Page 001 of 480

Withheld pursuant to/removed as

s.18

Page 002 of 480

Withheld pursuant to/removed as

s.18

Page 003 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 004 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 005 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 006 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 007 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 008 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 009 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 010 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 011 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 012 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 013 of 480

Withheld pursuant to/removed as

s.16 ; s.18

Page 014 of 480

Withheld pursuant to/removed as

s.16 ; s.18

BRITISH COLUMBIA

February 25, 2014 File: A3-7399

Lot 46 Management Society
1428 Silver Sands Road
P.O. Box 248
Sicamous, BC
V0E 2V0

Via email Only

Re: **Changes in and About a Stream Application**
Lagoon Dredging

Dear Sir/Madame;

This office has been reviewing your application to dredge the entrance to the lagoon at your site in Sicamous. During this review, we discovered that the Lot 46 Management Society is the holder of Conditional Water Licence C129749 for the purposes of Land Improvement. C129749 authorizes the operation and maintenance of a diversion structure on the Eagle River, a pipe conveying water from the Eagle River to the northern end of the lagoon and a channel that discharges into Shuswap Lake.

Based upon the information provided in the water licence, it is this office's opinion that the "channel" indicated in licence C129749 refers to the lagoon from the point where the water enters at the north end to where it exits into Shuswap Lake. Therefore, the Society may remove (dredge) the accumulated sediment from the channel at the location indicated in your application as maintenance of their licenced works and a Section 9 Authorization under the *Water Act* is not required.

Based upon the above, we are recommending that you do the following:

1. Submit a request to abandon your Changes in and About a Stream application to this office so that we man close the application file.
2. Request a refund of your application fee from the Financial Services Branch of this Ministry. The request can be made through email at Water.Revenue@gov.bc.ca quoting file A3-7399 on any correspondence.
3. Contact Dale Richter, the Water Officer responsible for your area, to notify him of the proposed works and receive any instructions on best management practices that must be

Ministry of Forests, Lands and Natural Resource Operations
Regional Water Management
Resource Authorizations
Thompson Okanagan Region
Mailing/Location Address:
1259 Dalhousie Drive
Kamloops British Columbia V2C 5Z5
Telephone: (250) 371-6200
Facsimile: (250) 828-4000
http://www.gov.bc.ca/

followed during the completion of the works. Mr. Richter is located in our Vernon office and can be contacted at (250) 588-1765 or Dale.Richter@gov.bc.ca.

4. Contact your local government (local or municipal) to determine if there are any additional requirements.
5. As this is the 4th application to dredge the lagoon entrance in the past eight years, the Society should carry out an investigation of the cause of the siltation and any methods that could be used to reduce the frequency of dredging or, and this is the preferred solution, eliminate the need for any future clearing of the lagoon entrance.

When you proceed with the proposed works, you should be aware that there is always a possibility for archaeological sites to exist that have not been identified or documented. All archaeological sites, whether known or undocumented, are protected under the heritage Conservation Act. If, during construction, you encounter any archaeological material, you must halt all activities and contact the Archaeological Branch at (250) 953-3334 for direction.

If you have any questions or concerns regarding this correspondence, please contact the Regional Water Management Office.

Yours truly,

Jeptha Ball, P. Eng.
Assistant Regional Water Manager
Water Stewardship Division
Ministry of Forest Lands Natural Resources

cc: Ecosystems Section, Kamloops, Attn: Mark Phillpotts (via email)
Water Authorizations Section, Kamloops, Attn: Dale Richter (via email)
FrontCounter BC, Kamloops, (via email)
Department of Fisheries and Oceans, Attn: Barry Zunti, (via email)

KERR WOOD LEIDAL
consulting engineers

Okanagan
202 - 3334 30th Avenue
Vernon, BC V1T 2C8
T 250 503 0841
F 250 503 0847

Water Management Plan

Prepared for:

Lot 46 Management Society

May 11, 2017
KWL Project No. 3691.001

Contents

1. Introduction 1-1
1.1 Project Background and Rationale 1-1
1.2 Authorizations, Permits, and Approvals 1-1
1.3 First Nations 1-2

2. Site Location and Context 2-1
2.1 Land Ownership and Land Use 2-1
2.2 Aquatic Habitat and Species 2-1

3. Dredging Operation 3-1
3.1 Sequence and Description of Works 3-1
3.2 Dredging Considerations 3-2
3.3 Dewatering and Water Management 3-2
3.4 Dredging Frequency/Schedule 3-2

4. Environmental Impacts and Mitigation 4-1
4.1 Potential Environmental Impacts 4-1
4.2 Environmental Protection and Mitigation Measures 4-1

5. Reporting 5-1
5.1 Completion Report 5-1
5.2 Environmental Monitoring Report 5-1
5.3 Fish Salvage Data 5-1
5.4 Conservation Data Centre Report 5-1
5.5 Archaeological Findings 5-2

6. Monitoring and Maintenance 6-1

7. Closure 7-1
Report Submission 7-1

References 7-1

Figures

Figure 1: Location Plan 1-3

Tables

Table 1: Fish Species Summary Table 2-2

Appendices

Appendix A: Site Photographs

1. Introduction

1.1 Project Background and Rationale

The Lot 46 Management Society (the Society) is composed of 17 homeowners who own properties on Silver Sands Road in Sicamous, BC. The properties are located along the east side of an artificial lagoon connected to Shuswap Lake, just north of the RW Bruhn Bridge (Highway 1 crossing; see Figure 1). The Society manages the lagoon and members have private docks for boat access to the lake. Sediment accumulates in the lagoon and the Society needs to dredge the lagoon to facilitate navigation of boats from private docks to the lake. This Water Management Plan provides operational guidance for the periodic dredging of the Lot 46 Lagoon, including measures to mitigate the potential impacts to water quality, aquatic habitat, fish, and other wildlife.

1.2 Authorizations, Permits, and Approvals

Existing Water Licence

The Society holds water licence C129749 which authorizes a maximum of 0.28 cubic metres per second (10 cubic feet per second) to be diverted through a diversion structure (point of diversion number PD52869) and pipe from the Eagle River into the constructed lagoon. See Figure 1 for a plan view of the licensed works.

A letter from the BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licensed works under their water licence. As a condition, the MFLNRO Regional Water Management Branch requires the Society develop a Water Management Plan (this plan) to guide the dredging operations.

Other Permits and Approvals

A fish salvage within the lagoon is required prior to dewatering and dredging. In order to conduct a fish salvage, the Society must obtain a Licence to Fish for Scientific Purposes from Fisheries and Oceans Canada (DFO) and a Scientific Fish Collection Permit from MFLNRO.

In order for dredging to proceed without requiring a review by DFO, the following conditions must be met:

- No temporary or permanent increase in the existing area of the lagoon below the high water mark;
- Dredged material is deposited and stabilized on land;
- Dredging has occurred in the last 10 years; and
- No dredging where SARA-listed shellfish occur except where exempted in the recovery strategy for that species.

1.3 First Nations

The following First Nations have traditional territory and/or interests in or nearby the project area (MOE 2016c):

- Neskonlith Indian Band;
- Secwepemc First Nation (falls within Secwepemc Reconciliation Framework Agreement Boundary);
- Okanagan Indian Band;
- Adams Lake Indian Band;
- Little Shuswap Indian Band; and
- Splats'in First Nation.

The dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis. As such, there is no expectation to consult with First Nations. However, in the interests of continued good relationships, the Society envisions contact with local First Nations contacts prior to any operation to learn if there are any potential conflicts with the operation.

Lot 46 Management Society Lagoon Water Management Support

Legend

Extent of Dredging (Lagoon)

Parcel Ownership (from the District of Sicamous Cadastral)

Municipal Park

Private

Reference: Orthophoto from Bing aerial image map.

KERR WOOD LEIDAL
consulting engineers

© 2017 Kerr Wood Leidal Associates Ltd.

Copyright Notice: These materials are copyright of Kerr Wood Leidal Associates Ltd. (KWL). Lot 46 Management Society is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to the Lot 46 Management Society Lot 46 Lagoon Water Management Support. Any other use of these materials without the written permission of KWL is prohibited.

50 0 50 (m)

1:2,000

Project No.	Date
3691-001	January 2017

Location Plan

Figure 1

Path: R:\3600-36991\3691-001\430-GIS\MXD-WA\3691001_Map.mxd Date Saved: 1/16/2017 3:21:32 PM
Author: JLau

2. Site Location and Context

The following section outlines the context and characteristics of the project site.

2.1 Land Ownership and Land Use

Land use around the lagoon is a mix of single family residential and recreational. Lot A District Lot 452 Kamloops Division Yale District Plan KAP52709, the lot being excavated, is private property owned by the Society.

Adjacent land owners will be notified with sufficient time to prepare for dredging operations. It is anticipated that three (3) months would be sufficient, but there may be particular circumstances that dictate otherwise. These special circumstances will be reviewed on a case-by-case basis.

2.2 Aquatic Habitat and Species

Aquatic Habitat

The constructed lagoon is primarily used for private moorage and is approximately 320 m long and 60 m wide with a surface area of approximately 18,700 m^2. It is approximately 3 m deep at its deepest point, with an average depth of roughly 1.5 m during low water.

The lagoon is currently fed by water from Eagle River via a diversion structure and pipe. The point of diversion from the river is located 2.9 km upstream from its confluence with Shuswap Lake. At the point of diversion, the bank full channel width of the Eagle River is approximately 60 m. Due to the relatively small rate of diversion, water in the lagoon is slow-flowing to stagnant. Substrates are mainly sands and silts which contribute to the ongoing accumulation of sediment in the lagoon. The shoreline is mainly sand. There is a small amount of vegetated shore along the south end of the lagoon, where grasses and some small shrubs grow to near the high water mark. In October 2016, there were no obvious aquatic plants growing in the lagoon.

Water from the lagoon exits into Shuswap Lake through a shallow outlet (approximately 12 m wide) immediately downstream of Sicamous Narrows. Sicamous Narrows is the short canal-like channel that connects Mara Lake with Shuswap Lake.

Fish and Other Wildlife

Table 1 provides the result of a desktop study to indicate the fish species present in the waterbodies that are connected with and nearby to the lagoon: Shuswap Lake, Mara Lake (including Sicamous Narrows), the Shuswap River (upstream of Mara Lake), and the Eagle River. These species may or may not be present in the lagoon.

Table 1: Fish Species Present in Shuswap Lake, Mara Lake, Shuswap Narrows, Shuswap River, & Eagle River

Common Name	Code	Latin Name	Species at Risk Status		
			BC List	COSEWIC	SARA
Bridgelip Sucker	BSU	*Catostomus columbianus*	Yellow	-	-
Bull Trout	BT	*Salvelinus confluentus*	Blue	SC (2012)	-
Burbot	BB	*Lota lota*	Yellow	-	-
Carp	CP	*Cyprinus carpio*	Exotic	-	-
Chinook Salmon	CH	*Oncorhynchus tshawytscha*	Yellow	-	-
Chiselmouth[1]	CMC	*Acrocheilus aclutaceus*	Blue	NAR (2003)	-
Coho Salmon (Interior Fraser population)	CO	*Oncorhynchus kisutch*	Yellow	T (2016)	-
Dolly Varden	DV	*Salvelinus malma*	Yellow	-	-
Emerald Shiner	ESC	*Notropis atherinoides*	Unknown	-	-
Kokanee	KO	*Oncorhynchus nerka*	Yellow	-	-
Lake Chub	LKC	*Couesius plumbeus*	Yellow	DD	-
Lake Trout	LT	*Salvelinus namaycush*	Yellow	-	-
Largescale Sucker	CSU	*Catostomus macrocheilus*	Yellow	-	-
Leopard Dace	LDC	*Rhinichthys falcatus*	Yellow	NAR (1990)	-
Longnose Dace	LNC	*Rhinichthys cataractae*	Yellow	-	-
Longnose Sucker	LSU	*Catostomus catostomus*	Yellow	-	-
Mountain Whitefish	MW	*Prosopium williamsoni*	Yellow	-	-
Northern Pikeminnow	NSC	*Ptycheilus oregonensis*	Yellow	-	-
Peamouth Chub	PCC	*Mylocheilus caurinus*	Yellow	-	-
Pink Salmon	PK	*Oncorhynchus gorbuscha*	Yellow	-	-
Prickly Sculpin	CAS	*Cottus asper*	Yellow	-	-
Pygmy Whitefish (Pacific populations)	PW	*Prosopium coulteri*	Yellow	NAR (2016)	-
Rainbow Trout	RB	*Oncorhynchus mykiss*	Yellow	-	-
Redside Shiner	RSC	*Richardsonius balteatus*	Yellow	-	-
Slimy Sculpin	CCG	*Cottus cognatus*	Yellow	-	-
Sockeye Salmon	SK	*Oncorhynchus nerka*	Yellow	-	-
Steelhead	ST	*Oncorhynchus mykiss*	Yellow	-	-
Westslope Cutthroat Trout (Pacific populations)	WCT	*Oncorhynchus clarki lewisi*	Blue	SC (2016)	1-SC (2010)
White Sturgeon (Upper Fraser River Population)	WSG	*Acipenser transmontanus*	Yellow	E (2012)	-
White Sucker	WSU	*Catostomus commersoni*	Yellow	-	-

Sources: MOE 2016a, MOE 2016b
[1]One Chiselmouth sampled in 1964 at northern outlet of Mara Lake at the beginning of Shuswap Narrows (CDC 2016)

It is unlikely that salmon, trout, or char use the lagoon to spawn due to the accumulation of fine sediments and frequent boat traffic in the lagoon. Based on *Shuswap Lake System and Adams Lake - Lake Char and Sockeye Spawning Atlas Overview Map* (DFO 2005), there is no spawning of Sockeye or Char (i.e., Bull Trout and Dolly Varden) in the lagoon or on the adjacent shoreline of Shuswap Lake.

Five fish species present or with potential to be present in Shuswap Lake and other nearby waterbodies are federally- or provincially-listed species at risk:

- Bull Trout (Salvelinus confluentus) are a blue-listed species in BC. Blue-listed species are Species of Special Concern (formerly Vulnerable) in BC and have characteristics which make them especially sensitive or vulnerable to natural or anthropogenic events (MOE 2016a). Bull Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on habitat characteristics and the extent of known spawning areas (DFO 2005).
- Chiselmouth (*Acrocheilus aclutaceus*) are also blue-listed Species of Special Concern in BC. One Chiselmouth was sampled in 1964 at the mouth of Mara Lake as it entered Shuswap Narrows (CDC 2016). Chiselmouth are absent form sites with maximum temperatures below 20 °C (Rosenfeld et al. 2001). Adults need deep, fast flowing water with substrate that supports periphyton (i.e., boulder and cobble; Rosenfeld et al. 1998). Juveniles need slow-moving backwater habitat and are usually found where there are aquatic plants, which provide habitat for food (invertebrates) and cover from predators (COSEWIC 2003, Rosenfeld 2003). Based on these requirements, it is highly unlikely that adult Chiselmouth use the lagoon, and possible that juveniles are present.
- Interior Fraser populations of Coho Salmon (*Oncorhynchus kisutch*) were re-assessed as Threatened (downgraded from Endangered) by the Committee of the Status of Endangered Wildlife in Canada (COSEWIC) in 2016 but have not been added to Schedule 1 of the *Species at Risk Act*. Coho fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- Pacific populations of Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*) were reconfirmed as a Species of Special Concern by COSEWIC in 2016 and are a Schedule 1 Species of Special Concern of the *Species at Risk Act* (SARA). Under SARA, species of special concern are defined being particularly sensitive to human activities or natural events but are not endangered or threatened. This species is also blue-listed in BC. Westslope Cutthroat Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- The Upper Fraser River population of White Sturgeon (*Acipenser transmontanus*) was assessed as Endangered by COSEWIC in 2012. It has been recorded in Kamloops Lake, and may occasionally enter the Thompson River system. However, it is very unlikely that White Sturgeon would be present in the lagoon based on its small size and habitat characteristics (COSEWIC 2012).

Western Painted Turtle (*Chrysemys picta bellii*) has been observed on the Eagle River just north of the project site (CDC 2016). These populations are part of the Intermountain - Rocky Mountain population that was reconfirmed as a Species of Special Concern by COSEWIC in 2016 and is a Schedule 1 Species of Special Concern under SARA. It is also blue-listed in BC. Because Western Painted Turtles can move up to several hundred metres by land (Gregory and Campbell 1987, COSEWIC 2006), they have the potential to feed, mate, and nest in the lagoon. The turtles begin mating in spring soon after the end of hibernation and begin nesting in June (Schwarzkopf and Brooks 1987, Ernst et al. 1994, COSEWIC 2006). Successful mating peaks in late summer and early fall (Gist et al. 1990). Females dig 10 cm deep nests on open south-facing slopes (Schwarzkopf and Brooks 1987, Weisrock and Janzen 1999). Eggs incubate for 72–104 days in the Pacific Northwest (Nussbaum et al. 1983). After

hatching in later summer and early fall, turtle hatchlings stay in the nest until the next spring (Gregory and Campbell 1987, St. John 2002). Adults hibernate over the winter in the muddy bottoms of streams and ponds, old mammal burrows, or other shelter (Cohen 1992).

The only shellfish listed under the *Species at Risk Act* that is present in the Okanagan drainage is the Rocky Mountain Ridged Mussel (*Gonidea angulata*), listed as a Species of Special Concern. In recent searches, *Gonidea angulata* was found as far north as Okanagan Lake near Vernon (COSEWIC 2010). Portions of the Shuswap watershed have not been surveyed for *Gonidia angulata* as of 2011 (DFO 2010b).

It is possible that amphibians use the lagoon for breeding or refuge. However, due to frequent boat traffic, it is not ideal habitat.

Migratory birds may use the grass and shrub area at the south end of the lagoon for foraging and breeding. Waterfowl use the lagoon for refuge and possibly for foraging.

3. Dredging Operation

3.1 Sequence and Description of Works

Dredging operation will proceed in the following sequence:

1. Installation of Erosion and Sediment Control Measures

Erosion and sediment control measures should be installed prior to starting dredging works. Additional supplies for erosion and sediment control should be stockpiled on site in case they are required.

2. Isolation of Lagoon

Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand-bag coffer dams, or sheet pile coffer dams. The preference is for methods that minimize the disturbance to sediment and aquatic life (i.e., aqua-dams). The diversion structure will be isolated using the knife-valve at its inlet (Appendix B, Photo 4).

3. Fish Salvage

After isolation, an initial fish salvage will be conducted by a Qualified Environmental Professional (QEP) who may also be the environmental monitor (EM). Salvage methods should be appropriate for the depth of water in the lagoon. Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.

3. Dewatering

After the initial fish salvage, dewatering should proceed immediately. Fish salvaging should continue as the lagoon is dewatered. Adequate pumping capacity should be retained in order to complete dewatering as quickly as possible. Water will be discharged over the coffer dam into Shuswap Lake.

4. Excavation and Grading

After complete salvage and dewatering, the EM will complete a review of the area to determine if there are any outstanding environmental concerns which need to be addressed.

Once the EM has approved the site for further work, dredging may begin. Dredging should commence only after the lagoon is fully isolated from flowing water and can continue only if this isolation is maintained.

Dredging will be completed by conventional equipment and be subject to review by the EM.

5. Rewatering Lagoon and Removal of Isolation Measures

The lagoon should be refilled and isolation measures removed in a manner so as to minimize the suspension of sediment in the water column and movement into Shuswap Lake.

6. Resume Normal Operation of the Lagoon

Once the lagoon has been filled to the level of the Shuswap lake, normal operation will continue.

3.2 Dredging Considerations

Engineering Specifications

The lagoon will be restored to original design parameters of a trapezoidal geometry consisting of minimum 4H:1V side slopes and flat bottom.

Machinery

The contractor shall decide what machinery is most appropriate for the works. It is assumed that conventional excavators and machinery will be used after isolation and dewatering of the lagoon is complete. The machinery will be clean and in satisfactory condition to undertake the work in a sensitive environment. The EM will review and approve equipment prior to the commencement of construction.

Disposal of Dredged Material

Dredged material should be disposed of on land and at an off site location. Disposal must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites Regulation and Hazardous Waste Regulation, and with any appropriate local government bylaws regarding the removal and deposition of spoil and dredged material.

3.3 Dewatering and Water Management

Isolation Measures

The isolation measures will be constructed according to the EM and will be designed to safely hold back water from entering the lagoon when fully dewatered without failure. This may be accomplished with an aqua-dam, sandbag dam, coffer dam, or other suitable method.

The knife valve on at the diversion structure from the Eagle River will be closed to isolate the lagoon from the river prior to fish salvage.

The contractor will keep a silt curtain on site and use it if necessary when installing or removing the dam to prevent silt from entering Shuswap Lake.

Pumping Capacity

The contractor shall ensure that they have sufficient pumping capacity to dewater the lagoon as quickly as possible.

Discharge Location

During dewatering, discharge water should be managed and directed to an area where it will not cause erosion or carry sediment-laden water into Shuswap Lake. If discharge water becomes turbid (likely near the end of dewatering), a silt curtain should be placed between the discharge location and the rest of Shuswap Lake. The contractor should ensure that they have adequate length of pipe or hoses so that the intakes can be situated in the deepest part of the lagoon and the discharge hose can be situated in an appropriate area as outlined above.

3.4 Dredging Frequency/Schedule

Dredging should be carried out only when necessary to ensure residents can navigate safely. If dredging is required frequently (i.e., annually), the Lot 46 Management Society should investigate the source and mechanism of the sedimentation and take steps to reduce the rate of accumulation of sediment within the lagoon so that the frequency of dredging can be reduced.

4. Environmental Impacts and Mitigation

4.1 Potential Environmental Impacts

The dredging operations may have the following environmental impacts (DFO 2010a):

- Removal or change in aquatic plants, leading to change in food supply, nutrients concentrations, and habitat structure;
- Sediment being suspended in water, leading to change in sediment concentrations and contaminant concentrations;
- Modification of channel or shoreline shape leading to change in stability and hydraulics, influencing substrate, leading to a change in food supply and habitat structure; and
- Direct injury to fish, amphibians, reptiles, or other aquatic organisms from machinery or materials.

4.2 Environmental Protection and Mitigation Measures

To mitigate the potential impacts listed above, dredging works should follow provincial Standards and Best Practices for Instream Works (MFLNRO and DFO 2010a, MFLNRO and DFO 2010b). These and other guidelines to follow are listed below.

Project Planning

- Notify consultants with the intention to dredge at least three months before the expected start date, to allow enough time for a QEP to obtain fish salvage permits.

Timing

- Dredging is anticipated at low water levels, typically seen in late summer to fall.
- Works in the lagoon should be completed from July 22 to April 1, the reduced risk timing window for instream works in Shuswap Lake for areas with no sockeye of char spawning (MFLNRO 2015).
- The nesting window for migratory birds in Sicamous is April 1 to August 17 (Environment and Climate Change Canada 2016). Machinery should not drive through grass or shrub areas where migratory birds may be nesting during this period, and no clearing of vegetation should occur during this period. If disturbance of vegetation is required during this period, a QEP must conduct a breeding bird survey. Any areas where there are active or suspected nests must be flagged off and not disturbed during works.

Erosion and Sediment Control

- The contractor should use appropriate erosion and sediment control measures to intercept and manage runoff and reduce the likelihood for soils to erode and the potential for sediment to enter nearby waterbodies. Set up measures before beginning other work. Measures may include but are not limited to:
    - Using a silt curtain when installing or removing isolation measures to prevent silt from entering Shuswap Lake;
    - During dewatering, using a silt curtain between the discharge location and the rest of Shuswap lake to keep sediment from moving into the lake;

- Covering spoil/dredged material with plastic sheeting and set up silt fencing around piles, if material is being stored temporarily;
- Placing spoil/dredged material where it will not erode into a waterbody or storm sewer;
- Keeping additional erosion and sediment control supplies on site in case of an unexpected storm or other event;
- Regular inspection of measures and modification/repair when necessary; and
- Maintenance of effective erosion and sediment control measures on any disturbed upland banks until banks are revegetated.

Site Access

- Machinery should access the site using existing roads, trails, and boat ramp to avoid disturbance to vegetation (see Figure 1).
- Minimize disturbance to the riparian area along the shoreline and protect trees, shrubs and grasses whenever possible.

Weather

- The contractor should monitor weather forecasts and avoid work during periods of heavy rain.
- Avoid construction or removal of coffer dam when Shuswap Lake has large waves or when high wind is in the forecast.

Environmental Monitor

- Dredging activities should be monitored by a QEP for the duration of the project, and full-time during sensitive works. Sensitive works include the installation and removal of the isolation measures, fish salvage, dewatering, and initial excavation.

Protection of Fish and Other Aquatic Organisms

- A QEP should complete a fish and amphibian salvage according to provincial best practices prior to any works below the high water mark.
- Before starting work, the EM should survey the site for any reptiles or amphibians, especially Western Painted Turtles. If any are found, they should be moved to a safe location away from the work site according to provincial best management practices. They should also look for signs of Western Painted Turtle mating or nesting. If a nest or potential nest is discovered, it should be flagged off and should not be disturbed during dredging operations. Ideally, the EM should survey the site in late summer/early fall at least 1 week prior to works.
- Salvage methods should be appropriate for the depth of water in the lagoon.
- Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.
- All dewatering pump intakes must have fish screens with a maximum screen opening of 2.54 mm (0.10 inches) to prevent fish impingement.
- The contractor should make every effort to dewater the lagoon as quickly as possible. The contractor shall ensure that they have sufficient pumping capacity. This will minimize the time that fish may be isolated within the lagoon in water with no flow.

- The dewatering pump intakes should be situated in the deepest location of the lagoon before dewatering, so that the intake does not need to be moved multiple times. This will minimize the disturbance of sediment and fish that may still be in the lagoon during dewatering.
- The salvage crew should stay on site from the beginning of dewatering until the lagoon is completely dewatered. If fish, amphibians, or reptiles remain in the lagoon during or after dewatering, they should be captured using dip nets and moved to a safe location outside the work area as quickly as possible.
- After partial dewatering, the EM should survey the banks and soft substrate of the exposed lagoon for Rocky Mountain Ridged Mussells (*Gonidea angulata*). If found, work should cease immediately and the client should contact DFO for guidance on how to proceed.

Dredged Material

- Return water (water draining from saturated sediment that has been dredged and placed on land temporarily) should be treated with settling basins or other appropriate means so that the concentration of total suspended solids is minimized before returning to the lagoon or Shuswap Lake.
- Return water should not enter the Eagle River.
- Dredged material must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites and Hazardous Waste regulations, and with any appropriate local government bylaws regarding spoil.
- Dredged material should not be used to infill the shoreline or adjacent wetland areas.

Operation of Machinery

- Beside and within the lagoon, operate machinery in a manner that minimizes the disturbance to the banks and upland areas around the lagoon.
- Only use the existing boat access ramp to move machinery from the access path into the lagoon.

Contamination and Spill Management

- Prevent the discharge of silt, sediment, sediment-laden water, or any other deleterious substance into the lagoon, Eagle River, Shuswap Lake, or any ditch or storm sewer that flows into these waterbodies.
- Ensure machinery is clean (power washed), in good working condition, and free of leaks, excess oil, grease, and seeds or tissue of noxious weeds.
- Do not refuel or service equipment within 30 m of a water body, including the lagoon.
- Keep a spill containment kit on site and ensure all staff are trained it its use. Immediately report any substance of reportable quantities that is harmful to aquatic life to the Environmental Emergency Management Plan Incident Reporting Hotline at 1-800-663-3456 and DFO's Observe, Record and Report hotline at 1-800-465-4336.
- Place generators and pumps inside fuel containment trays to contain any accidental spills of fuel or oil.

Post-operation

- If the banks of the lagoon are disturbed during construction, restore them to their original grade and condition.
- Stabilize any exposed areas such as shoreline by planting and seeding with native trees, shrubs, and/or grasses and mulching to prevent erosion. Grass can be planted by hydro-seeding or broadcast seeding and mulching.

5. Reporting

The following reporting should be completed each time dredging is undertaken.

5.1 Completion Report

The Society should prepare a completion report outlining the following:

- Start and end date of works, including dates of work sequence tasks in Section 3.1;
- Extent of dredging;
- Depth (with location) of lagoon prior to and after dredging;
- Specific construction methods used (e.g., isolation methods);
- Volume of dredged materials; and
- Location and details about where dredged materials were disposed of.

5.2 Environmental Monitoring Report

The Environmental Monitor should prepare an environmental monitoring report outlining the following:

- Description of works;
- Timing of works;
- Surface area below the high water mark affected;
- Dates of monitoring;
- Any non-compliance with this management plan, the water licence C129749, or relevant provincial or federal best management practices or guidance documents;
- Description of any incidents, difficulties, or spills, and how they were addressed and reported;
- Dates and details of any fish or wildlife salvages, including time of day, location, capture methods, location of release, species and number of animals captured and released, any fatalities, and the numbers of the required licences to capture fish and/or wildlife; and
- A summary of any other actions taken.

5.3 Fish Salvage Data

If a fish salvage is conducted, the EM should report the results of the salvage to the MFLNRO in the appropriate format required by the ministry.

5.4 Conservation Data Centre Report

If any Species at Risk (those outlined in Section 2.2 or otherwise) are observed or salvaged during dredging or as a result of associated monitoring, these should be reported to the BC Conservation Data Centre.

5.5 Archaeological Findings

The provincial *Heritage Conservation Act* protects archaeological sites within BC. The Archaeology Branch of MFLNRO oversees the enforcement of the Act. Because the lagoon is man-made, it is unlikely that archaeological sites will be discovered during dredging as long as it does not disturb sediment below the depth of the original excavation. If, while dredging, a potential archaeological site is found, work should cease immediately, and the contractor should contact the Archaeology Branch at 250-953-3334. A professional archaeologist will be required to assess the site and determine if further investigation or permitting is required.

6. Monitoring and Maintenance

The depth of the lagoon should be monitored by the Society annually in at least four locations (mouth, middle, head, under specific docks, etc.) and the depths recorded. These depths should be reported in the completion report following subsequent dredging.

The Society should also monitor the diversion structure and piping to ensure that it is operating in a manner to minimize the amount of sediment entering the lagoon from the Eagle River.

7. Closure

We trust that this Water Management Plan meets your requirements at present. Please do not hesitate to contact KWL at DMeredith@kwl.ca or 250-503-5817 if you have any questions or concerns.

Report Submission

Prepared by:

KERR WOOD LEIDAL ASSOCIATES LTD.

Luke Warkentin, B.Sc., B.I.T.
Junior Biologist

Reviewed by:

Patrick Lilley, M.Sc., R.P.Bio.
Senior Biologist

This document is a copy of the sealed and signed hard copy original retained on file. The content of the electronically transmitted document can be confirmed by referring to the filed original.

BRITISH COLUMBIA INSTITUTE OF AGROLOGISTS 2738 Dwayne W. Meredith P.Ag.

May 11, 2017

Dwayne Meredith, B.Sc., P.Ag.
Project Manager
Sector Leader – Water Resources

Statement of Limitations

This document has been prepared by Kerr Wood Leidal Associates Ltd. (KWL) for the exclusive use and benefit of LOT 46 MANAGEMENT SOCIETY for the Water Management Plan. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document.

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.

Copyright Notice

These materials (text, tables, figures and drawings included herein) are copyright of Kerr Wood Leidal Associates Ltd. (KWL). LOT 46 MANAGEMENT SOCIETY is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to Water Management Plan. Any other use of these materials without the written permission of KWL is prohibited.

Revision History

Revision #	Date	Status	Revision	Author
0	May 11, 2017	Final	Issued for Use	DWM
A	January 18, 2017	Draft	Issued for client review	LTW/PL

OQM | Organizational Quality Management Program

References

Conservation Data Centre (CDC). 2016. Species and Ecosystems at Risk – Publically Available Occurances. iMapBC Provincial Layer. Available at: http://maps.gov.bc.ca/ess/sv/imapbc//. Accessed: December 2016.

COSEWIC. 2003. COSEWIC assessment and update status report on the chiselmouth *Acrocheilus alutaceus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 22 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

COSEWIC. 2006. COSEWIC assessment and status report on the Western Painted Turtle *Chrysemys picta bellii* (Pacific Coast population, Intermountain-Rocky Mountain population and Prairie/Western Boreal - Canadian Shield population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 40 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2012. COSEWIC assessment and status report on the White Sturgeon *Acipenser transmontanus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxvii + 75 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

Environment and Climate Change Canada. 2016. General Nesting Periods of Migratory Birds in Canada. Available at: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4f39a78f-1. Accessed: January 2017.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Canada, Smithsonian Institution Press, Washington, D.C.

Fisheries and Oceans Canada (DFO). 2005. Shuswap Lake System and Adams Lake Lake Char and Sockeye Spawning Atlas Overview Map. Available at: http://www.shim.bc.ca/shuswap/. Accessed: December 2016.

Fisheries and Oceans Canada (DFO). 2010a. Management Plan for the Rocky Mountain Ridged Mussel (*Gonidea angulata*) in Canada [Final]. Species at Risk Act Management Plan Series. Fisheries and Oceans Canada, Vancouver. iv + 52 pp.

Fisheries and Oceans Canada (DFO). 2010b. Pathways of Effects – Dredging. Available at: http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/dredging-dragage-eng.html. Accessed: December 2016.

Gist, D.H., J.A. Michaelson, and J.M. Jones. 1990. Autumn mating in the painted turtle, Chrysemys picta. Herpetologica 46:331-336.

Gregory, P.T. and R.W. Campbell. 1987. The Reptiles of British Columbia. British Columbia Provincial Museum Handbook. Ministry of Provincial Secretary and Government Services, Victoria, B.C. 102 pp.

Ministry of Environment (MOE). 2016a. BC Species and Ecosystem Explorer. Available at: http://a100.gov.bc.ca/pub/eswp/. Accessed: December 2016.

Ministry of Environment (MOE). 2016b. Habitat Wizard Stream and Lake Reports. Available at: http://maps.gov.bc.ca/ess/sv/habwiz/. Accessed: December 2016.

Ministry of Environment (MOE). 2016c. Consultative Area Database Public Map Service. Available at: http://maps.gov.bc.ca/ess/sv/cadb/. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2015. Regional Terms & Conditions & Timing Windows for Thompson Region. Available at: http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/work_windows_thompson.pdf. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010a. Standards and Best Practices for Instream Works General BMPs & Standard Project Considerations. Version 1.0.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010b. Standards and Best Practices for Instream Works Channel Maintenance. Version 1.0.

Nussbaum, R.A., E.D. Brodie and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow, ID. 332 pp.

Rosenfeld, J.S, B. Wicks, M. Porter, and P. VanDishoek. 1998. Habitat Use by Chiselmouth (*Acrocheilus alutaceus*) in the Blackwater River. Prov. of BC Fish. Proj. Rep. RD 76.

Rosenfeld, J.S., M. Porter, M. Pearson, B. Wicks, P. Van Dishoeck, T. Patton, E. Parkinson, G. Hass, and J. D. McPhail. 2001. The influence of temperature and habitat on the distribution of chiselmouth *Acrocheilus alutaceus* in British Columbia. Environmental Biology of Fishes 62:401-413.

Rosenfeld, Jordan. 2003. Update COSEWIC status report on the chiselmouth, *Acrocheilus alutaceus*, in Canada. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Ottawa. 1-22 pp.

Schwarzkopf L., and R.J. Brooks. 1987. Nest-site selection and offspring sex ratio in painted turtles, Chrysemys picta. Copeia 1987:53-61.

St. John, A. 2002. Reptiles of the Northwest: British Columbia to California. Lone Pine Publishing, Edmonton, AB. 272 pp.

Weisrock, D.W. and F.J. Janzen. 1999. Thermal and fitness-related consequences of nest location in painted turtles (*Chrysemys picta*). Functional Ecology 13(2): 94-101.

Appendix A

Site Photographs

Appendix A – Site Photographs

Date Photographs Taken: October 26, 2016

Photo 1: Looking west from the access gate of the lagoon towards the mouth, with Shuswap Lake in the background (see Figure 1).

Photo 2: Looking north from the shore of the lagoon towards its head.

Appendix A – Site Photographs

Photo 3: Looking northeast from left bank of Eagle River at the Point of Diversion (PD 52869), showing knife valve on the intake.

Photo 4: Knife valve on intake from the Eagle River at the Point of Diversion (PD 52869).

Appendix A – Site Photographs

Photo 5: Location at head of the lagoon where the diversion pipe enters.

Photo 6: Outlet of diversion pipe at the head of the lagoon.

Appendix A – Site Photographs

Photo 7: Looking northeast into the lagoon from the mouth of the lagoon.

Photo 8: Looking northwest across the mouth of the lagoon, where the temporary isolation dam will be installed.

Appendix A – Site Photographs

Photo 9: Looking southwest from mouth of lagoon at Shuswap Lake, where temporary isolation dam will be installed.

Photo 10: Looking southwest, showing site access point from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Appendix A – Site Photographs

Photo 11: Looking west, showing access gate along access path from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Photo 12: Looking northeast, showing site access from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

From: St. Pierre, Christian FLNR:EX (Christian.StPierre@gov.bc.ca)
To: Koch, Carrie L FLNR:EX (Carrie.Koch@gov.bc.ca)
Subject: Re: Province of BC Referral Request on a Water Licence application File# 0281845 Lot 45 Management Society
Sent: 04/24/2020 05:34:53
Attachments: image001.jpg, image002.jpg
Message Body:

Hi Carrie,

I have several questions related to the Lot 46 plan, but first a few comments:

There is no discussion of the cause of the siltation and any method that could be used to reduce the need for dredging as recommended by FLNR in 2014

In general the plan lacks details and given that with this plan, when attached to their license, the proponent will be able to dredge without further considerations from government, we need to know exactly what they are proposing.

It would be most useful to have copy of previous plans or at least a descriptions/reports of the previous dredging to guide this plan. I do not know if KWL was involved before, but someone at the Lot 46 Society might know.

The questions:

1. The Site plan-drawing I have still shows the permanent pump connected to the Eagle River intake, do you have an updated version.
2. Related to the first one, I would like to see a detail plan of where all the proposed activities will occur (where will the water be pumped from/to, sediment storage area, location of the water isolation dam, access, sediment sources, etc
3. The plan list species from the literature but no field surveys have been completed. A fish, shellfish and amphibian survey needs to be carried out by a qualified professional in order to finalised the water management plan.

    a. The survey will dictate the mitigation measures needed the permits required and the least risk window to accomplish the proposed work.

4. Sediment generation is an important consideration for the activity and the proposed methods for isolating the lagoon must be the most benign adapted to the conditions.

    a. Aqua-dams is the preferred method, if uncertainty exist about the suitability of this method for the site then a site investigation must be completed, and a definitive method proposed in the plan and signed by a qualified professional.
    b. Water quality be monitoring details are lacking

That is it for now

From: Koch, Carrie L FLNR:EX
Sent: February-27-20 08:53
To: St. Pierre, Christian FLNR:EX
Subject: RE: Province of BC Referral Request on a Water Licence application File# 0281845

Good morning Christian,

I have taken over this file from Jeff. From what I understand the applicant previously had intentions to do a lot of work which involved reversing the direction of flow in the diversion pipe to the lagoon, but abandoned the application before a decision was made. They have recently re-applied to have the management plan (for dredging of the lagoon) included as a clause in their water licence but do not plan on making the other previously proposed changes.

I can't seem to locate the original referral for the application – do you know if you completed it before the application was abandoned?

Thanks,

Carrie

From: Nitychoruk, Jeff FLNR:EX <Jeff.Nitychoruk@gov.bc.ca>
Sent: February 26, 2020 4:28 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Subject: FW: Province of BC Referral Request on a Water Licence application File# 0281845

Do you care to respond to Christian?

I'm not sure he is aware this issue with the lagoon is "back-on" so to speak.

Jeff

From: St. Pierre, Christian FLNR:EX <Christian.StPierre@gov.bc.ca>
Sent: February 26, 2020 4:26 PM
To: Nitychoruk, Jeff FLNR:EX <Jeff.Nitychoruk@gov.bc.ca>

Subject: FW: Province of BC Referral Request on a Water Licence application File# 0281845

Hi Jeff,

I'm going through some old files on my desk – any thing ever happen with this one?

Cheers,

Christian St-Pierre, MRM, P.Ag.| Ecosystems Section | Thompson Okanagan Region
Ministry of Forests, Lands and Natural Resource Operations | 1259 Dalhousie Drive
Kamloops, BC V2C 5Z5
office 250-371-6236 | fax 250-828-4000

Please consider the environment before printing this e-mail.

Devez-vous vraiment imprimer ce courriel? Pensez à l'environnement.

From: Referral Apps REG3 ENV:EX <ReferralAppsREG3@gov.bc.ca>
Sent: November 27, 2017 15:07
To: St. Pierre, Christian FLNR:EX <Christian.StPierre@gov.bc.ca>
Subject: FW: Province of BC Referral Request on a Water Licence application File# 0281845

Please see the following referral.

The screening showed:

Known Values Thompson Okanagan Region.

- Provincial and Federal SEAR Data – Fish SAR and Regionally Important (Shuswap Lake/River)
- Water Licence Screening – High Risk Watersheds-Yellow Watersheds
- Water Features – Streams TOK 50m buffer, Lakes TOK 50 m buffer (nearby)

M:\WANSHARE\ESD\ESD_Shared\ECOSYSTEM\Thompson_Okanagan NRO\Development Review and Referrals\Referrals\FLNR Water Licence\2017\0281845_Lot 46 Management Society_Eagle River

Sincerely,

Dianna

From: FrontCounterBC@gov.bc.ca [mailto:FrontCounterBC@gov.bc.ca]
Sent: Wednesday, November 15, 2017 9:39 AM
To: Referral Apps REG3 ENV:EX
Subject: Province of BC Referral Request on a Water Licence application File# 0281845

Ministry of Forests, Lands and Natural Resource Operations - Ecosystems - Thompson Region 3
Allison Cebuliak, Bev Smith, Donna Romain, Mark Phillpotts, Mike Burwash, Christian St. Pierre, Al Caverly, Shauna Jones, Phil Belliveau, John Surgenor, Region 3 Referral mailbox

Water Licence
Referral Number: 97478340 - 001
Reference Number: 262524
Request Sent: November 15, 2017
Response Due: December 15, 2017

You are invited to comment on the following application. A response is required in order for the application and adjudication process to move ahead

See Summary Card

Please
Click Here to respond to this referral. You must be logged in using your Government IDIR account to view associated information. Note that forwarding or otherwise distributing this email will provide access to the associated information only if the receiver has a corresponding account.

For technical assistance with e-Referrals, please contact
fcbctechsupport@gov.bc.ca

For more information regarding this referral, please contact the "Email Coordinator" given within the referral.

Note that it can take an extended period of time to connect to the e-Referrals website, this is normal. Avoid re-clicking the "Next" button or you could extend this connection time.

Please do not reply to this email.

Jeff Nitychoruk

FrontCounter BC
Assistant Water Manager

(250) 260-4640
Jeff.Nitychoruk@gov.bc.ca

Page 050 of 480

Withheld pursuant to/removed as

s.18

Water Licence Amendment

Tracking Number: 100308711

Applicant Information

If approved, will the authorization be issued to an Individual or Company/Organization? Company/Organization

What is your relationship to the company/organization? Board Member

REFERRAL / PUBLIC COMMENT CONTACT INFORMATION

Company / Organization: Lot 46 Management society
Contact Name:
Contact Address: 1450 Silversands Road
Sicamous BC V0E 2V4
Contact Phone:
Contact Email:

APPLICANT COMPANY / ORGANIZATION CONTACT INFORMATION

Please enter the contact information of the Individual/Organization who is acting on behalf of the applicant.

Name: Lot 46 Management society
Doing Business As:
Phone:
Fax:
Email:
BC Incorporation Number:
Extra Provincial Inc. No:
Society Number: S0013702
GST Registration Number:
Contact Name:
Mailing Address: 1450 Silversands Road
Sicamous BC V0E 2V4

CORRESPONDENCE E-MAIL ADDRESS

For Business BCeID users, it is highly recommended to provide correspondence email address in this section. If left blank, all correspondence will be sent to the above given email address.

Email:
Contact Name:

TECHNICAL INFORMATION

GOVERNMENT AND FIRST NATION FEE EXEMPTION REQUEST

Do you belong to, are you applying on behalf of, or are you:

- A provincial government ministry
- The Government of Canada
- A First Nation for water use on reserve land
- A person applying to use water on Treaty Lands
- A Nisga'a citizen
- An entity applying to use water from the Nisga'a Water Reservation?

No

WATER LICENCE

Please enter your water licence number to start your application. Click 'Verify' to check the number you have entered.

Water Licence Number: C129749

LICENCE HOLDER

Name	Billing Address
Lot 46 Management Society	1424 Silver Sands Road, Sicamous BC V0E 2V4

LAND WHERE THE WATER IS USED

Lot A District Lot 452 KDYD Plan KAP52709

PURPOSES

We have the following purposes for your licence on record:

Purpose	Quantity	Irrigated Area
04A - Land Improve: General	.28317 m3/sec	0 ha

Source of Diversion

Current source of diversion: Surface water
Are you changing the source of water diversion? No

TYPE OF AMENDMENT

If you select Yes for one of the following options then you will not be able to select any other options.

Abandonment

This option allows you to request the abandonment of part of a water Licence. There is no fee to abandon part of the licence.

Do you want to abandon your water rights? No

Transfer of Appurtenancy

This option is used to request a transfer of all or part of the rights and obligations under a water licence to a different parcel of land. This application is valid only while the licensee continues to own the property described in the water licence. Application fees for a Transfer of Appurtenancy Amendment are payable upon receipt of new water rights. The recipient(s) of the new water licence(s) will be billed for the application fees and any outstanding rentals when the licence(s) are issued.

Do you want to transfer the licence to another property with a different legal land description? No

Apportionment

This option is used to request the division of the rights and obligations of a water licence between multiple parcels of land when the land to which the licence was issued for has been subdivided or is now separately owned. The land before and after the division must be the same and the licence is not being transferred to a different parcel of land. Application fees for an Apportionment Amendment are payable upon receipts of new water rights. The recipient(s) of the new water licences will be billed for the application fees and any outstanding rentals when licence(s) are issued.

Do you want to Apportion (divide) the water licence rights among 2 or more parcels of land? No

You can apply for one or more of the following options but not in combination with any of the three options above.

☑ **Change of Works**

This option is used to request a change to the works currently authorized by your water licence. Applications fees are payable upon submission of the application.

Please describe what you would like to change and why: We would like to add a Water Management Plan to the current water license.

CHANGE OF WORKS

CHANGES TO WORKS

Please add any previously approved works authorized by your water licence and specify the current status and your intention for each works. Also you may add any works that you would like to add to the existing licence under the "New Works" section.

