling protocol for this species (RIC 2000).

Methods

Gravel removal operations will be initiated only when there is a prolonged period of dry weather forecasted at a time when the discharge of the Lillooet River is at or below 25 m^3/sec as represented by the Water Survey of Canada Lillooet River gauge 08MG005 (WSC 2012).

Two excavators (225 and 400) will be mobilized to site using existing roadways, dikes and access ramps. If existing access ramps are not suitable for trucking the proposed volume of material, they will be reinforced using suitable material to minimize compaction and erosion. Disturbance to vegetation will be minimal and any tree removed will replaced using provincial tree replacement criteria (MELP 1996). It is expected that all construction will be directed by a qualified professional engineer to ensure design specifications are met. Kerr Wood Leidal has been contracted to oversee the gravel removal operations. All construction activities will also be monitored by a qualified experienced environmental monitor and/or a Lil'wat environmental technician as outlined in correspondence from Lil'wat Nation (Dorrans 2012). The environmental consultant is Ecofish Research Limited. Table 2 outlines relevant experience of the Ecofish team involved in the project. Detailed Resumes have been included in Appendix A.

Table 2 Ecofish Project Team

Personnel	Role	Experience
Adam Lewis, M.Sc. (R.P.Bio)	Project Manager	Adam Lewis is a fisheries biologist with over 20 years of experience consulting on fisheries and water use issues. Mr. Lewis has completed instream flow studies on over 24 streams, quantifying the relationship between fish and aquatic habitat. He has assessed, designed mitigation, and monitored dozens of projects, including more than 20 hydroelectric projects totalling 1000 MW installed capacity. He led the fisheries and aquatic assessments of the recently approved Upper Harrison Hydroelectric Project near Vancouver, a clustered development of 5 hydroelectric projects totalling over 100 MW. From 2001 to 2004 he was the environmental coordinator on four water use plans for BC Hydro, designing, managing, and reporting on aquatic studies and gaining consensus for study results and water use options for existing hydroelectric projects from a broad group of stakeholders including First Nations and fisheries agencies. He was the lead consultant developing the Assessment Methods for Aquatic Habitat and Instream Flow in British Columbia, the current guideline for impact assessment on hydro projects in BC. As president of Ecofish Research Ltd., he leads an exceptional team of environmental professionals.
Veronica Woodruff, Dipl. Tech.	Lead Field Technician	Veronica Woodruff has a technical diploma in Fish and Wildlife as well as Restoration of Natural Systems. She has 15 years experience working on environmental initiatives ranging from watershed management planning, riparian and aquatic restoration, population assessment, environmental construction monitoring, community stewardship and education. She has extensive experience working in freshwater systems in the Coast Mountains including assessing fish populations and habitat for the purposes of designing restoration projects. She has worked with various agencies such as Fisheries and Oceans Canada, Pemberton Valley Dyking District, Pacific Salmon Foundation and BC Hydro to find innovative ways to maximize partnerships to design, fund and build habitat for Pacific Salmon.She is an experienced fish and wildlife technician and environmental monitor.
Jocelyn Sereda	Field Technician	Jocelyn is an environmental technician with 7 years of experience in the environmental field in Alberta and British Columbia. She completed her Master of Science Degree at the University of Parma, Italy, where she studied the use of alternative methods of treating contaminated soils and water from mine tailing ponds. She has worked at Ecofish since 2011 and been involved as a technician in various environmental assessment projects. Her areas for expertise are fish and invertebrate abundance sampling, construction monitoring and environmental education.
Valeinna Dimma	Field Technician	Valeinna Dimma is an Aboriginal Environmental Technician with 5 years experience in fish sampling methods including minnow trapping, electrofishing, seine netting, angling and fyke nets. She has experience in FHAP Level 1 assessments, invertebrate and wildlife sampling. Valeinna is also a certified in erosion and sediment control and environmental construction monitoring. Valeinna has been working with Ecofish since 2012.

The following best management practices will be adhered to as detailed in Standards and Best Practices for Instream Works (2006) for the purposes of channel maintenance:

- Only material required to alleviate flood risk will be removed as outlined in prepared technical documents (KWL 2007, KWL 2011). No excavation will be done on the upper third of the bar head to maintain overall bar stability. There will be no disturbance to existing habitat features such as connected back channels. All vegetation will be maintained or replaced.
- Compensation habitat will be created to offset ongoing impacts from gravel removal operations.

- All excavation will be completed in isolation of flow outside the wetted width on exposed bars, eliminating risk on instream species and habitat.
- All activities will be monitored full-time by an appropriately qualified professional with the written authority to halt construction activities if deemed necessary. This included a pre-construction meeting with all contractors and project managers.
- A monitoring report will be prepared and submitted to the proponent and appropriate government agencies.
- All work will be undertaken only during low water, during extended periods of favourable weather.
- Works will be completed as quickly as possible.
- All equipment will be free of leaks and excessive oil and grease. All machinery will run environmentally sensitive hydraulic fluids. At no time will the machines enter the wetted width of the Lillooet River.
- A spill kit will be available on site with personnel trained in its use. Any spill will be reported immediately following Provincial guidelines.
- A minimum set-back will be maintained and a barrier of silt fencing will be installed between the wetted edge and the area of excavation prior to initiating construction.
- Excavated material will be removed from site.
- The upstream edge of the excavated area will be sloped towards downstream at an angle of 0.05%. The excavated area will be sloped from the stream bank towards to wetted edge at an angle of 2%. The up and downstream limits of the excavation will matched to the existing grade.

A summary of construction components, potential erosion, sediment and environmental issues have been outlined and presented in Table 3.

ECOFISH RESEARCH

Table 3 Summary of construction activities, potential issues and mitigative measures.

Project Component	Potential Sediment, Erosion and Environmental Issues	Mitigation Measures
Site Access	Trucking causing roadways to become muddy. Potential to mobilize sediment from rainfall into ditches.	Ensure all roadways connecting project sites remain clean
		Work only in periods of dry weather
	Heavy trucks compacting soils	Access site only from existing roadways, dikes and constructed access points.
		If neccesary, reinforce ramps with appropriate material for heavy trucking to reduce compaction and erosion.
	Fluid leaks and spills	Ensure all trucks are clean and free of leaks
		A spill kit must be present on site at all times
Gravel removal Operations	Sediment mobilization from excavation into the Lillooet River	Erect silt fence between excavation area and wetted edge. Maintain minimum set backs as outlined in engineering plan (10 m for Voyaguer & Belkin Bar, 5m for Beem Bar).
		Work only during extended periods of dry weather to reduce sediment mobilization and to ensure the river remains at low discharge
	Managing sediment laden water at excavation site. It is likely that there will be seepage into the site depending on the depth of excavation.	Allow any water to settle before constructing connections at up and downstream ends of the bar
	Potential to destablilize the wall of excavation closest to wetted edge	Maintian grades of outer excavation walls as outlined in engineering plan (6:1)
		Ongoing monitoring of stability during construction by engineer and environmental monitor
	Fluid leaks and spills	Ensure all machinery are clean, free of leaks and excessive grease
		A spill kit must be present on site at all times and environmental monitroing staff trained in its use.
	Fish stranding at excavation site when water levels rise	Ensure grading is consistent with engineering plan.
		Ensure adequate connections up and downstream of excavation.
	Vegetation removal	Minimize distrurbance to vegetated sections of the bars. Replace affected vegetation using Provincial criteria.