# *Lakelse Sockeye Recovery Program*

## *Williams Creek Upper Spawning Channel Completion and Lower Channel Feasibility*

View looking downstream at the project area – August 2011 (Photo – S.Devcic)

Prepared for:

***The Pacific Salmon Commission***
*600 – 1155 Robson Street*
*Vancouver, British Columbia*
*V6E 1B5*

***February 2013***

Prepared by:

***Fisheries and Oceans Canada***
*James Powell – Restoration Eng.Tech.*
*Sandra Devcic – Restoration Engineer*
*Lana Miller – Restoration Biologist*
*North Coast Area*

***NF-2011-H-1***

## Acknowledgements

The Department of Fisheries and Oceans was the primary proponent for the project. DFO provided personnel, technical expertise, financial administration and construction supervision.

The project has been undertaken in stages over a few years. Some of the players involved in the present stage were:

- Billabong Road and Bridge Maintenance, who undertook the construction and also contributed to the brainstorming when challenging ground conditions, were discovered. Their co-operation was appreciated.

- Nordic Tree Service was the contractor who quickly and efficiently brought down the larger trees in advance of construction.

Additional assistance was provided by:

- BC Ministry of Forests – Kalum Forest District, provided the appropriate permits to undertake the work.
- BC Ministry of Environment – Ecosystem and Water Management Branches, provided permits and cooperated with our efforts to obtain the water license and land tenure.
- BC Ministry of Transportation and Infrastructure – Skeena District, provided permits and donated the riprap ($100m^3$) for the work which will occur in the final stage when the river intake is installed (Phase 3).
- The Regional District of Kitimat-Stikine assisted with the coordination with the Thornhill Volunteer Fire Department and communication with the Jackpine Flats Community Association. Their support and cooperation with the project has encouraged us to continue on.
- And Mitch Drewes, who started and pursued many of the necessary permits that allowed us to move the project along over time.

*Thank you to everyone. Appreciation for your co-operation is heartily given.*

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# *1 INTRODUCTION*

The Lakelse Lake Watershed has historically been an important sockeye producing area. Salmon have been an integral part of the cultural history of the area as an abundant food source and are woven into the traditions and histories of First Nations people. However, the past century has been marked by an accumulation of pressures that have caused widespread degradation of ecosystem integrity and subsequent declines in sockeye abundance.

In 2003, when the Lakelse Lake Sockeye Recovery Program was formed, sockeye recruitment in the Lakelse Lake basin was hovering at a very low level. Concerns about the long term viability of the sockeye population led to the initiation of several habitat conservation and restoration projects aimed at aiding the recovery of Lakelse Lake sockeye stocks, including the Lakelse Lake Fry Outplant Project and the habitat improvement project, both funded by the Pacific Salmon Commission.

Williams Creek is the largest of 13 Lakelse Lake tributaries, historically supporting up to 80% of the Lakelse Lake sockeye. Returns have been recorded showing population sizes up to 50,000 in 1945, and averaging over 10,000 from 1933 to 1968. A decrease in returns to numbers averaging in the hundreds and low thousands have been recorded since this time. The decline appears to be largely the result of extensive logging throughout the watershed including logging of riparian areas and active channel crossings. Large flood events have occurred during and post logging which resulted in increased sediment accumulations of 73,000 ± 6,000 $m^3$/yr (Weiland, 2007). While these excessive sediment loads have now largely been transported by natural river flows into Lakelse Lake and riparian recovery is ongoing, a lack of suitable spawning habitat continues to be the main factor limiting sockeye production.

The Lakelse Sockeye Spawning Habitat Rehabilitation Study (2007-08) identified Reach 3 (Upper Williams Creek) of Williams Creek as extending from 1.9 km upstream of the confluence of Williams creek and Sockeye creek for 2.9 km, ending just above the Old Lakelse Lake road bridge. Investigations of several groundwater sites in the area of this reach were identified as having potential for spawning channel rehabilitation projects pending further study. The Upper Williams Creek Spawning Channel project (NF-2010-H-1, Miller) included a feasibility study to expand the work to the construction of a spawning channel with an intake supplying river water from Williams Creek.

The project is being carried out in three phases:

- Phase 1 - the excavation of a ground water fed test ditch and several groundwater test pits to evaluate ground water potential and overall project feasibility. Successfully carried out in Feb. /Mar. 2009.
- Phase 2 - the excavation of the first 470m of the spawning channel (June 2011).
- Phase 2b - necessary due to the distribution of the funding (present project), built the last 200m of channel and undertook preparations for Phase 3.
- Phase 3 will be the construction of the intake structure and pipe line to supply water from Williams Creek to the spawning channel, expected in the fall of 2012.

This report describes the work done in the design, construction and completion of the Upper Williams Creek Spawning Channel, Phase 2b.

### 1.1 Project Area

The Williams Creek drainage is located along the eastern margin of the Coast Mountains. Williams Creek has a mainstem length of 34.1 km. is the largest tributary in the Lakelse Lake basin, providing 62% of the total inflows to the lake. The creek flows into the northeast corner of Lakelse Lake and is a 4$^{th}$ order stream draining approximately 207 km$^2$ of steep, high elevation mountainsides. Williams Creek and its tributaries, Sockeye, Myron and Llewellyn creeks, comprise 25% of the total stream length in the Lakelse Lake basin. As stated, in most years up to 80% of the Lakelse sockeye return to Williams Creek.

#### 1.1.1 Upper Williams Creek Spawning Channel

The Upper Williams Creek Spawning Channel was located in the forested area southwest of the Williams Creek Bridge on Old Lakelse Lake road. Historically this section of Williams Creek was made up of a complex of side channels which provided a large amount of spawning opportunities for salmon. However, over time the river has experienced anthropologic impacts which changed its stability, causing the abandonment of the historic side channels and greatly reducing the amount of stable spawning habitat available.

The project site was selected to take advantage of an historic side channel location and capitalize on the groundwater potential. The large trees will help provide cover for juvenile fish for rearing and the groundwater will provide warmer water for overwintering and good incubation conditions. Figure 1 provides and overview of the project area obtained from Mapster (DFO) at 1:250,000 and Figure 2 has a closer look at the project area in relation to the local legal boundaries. Figure 2 was obtained from the Regional District of Kitimat-Stikine.

## *2 METHODS/PROJECT PLAN*

The following section provides a summary of the methods employed in project planning and preparation for construction of the remaining 220m of channel.

### 2.1 Pre-assessment/Planning

The work undertaken in the current stage of the project was to complete the channel excavation, approximately 220m, with the available funding. Due to the success undertaking the first portion of the channel excavation using the same contractor, we had a feeling of confidence that we would be able to finish channel construction in Phase 2b within budget.

There were a number of steps taken to prepare for construction of Phase 2b and Phase 3. They included design, permitting, and construction tender preparation.

Figure 1: Williams Creek Side Channel Area (1:250,000 scale)

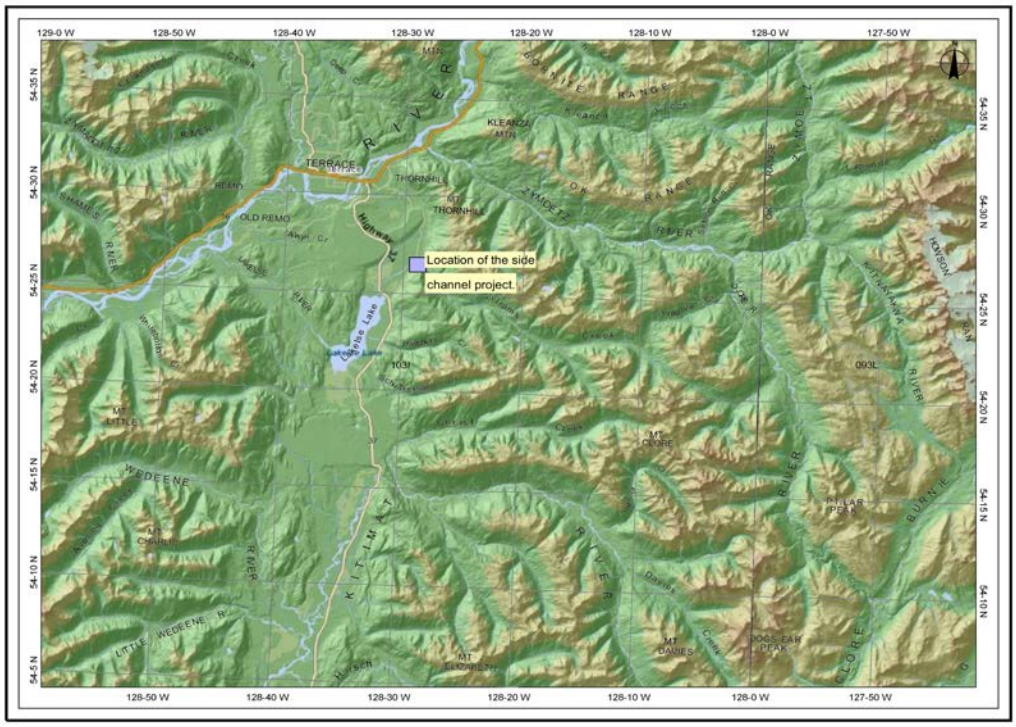
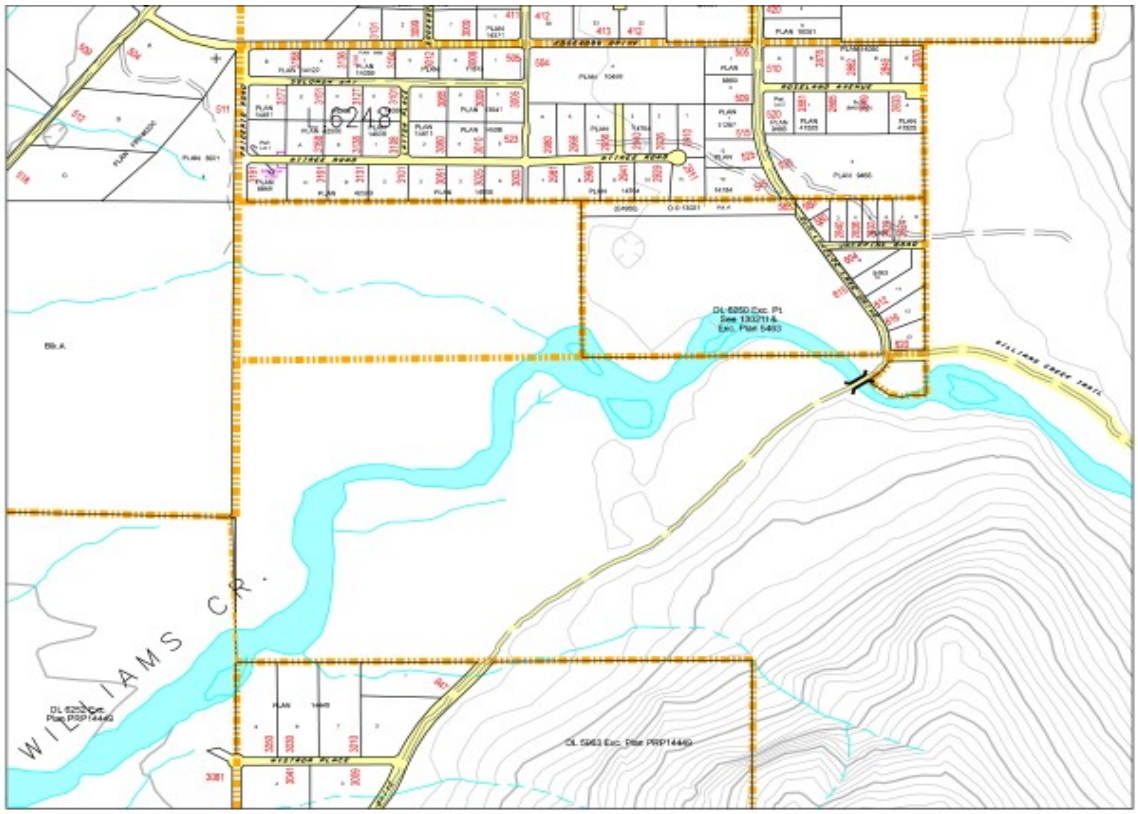



Figure 2: Index Map of the Project Area



### 2.1.1 Design

The design package for the remaining 200m of sidechannel was essentially the same as was used for the construction of the first 470m built in 2011. However, the elevation of the downstream end of the channel was now known, and an approximate elevation was selected for the water intake at Williams Creek. A new drawing was prepared for the tender and it can be found in Appendix 2.