PREVIOUSLY APPROVED WORKS

Works	Status	Intention
Canal	Fully Constructed	
Comments:		
Diversion structure	Fully Constructed	
Comments:		
Pipe	Fully Constructed	
Comments:		

Are any new works required? No

JOINT WORKS

Are any of your works joint with another person's or group's works? No

OTHER LANDS PHYSICALLY AFFECTED

Do your works affect another private landowner's property, e.g. is a pipe running over your neighbour's land to divert the water to your land? If yes, you will need to obtain their permission. If the land is owned by a private landowner a prefilled form that can be signed by the other landowner will be provided at the Signature step later in the application process.
Please select "Yes" to the following question when one of the following applies:

- you have changed your works and they are now physically affecting someone else's property who has NOT given their permission when the licence was approved
OR
- you had previously obtained permission from a land owner who is physically affected by your works but this land owner has changed.

Are there other lands that would be physically affected by your works? No

ATTACHED DOCUMENTS

Document Type	Description	Filename
Other	Water Management Plan	20200123091402793.pdf

PRIVACY DECLARATION

PRIVACY NOTE FOR THE COLLECTION, USE AND DISCLOSURE OF PERSONAL INFORMATIONPersonal information is collected by FrontCounter BC under the legal authority of section 26 (c) and 27 (1)(a)(i) of the Freedom of Information and Protection of Privacy Act (the Act). The collection, use, and disclosure of personal information is subject to the provisions of the Act. The personal information collected by FrontCounter BC will be used to process your inquiry or application(s). It may also be shared when strictly necessary with partner agencies that are also subject to the provisions of the Act. The personal information supplied in the application package may be used for referrals or notifications as required. Personal information may be used by FrontCounter BC for survey purposes.For more information regarding the collection, use, and/or disclosure of your personal information by FrontCounter BC, please contact FrontCounter BC at 1-877-855-3222 or at:FrontCounter BC Program DirectorFrontCounter BC, Provincial Operation441 Columbia StreetKamloops, BC V2C 2T3

☑ Check here to indicate that you have read and agree to the privacy declaration stated above.

IMPORTANT NOTICES

Please review the "Important Notices" below and then check the declaration at the bottom confirming that everything in this application is complete and accurate.

DECLARATION

☑ By submitting this application form, I declare that the information contained on this form is complete and accurate.

APPLICATION AND ASSOCIATED FEES

Item	Amount	Taxes	Total	Outstanding Balance
Groundwater Licence Amendment Fee	$125.00		$125.00	$0.00

OFFICE

Office to submit application to: Kamloops

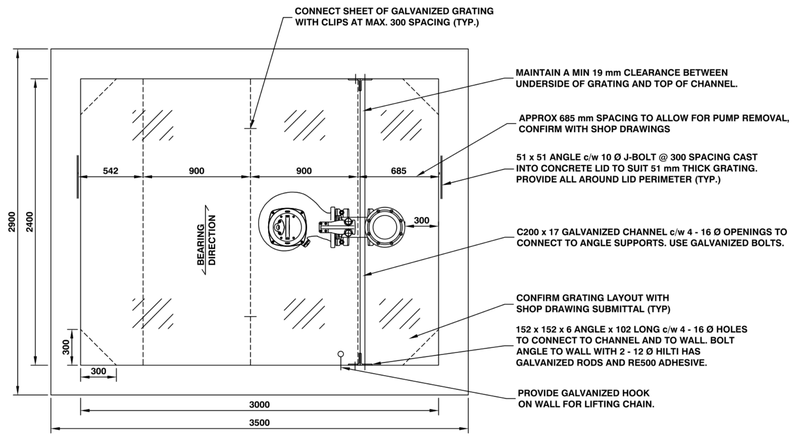
PROJECT INFORMATION

Is this application for an activity or project which requires more than one natural resource authorization from the Province of BC? No

OFFICE USE ONLY		
Office Kamloops	**File Number**	**Project Number**
	Disposition ID	**Client Number**

Copyright

SAVED 2016/05/17, 2:36 AM
Paper Size = ANSI D
At Full Size, this border measures 520 mm x 800 mm
millimetres
0 10 50 100
R:\3600-3699\3691-001\400-Work\3691-002 Plan & Section BLW.dwg



GRATING PLAN
Scale 1:25

NOTES:

1. ALL CONSTRUCTION IN ACCORDANCE w/MMCD SPECIFICATIONS AND STANDARD DETAILS.

2. CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY AND SECURITY.

3. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE AND ALL PRODUCTS SUPPLIED SHALL BE CSA APPROVED FOR USE IN CANADA.

4. ALL BACKFILL SHALL BE NATIVE MATERIAL UNLESS OTHERWISE REQUIRED BY THE ENGINEER. NATIVE MATERIAL SHALL BE APPROVED BY THE ENGINEER FOR REUSE.

5. PROVIDE SEDIMENT AND EROSION CONTROL TO MMCD AND LOCAL STANDARDS.

6. FOLLOW ALL DFO/FLNRO REGULATIONS AND BEST PRACTICES FOR CONSTRUCTION IN THE LAGOON AREA. NO WORK SHALL BE COMPLETED IN THE WET. DEWATER EXCAVATION AND DEWATERING DISCHARGE SHALL MEET THE DFO/FLNRO STANDARDS.

7. PUMP SHALL BE A SUBMERSIBLE SEWAGE STYLE PUMP SUITABLE FOR CONTINUOUS SUBMERGENCE AND PUMPING DRAINAGE WATER. PROVIDE A FLYGT MODEL NP3153LT c/w 624 INPELLER CAPABLE OF 182 L/S AT 2.5 m TDH. PROVIDE THE PUMP c/w 50 m OF CABLE, NECESSARY CONTROLS AND RELAYS, GALVANIZED LIFTING CHAIN AND GUIDERAILS, DISCHARGE HEAD, AND ALL SUPPORTING EQUIPMENT FOR A SUCCESSFUL INSTALLATION. SEE SPECIFICATIONS

8. PROVIDE SHOP DRAWINGS FOR ALL PRECAST CONCRETE UNITS. SHOP DRAWINGS SHALL BE SEALED BY AN ENGINEER REGISTERED IN BC. NOTE GRATING IS DESIGNED FOR A 4.8 KPA LOADING.

9. PROVIDE SHOP DRAWINGS FOR ALL METALWORK FOR REVIEW AND APPROVAL.

10. PROVIDE FREESTANDING INSULATED OUTDOOR PUMP CONTROL KIOSK COMPLETE WITH ALL REQUIRED CONTROLS AND WIRING INCLUDING:

a. 200A, 120/208 3Ø SERVICE EQUIPMENT INCLUDING PULLBOX, SERVICE PANEL AND METER BASE, SERVICE WILL BE UNDERGROUND;
b. MCP & STARTER WITH OVERLOAD RELAY SUITABLE FOR 15HP SUBMERSIBLE PUMP;
c. FLYGT MINICAS RELAY TO MONITOR PUMP SEAL LEAK AND OVER TEMPERATURE;
d. RED FLASHING ALARM LIGHT (WATERTIGHT) MOUNTED ON THE ROOF;
e. HEATER SUITABLE TO MAINTAIN MINIMUM 5°C IN -20°C AMBIENT TEMPERATURE;
f. 20A DUPLEX RECEPTACLE ON DEDICATED CIRCUIT;
g. LED INTERIOR LIGHTING COMPLETE WITH DOOR SWITCH;
h. THE PUMP CONTROL SHALL BE MANUAL ON/OFF WITH ALARMS TO SHUT DOWN THE PUMP. THE RED ALARM LIGHT SHALL BE ILLUMINATED WHEN THE PUMP IS IN "ON" POSITION BUT NOT RUNNING. CONDITIONS THAT WILL STOP THE PUMP ARE: OVERLOAD, PUMP SEAL LEAK, PUMP OVER TEMPERATURE & PUMP CHAMBER LOW LEVEL. PUMP CHAMBER LOW LEVEL SIGNAL WILL BE PROVIDED BY A FLOAT WITH A NORMALLY CLOSED CONTACT WHEN PUMP CHAMBER LEVEL IS GOOD. FLOAT AND WIRING WILL BE PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR;
i. OPERATOR DEVICES IE: PILOT LIGHTS, COMPLETE WITH LAMICOID LABELS;
j. TERMINAL BLOCKS ON DIN RAIL AS REQUIRED FOR ALL WIRING CONNECTIONS.

ALL EQUIPMENT AND WIRING SHALL BE CSA APPROVED.

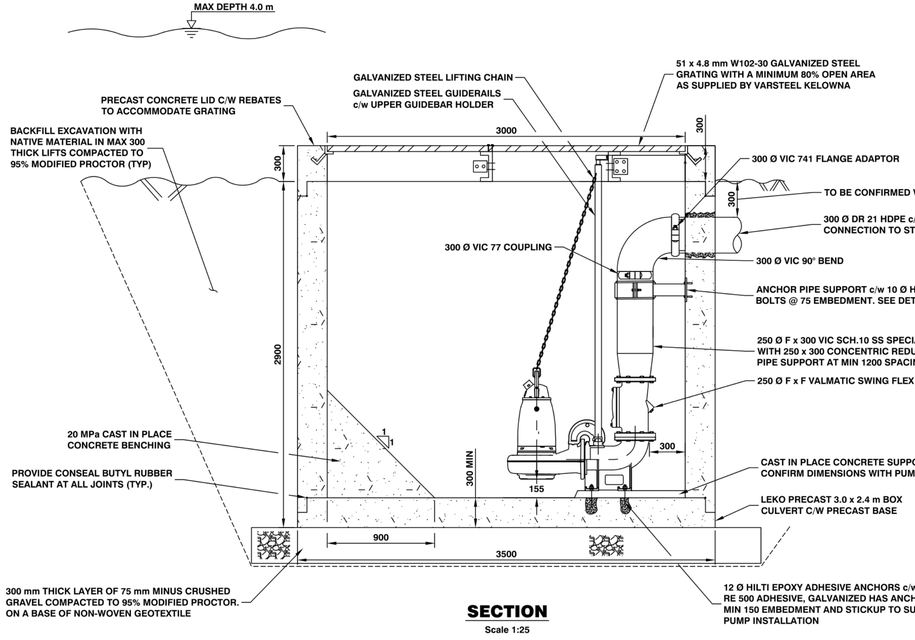
KIOSK SHALL BE 12 GAUGE SHEET STEEL WELDED CONSTRUCTION WITH BRACING AS REQUIRED AND WITH EDGES AND WELDS GROUND SMOOTH. KIOSK SHALL BE POWDER COATED GREEN.

KIOSK SHALL BE MANUFACTURED BY ALLIED CONTROLS, BURNABY, B.C.

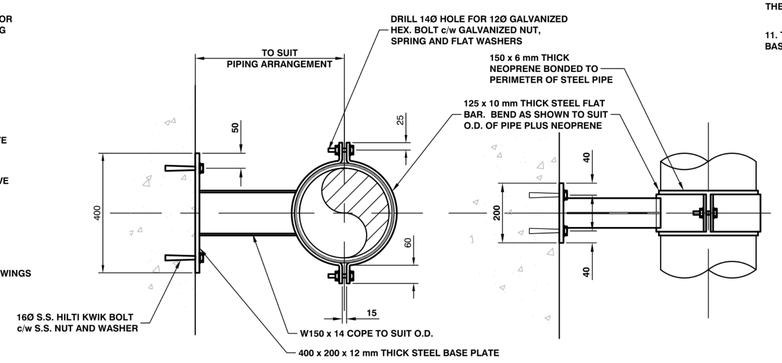
PROVIDE SHOP DRAWINGS FOR KIOSK CONSTRUCTION, ARRANGEMENT OF ALL COMPONENTS WITHIN AND WIRING DIAGRAMS SHOWING INTERCONNECTIONS OF ALL COMPONENTS.

CONSTRUCTION OF KIOSK SHALL NOT PROCEED UNTIL SHOP DRAWINGS HAVE BEEN APPROVED BY THE ENGINEER.

11. THE KIOSK SHALL BE INSTALLED ON A CAST IN PLACE CONCRETE PAD ON AN APPROVED GRAVEL BASE IN ACCORDANCE w/ MMCD STANDARDS.

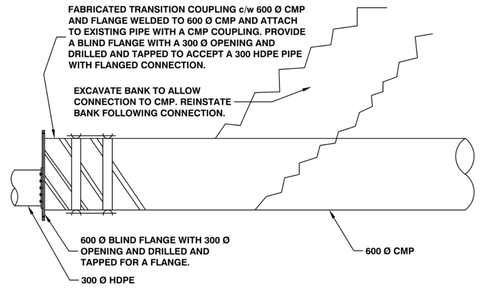


SECTION
Scale 1:25



PIPE SUPPORT DETAIL
SCALE: N.T.S

A
-



DETAIL
SCALE 1:25

B
-

KERR WOOD LEIDAL
consulting engineers
202 - 3334 30th Avenue
Vernon, BC V1T 2C8
T (250) 503-0841 F (250) 503-0847
E okanagan@kwl.ca

Seal:

Rev	Date	Des	Dwn	Chk	Description of Revision
A					REVIEW

Rev	Date	Des	Dwn	Chk	Description of Revision

LOT 46
LAGOON CIRCULATION PUMP STATION

SITE PLAN, SECTIONS & DETAILS

Project No.	Drawing No.	Rev.
3691.001	C-001	----
Group: CIVIL		

Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Water Licensing

WATER LICENCE TECHNICAL REPORT

Created Date:	Jan 23, 2020		**Due Date:**	Jun 11, 2020
Job #:	113332	**vFCBC Tracking #:**	100308711	Koch, Carrie L FLNR:EX (VER-FC)

EXECUTIVE SUMMARY

1. SUMMARY REMARKS

The applicant has applied to include a Water Management Plan as a condition of their licence to outline operations and maintenance practices for the licensed works (including the channel).

2. APPLICATION INFORMATION

FILE NO:	0281845	**WATER DISTRICT:**	Kamloops	**PRECINCT:**	13K - Kamloops / Sicamous
CLIENT CONTACT:	Lot 46 Management Society	**REGION:**	3 - Thompson	**PCL REQUIRED:**	N
CLIENT:	Lot 46 Management Society (28903)	**WATER USE PURPOSE & QUANTITY**	04A - Land Improve: General 0.28317m3/sec	**AQUIFER(s): STREAM(s):**	Eagle River
PRIORITY DATE:	Oct 11, 1968	**CONNECTED**	N	**CONNECTED WATER SOURCE(s):**	Eagle River
AMENDMENT TYPE:	Amendment	**AMENDMENT SUBTYPE:**	Section 26 Amendment	**CURRENT (ORIGINAL) LICENCE DETAILS**	C129749

Related Licences

Licence number	File number	Priority Date	Purpose	Volume	Comment

3. RECOMMENDATIONS

Grant

Prepared by:

Carrie Koch

Date: March 4, 2021

Koch, Carrie L FLNR:EX (VER-FC)
Water Stewardship Officer

A. BASIC APPLICANT INFORMATION

Applicant Name: Lot 46 Management Society (28903)
Client Name (if different from applicant):
Home Phone:s.22
Work Phone:
Fax:
Other Phone:
Email Address:

Certificate(s) of Title No.:
File No.: 0281845
Region: 3 - Thompson
District: Kamloops
Precinct: 13K - Kamloops / Sicamous

Quick Amendment: No
Transitioning Groundwater Use: *No*
Priority Date: *Oct 11, 1968*
Rationale for Priority Date (transitional licence only):

Application Details:

Works: canal, diversion structure, pipe
Status of Works: Fully Constructed, Fully Constructed, Fully Constructed

Purpose Use: Land Improve: General LIM - Land Improvement
Quantity Units: 0.28317 m3/sec

Aquifer Watershed Code/Name: **Stream Watershed Code/Name:**	South Thompson River	**PID:**	018-837-468	**Appurtenant Land - Legal Description:**	Lot A District Lot 452 KDYD Plan KAP52709

POD**: **Mapsheet code:**	PD52869 82.L.086.1.3	**Well ID Plate:** **Well Tag Number:** **Status of Well:**		**Source:** **Point of Re-Diversion:**	Eagle River N

**** PD (surface diversion), PW (well diversion), PG (groundwater diversion other than from a well)**

B. ADMINISTRATIVE DETAILS

N/A ☐ 1. General Comments

Licence C129749 authorizes the diversion and use of water for land improvement. Water is diverted from the Eagle River into a manmade channel to prevent the water from being stagnant. The manmade channel has been routinely dredged since its construction as early as 1968.

The licensee applied for multiple Section 9s under the *Water Act* and in 2014, a decision was made that dredging was considered maintenance of the licensed works and should be managed under their licence rather than via Section 9s. The 2014 letter states that "the Society may remove (dredge) the accumulated sediment from the channel at the location indicated in your application as maintenance of their licensed works" but also recommended that they contact the Water Officer to

notify them of the proposed works and receive instructions on best management practices that must be followed. The letter also recommended investigating the source of siltation and methods that could reduce the frequency of dredging.

Subsequently, the Water Officer at the time requested that the licensee prepare a management plan to outline maintenance and dredging operations for the channel.

The Society applied for an amendment to the licence in 2018. The amendment included two main aspects: 1. They proposed that reversing the flow of water from the channel into the Eagle River could help reduce siltation and 2. They provided a water management plan to support the maintenance of the licensed works. The Water Officer at the time reviewed the amendment application and met with eco-systems staff and First Nations. Many concerns were raised regarding reversal of the flow into the Eagle River. Before a decision was made the applicant withdrew the application.

Subsequently, in 2020 the licensee submitted the current application to include the same Water Management Plan in their licence. This amendment does not propose any changes to the flow direction. The Water Management Plan was revised/updated to reflect best management practices and address concerns raised by eco-systems staff, DFO staff, and the Water Officer. The final Water Management Plan is dated January 2021. The plan outlines some of the potential strategies that may be used for isolation and dredging the lagoon but requires a QEP to perform a site survey before each dredging event to determine the best method, monitoring, and timing for work.

The plan was worded with the intention to adapt to changing regulations and best management practices in the future. Specifically, the WMP requires that the Environmental Monitoring Report recommend any changes for future dredging activities. The license could be subject to a 30-year review under Section 23 of the *Water Sustainability Act*.

N/A ☒ 2. Transitioning Groundwater Use Priority Date Rationale

N/A ☐ 3. Source(s) and Point(s) of Diversion Comments

The point of diversion remains the same.

Eagle River	PD52869

N/A ☒ 4. Water Allocation Reserves, Notations(s), and Sensitive Streams

Reserves

Notations

Reference Point

Sensitive Stream Designation (if you have a groundwater diversion, is it hydraulically connected to a Sensitive Stream?):

N/A ☒ 5. Relevant Water Objective(s)

N/A ☒ 6. Designated Area for Water Sustainability Planning Processes

N/A ☒ 7. Drilling Authorization

N/A ☒ 8. Appurtenant Land Related Issues

OTHER LICENCES ON APPURTENANT LAND:
OTHER APPLICATIONS ON APPURTENANT LAND:
APPURTENANT LAND WITHIN MUNICIPALITY, IMPROVEMENT DISTRICT OR IRRIGATION DISTRICT:
OTHER GENERAL COMMENTS RELATED TO APPURTENANT LAND AND OTHER TENURES:

N/A ☒ 9. PERMIT OVER CROWN LAND

The channel is man-made and considered private property owned by Lot 46 Mgmt society.

N/A ☐ 10. REFERRALS TO GOVERNMENT AND OTHER AGENCIES

The application was referred to eco-systems staff in Kamloops. Ecosystems specialist, Christian St. Pierre responded with some comments and many questions that were not addressed in the Water Management Plan. Largely, the plan only included a desktop review and the plan seemed to be lacking detail about how dredging would be completed.

The Water Officer requested further clarification from the consultants and the plan was revised multiple times to address each of the questions/comments. The final January 2021 Water Management Plan addresses the concerns raised by the eco-systems staff.

Below are the comments and how each was addressed specifically:

"There is no discussion of the cause of the siltation and any method that could be used to reduce the need for dredging as recommended by FLNR in 2014"

The proponent responded that their application in 2018 to reverse the flow direction from the channel into the Eagle River was their attempt to resolve the issue of sedimentation in the channel. They agreed that further thought should be put towards this in the future and each dredging event will consider alternative options that would extend the amount of time before dredging was necessary again. The applicant is interested in minimizing siltation in the future because it will likely reduce the costs associated with maintenance. However, they did not believe there was a solution that would prevent dredging entirely and wanted to proceed with implementing the Management Plan for those events that are necessary.

"In general the plan lacks details and given that with this plan, when attached to their license, the proponent will be able to dredge without further considerations from government, we need to know exactly what they are proposing. It would be most useful to have copy of previous plans or at least a descriptions/reports of the previous dredging to guide this plan. I do not know if KWL was involved before, but someone at the Lot 46 Society might know."

The proponent reported that they do not have any documentation for previous dredging events. They believed that aqua-dams were used for isolation in the past but may not always be the best option moving forward. The plan was revised to include more detail and require a QEP perform an on-site survey to determine the best methods, monitoring, and timing for work.

"The Site plan-drawing I have still shows the permanent pump connected to the Eagle River intake, do you have an updated version."

The plan was revised to no longer show the pump.

"Related to the first one, I would like to see a detail plan of where all the proposed activities will occur (where will the water be pumped from/to, sediment storage area, location of the water isolation dam, access, sediment sources, etc"

The plan was revised to indicate potential locations for the proposed activities.

"The plan list species from the literature but no field surveys have been completed. A fish, shellfish and amphibian survey needs to be carried out by a qualified professional in order to finalised the water management plan.

a. **The survey will dictate the mitigation measures needed the permits required and the least risk window to accomplish the proposed work."**

The plan was revised to require a QEP perform an on-site survey before each dredging event to determine the best methods, monitoring, and timing for work.

"Sediment generation is an important consideration for the activity and the proposed methods for isolating the lagoon must be the most benign adapted to the conditions.

a. **Aqua-dams is the preferred method, if uncertainty exist about the suitability of this method for the site then a site investigation must be completed, and a definitive method proposed in the plan and signed by a qualified professional.**
b. **Water quality be monitoring details are lacking"**

The proponent reported that they do not have any documentation for previous dredging events. They believed that aqua-dams had been used for isolation in the past but may not always be the best option moving forward. The plan was revised to include more detail on the options and require a QEP perform an on-site survey to determine the best methods, monitoring, and timing for work. Section 4.2 was revised to address water quality monitoring. Monitoring for a minimum of turbidity is required during sensitive works.

During review of the application, the Water Officer was contacted by the Fishery Officer with Fisheries and Oceans Canada. The Fishery Officer was looking for more information about the water licence and management plan as part of an

investigation into recent removal of vegetation in contravention of the *Water Sustainability Act* s. 106(2)(b)(ii) and s. 35(1) of the *Fisheries Act*:

> *35 (1) No person shall carry on any work, undertaking or activity that results in the harmful alteration, disruption or destruction of fish habitat.*

The Fishery Officer did not agree that the licence or 2014 letter authorized the applicant to dredge the lagoon. The officer recommended clarifying some of the requirements regarding fish salvage permits and clarifying that the licence does not exempt the licensee from obligations under the *Fisheries Act*. The WO passed these recommendations onto the proponent and they were incorporated into the revised report.

N/A ☒ 11. NOTIFICATIONS/OBJECTIONS

11a. NEARBY LICENSEES, AND DOWNSTREAM LICENSEES ON CONNECTED STREAMS [insert contact details]
11b. JOINT WORKS [insert contact details]
11c. OTHER LANDS PHYSICALLY AFFECTED BY WORKS [insert contact details]

N/A ☐ 12. OTHER CONCERNED PARTIES

The plan requires that adjoining landowners be notified 3 months prior to each dredging event.

N/A ☒ 13. WATER LICENCES REQUIRING AMENDMENT

C. TECHNICAL INFORMATION

N/A ☐ 1. Physical, Hydrological and Hydrogeological Setting

The 'channel' authorized by the licence is a man-made lagoon. The entrance to the lagoon is near the confluence of Sicamous Narrows and Shuswap lake. The licensed works allow diversion of water from the Eagle River into the lagoon to maintain a flow and prevent the water from becoming stagnant. Many of the surrounding landowners have docks on the lagoon and use the channel for boat access to Shuswap Lake.

N/A ☐ 2. Description of Works to be Authorized

The authorized works are not changing as a result of this amendment.

Works:	canal	**Status of Works:**	Fully Constructed
Works:	diversion structure	**Status of Works:**	Fully Constructed
Works:	pipe	**Status of Works:**	Fully Constructed

N/A ☒ 3. Well(s) location

Well Tag Number: **Latitude:** **Longitude:**

N/A ☒ 4. Well(s) construction

Well ID plate number		**Well ID tag number**	
Well date of construction		**Well construction status**	
Well depth		**Well diameter**	

N/A ☒ 5. Summary of Licence Demand

Licence/Application	Domestic (m^3/day)	Other (m^3/day)	Irrigation* (m^3/yr)*	Other (m^3/yr)	Other (m^3/sec)	Storage (m^3/yr)	Daily Seasonal Demand in m^3/s
Existing GW Rights							
Existing SW Rights							
Quantity of water in this Application							

Excluded users (e.g. domestic groundwater)							
Totals							

* Irrigation Q based on (select N/A, 90, 100 or 120) day period unless otherwise indicated.

N/A ☐ 6. Source Supply-Demand Assessment

The quantity of water is not being changed by this amendment.

N/A ☒ 7. Well Pumping and Recovery Test

N/A ☒ 8. Long-term Yield/Adequacy of Well Supply

N/A ☒ 9. Impact on Connected Source(s)

Stream: Eagle River **Tributary to:** **Shuswap Lake**

Likely connected to surface water source? (Y/N)

Surface water source name #1		% connected to source #1		Distance to source #1	
Surface water source name #2		% connected to source #2		Distance to source #2	
Surface water source name #3		% connected to source #3		Distance to source #3	
Surface water source name #4		% connected to source #4		Distance to source #4	
Surface water source name #5		% connected to source #5		Distance to source #5	

Likely connected to aquifer source (if your aquifer likely connected to another aquifer)? (Y/N)

Groundwater source name #1		% connected to source #1	
Groundwater source name #2		% connected to source #2	
Groundwater source name #3		% connected to source #3	
Groundwater source name #4		% connected to source #4	
Groundwater source name #5		% connected to source #5	

N/A ☒ 10. Summary of Flow Records

N/A ☐ 11. Impact on Other Water Users

The amendment is not changing the quantity of the diversion on the Eagle River and there is only 1 licensed water user downstream of PD who is not expected to be impacted by this amendment.
The Water Management Plan outlines the operational procedure for maintenance of the channel to avoid and/or minimise impacts. This includes conditions to prevent sedimentation from entering Shuswap Lake (isolation, use of silk curtain, water quality monitoring).

N/A ☒ 12. Environmental Flow Needs (EFN) Consideration

N/A ☐ 13. Justification for Purpose and Quantity

The purpose and quantity are not changing.

N/A ☒ 14. Water Users' Community

N/A ☐ 15. Water Quality Issues (e.g. salinity, public health issues)

Water quality has been an important consideration in review of this application. As stated in Section 10. Referrals to Government and Other Agencies, eco-systems staff raised concerns about sedimentation and water quality monitoring following review of the initial water management plan.

The January 2021 Water Management Plan has been revised to include additional detail about isolation practices, the use of silt curtains during dewatering, and required monitoring of turbidity during sensitive works. Prior to any work, a QEP must perform a site survey to determine the best methods for works and any additional monitoring that will be required.

N/A ☐ 16. Environmental Considerations

See Section 10. Referrals to Government and Other Agencies.

N/A ☐ 17. Justification for Special Advice on Cover Letter

The licensee will be advised of the protection of archaeological sites under the *Heritage Conservation Act*.

N/A ☐ 18. Justification for Additional Clauses for Licence

The licence will include a clause referencing the Water Management Plan:

> ***During all phases of sediment removal and channel maintenance, the holder of this licence is subject to the Water Management Plan, January 2021, as attached to this water licence. These terms and conditions of the Water Management Plan, are hereby incorporated into this licence as if written herein as licence conditions, which requirements must be implemented by the licensee.***

I recommend maintaining Clause K from C129749:

> ***The rights hereby granted shall expire twelve months after the Comptroller of Water Rights notifies the licensee that the water of Eagle River is required for any purpose of higher rank than land improvement.***

I also recommend adding the habitat protection clause. The Water Management Plan already addresses many of the terms and conditions included in the document, but including this in the licence will ensure that it applies to all authorized works not just the practice of dredging the lagoon.

> ***During all phases of construction and maintenance of the licenced works and related activities, the holder of this licence is subject to the habitat protection requirements, described in the document entitled "Terms and Conditions for Construction and Maintenance of Licensed Works" (dated March 1, 2017). Those habitat protection requirements are hereby incorporated into this licence as if written herein as licence conditions, which requirements must be implemented by the licensee in conjunction with any guidance provided by a Water Manager or Habitat Officer.***

N/A ☒ 19. Site Inspection

N/A ☐ 20. First Nations Information and/or Results of Consultation

Refer to CAST for consultation summary.

D. LICENCE(S)

New (amended) Licence No. 502036
Conditional/Final: Conditional
Licence Status: Draft
File No: 0281845
Region: Thompson
District: Kamloops (13)
Precinct: Sicamous (13K)
PID: 018-837-468
Appurtenancy:
Lot A District Lot 452 KDYD Plan KAP52709

Licence Holder - Billed Client: Lot 46 Management Society
Licensee Name: Lot 46 Management Society
Client No.: 28903
Home Phone:s.22
Work Phone:
Fax:
Other Phone:
Email Address:

Exempt Client Details:
Licence Holder - Other: Lot 46 Management Society
Licence Documents Are To Be Sent To: Lot 46 Management Society (28903)

Well Tag Number:
Purpose/Uses: 04A - Land Improve: General
Quantity Units: 0.28317 m3/sec
Priority Date: Oct 11, 1968
Start of Annual Licence Cycle[1]**:** January 1
Source Name: Eagle River
Points Of Diversion: PD52869
Quantity Flag: T
Mapsheet Code: 82.L.086.1.3

Works (Status): canal (Fully Constructed), diversion structure (Fully Constructed), pipe (Fully Constructed)
Well Id Plate:
POD (Well):
Sector: LIM - Land Improvement
End of Annual Licence Cycle: December 31
Point Of Re-Diversion: No
Storage Flag: N
Water Rights Map: 82.L.086.1.3

[1] This field refers to the time of year that water may be used for the defined purpose, e.g. Waterworks = year round. Irrigation = April - September

E. PERMIT(S) OVER CROWN LAND

1. PCL NO.:

2. PCL REPLACEMENT:

3. PCL BILLING INSTRUCTIONS:

Page 065 of 480

Withheld pursuant to/removed as

s.13

Page 066 of 480

Withheld pursuant to/removed as

s.13

Page 067 of 480

Withheld pursuant to/removed as

s.13

Page 068 of 480

Withheld pursuant to/removed as

s.13

Withheld pursuant to/removed as

s.13

Page 070 of 480

Withheld pursuant to/removed as

s.13

Page 071 of 480

Withheld pursuant to/removed as

s.13

Page 072 of 480

Withheld pursuant to/removed as

s.13

Page 073 of 480

Withheld pursuant to/removed as

s.13

Page 074 of 480

Withheld pursuant to/removed as

s.13

Page 075 of 480

Withheld pursuant to/removed as

s.13

Page 076 of 480

Withheld pursuant to/removed as

s.13

Page 077 of 480

Withheld pursuant to/removed as

s.13

Page 078 of 480

Withheld pursuant to/removed as

s.13

Page 079 of 480

Withheld pursuant to/removed as

s.13

Page 080 of 480

Withheld pursuant to/removed as

s.13

Page 081 of 480

Withheld pursuant to/removed as

s.13

Page 082 of 480

Withheld pursuant to/removed as

s.13

Page 083 of 480

Withheld pursuant to/removed as

s.13

Page 084 of 480

Withheld pursuant to/removed as

s.13

Page 085 of 480

Withheld pursuant to/removed as

s.13

Page 086 of 480

Withheld pursuant to/removed as

s.13

Page 087 of 480

Withheld pursuant to/removed as

s.13

Page 088 of 480

Withheld pursuant to/removed as

s.13

Page 089 of 480

Withheld pursuant to/removed as

s.13

Page 090 of 480

Withheld pursuant to/removed as

s.13

Page 091 of 480

Withheld pursuant to/removed as

s.13

Withheld pursuant to/removed as

s.13

Page 093 of 480

Withheld pursuant to/removed as

s.13

Page 094 of 480

Withheld pursuant to/removed as

s.13

Page 095 of 480

Withheld pursuant to/removed as

s.13

Page 096 of 480

Withheld pursuant to/removed as

s.13

Page 097 of 480

Withheld pursuant to/removed as

s.13

Page 098 of 480

Withheld pursuant to/removed as

s.13

Page 099 of 480

Withheld pursuant to/removed as

s.13

Page 100 of 480

Withheld pursuant to/removed as

s.13

Page 101 of 480

Withheld pursuant to/removed as

s.13

Page 102 of 480

Withheld pursuant to/removed as

s.13

Page 103 of 480

Withheld pursuant to/removed as

s.13

Page 104 of 480

Withheld pursuant to/removed as

s.13

Page 105 of 480

Withheld pursuant to/removed as

s.13

Page 106 of 480

Withheld pursuant to/removed as

s.13

Page 107 of 480

Withheld pursuant to/removed as

s.13

Page 108 of 480

Withheld pursuant to/removed as

s.13

Page 109 of 480

Withheld pursuant to/removed as

s.13

Page 110 of 480

Withheld pursuant to/removed as

s.13

Page 111 of 480

Withheld pursuant to/removed as

s.13

Page 112 of 480

Withheld pursuant to/removed as

s.13

Page 113 of 480

Withheld pursuant to/removed as

s.13

Page 114 of 480

Withheld pursuant to/removed as

s.13

Page 115 of 480

Withheld pursuant to/removed as

s.13

Page 116 of 480

Withheld pursuant to/removed as

s.13

Page 117 of 480

Withheld pursuant to/removed as

s.13

Page 118 of 480

Withheld pursuant to/removed as

s.13

Page 119 of 480

Withheld pursuant to/removed as

s.13

Page 120 of 480

Withheld pursuant to/removed as

s.13

KERR WOOD LEIDAL
consulting engineers

Okanagan
202 - 3334 30th Avenue
Vernon, BC V1T 2C8
T 250 503 0841
F 250 503 0847

Water Management Plan

Prepared for:

Lot 46 Management Society

January 2021
KWL Project No. 3691.003

Contents

1. Introduction 1-1
1.1 Project Background and Rationale 1-1
1.2 Authorizations, Permits, and Approvals 1-1
1.3 First Nations 1-2

2. Site Location and Context 2-1
2.1 Land Ownership and Land Use 2-1
2.2 Aquatic Habitat and Species 2-1

3. Dredging Operation 3-1
3.1 Sequence and Description of Works 3-1
3.2 Dredging Considerations 3-2
3.3 Dewatering and Water Management 3-3
3.4 Dredging Frequency/Schedule 3-3

4. Environmental Impacts and Mitigation 4-1
4.1 Potential Environmental Impacts 4-1
4.2 Environmental Protection and Mitigation Measures 4-1

5. Reporting 5-1
5.1 Completion Report 5-1
5.2 Fish, Shellfish, and Amphibian Survey 5-1
5.3 Environmental Monitoring Report 5-1
5.4 Fish Salvage Data 5-1
5.5 Conservation Data Centre Report 5-2
5.6 Archaeological Findings 5-2

6. Monitoring and Maintenance 6-1

7. Closure 7-1
Report Submission 7-1

References 7-1

Figures

Figure 1: Location Plan 1-3

Tables

Table 1: Fish Species Present in Shuswap Lake, Mara Lake, Shuswap Narrows, Shuswap River, & Eagle River 2-2
Table 2: Potential Dredging Methods 3-2

Appendices

Appendix A: Site Photographs
Appendix B: Summary of Notification and Reporting Requirements
Appendix C: Sample Notification Template

1. Introduction

1.1 Project Background and Rationale

The Lot 46 Management Society (the Society) is composed of 17 homeowners who own properties on Silver Sands Road in Sicamous, BC. The properties are located along the east side of an artificial lagoon connected to Shuswap Lake, just north of the RW Bruhn Bridge (Highway 1 crossing; see Figure 1). The Society manages the lagoon and members have private docks for boat access to the lake. Sediment accumulates in the lagoon and the Society needs to dredge the lagoon to facilitate navigation of boats from private docks to the lake. This Water Management Plan provides operational guidance for the periodic dredging of the Lot 46 Lagoon, including measures to mitigate the potential impacts to water quality, aquatic habitat, fish, and other wildlife.

1.2 Authorizations, Permits, and Approvals

Existing Water Licence

The Society currently holds water licence C129749 which authorizes a maximum of 0.28 cubic metres per second (10 cubic feet per second) to be diverted through a diversion structure (point of diversion number PD52869) and pipe from the Eagle River into the constructed lagoon. See Figure 1 for a plan view of the licensed works.

A letter from the BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licensed works under their water licence. As a condition, the MFLNRO Regional Water Management Branch requires the Society develop a Water Management Plan (this plan) to guide the dredging operations.

Amendment of the existing water licence to include this plan may result in the current licence C129749 being superseded by a new licence number. Any reference made herein to the existing licence should be considered to also include any licence issued in substitution thereof.

Other Permits and Approvals

A fish and amphibian salvage within the lagoon is required prior to dewatering and dredging. In order to conduct a salvage, the Society must obtain a Licence to Fish for Scientific Purposes from Fisheries and Oceans Canada (DFO) and a Scientific Fish Collection Permit from MFLNRO.

In order for dredging to proceed without requiring a review by DFO, the following conditions must be met:

- No temporary or permanent increase in the existing area of the lagoon below the high water mark;
- Dredged material is deposited and stabilized on land;
- Dredging has occurred in the last 10 years; and
- No dredging where SARA-listed shellfish occur except where exempted in the recovery strategy for that species.

It should be noted that compliance with this Water Management Plan satisfies the requirements of the BC *Water Sustainability Act* as it pertains to the water licence. It does not exempt the Society or the

Contractor from familiarizing themselves with and adhering to all other Provincial and Federal regulations applicable to the works.

1.3 First Nations

The following First Nations have traditional territory and/or interests in or nearby the project area (MOE 2016c):

- Neskonlith Indian Band;
- Secwepemc First Nation (falls within Secwepemc Reconciliation Framework Agreement Boundary);
- Okanagan Indian Band;
- Adams Lake Indian Band;
- Little Shuswap Indian Band; and
- Splatsin.

The dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis. As such, there is no expectation to consult with First Nations. However, in the interests of continued good relationships, the Society envisions contact with local First Nations contacts prior to any operation to learn if there are any potential conflicts with the operation.

Copyright

2. Site Location and Context

The following section outlines the context and characteristics of the project site.

2.1 Land Ownership and Land Use

Land use around the lagoon is a mix of single family residential and recreational. Lot A District Lot 452 Kamloops Division Yale District Plan KAP52709, the lot being excavated, is private property owned by the Society.

Adjacent land owners will be notified with sufficient time to prepare for dredging operations. It is anticipated that three (3) months would be sufficient, but there may be particular circumstances that dictate otherwise. These special circumstances will be reviewed on a case-by-case basis.

2.2 Aquatic Habitat and Species

Aquatic Habitat

The constructed lagoon is primarily used for private moorage and is approximately 320 m long and 60 m wide with a surface area of approximately 18,700 m^2. It is approximately 3 m deep at its deepest point, with an average depth of roughly 1.5 m during low water.

The lagoon is currently fed by water from Eagle River via a diversion structure and pipe. The point of diversion from the river is located 2.9 km upstream from its confluence with Shuswap Lake. At the point of diversion, the bank full channel width of the Eagle River is approximately 60 m. Due to the relatively small rate of diversion, water in the lagoon is slow-flowing to stagnant. Substrates are mainly sands and silts which contribute to the ongoing accumulation of sediment in the lagoon. The shoreline is mainly sand. There is a small amount of vegetated shore along the south end of the lagoon, where grasses and some small shrubs grow to near the high water mark. In October 2016, there were no obvious aquatic plants growing in the lagoon.

Water from the lagoon exits into Shuswap Lake through a shallow outlet (approximately 12 m wide) immediately downstream of Sicamous Narrows. Sicamous Narrows is the short canal-like channel that connects Mara Lake with Shuswap Lake.

Fish and Other Wildlife

Table 1 provides the result of a desktop study to indicate the fish species present in the waterbodies that are connected with and nearby to the lagoon: Shuswap Lake, Mara Lake (including Sicamous Narrows), the Shuswap River (upstream of Mara Lake), and the Eagle River. These species may or may not be present in the lagoon.

Table 1: Fish Species Present in Shuswap Lake, Mara Lake, Shuswap Narrows, Shuswap River, & Eagle River

Common Name	Code	Latin Name	Species at Risk Status		
			BC List	COSEWIC	SARA
Bridgelip Sucker	BSU	*Catostomus columbianus*	Yellow	-	-
Bull Trout	BT	*Salvelinus confluentus*	Blue	SC (2012)	-
Burbot	BB	*Lota lota*	Yellow	-	-
Carp	CP	*Cyprinus carpio*	Exotic	-	-
Chinook Salmon	CH	*Oncorhynchus tshawytscha*	Yellow	-	-
Chiselmouth[1]	CMC	*Acrocheilus aclutaceus*	Blue	NAR (2003)	-
Coho Salmon (Interior Fraser population)	CO	*Oncorhynchus kisutch*	Yellow	T (2016)	-
Dolly Varden	DV	*Salvelinus malma*	Yellow	-	-
Emerald Shiner	ESC	*Notropis atherinoides*	Unknown	-	-
Kokanee	KO	*Oncorhynchus nerka*	Yellow	-	-
Lake Chub	LKC	*Couesius plumbeus*	Yellow	DD	-
Lake Trout	LT	*Salvelinus namaycush*	Yellow	-	-
Largescale Sucker	CSU	*Catostomus macrocheilus*	Yellow	-	-
Leopard Dace	LDC	*Rhinichthys falcatus*	Yellow	NAR (1990)	-
Longnose Dace	LNC	*Rhinichthys cataractae*	Yellow	-	-
Longnose Sucker	LSU	*Catostomus catostomus*	Yellow	-	-
Mountain Whitefish	MW	*Prosopium williamsoni*	Yellow	-	-
Northern Pikeminnow	NSC	*Ptycheilus oregonensis*	Yellow	-	-
Peamouth Chub	PCC	*Mylocheilus caurinus*	Yellow	-	-
Pink Salmon	PK	*Oncorhynchus gorbuscha*	Yellow	-	-
Prickly Sculpin	CAS	*Cottus asper*	Yellow	-	-
Pygmy Whitefish (Pacific populations)	PW	*Prosopium coulteri*	Yellow	NAR (2016)	-
Rainbow Trout	RB	*Oncorhynchus mykiss*	Yellow	-	-
Redside Shiner	RSC	*Richardsonius balteatus*	Yellow	-	-
Slimy Sculpin	CCG	*Cottus cognatus*	Yellow	-	-
Sockeye Salmon	SK	*Oncorhynchus nerka*	Yellow	-	-
Steelhead	ST	*Oncorhynchus mykiss*	Yellow	-	-
Westslope Cutthroat Trout (Pacific populations)	WCT	*Oncorhynchus clarki lewisi*	Blue	SC (2016)	1-SC (2010)
White Sturgeon (Upper Fraser River Population)	WSG	*Acipenser transmontanus*	Yellow	E (2012)	-
White Sucker	WSU	*Catostomus commersoni*	Yellow	-	-

Sources: MOE 2016a, MOE 2016b
[1]One Chiselmouth sampled in 1964 at northern outlet of Mara Lake at the beginning of Shuswap Narrows (CDC 2016)

It is unlikely that salmon, trout, or char use the lagoon to spawn due to the accumulation of fine sediments and frequent boat traffic in the lagoon. Based on *Shuswap Lake System and Adams Lake - Lake Char and Sockeye Spawning Atlas Overview Map* (DFO 2005), there is no spawning of Sockeye or Char (i.e., Bull Trout and Dolly Varden) in the lagoon or on the adjacent shoreline of Shuswap Lake.

Five fish species present or with potential to be present in Shuswap Lake and other nearby waterbodies are federally- or provincially-listed species at risk:

- Bull Trout (Salvelinus confluentus) are a blue-listed species in BC. Blue-listed species are Species of Special Concern (formerly Vulnerable) in BC and have characteristics which make them especially sensitive or vulnerable to natural or anthropogenic events (MOE 2016a). Bull Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on habitat characteristics and the extent of known spawning areas (DFO 2005).
- Chiselmouth (*Acrocheilus aclutaceus*) are also blue-listed Species of Special Concern in BC. One Chiselmouth was sampled in 1964 at the mouth of Mara Lake as it entered Shuswap Narrows (CDC 2016). Chiselmouth are absent form sites with maximum temperatures below 20 °C (Rosenfeld et al. 2001). Adults need deep, fast flowing water with substrate that supports periphyton (i.e., boulder and cobble; Rosenfeld et al. 1998). Juveniles need slow-moving backwater habitat and are usually found where there are aquatic plants, which provide habitat for food (invertebrates) and cover from predators (COSEWIC 2003, Rosenfeld 2003). Based on these requirements, it is highly unlikely that adult Chiselmouth use the lagoon, and possible that juveniles are present.
- Interior Fraser populations of Coho Salmon (*Oncorhynchus kisutch*) were re-assessed as Threatened (downgraded from Endangered) by the Committee of the Status of Endangered Wildlife in Canada (COSEWIC) in 2016 but have not been added to Schedule 1 of the *Species at Risk Act*. Coho fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- Pacific populations of Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*) were reconfirmed as a Species of Special Concern by COSEWIC in 2016 and are a Schedule 1 Species of Special Concern of the *Species at Risk Act* (SARA). Under SARA, species of special concern are defined being particularly sensitive to human activities or natural events but are not endangered or threatened. This species is also blue-listed in BC. Westslope Cutthroat Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- The Upper Fraser River population of White Sturgeon (*Acipenser transmontanus*) was assessed as Endangered by COSEWIC in 2012. It has been recorded in Kamloops Lake, and may occasionally enter the Thompson River system. However, it is very unlikely that White Sturgeon would be present in the lagoon based on its small size and habitat characteristics (COSEWIC 2012).