During this phase of the project, the design of the water intake system was finalized and used to submit the application for the water licence. After much consideration, it was decided that we would construct both a precast concrete streamside intake with a 12" diameter pipeline, as well as a linear infiltration system using Infiltrator brand components, similar to the systems that are being installed in the BC Interior when there is a chance that freezing may be an issue and have the potential to affect the survival of eggs in the gravel. The design of the water supply system can be found in Appendix 3.

The system is designed to provide up to 7.2 cfs of water to the channel system for short periods of time when a flush is needed for maintenance or to augment flows. The pipeline portion of the system is controlled by a valve on the pipe so that during times of year where the ground water is low and additional flows are required to maintain connectivity for the full length of the channel. The infiltration portion of the system is not. The infiltration system is intended merely to take advantage of the location of the pipeline and add to the groundwater already entering the channel in random locations. We expect that the infiltration will add to the groundwater already being collected and provide the majority of the baseline flows year round.

Photo 1 – 2012Feb17 – Planning the location of the future water intake

While constructing the channel in Phase 2, it was decided to incorporate a lock block sill at the downstream end of the channel so that there will be an option to easily conduct assessment once the work is complete. The sill was designed using lockblocks and a barrier screen will be incorporated into Phase 3 of the project. The final drawings of the sill can be seen in Appendix 4.

### 2.1.2 Permits, Applications and Statements

A number of permits were obtained in order to proceed with Phase 2b of the project. They are listed below:

- Project Review Application – DFO
- Notification of Works – Water Act – Ministry of Environment
- Statement of Work for construction tender
- Free Use Permit – MFLNRO Forests, Kalum
- Highway Use Permit – MOTI
- Communication with the Regional District of Kitimat-Stikine, Lakelse Watershed Society and the Jackpine Flats Community Association regarding the overall project and

And,

- Water Licence – Ministry of Environment – 2012Aug31

Photo 2 – June 25, 2012 – Typical channel construction

### 2.1.3 Construction Before the Channel Excavation Tender

Having learned from the construction of the first section of the channel, before tendering the last few hundred meters, reconnaissance was conducted and a route selected for the channel. Any trees that looked as though they would be obstructing the excavator's progress were identified and marked for removal. Trees were also marked for removal if they were included in the danger tree assessment undertaken during Phase 2 or if a tree falling professional identified them as being a safety risk.

Three quotes were obtained by invitation from local tree falling experts and Nordic Tree Service was selected for the project. Work was done in one day, June 7th, 2012. There were approximately 30 trees were fallen and bucked into 5m sections. A more complete description of the work can be found in the memo prepared by James Powell, dated June 15, 2012 (Appendix 5).

### 2.1.4 Construction Tender

Due to the method of competitive tendering during Phase 2 of the channel construction in 2011, it was possible to negotiate the price for Phase 2b directly with the same contractor, Billabong Road and Bridge Maintenance Inc. The statement of work prepared included the construction of the remaining portion of the channel for as far as is deemed reasonable, and the installation of the lock block sill at the downstream end of the newly constructed channel, where it connects to the original natural groundwater channel. The construction tender was overseen by DFO Contracting and no issues were encountered during this phase.

Photo 3 – June 22, 2012 – Channel construction near the log jam.

# *3 CONSTRUCTION PROGRESS*

The following section provides a summary of the main achievements for the project.

## 3.1 Channel Construction

Channel construction began on June 21, 2012 and was completed on June 27, 2012. Detailed summaries of the daily reports, including photos and progress can be found in Appendix 6. Having gained the experience during the first phase of the channel excavation, the remaining channel was completed in relatively short order. The newly constructed section of the channel winds through a narrower strip of land than the first section, confined by a natural side channel fed by a log jam and an oversteepened bank. The alignment was kept as far away from the natural side channel as possible and the excavated material was used to establish a berm to act as flood protection in the event that it is needed. The natural side channel was monitored during construction to check that it did not dewater, but no negative effects were noted and the juveniles rearing there were not disturbed.

During the construction of the first phase of the excavation, most of the complexing was done using available stumps, boulders and smaller diameter trees. For the second phase of the channel, having the trees cut down and bucked up in advance of the excavation provided plenty of larger diameter wood to add to the channel. Boulders were also used to anchor the toe of the slope as the banks are high and relatively steep. Over time we expect that they will stabilize with vegetation and slumping so that the channel can become more accessible.

Approximately 200m was added to the length of the overall channel. The top end of the channel is now about 50m from the proposed location of the streamside intake and easily accessible from the parking area so that the valve can be safely managed.

## 3.2 Sill Construction

The lock block sill was constructed as shown in the drawings, Appendix 4. Construction took place over 2 days. The first day was June 28, 2012. On this day the area was isolated and the lock blocks were set into place to construct the sill. A short summary of the progress on site can be found in the Daily Construction Reports, Appendix 6. The metal frame was installed August 2, 2012. It is made of aluminum and anchored to the blocks using Hilti products. There were no unusual circumstances encountered during construction, but due to the elevation of the groundwater during construction the block placement required quite a bit more effort than expected.

The sill is now ready for a slide in gate panel. We will include that in the next phase of the project and anticipate designing a system similar to one that is used in hatchery rearing channels.

Photo 4 – June 27, 2012 - Approaching the end of the open channel.

Photo 5 – August 2, 2012 – Installing the metal edge on the sill.

## 3.3 Other tasks

### 3.3.1 Project Materials and Supplies

Once the metalwork was completed for the sill, it was decided to purchase any necessary materials and supplies needed to complete Phase 3 of the overall project. The timing of the intake installation is important to successfully completing the tasks by the March 31, 2013 deadline for the next phase (NF-2012-H-1). The intake must be installed while water levels are low, which happens at the middle of September, before the fall rainy season begins. Because of the uncertainty inherent in the project, we decided to minimize the risk to the Contractor by purchasing the materials such as the manhole and precast intake, so that if changes are needed it will not affect the lump sum price for the installation.

# *4 Concluding remarks*

The detailed Phase 2b objectives included completing the channel construction for the Williams Spawning Channel and undertaking feasibility for the lower Williams Creek area. At the conclusion of the project, the channel construction had been completed and the water license obtained, a large percentage of the construction materials had been purchased for Phase 3 and the communication links for the local watershed groups are established. Achieving all of these objectives indicates a major step forward to eventually constructing a channel in the lower section of Williams Creek. By the time Phase 3 is completed, which is expected to be in the fall of 2012, we will have a fully operational channel that BC Parks can view in order to talk more directly about the options for a similar project in the lower river.

We met all of the objectives outlined and beginning immediately, in the coming season, we will finish off the channel project, by constructing the water supply system. As required by the conditions of the water license, assessment of the flows used will begin. The water license requests that flows be monitored in the river and channel for the next 5 years to get a better feel for how much water is being diverted out of Williams Creek for the project area.

There is also interest in moving fish into the channel shortly after completion of the water supply system. One way of doing this for sockeye would be to plant eyed eggs in the channel, but that will require approvals from the regulating bodies.

We appreciate the continued funding and support to carry on our projects in the Lakelse Lake Watershed.

# 5 References


1. (2004). *Lakelse Lake Sockeye Recovery Plan.* Prince Rupert, BC: Fisheries and Oceans Canada.
2. Leggat, M. (2009). *Lakelse Lake Suspended Sediment Study.* Smithers, BC: Ministry of Environment.
3. Miller, L., Devcic, S., & Kujat, M. (2011). *Upper Williams Creek Spawning Channel, Lakelse Sockeye Recovery Plan, NF-2009-H-8.* Prince Rupert, BC: Fisheries and Oceans Canada.
4. Miller, L., Devcic, S., & Powell, J. (2013). *Upper Williams Creek Spawning Channel, Lakelse Sockeye Recovery Plan, NF-2010-H-1.* Prince Rupert, BC: Fisheries and Oceans Canada.
5. Rabnett, K. (2008). *Lakelse Sockeye Spawning Habitat Rehabitation Study.* Hazelton, BC: Suskwa Research.
6. Weiland, I. S. (2007). *Sediment Source Mapping, Detailed Channel Assessment, and Reconnaissance Sediment Budget for Williams Creek for the Period 1949-2001.* Smithers, BC: Weiland Terrain Sciences & Fluvial Systems Research Inc.

# APPENDIX 1

# Proponent Information

## Proponent Information

**Department of Fisheries and Oceans Canada**
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Ecosystems Management Branch
Salmonid Enhancement Program
Resource Restoration Unit
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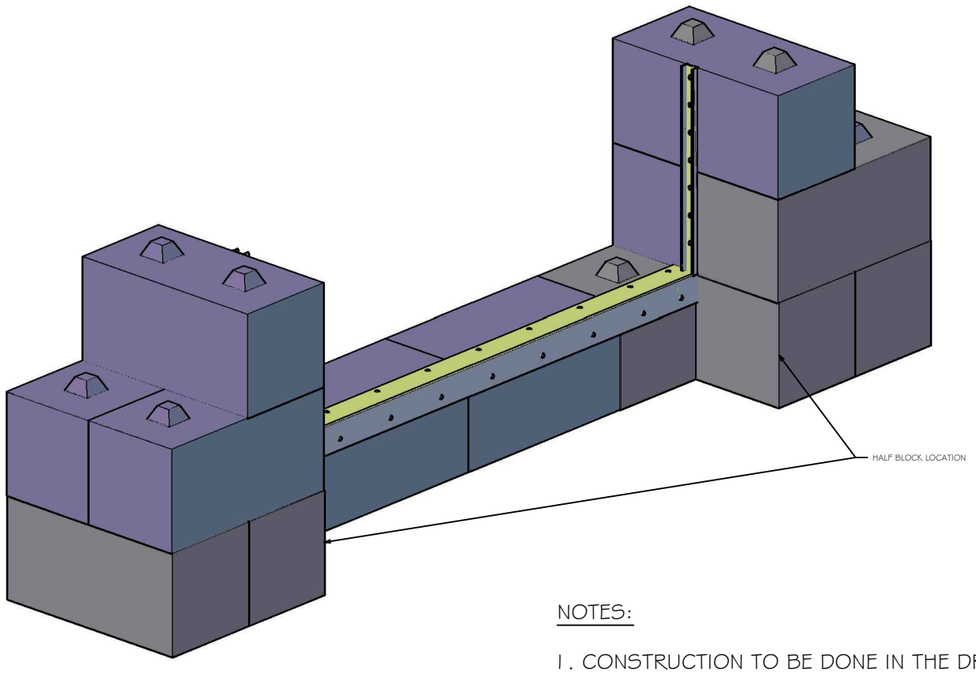
# APPENDIX 2

# DESIGN DRAWINGS PREPARED FOR THE CONSTRUCTION TENDER

# 3D




LIST OF LOCK BLOCKS (SUPPLIED)

2 - FULL SIZE FLAT TOPS 1500 X 750 X 750

2 - HALF SIZE NOTCHED 750 X 750 X 750

10 - FULL SIZE NOTCHED 1500 X 750 X 750

NOTES:

1. CONSTRUCTION TO BE DONE IN THE DRY IF POSSIBLE

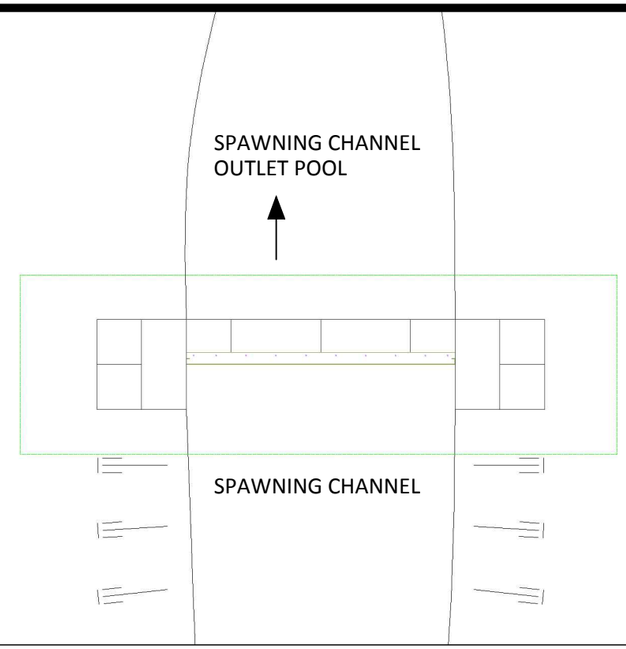
2. SITE MUST BE ISOLATED FROM POTENTIAL FISH PRESENCE AND SEDIMENT CONTROL MEASURES ACTIVATED THROUGHOUT CONSTRUCTION.

3. EQUIPMENT SHOULD BE SUITABLE FOR USE IN AND AROUND WATER.

4. EXISTING STREAMBED MATERIAL TO BE LEVELLED AND COMPACTED . FOUNDATION TO BE ASSESSED BY DFO BEFORE BLOCK PLACEMENT.

# PLAN

1:100

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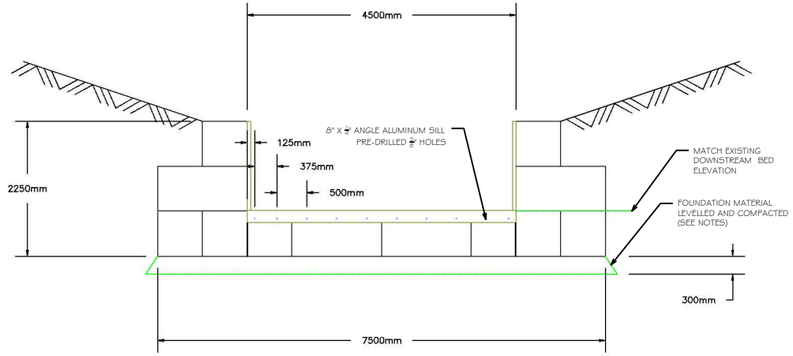
1:100




May, 2012

Fisheries and Oceans Canada
www.dfo-mpo.gc.ca

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| | INITIAL | DATE | |
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| CHECKED BY: | | | OWNER: FISHERIES AND OCEANS CANADA |

| DRAWING TITLE: LOCK BLOCK OUTLET WEIR | | |
|---|---|---|
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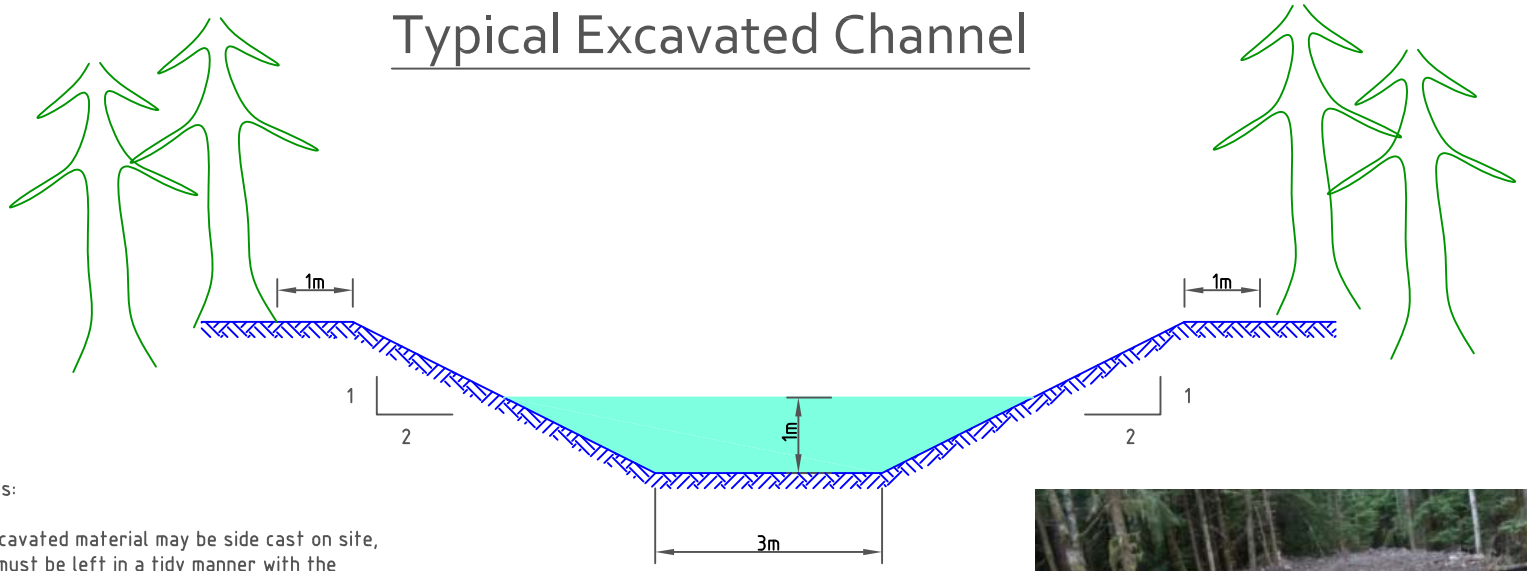
| WCSC-003 | | |

# Typical Excavated Channel




Notes:

1. Excavated material may be side cast on site, but must be left in a tidy manner with the forest duff spread on top to encourage quick natural regeneration of native plants. Sidecast material should be 1m. back from the edge of the excavated channel.

2. Habitat features are to be included as described in the statement of work

3. Where possible, excavate to approx. 1m. below start of visible ground water

4. Minimize the removal of large trees. Channel is not intended to be straight and can meander around to accomodate/take advantage of topography and forest cover

5. As much as possible, standing trees are not to be buried, use good industry practice.

Photo showing Typical excavation from Williams Creek 2011 including boulder placement and large woody debris (stumps)

May, 25, 2012

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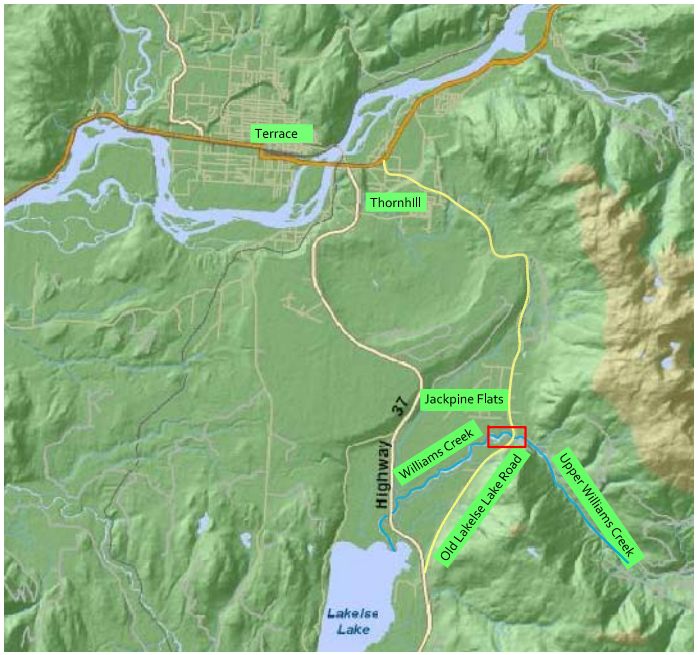
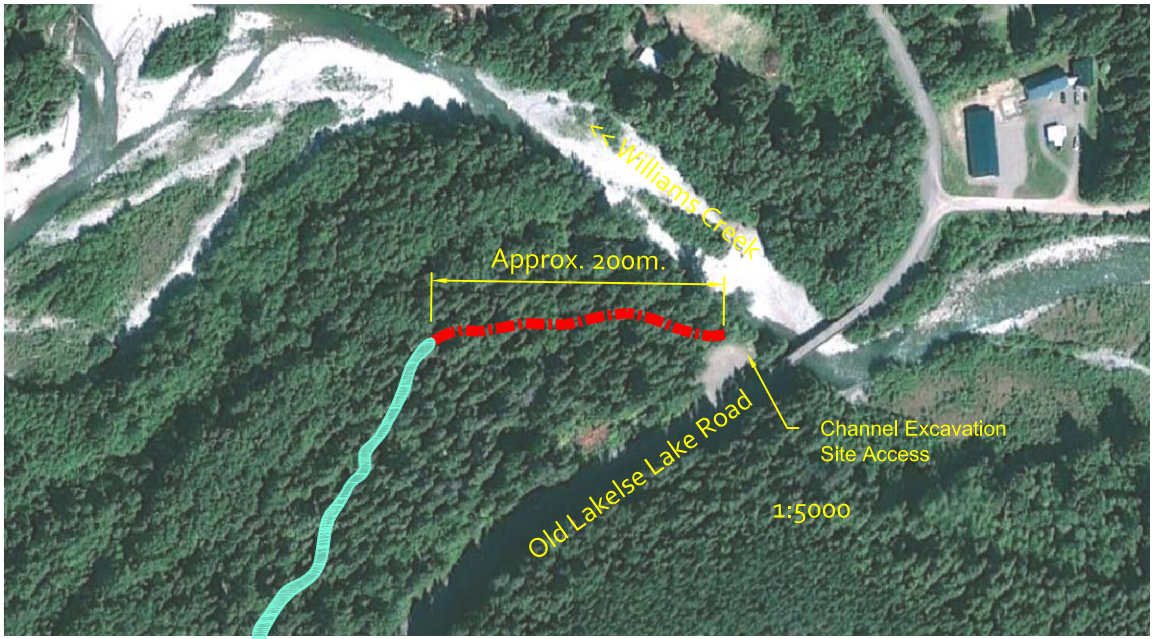
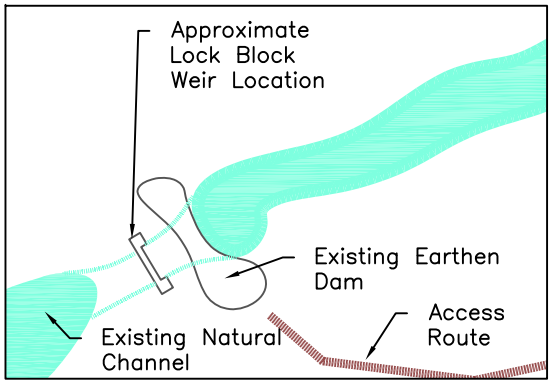
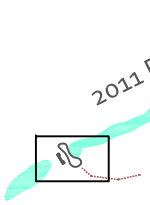
# Upper Williams Creek Side Channel
# Location Plan 2012