Western Painted Turtle (*Chrysemys picta bellii*) has been observed on the Eagle River just north of the project site (CDC 2016). These populations are part of the Intermountain - Rocky Mountain population that was reconfirmed as a Species of Special Concern by COSEWIC in 2016 and is a Schedule 1 Species of Special Concern under SARA. It is also blue-listed in BC. Because Western Painted Turtles can move up to several hundred metres by land (Gregory and Campbell 1987, COSEWIC 2006), they have the potential to feed, mate, and nest in the lagoon. The turtles begin mating in spring soon after the end of hibernation and begin nesting in June (Schwarzkopf and Brooks 1987, Ernst et al. 1994, COSEWIC 2006). Successful mating peaks in late summer and early fall (Gist et al. 1990). Females dig 10 cm deep nests on open south-facing slopes (Schwarzkopf and Brooks 1987, Weisrock and Janzen 1999). Eggs incubate for 72–104 days in the Pacific Northwest (Nussbaum et al. 1983). After

hatching in later summer and early fall, turtle hatchlings stay in the nest until the next spring (Gregory and Campbell 1987, St. John 2002). Adults hibernate over the winter in the muddy bottoms of streams and ponds, old mammal burrows, or other shelter (Cohen 1992).

The only shellfish listed under the *Species at Risk Act* that is present in the Okanagan drainage is the Rocky Mountain Ridged Mussel (*Gonidea angulata*), listed as a Species of Special Concern. In recent searches, *Gonidea angulata* was found as far north as Okanagan Lake near Vernon (COSEWIC 2010). Portions of the Shuswap watershed have not been surveyed for *Gonidia angulata* as of 2011 (DFO 2010b).

It is possible that amphibians use the lagoon for breeding or refuge. However, due to frequent boat traffic, it is not ideal habitat.

Migratory birds may use the grass and shrub area at the south end of the lagoon for foraging and breeding. Waterfowl use the lagoon for refuge and possibly for foraging.

3. Dredging Operation

3.1 Sequence and Description of Works

Dredging operation will proceed in the following sequence:

1. Installation of Erosion and Sediment Control Measures

Erosion and sediment control measures should be installed prior to starting dredging works, following any recommendations of the Qualified Environmental Professional (QEP). Additional supplies for erosion and sediment control should be stockpiled on site in case they are required.

2. Isolation of Lagoon

Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: water-filled flood barriers, sand-bag coffer dams, or sheet pile coffer dams. The preference is for methods that minimize the disturbance to sediment and aquatic life (i.e., flood barriers). The diversion structure will be isolated using the knife-valve at its inlet (Appendix B, Photo 4).

Isolation methods used for dredging works should follow the recommendations of the QEP as outlined in the Fish, Shellfish, and Amphibian survey report (refer to Section 5.2). Water filled flood barriers are currently the preferred method; if an alternative method is proposed it should be included in the survey report and signed off on by the QEP.

3. Fish Salvage

After isolation, an initial fish salvage will be conducted by a QEP who may also be the Environmental Monitor (EM). Salvage methods should be appropriate for the depth of water in the lagoon. Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.

4. Dewatering

After the initial fish salvage, dewatering should proceed immediately. Fish salvaging should continue as the lagoon is dewatered. Adequate pumping capacity should be retained in order to complete dewatering as quickly as possible. Water will be discharged over the isolation dam into Shuswap Lake.

5. Excavation and Grading

After complete salvage and dewatering, the EM will complete a review of the area to determine if there are any outstanding environmental concerns which need to be addressed.

Once the EM has approved the site for further work, dredging may begin. Dredging should commence only after the lagoon is fully isolated from flowing water and can continue only if this isolation is maintained.

Dredging will be completed by conventional equipment and be subject to review by the EM. Refer to Section 3.2 for additional considerations when selecting equipment and dredging methods.

6. Rewatering Lagoon and Removal of Isolation Measures

The lagoon should be refilled and isolation measures removed in a manner so as to minimize the suspension of sediment in the water column and movement into Shuswap Lake.

7. Resume Normal Operation of the Lagoon

Once the lagoon has been filled to the level of the Shuswap lake, normal operation will continue.

3.2 Dredging Considerations

Engineering Specifications

The lagoon will be restored to original design parameters of a trapezoidal geometry consisting of minimum 4H:1V side slopes and flat bottom.

Machinery

The contractor shall decide what machinery is most appropriate for the works. It is assumed that conventional excavators and machinery will be used after isolation and dewatering of the lagoon is complete. The machinery will be clean and in satisfactory condition to undertake the work in a sensitive environment. The EM will review and approve equipment prior to the commencement of construction.

Table 2: Potential Dredging Methods

Method	Description	Construction Considerations
Hydraulic Dredging	Adding large amounts of process water to the sediments in order to suspend fine materials in a slurry, and then pumping the slurry to a location where it can be dewatered or stored. This method is typically used in open water bodies and is cost effective for large, deep dredging operations. Requires large, specialized dredging vessels. Hopper dredges are able to store and transport the slurry on board, pipeline dredges discharge the slurry to a dewatering location.	• Does not require isolation or dewatering of the water body. • Most suitable for large water bodies and fine sediments. • Disposal of sediments is more challenging in slurry form; this may require dewatering systems or temporary detention areas (off site). • No permanent structures required.
Mechanical Dredging	Physically picking up sediments up by means of excavator or clamshell buckets and unloading on shore. This method is popular because it requires only conventional construction equipment, is a fast process, and can accurately remove material. If the body of water can be isolated and drained, excavator access can be significantly improved. If the lagoon is not fully dewatered, this may require additional access measures such as building sand bars across the water body. Mechanical dredging has been the preferred method for dredging the lagoon in the past.	• Requires dry space on the water's edge for an excavator to operate. • Most suitable for smaller water bodies or locations where rock is of concern. • Limited by the reach of an excavator and may require temporary structures such as sand bars in the water body. • Temporary isolation structures required to facilitate draining or dewatering of the water body.

Disposal of Dredged Material

Dredged material should be disposed of on land and at an off site location. Disposal must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites Regulation and Hazardous Waste Regulation, and with any appropriate local government bylaws regarding the removal and deposition of spoil and dredged material.

3.3 Dewatering and Water Management

Isolation Measures

The isolation measures will be constructed according to the EM and will be designed to safely hold back water from entering the lagoon when fully dewatered without failure. This may be accomplished with an aqua-dam, sandbag dam, coffer dam, or other suitable method.

The knife valve on at the diversion structure from the Eagle River will be closed to isolate the lagoon from the river prior to fish salvage.

The contractor will keep a silt curtain on site and use it if necessary when installing or removing the dam to prevent silt from entering Shuswap Lake.

Pumping Capacity

The contractor shall ensure that they have sufficient pumping capacity to dewater the lagoon as quickly as possible.

Discharge Location

During dewatering, discharge water should be managed and directed to an area where it will not cause erosion or carry sediment-laden water into Shuswap Lake. If discharge water becomes turbid (likely near the end of dewatering), a silt curtain should be placed between the discharge location and the rest of Shuswap Lake. The contractor should ensure that they have adequate length of pipe or hoses so that the intakes can be situated in the deepest part of the lagoon and the discharge hose can be situated in an appropriate area as outlined above.

3.4 Dredging Frequency/Schedule

Dredging should be carried out only when necessary to ensure residents can navigate safely. If dredging is required frequently (i.e., annually), the Lot 46 Management Society should investigate the source and mechanism of the sedimentation and take steps to reduce the rate of accumulation of sediment within the lagoon so that the frequency of dredging can be reduced.

4. Environmental Impacts and Mitigation

4.1 Potential Environmental Impacts

The dredging operations may have the following environmental impacts (DFO 2010a):

- Removal or change in aquatic plants, leading to change in food supply, nutrients concentrations, and habitat structure;
- Sediment being suspended in water, leading to change in sediment concentrations and contaminant concentrations;
- Modification of channel or shoreline shape leading to change in stability and hydraulics, influencing substrate, leading to a change in food supply and habitat structure; and
- Direct injury to fish, amphibians, reptiles, or other aquatic organisms from machinery or materials. The Society shall be responsible to notify DFO of direct injury to fish, amphibians, reptiles, or other aquatic organisms under S.38(4) of the Fisheries Act.

4.2 Environmental Protection and Mitigation Measures

To mitigate the potential impacts listed above, dredging works should follow provincial Standards and Best Practices for Instream Works (MFLNRO and DFO 2010a, MFLNRO and DFO 2010b), including any document issued in substitution thereof. These and other guidelines to follow are listed below.

Project Planning

- Notify consultants with the intention to dredge at least three months before the expected start date, to allow enough time for a QEP to obtain fish salvage permits.
- FLNRORD should also be notified of the intention to dredge 3 months before the expected start date. This is intended as an informal, courtesy notification only and will allow time to resolve any unexpected complications or changes in regulations and best management practices if necessary.

  Phone (1-877-855-3222) or Email (FrontCounterBC@gov.bc.ca) attn: Water Stewardship Officer.

Timing

- Dredging is anticipated at low water levels, typically seen in late summer to fall.
- Works in the lagoon should be completed from July 22 to April 1, the reduced risk timing window for instream works in Shuswap Lake for areas with no sockeye of char spawning (MFLNRO 2015).
- Timing of the works shall also take into account any QEP recommendations from the fish, shellfish, and amphibian survey report as outlined in Section 5.2.
- The nesting window for migratory birds in Sicamous is April 1 to August 17 (Environment and Climate Change Canada 2016). Machinery should not drive through grass or shrub areas where migratory birds may be nesting during this period, and no clearing of vegetation should occur during this period. If disturbance of vegetation is required during this period, a QEP must conduct a breeding bird survey. Any areas where there are active or suspected nests must be flagged off and not disturbed during works.

Erosion and Sediment Control

- The contractor should use appropriate erosion and sediment control measures to intercept and manage runoff and reduce the likelihood for soils to erode and the potential for sediment to enter nearby waterbodies. Set up measures before beginning other work, following any recommendations made by the QEP. Measures may include but are not limited to:
  - Using a silt curtain when installing or removing isolation measures to prevent silt from entering Shuswap Lake;
  - During dewatering, using a silt curtain between the discharge location and the rest of Shuswap lake to keep sediment from moving into the lake;
  - Covering spoil/dredged material with plastic sheeting and set up silt fencing around piles, if material is being stored temporarily;
  - Placing spoil/dredged material where it will not erode into a waterbody or storm sewer;
  - Keeping additional erosion and sediment control supplies on site in case of an unexpected storm or other event;
  - Regular inspection of measures and modification/repair when necessary; and
  - Maintenance of effective erosion and sediment control measures on any disturbed upland banks until banks are revegetated.

Site Access

- Machinery should access the site using existing roads, trails, and boat ramp to avoid disturbance to vegetation (see Figure 1).
- Avoid disturbance to the riparian area along the shoreline and protect trees, shrubs and grasses. Note that any harmful alteration, disruption or destruction of habitat is a violation of S.35(1) of the Fisheries Act.

Weather

- The contractor should monitor weather forecasts and avoid work during periods of heavy rain.
- Avoid construction or removal of isolation dam when Shuswap Lake has large waves or when high wind is in the forecast.

Environmental Monitoring

- Dredging activities should be monitored by a QEP for the duration of the project, and full-time during sensitive works. Sensitive works include the installation and removal of the isolation measures, dewatering, and initial excavation.
- Water quality monitoring will be required during sensitive works, particularly where return water is being discharged into Shuswap Lake, and as otherwise directed by the QEP. At a minimum, turbidity shall be monitored and recorded per BC Water Quality Guidelines. Other parameters such as pH shall be monitored at the discretion of the EM.

Protection of Fish and Other Aquatic Organisms

- Before starting work, the QEP should survey the site for any fish, shellfish, reptiles, or amphibians, especially Western Painted Turtles. If any are found, they should be moved to a safe location away from the work site according to provincial best management practices. They should also look for signs of Western Painted Turtle mating or nesting. If a nest or potential nest is discovered, it should be flagged off and should not be disturbed during dredging operations. Ideally, the EM should survey the site in late summer/early fall at least 1 week prior to works.
- Based on the survey, the QEP shall prepare a report outlining any additional mitigation measures, the appropriate timing window for the work, and the recommended isolation measures to be used.
- A QEP should complete a fish and amphibian salvage according to provincial best practices prior to any works below the high water mark.
- Salvage methods should be appropriate for the depth of water in the lagoon.
- Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.
- All dewatering pump intakes must have fish screens with a maximum screen opening of 2.54 mm (0.10 inches) to prevent fish impingement.
- The contractor should make every effort to dewater the lagoon as quickly as possible. The contractor shall ensure that they have sufficient pumping capacity. This will minimize the time that fish may be isolated within the lagoon in water with no flow.
- The dewatering pump intakes should be situated in the deepest location of the lagoon before dewatering, so that the intake does not need to be moved multiple times. This will minimize the disturbance of sediment and fish that may still be in the lagoon during dewatering.
- The salvage crew should stay on site from the beginning of dewatering until the lagoon is completely dewatered. If fish, amphibians, or reptiles remain in the lagoon during or after dewatering, they should be captured using dip nets and moved to a safe location outside the work area as quickly as possible.
- After partial dewatering, the EM should survey the banks and soft substrate of the exposed lagoon for Rocky Mountain Ridged Mussells (*Gonidea angulata*). If found, work should cease immediately and the client should contact DFO for guidance on how to proceed.

Dredged Material

- Return water (water draining from saturated sediment that has been dredged and placed on land temporarily) should be treated with settling basins or other appropriate means so that the concentration of total suspended solids is minimized before returning to the lagoon or Shuswap Lake.
- Return water should not enter the Eagle River.
- Dredged material must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites and Hazardous Waste regulations, and with any appropriate local government bylaws regarding spoil.
- Dredged material should not be used to infill the shoreline or adjacent wetland areas.

Operation of Machinery

- Beside and within the lagoon, operate machinery in a manner that minimizes the disturbance to the banks and upland areas around the lagoon.
- Only use the existing boat access ramp to move machinery from the access path into the lagoon.

Contamination and Spill Management

- Prevent the discharge of silt, sediment, sediment-laden water, or any other deleterious substance into the lagoon, Eagle River, Shuswap Lake, or any ditch or storm sewer that flows into these waterbodies.
- Ensure machinery is clean (power washed), in good working condition, and free of leaks, excess oil, grease, and seeds or tissue of noxious weeds.
- Do not refuel or service equipment within 30 m of a water body, including the lagoon.
- Keep a spill containment kit on site and ensure all staff are trained it its use. Immediately report any substance of reportable quantities that is harmful to aquatic life to the Environmental Emergency Management Plan Incident Reporting Hotline at 1-800-663-3456 and DFO's Observe, Record and Report hotline at 1-800-465-4336.
- Place generators and pumps inside fuel containment trays to contain any accidental spills of fuel or oil.

Post-operation

- If the banks of the lagoon are disturbed during construction, restore them to their original grade and condition.
- Stabilize any exposed areas such as shoreline by planting and seeding with native trees, shrubs, and/or grasses and mulching to prevent erosion. Grass can be planted by hydro-seeding or broadcast seeding and mulching.

5. Reporting

The following reporting is the responsibility of the Society to retain and must be completed each time dredging is undertaken. The Society will be prepared to provide a copy of the completion reporting and EMR to regulatory officials, if requested.

5.1 Completion Report

The Society will prepare a completion report outlining the following:

- Start and end date of works, including dates of work sequence tasks in Section 3.1;
- Extent of dredging;
- Depth (with location) of lagoon prior to and after dredging;
- Specific construction methods used (e.g., isolation methods);
- Volume of dredged materials; and
- Location and details about where dredged materials were disposed of.

5.2 Environmental Monitoring Report

Upon completion of the work, the EM should prepare an environmental monitoring report outlining the following:

- Description of works;
- Timing of works;
- Surface area below the high water mark affected;
- Dates of monitoring;
- Any non-compliance with this management plan, the water licence, or relevant provincial or federal best management practices or guidance documents;
- Description of any incidents, difficulties, or spills, and how they were addressed and reported;
- Dates and details of any fish or wildlife salvages, including time of day, location, capture methods, location of release, species and number of animals captured and released, any fatalities, and the numbers of the required licences to capture fish and/or wildlife;
- A record of all water quality measurements and any deviations from BC Water Quality Guidelines;
- A summary of any other actions taken; and
- Recommended updates or amendments for this Water Management Plan.

5.2.1 Fish, Shellfish, and Amphibian Survey

Prior to completing any isolation or dredging works, the QEP is required to perform a fish, shellfish, and amphibian survey (refer to Section 4.2). A summary report should be prepared by the QEP, covering the findings of this survey and impacts on the dredging operation:

- Any additional mitigation measures required;
- Appropriate timing window for the work;
- Recommended isolation method to be used.

5.2.2 Fish and Amphibian Salvage Data

If a fish and amphibian salvage is conducted, the EM should report the results of the salvage to DFO and the MFLNRO in the appropriate format required by the ministry.

5.2.3 Conservation Data Centre Report

If any Species at Risk (those outlined in Section 2.2 or otherwise) are observed or salvaged during dredging or as a result of associated monitoring, these should be reported to the BC Conservation Data Centre.

5.3 Archaeological Findings

The provincial *Heritage Conservation Act* protects archaeological sites within BC. The Archaeology Branch of MFLNRO oversees the enforcement of the Act. Because the lagoon is man-made, it is unlikely that archaeological sites will be discovered during dredging as long as it does not disturb sediment below the depth of the original excavation. If, while dredging, a potential archaeological site is found, work should cease immediately, and the contractor should contact the Archaeology Branch at 250-953-3334. A professional archaeologist will be required to assess the site and determine if further investigation or permitting is required.

6. Monitoring and Maintenance

The depth of the lagoon should be monitored by the Society annually in at least four locations (mouth, middle, head, under specific docks, etc.) and the depths recorded. These depths should be reported in the completion report following subsequent dredging.

The Society should also monitor the diversion structure and piping to ensure that it is operating in a manner to minimize the amount of sediment entering the lagoon from the Eagle River.

7. Closure

We trust that this Water Management Plan meets your requirements at present. Please do not hesitate to contact KWL at DMeredith@kwl.ca or 250-503-5817 if you have any questions or concerns.

Report Submission

Prepared by:

KERR WOOD LEIDAL ASSOCIATES LTD.

Patrick Lilley, M.Sc., R.P.Bio.
Senior Biologist

January 21, 2021

Dwayne Meredith, B.Sc., P.Ag.
Project Manager
Sector Leader – Water Resources

Statement of Limitations

This document has been prepared by Kerr Wood Leidal Associates Ltd. (KWL) for the exclusive use and benefit of LOT 46 MANAGEMENT SOCIETY for the Water Management Plan. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document.

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.

Copyright Notice

These materials (text, tables, figures and drawings included herein) are copyright of Kerr Wood Leidal Associates Ltd. (KWL). LOT 46 MANAGEMENT SOCIETY is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to Water Management Plan. Any other use of these materials without the written permission of KWL is prohibited.

Revision History

Revision #	Date	Status	Revision	Author
1	January 20, 2021	Revised	Incorporated input from MFLNRO and DFO reviews	PIC
0	May 11, 2017	Final	Issued for Use	DWM
A	January 18, 2017	Draft	Issued for client review	LTW/PL

OQM | Organizational Quality Management Program

References

Conservation Data Centre (CDC). 2016. Species and Ecosystems at Risk – Publically Available Occurances. iMapBC Provincial Layer. Available at: http://maps.gov.bc.ca/ess/sv/imapbc//. Accessed: December 2016.

COSEWIC. 2003. COSEWIC assessment and update status report on the chiselmouth *Acrocheilus alutaceus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 22 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

COSEWIC. 2006. COSEWIC assessment and status report on the Western Painted Turtle *Chrysemys picta bellii* (Pacific Coast population, Intermountain-Rocky Mountain population and Prairie/Western Boreal - Canadian Shield population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 40 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2012. COSEWIC assessment and status report on the White Sturgeon *Acipenser transmontanus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxvii + 75 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

Environment and Climate Change Canada. 2016. General Nesting Periods of Migratory Birds in Canada. Available at: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4f39a78f-1. Accessed: January 2017.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Canada, Smithsonian Institution Press, Washington, D.C.

Fisheries and Oceans Canada (DFO). 2005. Shuswap Lake System and Adams Lake Lake Char and Sockeye Spawning Atlas Overview Map. Available at: http://www.shim.bc.ca/shuswap/. Accessed: December 2016.

Fisheries and Oceans Canada (DFO). 2010a. Management Plan for the Rocky Mountain Ridged Mussel (*Gonidea angulata*) in Canada [Final]. Species at Risk Act Management Plan Series. Fisheries and Oceans Canada, Vancouver. iv + 52 pp.

Fisheries and Oceans Canada (DFO). 2010b. Pathways of Effects – Dredging. Available at: http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/dredging-dragage-eng.html. Accessed: December 2016.

Gist, D.H., J.A. Michaelson, and J.M. Jones. 1990. Autumn mating in the painted turtle, Chrysemys picta. Herpetologica 46:331-336.

Gregory, P.T. and R.W. Campbell. 1987. The Reptiles of British Columbia. British Columbia Provincial Museum Handbook. Ministry of Provincial Secretary and Government Services, Victoria, B.C. 102 pp.

Ministry of Environment (MOE). 2016a. BC Species and Ecosystem Explorer. Available at: http://a100.gov.bc.ca/pub/eswp/. Accessed: December 2016.

Ministry of Environment (MOE). 2016b. Habitat Wizard Stream and Lake Reports. Available at: http://maps.gov.bc.ca/ess/sv/habwiz/. Accessed: December 2016.

Ministry of Environment (MOE). 2016c. Consultative Area Database Public Map Service. Available at: http://maps.gov.bc.ca/ess/sv/cadb/. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2015. Regional Terms & Conditions & Timing Windows for Thompson Region. Available at: http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/work_windows_thompson.pdf. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010a. Standards and Best Practices for Instream Works General BMPs & Standard Project Considerations. Version 1.0.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010b. Standards and Best Practices for Instream Works Channel Maintenance. Version 1.0.

Nussbaum, R.A., E.D. Brodie and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow, ID. 332 pp.

Rosenfeld, J.S, B. Wicks, M. Porter, and P. VanDishoek. 1998. Habitat Use by Chiselmouth (*Acrocheilus alutaceus*) in the Blackwater River. Prov. of BC Fish. Proj. Rep. RD 76.

Rosenfeld, J.S., M. Porter, M. Pearson, B. Wicks, P. Van Dishoeck, T. Patton, E. Parkinson, G. Hass, and J. D. McPhail. 2001. The influence of temperature and habitat on the distribution of chiselmouth *Acrocheilus alutaceus* in British Columbia. Environmental Biology of Fishes 62:401-413.

Rosenfeld, Jordan. 2003. Update COSEWIC status report on the chiselmouth, *Acrocheilus alutaceus*, in Canada. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Ottawa. 1-22 pp.

Schwarzkopf L., and R.J. Brooks. 1987. Nest-site selection and offspring sex ratio in painted turtles, Chrysemys picta. Copeia 1987:53-61.

St. John, A. 2002. Reptiles of the Northwest: British Columbia to California. Lone Pine Publishing, Edmonton, AB. 272 pp.

Weisrock, D.W. and F.J. Janzen. 1999. Thermal and fitness-related consequences of nest location in painted turtles (*Chrysemys picta*). Functional Ecology 13(2): 94-101.

Appendix A

Site Photographs

Appendix A – Site Photographs

Date Photographs Taken: October 26, 2016

Photo 1: Looking west from the access gate of the lagoon towards the mouth, with Shuswap Lake in the background (see Figure 1).

Photo 2: Looking north from the shore of the lagoon towards its head.

Appendix A – Site Photographs

Photo 3: Looking northeast from left bank of Eagle River at the Point of Diversion (PD 52869), showing knife valve on the intake.

Photo 4: Knife valve on intake from the Eagle River at the Point of Diversion (PD 52869).

Appendix A – Site Photographs

Photo 5: Location at head of the lagoon where the diversion pipe enters.

Photo 6: Outlet of diversion pipe at the head of the lagoon.

Appendix A – Site Photographs

Photo 7: Looking northeast into the lagoon from the mouth of the lagoon.

Photo 8: Looking northwest across the mouth of the lagoon, where the temporary isolation dam will be installed.

Appendix A – Site Photographs

Photo 9: Looking southwest from mouth of lagoon at Shuswap Lake, where temporary isolation dam will be installed.

Photo 10: Looking southwest, showing site access point from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Appendix A – Site Photographs

Photo 11: Looking west, showing access gate along access path from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Photo 12: Looking northeast, showing site access from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Appendix B

Summary of Notification and Reporting Requirements

Summary of Notification and Reporting Requirements

Prior to Maintenance Works	
Notify Ministry of Forests, Lands and Natural Resource Operations and Rural Development Phone (1-877-855-3222) or Email (FrontCounterBC@gov.bc.ca)	This is intended as an informal, courtesy notification only and will allow time to resolve any unexpected complications or changes in regulations and best management practices if necessary.
Notify First Nations in Project Area • Neskonlith Indian Band; • Secwepemc First Nation; • Okanagan Indian Band; • Adams Lake Indian Band; • Little Shuswap Indian Band; and • Splatsin	In the interests of continued good relationships, the Society envisions contact with local First Nations contacts prior to any operation to learn if there are any potential conflicts with the operation. Refer to sample Notification Template in Appendix C.
Perform Fish, Shellfish, and Amphibian Survey	Prior to completing any isolation or dredging works, the Qualified Environmental Professional is required to perform a fish, shellfish, and amphibian survey

Maintenance Sequence

**Timing of the maintenance program should also take into account any Qualified Environmental Professional recommendations from the fish, shellfish, and amphibian survey report.*

1. Installation of Erosion and Sediment Control Measures
2. Isolation of Lagoon
3. Fish Salvage by Environmental Monitor or Qualified Environmental Professional
4. Dewatering
5. Excavation and Grading
6. Rewatering Lagoon and Removal of Isolation Measures
7. Resume Normal Operation of the Lagoon

Post-Maintenance Reporting	
Completion Report	Summarizing the timing, methods, and extent of the works completed during the maintenance program.
Environmental Monitoring Report	Prepared by the Environmental Monitor
Fish and Amphibian Salvage Data	A summary report should be prepared by the QEP, covering the findings and impacts of this survey.
Report to BC Conservation Data Centre	Applicable if any Species at Risk are observed/salvaged.

**Provide a copy of the reporting to regulatory officials, if requested.*

Appendix C

Sample Notification Template

Date: _____

To:

From: Lot 46 Management Society
1428 Silver Sands Road
Sicamous, BC

Notification of Dredging Maintenance

This letter is to notify your organization of upcoming dredging works at the Lot 46 Management Society Lagoon in Sicamous BC. The lot being excavated is private property owned by the Society. This maintenance is part of the licensed works covered under the Society's current water licence and will comply with all relevant Provincial and Federal regulations applicable to the works.

This notification is a courtesy on behalf of the Lot 46 Management Society intended to minimize service interruptions or conflicts to any concurrent works planned by your organization. Please contact the individual listed below if you have any questions about of the information presented herein.

Location (Legal Description): Lot A District Lot 452 Kamloops Division Yale District Plan KAP52709

Estimated Maintenance Dates: _____

Description of Maintenance Work: _____

_____

_____

_____

_____

Contact for Inquiries: _____

_____

_____

Job Summary

vFCFC Tracking Number	100308711	Date Application Received	2020-01-23
Application Type	Amendment	Water Source Type	Surface Water
ATS Number	558873	Property Civic Address	Silver Sands Rd Sicamous BC
Client Name	Lot 46 Management Society	Precinct	Kamloops / Sicamous
Coapplicant(s)	0	WSO/WST	Koch/Garnett
Agent	Kerr Wood Leidal Associates Ltd	Water Source Name	Eagle River
CSA:	VVEIRA	Additional works likely needed (if applicable):	0
Client #:	28903	Map sheet #:	082 L 086
WST assigned to file:	Kaylee	Geomark URL:	http://apps.gov.bc.ca/pub/geomark/geomarks/gm-854E83FBCBF2499D844BB466C1710ED2
PID:	018-837-468	POD	PD52869
COT Legal description:	Lot A, District Lot 452, KDYD Plan KAP52709.	Closest POD	FILL HERE
		Ecosystems Referral Sent	2020-03-09
Water use(s) applied for:	Land Improvement: General (Lagoon Dredging)	E-licensing job:	113332
Water Volume Applied for:	0.28317 m3/s	File #:	# 0281845
Works proposed in application:	Diversion Structure, canal, pipe (fully constructed). Temporary use of pump.	Water source reserves or restrictions:	0

Case Notes (to be kept in chronological order)

Date	Related Item	Commenter	Comment
09-Mar-20	FYI	Kaylee	This was attempted previously in 2017, can find abandoned amendment in job AMD21711110-0001

From s.22
To: Koch, Carrie L FLNR:EX (Carrie.Koch@gov.bc.ca)
Subject: Update/addition to ecological survey for the “lagoon” or “boat basin” of Lot 46 Management Society-Water License C129749
Sent: 10/26/2020 22:01:14
Message Body:

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

I am a member of the Lot 46 Society and have s.22
I have recently reviewed the ecological survey which was included with the water license application. I believe there were omissions in this report : There are Western PaintedTurtles, fresh water shellfish in these waters.
I know these turtles are protected in BC.
The River Otters regularly come into the lagoon and dig up and eat the clams.
from s.22 ..

From: Paige Cullingworth (PCullingworth@kwl.ca)
To: Koch, Carrie L FLNR:EX (Carrie.Koch@gov.bc.ca)
Cc: File (File@kwl.ca)
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society
Sent: 01/13/2021 01:45:46
Attachments: image001.png, image002.png, image003.png, image004.png, image005.jpg, image006.png, WaterManagementPlan_Rev1_2021.01.12.pdf
Message Body:

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

As discussed earlier today, please find attached the latest revision of the WMP with the requested changes. If approved, I will have it signed by the authors and send you an updated version.

As mentioned earlier, the Owner is hoping to perform maintenance at the lagoon as soon as February / March. I have advised them that the Water Licence Amendment is nearly complete and there is a strong likelihood of having it in place in time. I also advised that the Owner start planning the required Fish, Shellfish, and Amphibian Survey and begin the notifications process for the works.

Please let me know if you have any further comments on the attached document, or if it is approved. We look forward to the completion of this application.

Many thanks,

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File #

From: Paige Cullingworth
Sent: January 12, 2021 12:06 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Carrie,

I hope you had a good break over the holidays and a happy new year!

We are finalizing changes to our Water Management Plan and should have an updated copy to you tomorrow. Are you able to provide an approximate timeline for the approvals process?

The Owner of the lagoon has flagged to me that siltation levels in the lagoon are becoming critical and preventing adequate water flow into the lagoon (and any boat travel). I have attached some photos for reference. They are hoping to start dredging maintenance works as early as February. Do you think the amendment will be able to be processed in time? If not, is the Management Society still able to perform the maintenance, given the previous feedback from FLNRORD in 2014 which allowed them to do so? (letter attached). Any clarity on this matter would be appreciated.

Feel free to call if you'd like to discuss.

Regards,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File #

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: December 22, 2020 11:09 AM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Paige,

As I just mentioned on the phone the contact should be the Water Officer or Water Manager via FrontCounterBC.

Their current contact info is available here: http://www.frontcounterbc.gov.bc.ca/contact/

Happy Holidays!

Carrie Koch, Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Phone: 778-943-6871

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: December 22, 2020 10:17 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

Thank you for the comments. We are reviewing and making changes.

One clarification – how is the management society meant to notify FLNRORD 3 months prior to the dredging date? Is there an email I should include in the report as a contact, or an online notification system? It is my understanding that the intention of the water licence and WMP is that they will not be required to submit a formal notification every time the dredging works is scheduled. Please clarify.

Thank you and happy holidays!

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.003

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: December 17, 2020 5:01 PM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Paige,

I have finished reviewing the draft Water Management Plan (dated November 2020). Please provide changes or written responses for the following comments:

- The amendment would result in licence C129749 being superseded by a new licence number. Any references to C129749 in the plan should also reference any licence issued in substitution thereof.
- Indicate the proposed sediment storage area on the Plan.
- As we have previously discussed a fish, shellfish and amphibian survey must be done by a QEP prior to isolation or dredging. The QEP shall prepare a report outlining any additional mitigation measures, the appropriate timing window for the work, and isolation method to be used (if other than an aqua-dam).
    - I do not see this mentioned in the current plan.
    - Aqua-dams are currently the preferred method. If uncertainty exists about the suitability of this method for the site then an alternative method should be included (and signed off on) in the QEP's survey report.
        - The plan references coffer dams twice in the report (Section 3.1.4, 4.2) – is this the proposed method of isolation?
    - This should also be carried through the rest of the report for any references to mitigation measures, the timing window, or isolation method (for example Section 4.2 - Timing).
- Section 4.1
    - There is a duty to notify DFO of direct injury to fish, amphibians, reptiles, or other aquatic organisms under s.38(4) of the Fisheries Act.
- Section 4.2
    - References the document 'Standards and Best Practices for Instream Works'. This should also include any document issued in substitution thereof.
    - Project Planning: FLNRORD should also be notified of the intention to dredge 3 months before the expected start date. This will allow time to resolve any unexpected complications or changes in regulations and best management practices (if necessary).
    - With reference to: "Minimize disturbance to the riparian area along the shoreline and protect trees, shrubs and grasses whenever possible."

Any harmful alteration, disruption or destruction of habitat is a violation of s.35(1) of the Fisheries Act.

- Section 5.3
    - If a fish salvage is conducted the results should also be reported to DFO.
- Section 5.0

- Please clarify who is responsible for retaining the reports - Lot 46 Management Society?
- Copies of the Completion Report and Environmental Monitoring Report should be provided to FLNRORD.

- Section 5.2 Environmental Monitoring Report

  - The report should also include any updates or amendments recommended for the Water Management Plan

Please note I will be out of the office tomorrow Dec 18 and from December 24th- January 3rd.

Regards,

Carrie

Carrie Koch, Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Phone: 778-943-6871

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: December 4, 2020 10:55 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

Since our most recent phone calls, KWL has updated the Water Management Plan with two changes as discussed:

1. Add wording on methods that could be used for dredging, based on what has been done in the past or could conceivably be done. This is not to prescribe the future methods of dredging but rather to outline some considerations for each method.

    a. Specifically, include whether temporary or permanent structures would be used.

2. Add wording in Section 1.2 to explicitly state that the Water Management Plan does not exclude contractors from meeting requirements of the Fisheries Act and other DFO requirements.

I have attached the revised WMP in draft form. Once we have your approval, I will have it finalized with signatures and engineering seal.

Regards,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.003

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: November 4, 2020 2:28 PM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Paige,

Sorry I haven't gotten back to you yet. I have been discussing with one of our Habitat Officers. Are you available for a call either tomorrow or Monday?

Thanks,

Carrie

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: November 4, 2020 2:24 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>

Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

Just hoping to follow up on the application we spoke about in October. Are you able to provide any update?

Thank you,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File #

From: Paige Cullingworth
Sent: October 16, 2020 11:12 AM
To: Carrie.Koch@gov.bc.ca
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Carrie,

Thanks for the call this morning. As discussed, we are hoping to keep this conversation going and do what we can to help the application along. I understand that on your end the application has been parked, awaiting response to the questions (April 27). I have answered these below.

- The Site plan shows a permanent pumphouse on the Eagle River intake. As construction of a pump has not been included in the application please provide an updated plan without this feature.

My understanding is there were originally to be two licence amendments: 1) the first was adding a water management plan to allow the society to dredge 2) the second was a water license application to change the works to include a pumped arrangement. After subsequent discussion with the Strata and regulator, Lot 46 Society chose not to proceed with the second amendment as it meant an entire new license, abandon their old license – meaning loss of rights and priority. The application amendment currently in question is therefore only item 1) adding the water management plan.

- A detailed plan for where all proposed activities will occur (where water will be pumped from/to, sediment storage area, location of the water isolation dam, access to the site, sediment sources, etc). A copy of previous dredging plans, descriptions, or reports may help provide some of these details. There are no previous plans available. My understanding is that no previous dredging plan has been prepared. This plan would be prepared once construction is in the planning phase and will follow recommendations of a Qualified Environmental Professional (QEP).

The plan lists species from the literature but no field surveys have been completed. A fish, shellfish and amphibian survey needs to be carried out by a qualified professional in order to finalize the water management plan. The survey will dictate the mitigation measures needed, the permits required and the least risk window to accomplish the proposed work. The plan was to identify species likely in the area, i.e. a desktop study. Prior to de-watering, a QEP is to survey area, confirm protocols and any mitigation measures. This makes the most sense to perform once construction is in the planning phase.

- With reference to Section 3.1.2 “Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand bag coffer dams, or sheet pile coffer dams.” Sediment generation is an important consideration for the activity and the proposed methods for isolating the lagoon must be the most benign adapted to the conditions. Aqua-dams are the preferred method, if uncertainty exists about the suitability of this method for the site then a site investigation must be completed and definitive method proposed in the plan and signed by a qualified professional. There was a preference to put that risk on the contractor and not use a prescriptive approach. The best, cost-effective method would change over time.

- Details of water quality monitoring to be performed before, during, and/or after dredging. This would be per QEP recommendations and their findings of the site survey.

Please let us know what other information you require.

Regards,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.001

From: Paige Cullingworth
Sent: October 15, 2020 2:22 PM
To: Carrie.Koch@gov.bc.ca
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hello Carrie,

I am working with KWL as a consultant on behalf of Twin Anchors. We are looking to get a status update on the application referenced below (E-Licensing Job is 113332). Let me know if there a better Tracking Number I should be referencing.

I received the email chain below as background – can you please confirm whether your questions were addressed or where this application stands?

I would be happy to discuss over a call if you prefer.

Regards,

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.001

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Monday, April 27, 2020 at 1:32 PM
To: Todd Kyllo <todd@twinanchors.com>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49

Management Society

Hi Todd,

I have just finished reviewing your management plan with our Ecosystems Officer. Has there been any evaluation of the cause of siltation or methods to reduce the need for dredging? In general, the management plan is lacking sufficient information outlining the dredging process. Please provide the following information:

- The Site plan shows a permanent pumphouse on the Eagle River intake. As construction of a pump has not been included in the application please provide an updated plan without this feature.
- A detailed plan for where all proposed activities will occur (where water will be pumped from/to, sediment storage area, location of the water isolation dam, access to the site, sediment sources, etc). A copy of previous dredging plans, descriptions, or reports may help provide some of these details.

- The plan lists species from the literature but no field surveys have been completed. A fish, shellfish and amphibian survey needs to be carried out by a qualified professional in order to finalize the water management plan. The survey will dictate the mitigation measures needed, the permits required and the least risk window to accomplish the proposed work.

- With reference to Section 3.1.2 “Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand bag coffer dams, or sheet pile coffer dams.”

Sediment generation is an important consideration for the activity and the proposed methods for isolating the lagoon must be the most benign adapted to the conditions. Aqua-dams are the preferred method, if uncertainty exists about the suitability of this method for the site then a site investigation must be completed and definitive method proposed in the plan and signed by a qualified professional.

- Details of water quality monitoring to be performed before, during, and/or after dredging.

Regards,

Carrie Koch

Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Email:
Carrie.Koch@gov.bc.ca

Phone: 778-943-6871

From: Todd Kyllo <todd@twinanchors.com>
Sent: April 23, 2020 10:54 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Good morning looking to see if this application has any updates.

Regards,

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Friday, March 27, 2020 at 9:18 AM
To: Todd Kyllo <todd@twinanchors.com>

Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Good morning Todd,

We are in consultation with First Nations and the management plan is also being reviewed by one of our aquatic ecologists. Unfortunately it is hard to give a timeline for how much longer it will be before we have an answer. We aim to have a decision on applications within 140 days.

Thanks,

Carrie

From: Todd Kyllo <todd@twinanchors.com>
Sent: March 26, 2020 11:42 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: s.22 >; s.22 >
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Carrie

Can please provide an update on this file.

Thank you

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Tuesday, February 11, 2020 at 3:35 PM
To: Todd Kyllo <todd@twinanchors.com>
Cc: s.22
s.22
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Todd,

Thank you for forwarding on the archeological assessment. I have added it to the application file and I can see the change has come through successfully to our mapping databases. Unfortunately, we do have to go through the consultation process again but hopefully all the concerns from First Nations were addressed in 2018 and we will be able to move forward. I will let you know of any updates or if there is anymore information that we will need in the process.

Cheers,

Carrie

From: Todd Kyllo <todd@twinanchors.com>
Sent: February 11, 2020 2:53 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: s.22
s.22
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Carrie

I appreciate the quick response and would like to provide some additional background. The lagoon has been dredged approximately every three to five years since 1960's. The only reason we are looking to add this management plan to the current water license is because a former Front Counter employee (Jepha Ball) asked for it back in 2016. We also consulted with First Nations on February 8, 2018 at 2pm at their office with Jeff Nitychoruk, Robin Laubman, Christian St. Pierre, and Ray Cormie. This is going into year 5 now and we will be looking to do maintenance work in the lagoon entrance in the near future as boats cannot enter the lagoon in low water. I am also

providing you a letter and map showing the lagoon has been removed from cultural site EfQr-5. That being said I am hoping we can move this file to the stage that Front Counter asked for so as our past maintenance program can get back on schedule. My personal contact number is s.22 s.22

Regards,

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Tuesday, February 11, 2020 at 2:04 PM
To: Todd Kyllo <todd@twinanchors.com>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Todd,

I am the Water Stewardship Officer in the Sicamous region taking over from Jeff Nitychoruk who filled me in on the details of your water licence amendment application. I have started to review it and I am in the process of consulting with First Nations in the area. It is challenging to set a timeline moving forward but I can reassure you that I am working on your application. Please let me know if you have anymore questions.

Thank you,
Carrie

Carrie Koch

Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Direct Email: Carrie.Koch@gov.bc.ca

From: Nitychoruk, Jeff FLNR:EX <Jeff.Nitychoruk@gov.bc.ca>
Sent: February 11, 2020 1:33 PM
To: Aura, Bernadette FLNR:EX <Bernadette.Aura@gov.bc.ca>
Cc: 'Todd Kyllo' <todd@twinanchors.com>; Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Bernadette,

Carrie Koch is the water officer for Sicamous now. Please direct all questions related to active files in that precinct to her. She also manages Seymour and Grand Prairie.

Carrie, please see below.

Jeff Nitychoruk, R.P.Bio

Senior Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Direct Email: Jeff.Nitychoruk@gov.bc.ca

Main: (250)260-4640

From: Aura, Bernadette FLNR:EX <Bernadette.Aura@gov.bc.ca>
Sent: February 11, 2020 12:26 PM
To: Nitychoruk, Jeff FLNR:EX <Jeff.Nitychoruk@gov.bc.ca>
Cc: 'Todd Kyllo' <todd@twinanchors.com>
Subject: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Jeff,

Would you respond to Todd. The E-Licensing Job is 113332.

Thanks.

From: Todd Kyllo <todd@twinanchors.com>
Sent: February 11, 2020 9:07 AM
To: Aura, Bernadette FLNR:EX <Bernadette.Aura@gov.bc.ca>
Subject: Water management plan

Good morning

Just checking on how the plan is coming along.

Thanks

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

Page 173 of 480

Withheld pursuant to/removed as

s.13

Page 174 of 480

Withheld pursuant to/removed as

s.13

Page 175 of 480

Withheld pursuant to/removed as

s.13

Page 176 of 480

Withheld pursuant to/removed as

s.13

Page 177 of 480

Withheld pursuant to/removed as

s.13

Withheld pursuant to/removed as

s.13

Page 179 of 480

Withheld pursuant to/removed as

s.13

Page 180 of 480

Withheld pursuant to/removed as

s.13

Page 181 of 480

Withheld pursuant to/removed as

s.13

Page 182 of 480

Withheld pursuant to/removed as

s.13

Page 183 of 480

Withheld pursuant to/removed as

s.13

Page 184 of 480

Withheld pursuant to/removed as

s.13

Page 185 of 480

Withheld pursuant to/removed as

s.13

Page 186 of 480

Withheld pursuant to/removed as

s.13

Page 187 of 480

Withheld pursuant to/removed as

s.13

Page 188 of 480

Withheld pursuant to/removed as

s.13

Page 189 of 480

Withheld pursuant to/removed as

s.13

Page 190 of 480

Withheld pursuant to/removed as

s.13

Page 191 of 480

Withheld pursuant to/removed as

s.13

Page 192 of 480

Withheld pursuant to/removed as

s.13

Page 193 of 480

Withheld pursuant to/removed as

s.13

Page 194 of 480

Withheld pursuant to/removed as

s.13

Page 195 of 480

Withheld pursuant to/removed as

s.13

Page 196 of 480

Withheld pursuant to/removed as

s.13

Page 197 of 480

Withheld pursuant to/removed as

s.13

Page 198 of 480

Withheld pursuant to/removed as

s.13

Page 199 of 480

Withheld pursuant to/removed as

s.13

Page 200 of 480

Withheld pursuant to/removed as

s.13

Page 201 of 480

Withheld pursuant to/removed as

s.13

Page 202 of 480

Withheld pursuant to/removed as

s.13

Page 203 of 480

Withheld pursuant to/removed as

s.13

Page 204 of 480

Withheld pursuant to/removed as

s.13

Page 205 of 480

Withheld pursuant to/removed as

s.13

Page 206 of 480

Withheld pursuant to/removed as

s.13

From: Paige Cullingworth (PCullingworth@kwl.ca)
To: Koch, Carrie L FLNR:EX (Carrie.Koch@gov.bc.ca)
Cc: File (File@kwl.ca)
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society
Sent: 01/22/2021 16:57:23
Attachments: image001.png, image002.png, image003.png, image004.png, image005.jpg, image006.png, WaterManagementPlan_Rev1_2021.01.21-Sealed.pdf
Message Body:

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

Please see attached the final, signed, copy of the Lot 46 Water Management Plan, to be attached to the new water licence in substitution of C129749. The final changes include the addition of water quality monitoring and reporting. Thank you for working with us to achieve this licence amendment.

Regarding the upcoming dredging works in Feb/March, I clarified with the Owner that the Lagoon is not in need of a full maintenance program, but rather dredging in a localized area at the lagoon entrance. The sedimentation at the entrance has accumulated enough that boat access is impeded to the lagoon. The rest of the basin won't need any dredging for another year or two.

Dredging the lagoon entrance will not require any isolation as it is narrow and readily accessible by equipment on the shore. The entire process is estimated to take 1 day. What we propose for this work (to be overseen by KWL):

- Before the work: First Nations and FLNRO notification (*please confirm if this is still required for the reduced scope of work – does this conversation constitute notification on your end?*).
- Before the works: Fish Shellfish and Amphibian Survey by QEP (KWL) with summary memo and recommendations for erosion and sediment control (ESC). ESC will likely require silt curtains to prevent sedimentation from entering Shuswap Lake.
- During the work: Environmental monitoring (estimated ~1 day dredging, with monitor on site during any activity. Water quality monitoring throughout the entire process).
- Upon completion: Environmental monitoring report.
- Upon completion: Completion report

Please let me know if you have any concerns with the above. Once we have the new water licence we would plan to start with the Fish, Shellfish, and Amphibian survey as soon as possible.