Lock Block Weir Location




2012 Proposed Excavation

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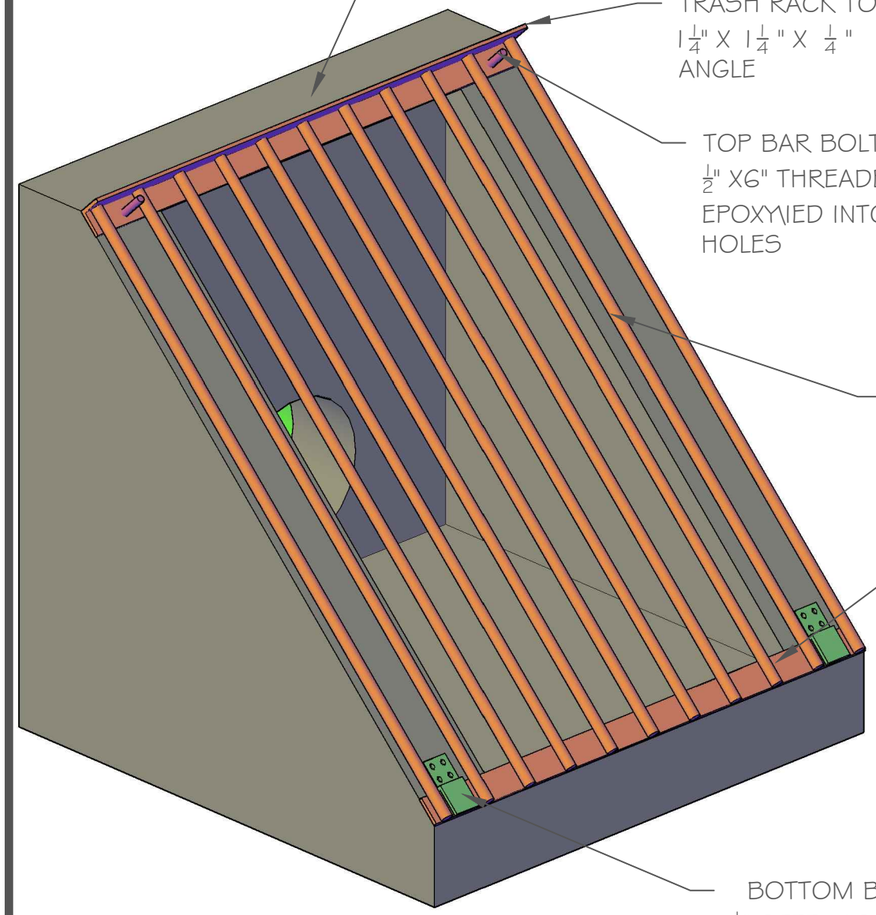
# APPENDIX 3

# DESIGN DRAWINGS OF THE WATER SUPPLY SYSTEM PREPARED FOR THE WATER LICENSE APPLICATION

## 3D

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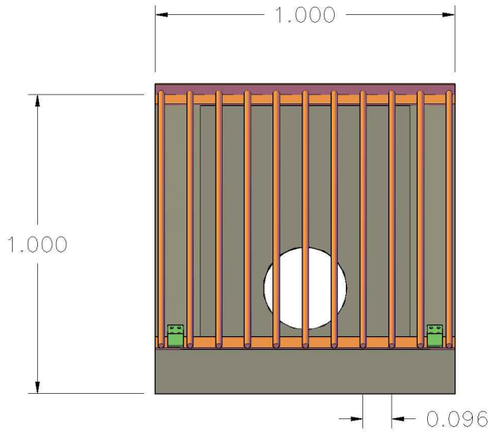
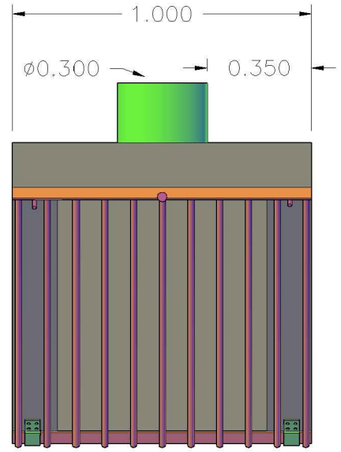
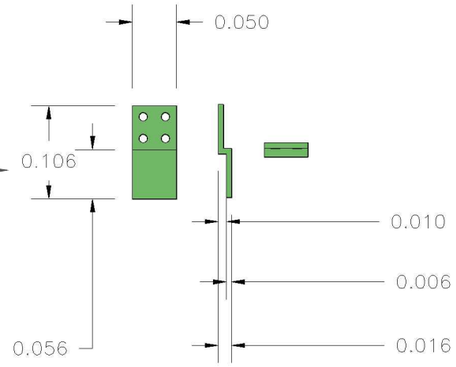
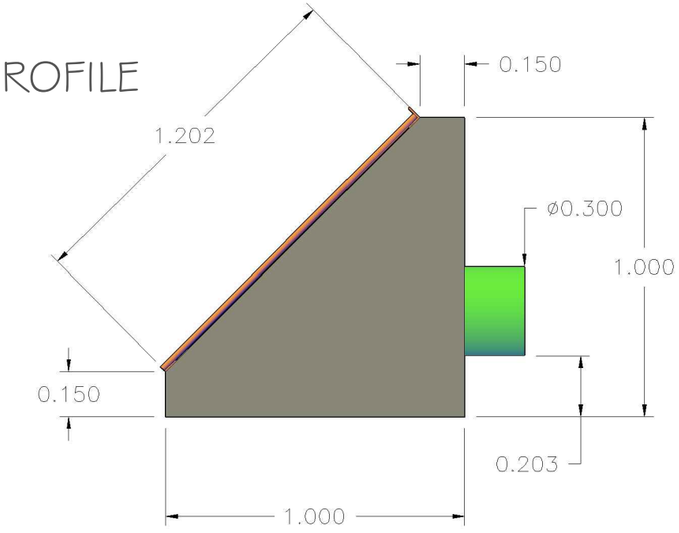



## PLAN




## PROFILE




MARCH 12,2012

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# Typical Excavated Channel

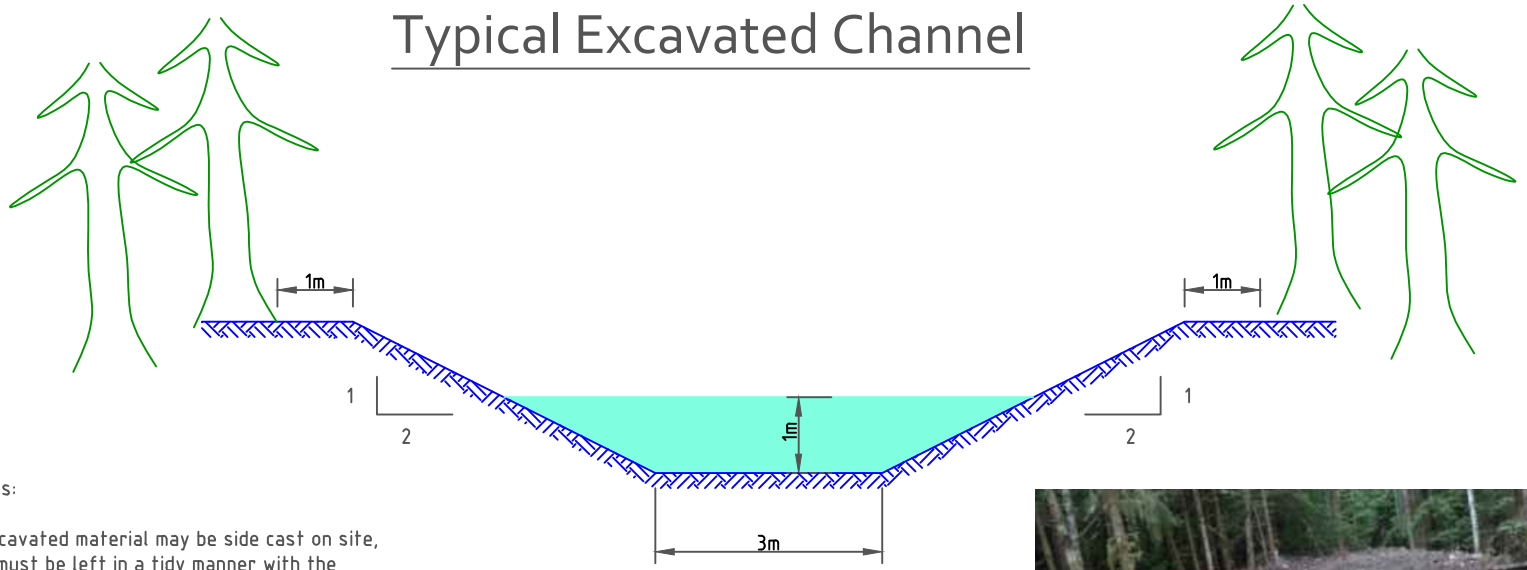


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Photo showing Typical excavation from Williams Creek 2011 including boulder placement and large woody debris (stumps)

May, 25, 2012

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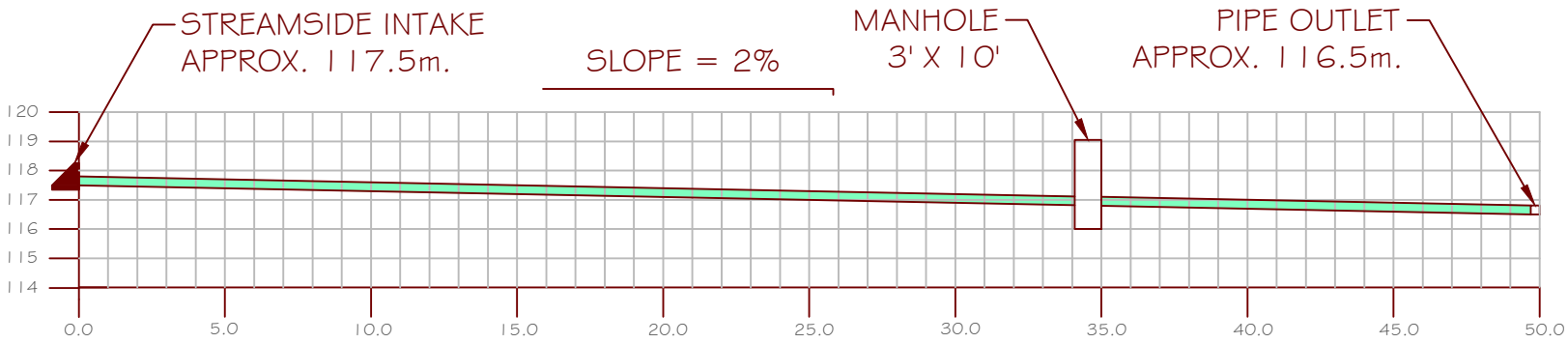


August 25, 2012

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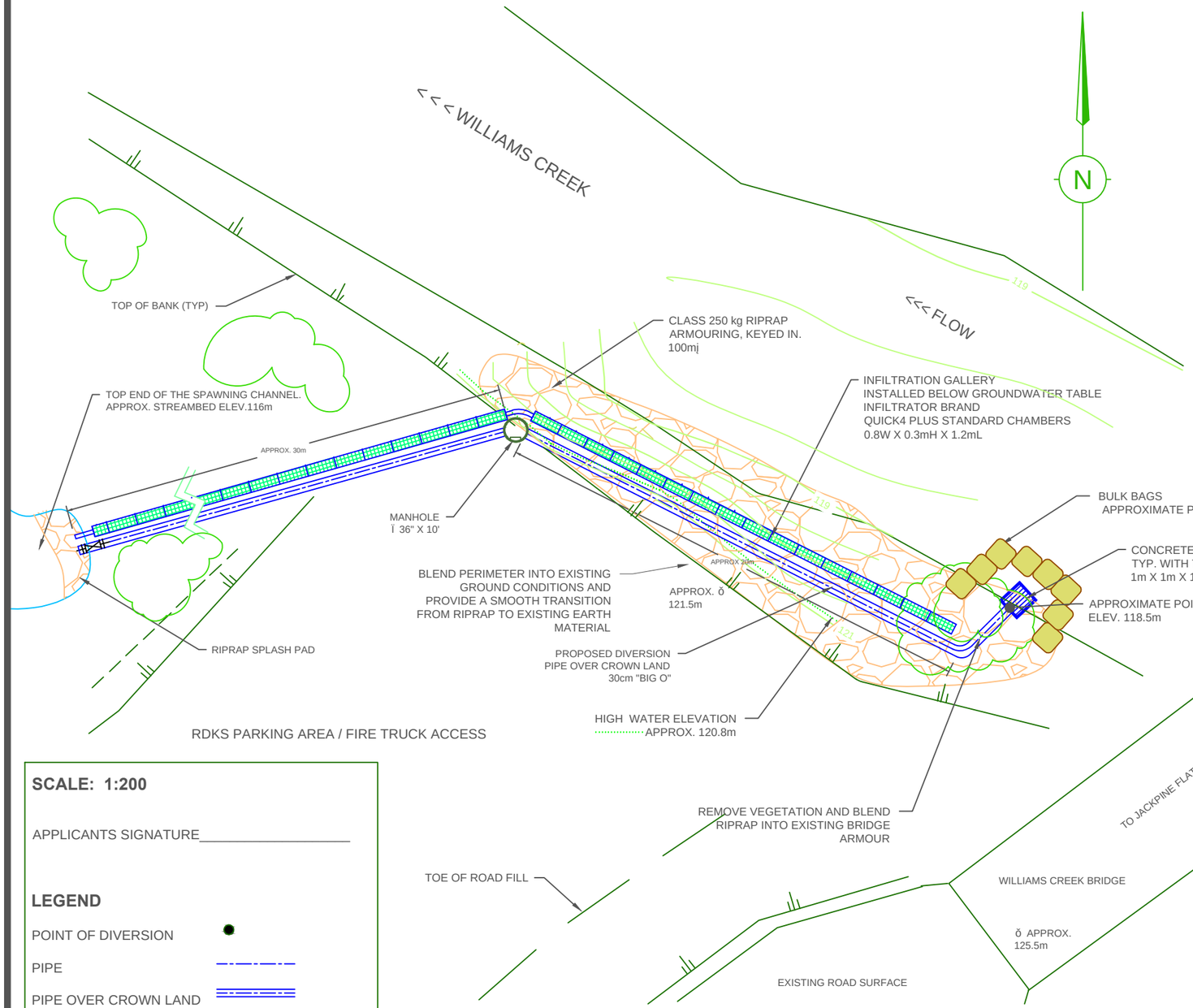
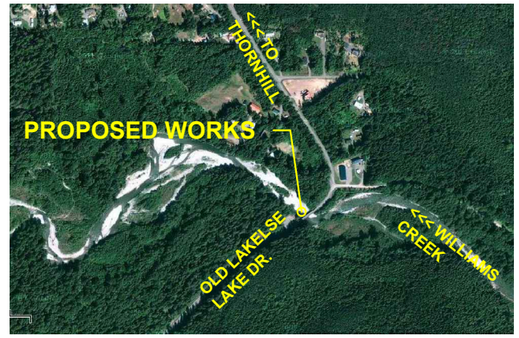
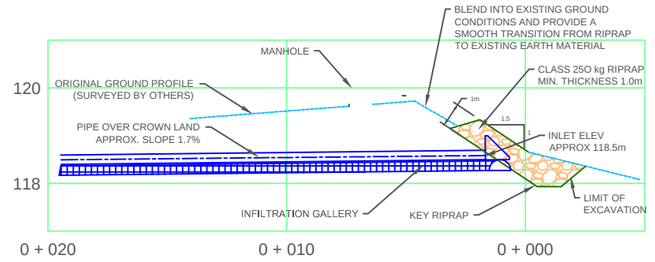
| CHECKED BY: | | OWNER: | |




LOCATION MAP
UTM - NAD 83 - 09 U - 0533780, 6032850




PROPOSED INLET ARMOURING PROFILE
1:250

NOTES:

1. RIPRAP SHALL BE KEYED IN PLACE AS INDICATED IN THE DRAWINGS, NOT END DUMPED.

2. CLASS 250 RIPRAP PLACED TO A NOMINAL DEPTH OF 1000 mm. ROCK SHALL BE HARD, DURABLE ANGULAR QUARRY ROCK GRADED AS FOLLOWS:
CLASS 250 - 85% OF ROCK > 25 kg.
- 50% OF ROCK > 250kg
- 15% OF ROCK > 750kg.

3. FOR VISUAL COMPREHENSION ONLY THE APPROXIMATE AVERAGE DIMENSION OF ANGULAR ROCK OF CLASS 250 IS 600mm.

4. ENSURE RIPRAP TO BE USED IS CLEAN, IS OF SUITABLE QUALITY AND IS KEYED INTO THE BANK SUCH THAT IT DOES NOT CONSTRICT THE CHANNEL BY EXTENDING INSIDE THE EXISTING BANK CONFIGURATION.

5. DISTURBANCE TO THE STREAMBANKS MUST BE MINIMIZED. BANK STABILITY AND EROSION PREVENTION IS CRITICAL. RECONSTRUCT AND REVEGETATE DISTURBED BANKS TO THEIR ORIGINAL CONDITION WHERE NECESSARY AS SOON AS ACTIVITY IS COMPLETED.

6. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT RESULT IN DEPOSITION OF DEBRIS, SOIL, OR OTHER MATERIAL DELETERIOUS TO FISH, IN ANY WATER COURSE.

7. SEDIMENT MUST BE PREVENTED FROM ENTERING THE WATERCOURSE, AS IT IS A VIOLATION UNDER THE FISHERIES ACT.

8. ALL EXCAVATION AND TRENCHING TO COMPLY WITH ALL REGULATORY AGENCIES AND SPECIFICATIONS.

9. ALL PIPE BEDDING, COMPACTION, EXCAVATION ENVELOPE TO BE AS PER MANUFACTURERS SPECIFICATIONS.

10. EXACT LOCATIONS MAY VARY ACCORDING TO SITE CONDITIONS

**SCALE: 1:200**

APPLICANTS SIGNATURE_____

**LEGEND**

POINT OF DIVERSION

PIPE

PIPE OVER CROWN LAND

MARCH 15, 2012

Fisheries and Oceans Canada
www.dfo-mpo.gc.ca

| | | | |
|---|---|---|---|
| SCALE: AS NOTED | PROJECT NO: | | |
| | | INITIAL | DATE |
| DRAWN BY: JAMES POWELL | | | |
| CHECKED BY: SANDRA DEVCIC | | | |

PROJECT: Williams Creek Spawning Channel

DRAWING TITLE: Inlet Protection

CLIENT:

OWNER: FISHERIES AND OCEANS CANADA

| DRAWING NUMBER | REV NO. | SHEET |
|---|---|---|
| 2012 WCSC 00 | | 1 / 1 |

DL 6250
EV ▱. P ⊿.
S ◯◯ 13021l
&
EV ▱.
PL ⊿ Ø 5463

EDGE OF WATER
ELEV. 116.8224

FLOW

WILLIAMS CREEK MAIN CHANNEL

APPROXIMATE DISTRICT LOT
BOUNDARY

END OF 2011 AS-BUILT
VALVE

MANHOLE

TO HOSPITAL FLATS

APPROX. INTAKE LOCATION,
STREAMBED ELEV. 118m (APPROX.)
NOTE: WATER FROM THE INTAKE WILL BE TRANSPORTED BY PIPE UNTIL THE TOPOGRAPHY OF THE SITE ALLOWS A STABLE TRANSITION TO OPEN CHANNEL. IT IS ANTICIPATED THAT THE PIPELINE WILL BE ABOUT 30-50M AND INCLUDE A FLOW CONTROL VALVE AND MANHOLE.

EDGE OF WATER
ELEV. 113.628

PARKING
AREA

KITSELAS BAND
LOGGING BLOCK
BOUNDARY

AREA WITH NUMEROUS
OLD CHANNELS

TEST DITCH -
CONSTRUCTED
FEB. 2009

2012 CHANNEL
(APPROXIMATE)

OLD LAKELSE LAKE DRIVE

TO HIGHWAY 16

WILLIAMS CREEK MAIN CHANNEL

LEGEND

| | |
|---|---|
| STREAM - ACTIVE | |
| STREAM - DRY CHANNEL | |
| 2011 - AS-BUILT CHANNEL | |
| 2012 - CHANNEL APPROXIMATE | |
| 2012 - PROPOSED INLET PIPE | |
| LOGGING BLOCK BOUNDARY | |
| LEGAL LOT BOUNDARY | |

2012 CHANNEL

EDGE OF WATER
ELEV. 100.500

KITSELAS BAND
LOGGING BLOCK
BOUNDARY

START OF 2011 AS-BUILT
(WEIR)

KITSELAS BAND
LOGGING BLOCK
BOUNDARY

EDGE OF WATER
ELEV. 103.640

LOCK BLOCK WEIR

August 3, 2012

Fisheries and Oceans Canada
www.dfo-mpo.gc.ca

| | | | |
|---|---|---|---|
| SCALE 1:5,000 | PROJECT NO: | | |
| | INITIAL | DATE | |
| DRAWN BY: JAMES POWELL | | | |
| CHECKED BY: | | | |

PROJECT: Williams Creek Spawning Channel

CLIENT:

OWNER:

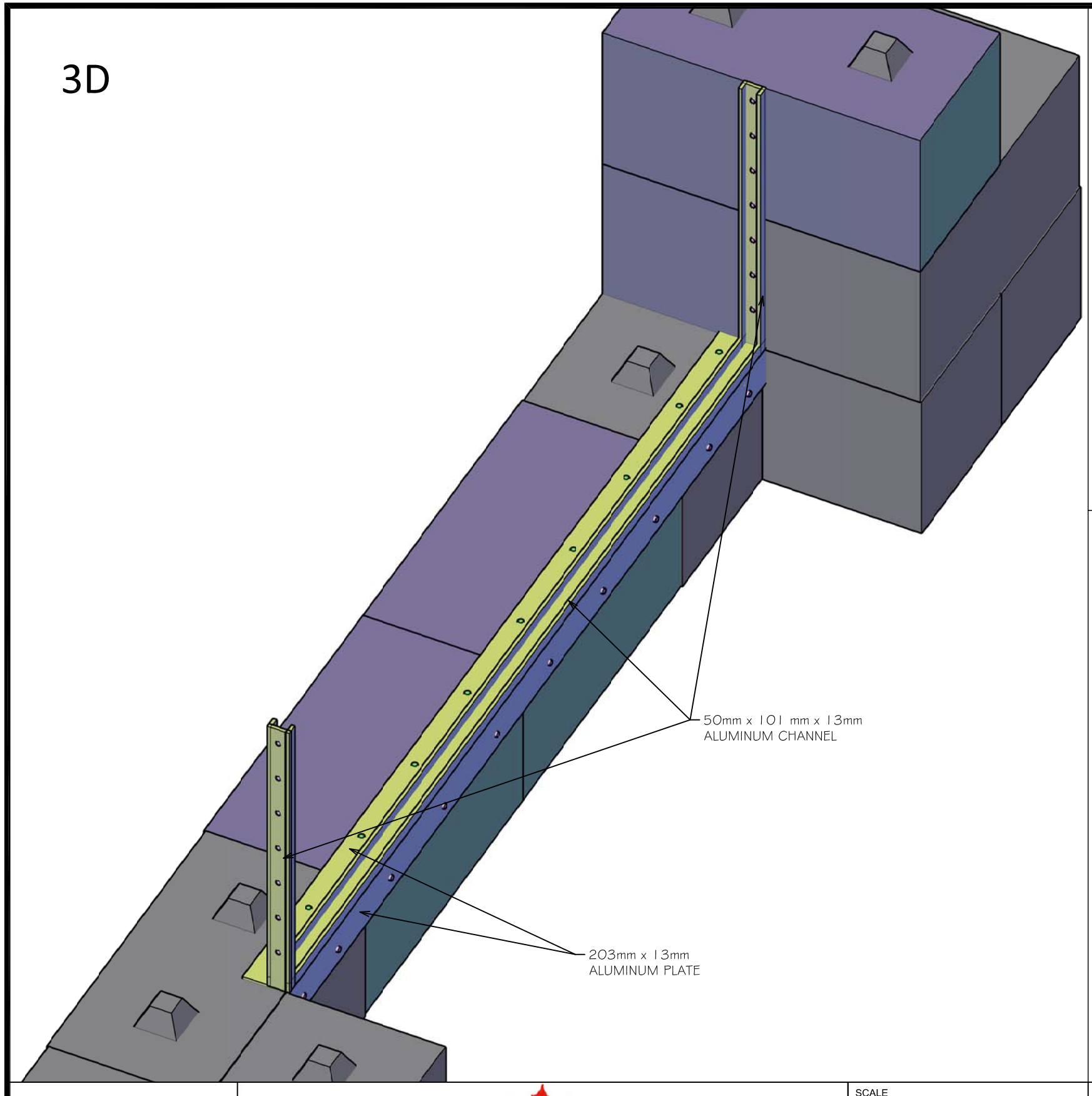
DRAWING TITLE: As Built

| DRAWING NUMBER | REV NO. | SHEET |
|---|---|---|
| 2012 WCSC 01 | | 1 / 1 |

# APPENDIX 4

# DESIGN DRAWINGS FOR THE LOCKBLOCK FENCE SILL

# 3D

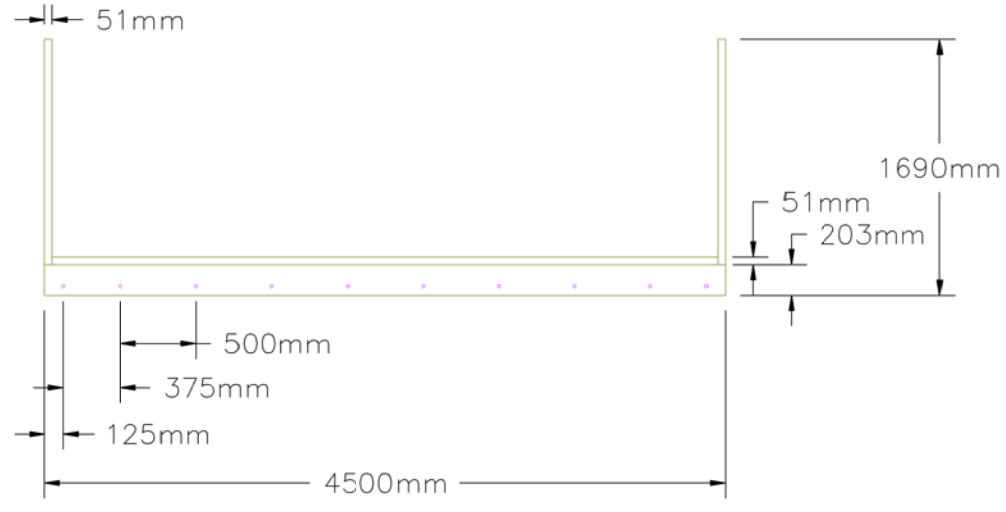



# PLAN

1:50


# FRONT

1:50

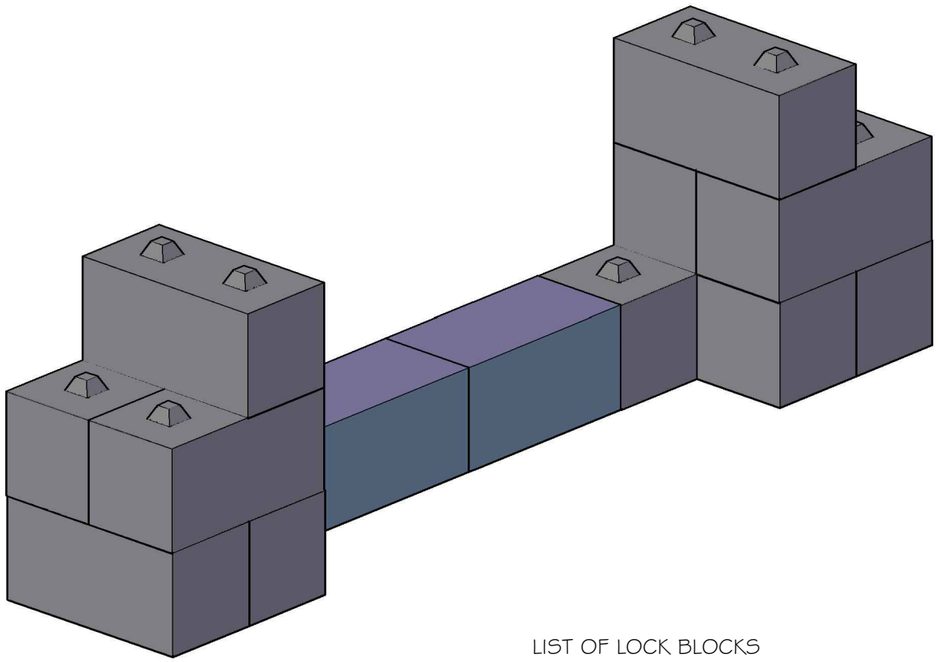



March 29, 2012

Fisheries and Oceans Canada
www.dfo-mpo.gc.ca

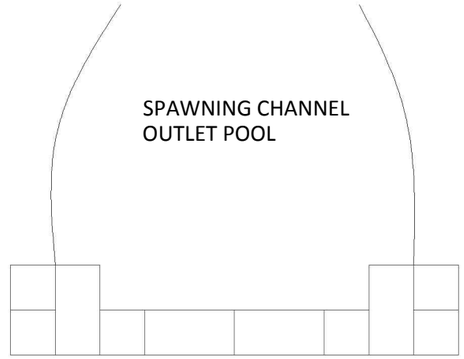
| | | | | | |
|---|---|---|---|---|---|
| SCALE | PROJECT NO: | | | PROJECT: WILLIAMS CREEK SPAWNING CHANNEL | DRAWING TITLE: LOCK BLOCK OUTLET WEIR |
| | | INITIAL | DATE | | |
| DRAWN BY: JAMES POWELL | | | | CLIENT: | DRAWING NUMBER / REV NO. / SHEET |
| CHECKED BY: | | | | OWNER: FISHERIES AND OCEANS CANADA | |

# 3D



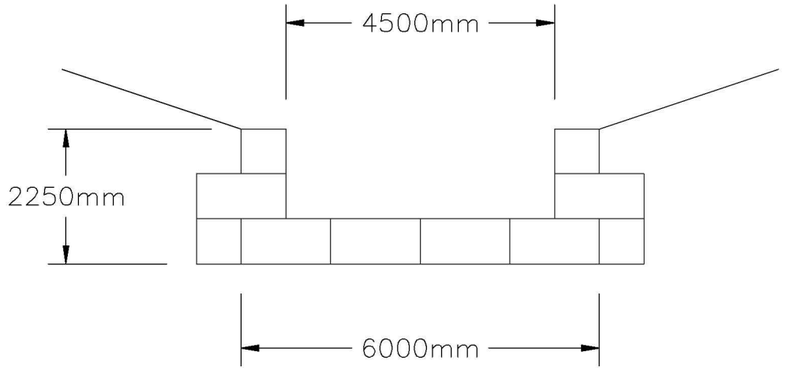
# PLAN

1:100




# FRONT

1:100




LIST OF LOCK BLOCKS

2 - FULL SIZE FLAT TOPS 1500 X 750 X 750

2 - HALF SIZE NOTCHED 750 X 750 X 750

10 - FULL SIZE NOTCHED 1500 X 750 X 750

March 29, 2012

Fisheries and Oceans Canada
www.dfo-mpo.gc.ca

| | | | |
|---|---|---|---|
| SCALE | PROJECT NO: | | |
| | | INITIAL | DATE |
| DRAWN BY: JAMES POWELL | | | |
| CHECKED BY: | | | |

PROJECT: WILLIAMS CREEK SPAWNING CHANNEL

DRAWING TITLE: LOCK BLOCK OUTLET WEIR

CLIENT:

OWNER: FISHERIES AND OCEANS CANADA

| DRAWING NUMBER | REV NO. | SHEET |
|---|---|---|
| | | |

# APPENDIX 5

# WILLIAMS CREEK TREE REMOVAL MEMO, J. POWELL

Fisheries and Oceans | Pêches et Océans

**MEMORANDUM NOTE DE SERVICE**

To / À: Note To File

From / De: James Powell
CC Sandra Devcic, Lana Miller

Security Classification - Classification de sécurité
**UNCLASSIFIED**

Our file - Notre référence
**UPPER WILLIAMS CREEK**

Your File - Votre référence

Date
**15 June, 2012**

Subject / Object: **WILLIAMS CREEK TREE REMOVAL**

Williams Creek flows from a 17, 000 ha watershed into the northwest end of Lakelse Lake approximately 20 km. south of Terrace B.C.. Williams Creek has historically supported the largest number of sockeye spawners in the lakelse watershed and has been identified as a priority for restoration work in the B.C. North Coast area. In 2010 a 3 phase habitat restoration project was undertaken adjacent to Upper Williams Creek by the North Coast Resource Restoration Unit with funding from the Pacific Salmon Commission to provide additional side channel rearing and spawning habitat. Phase one involved several test pits and a test channel to determine feasibility. With the success of phase one, phase two includes excavating a 700m. long side channel down to an elevation that takes advantage of existing groundwater. Phase one also includes the construction of a downstream lock block weir to facilitate future monitoring and exclusion requirements. Phase three will involve the installation of an intake system using both a stream side river intake and an infiltration gallery.

The phase two excavation began in June of 2011 with the excavation of the first 470m of channel. The continuation of the remaining 200m. of channel required the removal of several large trees along the excavation route. Three contractors were provided with a Statement of work and met on site for a site visit. The successful bidder, Nordic Tree Services completed the tree removal on June 7th, 2012. The following is a summary of the work completed.

The photos below were taken facing east, walking along the route of the tree removal from the upstream end of the 2011 excavation to the parking area at the Williams Creek Bridge on Old Lakelse Lake Road. These Photos show the general condition of the channel route after the trees were fallen and bucked.

*Photos 1-9, General Conditions of Channel Route After Tree Falling and Bucking*

Some of the felled trees landed across the natural channel that runs parallel to the excavation route on the north side. All but one of these trees cross well above the channel. The one cottonwood in the channel does not appear to be impeding natural flow.

*Photos 10, 11- Showing Trees Fallen Across Natural Channel*

| Tree # | Species | Condition | Notes | Trunk Diameter (cm) | Bucked @ | | | UTM (from GPS) N | E |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Hemlock | Windfall | | 50 | St | | | 533721 | 6032859 |
| 2 | Hemlock | Windfall | | 42 | St | 5 | | 533730 | 6032860 |
| 3 | Hemlock | Felled | | 55 | St | 5 | 6 13 | 533705 | 6032862 |
| 4 | Hemlock | Felled | | 50 | St | 14 | | 533693 | 6032892 |
| 5 | Cedar | Old Windfall | | 60 | | 9 | 14 | 533708 | 6032873 |
| 6 | Spruce | Felled | | 26 | St | | | 533667 | 6032873 |
| 7 | Cedar | Old Windfall | | 40 | | 6 | | 533647 | 6032884 |
| 8 | Alder | Felled | | 25 | St | 10 | | 533670 | 6032859 |
| 9 | Hemlock | Felled | Crosses Nat. Channel | 70 | St | 5 | 17 | 533653 | 6032901 |
| 10 | Hemlock | Felled | | 50 | St | 7 | 15 | 533644 | 6032886 |
| 11 | Hemlock | Felled | | 54 | St | 6 | 10 | 533624 | 6032876 |
| 12 | Cottonwood | Felled | In Nat. Channel | 110 | St | 7 | 15 21 | 533620 | 6032890 |
| 13 | Hemlock | Felled | No Stump Visible | 20 | St | 6 | 12 | 533620 | 6032890 |
| 14 | Hemlock | Felled | | 45 | St | 7 | 14 | 533614 | 6032867 |
| 15 | Spruce | Felled | Crosses Nat. Channel | 70 | St | 7 | | 533608 | 6032887 |
| 16 | Hemlock | Felled | Crosses Nat. Channel | 60 | St | 5 | | 533614 | 6032879 |
| 17 | Cottonwood | Felled | | 100 | St | | | 533613 | 6032877 |
| 18 | Hemlock | Felled | Small Snag | 50 | St | | | 533605 | 6032873 |
| 19 | Cedar | Felled | | 50 | St | 7 | 18 | 533608 | 6032875 |
| 20 | Hemlock | Felled | | 48 | St | 4 | 10 | 533597 | 6032855 |
| 21 | Hemlock | Felled | | 60 | St | 6 | 14 | 533597 | 6032864 |
| 22 | Hemlock | Felled | | 40 | St | 10 | 16 | 533608 | 6032877 |
| 23 | Cedar | Windfall | | 90 | | 10 | 14 | 533607 | 6032868 |
| 24 | Cedar | Windfall | | 30 | St | | | 533591 | 6032870 |
| 25 | Hemlock | Felled | | 35 | St | 8 | | 533583 | 6032856 |
| 26 | Hemlock | Felled | | 50 | St | 7 | 12 18 | 533580 | 6032854 |
| 27 | Hemlock | Felled | Top in 2012 Channel | 30 | St | 6 | 12 | 533580 | 6032854 |
| 28 | Hemlock | Felled | | 40 | St | 8 | | 533568 | 6032838 |
| 29 | Hemlock | Felled | Top in 2012 Channel | 50 | St | 5 | | 533566 | 6032857 |
| 30 | Hemlock | Felled | Top in 2012 Channel | 50 | St | 4 | | 533565 | 6032857 |
| | | | Ave Diameter | 51.6667 | | | | | |

*Table 1, Some details regarding individual trees fallen and/or bucked*

The following photos show the stumps and trunks of the individual trees fallen and/or bucked.