Feel free to call if you'd like to discuss.

Thanks,

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.003

From: Paige Cullingworth
Sent: January 12, 2021 5:46 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Carrie,

As discussed earlier today, please find attached the latest revision of the WMP with the requested changes. If approved, I will have it signed by the authors and send you an updated version.

As mentioned earlier, the Owner is hoping to perform maintenance at the lagoon as soon as February / March. I have advised them that the Water Licence Amendment is nearly complete and there is a strong likelihood of having it in place in time. I also advised that the Owner start planning the required Fish, Shellfish, and Amphibian Survey and begin the notifications process for the works.

Please let me know if you have any further comments on the attached document, or if it is approved. We look forward to the completion of this application.

Many thanks,

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File #

From: Paige Cullingworth
Sent: January 12, 2021 12:06 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Carrie,

I hope you had a good break over the holidays and a happy new year!

We are finalizing changes to our Water Management Plan and should have an updated copy to you tomorrow. Are you able to provide an approximate timeline for the approvals process?

The Owner of the lagoon has flagged to me that siltation levels in the lagoon are becoming critical and preventing adequate water flow into the lagoon (and any boat travel). I have attached some photos for reference. They are hoping to start dredging maintenance works as early as February. Do you think the amendment will be able to be processed in time? If not, is the Management Society still able to perform the maintenance, given the previous feedback from FLNRORD in 2014 which allowed them to do so? (letter attached). Any clarity on this matter would be appreciated.

Feel free to call if you'd like to discuss.

Regards,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File #

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: December 22, 2020 11:09 AM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Paige,

As I just mentioned on the phone the contact should be the Water Officer or Water Manager via FrontCounterBC.

Their current contact info is available here: http://www.frontcounterbc.gov.bc.ca/contact/

Happy Holidays!

Carrie Koch, Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Phone: 778-943-6871

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: December 22, 2020 10:17 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

Thank you for the comments. We are reviewing and making changes.

One clarification – how is the management society meant to notify FLNRORD 3 months prior to the dredging date? Is there an email I should include in the report as a contact, or an online notification system? It is my understanding that the intention of the water licence and WMP is that they will not be required to submit a formal notification every time the dredging works is scheduled. Please clarify.

Thank you and happy holidays!

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.003

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: December 17, 2020 5:01 PM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Paige,

I have finished reviewing the draft Water Management Plan (dated November 2020). Please provide changes or written responses for the following comments:

- The amendment would result in licence C129749 being superseded by a new licence number. Any references to C129749 in the plan should also reference any licence issued in substitution thereof.
- Indicate the proposed sediment storage area on the Plan.
- As we have previously discussed a fish, shellfish and amphibian survey must be done by a QEP prior to isolation or dredging. The QEP shall prepare a report outlining any additional mitigation measures, the appropriate timing window for the work, and isolation method to be used (if other than an aqua-dam).
    - I do not see this mentioned in the current plan.
    - Aqua-dams are currently the preferred method. If uncertainty exists about the suitability of this method for the site then an alternative method should be included (and signed off on) in the QEP's survey report.
        - The plan references coffer dams twice in the report (Section 3.1.4, 4.2) – is this the proposed method of isolation?
    - This should also be carried through the rest of the report for any references to mitigation measures, the timing window, or isolation method (for example Section 4.2 - Timing).
- Section 4.1
    - There is a duty to notify DFO of direct injury to fish, amphibians, reptiles, or other aquatic organisms under s.38(4) of the Fisheries Act.
- Section 4.2
    - References the document 'Standards and Best Practices for Instream Works'. This should also include any document issued in substitution thereof.
    - Project Planning: FLNRORD should also be notified of the intention to dredge 3 months before the expected start date. This will allow time to resolve any unexpected complications or changes in regulations and best management practices (if necessary).
    - With reference to: "Minimize disturbance to the riparian area along the shoreline and protect trees, shrubs and grasses whenever possible."

Any harmful alteration, disruption or destruction of habitat is a violation of s.35(1) of the Fisheries Act.

- Section 5.3
    - If a fish salvage is conducted the results should also be reported to DFO.

- Section 5.0
    - Please clarify who is responsible for retaining the reports - Lot 46 Management Society?
    - Copies of the Completion Report and Environmental Monitoring Report should be provided to FLNRORD.
- Section 5.2 Environmental Monitoring Report
    - The report should also include any updates or amendments recommended for the Water Management Plan

Please note I will be out of the office tomorrow Dec 18 and from December 24th- January 3rd.

Regards,

Carrie

Carrie Koch, Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Phone: 778-943-6871

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: December 4, 2020 10:55 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

Since our most recent phone calls, KWL has updated the Water Management Plan with two

changes as discussed:

1. Add wording on methods that could be used for dredging, based on what has been done in the past or could conceivably be done. This is not to prescribe the future methods of dredging but rather to outline some considerations for each method.

    a. Specifically, include whether temporary or permanent structures would be used.

2. Add wording in Section 1.2 to explicitly state that the Water Management Plan does not exclude contractors from meeting requirements of the Fisheries Act and other DFO requirements.

I have attached the revised WMP in draft form. Once we have your approval, I will have it finalized with signatures and engineering seal.

Regards,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.003

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: November 4, 2020 2:28 PM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Paige,

Sorry I haven't gotten back to you yet. I have been discussing with one of our Habitat Officers. Are you available for a call either tomorrow or Monday?

Thanks,

Carrie

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: November 4, 2020 2:24 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>

Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

Just hoping to follow up on the application we spoke about in October. Are you able to provide any update?

Thank you,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File #

From: Paige Cullingworth
Sent: October 16, 2020 11:12 AM
To: Carrie.Koch@gov.bc.ca
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Carrie,

Thanks for the call this morning. As discussed, we are hoping to keep this conversation going and do what we can to help the application along. I understand that on your end the application has been parked, awaiting response to the questions (April 27). I have answered these below.

- The Site plan shows a permanent pumphouse on the Eagle River intake. As construction of a pump has not been included in the application please provide an updated plan without this feature.

My understanding is there were originally to be two licence amendments: 1) the first was adding a water management plan to allow the society to dredge 2) the second was a water license application to change the works to include a pumped arrangement. After subsequent discussion with the Strata and regulator, Lot 46 Society chose not to proceed with the second amendment as it meant an entire new license, abandon their old license – meaning loss of rights and priority. The application amendment currently in question is therefore only item 1) adding the water management plan.

- A detailed plan for where all proposed activities will occur (where water will be pumped from/to, sediment storage area, location of the water isolation dam, access to the site, sediment sources, etc). A copy of previous dredging plans, descriptions, or reports may help provide some of these details. There are no previous plans available. My understanding is that no previous dredging plan has been prepared. This plan would be prepared once construction is in the planning phase and will follow recommendations of a Qualified Environmental Professional (QEP).

The plan lists species from the literature but no field surveys have been completed. A fish, shellfish and amphibian survey needs to be carried out by a qualified professional in order to finalize the water management plan. The survey will dictate the mitigation measures needed, the permits required and the least risk window to accomplish the proposed work. The plan was to identify species likely in the area, i.e. a desktop study. Prior to de-watering, a QEP is to survey area, confirm protocols and any mitigation measures. This makes the most sense to perform once construction is in the planning phase.

- With reference to Section 3.1.2 “Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand bag coffer dams, or sheet pile coffer dams.” Sediment generation is an important consideration for the activity and the proposed methods for isolating the lagoon must be the most benign adapted to the conditions. Aqua-dams are the preferred method, if uncertainty exists about the suitability of this method for the site then a site investigation must be completed and definitive method proposed in the plan and signed by a qualified professional. There was a preference to put that risk on the contractor and not use a prescriptive approach. The best, cost-effective method would change over time.

- Details of water quality monitoring to be performed before, during, and/or after dredging. This would be per QEP recommendations and their findings of the site survey.

Please let us know what other information you require.

Regards,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.001

From: Paige Cullingworth
Sent: October 15, 2020 2:22 PM
To: Carrie.Koch@gov.bc.ca
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hello Carrie,

I am working with KWL as a consultant on behalf of Twin Anchors. We are looking to get a status update on the application referenced below (E-Licensing Job is 113332). Let me know if there a better Tracking Number I should be referencing.

I received the email chain below as background – can you please confirm whether your questions were addressed or where this application stands?

I would be happy to discuss over a call if you prefer.

Regards,

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.001

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Monday, April 27, 2020 at 1:32 PM
To: Todd Kyllo <todd@twinanchors.com>

Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Todd,

I have just finished reviewing your management plan with our Ecosystems Officer. Has there been any evaluation of the cause of siltation or methods to reduce the need for dredging? In general, the management plan is lacking sufficient information outlining the dredging process. Please provide the following information:

- The Site plan shows a permanent pumphouse on the Eagle River intake. As construction of a pump has not been included in the application please provide an updated plan without this feature.
- A detailed plan for where all proposed activities will occur (where water will be pumped from/to, sediment storage area, location of the water isolation dam, access to the site, sediment sources, etc). A copy of previous dredging plans, descriptions, or reports may help provide some of these details.

- The plan lists species from the literature but no field surveys have been completed. A fish, shellfish and amphibian survey needs to be carried out by a qualified professional in order to finalize the water management plan. The survey will dictate the mitigation measures needed, the permits required and the least risk window to accomplish the proposed work.

- With reference to Section 3.1.2 “Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand bag coffer dams, or sheet pile coffer dams.”

Sediment generation is an important consideration for the activity and the proposed methods for isolating the lagoon must be the most benign adapted to the conditions. Aqua-dams are the preferred method, if uncertainty exists about the suitability of this method for the site then a site investigation must be completed and definitive method proposed in the plan and signed by a qualified professional.

- Details of water quality monitoring to be performed before, during, and/or after dredging.

Regards,

Carrie Koch

Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Email:

Carrie.Koch@gov.bc.ca

Phone: 778-943-6871

From: Todd Kyllo <todd@twinanchors.com>
Sent: April 23, 2020 10:54 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Good morning looking to see if this application has any updates.

Regards,

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Friday, March 27, 2020 at 9:18 AM

To: Todd Kyllo <todd@twinanchors.com>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Good morning Todd,

We are in consultation with First Nations and the management plan is also being reviewed by one of our aquatic ecologists. Unfortunately it is hard to give a timeline for how much longer it will be before we have an answer. We aim to have a decision on applications within 140 days.

Thanks,

Carrie

From: Todd Kyllo <todd@twinanchors.com>
Sent: March 26, 2020 11:42 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: s.22
s.22
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Carrie

Can please provide an update on this file.

Thank you

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Tuesday, February 11, 2020 at 3:35 PM
To: Todd Kyllo <todd@twinanchors.com>
Cc s.22
s.22
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Todd,

Thank you for forwarding on the archeological assessment. I have added it to the application file and I can see the change has come through successfully to our mapping databases. Unfortunately, we do have to go through the consultation process again but hopefully all the concerns from First Nations were addressed in 2018 and we will be able to move forward. I will let you know of any updates or if there is anymore information that we will need in the process.

Cheers,

Carrie

From: Todd Kyllo <todd@twinanchors.com>
Sent: February 11, 2020 2:53 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: s.22 >;
s.22 >
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Carrie

I appreciate the quick response and would like to provide some additional background. The lagoon has been dredged approximately every three to five years since 1960's. The only reason we are looking to add this management plan to the current water license is because a former Front Counter employee (Jepha Ball) asked for it back in 2016. We also consulted with First Nations on February 8, 2018 at 2pm at their office with Jeff Nitychoruk, Robin Laubman, Christian St. Pierre, and Ray Cormie. This is going into year 5 now and we will be looking to do maintenance work in

the lagoon entrance in the near future as boats cannot enter the lagoon in low water. I am also providing you a letter and map showing the lagoon has been removed from cultural site EfQr-5. That being said I am hoping we can move this file to the stage that Front Counter asked for so as our past maintenance program can get back on schedule. My personal contact number is s.22
s.22

Regards,

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Tuesday, February 11, 2020 at 2:04 PM
To: Todd Kyllo <todd@twinanchors.com>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Todd,

I am the Water Stewardship Officer in the Sicamous region taking over from Jeff Nitychoruk who filled me in on the details of your water licence amendment application. I have started to review it and I am in the process of consulting with First Nations in the area. It is challenging to set a timeline moving forward but I can reassure you that I am working on your application. Please let me know if you have anymore questions.

Thank you,
Carrie

Carrie Koch

Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Direct Email: Carrie.Koch@gov.bc.ca

From: Nitychoruk, Jeff FLNR:EX <Jeff.Nitychoruk@gov.bc.ca>
Sent: February 11, 2020 1:33 PM
To: Aura, Bernadette FLNR:EX <Bernadette.Aura@gov.bc.ca>
Cc: 'Todd Kyllo' <todd@twinanchors.com>; Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Bernadette,

Carrie Koch is the water officer for Sicamous now. Please direct all questions related to active files in that precinct to her. She also manages Seymour and Grand Prairie.

Carrie, please see below.

Jeff Nitychoruk, R.P.Bio

Senior Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Direct Email: Jeff.Nitychoruk@gov.bc.ca

Main: (250)260-4640

From: Aura, Bernadette FLNR:EX <Bernadette.Aura@gov.bc.ca>
Sent: February 11, 2020 12:26 PM
To: Nitychoruk, Jeff FLNR:EX <Jeff.Nitychoruk@gov.bc.ca>
Cc: 'Todd Kyllo' <todd@twinanchors.com>
Subject: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Jeff,

Would you respond to Todd. The E-Licensing Job is 113332.

Thanks.

From: Todd Kyllo <todd@twinanchors.com>
Sent: February 11, 2020 9:07 AM
To: Aura, Bernadette FLNR:EX <Bernadette.Aura@gov.bc.ca>
Subject: Water management plan

Good morning

Just checking on how the plan is coming along.

Thanks

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

KERR WOOD LEIDAL
consulting engineers

Okanagan
202 - 3334 30th Avenue
Vernon, BC V1T 2C8
T 250 503 0841
F 250 503 0847

Water Management Plan

Prepared for:

Lot 46 Management Society

January 2021
KWL Project No. 3691.003

Contents

1. Introduction 1-1
1.1 Project Background and Rationale 1-1
1.2 Authorizations, Permits, and Approvals 1-1
1.3 First Nations 1-2

2. Site Location and Context 2-1
2.1 Land Ownership and Land Use 2-1
2.2 Aquatic Habitat and Species 2-1

3. Dredging Operation 3-1
3.1 Sequence and Description of Works 3-1
3.2 Dredging Considerations 3-2
3.3 Dewatering and Water Management 3-3
3.4 Dredging Frequency/Schedule 3-3

4. Environmental Impacts and Mitigation 4-1
4.1 Potential Environmental Impacts 4-1
4.2 Environmental Protection and Mitigation Measures 4-1

5. Reporting 5-1
5.1 Completion Report 5-1
5.2 Fish, Shellfish, and Amphibian Survey 5-1
5.3 Environmental Monitoring Report 5-1
5.4 Fish Salvage Data 5-1
5.5 Conservation Data Centre Report 5-2
5.6 Archaeological Findings 5-2

6. Monitoring and Maintenance 6-1

7. Closure 7-1
Report Submission 7-1

References 7-1

Figures

Figure 1: Location Plan 1-3

Tables

Table 1: Fish Species Present in Shuswap Lake, Mara Lake, Shuswap Narrows, Shuswap River, & Eagle River 2-2
Table 2: Potential Dredging Methods 3-2

Appendices

Appendix A: Site Photographs
Appendix B: Summary of Notification and Reporting Requirements
Appendix C: Sample Notification Template

1. Introduction

1.1 Project Background and Rationale

The Lot 46 Management Society (the Society) is composed of 17 homeowners who own properties on Silver Sands Road in Sicamous, BC. The properties are located along the east side of an artificial lagoon connected to Shuswap Lake, just north of the RW Bruhn Bridge (Highway 1 crossing; see Figure 1). The Society manages the lagoon and members have private docks for boat access to the lake. Sediment accumulates in the lagoon and the Society needs to dredge the lagoon to facilitate navigation of boats from private docks to the lake. This Water Management Plan provides operational guidance for the periodic dredging of the Lot 46 Lagoon, including measures to mitigate the potential impacts to water quality, aquatic habitat, fish, and other wildlife.

1.2 Authorizations, Permits, and Approvals

Existing Water Licence

The Society currently holds water licence C129749 which authorizes a maximum of 0.28 cubic metres per second (10 cubic feet per second) to be diverted through a diversion structure (point of diversion number PD52869) and pipe from the Eagle River into the constructed lagoon. See Figure 1 for a plan view of the licensed works.

A letter from the BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licensed works under their water licence. As a condition, the MFLNRO Regional Water Management Branch requires the Society develop a Water Management Plan (this plan) to guide the dredging operations.

Amendment of the existing water licence to include this plan may result in the current licence C129749 being superseded by a new licence number. Any reference made herein to the existing licence should be considered to also include any licence issued in substitution thereof.

Other Permits and Approvals

A fish and amphibian salvage within the lagoon is required prior to dewatering and dredging. In order to conduct a salvage, the Society must obtain a Licence to Fish for Scientific Purposes from Fisheries and Oceans Canada (DFO) and a Scientific Fish Collection Permit from MFLNRO.

In order for dredging to proceed without requiring a review by DFO, the following conditions must be met:

- No temporary or permanent increase in the existing area of the lagoon below the high water mark;
- Dredged material is deposited and stabilized on land;
- Dredging has occurred in the last 10 years; and
- No dredging where SARA-listed shellfish occur except where exempted in the recovery strategy for that species.

It should be noted that compliance with this Water Management Plan satisfies the requirements of the BC *Water Sustainability Act* as it pertains to the water licence. It does not exempt the Society or the

Contractor from familiarizing themselves with and adhering to all other Provincial and Federal regulations applicable to the works.

1.3 First Nations

The following First Nations have traditional territory and/or interests in or nearby the project area (MOE 2016c):

- Neskonlith Indian Band;
- Secwepemc First Nation (falls within Secwepemc Reconciliation Framework Agreement Boundary);
- Okanagan Indian Band;
- Adams Lake Indian Band;
- Little Shuswap Indian Band; and
- Splatsin.

The dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis. As such, there is no expectation to consult with First Nations. However, in the interests of continued good relationships, the Society envisions contact with local First Nations contacts prior to any operation to learn if there are any potential conflicts with the operation.

Copyright

2. Site Location and Context

The following section outlines the context and characteristics of the project site.

2.1 Land Ownership and Land Use

Land use around the lagoon is a mix of single family residential and recreational. Lot A District Lot 452 Kamloops Division Yale District Plan KAP52709, the lot being excavated, is private property owned by the Society.

Adjacent land owners will be notified with sufficient time to prepare for dredging operations. It is anticipated that three (3) months would be sufficient, but there may be particular circumstances that dictate otherwise. These special circumstances will be reviewed on a case-by-case basis.

2.2 Aquatic Habitat and Species

Aquatic Habitat

The constructed lagoon is primarily used for private moorage and is approximately 320 m long and 60 m wide with a surface area of approximately 18,700 m^2. It is approximately 3 m deep at its deepest point, with an average depth of roughly 1.5 m during low water.

The lagoon is currently fed by water from Eagle River via a diversion structure and pipe. The point of diversion from the river is located 2.9 km upstream from its confluence with Shuswap Lake. At the point of diversion, the bank full channel width of the Eagle River is approximately 60 m. Due to the relatively small rate of diversion, water in the lagoon is slow-flowing to stagnant. Substrates are mainly sands and silts which contribute to the ongoing accumulation of sediment in the lagoon. The shoreline is mainly sand. There is a small amount of vegetated shore along the south end of the lagoon, where grasses and some small shrubs grow to near the high water mark. In October 2016, there were no obvious aquatic plants growing in the lagoon.

Water from the lagoon exits into Shuswap Lake through a shallow outlet (approximately 12 m wide) immediately downstream of Sicamous Narrows. Sicamous Narrows is the short canal-like channel that connects Mara Lake with Shuswap Lake.

Fish and Other Wildlife

Table 1 provides the result of a desktop study to indicate the fish species present in the waterbodies that are connected with and nearby to the lagoon: Shuswap Lake, Mara Lake (including Sicamous Narrows), the Shuswap River (upstream of Mara Lake), and the Eagle River. These species may or may not be present in the lagoon.

Table 1: Fish Species Present in Shuswap Lake, Mara Lake, Shuswap Narrows, Shuswap River, & Eagle River

Common Name	Code	Latin Name	Species at Risk Status		
			BC List	COSEWIC	SARA
Bridgelip Sucker	BSU	*Catostomus columbianus*	Yellow	-	-
Bull Trout	BT	*Salvelinus confluentus*	Blue	SC (2012)	-
Burbot	BB	*Lota lota*	Yellow	-	-
Carp	CP	*Cyprinus carpio*	Exotic	-	-
Chinook Salmon	CH	*Oncorhynchus tshawytscha*	Yellow	-	-
Chiselmouth[1]	CMC	*Acrocheilus aclutaceus*	Blue	NAR (2003)	-
Coho Salmon (Interior Fraser population)	CO	*Oncorhynchus kisutch*	Yellow	T (2016)	-
Dolly Varden	DV	*Salvelinus malma*	Yellow	-	-
Emerald Shiner	ESC	*Notropis atherinoides*	Unknown	-	-
Kokanee	KO	*Oncorhynchus nerka*	Yellow	-	-
Lake Chub	LKC	*Couesius plumbeus*	Yellow	DD	-
Lake Trout	LT	*Salvelinus namaycush*	Yellow	-	-
Largescale Sucker	CSU	*Catostomus macrocheilus*	Yellow	-	-
Leopard Dace	LDC	*Rhinichthys falcatus*	Yellow	NAR (1990)	-
Longnose Dace	LNC	*Rhinichthys cataractae*	Yellow	-	-
Longnose Sucker	LSU	*Catostomus catostomus*	Yellow	-	-
Mountain Whitefish	MW	*Prosopium williamsoni*	Yellow	-	-
Northern Pikeminnow	NSC	*Ptycheilus oregonensis*	Yellow	-	-
Peamouth Chub	PCC	*Mylocheilus caurinus*	Yellow	-	-
Pink Salmon	PK	*Oncorhynchus gorbuscha*	Yellow	-	-
Prickly Sculpin	CAS	*Cottus asper*	Yellow	-	-
Pygmy Whitefish (Pacific populations)	PW	*Prosopium coulteri*	Yellow	NAR (2016)	-
Rainbow Trout	RB	*Oncorhynchus mykiss*	Yellow	-	-
Redside Shiner	RSC	*Richardsonius balteatus*	Yellow	-	-
Slimy Sculpin	CCG	*Cottus cognatus*	Yellow	-	-
Sockeye Salmon	SK	*Oncorhynchus nerka*	Yellow	-	-
Steelhead	ST	*Oncorhynchus mykiss*	Yellow	-	-
Westslope Cutthroat Trout (Pacific populations)	WCT	*Oncorhynchus clarki lewisi*	Blue	SC (2016)	1-SC (2010)
White Sturgeon (Upper Fraser River Population)	WSG	*Acipenser transmontanus*	Yellow	E (2012)	-
White Sucker	WSU	*Catostomus commersoni*	Yellow	-	-

Sources: MOE 2016a, MOE 2016b
[1]One Chiselmouth sampled in 1964 at northern outlet of Mara Lake at the beginning of Shuswap Narrows (CDC 2016)

It is unlikely that salmon, trout, or char use the lagoon to spawn due to the accumulation of fine sediments and frequent boat traffic in the lagoon. Based on *Shuswap Lake System and Adams Lake - Lake Char and Sockeye Spawning Atlas Overview Map* (DFO 2005), there is no spawning of Sockeye or Char (i.e., Bull Trout and Dolly Varden) in the lagoon or on the adjacent shoreline of Shuswap Lake.

Five fish species present or with potential to be present in Shuswap Lake and other nearby waterbodies are federally- or provincially-listed species at risk:

- Bull Trout (Salvelinus confluentus) are a blue-listed species in BC. Blue-listed species are Species of Special Concern (formerly Vulnerable) in BC and have characteristics which make them especially sensitive or vulnerable to natural or anthropogenic events (MOE 2016a). Bull Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on habitat characteristics and the extent of known spawning areas (DFO 2005).
- Chiselmouth (*Acrocheilus aclutaceus*) are also blue-listed Species of Special Concern in BC. One Chiselmouth was sampled in 1964 at the mouth of Mara Lake as it entered Shuswap Narrows (CDC 2016). Chiselmouth are absent form sites with maximum temperatures below 20 °C (Rosenfeld et al. 2001). Adults need deep, fast flowing water with substrate that supports periphyton (i.e., boulder and cobble; Rosenfeld et al. 1998). Juveniles need slow-moving backwater habitat and are usually found where there are aquatic plants, which provide habitat for food (invertebrates) and cover from predators (COSEWIC 2003, Rosenfeld 2003). Based on these requirements, it is highly unlikely that adult Chiselmouth use the lagoon, and possible that juveniles are present.
- Interior Fraser populations of Coho Salmon (*Oncorhynchus kisutch*) were re-assessed as Threatened (downgraded from Endangered) by the Committee of the Status of Endangered Wildlife in Canada (COSEWIC) in 2016 but have not been added to Schedule 1 of the *Species at Risk Act*. Coho fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- Pacific populations of Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*) were reconfirmed as a Species of Special Concern by COSEWIC in 2016 and are a Schedule 1 Species of Special Concern of the *Species at Risk Act* (SARA). Under SARA, species of special concern are defined being particularly sensitive to human activities or natural events but are not endangered or threatened. This species is also blue-listed in BC. Westslope Cutthroat Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- The Upper Fraser River population of White Sturgeon (*Acipenser transmontanus*) was assessed as Endangered by COSEWIC in 2012. It has been recorded in Kamloops Lake, and may occasionally enter the Thompson River system. However, it is very unlikely that White Sturgeon would be present in the lagoon based on its small size and habitat characteristics (COSEWIC 2012).

Western Painted Turtle (*Chrysemys picta bellii*) has been observed on the Eagle River just north of the project site (CDC 2016). These populations are part of the Intermountain - Rocky Mountain population that was reconfirmed as a Species of Special Concern by COSEWIC in 2016 and is a Schedule 1 Species of Special Concern under SARA. It is also blue-listed in BC. Because Western Painted Turtles can move up to several hundred metres by land (Gregory and Campbell 1987, COSEWIC 2006), they have the potential to feed, mate, and nest in the lagoon. The turtles begin mating in spring soon after the end of hibernation and begin nesting in June (Schwarzkopf and Brooks 1987, Ernst et al. 1994, COSEWIC 2006). Successful mating peaks in late summer and early fall (Gist et al. 1990). Females dig 10 cm deep nests on open south-facing slopes (Schwarzkopf and Brooks 1987, Weisrock and Janzen 1999). Eggs incubate for 72–104 days in the Pacific Northwest (Nussbaum et al. 1983). After

hatching in later summer and early fall, turtle hatchlings stay in the nest until the next spring (Gregory and Campbell 1987, St. John 2002). Adults hibernate over the winter in the muddy bottoms of streams and ponds, old mammal burrows, or other shelter (Cohen 1992).

The only shellfish listed under the *Species at Risk Act* that is present in the Okanagan drainage is the Rocky Mountain Ridged Mussel (*Gonidea angulata*), listed as a Species of Special Concern. In recent searches, *Gonidea angulata* was found as far north as Okanagan Lake near Vernon (COSEWIC 2010). Portions of the Shuswap watershed have not been surveyed for *Gonidia angulata* as of 2011 (DFO 2010b).

It is possible that amphibians use the lagoon for breeding or refuge. However, due to frequent boat traffic, it is not ideal habitat.

Migratory birds may use the grass and shrub area at the south end of the lagoon for foraging and breeding. Waterfowl use the lagoon for refuge and possibly for foraging.

3. Dredging Operation

3.1 Sequence and Description of Works

Dredging operation will proceed in the following sequence:

1. Installation of Erosion and Sediment Control Measures

Erosion and sediment control measures should be installed prior to starting dredging works, following any recommendations of the Qualified Environmental Professional (QEP). Additional supplies for erosion and sediment control should be stockpiled on site in case they are required.

2. Isolation of Lagoon

Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: water-filled flood barriers, sand-bag coffer dams, or sheet pile coffer dams. The preference is for methods that minimize the disturbance to sediment and aquatic life (i.e., flood barriers). The diversion structure will be isolated using the knife-valve at its inlet (Appendix B, Photo 4).

Isolation methods used for dredging works should follow the recommendations of the QEP as outlined in the Fish, Shellfish, and Amphibian survey report (refer to Section 5.2). Water filled flood barriers are currently the preferred method; if an alternative method is proposed it should be included in the survey report and signed off on by the QEP.

3. Fish Salvage

After isolation, an initial fish salvage will be conducted by a QEP who may also be the Environmental Monitor (EM). Salvage methods should be appropriate for the depth of water in the lagoon. Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.

4. Dewatering

After the initial fish salvage, dewatering should proceed immediately. Fish salvaging should continue as the lagoon is dewatered. Adequate pumping capacity should be retained in order to complete dewatering as quickly as possible. Water will be discharged over the isolation dam into Shuswap Lake.

5. Excavation and Grading

After complete salvage and dewatering, the EM will complete a review of the area to determine if there are any outstanding environmental concerns which need to be addressed.

Once the EM has approved the site for further work, dredging may begin. Dredging should commence only after the lagoon is fully isolated from flowing water and can continue only if this isolation is maintained.

Dredging will be completed by conventional equipment and be subject to review by the EM. Refer to Section 3.2 for additional considerations when selecting equipment and dredging methods.

6. Rewatering Lagoon and Removal of Isolation Measures

The lagoon should be refilled and isolation measures removed in a manner so as to minimize the suspension of sediment in the water column and movement into Shuswap Lake.

7. Resume Normal Operation of the Lagoon

Once the lagoon has been filled to the level of the Shuswap lake, normal operation will continue.

3.2 Dredging Considerations

Engineering Specifications

The lagoon will be restored to original design parameters of a trapezoidal geometry consisting of minimum 4H:1V side slopes and flat bottom.

Machinery

The contractor shall decide what machinery is most appropriate for the works. It is assumed that conventional excavators and machinery will be used after isolation and dewatering of the lagoon is complete. The machinery will be clean and in satisfactory condition to undertake the work in a sensitive environment. The EM will review and approve equipment prior to the commencement of construction.

Table 2: Potential Dredging Methods

Method	Description	Construction Considerations
Hydraulic Dredging	Adding large amounts of process water to the sediments in order to suspend fine materials in a slurry, and then pumping the slurry to a location where it can be dewatered or stored. This method is typically used in open water bodies and is cost effective for large, deep dredging operations. Requires large, specialized dredging vessels. Hopper dredges are able to store and transport the slurry on board, pipeline dredges discharge the slurry to a dewatering location.	• Does not require isolation or dewatering of the water body. • Most suitable for large water bodies and fine sediments. • Disposal of sediments is more challenging in slurry form; this may require dewatering systems or temporary detention areas (off site). • No permanent structures required.
Mechanical Dredging	Physically picking up sediments up by means of excavator or clamshell buckets and unloading on shore. This method is popular because it requires only conventional construction equipment, is a fast process, and can accurately remove material. If the body of water can be isolated and drained, excavator access can be significantly improved. If the lagoon is not fully dewatered, this may require additional access measures such as building sand bars across the water body. Mechanical dredging has been the preferred method for dredging the lagoon in the past.	• Requires dry space on the water's edge for an excavator to operate. • Most suitable for smaller water bodies or locations where rock is of concern. • Limited by the reach of an excavator and may require temporary structures such as sand bars in the water body. • Temporary isolation structures required to facilitate draining or dewatering of the water body.

Disposal of Dredged Material

Dredged material should be disposed of on land and at an off site location. Disposal must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites Regulation and Hazardous Waste Regulation, and with any appropriate local government bylaws regarding the removal and deposition of spoil and dredged material.

3.3 Dewatering and Water Management

Isolation Measures

The isolation measures will be constructed according to the EM and will be designed to safely hold back water from entering the lagoon when fully dewatered without failure. This may be accomplished with an aqua-dam, sandbag dam, coffer dam, or other suitable method.

The knife valve on at the diversion structure from the Eagle River will be closed to isolate the lagoon from the river prior to fish salvage.

The contractor will keep a silt curtain on site and use it if necessary when installing or removing the dam to prevent silt from entering Shuswap Lake.

Pumping Capacity

The contractor shall ensure that they have sufficient pumping capacity to dewater the lagoon as quickly as possible.

Discharge Location

During dewatering, discharge water should be managed and directed to an area where it will not cause erosion or carry sediment-laden water into Shuswap Lake. If discharge water becomes turbid (likely near the end of dewatering), a silt curtain should be placed between the discharge location and the rest of Shuswap Lake. The contractor should ensure that they have adequate length of pipe or hoses so that the intakes can be situated in the deepest part of the lagoon and the discharge hose can be situated in an appropriate area as outlined above.

3.4 Dredging Frequency/Schedule

Dredging should be carried out only when necessary to ensure residents can navigate safely. If dredging is required frequently (i.e., annually), the Lot 46 Management Society should investigate the source and mechanism of the sedimentation and take steps to reduce the rate of accumulation of sediment within the lagoon so that the frequency of dredging can be reduced.

4. Environmental Impacts and Mitigation

4.1 Potential Environmental Impacts

The dredging operations may have the following environmental impacts (DFO 2010a):

- Removal or change in aquatic plants, leading to change in food supply, nutrients concentrations, and habitat structure;
- Sediment being suspended in water, leading to change in sediment concentrations and contaminant concentrations;
- Modification of channel or shoreline shape leading to change in stability and hydraulics, influencing substrate, leading to a change in food supply and habitat structure; and
- Direct injury to fish, amphibians, reptiles, or other aquatic organisms from machinery or materials. The Society shall be responsible to notify DFO of direct injury to fish, amphibians, reptiles, or other aquatic organisms under S.38(4) of the Fisheries Act.

4.2 Environmental Protection and Mitigation Measures

To mitigate the potential impacts listed above, dredging works should follow provincial Standards and Best Practices for Instream Works (MFLNRO and DFO 2010a, MFLNRO and DFO 2010b), including any document issued in substitution thereof. These and other guidelines to follow are listed below.

Project Planning

- Notify consultants with the intention to dredge at least three months before the expected start date, to allow enough time for a QEP to obtain fish salvage permits.
- FLNRORD should also be notified of the intention to dredge 3 months before the expected start date. This is intended as an informal, courtesy notification only and will allow time to resolve any unexpected complications or changes in regulations and best management practices if necessary.

  Phone (1-877-855-3222) or Email (FrontCounterBC@gov.bc.ca) attn: Water Stewardship Officer.

Timing

- Dredging is anticipated at low water levels, typically seen in late summer to fall.
- Works in the lagoon should be completed from July 22 to April 1, the reduced risk timing window for instream works in Shuswap Lake for areas with no sockeye of char spawning (MFLNRO 2015).
- Timing of the works shall also take into account any QEP recommendations from the fish, shellfish, and amphibian survey report as outlined in Section 5.2.
- The nesting window for migratory birds in Sicamous is April 1 to August 17 (Environment and Climate Change Canada 2016). Machinery should not drive through grass or shrub areas where migratory birds may be nesting during this period, and no clearing of vegetation should occur during this period. If disturbance of vegetation is required during this period, a QEP must conduct a breeding bird survey. Any areas where there are active or suspected nests must be flagged off and not disturbed during works.

Erosion and Sediment Control

- The contractor should use appropriate erosion and sediment control measures to intercept and manage runoff and reduce the likelihood for soils to erode and the potential for sediment to enter nearby waterbodies. Set up measures before beginning other work, following any recommendations made by the QEP. Measures may include but are not limited to:
  - Using a silt curtain when installing or removing isolation measures to prevent silt from entering Shuswap Lake;
  - During dewatering, using a silt curtain between the discharge location and the rest of Shuswap lake to keep sediment from moving into the lake;
  - Covering spoil/dredged material with plastic sheeting and set up silt fencing around piles, if material is being stored temporarily;
  - Placing spoil/dredged material where it will not erode into a waterbody or storm sewer;
  - Keeping additional erosion and sediment control supplies on site in case of an unexpected storm or other event;
  - Regular inspection of measures and modification/repair when necessary; and
  - Maintenance of effective erosion and sediment control measures on any disturbed upland banks until banks are revegetated.

Site Access

- Machinery should access the site using existing roads, trails, and boat ramp to avoid disturbance to vegetation (see Figure 1).
- Avoid disturbance to the riparian area along the shoreline and protect trees, shrubs and grasses. Note that any harmful alteration, disruption or destruction of habitat is a violation of S.35(1) of the Fisheries Act.

Weather

- The contractor should monitor weather forecasts and avoid work during periods of heavy rain.
- Avoid construction or removal of isolation dam when Shuswap Lake has large waves or when high wind is in the forecast.

Environmental Monitoring

- Dredging activities should be monitored by a QEP for the duration of the project, and full-time during sensitive works. Sensitive works include the installation and removal of the isolation measures, dewatering, and initial excavation.
- Water quality monitoring will be required during sensitive works, particularly where return water is being discharged into Shuswap Lake, and as otherwise directed by the QEP. At a minimum, turbidity shall be monitored and recorded per BC Water Quality Guidelines. Other parameters such as pH shall be monitored at the discretion of the EM.

Protection of Fish and Other Aquatic Organisms

- Before starting work, the QEP should survey the site for any fish, shellfish, reptiles, or amphibians, especially Western Painted Turtles. If any are found, they should be moved to a safe location away from the work site according to provincial best management practices. They should also look for signs of Western Painted Turtle mating or nesting. If a nest or potential nest is discovered, it should be flagged off and should not be disturbed during dredging operations. Ideally, the EM should survey the site in late summer/early fall at least 1 week prior to works.
- Based on the survey, the QEP shall prepare a report outlining any additional mitigation measures, the appropriate timing window for the work, and the recommended isolation measures to be used.
- A QEP should complete a fish and amphibian salvage according to provincial best practices prior to any works below the high water mark.
- Salvage methods should be appropriate for the depth of water in the lagoon.
- Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.
- All dewatering pump intakes must have fish screens with a maximum screen opening of 2.54 mm (0.10 inches) to prevent fish impingement.
- The contractor should make every effort to dewater the lagoon as quickly as possible. The contractor shall ensure that they have sufficient pumping capacity. This will minimize the time that fish may be isolated within the lagoon in water with no flow.
- The dewatering pump intakes should be situated in the deepest location of the lagoon before dewatering, so that the intake does not need to be moved multiple times. This will minimize the disturbance of sediment and fish that may still be in the lagoon during dewatering.
- The salvage crew should stay on site from the beginning of dewatering until the lagoon is completely dewatered. If fish, amphibians, or reptiles remain in the lagoon during or after dewatering, they should be captured using dip nets and moved to a safe location outside the work area as quickly as possible.
- After partial dewatering, the EM should survey the banks and soft substrate of the exposed lagoon for Rocky Mountain Ridged Mussells (*Gonidea angulata*). If found, work should cease immediately and the client should contact DFO for guidance on how to proceed.

Dredged Material

- Return water (water draining from saturated sediment that has been dredged and placed on land temporarily) should be treated with settling basins or other appropriate means so that the concentration of total suspended solids is minimized before returning to the lagoon or Shuswap Lake.
- Return water should not enter the Eagle River.
- Dredged material must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites and Hazardous Waste regulations, and with any appropriate local government bylaws regarding spoil.
- Dredged material should not be used to infill the shoreline or adjacent wetland areas.

Operation of Machinery

- Beside and within the lagoon, operate machinery in a manner that minimizes the disturbance to the banks and upland areas around the lagoon.
- Only use the existing boat access ramp to move machinery from the access path into the lagoon.

Contamination and Spill Management

- Prevent the discharge of silt, sediment, sediment-laden water, or any other deleterious substance into the lagoon, Eagle River, Shuswap Lake, or any ditch or storm sewer that flows into these waterbodies.
- Ensure machinery is clean (power washed), in good working condition, and free of leaks, excess oil, grease, and seeds or tissue of noxious weeds.
- Do not refuel or service equipment within 30 m of a water body, including the lagoon.
- Keep a spill containment kit on site and ensure all staff are trained it its use. Immediately report any substance of reportable quantities that is harmful to aquatic life to the Environmental Emergency Management Plan Incident Reporting Hotline at 1-800-663-3456 and DFO's Observe, Record and Report hotline at 1-800-465-4336.
- Place generators and pumps inside fuel containment trays to contain any accidental spills of fuel or oil.

Post-operation

- If the banks of the lagoon are disturbed during construction, restore them to their original grade and condition.
- Stabilize any exposed areas such as shoreline by planting and seeding with native trees, shrubs, and/or grasses and mulching to prevent erosion. Grass can be planted by hydro-seeding or broadcast seeding and mulching.

5. Reporting

The following reporting is the responsibility of the Society to retain and must be completed each time dredging is undertaken. The Society will be prepared to provide a copy of the completion reporting and EMR to regulatory officials, if requested.

5.1 Completion Report

The Society will prepare a completion report outlining the following:

- Start and end date of works, including dates of work sequence tasks in Section 3.1;
- Extent of dredging;
- Depth (with location) of lagoon prior to and after dredging;
- Specific construction methods used (e.g., isolation methods);
- Volume of dredged materials; and
- Location and details about where dredged materials were disposed of.

5.2 Environmental Monitoring Report

Upon completion of the work, the EM should prepare an environmental monitoring report outlining the following:

- Description of works;
- Timing of works;
- Surface area below the high water mark affected;
- Dates of monitoring;
- Any non-compliance with this management plan, the water licence, or relevant provincial or federal best management practices or guidance documents;
- Description of any incidents, difficulties, or spills, and how they were addressed and reported;
- Dates and details of any fish or wildlife salvages, including time of day, location, capture methods, location of release, species and number of animals captured and released, any fatalities, and the numbers of the required licences to capture fish and/or wildlife;
- A record of all water quality measurements and any deviations from BC Water Quality Guidelines;
- A summary of any other actions taken; and
- Recommended updates or amendments for this Water Management Plan.

5.2.1 Fish, Shellfish, and Amphibian Survey

Prior to completing any isolation or dredging works, the QEP is required to perform a fish, shellfish, and amphibian survey (refer to Section 4.2). A summary report should be prepared by the QEP, covering the findings of this survey and impacts on the dredging operation:

- Any additional mitigation measures required;
- Appropriate timing window for the work;
- Recommended isolation method to be used.

5.2.2 Fish and Amphibian Salvage Data

If a fish and amphibian salvage is conducted, the EM should report the results of the salvage to DFO and the MFLNRO in the appropriate format required by the ministry.

5.2.3 Conservation Data Centre Report

If any Species at Risk (those outlined in Section 2.2 or otherwise) are observed or salvaged during dredging or as a result of associated monitoring, these should be reported to the BC Conservation Data Centre.

5.3 Archaeological Findings

The provincial *Heritage Conservation Act* protects archaeological sites within BC. The Archaeology Branch of MFLNRO oversees the enforcement of the Act. Because the lagoon is man-made, it is unlikely that archaeological sites will be discovered during dredging as long as it does not disturb sediment below the depth of the original excavation. If, while dredging, a potential archaeological site is found, work should cease immediately, and the contractor should contact the Archaeology Branch at 250-953-3334. A professional archaeologist will be required to assess the site and determine if further investigation or permitting is required.

6. Monitoring and Maintenance

The depth of the lagoon should be monitored by the Society annually in at least four locations (mouth, middle, head, under specific docks, etc.) and the depths recorded. These depths should be reported in the completion report following subsequent dredging.

The Society should also monitor the diversion structure and piping to ensure that it is operating in a manner to minimize the amount of sediment entering the lagoon from the Eagle River.

7. Closure

We trust that this Water Management Plan meets your requirements at present. Please do not hesitate to contact KWL at DMeredith@kwl.ca or 250-503-5817 if you have any questions or concerns.

Report Submission

Prepared by:

KERR WOOD LEIDAL ASSOCIATES LTD.

Patrick Lilley, M.Sc., R.P.Bio.
Senior Biologist

January 21, 2021

Dwayne Meredith, B.Sc., P.Ag.
Project Manager
Sector Leader – Water Resources

Statement of Limitations

This document has been prepared by Kerr Wood Leidal Associates Ltd. (KWL) for the exclusive use and benefit of LOT 46 MANAGEMENT SOCIETY for the Water Management Plan. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document.

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.

Copyright Notice

These materials (text, tables, figures and drawings included herein) are copyright of Kerr Wood Leidal Associates Ltd. (KWL). LOT 46 MANAGEMENT SOCIETY is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to Water Management Plan. Any other use of these materials without the written permission of KWL is prohibited.

Revision History

Revision #	Date	Status	Revision	Author
1	January 20, 2021	Revised	Incorporated input from MFLNRO and DFO reviews	PIC
0	May 11, 2017	Final	Issued for Use	DWM
A	January 18, 2017	Draft	Issued for client review	LTW/PL

OQM | Organizational Quality Management Program

References

Conservation Data Centre (CDC). 2016. Species and Ecosystems at Risk – Publically Available Occurances. iMapBC Provincial Layer. Available at: http://maps.gov.bc.ca/ess/sv/imapbc//. Accessed: December 2016.

COSEWIC. 2003. COSEWIC assessment and update status report on the chiselmouth *Acrocheilus alutaceus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 22 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

COSEWIC. 2006. COSEWIC assessment and status report on the Western Painted Turtle *Chrysemys picta bellii* (Pacific Coast population, Intermountain-Rocky Mountain population and Prairie/Western Boreal - Canadian Shield population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 40 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2012. COSEWIC assessment and status report on the White Sturgeon *Acipenser transmontanus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxvii + 75 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

Environment and Climate Change Canada. 2016. General Nesting Periods of Migratory Birds in Canada. Available at: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4f39a78f-1. Accessed: January 2017.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Canada, Smithsonian Institution Press, Washington, D.C.

Fisheries and Oceans Canada (DFO). 2005. Shuswap Lake System and Adams Lake Lake Char and Sockeye Spawning Atlas Overview Map. Available at: http://www.shim.bc.ca/shuswap/. Accessed: December 2016.

Fisheries and Oceans Canada (DFO). 2010a. Management Plan for the Rocky Mountain Ridged Mussel (*Gonidea angulata*) in Canada [Final]. Species at Risk Act Management Plan Series. Fisheries and Oceans Canada, Vancouver. iv + 52 pp.

Fisheries and Oceans Canada (DFO). 2010b. Pathways of Effects – Dredging. Available at: http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/dredging-dragage-eng.html. Accessed: December 2016.

Gist, D.H., J.A. Michaelson, and J.M. Jones. 1990. Autumn mating in the painted turtle, Chrysemys picta. Herpetologica 46:331-336.