*Photos 11, 12 - Tree # 1, Hemlock*


*Photos 13, 14 - Tree # 3, Hemlock*


*Photos 15, 16 - Tree # 4, Hemlock*


*Photos17, 18- Tree # 5, Hemlock*


*Photos 19, 20 - Tree # 6, Spruce*


*Photos* 21, 22 - *Tree # 7, Cedar*


*Photos* 23, 24 - *Tree # 8, Alder*


*Photos* 25, 26 - *Tree # 9, Hemlock*


*Photos* 27, 28 - *Tree # 10, Hemlock*


*Photos* 29, *30 - Tree # 11, Hemlock*


*Photos 31, 32 - Tree # 12, Cottonwood*

*Photo 33 - Tree # 13, Hemlock*


*Photos 34, 35 - Tree # 14, Hemlock*


*Photos* 36, 37 - *Tree # 15, Spruce*


*Photos* 38, 39 - *Tree # 16, Hemlock*


*Photos 40,41 - Tree # 17, Cottonwood*


*Photos* 42, 43 - Tree # 18, Hemlock


*Photos 44, 45 - Tree # 19, Cedar*


*Photos 46,47 - Tree # 20, Hemlock*


*Photos 48, 49 - Tree # 21, Hemlock*


*Photos 50, 51 - Tree # 22, Hemlock*


*Photos* 52, 53 - *Tree # 23, Cedar*


*Photos 54, 55 - Tree # 24, Cedar*

*Photo 56 - Tree # 25, Hemlock*


*Photos 57, 58 - Tree # 26, Hemlock*


*Photos 59, 60 - Tree # 27, Hemlock*


*Photos 61 ,62 - Tree # 28, Hemlock*


*Photos 63,64 - Tree # 29, Hemlock*

*Photos 65, 66 -T ree # 30, Hemlock*

# APPENDIX 6

# DAILY CONSTRUCTION REPORT, J.POWELL

Fisheries and Oceans | Pêches et Océans

**MEMORANDUM** **NOTE DE SERVICE**

To / À: Note To File

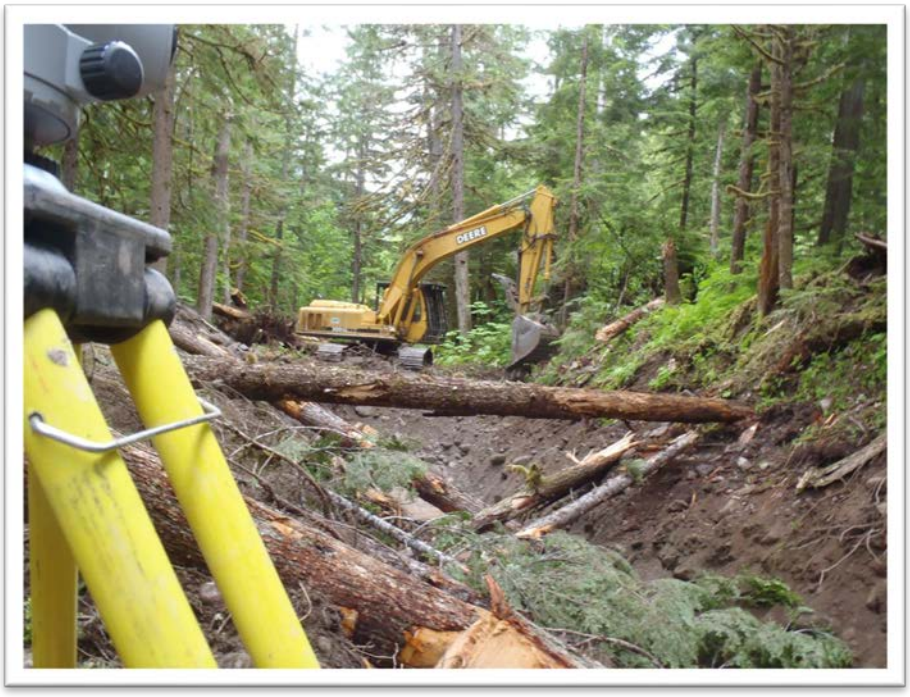
From / De: James Powell
CC; Lana Miller, Sandra Devcic

| |
|---|
| Security Classification - Classification de sécurité<br>**UNCLASSIFIED** |
| Our file - Notre référence<br>**WILLIAMS CREEK** |
| Your File - Votre référence |
| Date<br>**July 3, 2012** |

Subject / Object

# Upper Williams Creek Side Channel Phase 2b

## Daily Progress



Canada

## Overview:

Williams Creek flows from a 17, 000 ha watershed into the northwest end of Lakelse Lake approximately 20 km. south of Terrace B.C.. Williams Creek has historically supported the largest number of sockeye spawners in the lakelse watershed and has been identified as a priority for restoration work in the B.C. North Coast area. Several restoration projects are currently underway in an effort to increase the capacity for sockeye spawning in the watershed. In 2009 a side channel project was undertaken by the DFO North Coast Resource Restoration Unit (NCRRU) with funding from the Pacific Salmon Commission (PSC) to provide additional side channel rearing and spawning habitat for Williams Creek sockeye and coho. The project is located adjacent to Williams Creek near the bridge on Old Lakelse Lake Road. This project is being constructed in three phases:

- Phase 1: Feasibility studies including; a site survey to determine the suitability of the topography, excavation of test pits, and construction of a groundwater test ditch.
- Phase 2: Excavation of a 680m spawning/rearing channel along the route of historic side channels adjacent to Upper Williams creek and the installation of a downstream lock block weir to facilitate future monitoring and exclusion requirements.
- Phase 3: Installation of a streamside intake and infiltration gallery immediately downstream of the bridge crossing Williams Creek on Old Lakelse Lake road and installation of a supply pipe approximately 80m long from the intakes to the constructed channel.

The Phase 1 site survey, test pits, and test ditch were completed in 2009 and subsequent monitoring determined the feasibility of the continuation of the project. Phase 2 began in June of 2011 with the excavation of the first 470m of channel starting from the downstream end and working upstream to within 210m of the parking area adjacent to the Williams Creek Bridge. This report summarizes the completion of Phase 2, the excavation of the final 210m of channel and the construction of the downstream lock block weir.

## Construction Summary:

All necessary permits were obtained prior to construction including; a free use permit for tree falling, a highways access permit, a provincial notification of works, DFO notification and a Map Reserve. A water licence has also been applied for in preparation for the construction of the channel intake.

Prior to construction, several trees need to be removed from the path of the excavation route. A statement of work was prepared and three tree falling businesses were contacted for bids. Nordic Tree services was the successful bidder. On June 7, 30 trees were felled and bucked to 5m lengths and left on site to be used as complexing for the channel.

Billabong Road and Bridge Maintenance was contracted to undertake the 2012 channel excavation and lock block weir construction. They were provided with a statement of work and from June 21$^{st}$ to 29$^{th}$, 2012 the final 210 m of the channel was excavated to 2-3m wide rising at a slope of 1%. Complexing of the channel included the placement of 109 logs, 22 stumps and 245 boulders. Material from the excavation of the channel was side cast and blended to the natural topography to the limit of the reach of the excavator. A lock block weir with a 4.5m wide sill was constructed at the downstream end of the channel. Measurements were taken for the manufacture of a metal angle facing and upright channels to be installed on the lock block weir to facilitate screens or weirs for future monitoring and exclusion requirements.

All construction was supervised and monitored by Sandra Devcic, NCRRU Engineer and James Powell, NCRRU engineering technician. Billabong Road and Bridge Maintenance provided a John Deere 200LC excavator with environmentally safe hydraulic oil, operated by Jack Lee and supervised by Dave Bell. Additional personnel provided by Billabong included flag persons for moving equipment on and off site and a general labourer for assistance with lock block placement. Billabong also provided a 3"Honda trash pump and various hand tools.

Daily Progress Summary:

June 21, 2012

- Safety meeting held
- Path cleared along channel route
- 50m of channel excavated
- Elevations taken @ 10m intervals
- 28 logs, 7 stumps and 10 boulders placed in channel

*Photo 1: Clearing the channel route*

*Photo 2: Newly excavated channel*

June 22, 2012:

- Excavation of 35m of channel
- Placement of 22 logs, 9 stumps and 25 boulders
- Removal of logs that had fallen across adjacent natural channel when trees were felled to clear path for channel excavation
- Hand clean up of debris in natural side channel
- Monitoring of water level in natural side channel
- Channel bottom elevations @ 10m intervals

-

*Photo 3: Adjacent natural channel*

*Photo 4: Removing logs from natural channel*

June 25, 2012:

- Excavation of 40m of channel
- Placement of 24 logs, 2 stumps and 100+ boulders
- Continued monitoring of water levels in adjacent natural channel
- Channel bottom elevations @10m intervals

*Photo 5: Continued channel excavation*

June 26, 2012

- Excavation of 50m of channel
- Placement of 23 logs, 4 stumps and 60+.5m boulders
- Continued monitoring of water levels in adjacent natural channel
- Channel bottom elevations @10m intervals

*Photo 6: Continued channel excavation*

*Photo 7: Typical excavated channel*

June 27, 2012:

- Excavation of final 25m of channel
- Placement of 12logs and 50 boulders
- Continued monitoring of water levels in adjacent natural channel
- Relocation of excavator to downstream weir location
- Levelling and widening of downstream plug for supporting excavator
- Begin excavation for placement of lock block weir
- Seeding of excavated material along 50m of channel at upstream end

*Photo 8: Typical excavated channel*

*Photo9: Excavation for placement of lock block weir*

June 28, 2012:

- Completion of lock block weir excavation to 0.75m below elevation of downstream channel bottom
- Continuous pumping of lock block weir excavation to maintain isolation between the excavation and the downstream natural channel
- Placement of lock blocks to form downstream weir

*Photo 10: Lock block weir excavation continued*

*Photo 11: Completed lock block weir*

June 29, 2012:

- Backfill lock block weir to blend with natural topography
- Adjust natural channel to blend with weir sill elevation
- Elevations to tie in weir sill elevation with 2011 channel as built survey pin

*Photo 12: Looking downstream from 2011channel towards lock block weir*

Aug 2, 2012:

- Seine and isolate lock block weir area
- Install sill and channel on lock block weir

*Photo 13: Installing lock block weir sill*

# WILLIAMS CREEK SIDE CHANNEL EXCAVATION

## PHASE 2 - 2012 - DAILY ELEVATIONS

| DATE | SHOT | ROD | HI | CH. BOT. ELEV | HUB ELEV |
|---|---|---|---|---|---|
| 21-Jun | ALL NORTH AS BUILT PIN | 2.273 | 118.293 | | **116.020** |
| | POOL AT END OF 2011 CHANNEL | 3.905 | | 114.388 | |
| | 0+4m | 3.707 | | 114.586 | |
| | 0+8m | 3.552 | | 114.741 | |
| | 0+16m | 3.615 | | 114.678 | |
| | 0+20m | 3.659 | | 114.634 | |
| | FS TO HUB 1 | 1.611 | | | **116.682** |
| | BS TO HUB 1 | 1.235 | 117.917 | | |
| | 0+30m | 3.215 | | 114.702 | |
| | 0+40m | 3.275 | | 114.642 | |
| | 0+50m | 3.240 | | 114.677 | |
| 22-Jun | BS TO HUB 1 | 1.875 | 118.557 | | |
| | 0+60m | 3.749 | | 114.808 | |
| | 0+65m | 3.695 | | 114.862 | |
| | 0+75m | 3.585 | | 114.972 | |
| | 0+80m | 3.589 | | 114.968 | |
| 25-Jun | BS TO HUB 1 | 2.645 | 119.327 | | |
| | FS TO HUB 2 | 0.700 | | | **118.627** |
| | 0+90m | 3.840 | | 115.487 | |
| | 0+100m | 3.722 | | 115.605 | |
| | 0+110m | 3.613 | | 115.714 | |
| | BS TO HUB 2 | 0.754 | 119.381 | | |
| | 0+120m | 3.586 | | 115.795 | |
| | 0+130m | 3.453 | | 115.928 | |
| | 0+140m | 3.456 | | 115.925 | |
| | FS TO HUB 3 | 0.005 | | | **119.386** |
| | BS TO HUB 3 | 0.547 | 119.933 | | |
| | 0+150m | 3.926 | | 116.007 | |
| | 0+160m | 3.868 | | 116.065 | |
| | 0+170m | 3.887 | | 116.046 | |
| 26-Jun | BS TO HUB 3 | 0.495 | 119.881 | | |
| | 0+180m | 3.732 | | 116.149 | |
| | 0+190m | 3.542 | | 116.339 | |
| | 0+200m | 3.452 | | 116.429 | |
| | 0+210m | 3.464 | | 116.417 | |
| | FS to HUB 4 | 0.253 | | | **119.628** |
| | BS to HUB 4 | 3.044 | 122.672 | | |
| | W/L Williams - North End of Parking Lot | 3.138 | | 119.534 | |
| | Edge of Water - Clump of Trees | 2.792 | | 119.880 | |
| | High Water Mark - Clump of Trees | 1.960 | | 120.712 | |
| | Bottom Of Creek - Clump of Trees | 3.709 | | 118.963 | |
| | FS TP middle of parking lot | 0.335 | | | **122.337** |
| | BS TP middle of parking lot | 2.228 | 124.565 | | |
| | AN Hub ACL 280 at parking lot entrance | 0.787 | | 123.778 | **123.778** |

# WILLIAMS CREEK SIDE CHANNEL EXCAVATION

## PHASE 2 - 2012 - ELEVATIONS AND SLOPES

| STN | ELEV | RISE | SLOPE | SECTION | SECTION |
|---|---|---|---|---|---|
| 0 | 114.388 | | | RISE | SLOPE |
| 4 | 114.586 | 0.198 | 4.950 | 0.198 | 4.950 |
| 8 | 114.741 | 0.353 | 4.412 | 0.155 | 3.875 |
| 16 | 114.678 | 0.290 | 1.813 | -0.063 | -0.787 |
| 20 | 114.634 | 0.246 | 1.230 | -0.044 | -1.100 |
| 30 | 114.702 | 0.314 | 1.047 | 0.068 | 0.680 |
| 40 | 114.642 | 0.254 | 0.635 | -0.060 | -0.600 |
| 50 | 114.677 | 0.289 | 0.578 | 0.035 | 0.350 |
| 60 | 114.808 | 0.420 | 0.700 | 0.131 | 0.873 |
| 65 | 114.862 | 0.474 | 0.729 | 0.054 | 0.540 |
| 75 | 114.972 | 0.584 | 0.779 | 0.110 | 2.200 |
| 80 | 114.968 | 0.580 | 0.725 | -0.004 | -0.040 |
| 90 | 115.487 | 1.099 | 1.221 | 0.519 | 5.190 |
| 100 | 115.605 | 1.217 | 1.217 | 0.118 | 1.180 |
| 110 | 115.714 | 1.326 | 1.205 | 0.109 | 1.090 |
| 120 | 115.795 | 1.407 | 1.173 | 0.081 | 0.810 |
| 130 | 115.928 | 1.540 | 1.185 | 0.133 | 1.330 |
| 140 | 115.925 | 1.537 | 1.098 | -0.003 | -0.030 |
| 150 | 116.007 | 1.619 | 1.079 | 0.082 | 0.820 |
| 160 | 116.065 | 1.677 | 1.048 | 0.058 | 0.580 |
| 170 | 116.046 | 1.658 | 0.975 | -0.019 | -0.190 |
| 180 | 116.149 | 1.761 | 0.978 | 0.103 | 1.030 |
| 190 | 116.339 | 1.951 | 1.027 | 0.190 | 1.900 |
| 200 | 116.429 | 2.041 | 1.021 | 0.090 | 0.900 |
| 210 | 116.417 | 2.029 | 0.966 | -0.012 | 0.006 |

# WILLIAMS CREEK SIDE CHANNEL EXCAVATION

## PHASE 2 - 2012 - WEIR ELEVATIONS

| DATE | SHOT | ROD | HI | ELEV |
|---|---|---|---|---|
| 29-Jun | ACL 810 @ 0+80m | 0.582 | 112.622 | 112.040 |
| | NORTH END LOCK BLOCK WEIR | 2.774 | | 109.848 |
| | SOUTH END LOCK BLOCK WEIR | 2.778 | | 109.844 |

# WILLIAMS CREEK SIDE CHANNEL EXCAVATION

# PHASE 2 - 2012 - ELEVATIONS SUMMARY

| LOCATION | ELEV m | RISE m | DIST m | SLOPE % |
|---|---|---|---|---|
| LOCK BLOCK WEIR | 109.846 | | | |
| END OF 2011 CHANNEL 0+470m | 114.388 | 4.542 | 470 | 0.97 |
| END OF 2012 CHANNEL 0+680m | 116.417 | 6.571 | 680 | 0.97 |

**ELEVATIONS FOR INTAKE INSTALL**

| | |
|---|---|
| BOTTOM OF CREEK BELOW BRIDGE | 118.96 |
| ESTIMATED ELEVATION OF INTAKE | 117.46 |
| END OF CONSTRUCTED CHANNEL | 116.42 |
| DIFFERENCE IN ELEVATION | 1.05 |
| PIPE LENGTH | 50 |
| SLOPE OF PIPE | 2.09 |

er Williams Creek Side Channel Complexing

| Date | Length Excavated | logs | stumps | boulders |
|---|---|---|---|---|
| 21-Jun | 35 | 28 | 7 | 10 |
| 22-Jun | 35 | 22 | 9 | 25 |
| 25-Jun | 40 | 24 | 2 | 100 |
| 26-Jun | 50 | 23 | 4 | 60 |
| 27-Jun | 25 | 12 | | 50 |
| Total | 185 | 109 | 22 | 245 |

# APPENDIX 7

# FINANCIAL REPORT

# 2012 Project Budget Form

**H-1**

NF-2011-H-1

**Name of Project:** **Lakelse Sockeye Recovery Program:**

Williams Creek Upper Spawning Channel

| ELIGIBLE COSTS | | | | | TOTAL PROJECT BUDGET | | OTHER FUNDING | PSC N. FUND GRANT AMOUNT | ACTUAL AMOUNT SPENT | VARIANCE | EXPLANATION |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Labour** | | | | | | | | | | | |
| **Wages & Salaries** | | | | | | | | | | | |
| Position | # of crew | # of work days | hrs per day | rate per hour | **Total (In-kind & cash + PSC Amount )** | | **In-Kind & Cash** | **PSC Amount** | | | |
| Restoration Biologist | 1 | 16 | 8 | 40 | 5,120 | | 5,120 | | | | |
| DFO Engineering Technician | 1 | 10 | 8 | 40 | 3,200 | | 3,200 | | | | |
| DFO Engineering | 1 | 8 | 8 | 60 | 3,840 | | 3,840 | | | | |
| Financial administration (DFO in-kind) | 3 | 5 | 8 | 25 | 3,000 | | 3,000 | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Person Days (# of crew x work days) | | | | **sub total** | 15,160 | | 15,160 | - | - | | |
| **Labour - Employer Costs ( percent of wages subtotal amount )** | | | | | | | | | | | |
| | rate | 0% | | **sub total** | | | | | | | |
| **Subcontractors & Consultants** | # of crew | # of work days | hrs per day | rate per hour | | | | | | | |
| Heavy equipment, design and fabrication of intake, site supervision | | | | | 28,500 | | | 28,500 | 28,536.14 | 100.13% | |
| Environmental monitoring, coordination | | | | | 5,000 | | 2,000 | 3,000 | 3,062.98 | 102.10% | |
| Survey and drafting | | | | | 7,000 | | 2,000 | 5,000 | 6,407.70 | 128.15% | See Note 1 |
| | | | | | | | | | | | |
| Insurance if applicable | rate | 0% | | | | | | | | | |
| | | | | **sub total** | 40,500 | | 4,000 | 36,500 | 38,007 | | |
| **Volunteer Labour** | # of crew | # of work days | hrs per day | | | | | | | | |
| Skilled | 2 | 6 | 8 | 25 | 2,400 | | 2,400 | | | | |
| Un-skilled | 2 | 6 | 8 | 15 | 1,440 | | 1,440 | | | | |
| Insurance if applicable | rate | 0% | | | | | | | | | |
| | | | | **sub total** | 3,840 | | 3,840 | | | | |
| | | | | **Total Labour Costs** | 59,500 | | 23,000 | 36,500 | 38,007 | | |

**Provide details in the space below**

| **Site / Project Costs** | **(use an additional page if needed )** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Travel (do not include to & from work) | Travel for field work | 3,000 | 1,500 | 1,500 | - | 0.00% | |
| Small Tools & Equipment | | | | | | | | |
| Site Supplies & Materials | Temp loggers, perforated pipes | 1,500 | | 1,500 | 1,500.49 | 100.03% | |
| Equipment Rental | Pumps, water monitoring equipment | 2,000 | 2,000 | | | | |
| Work & Safety Gear | | | | | | | |
| Repairs & Maintenace | | | | | | | |
| Permits | | | | | | | |
| Technical Monitoring | | 1,000 | 1,000 | | | | |
| Other site costs | | | | | | | |
| | **Total Site / Project Costs** | 7,500 | 4,500 | 3,000 | 1,500.49 | | |

| **ELIGIBLE COSTS** | | | | **BUDGET** | **OTHER FUNDING** | **CONTRIBUTION FUNDING** | **ACTUAL AMOUNT SPENT** | **VARIANCE** | **EXPLANATION** |
|---|---|---|---|---|---|---|---|---|---|
| **Training (e.g Swiftwater, bear aware, electrofishing, etc).** | | | | **Total (PSC + In-kind + cash)** | **In-Kind & Cash** | **PSC Amount** | | | |
| Name of course | # of crew | # of days | | | | | | | |
| Bear aware | 3 | 1 | ~200 each | 600 | 600 | | | | |
| Shotgun certification | 2 | 2 | ~500 each | 1,000 | 1,000 | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | **Total Training Costs** | 1,600 | 1,600 | | | | |

| **Overhead / Indirect Costs** | (If the PSC contribution to Indirect costs exceeds 20% of the total PSC grant you will be required to submit back-up documentation justifying the expense). | | | | | | |
|---|---|---|---|---|---|---|---|
| Office space; including utilities, etc. | Project administration and overhead | 4,000 | 1,500 | 2,500 | 2,535.86 | 101.43% | |
| Insurance | | | | | | | |
| Office supplies | | | | | | | |
| Telephone & long Distance | | | | | | | |
| Photocopies & printing | | | | | | | |
| Other overhead costs | | | | | | | |
| | **Total Overhead Costs** | 4,000 | 1,500 | 2,500 | 2,536 | | |

**Capital Costs / Assets** **Provide details in the space below (use an additional page if needed )**

**H-1**

Assets are things of value that have an initial cost of $250 or more and which can be readily misappropriated for personal use or gain or which are not, or will not be, fully consumed during the term of the project.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| n/a | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | **Total Capital Costs** | | | | | | |
| | | **Project Total Costs** | 72,600 | 30,600 | 42,000 | 42,043 | 100.10% | - |

## Budget Summary

**(PSC + in-kind + cash)**

| | |
|---|---|
| **Total Labour Costs** | 59,500 |
| **Total Site / Project Costs** | 7,500 |
| **Total Training Costs** | |
| **Total Overhead Costs** | 4,000 |
| **Total Capital Costs** | |
| **Project Total** | 72,600 |

Note: The survey and drafting of the as-built product was slightly more expensive than anticipated. Predicted costs associated with project travel were provided in-kind, and the budget was readjusted to accommodate the extra expense.