Gregory, P.T. and R.W. Campbell. 1987. The Reptiles of British Columbia. British Columbia Provincial Museum Handbook. Ministry of Provincial Secretary and Government Services, Victoria, B.C. 102 pp.

Ministry of Environment (MOE). 2016a. BC Species and Ecosystem Explorer. Available at: http://a100.gov.bc.ca/pub/eswp/. Accessed: December 2016.

Ministry of Environment (MOE). 2016b. Habitat Wizard Stream and Lake Reports. Available at: http://maps.gov.bc.ca/ess/sv/habwiz/. Accessed: December 2016.

Ministry of Environment (MOE). 2016c. Consultative Area Database Public Map Service. Available at: http://maps.gov.bc.ca/ess/sv/cadb/. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2015. Regional Terms & Conditions & Timing Windows for Thompson Region. Available at: http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/work_windows_thompson.pdf. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010a. Standards and Best Practices for Instream Works General BMPs & Standard Project Considerations. Version 1.0.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010b. Standards and Best Practices for Instream Works Channel Maintenance. Version 1.0.

Nussbaum, R.A., E.D. Brodie and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow, ID. 332 pp.

Rosenfeld, J.S, B. Wicks, M. Porter, and P. VanDishoek. 1998. Habitat Use by Chiselmouth (*Acrocheilus alutaceus*) in the Blackwater River. Prov. of BC Fish. Proj. Rep. RD 76.

Rosenfeld, J.S., M. Porter, M. Pearson, B. Wicks, P. Van Dishoeck, T. Patton, E. Parkinson, G. Hass, and J. D. McPhail. 2001. The influence of temperature and habitat on the distribution of chiselmouth *Acrocheilus alutaceus* in British Columbia. Environmental Biology of Fishes 62:401-413.

Rosenfeld, Jordan. 2003. Update COSEWIC status report on the chiselmouth, *Acrocheilus alutaceus*, in Canada. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Ottawa. 1-22 pp.

Schwarzkopf L., and R.J. Brooks. 1987. Nest-site selection and offspring sex ratio in painted turtles, Chrysemys picta. Copeia 1987:53-61.

St. John, A. 2002. Reptiles of the Northwest: British Columbia to California. Lone Pine Publishing, Edmonton, AB. 272 pp.

Weisrock, D.W. and F.J. Janzen. 1999. Thermal and fitness-related consequences of nest location in painted turtles (*Chrysemys picta*). Functional Ecology 13(2): 94-101.

Appendix A

Site Photographs

Appendix A – Site Photographs

Date Photographs Taken: October 26, 2016

Photo 1: Looking west from the access gate of the lagoon towards the mouth, with Shuswap Lake in the background (see Figure 1).

Photo 2: Looking north from the shore of the lagoon towards its head.

Appendix A – Site Photographs

Photo 3: Looking northeast from left bank of Eagle River at the Point of Diversion (PD 52869), showing knife valve on the intake.

Photo 4: Knife valve on intake from the Eagle River at the Point of Diversion (PD 52869).

Appendix A – Site Photographs

Photo 5: Location at head of the lagoon where the diversion pipe enters.

Photo 6: Outlet of diversion pipe at the head of the lagoon.

Appendix A – Site Photographs

Photo 7: Looking northeast into the lagoon from the mouth of the lagoon.

Photo 8: Looking northwest across the mouth of the lagoon, where the temporary isolation dam will be installed.

Appendix A – Site Photographs

Photo 9: Looking southwest from mouth of lagoon at Shuswap Lake, where temporary isolation dam will be installed.

Photo 10: Looking southwest, showing site access point from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Appendix A – Site Photographs

Photo 11: Looking west, showing access gate along access path from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Photo 12: Looking northeast, showing site access from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Appendix B

Summary of Notification and Reporting Requirements

Summary of Notification and Reporting Requirements

Prior to Maintenance Works	
Notify Ministry of Forests, Lands and Natural Resource Operations and Rural Development Phone (1-877-855-3222) or Email (FrontCounterBC@gov.bc.ca)	This is intended as an informal, courtesy notification only and will allow time to resolve any unexpected complications or changes in regulations and best management practices if necessary.
Notify First Nations in Project Area • Neskonlith Indian Band; • Secwepemc First Nation; • Okanagan Indian Band; • Adams Lake Indian Band; • Little Shuswap Indian Band; and • Splatsin	In the interests of continued good relationships, the Society envisions contact with local First Nations contacts prior to any operation to learn if there are any potential conflicts with the operation. Refer to sample Notification Template in Appendix C.
Perform Fish, Shellfish, and Amphibian Survey	Prior to completing any isolation or dredging works, the Qualified Environmental Professional is required to perform a fish, shellfish, and amphibian survey

Maintenance Sequence

**Timing of the maintenance program should also take into account any Qualified Environmental Professional recommendations from the fish, shellfish, and amphibian survey report.*

1. Installation of Erosion and Sediment Control Measures
2. Isolation of Lagoon
3. Fish Salvage by Environmental Monitor or Qualified Environmental Professional
4. Dewatering
5. Excavation and Grading
6. Rewatering Lagoon and Removal of Isolation Measures
7. Resume Normal Operation of the Lagoon

Post-Maintenance Reporting	
Completion Report	Summarizing the timing, methods, and extent of the works completed during the maintenance program.
Environmental Monitoring Report	Prepared by the Environmental Monitor
Fish and Amphibian Salvage Data	A summary report should be prepared by the QEP, covering the findings and impacts of this survey.
Report to BC Conservation Data Centre	Applicable if any Species at Risk are observed/salvaged.

**Provide a copy of the reporting to regulatory officials, if requested.*

Appendix C

Sample Notification Template

Date: _____

To:

From: Lot 46 Management Society
1428 Silver Sands Road
Sicamous, BC

Notification of Dredging Maintenance

This letter is to notify your organization of upcoming dredging works at the Lot 46 Management Society Lagoon in Sicamous BC. The lot being excavated is private property owned by the Society. This maintenance is part of the licensed works covered under the Society's current water licence and will comply with all relevant Provincial and Federal regulations applicable to the works.

This notification is a courtesy on behalf of the Lot 46 Management Society intended to minimize service interruptions or conflicts to any concurrent works planned by your organization. Please contact the individual listed below if you have any questions about of the information presented herein.

Location (Legal Description): Lot A District Lot 452 Kamloops Division Yale District Plan KAP52709

Estimated Maintenance Dates: _____

Description of Maintenance Work: _____

_____

_____

_____

_____

Contact for Inquiries: _____

_____

_____

From: Paige Cullingworth (PCullingworth@kwl.ca)
To: Koch, Carrie L FLNR:EX (Carrie.Koch@gov.bc.ca)
Cc: File (File@kwl.ca)
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society
Sent: 03/05/2021 22:14:26
Attachments: image001.png, image002.png, image003.png, image004.png, image005.jpg, image006.png
Message Body:

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Much appreciated, thanks Carrie.

Have a good weekend.

Paige Cullingworth, P.Eng.

Project Engineer

D (250) 503-5807

KWL File #

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: March 5, 2021 2:13 PM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

The licence will be sent out to Lot 46 Management Society in the mail. It will also be viewable in the online
Water Rights Database which you can search using the client number (28903). I can try to keep an eye on it and let you know.

Carrie

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: March 5, 2021 2:05 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

That's great Carrie, and thanks for the updated contact information.

Will an email be sent when the application is complete? Or do I need to find it online somewhere.

Cheers,

Paige Cullingworth, P.Eng.

Project Engineer

D (250) 503-5807

KWL File #

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: March 5, 2021 10:24 AM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Paige,

The application should be done shortly. Thank you for the update on the dredging plans. I would like to pass on that we have just created a new email inbox for licence reporting/notification information in the future should I no longer be in this position. The contact information in Section 4.2 of the WMP is still accurate but this new email address is a good way to reach our team directly: Waterallocation.dos@gov.bc.ca

I look forward to working with you on more projects in the future.

Thanks,

Carrie Koch, Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Phone: 778-943-6871

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: March 4, 2021 11:15 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hello Carrie,

Further to my previous email, we had discussed potential dredging works this spring, however given the timeline we have been able to defer it to next year. The Owner has postponed any lagoon dredging until early 2022, at which time the lagoon inlet will be maintained. A detailed dredging plan will be developed at that time and all regulatory agencies will be notified per the Water Management Plan.

Thank you,

Paige

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: Thursday, March 4, 2021 11:10:30 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Good morning Carrie,

I believe the deadline for comments from the impacted First Nations Groups on this project has recently elapsed in February. Can you please confirm whether there are any comments or whether the new water licence will be issued?

Regards,

Paige

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: Thursday, January 28, 2021, 11:28 a.m.
To: Koch, Carrie L FLNR:EX
Cc: File
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Carrie,

Just following up. Let me know if there is anything else you require.

Regards,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File #

From: Paige Cullingworth
Sent: January 22, 2021 8:57 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Carrie,

Please see attached the final, signed, copy of the Lot 46 Water Management Plan, to be attached to the new water licence in substitution of C129749. The final changes include the addition of water

quality monitoring and reporting. Thank you for working with us to achieve this licence amendment.

Regarding the upcoming dredging works in Feb/March, I clarified with the Owner that the Lagoon is not in need of a full maintenance program, but rather dredging in a localized area at the lagoon entrance. The sedimentation at the entrance has accumulated enough that boat access is impeded to the lagoon. The rest of the basin won't need any dredging for another year or two.

Dredging the lagoon entrance will not require any isolation as it is narrow and readily accessible by equipment on the shore. The entire process is estimated to take 1 day. What we propose for this work (to be overseen by KWL):

- Before the work: First Nations and FLNRO notification (*please confirm if this is still required for the reduced scope of work – does this conversation constitute notification on your end?*).
- Before the works: Fish Shellfish and Amphibian Survey by QEP (KWL) with summary memo and recommendations for erosion and sediment control (ESC). ESC will likely require silt curtains to prevent sedimentation from entering Shuswap Lake.
- During the work: Environmental monitoring (estimated ~1 day dredging, with monitor on site during any activity. Water quality monitoring throughout the entire process).
- Upon completion: Environmental monitoring report.
- Upon completion: Completion report

Please let me know if you have any concerns with the above. Once we have the new water licence we would plan to start with the Fish, Shellfish, and Amphibian survey as soon as possible.

Feel free to call if you'd like to discuss.

Thanks,

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.003

From: Paige Cullingworth
Sent: January 12, 2021 5:46 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Carrie,

As discussed earlier today, please find attached the latest revision of the WMP with the requested

changes. If approved, I will have it signed by the authors and send you an updated version.

As mentioned earlier, the Owner is hoping to perform maintenance at the lagoon as soon as February / March. I have advised them that the Water Licence Amendment is nearly complete and there is a strong likelihood of having it in place in time. I also advised that the Owner start planning the required Fish, Shellfish, and Amphibian Survey and begin the notifications process for the works.

Please let me know if you have any further comments on the attached document, or if it is approved. We look forward to the completion of this application.

Many thanks,

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File #

From: Paige Cullingworth
Sent: January 12, 2021 12:06 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Carrie,

I hope you had a good break over the holidays and a happy new year!

We are finalizing changes to our Water Management Plan and should have an updated copy to you tomorrow. Are you able to provide an approximate timeline for the approvals process?

The Owner of the lagoon has flagged to me that siltation levels in the lagoon are becoming critical and preventing adequate water flow into the lagoon (and any boat travel). I have attached some photos for reference. They are hoping to start dredging maintenance works as early as February. Do you think the amendment will be able to be processed in time? If not, is the Management Society still able to perform the maintenance, given the previous feedback from FLNRORD in 2014 which allowed them to do so? (letter attached). Any clarity on this matter would be appreciated.

Feel free to call if you'd like to discuss.

Regards,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File #

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: December 22, 2020 11:09 AM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Paige,

As I just mentioned on the phone the contact should be the Water Officer or Water Manager via FrontCounterBC.

Their current contact info is available here: http://www.frontcounterbc.gov.bc.ca/contact/

Happy Holidays!

Carrie Koch, Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Phone: 778-943-6871

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: December 22, 2020 10:17 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

Thank you for the comments. We are reviewing and making changes.

One clarification – how is the management society meant to notify FLNRORD 3 months prior to the dredging date? Is there an email I should include in the report as a contact, or an online notification system? It is my understanding that the intention of the water licence and WMP is that they will not be required to submit a formal notification every time the dredging works is scheduled. Please clarify.

Thank you and happy holidays!

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.003

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: December 17, 2020 5:01 PM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Paige,

I have finished reviewing the draft Water Management Plan (dated November 2020). Please provide changes or written responses for the following comments:

- The amendment would result in licence C129749 being superseded by a new licence number. Any references to C129749 in the plan should also reference any licence issued in substitution thereof.
- Indicate the proposed sediment storage area on the Plan.
- As we have previously discussed a fish, shellfish and amphibian survey must be done by a

QEP prior to isolation or dredging. The QEP shall prepare a report outlining any additional mitigation measures, the appropriate timing window for the work, and isolation method to be used (if other than an aqua-dam).

- I do not see this mentioned in the current plan.
- Aqua-dams are currently the preferred method. If uncertainty exists about the suitability of this method for the site then an alternative method should be included (and signed off on) in the QEP's survey report.
    - The plan references coffer dams twice in the report (Section 3.1.4, 4.2) – is this the proposed method of isolation?
- This should also be carried through the rest of the report for any references to mitigation measures, the timing window, or isolation method (for example Section 4.2 - Timing).

- Section 4.1
    - There is a duty to notify DFO of direct injury to fish, amphibians, reptiles, or other aquatic organisms under s.38(4) of the Fisheries Act.

- Section 4.2
    - References the document 'Standards and Best Practices for Instream Works'. This should also include any document issued in substitution thereof.
    - Project Planning: FLNRORD should also be notified of the intention to dredge 3 months before the expected start date. This will allow time to resolve any unexpected complications or changes in regulations and best management practices (if necessary).
    - With reference to: "Minimize disturbance to the riparian area along the shoreline and protect trees, shrubs and grasses whenever possible."

Any harmful alteration, disruption or destruction of habitat is a violation of s.35(1) of the Fisheries Act.

- Section 5.3
    - If a fish salvage is conducted the results should also be reported to DFO.

- Section 5.0
    - Please clarify who is responsible for retaining the reports - Lot 46 Management Society?
    - Copies of the Completion Report and Environmental Monitoring Report should be provided to FLNRORD.

- Section 5.2 Environmental Monitoring Report
    - The report should also include any updates or amendments recommended for the Water Management Plan

Please note I will be out of the office tomorrow Dec 18 and from December 24th- January 3rd.

Regards,

Carrie

Carrie Koch, Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Phone: 778-943-6871

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: December 4, 2020 10:55 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

Since our most recent phone calls, KWL has updated the Water Management Plan with two changes as discussed:

1. Add wording on methods that could be used for dredging, based on what has been done in the past or could conceivably be done. This is not to prescribe the future methods of dredging but rather to outline some considerations for each method.

    a. Specifically, include whether temporary or permanent structures would be used.

Add wording in Section 1.2 to explicitly state that the Water Management Plan does not exclude contractors from meeting requirements of the Fisheries Act and other DFO requirements.

I have attached the revised WMP in draft form. Once we have your approval, I will have it finalized with signatures and engineering seal.

Regards,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.003

From: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Sent: November 4, 2020 2:28 PM
To: Paige Cullingworth <PCullingworth@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Paige,

Sorry I haven't gotten back to you yet. I have been discussing with one of our Habitat Officers. Are you available for a call either tomorrow or Monday?

Thanks,

Carrie

From: Paige Cullingworth <PCullingworth@kwl.ca>
Sent: November 4, 2020 2:24 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Carrie,

Just hoping to follow up on the application we spoke about in October. Are you able to provide any update?

Thank you,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File #

From: Paige Cullingworth
Sent: October 16, 2020 11:12 AM
To: Carrie.Koch@gov.bc.ca
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 46 Management Society

Hi Carrie,

Thanks for the call this morning. As discussed, we are hoping to keep this conversation going and do what we can to help the application along. I understand that on your end the application has been parked, awaiting response to the questions (April 27). I have answered these below.

- The Site plan shows a permanent pumphouse on the Eagle River intake. As construction of a pump has not been included in the application please provide an updated plan without this feature.

My understanding is there were originally to be two licence amendments: 1) the first was adding a water management plan to allow the society to dredge 2) the second was a water license application to change the works to include a pumped arrangement. After subsequent discussion with the Strata and regulator, Lot 46 Society chose not to proceed with the second amendment as it meant an entire new license, abandon their old license – meaning loss of rights and priority. The application amendment currently in question is therefore only item 1) adding the water management plan.

- A detailed plan for where all proposed activities will occur (where water will be pumped from/to, sediment storage area, location of the water isolation dam, access to the site, sediment sources, etc). A copy of previous dredging plans, descriptions, or reports may help provide some of these details. There are no previous plans available. My understanding is that no previous dredging plan has been prepared. This plan would be prepared once construction is in the planning phase and will follow recommendations of a Qualified Environmental Professional (QEP).

The plan lists species from the literature but no field surveys have been completed. A fish, shellfish and amphibian survey needs to be carried out by a qualified professional in order to finalize the water management plan. The survey will dictate the mitigation measures needed, the permits required and the least risk window to accomplish the proposed work. The plan was to identify species likely in the area, i.e. a desktop study. Prior to de-watering, a QEP is to survey area, confirm protocols and any mitigation measures. This makes the most sense to perform once construction is in the planning phase.

- With reference to Section 3.1.2 "Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand bag coffer dams, or sheet pile coffer dams." Sediment generation is an important consideration for the activity and the proposed methods for isolating the lagoon must be the most benign adapted to the conditions. Aqua-dams are the preferred method, if uncertainty exists about the suitability of this method for the site then a site investigation must be completed and definitive method proposed in the plan and signed by a qualified professional. There was a preference to put that risk on the contractor and not use a prescriptive approach. The best, cost-effective method would change over time.

- Details of water quality monitoring to be performed before, during, and/or after dredging. This would be per QEP recommendations and their findings of the site survey.

Please let us know what other information you require.

Regards,

Paige

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.001

From: Paige Cullingworth
Sent: October 15, 2020 2:22 PM
To: Carrie.Koch@gov.bc.ca
Cc: File <File@kwl.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hello Carrie,

I am working with KWL as a consultant on behalf of Twin Anchors. We are looking to get a status update on the application referenced below (E-Licensing Job is 113332). Let me know if there a better Tracking Number I should be referencing.

I received the email chain below as background – can you please confirm whether your questions were addressed or where this application stands?

I would be happy to discuss over a call if you prefer.

Regards,

Paige Cullingworth, EIT

Junior Design Engineer

D (250) 503-5807

KWL File # 3691.001

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Monday, April 27, 2020 at 1:32 PM
To: Todd Kyllo <todd@twinanchors.com>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Todd,

I have just finished reviewing your management plan with our Ecosystems Officer. Has there been any evaluation of the cause of siltation or methods to reduce the need for dredging? In general, the management plan is lacking sufficient information outlining the dredging process. Please provide the following information:

- The Site plan shows a permanent pumphouse on the Eagle River intake. As construction of a pump has not been included in the application please provide an updated plan without this feature.
- A detailed plan for where all proposed activities will occur (where water will be pumped from/to,

sediment storage area, location of the water isolation dam, access to the site, sediment sources, etc). A copy of previous dredging plans, descriptions, or reports may help provide some of these details.

- The plan lists species from the literature but no field surveys have been completed. A fish, shellfish and amphibian survey needs to be carried out by a qualified professional in order to finalize the water management plan. The survey will dictate the mitigation measures needed, the permits required and the least risk window to accomplish the proposed work.

- With reference to Section 3.1.2 “Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand bag coffer dams, or sheet pile coffer dams.”

Sediment generation is an important consideration for the activity and the proposed methods for isolating the lagoon must be the most benign adapted to the conditions. Aqua-dams are the preferred method, if uncertainty exists about the suitability of this method for the site then a site investigation must be completed and definitive method proposed in the plan and signed by a qualified professional.

- Details of water quality monitoring to be performed before, during, and/or after dredging.

Regards,

Carrie Koch

Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Email:
Carrie.Koch@gov.bc.ca

Phone: 778-943-6871

From: Todd Kyllo <todd@twinanchors.com>
Sent: April 23, 2020 10:54 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Good morning looking to see if this application has any updates.

Regards,

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Friday, March 27, 2020 at 9:18 AM
To: Todd Kyllo <todd@twinanchors.com>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Good morning Todd,

We are in consultation with First Nations and the management plan is also being reviewed by one of our aquatic ecologists. Unfortunately it is hard to give a timeline for how much longer it will be before we have an answer. We aim to have a decision on applications within 140 days.

Thanks,

Carrie

From: Todd Kyllo <todd@twinanchors.com>
Sent: March 26, 2020 11:42 AM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: s.22 ;
s.22
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Carrie

Can please provide an update on this file.

Thank you

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Tuesday, February 11, 2020 at 3:35 PM
To: Todd Kyllo <todd@twinanchors.com>
Ccs.22 ,
s.22 ,
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Todd,

Thank you for forwarding on the archeological assessment. I have added it to the application file and I can see the change has come through successfully to our mapping databases. Unfortunately, we do have to go through the consultation process again but hopefully all the concerns from First Nations were addressed in 2018 and we will be able to move forward. I will let you know of any updates or if there is anymore information that we will need in the process.

Cheers,

Carrie

From: Todd Kyllo <todd@twinanchors.com>
Sent: February 11, 2020 2:53 PM
To: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Cc: s.22 ;
s.22
Subject: Re: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Carrie

I appreciate the quick response and would like to provide some additional background. The lagoon has been dredged approximately every three to five years since 1960's. The only reason we are looking to add this management plan to the current water license is because a former Front Counter employee (Jepha Ball) asked for it back in 2016. We also consulted with First Nations on February 8, 2018 at 2pm at their office with Jeff Nitychoruk, Robin Laubman, Christian St. Pierre, and Ray Cormie. This is going into year 5 now and we will be looking to do maintenance work in the lagoon entrance in the near future as boats cannot enter the lagoon in low water. I am also providing you a letter and map showing the lagoon has been removed from cultural site EfQr-5. That being said I am hoping we can move this file to the stage that Front Counter asked for so as our past maintenance program can get back on schedule. My personal contact number iss.22
s.22

Regards,

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

From: "Koch, Carrie L FLNR:EX" <Carrie.Koch@gov.bc.ca>
Date: Tuesday, February 11, 2020 at 2:04 PM
To: Todd Kyllo <todd@twinanchors.com>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Todd,

I am the Water Stewardship Officer in the Sicamous region taking over from Jeff Nitychoruk who filled me in on the details of your water licence amendment application. I have started to review it and I am in the process of consulting with First Nations in the area. It is challenging to set a timeline moving forward but I can reassure you that I am working on your application. Please let me know if you have anymore questions.

Thank you,
Carrie

Carrie Koch

Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Direct Email: Carrie.Koch@gov.bc.ca

From: Nitychoruk, Jeff FLNR:EX <Jeff.Nitychoruk@gov.bc.ca>
Sent: February 11, 2020 1:33 PM
To: Aura, Bernadette FLNR:EX <Bernadette.Aura@gov.bc.ca>
Cc: 'Todd Kyllo' <todd@twinanchors.com>; Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Subject: RE: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Bernadette,

Carrie Koch is the water officer for Sicamous now. Please direct all questions related to active files in that precinct to her. She also manages Seymour and Grand Prairie.

Carrie, please see below.

Jeff Nitychoruk, R.P.Bio

Senior Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Direct Email: Jeff.Nitychoruk@gov.bc.ca

Main: (250)260-4640

From: Aura, Bernadette FLNR:EX <Bernadette.Aura@gov.bc.ca>
Sent: February 11, 2020 12:26 PM
To: Nitychoruk, Jeff FLNR:EX <Jeff.Nitychoruk@gov.bc.ca>
Cc: 'Todd Kyllo' <todd@twinanchors.com>
Subject: Application for Water License Amendment - Water License C129749 - Lot 49 Management Society

Hi Jeff,

Would you respond to Todd. The E-Licensing Job is 113332.

Thanks.

From: Todd Kyllo <todd@twinanchors.com>
Sent: February 11, 2020 9:07 AM
To: Aura, Bernadette FLNR:EX <Bernadette.Aura@gov.bc.ca>
Subject: Water management plan

Good morning

Just checking on how the plan is coming along.

Thanks

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

From: Badry, Lia (Lia.Badry@dfo-mpo.gc.ca)
To: Koch, Carrie L FLNR:EX (Carrie.Koch@gov.bc.ca)
Subject: RE: Lot 46
Sent: 06/12/2020 20:30:36
Attachments: image002.png, image003.jpg, image005.jpg, image006.png, Lot 46 Management Plan - BADRY edits.pdf
Message Body:

Hey Carrie,

I left you a voice mail this morning regarding this file. I have gone over the Management Plan and water license with a fine tooth comb and from what I gather, the Management Plan outlines activities related to dredging only, and the water license is only for the diversion of water from the Eagle River.

I do not see any other permissions given to the community for any other works. The letter issued to them from the province on Feb 25, 2014 re: file A3-7399 gave indication that they could dredge the mouth of the lagoon for that instance only. I don't want them to think that this is a blanket authorization for any future works, as it seems to be indicated on page 1-1 of the current Management Plan under the existing water license information.

Is the new water license going to refer to the Management Plan for conditions that are to be followed? As of now, I don't actually see any approval at all for dredging activities and Todd KYLLO indicated that this Management Plan has never been approved by FrontCounter or First Nations. What authority do they have or have they had to do this? Is it considered a necessity to maintain the diversion structure from the Eagle River?

Please see the attached document for my notes. If you are so inclined, you could add a statement to the strata that approval from the Province in no way exempts anyone from requirements under the Fisheries Act.

Thank you so much for collaborating with me on this. We really want to make sure that everything is clear for all parties to understand, so that we don't have any issues going forward. If you could keep me informed on the progression of this that would be greatly appreciated. This is all new for me so if you think there is something else I can do on my end please let me know!

Lia Badry

Fishery Officer

Salmon Arm Field Unit

Box 1160

1751 10 Avenue, SW

Salmon Arm, BC, V1E 4P3

Office (250) 804-7000

Cell (250) 463-3787

Fax (250) 804-7010

E-mail Lia.Badry@dfo-mpo.gc.ca

Website: http://www.pac.dfo-mpo.gc.ca

Observe, Record & Report Violations (Toll Free) :1-800-465-4336 24Hours | Observez, enregistrez et signalez (sans frais) : 1-800-465-4336 24 Hr.

CONFIDENTIALITY NOTICE: The contents of this electronic mail message are confidential and strictly reserved for the sole use of its intended recipients. If you receive this message in error, please notify the sender immediately and delete the original message as well as all copies. Any disclosure, copying, distribution, review, transmission, dissemination or reliance on the contents of the information by anyone other than its intended recipients is strictly prohibited.

From: Koch, Carrie L FLNR:EX [mailto:Carrie.Koch@gov.bc.ca]
Sent: June-08-20 11:09 AM
To: Badry, Lia
Subject: RE: Lot 46

Hi Lia,

Here is the current license and a copy of the management plan that they have provided. After speaking with Christian, we both agreed that the management plan seemed to be lacking a sufficient level of detail. I have requested that they provide:

- An updated site plan detailing where all of the proposed activities will occur (where water will be pumped from/to, sediment storage area, location of water isolation dam, access to the site, sediment source, etc).
- A fish, shellfish and amphibian survey performed by a QEP. The management plan includes a list of species from literature but no field surveys have been completed.
- Change Section 3.1.2 to indicate that Aqua-dams are the preferred method and use of any alternative methods must be investigated and signed off by a qualified professional.

    - Section 3.1.2: “Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand bag coffer dams, or sheet pile coffer dams.”

- Details about any water quality monitoring before, during, and/or after dredging

Let me know if you need anything else.

Carrie Koch

Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Email:
Carrie.Koch@gov.bc.ca

Phone: 778-943-6871

From: St. Pierre, Christian FLNR:EX <Christian.StPierre@gov.bc.ca>
Sent: June 8, 2020 10:42 AM
To: Badry, Lia <Lia.Badry@dfo-mpo.gc.ca>
Cc: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>; Nitychoruk, Jeff FLNR:EX <Jeff.Nitychoruk@gov.bc.ca>
Subject: RE: Lot 46

Hi Lia,

Carrie Koch is the water officer for the file and can provide you the most up to date information.

Best regards,

Christian St-Pierre, MRM, P.Ag.| Ecosystems Section | Thompson Okanagan Region
Ministry of Forests, Lands and Natural Resource Operations | 1259 Dalhousie Drive
Kamloops, BC V2C 5Z5
office 250-312-6565 | fax 250-828-4000

Please consider the environment before printing this e-mail.

Devez-vous vraiment imprimer ce courriel? Pensez à l'environnement.

From: Badry, Lia <Lia.Badry@dfo-mpo.gc.ca>
Sent: June 8, 2020 08:56
To: St. Pierre, Christian FLNR:EX <Christian.StPierre@gov.bc.ca>
Subject: FW: Lot 46

Hi Christian,

As discussed, please find below the water license number for the Silver Sands community in Sicamous. I am trying to track down a copy of that license as well as the management plan. Any contacts / leads you can provide me with would be greatly appreciated!

Thank you,

Lia Badry

Fishery Officer

Salmon Arm Field Unit

Box 1160

1751 10 Avenue, SW

Salmon Arm, BC, V1E 4P3

Office (250) 804-7000

Cell (250) 463-3787

Fax (250) 804-7010

E-mail Lia.Badry@dfo-mpo.gc.ca

Website: http://www.pac.dfo-mpo.gc.ca

Observe, Record & Report Violations (Toll Free) :1-800-465-4336 24Hours | Observez, enregistrez et signalez (sans frais) : 1-800-465-4336 24 Hr.

CONFIDENTIALITY NOTICE: The contents of this electronic mail message are confidential and strictly reserved for the sole use of its intended recipients. If you receive this message in error, please notify the sender immediately and delete the original message as well as all copies. Any disclosure, copying, distribution, review, transmission, dissemination or reliance on the contents of the information by anyone other than its intended recipients is strictly prohibited.

From: Todd Kyllo [mailto:todd@twinanchors.com]
Sent: June-02-20 8:42 AM
To: Badry, Lia
Subject: Lot 46

Good Morning

I am awaiting the file from our secretary on the actual water license currently in place. The license number is C-129749. The new management plan has been reviewed by the Province and needs some detail on the site management part and will then be complete. The new plan was completed in 2015 however between First Nations consultation and Front Counter it has not been approved.

Todd Kyllo – President

MAIN: **250.836.2450** TOLLFREE: **1.800.663.4026**

PO Box 318, 200 Old Town Road West, Sicamous, BC V0E

2V4

www.twinanchors.com www.twinanchorsmfg.com

KERR WOOD LEIDAL
consulting engineers

Okanagan
202 - 3334 30th Avenue
Vernon, BC V1T 2C8
T 250 503 0841
F 250 503 0847

Water Management Plan

Prepared for:

Lot 46 Management Society

May 11, 2017
KWL Project No. 3691.001

Contents

1. Introduction 1-1
1.1 Project Background and Rationale 1-1
1.2 Authorizations, Permits, and Approvals 1-1
1.3 First Nations 1-2

2. Site Location and Context 2-1
2.1 Land Ownership and Land Use 2-1
2.2 Aquatic Habitat and Species 2-1

3. Dredging Operation 3-1
3.1 Sequence and Description of Works 3-1
3.2 Dredging Considerations 3-2
3.3 Dewatering and Water Management 3-2
3.4 Dredging Frequency/Schedule 3-2

4. Environmental Impacts and Mitigation 4-1
4.1 Potential Environmental Impacts 4-1
4.2 Environmental Protection and Mitigation Measures 4-1

5. Reporting 5-1
5.1 Completion Report 5-1
5.2 Environmental Monitoring Report 5-1
5.3 Fish Salvage Data 5-1
5.4 Conservation Data Centre Report 5-1
5.5 Archaeological Findings 5-2

6. Monitoring and Maintenance 6-1

7. Closure 7-1
Report Submission 7-1

References 7-1

Figures

Figure 1: Location Plan 1-3

Tables

Table 1: Fish Species Summary Table 2-2

Appendices

Appendix A: Site Photographs

1. Introduction

1.1 Project Background and Rationale

The Lot 46 Management Society (the Society) is composed of 17 homeowners who own properties on Silver Sands Road in Sicamous, BC. The properties are located along the east side of an artificial lagoon connected to Shuswap Lake, just north of the RW Bruhn Bridge (Highway 1 crossing; see Figure 1). The Society manages the lagoon and members have private docks for boat access to the lake. Sediment accumulates in the lagoon and the Society needs to dredge the lagoon to facilitate navigation of boats from private docks to the lake. This Water Management Plan provides operational guidance for the periodic dredging of the Lot 46 Lagoon, including measures to mitigate the potential impacts to water quality, aquatic habitat, fish, and other wildlife.

1.2 Authorizations, Permits, and Approvals

Existing Water Licence

The Society holds water licence C129749 which authorizes a maximum of 0.28 cubic metres per second (10 cubic feet per second) to be diverted through a diversion structure (point of diversion number PD52869) and pipe from the Eagle River into the constructed lagoon. See Figure 1 for a plan view of the licensed works.

A letter from the BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licensed works under their water licence. As a condition, the MFLNRO Regional Water Management Branch requires the Society develop a Water Management Plan (this plan) to guide the dredging operations.

Other Permits and Approvals

A fish salvage within the lagoon is required prior to dewatering and dredging. In order to conduct a fish salvage, the Society must obtain a Licence to Fish for Scientific Purposes from Fisheries and Oceans Canada (DFO) and a Scientific Fish Collection Permit from MFLNRO.

In order for dredging to proceed without requiring a review by DFO, the following conditions must be met:

- No temporary or permanent increase in the existing area of the lagoon below the high water mark;
- Dredged material is deposited and stabilized on land;
- Dredging has occurred in the last 10 years; and
- No dredging where SARA-listed shellfish occur except where exempted in the recovery strategy for that species.

1.3 First Nations

The following First Nations have traditional territory and/or interests in or nearby the project area (MOE 2016c):

- Neskonlith Indian Band;
- Secwepemc First Nation (falls within Secwepemc Reconciliation Framework Agreement Boundary);
- Okanagan Indian Band;
- Adams Lake Indian Band;
- Little Shuswap Indian Band; and
- Splats'in First Nation.

The dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis. As such, there is no expectation to consult with First Nations. However, in the interests of continued good relationships, the Society envisions contact with local First Nations contacts prior to any operation to learn if there are any potential conflicts with the operation.

Lot 46 Management Society Lagoon Water Management Support

Legend

Extent of Dredging (Lagoon)

Parcel Ownership (from the District of Sicamous Cadastral)

Municipal Park

Private

Reference: Orthophoto from Bing aerial image map.

KERR WOOD LEIDAL
consulting engineers

© 2017 Kerr Wood Leidal Associates Ltd.

Copyright Notice: These materials are copyright of Kerr Wood Leidal Associates Ltd. (KWL). Lot 46 Management Society is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to the Lot 46 Management Society Lot 46 Lagoon Water Management Support. Any other use of these materials without the written permission of KWL is prohibited.

50 0 50 (m)

1:2,000

Project No.	Date
3691-001	January 2017

Location Plan

Figure 1

Path: R:\3600-36991\3691-001\430-GIS\MXD-WK\3691001_Map.mxd Date Saved: 1/16/2017 3:21:32 PM
Author: JLau

2. Site Location and Context

The following section outlines the context and characteristics of the project site.

2.1 Land Ownership and Land Use

Land use around the lagoon is a mix of single family residential and recreational. Lot A District Lot 452 Kamloops Division Yale District Plan KAP52709, the lot being excavated, is private property owned by the Society.

Adjacent land owners will be notified with sufficient time to prepare for dredging operations. It is anticipated that three (3) months would be sufficient, but there may be particular circumstances that dictate otherwise. These special circumstances will be reviewed on a case-by-case basis.

2.2 Aquatic Habitat and Species

Aquatic Habitat

The constructed lagoon is primarily used for private moorage and is approximately 320 m long and 60 m wide with a surface area of approximately 18,700 m^2. It is approximately 3 m deep at its deepest point, with an average depth of roughly 1.5 m during low water.

The lagoon is currently fed by water from Eagle River via a diversion structure and pipe. The point of diversion from the river is located 2.9 km upstream from its confluence with Shuswap Lake. At the point of diversion, the bank full channel width of the Eagle River is approximately 60 m. Due to the relatively small rate of diversion, water in the lagoon is slow-flowing to stagnant. Substrates are mainly sands and silts which contribute to the ongoing accumulation of sediment in the lagoon. The shoreline is mainly sand. There is a small amount of vegetated shore along the south end of the lagoon, where grasses and some small shrubs grow to near the high water mark. In October 2016, there were no obvious aquatic plants growing in the lagoon.

Water from the lagoon exits into Shuswap Lake through a shallow outlet (approximately 12 m wide) immediately downstream of Sicamous Narrows. Sicamous Narrows is the short canal-like channel that connects Mara Lake with Shuswap Lake.

Fish and Other Wildlife

Table 1 provides the result of a desktop study to indicate the fish species present in the waterbodies that are connected with and nearby to the lagoon: Shuswap Lake, Mara Lake (including Sicamous Narrows), the Shuswap River (upstream of Mara Lake), and the Eagle River. These species may or may not be present in the lagoon.

Table 1: Fish Species Present in Shuswap Lake, Mara Lake, Shuswap Narrows, Shuswap River, & Eagle River

Common Name	Code	Latin Name	Species at Risk Status		
			BC List	COSEWIC	SARA
Bridgelip Sucker	BSU	*Catostomus columbianus*	Yellow	-	-
Bull Trout	BT	*Salvelinus confluentus*	Blue	SC (2012)	-
Burbot	BB	*Lota lota*	Yellow	-	-
Carp	CP	*Cyprinus carpio*	Exotic	-	-
Chinook Salmon	CH	*Oncorhynchus tshawytscha*	Yellow	-	-
Chiselmouth[1]	CMC	*Acrocheilus aclutaceus*	Blue	NAR (2003)	-
Coho Salmon (Interior Fraser population)	CO	*Oncorhynchus kisutch*	Yellow	T (2016)	-
Dolly Varden	DV	*Salvelinus malma*	Yellow	-	-
Emerald Shiner	ESC	*Notropis atherinoides*	Unknown	-	-
Kokanee	KO	*Oncorhynchus nerka*	Yellow	-	-
Lake Chub	LKC	*Couesius plumbeus*	Yellow	DD	-
Lake Trout	LT	*Salvelinus namaycush*	Yellow	-	-
Largescale Sucker	CSU	*Catostomus macrocheilus*	Yellow	-	-
Leopard Dace	LDC	*Rhinichthys falcatus*	Yellow	NAR (1990)	-
Longnose Dace	LNC	*Rhinichthys cataractae*	Yellow	-	-
Longnose Sucker	LSU	*Catostomus catostomus*	Yellow	-	-
Mountain Whitefish	MW	*Prosopium williamsoni*	Yellow	-	-
Northern Pikeminnow	NSC	*Ptycheilus oregonensis*	Yellow	-	-
Peamouth Chub	PCC	*Mylocheilus caurinus*	Yellow	-	-
Pink Salmon	PK	*Oncorhynchus gorbuscha*	Yellow	-	-
Prickly Sculpin	CAS	*Cottus asper*	Yellow	-	-
Pygmy Whitefish (Pacific populations)	PW	*Prosopium coulteri*	Yellow	NAR (2016)	-
Rainbow Trout	RB	*Oncorhynchus mykiss*	Yellow	-	-
Redside Shiner	RSC	*Richardsonius balteatus*	Yellow	-	-
Slimy Sculpin	CCG	*Cottus cognatus*	Yellow	-	-
Sockeye Salmon	SK	*Oncorhynchus nerka*	Yellow	-	-
Steelhead	ST	*Oncorhynchus mykiss*	Yellow	-	-
Westslope Cutthroat Trout (Pacific populations)	WCT	*Oncorhynchus clarki lewisi*	Blue	SC (2016)	1-SC (2010)
White Sturgeon (Upper Fraser River Population)	WSG	*Acipenser transmontanus*	Yellow	E (2012)	-
White Sucker	WSU	*Catostomus commersoni*	Yellow	-	-

Sources: MOE 2016a, MOE 2016b
[1]One Chiselmouth sampled in 1964 at northern outlet of Mara Lake at the beginning of Shuswap Narrows (CDC 2016)

It is unlikely that salmon, trout, or char use the lagoon to spawn due to the accumulation of fine sediments and frequent boat traffic in the lagoon. Based on *Shuswap Lake System and Adams Lake - Lake Char and Sockeye Spawning Atlas Overview Map* (DFO 2005), there is no spawning of Sockeye or Char (i.e., Bull Trout and Dolly Varden) in the lagoon or on the adjacent shoreline of Shuswap Lake.

Five fish species present or with potential to be present in Shuswap Lake and other nearby waterbodies are federally- or provincially-listed species at risk:

- Bull Trout (Salvelinus confluentus) are a blue-listed species in BC. Blue-listed species are Species of Special Concern (formerly Vulnerable) in BC and have characteristics which make them especially sensitive or vulnerable to natural or anthropogenic events (MOE 2016a). Bull Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on habitat characteristics and the extent of known spawning areas (DFO 2005).
- Chiselmouth (*Acrocheilus aclutaceus*) are also blue-listed Species of Special Concern in BC. One Chiselmouth was sampled in 1964 at the mouth of Mara Lake as it entered Shuswap Narrows (CDC 2016). Chiselmouth are absent form sites with maximum temperatures below 20 °C (Rosenfeld et al. 2001). Adults need deep, fast flowing water with substrate that supports periphyton (i.e., boulder and cobble; Rosenfeld et al. 1998). Juveniles need slow-moving backwater habitat and are usually found where there are aquatic plants, which provide habitat for food (invertebrates) and cover from predators (COSEWIC 2003, Rosenfeld 2003). Based on these requirements, it is highly unlikely that adult Chiselmouth use the lagoon, and possible that juveniles are present.
- Interior Fraser populations of Coho Salmon (*Oncorhynchus kisutch*) were re-assessed as Threatened (downgraded from Endangered) by the Committee of the Status of Endangered Wildlife in Canada (COSEWIC) in 2016 but have not been added to Schedule 1 of the *Species at Risk Act*. Coho fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- Pacific populations of Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*) were reconfirmed as a Species of Special Concern by COSEWIC in 2016 and are a Schedule 1 Species of Special Concern of the *Species at Risk Act* (SARA). Under SARA, species of special concern are defined being particularly sensitive to human activities or natural events but are not endangered or threatened. This species is also blue-listed in BC. Westslope Cutthroat Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- The Upper Fraser River population of White Sturgeon (*Acipenser transmontanus*) was assessed as Endangered by COSEWIC in 2012. It has been recorded in Kamloops Lake, and may occasionally enter the Thompson River system. However, it is very unlikely that White Sturgeon would be present in the lagoon based on its small size and habitat characteristics (COSEWIC 2012).

Western Painted Turtle (*Chrysemys picta bellii*) has been observed on the Eagle River just north of the project site (CDC 2016). These populations are part of the Intermountain - Rocky Mountain population that was reconfirmed as a Species of Special Concern by COSEWIC in 2016 and is a Schedule 1 Species of Special Concern under SARA. It is also blue-listed in BC. Because Western Painted Turtles can move up to several hundred metres by land (Gregory and Campbell 1987, COSEWIC 2006), they have the potential to feed, mate, and nest in the lagoon. The turtles begin mating in spring soon after the end of hibernation and begin nesting in June (Schwarzkopf and Brooks 1987, Ernst et al. 1994, COSEWIC 2006). Successful mating peaks in late summer and early fall (Gist et al. 1990). Females dig 10 cm deep nests on open south-facing slopes (Schwarzkopf and Brooks 1987, Weisrock and Janzen 1999). Eggs incubate for 72–104 days in the Pacific Northwest (Nussbaum et al. 1983). After

hatching in later summer and early fall, turtle hatchlings stay in the nest until the next spring (Gregory and Campbell 1987, St. John 2002). Adults hibernate over the winter in the muddy bottoms of streams and ponds, old mammal burrows, or other shelter (Cohen 1992).

The only shellfish listed under the *Species at Risk Act* that is present in the Okanagan drainage is the Rocky Mountain Ridged Mussel (*Gonidea angulata*), listed as a Species of Special Concern. In recent searches, *Gonidea angulata* was found as far north as Okanagan Lake near Vernon (COSEWIC 2010). Portions of the Shuswap watershed have not been surveyed for *Gonidia angulata* as of 2011 (DFO 2010b).

It is possible that amphibians use the lagoon for breeding or refuge. However, due to frequent boat traffic, it is not ideal habitat.

Migratory birds may use the grass and shrub area at the south end of the lagoon for foraging and breeding. Waterfowl use the lagoon for refuge and possibly for foraging.

3. Dredging Operation

3.1 Sequence and Description of Works

Dredging operation will proceed in the following sequence:

1. Installation of Erosion and Sediment Control Measures

Erosion and sediment control measures should be installed prior to starting dredging works. Additional supplies for erosion and sediment control should be stockpiled on site in case they are required.

2. Isolation of Lagoon

Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand-bag coffer dams, or sheet pile coffer dams. The preference is for methods that minimize the disturbance to sediment and aquatic life (i.e., aqua-dams). The diversion structure will be isolated using the knife-valve at its inlet (Appendix B, Photo 4).

3. Fish Salvage

After isolation, an initial fish salvage will be conducted by a Qualified Environmental Professional (QEP) who may also be the environmental monitor (EM). Salvage methods should be appropriate for the depth of water in the lagoon. Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.

3. Dewatering

After the initial fish salvage, dewatering should proceed immediately. Fish salvaging should continue as the lagoon is dewatered. Adequate pumping capacity should be retained in order to complete dewatering as quickly as possible. Water will be discharged over the coffer dam into Shuswap Lake.

4. Excavation and Grading

After complete salvage and dewatering, the EM will complete a review of the area to determine if there are any outstanding environmental concerns which need to be addressed.

Once the EM has approved the site for further work, dredging may begin. Dredging should commence only after the lagoon is fully isolated from flowing water and can continue only if this isolation is maintained.

Dredging will be completed by conventional equipment and be subject to review by the EM.

5. Rewatering Lagoon and Removal of Isolation Measures

The lagoon should be refilled and isolation measures removed in a manner so as to minimize the suspension of sediment in the water column and movement into Shuswap Lake.

6. Resume Normal Operation of the Lagoon

Once the lagoon has been filled to the level of the Shuswap lake, normal operation will continue.

3.2 Dredging Considerations

Engineering Specifications

The lagoon will be restored to original design parameters of a trapezoidal geometry consisting of minimum 4H:1V side slopes and flat bottom.

Machinery

The contractor shall decide what machinery is most appropriate for the works. It is assumed that conventional excavators and machinery will be used after isolation and dewatering of the lagoon is complete. The machinery will be clean and in satisfactory condition to undertake the work in a sensitive environment. The EM will review and approve equipment prior to the commencement of construction.

Disposal of Dredged Material

Dredged material should be disposed of on land and at an off site location. Disposal must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites Regulation and Hazardous Waste Regulation, and with any appropriate local government bylaws regarding the removal and deposition of spoil and dredged material.

3.3 Dewatering and Water Management

Isolation Measures

The isolation measures will be constructed according to the EM and will be designed to safely hold back water from entering the lagoon when fully dewatered without failure. This may be accomplished with an aqua-dam, sandbag dam, coffer dam, or other suitable method.

The knife valve on at the diversion structure from the Eagle River will be closed to isolate the lagoon from the river prior to fish salvage.

The contractor will keep a silt curtain on site and use it if necessary when installing or removing the dam to prevent silt from entering Shuswap Lake.

Pumping Capacity

The contractor shall ensure that they have sufficient pumping capacity to dewater the lagoon as quickly as possible.

Discharge Location

During dewatering, discharge water should be managed and directed to an area where it will not cause erosion or carry sediment-laden water into Shuswap Lake. If discharge water becomes turbid (likely near the end of dewatering), a silt curtain should be placed between the discharge location and the rest of Shuswap Lake. The contractor should ensure that they have adequate length of pipe or hoses so that the intakes can be situated in the deepest part of the lagoon and the discharge hose can be situated in an appropriate area as outlined above.

3.4 Dredging Frequency/Schedule

Dredging should be carried out only when necessary to ensure residents can navigate safely. If dredging is required frequently (i.e., annually), the Lot 46 Management Society should investigate the source and mechanism of the sedimentation and take steps to reduce the rate of accumulation of sediment within the lagoon so that the frequency of dredging can be reduced.

4. Environmental Impacts and Mitigation

4.1 Potential Environmental Impacts

The dredging operations may have the following environmental impacts (DFO 2010a):

- Removal or change in aquatic plants, leading to change in food supply, nutrients concentrations, and habitat structure;
- Sediment being suspended in water, leading to change in sediment concentrations and contaminant concentrations;
- Modification of channel or shoreline shape leading to change in stability and hydraulics, influencing substrate, leading to a change in food supply and habitat structure; and
- Direct injury to fish, amphibians, reptiles, or other aquatic organisms from machinery or materials.

4.2 Environmental Protection and Mitigation Measures

To mitigate the potential impacts listed above, dredging works should follow provincial Standards and Best Practices for Instream Works (MFLNRO and DFO 2010a, MFLNRO and DFO 2010b). These and other guidelines to follow are listed below.

Project Planning

- Notify consultants with the intention to dredge at least three months before the expected start date, to allow enough time for a QEP to obtain fish salvage permits.

Timing

- Dredging is anticipated at low water levels, typically seen in late summer to fall.
- Works in the lagoon should be completed from July 22 to April 1, the reduced risk timing window for instream works in Shuswap Lake for areas with no sockeye of char spawning (MFLNRO 2015).
- The nesting window for migratory birds in Sicamous is April 1 to August 17 (Environment and Climate Change Canada 2016). Machinery should not drive through grass or shrub areas where migratory birds may be nesting during this period, and no clearing of vegetation should occur during this period. If disturbance of vegetation is required during this period, a QEP must conduct a breeding bird survey. Any areas where there are active or suspected nests must be flagged off and not disturbed during works.

Erosion and Sediment Control

- The contractor should use appropriate erosion and sediment control measures to intercept and manage runoff and reduce the likelihood for soils to erode and the potential for sediment to enter nearby waterbodies. Set up measures before beginning other work. Measures may include but are not limited to:
    - Using a silt curtain when installing or removing isolation measures to prevent silt from entering Shuswap Lake;
    - During dewatering, using a silt curtain between the discharge location and the rest of Shuswap lake to keep sediment from moving into the lake;

- Covering spoil/dredged material with plastic sheeting and set up silt fencing around piles, if material is being stored temporarily;
- Placing spoil/dredged material where it will not erode into a waterbody or storm sewer;
- Keeping additional erosion and sediment control supplies on site in case of an unexpected storm or other event;
- Regular inspection of measures and modification/repair when necessary; and
- Maintenance of effective erosion and sediment control measures on any disturbed upland banks until banks are revegetated.

Site Access

- Machinery should access the site using existing roads, trails, and boat ramp to avoid disturbance to vegetation (see Figure 1).
- Minimize disturbance to the riparian area along the shoreline and protect trees, shrubs and grasses whenever possible.

Weather

- The contractor should monitor weather forecasts and avoid work during periods of heavy rain.
- Avoid construction or removal of coffer dam when Shuswap Lake has large waves or when high wind is in the forecast.

Environmental Monitor

- Dredging activities should be monitored by a QEP for the duration of the project, and full-time during sensitive works. Sensitive works include the installation and removal of the isolation measures, fish salvage, dewatering, and initial excavation.

Protection of Fish and Other Aquatic Organisms

- A QEP should complete a fish and amphibian salvage according to provincial best practices prior to any works below the high water mark.
- Before starting work, the EM should survey the site for any reptiles or amphibians, especially Western Painted Turtles. If any are found, they should be moved to a safe location away from the work site according to provincial best management practices. They should also look for signs of Western Painted Turtle mating or nesting. If a nest or potential nest is discovered, it should be flagged off and should not be disturbed during dredging operations. Ideally, the EM should survey the site in late summer/early fall at least 1 week prior to works.
- Salvage methods should be appropriate for the depth of water in the lagoon.
- Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.
- All dewatering pump intakes must have fish screens with a maximum screen opening of 2.54 mm (0.10 inches) to prevent fish impingement.
- The contractor should make every effort to dewater the lagoon as quickly as possible. The contractor shall ensure that they have sufficient pumping capacity. This will minimize the time that fish may be isolated within the lagoon in water with no flow.

- The dewatering pump intakes should be situated in the deepest location of the lagoon before dewatering, so that the intake does not need to be moved multiple times. This will minimize the disturbance of sediment and fish that may still be in the lagoon during dewatering.
- The salvage crew should stay on site from the beginning of dewatering until the lagoon is completely dewatered. If fish, amphibians, or reptiles remain in the lagoon during or after dewatering, they should be captured using dip nets and moved to a safe location outside the work area as quickly as possible.
- After partial dewatering, the EM should survey the banks and soft substrate of the exposed lagoon for Rocky Mountain Ridged Mussells (*Gonidea angulata*). If found, work should cease immediately and the client should contact DFO for guidance on how to proceed.

Dredged Material

- Return water (water draining from saturated sediment that has been dredged and placed on land temporarily) should be treated with settling basins or other appropriate means so that the concentration of total suspended solids is minimized before returning to the lagoon or Shuswap Lake.
- Return water should not enter the Eagle River.
- Dredged material must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites and Hazardous Waste regulations, and with any appropriate local government bylaws regarding spoil.
- Dredged material should not be used to infill the shoreline or adjacent wetland areas.

Operation of Machinery

- Beside and within the lagoon, operate machinery in a manner that minimizes the disturbance to the banks and upland areas around the lagoon.
- Only use the existing boat access ramp to move machinery from the access path into the lagoon.

Contamination and Spill Management

- Prevent the discharge of silt, sediment, sediment-laden water, or any other deleterious substance into the lagoon, Eagle River, Shuswap Lake, or any ditch or storm sewer that flows into these waterbodies.
- Ensure machinery is clean (power washed), in good working condition, and free of leaks, excess oil, grease, and seeds or tissue of noxious weeds.
- Do not refuel or service equipment within 30 m of a water body, including the lagoon.
- Keep a spill containment kit on site and ensure all staff are trained it its use. Immediately report any substance of reportable quantities that is harmful to aquatic life to the Environmental Emergency Management Plan Incident Reporting Hotline at 1-800-663-3456 and DFO's Observe, Record and Report hotline at 1-800-465-4336.
- Place generators and pumps inside fuel containment trays to contain any accidental spills of fuel or oil.

Post-operation

- If the banks of the lagoon are disturbed during construction, restore them to their original grade and condition.
- Stabilize any exposed areas such as shoreline by planting and seeding with native trees, shrubs, and/or grasses and mulching to prevent erosion. Grass can be planted by hydro-seeding or broadcast seeding and mulching.

5. Reporting

The following reporting should be completed each time dredging is undertaken.

5.1 Completion Report

The Society should prepare a completion report outlining the following:

- Start and end date of works, including dates of work sequence tasks in Section 3.1;
- Extent of dredging;
- Depth (with location) of lagoon prior to and after dredging;
- Specific construction methods used (e.g., isolation methods);
- Volume of dredged materials; and
- Location and details about where dredged materials were disposed of.

5.2 Environmental Monitoring Report

The Environmental Monitor should prepare an environmental monitoring report outlining the following:

- Description of works;
- Timing of works;
- Surface area below the high water mark affected;
- Dates of monitoring;
- Any non-compliance with this management plan, the water licence C129749, or relevant provincial or federal best management practices or guidance documents;
- Description of any incidents, difficulties, or spills, and how they were addressed and reported;
- Dates and details of any fish or wildlife salvages, including time of day, location, capture methods, location of release, species and number of animals captured and released, any fatalities, and the numbers of the required licences to capture fish and/or wildlife; and
- A summary of any other actions taken.

5.3 Fish Salvage Data

If a fish salvage is conducted, the EM should report the results of the salvage to the MFLNRO in the appropriate format required by the ministry.

5.4 Conservation Data Centre Report

If any Species at Risk (those outlined in Section 2.2 or otherwise) are observed or salvaged during dredging or as a result of associated monitoring, these should be reported to the BC Conservation Data Centre.

5.5 Archaeological Findings

The provincial *Heritage Conservation Act* protects archaeological sites within BC. The Archaeology Branch of MFLNRO oversees the enforcement of the Act. Because the lagoon is man-made, it is unlikely that archaeological sites will be discovered during dredging as long as it does not disturb sediment below the depth of the original excavation. If, while dredging, a potential archaeological site is found, work should cease immediately, and the contractor should contact the Archaeology Branch at 250-953-3334. A professional archaeologist will be required to assess the site and determine if further investigation or permitting is required.

6. Monitoring and Maintenance

The depth of the lagoon should be monitored by the Society annually in at least four locations (mouth, middle, head, under specific docks, etc.) and the depths recorded. These depths should be reported in the completion report following subsequent dredging.

The Society should also monitor the diversion structure and piping to ensure that it is operating in a manner to minimize the amount of sediment entering the lagoon from the Eagle River.

7. Closure

We trust that this Water Management Plan meets your requirements at present. Please do not hesitate to contact KWL at DMeredith@kwl.ca or 250-503-5817 if you have any questions or concerns.

Report Submission

Prepared by:

KERR WOOD LEIDAL ASSOCIATES LTD.

Luke Warkentin, B.Sc., B.I.T.
Junior Biologist

Reviewed by:

Patrick Lilley, M.Sc., R.P.Bio.
Senior Biologist

This document is a copy of the sealed and signed hard copy original retained on file. The content of the electronically transmitted document can be confirmed by referring to the filed original.

BRITISH COLUMBIA INSTITUTE OF AGROLOGISTS 2738 Dwayne W. Meredith P.Ag.

May 11, 2017

Dwayne Meredith, B.Sc., P.Ag.
Project Manager
Sector Leader – Water Resources

Statement of Limitations

This document has been prepared by Kerr Wood Leidal Associates Ltd. (KWL) for the exclusive use and benefit of LOT 46 MANAGEMENT SOCIETY for the Water Management Plan. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document.

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.

Copyright Notice

These materials (text, tables, figures and drawings included herein) are copyright of Kerr Wood Leidal Associates Ltd. (KWL). LOT 46 MANAGEMENT SOCIETY is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to Water Management Plan. Any other use of these materials without the written permission of KWL is prohibited.

Revision History

Revision #	Date	Status	Revision	Author
0	May 11, 2017	Final	Issued for Use	DWM
A	January 18, 2017	Draft	Issued for client review	LTW/PL

OQM | Organizational Quality Management Program

References

Conservation Data Centre (CDC). 2016. Species and Ecosystems at Risk – Publically Available Occurances. iMapBC Provincial Layer. Available at: http://maps.gov.bc.ca/ess/sv/imapbc//. Accessed: December 2016.

COSEWIC. 2003. COSEWIC assessment and update status report on the chiselmouth *Acrocheilus alutaceus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 22 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

COSEWIC. 2006. COSEWIC assessment and status report on the Western Painted Turtle *Chrysemys picta bellii* (Pacific Coast population, Intermountain-Rocky Mountain population and Prairie/Western Boreal - Canadian Shield population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 40 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2012. COSEWIC assessment and status report on the White Sturgeon *Acipenser transmontanus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxvii + 75 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

Environment and Climate Change Canada. 2016. General Nesting Periods of Migratory Birds in Canada. Available at: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4f39a78f-1. Accessed: January 2017.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Canada, Smithsonian Institution Press, Washington, D.C.

Fisheries and Oceans Canada (DFO). 2005. Shuswap Lake System and Adams Lake Lake Char and Sockeye Spawning Atlas Overview Map. Available at: http://www.shim.bc.ca/shuswap/. Accessed: December 2016.

Fisheries and Oceans Canada (DFO). 2010a. Management Plan for the Rocky Mountain Ridged Mussel (*Gonidea angulata*) in Canada [Final]. Species at Risk Act Management Plan Series. Fisheries and Oceans Canada, Vancouver. iv + 52 pp.

Fisheries and Oceans Canada (DFO). 2010b. Pathways of Effects – Dredging. Available at: http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/dredging-dragage-eng.html. Accessed: December 2016.

Gist, D.H., J.A. Michaelson, and J.M. Jones. 1990. Autumn mating in the painted turtle, Chrysemys picta. Herpetologica 46:331-336.

Gregory, P.T. and R.W. Campbell. 1987. The Reptiles of British Columbia. British Columbia Provincial Museum Handbook. Ministry of Provincial Secretary and Government Services, Victoria, B.C. 102 pp.

Ministry of Environment (MOE). 2016a. BC Species and Ecosystem Explorer. Available at: http://a100.gov.bc.ca/pub/eswp/. Accessed: December 2016.

Ministry of Environment (MOE). 2016b. Habitat Wizard Stream and Lake Reports. Available at: http://maps.gov.bc.ca/ess/sv/habwiz/. Accessed: December 2016.

Ministry of Environment (MOE). 2016c. Consultative Area Database Public Map Service. Available at: http://maps.gov.bc.ca/ess/sv/cadb/. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2015. Regional Terms & Conditions & Timing Windows for Thompson Region. Available at: http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/work_windows_thompson.pdf. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010a. Standards and Best Practices for Instream Works General BMPs & Standard Project Considerations. Version 1.0.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010b. Standards and Best Practices for Instream Works Channel Maintenance. Version 1.0.

Nussbaum, R.A., E.D. Brodie and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow, ID. 332 pp.

Rosenfeld, J.S, B. Wicks, M. Porter, and P. VanDishoek. 1998. Habitat Use by Chiselmouth (*Acrocheilus alutaceus*) in the Blackwater River. Prov. of BC Fish. Proj. Rep. RD 76.

Rosenfeld, J.S., M. Porter, M. Pearson, B. Wicks, P. Van Dishoeck, T. Patton, E. Parkinson, G. Hass, and J. D. McPhail. 2001. The influence of temperature and habitat on the distribution of chiselmouth *Acrocheilus alutaceus* in British Columbia. Environmental Biology of Fishes 62:401-413.

Rosenfeld, Jordan. 2003. Update COSEWIC status report on the chiselmouth, *Acrocheilus alutaceus*, in Canada. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Ottawa. 1-22 pp.

Schwarzkopf L., and R.J. Brooks. 1987. Nest-site selection and offspring sex ratio in painted turtles, Chrysemys picta. Copeia 1987:53-61.

St. John, A. 2002. Reptiles of the Northwest: British Columbia to California. Lone Pine Publishing, Edmonton, AB. 272 pp.

Weisrock, D.W. and F.J. Janzen. 1999. Thermal and fitness-related consequences of nest location in painted turtles (*Chrysemys picta*). Functional Ecology 13(2): 94-101.

Appendix A

Site Photographs

Appendix A – Site Photographs

Date Photographs Taken: October 26, 2016

Photo 1: Looking west from the access gate of the lagoon towards the mouth, with Shuswap Lake in the background (see Figure 1).

Photo 2: Looking north from the shore of the lagoon towards its head.

Appendix A – Site Photographs

Photo 3: Looking northeast from left bank of Eagle River at the Point of Diversion (PD 52869), showing knife valve on the intake.

Photo 4: Knife valve on intake from the Eagle River at the Point of Diversion (PD 52869).

Appendix A – Site Photographs

Photo 5: Location at head of the lagoon where the diversion pipe enters.

Photo 6: Outlet of diversion pipe at the head of the lagoon.

Appendix A – Site Photographs

Photo 7: Looking northeast into the lagoon from the mouth of the lagoon.

Photo 8: Looking northwest across the mouth of the lagoon, where the temporary isolation dam will be installed.

Appendix A – Site Photographs

Photo 9: Looking southwest from mouth of lagoon at Shuswap Lake, where temporary isolation dam will be installed.

Photo 10: Looking southwest, showing site access point from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Appendix A – Site Photographs

Photo 11: Looking west, showing access gate along access path from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Photo 12: Looking northeast, showing site access from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Page 313 of 480

Withheld pursuant to/removed as

s.13 ; s.16

Page 314 of 480

Withheld pursuant to/removed as

s.13 ; s.16

Page 315 of 480

Withheld pursuant to/removed as

s.13 ; s.16

Page 316 of 480

Withheld pursuant to/removed as

s.13 ; s.16

Page 317 of 480

Withheld pursuant to/removed as

s.13 ; s.16

Page 318 of 480

Withheld pursuant to/removed as

s.13 ; s.16

Page 319 of 480

Withheld pursuant to/removed as

s.13 ; s.16

Page 320 of 480

Withheld pursuant to/removed as

s.13 ; s.14 ; s.16

Page 321 of 480

Withheld pursuant to/removed as

s.13 ; s.14 ; s.16

Page 322 of 480

Withheld pursuant to/removed as

s.13 ; s.14 ; s.16

Page 323 of 480

Withheld pursuant to/removed as

s.13 ; s.14 ; s.16

Adams Lake Indian Band

Project Name:
0281845 Water First Nations Referral: File #281845 Application #100308711 (Carrie Koch)

Consulting Org Contact:
Carrie Koch

Consulting Organization:
Government of British Columbia

Date Received:
Wednesday, February 5, 2020

While Adams Lake defers to the Splatsin on 0281845 Water First Nations Referral: File #281845 Application #100308711 (Carrie Koch), we reiterate that Adams Lake holds constitutionally protected Aboriginal rights including title throughout the entirety of Secwepemculucw. Members of Adams Lake continue to exercise their Aboriginal rights as their ancestors have done for generations, including hunting, trapping, gathering and fishing, along with rights associated with spiritual and cultural traditions that are practiced in accordance with Secwepemc customs, laws and governance structures.

With that being said, the Adams Lake Indian Band wishes to express its concerns on this proposed activity. Through a preliminary analysis we have identified some concerns which include:
numerous overlaps with traditional use, trails and nearby archaeological sites. Due to COVID the band has neither the time nor capacity to review this referral in detail.

Regards,

Dave Nordquist, RPF
Title and Rights Coordinator
Adams Lake Indian Band

From: Okanagan Indian Band (no-reply-okib@knowledgekeeper.ca)
To: Colleen.Marchand@okanagan.org; Koch, Carrie L FLNR:EX (Carrie.Koch@gov.bc.ca)
Subject: Decision regarding consultation: 100308711 - Water Licence Amendment Shuswap Lake Lagoon
Sent: 04/02/2020 23:37:51
Attachments: letter-fnlrod-re-lot-46-dredging.pdf
Message Body:

Hello,

Please find attached a decision to the above noted project.

Regards,

Okanagan Indian Band

Please do not reply to this email.

Okanagan Indian Band
12420 Westside Road • Vernon, BC, • V1H 2A4
Telephone: 250-542-4328 • Facsimile 250-542-4990
Email: okibreferrals@okanagan.org

"This correspondence will not be construed so as to prejudice, limit, or derogate from any rights, claims or interests in respect of any Aboriginal title, rights and interests of Okanagan or Syilx Nation recognized and affirmed under Section 35 of the Constitution Act, 1982 and nothing in this letter indicates acceptance by Okanagan of federal or provincial Crown jurisdiction over ownership of land, water or other resources within the Territory."

March 30, 2020

Carrie Koch
Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Kamloops, BC
Carrie.koch@gov.ab.ca

Attention: Carrie Koch

Dear Carrie Koch:

Re: Application to amend water license C129749, Application #100308711

The Okanagan Indian Band ("OKIB") acknowledges receipt of correspondence from the Government of British Columbia dated January 28, 2020 regarding notice under the *Water Sustainability Act* from the Lot 46 Management Society for an application to amend their existing water license C129749 to allow for dredging in a constructed lagoon on Shuswap lake on an as needed basis [Application #100308711]. OKIB has reviewed the information and has set out a number of questions and concerns below that we need answered to understand the potential impacts of this application.

OKIB is a member community of the Syilx (Okanagan Nation) which asserts and is pursuing a claim to Aboriginal rights and title in Syilx traditional territory. OKIB asserts rights to the water resources of our traditional territory as part of the Syilx. Accordingly, any potential impact arising from the application in question, or cumulative impacts resulting from British Columbia's granting of statutory water rights on Syilx's Aboriginal water rights and title will trigger British Columbia's duty to consult and accommodate OKIB. Further, OKIB asserts Aboriginal and other common law rights to the water resources within, under, and adjacent to our reserve lands and OKIB has the right to govern those water resources. To the extent the application in question potentially impacts OKIB's reserve land water resources and/or OKIB's ability and authority to

govern our reserve land water resources, British Columbia's duty to consult is engaged at a higher level, including the requirement to obtain OKIB's consent.

Consultation Process

To have the opportunity to engage in meaningful consultation, OKIB must be given sufficient information about the potential application and adequate capacity funding to engage in the process. Despite changes to the *Water Sustainability Act* resulting in an increase in water-related consultation referrals by the Province, OKIB has received no funding to allow us to participate in consultation on water licences. In *Clyde River (Hamlet) v. Petroleum Geo-Services Inc.,* 2017 SCC 40, the Supreme Court of Canada said that a lack of participant funding can significantly impair the ability to consult. Water is an important issue for OKIB culturally, ecologically, and as a matter of survival and economic success. However, we are hampered in our ability to engage by limited budgets and personnel. The lack of funding impacts our ability to respond in a substantive, timely, and informed manner to your requests for comment.

As noted, the application raises the issue of cumulative impacts on OKIB's water rights. In *Chippewas of the Thames First Nation v. Enbridge Pipelines*, 2017 SCC 41**,** the Supreme Court of Canada stated that it may be impossible to understand the severity of a particular project's impact on Aboriginal rights without considering the cumulative impact of the project and other development. An assessment of a project's cumulative effects may, in turn, inform the scope of consultation required. Further to this point, we request information with respect to how the appropriate level of consultation was determined in this case, and what constitutes "engagement" at a "normal level".

Finally, there has been a failure to consult the OKIB with respect to the *Water Sustainability Act* scheme as a whole, and this failure cannot now be remedied by consultation on applications.

Initial Questions and Concerns Regarding this Application

The proposed application to amend an existing water license to allow dredging in a constructed lagoon on Shuswap Lake on an as needed basis may impact OKIB's traditional uses of water in the Shuswap River watershed. The application falls within the Shuswap River's watershed that drains north to Mara Lake and the dredging may impact water quality in the Shuswap River.

OKIB supports the ongoing work of the Shuswap Watershed Council in the monitoring of water quantity and quality that directly affect the availability of water for both traditional and contemporary uses of the water within the OKIB traditional territory. The OKIB provided information on Aboriginal Interests within the Shuswap River Watershed Sustainability Plan (SRWSP, 2014) and seeks

confirmation from the Ministry of Forests, Lands, Natural Resource Operations and Rural Development that the proponent will respect our recommendations and (as a minimum) comply with the objectives specified within the SRWSP regarding the protection of water quality and habitat.

To engage in consultation on this water licence, OKIB requires answers to the following:

1) Will the Ministry consider the Shuswap River Watershed Sustainability Plan (SRWSP) in granting the application?

2) Will the Ministry require the applicant to comply with the objectives specified in the SRWSP regarding the protection of water quality and habitat (see especially "Objective 1: Land Use Planning & Urban/ Residential Developments")?

3) Has a cumulative effects assessment been performed to ascertain whether the change in use does not further deteriorate water quality within the Shuswap River watershed as a potential drinking water source for OKIB?

4) The proponent has asked that Kerr Wood Leidal's Water Management Plan (WMP) be attached to the water license. The WMP includes a new proposed pump station but does not provide information on the pump station itself. Does the inclusion of a pump station in the WMP allow Lot 46 to now modify the works and install a new pump station without an amendment to the existing water licence?

5) The WMP states that "the dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis." This conclusion is based on the following statement earlier in the document: "A letter from BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licenced works under their water licence". No information is provided regarding the original conditional licence and the approvals in place for the original construction or maintenance of the lagoon system. It appears that any future maintenance, alteration or otherwise of the lagoon is covered under a grandfathered provision with no back up documentation other than the skeletal C129749 licence itself and the original licence 35177 that comprises 1 page and a sketch. Please provide us with details on how the dredging is currently done.

6) How did the Province consult with OKIB on the original water license application?

7) The WMP states that a DFO review is not required contrary to DFO's own requirements and Code of Practice. Will the Province require the proponent to apply for a DFO review?

8) The WMP uses an abbreviated set of criteria to eliminate the need for a DFO review rather than addressing the full list of required criteria that includes PCB testing within the past 5 years and confirmation that the site has been dredged within the past 10 years. No rationale is provided for abbreviating the list. Was the existing channel dredged during the past 10 years? Has there been stormwater drainage into the channel containing deleterious substances?

9) The best management practices (BMPs) outlined in the WMP are erroneous and deficient as they cite incorrect practices and procedures while failing to include others. Please outline the practices and procedures the proponent will be required to follow to ensure that any discharge from the project is adequately treated and solids will be stabilized to prevent impacts to water quality.

10) The materials to be dredged are predominately a silt fraction with long settling times. How will the discharge of turbid waters into Shuswap Lake or Eagle River be prevented?

s.16; s.18

OKIB has been provided no information with this notice that answers these questions. In *Gitxaala Nation v Canada*, 2016 FCA 187, the Federal Court of Appeal noted how a failure to provide information that is central to the interests of affected First Nations results in inadequate consultation. To engage in any degree of meaningful consultation, OKIB requires sufficient information on the proposed discharge before it can proceed.

Finally, the WMP states that the existence of a 1968 water licence eliminates the need for consultation with First Nations. We object to the assertion that an existing water license dispenses with the need for consultation. Per *Haida Nation v British Columbia (Minister of Forests),* 2004 SCC 73 the Crown has a duty to consult when they have knowledge, real or constructive, of the potential existence of an Aboriginal right or title and contemplates conduct that might adversely affect it. As stated, OKIB asserts rights to the water resources within Syilx traditional territory and has made this known to the Province. Any applications to amend, renew or grant a water license within our territory

may impact our Aboriginal right to water resources, as such the Province has a duty to consult with us on the potential impacts arising from this application to amend the water license.

We look forward to your response to our requests above.

Yours truly,

Colleen Marchand, Director of Territorial Stewardship

Koch, Carrie L FLNR:EX

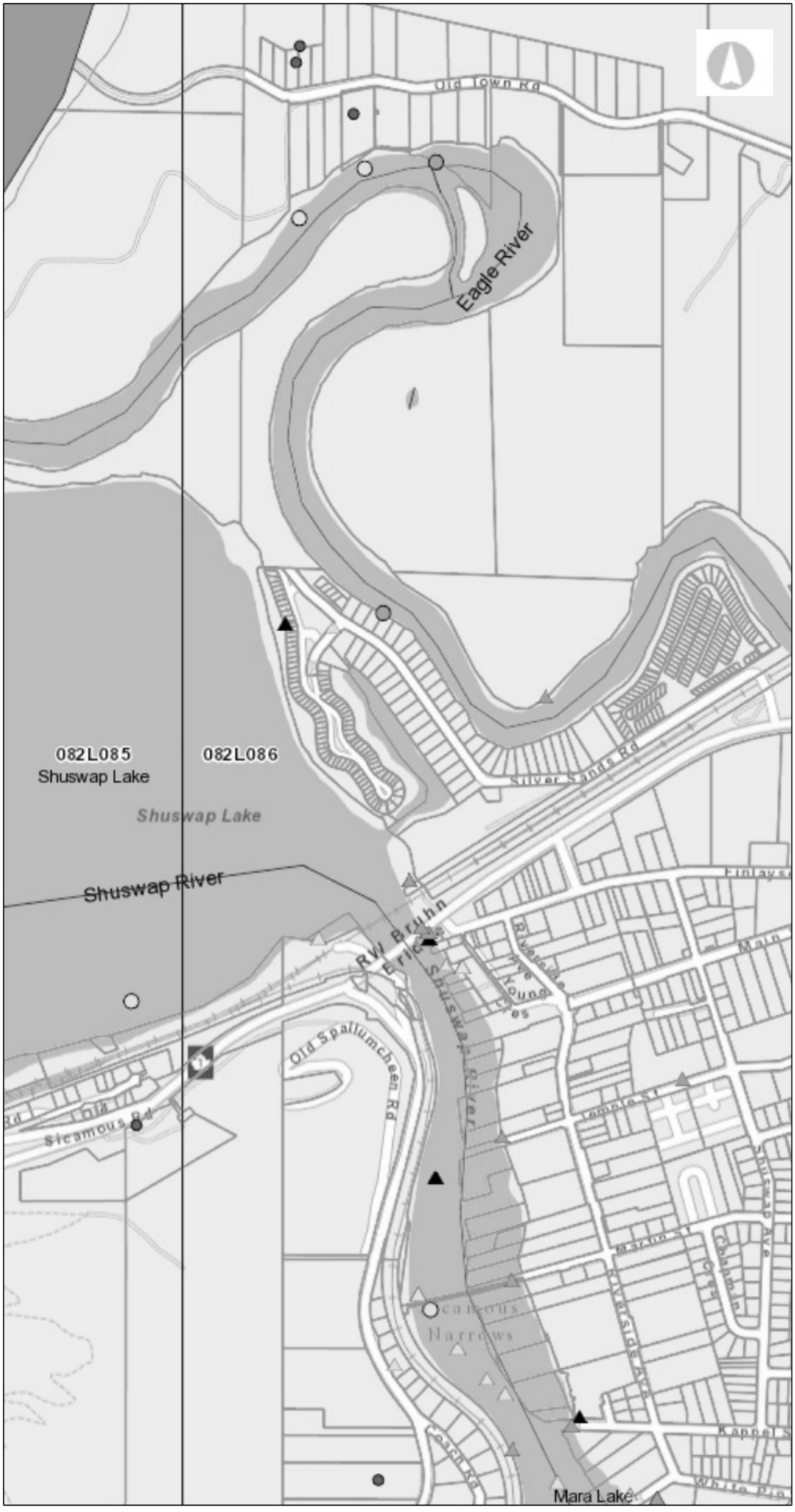
From: Jones, Debra L FLNR:EX
Sent: January 28, 2020 12:02 PM
To: Jones, Debra L FLNR:EX
Cc: Koch, Carrie L FLNR:EX
Subject: Water First Nations Referral: File #281845 Application #100308711 (Carrie Koch)
Attachments: Lot 46 - iMap.pdf; Management plan.pdf; Redacted Application.pdf

Dear Chief and Council

Authorization type: Water Licence Amendment
Purpose: Applicant has applied to amend their existing licence to include a clause that allows dredging (on an as needed basis) of a Constructed Lagoon on Shuswap Lake as maintenance of works associated with their licence. Applicant has provided an Environmental Management Plan.
Initial referral period: 60 days
Geomark:
http://apps.gov.bc.ca/pub/geomark/geomarks/gm-4FE18E9AE28F4EF78D622A5CD1B6B7F7

Government contact:

Carrie Koch
Carrie.Koch@gov.bc.ca
250-558-1722



BRITISH COLUMBIA

iMapBC Mapping

Legend

Water Rights - Licences - Int
POD_STATUS
Active
Inactive

Water Rights - Applications
APPLICATION_STATUS
Active Application
Refused

Water Reserves - Points

Water Allocation Restrictions

Sensitive Streams - Points

Water Rights - Licences
POD_STATUS
Active
Inactive

Water Wells - All

Water Sustainability Act App Section 10 and 11 Locations
APPROVAL_STATUS
Other
Current
Expired
Refused
Unknown

Water Rights - Applications
APPLICATION_STATUS
Active Application

0 0.37 0.7 km

1: 18,055.95

Copyright/Disclaimer

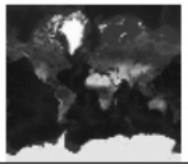
The material contained in this web site is owned by the Government of British Columbia and protected by copyright law. It may not be reproduced or redistributed without the prior written permission of the Province of British Columbia. To request permission to reproduce all or part of the material on this web site please complete the Copyright Permission Request Form which can be accessed through the Copyright Information Page.

CAUTION: Maps obtained using this site are not designed to assist in navigation. These maps may be generalized and may not reflect current conditions. Uncharted hazards may exist. DO NOT USE THESE MAPS FOR NAVIGATIONAL PURPOSES.

Datum: NAD83

Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere

Key Map of British Columbia



KERR WOOD LEIDAL
consulting engineers

Okanagan
202 - 3334 30th Avenue
Vernon, BC V1T 2C8
T 250 503 0841
F 250 503 0847

Water Management Plan

Prepared for:

Lot 46 Management Society

May 11, 2017
KWL Project No. 3691.001

Contents

1. Introduction 1-1
1.1 Project Background and Rationale 1-1
1.2 Authorizations, Permits, and Approvals 1-1
1.3 First Nations 1-2

2. Site Location and Context 2-1
2.1 Land Ownership and Land Use 2-1
2.2 Aquatic Habitat and Species 2-1

3. Dredging Operation 3-1
3.1 Sequence and Description of Works 3-1
3.2 Dredging Considerations 3-2
3.3 Dewatering and Water Management 3-2
3.4 Dredging Frequency/Schedule 3-2

4. Environmental Impacts and Mitigation 4-1
4.1 Potential Environmental Impacts 4-1
4.2 Environmental Protection and Mitigation Measures 4-1

5. Reporting 5-1
5.1 Completion Report 5-1
5.2 Environmental Monitoring Report 5-1
5.3 Fish Salvage Data 5-1
5.4 Conservation Data Centre Report 5-1
5.5 Archaeological Findings 5-2

6. Monitoring and Maintenance 6-1

7. Closure 7-1
Report Submission 7-1

References 7-1

Figures

Figure 1: Location Plan 1-3

Tables

Table 1: Fish Species Summary Table 2-2

Appendices

Appendix A: Site Photographs

1. Introduction

1.1 Project Background and Rationale

The Lot 46 Management Society (the Society) is composed of 17 homeowners who own properties on Silver Sands Road in Sicamous, BC. The properties are located along the east side of an artificial lagoon connected to Shuswap Lake, just north of the RW Bruhn Bridge (Highway 1 crossing; see Figure 1). The Society manages the lagoon and members have private docks for boat access to the lake. Sediment accumulates in the lagoon and the Society needs to dredge the lagoon to facilitate navigation of boats from private docks to the lake. This Water Management Plan provides operational guidance for the periodic dredging of the Lot 46 Lagoon, including measures to mitigate the potential impacts to water quality, aquatic habitat, fish, and other wildlife.

1.2 Authorizations, Permits, and Approvals

Existing Water Licence

The Society holds water licence C129749 which authorizes a maximum of 0.28 cubic metres per second (10 cubic feet per second) to be diverted through a diversion structure (point of diversion number PD52869) and pipe from the Eagle River into the constructed lagoon. See Figure 1 for a plan view of the licensed works.

A letter from the BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licensed works under their water licence. As a condition, the MFLNRO Regional Water Management Branch requires the Society develop a Water Management Plan (this plan) to guide the dredging operations.

Other Permits and Approvals

A fish salvage within the lagoon is required prior to dewatering and dredging. In order to conduct a fish salvage, the Society must obtain a Licence to Fish for Scientific Purposes from Fisheries and Oceans Canada (DFO) and a Scientific Fish Collection Permit from MFLNRO.

In order for dredging to proceed without requiring a review by DFO, the following conditions must be met:

- No temporary or permanent increase in the existing area of the lagoon below the high water mark;
- Dredged material is deposited and stabilized on land;
- Dredging has occurred in the last 10 years; and
- No dredging where SARA-listed shellfish occur except where exempted in the recovery strategy for that species.

1.3 First Nations

The following First Nations have traditional territory and/or interests in or nearby the project area (MOE 2016c):

- Neskonlith Indian Band;
- Secwepemc First Nation (falls within Secwepemc Reconciliation Framework Agreement Boundary);
- Okanagan Indian Band;
- Adams Lake Indian Band;
- Little Shuswap Indian Band; and
- Splats'in First Nation.

The dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis. As such, there is no expectation to consult with First Nations. However, in the interests of continued good relationships, the Society envisions contact with local First Nations contacts prior to any operation to learn if there are any potential conflicts with the operation.

Lot 46 Management Society Lagoon Water Management Support

Legend

- Extent of Dredging (Lagoon)

Parcel Ownership (from the District of Sicamous Cadastral)

- Municipal Park
- Private

Reference: Orthophoto from Bing aerial image map.

KERR WOOD LEIDAL
consulting engineers

© 2017 Kerr Wood Leidal Associates Ltd.

Copyright Notice: These materials are copyright of Kerr Wood Leidal Associates Ltd. (KWL). Lot 46 Management Society is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to the Lot 46 Management Society Lot 46 Lagoon Water Management Support. Any other use of these materials without the written permission of KWL is prohibited.

50 0 50 (m)

1:2,000

Project No.	Date
3691-001	January 2017

Location Plan

Figure 1

Path: R:\3600-36991\3691-001\430-GIS\MXD-WA\3691001_Map.mxd Date Saved: 1/16/2017 3:21:32 PM
Author: JLau

2. Site Location and Context

The following section outlines the context and characteristics of the project site.

2.1 Land Ownership and Land Use

Land use around the lagoon is a mix of single family residential and recreational. Lot A District Lot 452 Kamloops Division Yale District Plan KAP52709, the lot being excavated, is private property owned by the Society.

Adjacent land owners will be notified with sufficient time to prepare for dredging operations. It is anticipated that three (3) months would be sufficient, but there may be particular circumstances that dictate otherwise. These special circumstances will be reviewed on a case-by-case basis.

2.2 Aquatic Habitat and Species

Aquatic Habitat

The constructed lagoon is primarily used for private moorage and is approximately 320 m long and 60 m wide with a surface area of approximately 18,700 m^2. It is approximately 3 m deep at its deepest point, with an average depth of roughly 1.5 m during low water.

The lagoon is currently fed by water from Eagle River via a diversion structure and pipe. The point of diversion from the river is located 2.9 km upstream from its confluence with Shuswap Lake. At the point of diversion, the bank full channel width of the Eagle River is approximately 60 m. Due to the relatively small rate of diversion, water in the lagoon is slow-flowing to stagnant. Substrates are mainly sands and silts which contribute to the ongoing accumulation of sediment in the lagoon. The shoreline is mainly sand. There is a small amount of vegetated shore along the south end of the lagoon, where grasses and some small shrubs grow to near the high water mark. In October 2016, there were no obvious aquatic plants growing in the lagoon.

Water from the lagoon exits into Shuswap Lake through a shallow outlet (approximately 12 m wide) immediately downstream of Sicamous Narrows. Sicamous Narrows is the short canal-like channel that connects Mara Lake with Shuswap Lake.

Fish and Other Wildlife

Table 1 provides the result of a desktop study to indicate the fish species present in the waterbodies that are connected with and nearby to the lagoon: Shuswap Lake, Mara Lake (including Sicamous Narrows), the Shuswap River (upstream of Mara Lake), and the Eagle River. These species may or may not be present in the lagoon.

Table 1: Fish Species Present in Shuswap Lake, Mara Lake, Shuswap Narrows, Shuswap River, & Eagle River

Common Name	Code	Latin Name	Species at Risk Status		
			BC List	COSEWIC	SARA
Bridgelip Sucker	BSU	*Catostomus columbianus*	Yellow	-	-
Bull Trout	BT	*Salvelinus confluentus*	Blue	SC (2012)	-
Burbot	BB	*Lota lota*	Yellow	-	-
Carp	CP	*Cyprinus carpio*	Exotic	-	-
Chinook Salmon	CH	*Oncorhynchus tshawytscha*	Yellow	-	-
Chiselmouth[1]	CMC	*Acrocheilus aclutaceus*	Blue	NAR (2003)	-
Coho Salmon (Interior Fraser population)	CO	*Oncorhynchus kisutch*	Yellow	T (2016)	-
Dolly Varden	DV	*Salvelinus malma*	Yellow	-	-
Emerald Shiner	ESC	*Notropis atherinoides*	Unknown	-	-
Kokanee	KO	*Oncorhynchus nerka*	Yellow	-	-
Lake Chub	LKC	*Couesius plumbeus*	Yellow	DD	-
Lake Trout	LT	*Salvelinus namaycush*	Yellow	-	-
Largescale Sucker	CSU	*Catostomus macrocheilus*	Yellow	-	-
Leopard Dace	LDC	*Rhinichthys falcatus*	Yellow	NAR (1990)	-
Longnose Dace	LNC	*Rhinichthys cataractae*	Yellow	-	-
Longnose Sucker	LSU	*Catostomus catostomus*	Yellow	-	-
Mountain Whitefish	MW	*Prosopium williamsoni*	Yellow	-	-
Northern Pikeminnow	NSC	*Ptycheilus oregonensis*	Yellow	-	-
Peamouth Chub	PCC	*Mylocheilus caurinus*	Yellow	-	-
Pink Salmon	PK	*Oncorhynchus gorbuscha*	Yellow	-	-
Prickly Sculpin	CAS	*Cottus asper*	Yellow	-	-
Pygmy Whitefish (Pacific populations)	PW	*Prosopium coulteri*	Yellow	NAR (2016)	-
Rainbow Trout	RB	*Oncorhynchus mykiss*	Yellow	-	-
Redside Shiner	RSC	*Richardsonius balteatus*	Yellow	-	-
Slimy Sculpin	CCG	*Cottus cognatus*	Yellow	-	-
Sockeye Salmon	SK	*Oncorhynchus nerka*	Yellow	-	-
Steelhead	ST	*Oncorhynchus mykiss*	Yellow	-	-
Westslope Cutthroat Trout (Pacific populations)	WCT	*Oncorhynchus clarki lewisi*	Blue	SC (2016)	1-SC (2010)
White Sturgeon (Upper Fraser River Population)	WSG	*Acipenser transmontanus*	Yellow	E (2012)	-
White Sucker	WSU	*Catostomus commersoni*	Yellow	-	-

Sources: MOE 2016a, MOE 2016b
[1]One Chiselmouth sampled in 1964 at northern outlet of Mara Lake at the beginning of Shuswap Narrows (CDC 2016)

It is unlikely that salmon, trout, or char use the lagoon to spawn due to the accumulation of fine sediments and frequent boat traffic in the lagoon. Based on *Shuswap Lake System and Adams Lake - Lake Char and Sockeye Spawning Atlas Overview Map* (DFO 2005), there is no spawning of Sockeye or Char (i.e., Bull Trout and Dolly Varden) in the lagoon or on the adjacent shoreline of Shuswap Lake.

Five fish species present or with potential to be present in Shuswap Lake and other nearby waterbodies are federally- or provincially-listed species at risk:

- Bull Trout (Salvelinus confluentus) are a blue-listed species in BC. Blue-listed species are Species of Special Concern (formerly Vulnerable) in BC and have characteristics which make them especially sensitive or vulnerable to natural or anthropogenic events (MOE 2016a). Bull Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on habitat characteristics and the extent of known spawning areas (DFO 2005).
- Chiselmouth (*Acrocheilus aclutaceus*) are also blue-listed Species of Special Concern in BC. One Chiselmouth was sampled in 1964 at the mouth of Mara Lake as it entered Shuswap Narrows (CDC 2016). Chiselmouth are absent form sites with maximum temperatures below 20 °C (Rosenfeld et al. 2001). Adults need deep, fast flowing water with substrate that supports periphyton (i.e., boulder and cobble; Rosenfeld et al. 1998). Juveniles need slow-moving backwater habitat and are usually found where there are aquatic plants, which provide habitat for food (invertebrates) and cover from predators (COSEWIC 2003, Rosenfeld 2003). Based on these requirements, it is highly unlikely that adult Chiselmouth use the lagoon, and possible that juveniles are present.
- Interior Fraser populations of Coho Salmon (*Oncorhynchus kisutch*) were re-assessed as Threatened (downgraded from Endangered) by the Committee of the Status of Endangered Wildlife in Canada (COSEWIC) in 2016 but have not been added to Schedule 1 of the *Species at Risk Act*. Coho fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- Pacific populations of Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*) were reconfirmed as a Species of Special Concern by COSEWIC in 2016 and are a Schedule 1 Species of Special Concern of the *Species at Risk Act* (SARA). Under SARA, species of special concern are defined being particularly sensitive to human activities or natural events but are not endangered or threatened. This species is also blue-listed in BC. Westslope Cutthroat Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- The Upper Fraser River population of White Sturgeon (*Acipenser transmontanus*) was assessed as Endangered by COSEWIC in 2012. It has been recorded in Kamloops Lake, and may occasionally enter the Thompson River system. However, it is very unlikely that White Sturgeon would be present in the lagoon based on its small size and habitat characteristics (COSEWIC 2012).

Western Painted Turtle (*Chrysemys picta bellii*) has been observed on the Eagle River just north of the project site (CDC 2016). These populations are part of the Intermountain - Rocky Mountain population that was reconfirmed as a Species of Special Concern by COSEWIC in 2016 and is a Schedule 1 Species of Special Concern under SARA. It is also blue-listed in BC. Because Western Painted Turtles can move up to several hundred metres by land (Gregory and Campbell 1987, COSEWIC 2006), they have the potential to feed, mate, and nest in the lagoon. The turtles begin mating in spring soon after the end of hibernation and begin nesting in June (Schwarzkopf and Brooks 1987, Ernst et al. 1994, COSEWIC 2006). Successful mating peaks in late summer and early fall (Gist et al. 1990). Females dig 10 cm deep nests on open south-facing slopes (Schwarzkopf and Brooks 1987, Weisrock and Janzen 1999). Eggs incubate for 72–104 days in the Pacific Northwest (Nussbaum et al. 1983). After

hatching in later summer and early fall, turtle hatchlings stay in the nest until the next spring (Gregory and Campbell 1987, St. John 2002). Adults hibernate over the winter in the muddy bottoms of streams and ponds, old mammal burrows, or other shelter (Cohen 1992).

The only shellfish listed under the *Species at Risk Act* that is present in the Okanagan drainage is the Rocky Mountain Ridged Mussel (*Gonidea angulata*), listed as a Species of Special Concern. In recent searches, *Gonidea angulata* was found as far north as Okanagan Lake near Vernon (COSEWIC 2010). Portions of the Shuswap watershed have not been surveyed for *Gonidia angulata* as of 2011 (DFO 2010b).

It is possible that amphibians use the lagoon for breeding or refuge. However, due to frequent boat traffic, it is not ideal habitat.

Migratory birds may use the grass and shrub area at the south end of the lagoon for foraging and breeding. Waterfowl use the lagoon for refuge and possibly for foraging.

3. Dredging Operation

3.1 Sequence and Description of Works

Dredging operation will proceed in the following sequence:

1. Installation of Erosion and Sediment Control Measures

Erosion and sediment control measures should be installed prior to starting dredging works. Additional supplies for erosion and sediment control should be stockpiled on site in case they are required.

2. Isolation of Lagoon

Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand-bag coffer dams, or sheet pile coffer dams. The preference is for methods that minimize the disturbance to sediment and aquatic life (i.e., aqua-dams). The diversion structure will be isolated using the knife-valve at its inlet (Appendix B, Photo 4).

3. Fish Salvage

After isolation, an initial fish salvage will be conducted by a Qualified Environmental Professional (QEP) who may also be the environmental monitor (EM). Salvage methods should be appropriate for the depth of water in the lagoon. Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.

3. Dewatering

After the initial fish salvage, dewatering should proceed immediately. Fish salvaging should continue as the lagoon is dewatered. Adequate pumping capacity should be retained in order to complete dewatering as quickly as possible. Water will be discharged over the coffer dam into Shuswap Lake.

4. Excavation and Grading

After complete salvage and dewatering, the EM will complete a review of the area to determine if there are any outstanding environmental concerns which need to be addressed.

Once the EM has approved the site for further work, dredging may begin. Dredging should commence only after the lagoon is fully isolated from flowing water and can continue only if this isolation is maintained.

Dredging will be completed by conventional equipment and be subject to review by the EM.

5. Rewatering Lagoon and Removal of Isolation Measures

The lagoon should be refilled and isolation measures removed in a manner so as to minimize the suspension of sediment in the water column and movement into Shuswap Lake.

6. Resume Normal Operation of the Lagoon

Once the lagoon has been filled to the level of the Shuswap lake, normal operation will continue.

3.2 Dredging Considerations

Engineering Specifications

The lagoon will be restored to original design parameters of a trapezoidal geometry consisting of minimum 4H:1V side slopes and flat bottom.

Machinery

The contractor shall decide what machinery is most appropriate for the works. It is assumed that conventional excavators and machinery will be used after isolation and dewatering of the lagoon is complete. The machinery will be clean and in satisfactory condition to undertake the work in a sensitive environment. The EM will review and approve equipment prior to the commencement of construction.

Disposal of Dredged Material

Dredged material should be disposed of on land and at an off site location. Disposal must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites Regulation and Hazardous Waste Regulation, and with any appropriate local government bylaws regarding the removal and deposition of spoil and dredged material.

3.3 Dewatering and Water Management

Isolation Measures

The isolation measures will be constructed according to the EM and will be designed to safely hold back water from entering the lagoon when fully dewatered without failure. This may be accomplished with an aqua-dam, sandbag dam, coffer dam, or other suitable method.

The knife valve on at the diversion structure from the Eagle River will be closed to isolate the lagoon from the river prior to fish salvage.

The contractor will keep a silt curtain on site and use it if necessary when installing or removing the dam to prevent silt from entering Shuswap Lake.

Pumping Capacity

The contractor shall ensure that they have sufficient pumping capacity to dewater the lagoon as quickly as possible.

Discharge Location

During dewatering, discharge water should be managed and directed to an area where it will not cause erosion or carry sediment-laden water into Shuswap Lake. If discharge water becomes turbid (likely near the end of dewatering), a silt curtain should be placed between the discharge location and the rest of Shuswap Lake. The contractor should ensure that they have adequate length of pipe or hoses so that the intakes can be situated in the deepest part of the lagoon and the discharge hose can be situated in an appropriate area as outlined above.

3.4 Dredging Frequency/Schedule

Dredging should be carried out only when necessary to ensure residents can navigate safely. If dredging is required frequently (i.e., annually), the Lot 46 Management Society should investigate the source and mechanism of the sedimentation and take steps to reduce the rate of accumulation of sediment within the lagoon so that the frequency of dredging can be reduced.

4. Environmental Impacts and Mitigation

4.1 Potential Environmental Impacts

The dredging operations may have the following environmental impacts (DFO 2010a):

- Removal or change in aquatic plants, leading to change in food supply, nutrients concentrations, and habitat structure;
- Sediment being suspended in water, leading to change in sediment concentrations and contaminant concentrations;
- Modification of channel or shoreline shape leading to change in stability and hydraulics, influencing substrate, leading to a change in food supply and habitat structure; and
- Direct injury to fish, amphibians, reptiles, or other aquatic organisms from machinery or materials.

4.2 Environmental Protection and Mitigation Measures

To mitigate the potential impacts listed above, dredging works should follow provincial Standards and Best Practices for Instream Works (MFLNRO and DFO 2010a, MFLNRO and DFO 2010b). These and other guidelines to follow are listed below.

Project Planning

- Notify consultants with the intention to dredge at least three months before the expected start date, to allow enough time for a QEP to obtain fish salvage permits.

Timing

- Dredging is anticipated at low water levels, typically seen in late summer to fall.
- Works in the lagoon should be completed from July 22 to April 1, the reduced risk timing window for instream works in Shuswap Lake for areas with no sockeye of char spawning (MFLNRO 2015).
- The nesting window for migratory birds in Sicamous is April 1 to August 17 (Environment and Climate Change Canada 2016). Machinery should not drive through grass or shrub areas where migratory birds may be nesting during this period, and no clearing of vegetation should occur during this period. If disturbance of vegetation is required during this period, a QEP must conduct a breeding bird survey. Any areas where there are active or suspected nests must be flagged off and not disturbed during works.

Erosion and Sediment Control

- The contractor should use appropriate erosion and sediment control measures to intercept and manage runoff and reduce the likelihood for soils to erode and the potential for sediment to enter nearby waterbodies. Set up measures before beginning other work. Measures may include but are not limited to:
    - Using a silt curtain when installing or removing isolation measures to prevent silt from entering Shuswap Lake;
    - During dewatering, using a silt curtain between the discharge location and the rest of Shuswap lake to keep sediment from moving into the lake;

- Covering spoil/dredged material with plastic sheeting and set up silt fencing around piles, if material is being stored temporarily;
- Placing spoil/dredged material where it will not erode into a waterbody or storm sewer;
- Keeping additional erosion and sediment control supplies on site in case of an unexpected storm or other event;
- Regular inspection of measures and modification/repair when necessary; and
- Maintenance of effective erosion and sediment control measures on any disturbed upland banks until banks are revegetated.

Site Access

- Machinery should access the site using existing roads, trails, and boat ramp to avoid disturbance to vegetation (see Figure 1).
- Minimize disturbance to the riparian area along the shoreline and protect trees, shrubs and grasses whenever possible.

Weather

- The contractor should monitor weather forecasts and avoid work during periods of heavy rain.
- Avoid construction or removal of coffer dam when Shuswap Lake has large waves or when high wind is in the forecast.

Environmental Monitor

- Dredging activities should be monitored by a QEP for the duration of the project, and full-time during sensitive works. Sensitive works include the installation and removal of the isolation measures, fish salvage, dewatering, and initial excavation.

Protection of Fish and Other Aquatic Organisms

- A QEP should complete a fish and amphibian salvage according to provincial best practices prior to any works below the high water mark.
- Before starting work, the EM should survey the site for any reptiles or amphibians, especially Western Painted Turtles. If any are found, they should be moved to a safe location away from the work site according to provincial best management practices. They should also look for signs of Western Painted Turtle mating or nesting. If a nest or potential nest is discovered, it should be flagged off and should not be disturbed during dredging operations. Ideally, the EM should survey the site in late summer/early fall at least 1 week prior to works.
- Salvage methods should be appropriate for the depth of water in the lagoon.
- Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.
- All dewatering pump intakes must have fish screens with a maximum screen opening of 2.54 mm (0.10 inches) to prevent fish impingement.
- The contractor should make every effort to dewater the lagoon as quickly as possible. The contractor shall ensure that they have sufficient pumping capacity. This will minimize the time that fish may be isolated within the lagoon in water with no flow.

- The dewatering pump intakes should be situated in the deepest location of the lagoon before dewatering, so that the intake does not need to be moved multiple times. This will minimize the disturbance of sediment and fish that may still be in the lagoon during dewatering.
- The salvage crew should stay on site from the beginning of dewatering until the lagoon is completely dewatered. If fish, amphibians, or reptiles remain in the lagoon during or after dewatering, they should be captured using dip nets and moved to a safe location outside the work area as quickly as possible.
- After partial dewatering, the EM should survey the banks and soft substrate of the exposed lagoon for Rocky Mountain Ridged Mussells (*Gonidea angulata*). If found, work should cease immediately and the client should contact DFO for guidance on how to proceed.

Dredged Material

- Return water (water draining from saturated sediment that has been dredged and placed on land temporarily) should be treated with settling basins or other appropriate means so that the concentration of total suspended solids is minimized before returning to the lagoon or Shuswap Lake.
- Return water should not enter the Eagle River.
- Dredged material must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites and Hazardous Waste regulations, and with any appropriate local government bylaws regarding spoil.
- Dredged material should not be used to infill the shoreline or adjacent wetland areas.

Operation of Machinery

- Beside and within the lagoon, operate machinery in a manner that minimizes the disturbance to the banks and upland areas around the lagoon.
- Only use the existing boat access ramp to move machinery from the access path into the lagoon.

Contamination and Spill Management

- Prevent the discharge of silt, sediment, sediment-laden water, or any other deleterious substance into the lagoon, Eagle River, Shuswap Lake, or any ditch or storm sewer that flows into these waterbodies.
- Ensure machinery is clean (power washed), in good working condition, and free of leaks, excess oil, grease, and seeds or tissue of noxious weeds.
- Do not refuel or service equipment within 30 m of a water body, including the lagoon.
- Keep a spill containment kit on site and ensure all staff are trained it its use. Immediately report any substance of reportable quantities that is harmful to aquatic life to the Environmental Emergency Management Plan Incident Reporting Hotline at 1-800-663-3456 and DFO's Observe, Record and Report hotline at 1-800-465-4336.
- Place generators and pumps inside fuel containment trays to contain any accidental spills of fuel or oil.

Post-operation

- If the banks of the lagoon are disturbed during construction, restore them to their original grade and condition.
- Stabilize any exposed areas such as shoreline by planting and seeding with native trees, shrubs, and/or grasses and mulching to prevent erosion. Grass can be planted by hydro-seeding or broadcast seeding and mulching.

5. Reporting

The following reporting should be completed each time dredging is undertaken.

5.1 Completion Report

The Society should prepare a completion report outlining the following:

- Start and end date of works, including dates of work sequence tasks in Section 3.1;
- Extent of dredging;
- Depth (with location) of lagoon prior to and after dredging;
- Specific construction methods used (e.g., isolation methods);
- Volume of dredged materials; and
- Location and details about where dredged materials were disposed of.

5.2 Environmental Monitoring Report

The Environmental Monitor should prepare an environmental monitoring report outlining the following:

- Description of works;
- Timing of works;
- Surface area below the high water mark affected;
- Dates of monitoring;
- Any non-compliance with this management plan, the water licence C129749, or relevant provincial or federal best management practices or guidance documents;
- Description of any incidents, difficulties, or spills, and how they were addressed and reported;
- Dates and details of any fish or wildlife salvages, including time of day, location, capture methods, location of release, species and number of animals captured and released, any fatalities, and the numbers of the required licences to capture fish and/or wildlife; and
- A summary of any other actions taken.

5.3 Fish Salvage Data

If a fish salvage is conducted, the EM should report the results of the salvage to the MFLNRO in the appropriate format required by the ministry.

5.4 Conservation Data Centre Report

If any Species at Risk (those outlined in Section 2.2 or otherwise) are observed or salvaged during dredging or as a result of associated monitoring, these should be reported to the BC Conservation Data Centre.

5.5 Archaeological Findings

The provincial *Heritage Conservation Act* protects archaeological sites within BC. The Archaeology Branch of MFLNRO oversees the enforcement of the Act. Because the lagoon is man-made, it is unlikely that archaeological sites will be discovered during dredging as long as it does not disturb sediment below the depth of the original excavation. If, while dredging, a potential archaeological site is found, work should cease immediately, and the contractor should contact the Archaeology Branch at 250-953-3334. A professional archaeologist will be required to assess the site and determine if further investigation or permitting is required.

6. Monitoring and Maintenance

The depth of the lagoon should be monitored by the Society annually in at least four locations (mouth, middle, head, under specific docks, etc.) and the depths recorded. These depths should be reported in the completion report following subsequent dredging.

The Society should also monitor the diversion structure and piping to ensure that it is operating in a manner to minimize the amount of sediment entering the lagoon from the Eagle River.

7. Closure

We trust that this Water Management Plan meets your requirements at present. Please do not hesitate to contact KWL at DMeredith@kwl.ca or 250-503-5817 if you have any questions or concerns.

Report Submission

Prepared by:

KERR WOOD LEIDAL ASSOCIATES LTD.

Luke Warkentin, B.Sc., B.I.T.
Junior Biologist

Reviewed by:

Patrick Lilley, M.Sc., R.P.Bio.
Senior Biologist

This document is a copy of the sealed and signed hard copy original retained on file. The content of the electronically transmitted document can be confirmed by referring to the filed original.

BRITISH COLUMBIA INSTITUTE OF AGROLOGISTS 2738 Dwayne W. Meredith P.Ag.

May 11, 2017

Dwayne Meredith, B.Sc., P.Ag.
Project Manager
Sector Leader – Water Resources

Statement of Limitations

This document has been prepared by Kerr Wood Leidal Associates Ltd. (KWL) for the exclusive use and benefit of LOT 46 MANAGEMENT SOCIETY for the Water Management Plan. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document.

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.

Copyright Notice

These materials (text, tables, figures and drawings included herein) are copyright of Kerr Wood Leidal Associates Ltd. (KWL). LOT 46 MANAGEMENT SOCIETY is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to Water Management Plan. Any other use of these materials without the written permission of KWL is prohibited.

Revision History

Revision #	Date	Status	Revision	Author
0	May 11, 2017	Final	Issued for Use	DWM
A	January 18, 2017	Draft	Issued for client review	LTW/PL

OQM | Organizational Quality Management Program

References

Conservation Data Centre (CDC). 2016. Species and Ecosystems at Risk – Publically Available Occurances. iMapBC Provincial Layer. Available at: http://maps.gov.bc.ca/ess/sv/imapbc//. Accessed: December 2016.

COSEWIC. 2003. COSEWIC assessment and update status report on the chiselmouth *Acrocheilus alutaceus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 22 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

COSEWIC. 2006. COSEWIC assessment and status report on the Western Painted Turtle *Chrysemys picta bellii* (Pacific Coast population, Intermountain-Rocky Mountain population and Prairie/Western Boreal - Canadian Shield population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 40 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2012. COSEWIC assessment and status report on the White Sturgeon *Acipenser transmontanus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxvii + 75 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

Environment and Climate Change Canada. 2016. General Nesting Periods of Migratory Birds in Canada. Available at: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4f39a78f-1. Accessed: January 2017.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Canada, Smithsonian Institution Press, Washington, D.C.

Fisheries and Oceans Canada (DFO). 2005. Shuswap Lake System and Adams Lake Lake Char and Sockeye Spawning Atlas Overview Map. Available at: http://www.shim.bc.ca/shuswap/. Accessed: December 2016.

Fisheries and Oceans Canada (DFO). 2010a. Management Plan for the Rocky Mountain Ridged Mussel (*Gonidea angulata*) in Canada [Final]. Species at Risk Act Management Plan Series. Fisheries and Oceans Canada, Vancouver. iv + 52 pp.

Fisheries and Oceans Canada (DFO). 2010b. Pathways of Effects – Dredging. Available at: http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/dredging-dragage-eng.html. Accessed: December 2016.

Gist, D.H., J.A. Michaelson, and J.M. Jones. 1990. Autumn mating in the painted turtle, Chrysemys picta. Herpetologica 46:331-336.

Gregory, P.T. and R.W. Campbell. 1987. The Reptiles of British Columbia. British Columbia Provincial Museum Handbook. Ministry of Provincial Secretary and Government Services, Victoria, B.C. 102 pp.

Ministry of Environment (MOE). 2016a. BC Species and Ecosystem Explorer. Available at: http://a100.gov.bc.ca/pub/eswp/. Accessed: December 2016.

Ministry of Environment (MOE). 2016b. Habitat Wizard Stream and Lake Reports. Available at: http://maps.gov.bc.ca/ess/sv/habwiz/. Accessed: December 2016.

Ministry of Environment (MOE). 2016c. Consultative Area Database Public Map Service. Available at: http://maps.gov.bc.ca/ess/sv/cadb/. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2015. Regional Terms & Conditions & Timing Windows for Thompson Region. Available at: http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/work_windows_thompson.pdf. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010a. Standards and Best Practices for Instream Works General BMPs & Standard Project Considerations. Version 1.0.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010b. Standards and Best Practices for Instream Works Channel Maintenance. Version 1.0.

Nussbaum, R.A., E.D. Brodie and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow, ID. 332 pp.

Rosenfeld, J.S, B. Wicks, M. Porter, and P. VanDishoek. 1998. Habitat Use by Chiselmouth (*Acrocheilus alutaceus*) in the Blackwater River. Prov. of BC Fish. Proj. Rep. RD 76.

Rosenfeld, J.S., M. Porter, M. Pearson, B. Wicks, P. Van Dishoeck, T. Patton, E. Parkinson, G. Hass, and J. D. McPhail. 2001. The influence of temperature and habitat on the distribution of chiselmouth *Acrocheilus alutaceus* in British Columbia. Environmental Biology of Fishes 62:401-413.

Rosenfeld, Jordan. 2003. Update COSEWIC status report on the chiselmouth, *Acrocheilus alutaceus*, in Canada. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Ottawa. 1-22 pp.

Schwarzkopf L., and R.J. Brooks. 1987. Nest-site selection and offspring sex ratio in painted turtles, Chrysemys picta. Copeia 1987:53-61.

St. John, A. 2002. Reptiles of the Northwest: British Columbia to California. Lone Pine Publishing, Edmonton, AB. 272 pp.

Weisrock, D.W. and F.J. Janzen. 1999. Thermal and fitness-related consequences of nest location in painted turtles (*Chrysemys picta*). Functional Ecology 13(2): 94-101.

Appendix A

Site Photographs

Appendix A – Site Photographs

Date Photographs Taken: October 26, 2016

Photo 1: Looking west from the access gate of the lagoon towards the mouth, with Shuswap Lake in the background (see Figure 1).

Photo 2: Looking north from the shore of the lagoon towards its head.

Appendix A – Site Photographs

Photo 3: Looking northeast from left bank of Eagle River at the Point of Diversion (PD 52869), showing knife valve on the intake.

Photo 4: Knife valve on intake from the Eagle River at the Point of Diversion (PD 52869).

Appendix A – Site Photographs

Photo 5: Location at head of the lagoon where the diversion pipe enters.

Photo 6: Outlet of diversion pipe at the head of the lagoon.

Appendix A – Site Photographs

Photo 7: Looking northeast into the lagoon from the mouth of the lagoon.

Photo 8: Looking northwest across the mouth of the lagoon, where the temporary isolation dam will be installed.

Appendix A – Site Photographs

Photo 9: Looking southwest from mouth of lagoon at Shuswap Lake, where temporary isolation dam will be installed.

Photo 10: Looking southwest, showing site access point from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Appendix A – Site Photographs

Photo 11: Looking west, showing access gate along access path from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Photo 12: Looking northeast, showing site access from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Okanagan Indian Band
12420 Westside Road • Vernon, BC, • V1H 2A4
Telephone: 250-542-4328 • Facsimile 250-542-4990
Email: okibreferrals@okanagan.org

"This correspondence will not be construed so as to prejudice, limit, or derogate from any rights, claims or interests in respect of any Aboriginal title, rights and interests of Okanagan or Syilx Nation recognized and affirmed under Section 35 of the Constitution Act, 1982 and nothing in this letter indicates acceptance by Okanagan of federal or provincial Crown jurisdiction over ownership of land, water or other resources within the Territory."

March 30, 2020

Carrie Koch
Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Kamloops, BC
Carrie.koch@gov.ab.ca

Attention: Carrie Koch

Dear Carrie Koch:

Re: Application to amend water license C129749, Application #100308711

The Okanagan Indian Band ("OKIB") acknowledges receipt of correspondence from the Government of British Columbia dated January 28, 2020 regarding notice under the *Water Sustainability Act* from the Lot 46 Management Society for an application to amend their existing water license C129749 to allow for dredging in a constructed lagoon on Shuswap lake on an as needed basis [Application #100308711]. OKIB has reviewed the information and has set out a number of questions and concerns below that we need answered to understand the potential impacts of this application.

OKIB is a member community of the Syilx (Okanagan Nation) which asserts and is pursuing a claim to Aboriginal rights and title in Syilx traditional territory. OKIB asserts rights to the water resources of our traditional territory as part of the Syilx. Accordingly, any potential impact arising from the application in question, or cumulative impacts resulting from British Columbia's granting of statutory water rights on Syilx's Aboriginal water rights and title will trigger British Columbia's duty to consult and accommodate OKIB. Further, OKIB asserts Aboriginal and other common law rights to the water resources within, under, and adjacent to our reserve lands and OKIB has the right to govern those water resources. To the extent the application in question potentially impacts OKIB's reserve land water resources and/or OKIB's ability and authority to

govern our reserve land water resources, British Columbia's duty to consult is engaged at a higher level, including the requirement to obtain OKIB's consent.

Consultation Process

To have the opportunity to engage in meaningful consultation, OKIB must be given sufficient information about the potential application and adequate capacity funding to engage in the process. Despite changes to the *Water Sustainability Act* resulting in an increase in water-related consultation referrals by the Province, OKIB has received no funding to allow us to participate in consultation on water licences. In *Clyde River (Hamlet) v. Petroleum Geo-Services Inc.,* 2017 SCC 40, the Supreme Court of Canada said that a lack of participant funding can significantly impair the ability to consult. Water is an important issue for OKIB culturally, ecologically, and as a matter of survival and economic success. However, we are hampered in our ability to engage by limited budgets and personnel. The lack of funding impacts our ability to respond in a substantive, timely, and informed manner to your requests for comment.

As noted, the application raises the issue of cumulative impacts on OKIB's water rights. In *Chippewas of the Thames First Nation v. Enbridge Pipelines*, 2017 SCC 41**,** the Supreme Court of Canada stated that it may be impossible to understand the severity of a particular project's impact on Aboriginal rights without considering the cumulative impact of the project and other development. An assessment of a project's cumulative effects may, in turn, inform the scope of consultation required. Further to this point, we request information with respect to how the appropriate level of consultation was determined in this case, and what constitutes "engagement" at a "normal level".

Finally, there has been a failure to consult the OKIB with respect to the *Water Sustainability Act* scheme as a whole, and this failure cannot now be remedied by consultation on applications.

Initial Questions and Concerns Regarding this Application

The proposed application to amend an existing water license to allow dredging in a constructed lagoon on Shuswap Lake on an as needed basis may impact OKIB's traditional uses of water in the Shuswap River watershed. The application falls within the Shuswap River's watershed that drains north to Mara Lake and the dredging may impact water quality in the Shuswap River.

OKIB supports the ongoing work of the Shuswap Watershed Council in the monitoring of water quantity and quality that directly affect the availability of water for both traditional and contemporary uses of the water within the OKIB traditional territory. The OKIB provided information on Aboriginal Interests within the Shuswap River Watershed Sustainability Plan (SRWSP, 2014) and seeks

confirmation from the Ministry of Forests, Lands, Natural Resource Operations and Rural Development that the proponent will respect our recommendations and (as a minimum) comply with the objectives specified within the SRWSP regarding the protection of water quality and habitat.

To engage in consultation on this water licence, OKIB requires answers to the following:

1) Will the Ministry consider the Shuswap River Watershed Sustainability Plan (SRWSP) in granting the application?

2) Will the Ministry require the applicant to comply with the objectives specified in the SRWSP regarding the protection of water quality and habitat (see especially "Objective 1: Land Use Planning & Urban/ Residential Developments")?

3) Has a cumulative effects assessment been performed to ascertain whether the change in use does not further deteriorate water quality within the Shuswap River watershed as a potential drinking water source for OKIB?

4) The proponent has asked that Kerr Wood Leidal's Water Management Plan (WMP) be attached to the water license. The WMP includes a new proposed pump station but does not provide information on the pump station itself. Does the inclusion of a pump station in the WMP allow Lot 46 to now modify the works and install a new pump station without an amendment to the existing water licence?

5) The WMP states that "the dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis." This conclusion is based on the following statement earlier in the document: "A letter from BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licenced works under their water licence". No information is provided regarding the original conditional licence and the approvals in place for the original construction or maintenance of the lagoon system. It appears that any future maintenance, alteration or otherwise of the lagoon is covered under a grandfathered provision with no back up documentation other than the skeletal C129749 licence itself and the original licence 35177 that comprises 1 page and a sketch. Please provide us with details on how the dredging is currently done.

6) How did the Province consult with OKIB on the original water license application?

7) The WMP states that a DFO review is not required contrary to DFO's own requirements and Code of Practice. Will the Province require the proponent to apply for a DFO review?

8) The WMP uses an abbreviated set of criteria to eliminate the need for a DFO review rather than addressing the full list of required criteria that includes PCB testing within the past 5 years and confirmation that the site has been dredged within the past 10 years. No rationale is provided for abbreviating the list. Was the existing channel dredged during the past 10 years? Has there been stormwater drainage into the channel containing deleterious substances?

9) The best management practices (BMPs) outlined in the WMP are erroneous and deficient as they cite incorrect practices and procedures while failing to include others. Please outline the practices and procedures the proponent will be required to follow to ensure that any discharge from the project is adequately treated and solids will be stabilized to prevent impacts to water quality.

10) The materials to be dredged are predominately a silt fraction with long settling times. How will the discharge of turbid waters into Shuswap Lake or Eagle River be prevented?

s.16; s.18

OKIB has been provided no information with this notice that answers these questions. In *Gitxaala Nation v Canada*, 2016 FCA 187, the Federal Court of Appeal noted how a failure to provide information that is central to the interests of affected First Nations results in inadequate consultation. To engage in any degree of meaningful consultation, OKIB requires sufficient information on the proposed discharge before it can proceed.

Finally, the WMP states that the existence of a 1968 water licence eliminates the need for consultation with First Nations. We object to the assertion that an existing water license dispenses with the need for consultation. Per *Haida Nation v British Columbia (Minister of Forests),* 2004 SCC 73 the Crown has a duty to consult when they have knowledge, real or constructive, of the potential existence of an Aboriginal right or title and contemplates conduct that might adversely affect it. As stated, OKIB asserts rights to the water resources within Syilx traditional territory and has made this known to the Province. Any applications to amend, renew or grant a water license within our territory

may impact our Aboriginal right to water resources, as such the Province has a duty to consult with us on the potential impacts arising from this application to amend the water license.

We look forward to your response to our requests above.

Yours truly,

Colleen Marchand, Director of Territorial Stewardship

Ministry of
Forests, Lands, Natural
Resource Operations
and Rural Development

File: 0281845

January 26, 2021

Colleen Marchand
Director of Territorial Stewardship
Okanagan Indian Band
Colleen.Marchand@okanagan.org
okibreferrals@okanagan.org

Dear Colleen Marchand:

Re: Application to amend water license C129749, Application #100308711

The Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) acknowledges receipt of your letter dated March 30, 2020 regarding an application to amend water licence C129749.

Water licence C129749 was first issued in 1970 for the purpose of land management. The licensee was granted the right to divert 0.28317 cubic metres of water per second from the Eagle River into the artificial lagoon. Since then, the licensee routinely dredged the lagoon to remove accumulated sediment.

In 2014, the licensee applied for a Section 9 approval under the *Water Act* to dredge the lagoon (now Section 11 under the *Water Sustainability Act*). A 2014 letter from FLNRORD to the licensee refused the application stating that the licensee may remove (dredge) accumulated sediment from the channel as maintenance of their authorized works (a copy of this letter is attached). Based on information included in the original licence, the "channel" was determined to be the lagoon from the point where water enters at the northern end to where it exists into Shuswap Lake. The letter directed the licensee to contact the Water Officer to discuss best management practices and subsequently a Water Management Plan was requested to outline future maintenance practices.

In 2017, the licensee applied for an amendment to C129749 to dredge the constructed lagoon and reverse the flow of water from the channel into the Eagle River to prevent future sediment accumulation. A notification letter was sent to Okanagan Indian Band dated November 22, 2017. The licensee chose to abandon the application before a final decision was reached.

In January 2020, the licensee again applied for an amendment to C129749. The application requests an amendment to include the Water Management Plan as a clause in the water licence. The amendment would result in the licensee being required to follow the conditions of the management plan in future maintenance of works and dredging of the channel. The application does not include requests to change the direction of flow as in 2017.

Since receipt of your letter in March 2020, I have been working with the applicant and their representatives to revise the management plan to ensure future dredging avoids and/or mitigates

impacts and adheres to best management practices now and into the future. A copy of the revised Water Management Plan, dated January 2021, is attached. Please see below the answers to the questions included in your letter from March 2020. If you have any additional questions for this application please respond to me via phone or email by **February 26th, 2021**.

Regards,

Carrie Koch

Carrie Koch
Water Stewardship Officer
Carrie.Koch@gov.bc.ca
778-943-6871

1. **Will the Ministry consider the Shuswap River Watershed Sustainability Plan (SRWSP) in granting the application?**

   (See answer to Question 2 below)

2. **Will the Ministry require the applicant to comply with the objectives specified in the SRWSP regarding the protection of water quality and habitat (see especially "Objective 1: Land Use Planning & Urban/ Residential Developments")?**

   Objective 1 in the SRWSP addresses water quality concerns in the Shuswap River Watershed. The Technical Assessment completed by Golder and Associates for the Shuswap River Watershed found that potential areas of concern for water quality were related to intensive agriculture, waste management and wastewater treatment, and industry largely located in the Middle and Lower Shuswap River Watershed. Dredging of the lagoon is unlikely to have impacts to the nutrient or microbial composition of the watershed.

   Turbidity and sediment were not identified as concerns for water quality in the Shuswap River Watershed. The WMP outlines the proposed dredging procedures to minimize sediment entering nearby waterbodies including the use of a silt curtain, careful placement and covering of spoil/dredged material to prevent erosion, and maintenance of erosion and sediment control measures until any disturbed banks are revegetated. The WMP has also been revised to include water quality monitoring for turbidity during sensitive works as per the BC Water Quality Guidelines.

3. **Has a cumulative effects assessment been performed to ascertain whether the change in use does not further deteriorate water quality within the Shuswap River watershed as a potential drinking water source for OKIB?**

   This application does not suggest a change in use. The lagoon has been dredged every few years on a regular basis since the 1960s. Environmental impacts have likely already been realised by the lagoon, Shuswap Lake, and the larger watershed.

4. **The proponent has asked that Kerr Wood Leidal's Water Management Plan (WMP) be attached to the water license. The WMP includes a new proposed pump station but does not provide information on the pump station itself. Does the inclusion of a pump station in the WMP allow Lot 46 to now modify the works and install a new pump station without an amendment to the existing water licence?**

   The proposed pump station indicated on the map was from a previous amendment application Lot 46 Management Society (Lot 46) submitted in 2018. This previous amendment was abandoned by Lot 46 before a decision was made. The revised Water Management Plan does not include a pump station on the plan.

5. **The WMP states that "the dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis." This conclusion is based on the following statement earlier in the document: "A letter from BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licenced works under their water licence". No information is provided regarding the original conditional licence and the approvals in place for the original construction or maintenance of the lagoon system. It appears that any future maintenance, alteration or otherwise of the lagoon is covered under a grandfathered provision with no back up documentation other than the skeletal C129749 licence itself and the original licence 35177 that comprises 1 page and a sketch. Please provide us with details on how the dredging is currently done.**

   The lagoon was man-made via excavation. No documents are available regarding how dredging has been done at the site in the past. However, the 2014 letter suggests that the licensee had applied for Changes in and About a Steam at least 4 times between 2006 and 2014. Also, the document *Shoreline Management Guideline For Fish and Fish Habitat: Shuswap, Mara and Little Shuswap Lakes (2011)* states that DFO recognizes that the site has been previously dredged with 'appropriate approvals'.

   > *"DFO recognizes that the following sites on the Shuswap Lake were previously dredged with appropriate approvals: i) Shuswap Lake Estates (Chase); ii) Captain's Village Marina (Scotch Creek); iii) Canoe Boat Club (Canoe); and,* ***iv) Lot 46 Society (Sicamous).***

   In 2014 the decision was made by FLNRORD staff that the licensee had the right to "remove (dredge) the accumulated sediment from the channel … as maintenance of their licenced works". The letter recommends the licensee contact the Water Officer to discuss best management practices which lead to the requirement for a management plan to outline dredging practices moving forward and minimize impacts to the lagoon, Shuswap Lake, and the larger watershed. Including a direct reference to the WMP in the licence will require the licensee to adhere to the dredging processes detailed in the report.

   Copies of both the 2014 letter and the Water Management Plan are attached.

6. **How did the Province consult with OKIB on the original water license application?**

   The original water license was granted in 1968. Consultation was not performed at this time.

7. **The WMP states that a DFO review is not required contrary to DFO's own requirements and Code of Practice. Will the Province require the proponent to apply for a DFO review?**

   The Water Management Plan has been updated to state that the licence does not exempt the licensee from the requirements of the *Fisheries Act* or other applicable legislation.

   The plan has also been updated to require a fish, shellfish, and amphibian survey by a qualified professional before dredging is done. This survey will help dictate the permits required, any additional mitigation measures required, and the timing window for work.

8. **The WMP uses an abbreviated set of criteria to eliminate the need for a DFO review rather than addressing the full list of required criteria that includes PCB testing within the past 5 years and confirmation that the site has been dredged within the past 10 years. No rationale is provided for abbreviating the list. Was the existing channel dredged during the past 10 years? Has there been stormwater drainage into the channel containing deleterious substances?**

   The report aims to give a general overview of the criteria for a DFO review but does not state the site is exempt from review. The licence does not exempt the licensee from other applicable laws and regulations, including the *Fisheries Act*.

9. **The best management practices (BMPs) outlined in the WMP are erroneous and deficient as they cite incorrect practices and procedures while failing to include others. Please outline the practices and procedures the proponent will be required to follow to ensure that any discharge from the project is adequately treated and solids will be stabilized to prevent impacts to water quality.**

   Sediment generation is an important consideration for dredging of the lagoon. The report originally stated that isolation methods at the mouth of the lagoon would be determined by the contractor.

   The report has now been updated to require a fish, shellfish, and amphibian survey be performed by a qualified professional. The qualified professional will confirm the best method of isolation and dictate any additional mitigation measures. Water quality monitoring (with a minimum of turbidity) will be recorded during sensitive works such as dewatering and re-watering the isolated lagoon.

   The WMP states that works must be completed as set out in the provincial Standards and Best Practices for Instream Works, or any document issued in substitution thereof. The revised WMP states that the licensee must notify FLNRORD three months prior to dredging to allow time for FLNRORD staff to inform the licensee of any changes in regulations or best management practices since the last dredging event.

10. **The materials to be dredged are predominately a silt fraction with long settling times. How will the discharge of turbid waters into Shuswap Lake or Eagle River be prevented?**

    No water from the lagoon will be discharged into the Eagle River. The diversion channel will be closed off prior to dewatering and only reopened after the lagoon has been refilled.

    Discharge of turbid waters into Shuswap Lake will be prevented using a silt curtain during installation of the isolation feature, dewatering, and removal of the isolation feature. Turbidity will also be monitored during sensitive works such as dewatering and re-watering the isolated lagoon.

Ministry of
Forests, Lands and
Natural Resource Operations

File: 0281845

January 29, 2020

Chief Byron Louis and Council
Okanagan Indian Band
12420 Westside Road
Vernon, BC V1H 2A4

Dear Chief Byron Louis and Council:

Re: Application to maintain water licence works by dredging a Constructed Lagoon on Shuswap Lake

Proponent(s): Lot 46 Management Society

Proposal Description:

The proponent wishes to isolate and dredge a constructed lagoon on Shuswap Lake. For the sake of expediency, I refer you to the attached, QEP-prepared Water Management Plan that describes the proposed activities in full detail. A geomark link to assist you in locating the property has been included herein.

General Location: 1450 Silver Sands Road, Sicamous, BC

Legal Description: Lot A, District Lot 452, Kamloops Division Yale District, Plan KAP52709

Geomark:
http://apps.gov.bc.ca/pub/geomark/geomarks/gm-4FE18E9AE28F4EF78D622A5CD1B6B7F7

Proposed Consultation Period: 60 days from mail-out date

Please respond as soon as possible so that your interests can be fully considered during the consultation process and a decision made by the statutory decision maker after the proposed consultation period.

Contact: Carrie Koch, Water Authorization Officer
Carrie.Koch@gov.bc.ca
(250) 558-1722

This consultation is being initiated at a normal level. The consultation level for specific circumstances may be adjusted to a different consultation level based on information we receive from you. We are interested in understanding further the nature of your Aboriginal interests, how you consider the proposed licence may impact those interests, and what potential measures you might recommend to address your concerns.

The Province will be making a decision on the application after 60 days from the date this letter was mailed. Please provide any further comments as early as possible so that any concerns can be fully considered.

Regards,

Carrie Koch

Carrie Koch
Water Authorizations Officer
Okanagan Shuswap Natural Resource District

Enclosure (Management Plan)

Ministry of Forests, Lands and Natural Resource Operations Okanagan Shuswap Natural Resource District

Mailing Address:
2501 – 14th Ave
Vernon, BC V1T 8Z1

Tel: (250) 558-1700
Fax: (250) 549-5485
Website: www.gov.bc.ca/for/dos/

Ministry of
Forests, Lands, Natural
Resource Operations
and Rural Development

File: 0281845

January 26, 2021

Colleen Marchand
Director of Territorial Stewardship
Okanagan Indian Band
Colleen.Marchand@okanagan.org
okibreferrals@okanagan.org

Dear Colleen Marchand:

Re: Application to amend water license C129749, Application #100308711

The Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) acknowledges receipt of your letter dated March 30, 2020 regarding an application to amend water licence C129749.

Water licence C129749 was first issued in 1970 for the purpose of land management. The licensee was granted the right to divert 0.28317 cubic metres of water per second from the Eagle River into the artificial lagoon. Since then, the licensee routinely dredged the lagoon to remove accumulated sediment.

In 2014, the licensee applied for a Section 9 approval under the *Water Act* to dredge the lagoon (now Section 11 under the *Water Sustainability Act*). A 2014 letter from FLNRORD to the licensee refused the application stating that the licensee may remove (dredge) accumulated sediment from the channel as maintenance of their authorized works (a copy of this letter is attached). Based on information included in the original licence, the "channel" was determined to be the lagoon from the point where water enters at the northern end to where it exists into Shuswap Lake. The letter directed the licensee to contact the Water Officer to discuss best management practices and subsequently a Water Management Plan was requested to outline future maintenance practices.

In 2017, the licensee applied for an amendment to C129749 to dredge the constructed lagoon and reverse the flow of water from the channel into the Eagle River to prevent future sediment accumulation. A notification letter was sent to Okanagan Indian Band dated November 22, 2017. The licensee chose to abandon the application before a final decision was reached.

In January 2020, the licensee again applied for an amendment to C129749. The application requests an amendment to include the Water Management Plan as a clause in the water licence. The amendment would result in the licensee being required to follow the conditions of the management plan in future maintenance of works and dredging of the channel. The application does not include requests to change the direction of flow as in 2017.

Since receipt of your letter in March 2020, I have been working with the applicant and their representatives to revise the management plan to ensure future dredging avoids and/or mitigates

impacts and adheres to best management practices now and into the future. A copy of the revised Water Management Plan, dated January 2021, is attached. Please see below the answers to the questions included in your letter from March 2020. If you have any additional questions for this application please respond to me via phone or email by **February 26th, 2021**.

Regards,

Carrie Koch

Carrie Koch
Water Stewardship Officer
Carrie.Koch@gov.bc.ca
778-943-6871

1. **Will the Ministry consider the Shuswap River Watershed Sustainability Plan (SRWSP) in granting the application?**

   (See answer to Question 2 below)

2. **Will the Ministry require the applicant to comply with the objectives specified in the SRWSP regarding the protection of water quality and habitat (see especially "Objective 1: Land Use Planning & Urban/ Residential Developments")?**

   Objective 1 in the SRWSP addresses water quality concerns in the Shuswap River Watershed. The Technical Assessment completed by Golder and Associates for the Shuswap River Watershed found that potential areas of concern for water quality were related to intensive agriculture, waste management and wastewater treatment, and industry largely located in the Middle and Lower Shuswap River Watershed. Dredging of the lagoon is unlikely to have impacts to the nutrient or microbial composition of the watershed.

   Turbidity and sediment were not identified as concerns for water quality in the Shuswap River Watershed. The WMP outlines the proposed dredging procedures to minimize sediment entering nearby waterbodies including the use of a silt curtain, careful placement and covering of spoil/dredged material to prevent erosion, and maintenance of erosion and sediment control measures until any disturbed banks are revegetated. The WMP has also been revised to include water quality monitoring for turbidity during sensitive works as per the BC Water Quality Guidelines.

3. **Has a cumulative effects assessment been performed to ascertain whether the change in use does not further deteriorate water quality within the Shuswap River watershed as a potential drinking water source for OKIB?**

   This application does not suggest a change in use. The lagoon has been dredged every few years on a regular basis since the 1960s. Environmental impacts have likely already been realised by the lagoon, Shuswap Lake, and the larger watershed.

4. **The proponent has asked that Kerr Wood Leidal's Water Management Plan (WMP) be attached to the water license. The WMP includes a new proposed pump station but does not provide information on the pump station itself. Does the inclusion of a pump station in the WMP allow Lot 46 to now modify the works and install a new pump station without an amendment to the existing water licence?**

   The proposed pump station indicated on the map was from a previous amendment application Lot 46 Management Society (Lot 46) submitted in 2018. This previous amendment was abandoned by Lot 46 before a decision was made. The revised Water Management Plan does not include a pump station on the plan.

5. **The WMP states that "the dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis." This conclusion is based on the following statement earlier in the document: "A letter from BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licenced works under their water licence". No information is provided regarding the original conditional licence and the approvals in place for the original construction or maintenance of the lagoon system. It appears that any future maintenance, alteration or otherwise of the lagoon is covered under a grandfathered provision with no back up documentation other than the skeletal C129749 licence itself and the original licence 35177 that comprises 1 page and a sketch. Please provide us with details on how the dredging is currently done.**

   The lagoon was man-made via excavation. No documents are available regarding how dredging has been done at the site in the past. However, the 2014 letter suggests that the licensee had applied for Changes in and About a Steam at least 4 times between 2006 and 2014. Also, the document *Shoreline Management Guideline For Fish and Fish Habitat: Shuswap, Mara and Little Shuswap Lakes (2011)* states that DFO recognizes that the site has been previously dredged with 'appropriate approvals'.

   > *"DFO recognizes that the following sites on the Shuswap Lake were previously dredged with appropriate approvals: i) Shuswap Lake Estates (Chase); ii) Captain's Village Marina (Scotch Creek); iii) Canoe Boat Club (Canoe); and,* ***iv) Lot 46 Society (Sicamous).***

   In 2014 the decision was made by FLNRORD staff that the licensee had the right to "remove (dredge) the accumulated sediment from the channel … as maintenance of their licenced works". The letter recommends the licensee contact the Water Officer to discuss best management practices which lead to the requirement for a management plan to outline dredging practices moving forward and minimize impacts to the lagoon, Shuswap Lake, and the larger watershed. Including a direct reference to the WMP in the licence will require the licensee to adhere to the dredging processes detailed in the report.

   Copies of both the 2014 letter and the Water Management Plan are attached.

6. **How did the Province consult with OKIB on the original water license application?**

   The original water license was granted in 1968. Consultation was not performed at this time.

7. **The WMP states that a DFO review is not required contrary to DFO's own requirements and Code of Practice. Will the Province require the proponent to apply for a DFO review?**

   The Water Management Plan has been updated to state that the licence does not exempt the licensee from the requirements of the *Fisheries Act* or other applicable legislation.

   The plan has also been updated to require a fish, shellfish, and amphibian survey by a qualified professional before dredging is done. This survey will help dictate the permits required, any additional mitigation measures required, and the timing window for work.

8. **The WMP uses an abbreviated set of criteria to eliminate the need for a DFO review rather than addressing the full list of required criteria that includes PCB testing within the past 5 years and confirmation that the site has been dredged within the past 10 years. No rationale is provided for abbreviating the list. Was the existing channel dredged during the past 10 years? Has there been stormwater drainage into the channel containing deleterious substances?**

   The report aims to give a general overview of the criteria for a DFO review but does not state the site is exempt from review. The licence does not exempt the licensee from other applicable laws and regulations, including the *Fisheries Act*.

9. **The best management practices (BMPs) outlined in the WMP are erroneous and deficient as they cite incorrect practices and procedures while failing to include others. Please outline the practices and procedures the proponent will be required to follow to ensure that any discharge from the project is adequately treated and solids will be stabilized to prevent impacts to water quality.**

   Sediment generation is an important consideration for dredging of the lagoon. The report originally stated that isolation methods at the mouth of the lagoon would be determined by the contractor.

   The report has now been updated to require a fish, shellfish, and amphibian survey be performed by a qualified professional. The qualified professional will confirm the best method of isolation and dictate any additional mitigation measures. Water quality monitoring (with a minimum of turbidity) will be recorded during sensitive works such as dewatering and re-watering the isolated lagoon.

   The WMP states that works must be completed as set out in the provincial Standards and Best Practices for Instream Works, or any document issued in substitution thereof. The revised WMP states that the licensee must notify FLNRORD three months prior to dredging to allow time for FLNRORD staff to inform the licensee of any changes in regulations or best management practices since the last dredging event.

10. **The materials to be dredged are predominately a silt fraction with long settling times. How will the discharge of turbid waters into Shuswap Lake or Eagle River be prevented?**

    No water from the lagoon will be discharged into the Eagle River. The diversion channel will be closed off prior to dewatering and only reopened after the lagoon has been refilled.

    Discharge of turbid waters into Shuswap Lake will be prevented using a silt curtain during installation of the isolation feature, dewatering, and removal of the isolation feature. Turbidity will also be monitored during sensitive works such as dewatering and re-watering the isolated lagoon.

s.16; s.18

Okanagan Indian Band
12420 Westside Road • Vernon, BC, • V1H 2A4
Telephone: 250-542-4328 • Facsimile 250-542-4990
Email: okibreferrals@okanagan.org

"This correspondence will not be construed so as to prejudice, limit, or derogate from any rights, claims or interests in respect of any Aboriginal title, rights and interests of Okanagan or Syilx Nation recognized and affirmed under Section 35 of the Constitution Act, 1982 and nothing in this letter indicates acceptance by Okanagan of federal or provincial Crown jurisdiction over ownership of land, water or other resources within the Territory."

March 30, 2020

Carrie Koch
Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Kamloops, BC
Carrie.koch@gov.ab.ca

Attention: Carrie Koch

Dear Carrie Koch:

Re: Application to amend water license C129749, Application #100308711

The Okanagan Indian Band ("OKIB") acknowledges receipt of correspondence from the Government of British Columbia dated January 28, 2020 regarding notice under the *Water Sustainability Act* from the Lot 46 Management Society for an application to amend their existing water license C129749 to allow for dredging in a constructed lagoon on Shuswap lake on an as needed basis [Application #100308711]. OKIB has reviewed the information and has set out a number of questions and concerns below that we need answered to understand the potential impacts of this application.

OKIB is a member community of the Syilx (Okanagan Nation) which asserts and is pursuing a claim to Aboriginal rights and title in Syilx traditional territory. OKIB asserts rights to the water resources of our traditional territory as part of the Syilx. Accordingly, any potential impact arising from the application in question, or cumulative impacts resulting from British Columbia's granting of statutory water rights on Syilx's Aboriginal water rights and title will trigger British Columbia's duty to consult and accommodate OKIB. Further, OKIB asserts Aboriginal and other common law rights to the water resources within, under, and adjacent to our reserve lands and OKIB has the right to govern those water resources. To the extent the application in question potentially impacts OKIB's reserve land water resources and/or OKIB's ability and authority to

govern our reserve land water resources, British Columbia's duty to consult is engaged at a higher level, including the requirement to obtain OKIB's consent.

Consultation Process

To have the opportunity to engage in meaningful consultation, OKIB must be given sufficient information about the potential application and adequate capacity funding to engage in the process. Despite changes to the *Water Sustainability Act* resulting in an increase in water-related consultation referrals by the Province, OKIB has received no funding to allow us to participate in consultation on water licences. In *Clyde River (Hamlet) v. Petroleum Geo-Services Inc.,* 2017 SCC 40, the Supreme Court of Canada said that a lack of participant funding can significantly impair the ability to consult. Water is an important issue for OKIB culturally, ecologically, and as a matter of survival and economic success. However, we are hampered in our ability to engage by limited budgets and personnel. The lack of funding impacts our ability to respond in a substantive, timely, and informed manner to your requests for comment.

As noted, the application raises the issue of cumulative impacts on OKIB's water rights. In *Chippewas of the Thames First Nation v. Enbridge Pipelines*, 2017 SCC 41**,** the Supreme Court of Canada stated that it may be impossible to understand the severity of a particular project's impact on Aboriginal rights without considering the cumulative impact of the project and other development. An assessment of a project's cumulative effects may, in turn, inform the scope of consultation required. Further to this point, we request information with respect to how the appropriate level of consultation was determined in this case, and what constitutes "engagement" at a "normal level".

Finally, there has been a failure to consult the OKIB with respect to the *Water Sustainability Act* scheme as a whole, and this failure cannot now be remedied by consultation on applications.

Initial Questions and Concerns Regarding this Application

The proposed application to amend an existing water license to allow dredging in a constructed lagoon on Shuswap Lake on an as needed basis may impact OKIB's traditional uses of water in the Shuswap River watershed. The application falls within the Shuswap River's watershed that drains north to Mara Lake and the dredging may impact water quality in the Shuswap River.

OKIB supports the ongoing work of the Shuswap Watershed Council in the monitoring of water quantity and quality that directly affect the availability of water for both traditional and contemporary uses of the water within the OKIB traditional territory. The OKIB provided information on Aboriginal Interests within the Shuswap River Watershed Sustainability Plan (SRWSP, 2014) and seeks

confirmation from the Ministry of Forests, Lands, Natural Resource Operations and Rural Development that the proponent will respect our recommendations and (as a minimum) comply with the objectives specified within the SRWSP regarding the protection of water quality and habitat.

To engage in consultation on this water licence, OKIB requires answers to the following:

1) Will the Ministry consider the Shuswap River Watershed Sustainability Plan (SRWSP) in granting the application?

2) Will the Ministry require the applicant to comply with the objectives specified in the SRWSP regarding the protection of water quality and habitat (see especially "Objective 1: Land Use Planning & Urban/ Residential Developments")?

3) Has a cumulative effects assessment been performed to ascertain whether the change in use does not further deteriorate water quality within the Shuswap River watershed as a potential drinking water source for OKIB?

4) The proponent has asked that Kerr Wood Leidal's Water Management Plan (WMP) be attached to the water license. The WMP includes a new proposed pump station but does not provide information on the pump station itself. Does the inclusion of a pump station in the WMP allow Lot 46 to now modify the works and install a new pump station without an amendment to the existing water licence?

5) The WMP states that "the dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis." This conclusion is based on the following statement earlier in the document: "A letter from BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licenced works under their water licence". No information is provided regarding the original conditional licence and the approvals in place for the original construction or maintenance of the lagoon system. It appears that any future maintenance, alteration or otherwise of the lagoon is covered under a grandfathered provision with no back up documentation other than the skeletal C129749 licence itself and the original licence 35177 that comprises 1 page and a sketch. Please provide us with details on how the dredging is currently done.

6) How did the Province consult with OKIB on the original water license application?

7) The WMP states that a DFO review is not required contrary to DFO's own requirements and Code of Practice. Will the Province require the proponent to apply for a DFO review?

8) The WMP uses an abbreviated set of criteria to eliminate the need for a DFO review rather than addressing the full list of required criteria that includes PCB testing within the past 5 years and confirmation that the site has been dredged within the past 10 years. No rationale is provided for abbreviating the list. Was the existing channel dredged during the past 10 years? Has there been stormwater drainage into the channel containing deleterious substances?

9) The best management practices (BMPs) outlined in the WMP are erroneous and deficient as they cite incorrect practices and procedures while failing to include others. Please outline the practices and procedures the proponent will be required to follow to ensure that any discharge from the project is adequately treated and solids will be stabilized to prevent impacts to water quality.

10) The materials to be dredged are predominately a silt fraction with long settling times. How will the discharge of turbid waters into Shuswap Lake or Eagle River be prevented?

s.16; s.18

OKIB has been provided no information with this notice that answers these questions. In *Gitxaala Nation v Canada*, 2016 FCA 187, the Federal Court of Appeal noted how a failure to provide information that is central to the interests of affected First Nations results in inadequate consultation. To engage in any degree of meaningful consultation, OKIB requires sufficient information on the proposed discharge before it can proceed.

Finally, the WMP states that the existence of a 1968 water licence eliminates the need for consultation with First Nations. We object to the assertion that an existing water license dispenses with the need for consultation. Per *Haida Nation v British Columbia (Minister of Forests),* 2004 SCC 73 the Crown has a duty to consult when they have knowledge, real or constructive, of the potential existence of an Aboriginal right or title and contemplates conduct that might adversely affect it. As stated, OKIB asserts rights to the water resources within Syilx traditional territory and has made this known to the Province. Any applications to amend, renew or grant a water license within our territory

may impact our Aboriginal right to water resources, as such the Province has a duty to consult with us on the potential impacts arising from this application to amend the water license.

We look forward to your response to our requests above.

Yours truly,

Colleen Marchand, Director of Territorial Stewardship

From: Koch, Carrie L FLNR:EX (Carrie.Koch@gov.bc.ca)
To: Colleen.Marchand@okanagan.org
Cc: okibreferrals@okanagan.org
Subject: RE: Decision regarding consultation: 100308711 - Water Licence Amendment Shuswap Lake Lagoon
Sent: 01/27/2021 00:51:12
Attachments: image001.png, OKIB Letter 3.30.2020.pdf, OKIB Response Letter 1.26.2021.pdf, FLNRO Letter 2.25.2014.pdf, Archeological Impact Assessment Jan 2019.pdf, WaterManagementPlan_Rev1_2021.01.21-Sealed.pdf
Message Body:

Good afternoon,

Please see the attached letter in response to your letter dated March 30, 2020 regarding an application to amend water licence C129749.

Since receipt of your letter in March 2020, I have been working with the applicant and their representatives to revise the Water Management Plan to ensure future dredging avoids and/or mitigates impacts and adheres to best management practices now and into the future. A copy of the revised Water Management Plan, dated January 2021, is attached as well as answers to your questions earlier questions.

If you have any additional questions for this application please respond via phone or email by **February 26th, 2021**.

Regards,

Carrie Koch, Water Stewardship Officer

Okanagan Shuswap Natural Resource District

Ministry of Forests, Lands and Natural Resource Operations

2501 - 14th Avenue, Vernon, BC V1T 8Z1

Phone: 778-943-6871

From: Okanagan Indian Band <no-reply-okib@knowledgekeeper.ca>
Sent: April 2, 2020 4:38 PM
To: Colleen.Marchand@okanagan.org; Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Subject: Decision regarding consultation: 100308711 - Water Licence Amendment Shuswap Lake Lagoon

Hello,

Please find attached a decision to the above noted project.

Regards,

Okanagan Indian Band

Please do not reply to this email.

BRITISH COLUMBIA

February 25, 2014 File: A3-7399

Lot 46 Management Society
1428 Silver Sands Road
P.O. Box 248
Sicamous, BC
V0E 2V0

Via email Only

Re: **Changes in and About a Stream Application**
Lagoon Dredging

Dear Sir/Madame;

This office has been reviewing your application to dredge the entrance to the lagoon at your site in Sicamous. During this review, we discovered that the Lot 46 Management Society is the holder of Conditional Water Licence C129749 for the purposes of Land Improvement. C129749 authorizes the operation and maintenance of a diversion structure on the Eagle River, a pipe conveying water from the Eagle River to the northern end of the lagoon and a channel that discharges into Shuswap Lake.

Based upon the information provided in the water licence, it is this office's opinion that the "channel" indicated in licence C129749 refers to the lagoon from the point where the water enters at the north end to where it exits into Shuswap Lake. Therefore, the Society may remove (dredge) the accumulated sediment from the channel at the location indicated in your application as maintenance of their licenced works and a Section 9 Authorization under the *Water Act* is not required.

Based upon the above, we are recommending that you do the following:

1. Submit a request to abandon your Changes in and About a Stream application to this office so that we man close the application file.
2. Request a refund of your application fee from the Financial Services Branch of this Ministry. The request can be made through email at Water.Revenue@gov.bc.ca quoting file A3-7399 on any correspondence.
3. Contact Dale Richter, the Water Officer responsible for your area, to notify him of the proposed works and receive any instructions on best management practices that must be

Ministry of Forests, Lands and Natural Resource Operations | **Regional Water Management Resource Authorizations Thompson Okanagan Region** | **Mailing/Location Address: 1259 Dalhousie Drive Kamloops British Columbia V2C 5Z5** | **Telephone: (250) 371-6200 Facsimile: (250) 828-4000 http://www.gov.bc.ca//**

followed during the completion of the works. Mr. Richter is located in our Vernon office and can be contacted at (250) 588-1765 or Dale.Richter@gov.bc.ca.

4. Contact your local government (local or municipal) to determine if there are any additional requirements.
5. As this is the 4th application to dredge the lagoon entrance in the past eight years, the Society should carry out an investigation of the cause of the siltation and any methods that could be used to reduce the frequency of dredging or, and this is the preferred solution, eliminate the need for any future clearing of the lagoon entrance.

When you proceed with the proposed works, you should be aware that there is always a possibility for archaeological sites to exist that have not been identified or documented. All archaeological sites, whether known or undocumented, are protected under the heritage Conservation Act. If, during construction, you encounter any archaeological material, you must halt all activities and contact the Archaeological Branch at (250) 953-3334 for direction.

If you have any questions or concerns regarding this correspondence, please contact the Regional Water Management Office.

Yours truly,

Jeptha Ball, P. Eng.
Assistant Regional Water Manager
Water Stewardship Division
Ministry of Forest Lands Natural Resources

cc: Ecosystems Section, Kamloops, Attn: Mark Phillpotts (via email)
Water Authorizations Section, Kamloops, Attn: Dale Richter (via email)
FrontCounter BC, Kamloops, (via email)
Department of Fisheries and Oceans, Attn: Barry Zunti, (via email)

Okanagan Indian Band
12420 Westside Road • Vernon, BC, • V1H 2A4
Telephone: 250-542-4328 • Facsimile 250-542-4990
Email: okibreferrals@okanagan.org

"This correspondence will not be construed so as to prejudice, limit, or derogate from any rights, claims or interests in respect of any Aboriginal title, rights and interests of Okanagan or Syilx Nation recognized and affirmed under Section 35 of the Constitution Act, 1982 and nothing in this letter indicates acceptance by Okanagan of federal or provincial Crown jurisdiction over ownership of land, water or other resources within the Territory."

March 30, 2020

Carrie Koch
Ministry of Forests, Lands, Natural Resource Operations and Rural Development
Kamloops, BC
Carrie.koch@gov.ab.ca

Attention: Carrie Koch

Dear Carrie Koch:

Re: Application to amend water license C129749, Application #100308711

The Okanagan Indian Band ("OKIB") acknowledges receipt of correspondence from the Government of British Columbia dated January 28, 2020 regarding notice under the *Water Sustainability Act* from the Lot 46 Management Society for an application to amend their existing water license C129749 to allow for dredging in a constructed lagoon on Shuswap lake on an as needed basis [Application #100308711]. OKIB has reviewed the information and has set out a number of questions and concerns below that we need answered to understand the potential impacts of this application.

OKIB is a member community of the Syilx (Okanagan Nation) which asserts and is pursuing a claim to Aboriginal rights and title in Syilx traditional territory. OKIB asserts rights to the water resources of our traditional territory as part of the Syilx. Accordingly, any potential impact arising from the application in question, or cumulative impacts resulting from British Columbia's granting of statutory water rights on Syilx's Aboriginal water rights and title will trigger British Columbia's duty to consult and accommodate OKIB. Further, OKIB asserts Aboriginal and other common law rights to the water resources within, under, and adjacent to our reserve lands and OKIB has the right to govern those water resources. To the extent the application in question potentially impacts OKIB's reserve land water resources and/or OKIB's ability and authority to

govern our reserve land water resources, British Columbia's duty to consult is engaged at a higher level, including the requirement to obtain OKIB's consent.

Consultation Process

To have the opportunity to engage in meaningful consultation, OKIB must be given sufficient information about the potential application and adequate capacity funding to engage in the process. Despite changes to the *Water Sustainability Act* resulting in an increase in water-related consultation referrals by the Province, OKIB has received no funding to allow us to participate in consultation on water licences. In *Clyde River (Hamlet) v. Petroleum Geo-Services Inc.,* 2017 SCC 40, the Supreme Court of Canada said that a lack of participant funding can significantly impair the ability to consult. Water is an important issue for OKIB culturally, ecologically, and as a matter of survival and economic success. However, we are hampered in our ability to engage by limited budgets and personnel. The lack of funding impacts our ability to respond in a substantive, timely, and informed manner to your requests for comment.

As noted, the application raises the issue of cumulative impacts on OKIB's water rights. In *Chippewas of the Thames First Nation v. Enbridge Pipelines*, 2017 SCC 41**,** the Supreme Court of Canada stated that it may be impossible to understand the severity of a particular project's impact on Aboriginal rights without considering the cumulative impact of the project and other development. An assessment of a project's cumulative effects may, in turn, inform the scope of consultation required. Further to this point, we request information with respect to how the appropriate level of consultation was determined in this case, and what constitutes "engagement" at a "normal level".

Finally, there has been a failure to consult the OKIB with respect to the *Water Sustainability Act* scheme as a whole, and this failure cannot now be remedied by consultation on applications.

Initial Questions and Concerns Regarding this Application

The proposed application to amend an existing water license to allow dredging in a constructed lagoon on Shuswap Lake on an as needed basis may impact OKIB's traditional uses of water in the Shuswap River watershed. The application falls within the Shuswap River's watershed that drains north to Mara Lake and the dredging may impact water quality in the Shuswap River.

OKIB supports the ongoing work of the Shuswap Watershed Council in the monitoring of water quantity and quality that directly affect the availability of water for both traditional and contemporary uses of the water within the OKIB traditional territory. The OKIB provided information on Aboriginal Interests within the Shuswap River Watershed Sustainability Plan (SRWSP, 2014) and seeks

confirmation from the Ministry of Forests, Lands, Natural Resource Operations and Rural Development that the proponent will respect our recommendations and (as a minimum) comply with the objectives specified within the SRWSP regarding the protection of water quality and habitat.

To engage in consultation on this water licence, OKIB requires answers to the following:

1) Will the Ministry consider the Shuswap River Watershed Sustainability Plan (SRWSP) in granting the application?

2) Will the Ministry require the applicant to comply with the objectives specified in the SRWSP regarding the protection of water quality and habitat (see especially "Objective 1: Land Use Planning & Urban/ Residential Developments")?

3) Has a cumulative effects assessment been performed to ascertain whether the change in use does not further deteriorate water quality within the Shuswap River watershed as a potential drinking water source for OKIB?

4) The proponent has asked that Kerr Wood Leidal's Water Management Plan (WMP) be attached to the water license. The WMP includes a new proposed pump station but does not provide information on the pump station itself. Does the inclusion of a pump station in the WMP allow Lot 46 to now modify the works and install a new pump station without an amendment to the existing water licence?

5) The WMP states that "the dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis." This conclusion is based on the following statement earlier in the document: "A letter from BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licenced works under their water licence". No information is provided regarding the original conditional licence and the approvals in place for the original construction or maintenance of the lagoon system. It appears that any future maintenance, alteration or otherwise of the lagoon is covered under a grandfathered provision with no back up documentation other than the skeletal C129749 licence itself and the original licence 35177 that comprises 1 page and a sketch. Please provide us with details on how the dredging is currently done.

6) How did the Province consult with OKIB on the original water license application?

7) The WMP states that a DFO review is not required contrary to DFO's own requirements and Code of Practice. Will the Province require the proponent to apply for a DFO review?

8) The WMP uses an abbreviated set of criteria to eliminate the need for a DFO review rather than addressing the full list of required criteria that includes PCB testing within the past 5 years and confirmation that the site has been dredged within the past 10 years. No rationale is provided for abbreviating the list. Was the existing channel dredged during the past 10 years? Has there been stormwater drainage into the channel containing deleterious substances?

9) The best management practices (BMPs) outlined in the WMP are erroneous and deficient as they cite incorrect practices and procedures while failing to include others. Please outline the practices and procedures the proponent will be required to follow to ensure that any discharge from the project is adequately treated and solids will be stabilized to prevent impacts to water quality.

10) The materials to be dredged are predominately a silt fraction with long settling times. How will the discharge of turbid waters into Shuswap Lake or Eagle River be prevented?

s.16; s.18

OKIB has been provided no information with this notice that answers these questions. In *Gitxaala Nation v Canada*, 2016 FCA 187, the Federal Court of Appeal noted how a failure to provide information that is central to the interests of affected First Nations results in inadequate consultation. To engage in any degree of meaningful consultation, OKIB requires sufficient information on the proposed discharge before it can proceed.

Finally, the WMP states that the existence of a 1968 water licence eliminates the need for consultation with First Nations. We object to the assertion that an existing water license dispenses with the need for consultation. Per *Haida Nation v British Columbia (Minister of Forests),* 2004 SCC 73 the Crown has a duty to consult when they have knowledge, real or constructive, of the potential existence of an Aboriginal right or title and contemplates conduct that might adversely affect it. As stated, OKIB asserts rights to the water resources within Syilx traditional territory and has made this known to the Province. Any applications to amend, renew or grant a water license within our territory

may impact our Aboriginal right to water resources, as such the Province has a duty to consult with us on the potential impacts arising from this application to amend the water license.

We look forward to your response to our requests above.

Yours truly,

Colleen Marchand, Director of Territorial Stewardship

Ministry of
Forests, Lands, Natural
Resource Operations
and Rural Development

File: 0281845

January 26, 2021

Colleen Marchand
Director of Territorial Stewardship
Okanagan Indian Band
Colleen.Marchand@okanagan.org
okibreferrals@okanagan.org

Dear Colleen Marchand:

Re: Application to amend water license C129749, Application #100308711

The Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) acknowledges receipt of your letter dated March 30, 2020 regarding an application to amend water licence C129749.

Water licence C129749 was first issued in 1970 for the purpose of land management. The licensee was granted the right to divert 0.28317 cubic metres of water per second from the Eagle River into the artificial lagoon. Since then, the licensee routinely dredged the lagoon to remove accumulated sediment.

In 2014, the licensee applied for a Section 9 approval under the *Water Act* to dredge the lagoon (now Section 11 under the *Water Sustainability Act*). A 2014 letter from FLNRORD to the licensee refused the application stating that the licensee may remove (dredge) accumulated sediment from the channel as maintenance of their authorized works (a copy of this letter is attached). Based on information included in the original licence, the "channel" was determined to be the lagoon from the point where water enters at the northern end to where it exists into Shuswap Lake. The letter directed the licensee to contact the Water Officer to discuss best management practices and subsequently a Water Management Plan was requested to outline future maintenance practices.

In 2017, the licensee applied for an amendment to C129749 to dredge the constructed lagoon and reverse the flow of water from the channel into the Eagle River to prevent future sediment accumulation. A notification letter was sent to Okanagan Indian Band dated November 22, 2017. The licensee chose to abandon the application before a final decision was reached.

In January 2020, the licensee again applied for an amendment to C129749. The application requests an amendment to include the Water Management Plan as a clause in the water licence. The amendment would result in the licensee being required to follow the conditions of the management plan in future maintenance of works and dredging of the channel. The application does not include requests to change the direction of flow as in 2017.

Since receipt of your letter in March 2020, I have been working with the applicant and their representatives to revise the management plan to ensure future dredging avoids and/or mitigates

impacts and adheres to best management practices now and into the future. A copy of the revised Water Management Plan, dated January 2021, is attached. Please see below the answers to the questions included in your letter from March 2020. If you have any additional questions for this application please respond to me via phone or email by **February 26th, 2021**.

Regards,

Carrie Koch

Carrie Koch
Water Stewardship Officer
Carrie.Koch@gov.bc.ca
778-943-6871

1. **Will the Ministry consider the Shuswap River Watershed Sustainability Plan (SRWSP) in granting the application?**

   (See answer to Question 2 below)

2. **Will the Ministry require the applicant to comply with the objectives specified in the SRWSP regarding the protection of water quality and habitat (see especially "Objective 1: Land Use Planning & Urban/ Residential Developments")?**

   Objective 1 in the SRWSP addresses water quality concerns in the Shuswap River Watershed. The Technical Assessment completed by Golder and Associates for the Shuswap River Watershed found that potential areas of concern for water quality were related to intensive agriculture, waste management and wastewater treatment, and industry largely located in the Middle and Lower Shuswap River Watershed. Dredging of the lagoon is unlikely to have impacts to the nutrient or microbial composition of the watershed.

   Turbidity and sediment were not identified as concerns for water quality in the Shuswap River Watershed. The WMP outlines the proposed dredging procedures to minimize sediment entering nearby waterbodies including the use of a silt curtain, careful placement and covering of spoil/dredged material to prevent erosion, and maintenance of erosion and sediment control measures until any disturbed banks are revegetated. The WMP has also been revised to include water quality monitoring for turbidity during sensitive works as per the BC Water Quality Guidelines.

3. **Has a cumulative effects assessment been performed to ascertain whether the change in use does not further deteriorate water quality within the Shuswap River watershed as a potential drinking water source for OKIB?**

   This application does not suggest a change in use. The lagoon has been dredged every few years on a regular basis since the 1960s. Environmental impacts have likely already been realised by the lagoon, Shuswap Lake, and the larger watershed.

4. **The proponent has asked that Kerr Wood Leidal's Water Management Plan (WMP) be attached to the water license. The WMP includes a new proposed pump station but does not provide information on the pump station itself. Does the inclusion of a pump station in the WMP allow Lot 46 to now modify the works and install a new pump station without an amendment to the existing water licence?**

   The proposed pump station indicated on the map was from a previous amendment application Lot 46 Management Society (Lot 46) submitted in 2018. This previous amendment was abandoned by Lot 46 before a decision was made. The revised Water Management Plan does not include a pump station on the plan.

5. **The WMP states that "the dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis." This conclusion is based on the following statement earlier in the document: "A letter from BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licenced works under their water licence". No information is provided regarding the original conditional licence and the approvals in place for the original construction or maintenance of the lagoon system. It appears that any future maintenance, alteration or otherwise of the lagoon is covered under a grandfathered provision with no back up documentation other than the skeletal C129749 licence itself and the original licence 35177 that comprises 1 page and a sketch. Please provide us with details on how the dredging is currently done.**

   The lagoon was man-made via excavation. No documents are available regarding how dredging has been done at the site in the past. However, the 2014 letter suggests that the licensee had applied for Changes in and About a Steam at least 4 times between 2006 and 2014. Also, the document *Shoreline Management Guideline For Fish and Fish Habitat: Shuswap, Mara and Little Shuswap Lakes (2011)* states that DFO recognizes that the site has been previously dredged with 'appropriate approvals'.

   > *"DFO recognizes that the following sites on the Shuswap Lake were previously dredged with appropriate approvals: i) Shuswap Lake Estates (Chase); ii) Captain's Village Marina (Scotch Creek); iii) Canoe Boat Club (Canoe); and,* ***iv) Lot 46 Society (Sicamous).***

   In 2014 the decision was made by FLNRORD staff that the licensee had the right to "remove (dredge) the accumulated sediment from the channel … as maintenance of their licenced works". The letter recommends the licensee contact the Water Officer to discuss best management practices which lead to the requirement for a management plan to outline dredging practices moving forward and minimize impacts to the lagoon, Shuswap Lake, and the larger watershed. Including a direct reference to the WMP in the licence will require the licensee to adhere to the dredging processes detailed in the report.

   Copies of both the 2014 letter and the Water Management Plan are attached.

6. **How did the Province consult with OKIB on the original water license application?**

   The original water license was granted in 1968. Consultation was not performed at this time.

7. **The WMP states that a DFO review is not required contrary to DFO's own requirements and Code of Practice. Will the Province require the proponent to apply for a DFO review?**

   The Water Management Plan has been updated to state that the licence does not exempt the licensee from the requirements of the *Fisheries Act* or other applicable legislation.

   The plan has also been updated to require a fish, shellfish, and amphibian survey by a qualified professional before dredging is done. This survey will help dictate the permits required, any additional mitigation measures required, and the timing window for work.

8. **The WMP uses an abbreviated set of criteria to eliminate the need for a DFO review rather than addressing the full list of required criteria that includes PCB testing within the past 5 years and confirmation that the site has been dredged within the past 10 years. No rationale is provided for abbreviating the list. Was the existing channel dredged during the past 10 years? Has there been stormwater drainage into the channel containing deleterious substances?**

   The report aims to give a general overview of the criteria for a DFO review but does not state the site is exempt from review. The licence does not exempt the licensee from other applicable laws and regulations, including the *Fisheries Act*.

9. **The best management practices (BMPs) outlined in the WMP are erroneous and deficient as they cite incorrect practices and procedures while failing to include others. Please outline the practices and procedures the proponent will be required to follow to ensure that any discharge from the project is adequately treated and solids will be stabilized to prevent impacts to water quality.**

   Sediment generation is an important consideration for dredging of the lagoon. The report originally stated that isolation methods at the mouth of the lagoon would be determined by the contractor.

   The report has now been updated to require a fish, shellfish, and amphibian survey be performed by a qualified professional. The qualified professional will confirm the best method of isolation and dictate any additional mitigation measures. Water quality monitoring (with a minimum of turbidity) will be recorded during sensitive works such as dewatering and re-watering the isolated lagoon.

   The WMP states that works must be completed as set out in the provincial Standards and Best Practices for Instream Works, or any document issued in substitution thereof. The revised WMP states that the licensee must notify FLNRORD three months prior to dredging to allow time for FLNRORD staff to inform the licensee of any changes in regulations or best management practices since the last dredging event.

10. **The materials to be dredged are predominately a silt fraction with long settling times. How will the discharge of turbid waters into Shuswap Lake or Eagle River be prevented?**

    No water from the lagoon will be discharged into the Eagle River. The diversion channel will be closed off prior to dewatering and only reopened after the lagoon has been refilled.

    Discharge of turbid waters into Shuswap Lake will be prevented using a silt curtain during installation of the isolation feature, dewatering, and removal of the isolation feature. Turbidity will also be monitored during sensitive works such as dewatering and re-watering the isolated lagoon.

s.16; s.18

Page 400 of 480

Withheld pursuant to/removed as

s.18

Page 401 of 480

Withheld pursuant to/removed as

s.18

KERR WOOD LEIDAL
consulting engineers

Okanagan
202 - 3334 30th Avenue
Vernon, BC V1T 2C8
T 250 503 0841
F 250 503 0847

Water Management Plan

Prepared for:

Lot 46 Management Society

January 2021
KWL Project No. 3691.003

Contents

1. Introduction 1-1
1.1 Project Background and Rationale 1-1
1.2 Authorizations, Permits, and Approvals 1-1
1.3 First Nations 1-2

2. Site Location and Context 2-1
2.1 Land Ownership and Land Use 2-1
2.2 Aquatic Habitat and Species 2-1

3. Dredging Operation 3-1
3.1 Sequence and Description of Works 3-1
3.2 Dredging Considerations 3-2
3.3 Dewatering and Water Management 3-3
3.4 Dredging Frequency/Schedule 3-3

4. Environmental Impacts and Mitigation 4-1
4.1 Potential Environmental Impacts 4-1
4.2 Environmental Protection and Mitigation Measures 4-1

5. Reporting 5-1
5.1 Completion Report 5-1
5.2 Fish, Shellfish, and Amphibian Survey 5-1
5.3 Environmental Monitoring Report 5-1
5.4 Fish Salvage Data 5-1
5.5 Conservation Data Centre Report 5-2
5.6 Archaeological Findings 5-2

6. Monitoring and Maintenance 6-1

7. Closure 7-1
Report Submission 7-1

References 7-1

Figures

Figure 1: Location Plan 1-3

Tables

Table 1: Fish Species Present in Shuswap Lake, Mara Lake, Shuswap Narrows, Shuswap River, & Eagle River 2-2
Table 2: Potential Dredging Methods 3-2

Appendices

Appendix A: Site Photographs
Appendix B: Summary of Notification and Reporting Requirements
Appendix C: Sample Notification Template

1. Introduction

1.1 Project Background and Rationale

The Lot 46 Management Society (the Society) is composed of 17 homeowners who own properties on Silver Sands Road in Sicamous, BC. The properties are located along the east side of an artificial lagoon connected to Shuswap Lake, just north of the RW Bruhn Bridge (Highway 1 crossing; see Figure 1). The Society manages the lagoon and members have private docks for boat access to the lake. Sediment accumulates in the lagoon and the Society needs to dredge the lagoon to facilitate navigation of boats from private docks to the lake. This Water Management Plan provides operational guidance for the periodic dredging of the Lot 46 Lagoon, including measures to mitigate the potential impacts to water quality, aquatic habitat, fish, and other wildlife.

1.2 Authorizations, Permits, and Approvals

Existing Water Licence

The Society currently holds water licence C129749 which authorizes a maximum of 0.28 cubic metres per second (10 cubic feet per second) to be diverted through a diversion structure (point of diversion number PD52869) and pipe from the Eagle River into the constructed lagoon. See Figure 1 for a plan view of the licensed works.

A letter from the BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licensed works under their water licence. As a condition, the MFLNRO Regional Water Management Branch requires the Society develop a Water Management Plan (this plan) to guide the dredging operations.

Amendment of the existing water licence to include this plan may result in the current licence C129749 being superseded by a new licence number. Any reference made herein to the existing licence should be considered to also include any licence issued in substitution thereof.

Other Permits and Approvals

A fish and amphibian salvage within the lagoon is required prior to dewatering and dredging. In order to conduct a salvage, the Society must obtain a Licence to Fish for Scientific Purposes from Fisheries and Oceans Canada (DFO) and a Scientific Fish Collection Permit from MFLNRO.

In order for dredging to proceed without requiring a review by DFO, the following conditions must be met:

- No temporary or permanent increase in the existing area of the lagoon below the high water mark;
- Dredged material is deposited and stabilized on land;
- Dredging has occurred in the last 10 years; and
- No dredging where SARA-listed shellfish occur except where exempted in the recovery strategy for that species.

It should be noted that compliance with this Water Management Plan satisfies the requirements of the BC *Water Sustainability Act* as it pertains to the water licence. It does not exempt the Society or the

Contractor from familiarizing themselves with and adhering to all other Provincial and Federal regulations applicable to the works.

1.3 First Nations

The following First Nations have traditional territory and/or interests in or nearby the project area (MOE 2016c):

- Neskonlith Indian Band;
- Secwepemc First Nation (falls within Secwepemc Reconciliation Framework Agreement Boundary);
- Okanagan Indian Band;
- Adams Lake Indian Band;
- Little Shuswap Indian Band; and
- Splatsin.

The dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis. As such, there is no expectation to consult with First Nations. However, in the interests of continued good relationships, the Society envisions contact with local First Nations contacts prior to any operation to learn if there are any potential conflicts with the operation.

Copyright

2. Site Location and Context

The following section outlines the context and characteristics of the project site.

2.1 Land Ownership and Land Use

Land use around the lagoon is a mix of single family residential and recreational. Lot A District Lot 452 Kamloops Division Yale District Plan KAP52709, the lot being excavated, is private property owned by the Society.

Adjacent land owners will be notified with sufficient time to prepare for dredging operations. It is anticipated that three (3) months would be sufficient, but there may be particular circumstances that dictate otherwise. These special circumstances will be reviewed on a case-by-case basis.

2.2 Aquatic Habitat and Species

Aquatic Habitat

The constructed lagoon is primarily used for private moorage and is approximately 320 m long and 60 m wide with a surface area of approximately 18,700 m^2. It is approximately 3 m deep at its deepest point, with an average depth of roughly 1.5 m during low water.

The lagoon is currently fed by water from Eagle River via a diversion structure and pipe. The point of diversion from the river is located 2.9 km upstream from its confluence with Shuswap Lake. At the point of diversion, the bank full channel width of the Eagle River is approximately 60 m. Due to the relatively small rate of diversion, water in the lagoon is slow-flowing to stagnant. Substrates are mainly sands and silts which contribute to the ongoing accumulation of sediment in the lagoon. The shoreline is mainly sand. There is a small amount of vegetated shore along the south end of the lagoon, where grasses and some small shrubs grow to near the high water mark. In October 2016, there were no obvious aquatic plants growing in the lagoon.

Water from the lagoon exits into Shuswap Lake through a shallow outlet (approximately 12 m wide) immediately downstream of Sicamous Narrows. Sicamous Narrows is the short canal-like channel that connects Mara Lake with Shuswap Lake.

Fish and Other Wildlife

Table 1 provides the result of a desktop study to indicate the fish species present in the waterbodies that are connected with and nearby to the lagoon: Shuswap Lake, Mara Lake (including Sicamous Narrows), the Shuswap River (upstream of Mara Lake), and the Eagle River. These species may or may not be present in the lagoon.

Table 1: Fish Species Present in Shuswap Lake, Mara Lake, Shuswap Narrows, Shuswap River, & Eagle River

Common Name	Code	Latin Name	Species at Risk Status		
			BC List	COSEWIC	SARA
Bridgelip Sucker	BSU	*Catostomus columbianus*	Yellow	-	-
Bull Trout	BT	*Salvelinus confluentus*	Blue	SC (2012)	-
Burbot	BB	*Lota lota*	Yellow	-	-
Carp	CP	*Cyprinus carpio*	Exotic	-	-
Chinook Salmon	CH	*Oncorhynchus tshawytscha*	Yellow	-	-
Chiselmouth[1]	CMC	*Acrocheilus aclutaceus*	Blue	NAR (2003)	-
Coho Salmon (Interior Fraser population)	CO	*Oncorhynchus kisutch*	Yellow	T (2016)	-
Dolly Varden	DV	*Salvelinus malma*	Yellow	-	-
Emerald Shiner	ESC	*Notropis atherinoides*	Unknown	-	-
Kokanee	KO	*Oncorhynchus nerka*	Yellow	-	-
Lake Chub	LKC	*Couesius plumbeus*	Yellow	DD	-
Lake Trout	LT	*Salvelinus namaycush*	Yellow	-	-
Largescale Sucker	CSU	*Catostomus macrocheilus*	Yellow	-	-
Leopard Dace	LDC	*Rhinichthys falcatus*	Yellow	NAR (1990)	-
Longnose Dace	LNC	*Rhinichthys cataractae*	Yellow	-	-
Longnose Sucker	LSU	*Catostomus catostomus*	Yellow	-	-
Mountain Whitefish	MW	*Prosopium williamsoni*	Yellow	-	-
Northern Pikeminnow	NSC	*Ptycheilus oregonensis*	Yellow	-	-
Peamouth Chub	PCC	*Mylocheilus caurinus*	Yellow	-	-
Pink Salmon	PK	*Oncorhynchus gorbuscha*	Yellow	-	-
Prickly Sculpin	CAS	*Cottus asper*	Yellow	-	-
Pygmy Whitefish (Pacific populations)	PW	*Prosopium coulteri*	Yellow	NAR (2016)	-
Rainbow Trout	RB	*Oncorhynchus mykiss*	Yellow	-	-
Redside Shiner	RSC	*Richardsonius balteatus*	Yellow	-	-
Slimy Sculpin	CCG	*Cottus cognatus*	Yellow	-	-
Sockeye Salmon	SK	*Oncorhynchus nerka*	Yellow	-	-
Steelhead	ST	*Oncorhynchus mykiss*	Yellow	-	-
Westslope Cutthroat Trout (Pacific populations)	WCT	*Oncorhynchus clarki lewisi*	Blue	SC (2016)	1-SC (2010)
White Sturgeon (Upper Fraser River Population)	WSG	*Acipenser transmontanus*	Yellow	E (2012)	-
White Sucker	WSU	*Catostomus commersoni*	Yellow	-	-

Sources: MOE 2016a, MOE 2016b
[1]One Chiselmouth sampled in 1964 at northern outlet of Mara Lake at the beginning of Shuswap Narrows (CDC 2016)

It is unlikely that salmon, trout, or char use the lagoon to spawn due to the accumulation of fine sediments and frequent boat traffic in the lagoon. Based on *Shuswap Lake System and Adams Lake - Lake Char and Sockeye Spawning Atlas Overview Map* (DFO 2005), there is no spawning of Sockeye or Char (i.e., Bull Trout and Dolly Varden) in the lagoon or on the adjacent shoreline of Shuswap Lake.

Five fish species present or with potential to be present in Shuswap Lake and other nearby waterbodies are federally- or provincially-listed species at risk:

- Bull Trout (Salvelinus confluentus) are a blue-listed species in BC. Blue-listed species are Species of Special Concern (formerly Vulnerable) in BC and have characteristics which make them especially sensitive or vulnerable to natural or anthropogenic events (MOE 2016a). Bull Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on habitat characteristics and the extent of known spawning areas (DFO 2005).
- Chiselmouth (*Acrocheilus aclutaceus*) are also blue-listed Species of Special Concern in BC. One Chiselmouth was sampled in 1964 at the mouth of Mara Lake as it entered Shuswap Narrows (CDC 2016). Chiselmouth are absent form sites with maximum temperatures below 20 °C (Rosenfeld et al. 2001). Adults need deep, fast flowing water with substrate that supports periphyton (i.e., boulder and cobble; Rosenfeld et al. 1998). Juveniles need slow-moving backwater habitat and are usually found where there are aquatic plants, which provide habitat for food (invertebrates) and cover from predators (COSEWIC 2003, Rosenfeld 2003). Based on these requirements, it is highly unlikely that adult Chiselmouth use the lagoon, and possible that juveniles are present.
- Interior Fraser populations of Coho Salmon (*Oncorhynchus kisutch*) were re-assessed as Threatened (downgraded from Endangered) by the Committee of the Status of Endangered Wildlife in Canada (COSEWIC) in 2016 but have not been added to Schedule 1 of the *Species at Risk Act*. Coho fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- Pacific populations of Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*) were reconfirmed as a Species of Special Concern by COSEWIC in 2016 and are a Schedule 1 Species of Special Concern of the *Species at Risk Act* (SARA). Under SARA, species of special concern are defined being particularly sensitive to human activities or natural events but are not endangered or threatened. This species is also blue-listed in BC. Westslope Cutthroat Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- The Upper Fraser River population of White Sturgeon (*Acipenser transmontanus*) was assessed as Endangered by COSEWIC in 2012. It has been recorded in Kamloops Lake, and may occasionally enter the Thompson River system. However, it is very unlikely that White Sturgeon would be present in the lagoon based on its small size and habitat characteristics (COSEWIC 2012).

Western Painted Turtle (*Chrysemys picta bellii*) has been observed on the Eagle River just north of the project site (CDC 2016). These populations are part of the Intermountain - Rocky Mountain population that was reconfirmed as a Species of Special Concern by COSEWIC in 2016 and is a Schedule 1 Species of Special Concern under SARA. It is also blue-listed in BC. Because Western Painted Turtles can move up to several hundred metres by land (Gregory and Campbell 1987, COSEWIC 2006), they have the potential to feed, mate, and nest in the lagoon. The turtles begin mating in spring soon after the end of hibernation and begin nesting in June (Schwarzkopf and Brooks 1987, Ernst et al. 1994, COSEWIC 2006). Successful mating peaks in late summer and early fall (Gist et al. 1990). Females dig 10 cm deep nests on open south-facing slopes (Schwarzkopf and Brooks 1987, Weisrock and Janzen 1999). Eggs incubate for 72–104 days in the Pacific Northwest (Nussbaum et al. 1983). After

hatching in later summer and early fall, turtle hatchlings stay in the nest until the next spring (Gregory and Campbell 1987, St. John 2002). Adults hibernate over the winter in the muddy bottoms of streams and ponds, old mammal burrows, or other shelter (Cohen 1992).

The only shellfish listed under the *Species at Risk Act* that is present in the Okanagan drainage is the Rocky Mountain Ridged Mussel (*Gonidea angulata*), listed as a Species of Special Concern. In recent searches, *Gonidea angulata* was found as far north as Okanagan Lake near Vernon (COSEWIC 2010). Portions of the Shuswap watershed have not been surveyed for *Gonidia angulata* as of 2011 (DFO 2010b).

It is possible that amphibians use the lagoon for breeding or refuge. However, due to frequent boat traffic, it is not ideal habitat.

Migratory birds may use the grass and shrub area at the south end of the lagoon for foraging and breeding. Waterfowl use the lagoon for refuge and possibly for foraging.

3. Dredging Operation

3.1 Sequence and Description of Works

Dredging operation will proceed in the following sequence:

1. Installation of Erosion and Sediment Control Measures

Erosion and sediment control measures should be installed prior to starting dredging works, following any recommendations of the Qualified Environmental Professional (QEP). Additional supplies for erosion and sediment control should be stockpiled on site in case they are required.

2. Isolation of Lagoon

Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: water-filled flood barriers, sand-bag coffer dams, or sheet pile coffer dams. The preference is for methods that minimize the disturbance to sediment and aquatic life (i.e., flood barriers). The diversion structure will be isolated using the knife-valve at its inlet (Appendix B, Photo 4).

Isolation methods used for dredging works should follow the recommendations of the QEP as outlined in the Fish, Shellfish, and Amphibian survey report (refer to Section 5.2). Water filled flood barriers are currently the preferred method; if an alternative method is proposed it should be included in the survey report and signed off on by the QEP.

3. Fish Salvage

After isolation, an initial fish salvage will be conducted by a QEP who may also be the Environmental Monitor (EM). Salvage methods should be appropriate for the depth of water in the lagoon. Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.

4. Dewatering

After the initial fish salvage, dewatering should proceed immediately. Fish salvaging should continue as the lagoon is dewatered. Adequate pumping capacity should be retained in order to complete dewatering as quickly as possible. Water will be discharged over the isolation dam into Shuswap Lake.

5. Excavation and Grading

After complete salvage and dewatering, the EM will complete a review of the area to determine if there are any outstanding environmental concerns which need to be addressed.

Once the EM has approved the site for further work, dredging may begin. Dredging should commence only after the lagoon is fully isolated from flowing water and can continue only if this isolation is maintained.

Dredging will be completed by conventional equipment and be subject to review by the EM. Refer to Section 3.2 for additional considerations when selecting equipment and dredging methods.

6. Rewatering Lagoon and Removal of Isolation Measures

The lagoon should be refilled and isolation measures removed in a manner so as to minimize the suspension of sediment in the water column and movement into Shuswap Lake.

7. Resume Normal Operation of the Lagoon

Once the lagoon has been filled to the level of the Shuswap lake, normal operation will continue.

3.2 Dredging Considerations

Engineering Specifications

The lagoon will be restored to original design parameters of a trapezoidal geometry consisting of minimum 4H:1V side slopes and flat bottom.

Machinery

The contractor shall decide what machinery is most appropriate for the works. It is assumed that conventional excavators and machinery will be used after isolation and dewatering of the lagoon is complete. The machinery will be clean and in satisfactory condition to undertake the work in a sensitive environment. The EM will review and approve equipment prior to the commencement of construction.

Table 2: Potential Dredging Methods

Method	Description	Construction Considerations
Hydraulic Dredging	Adding large amounts of process water to the sediments in order to suspend fine materials in a slurry, and then pumping the slurry to a location where it can be dewatered or stored. This method is typically used in open water bodies and is cost effective for large, deep dredging operations. Requires large, specialized dredging vessels. Hopper dredges are able to store and transport the slurry on board, pipeline dredges discharge the slurry to a dewatering location.	• Does not require isolation or dewatering of the water body. • Most suitable for large water bodies and fine sediments. • Disposal of sediments is more challenging in slurry form; this may require dewatering systems or temporary detention areas (off site). • No permanent structures required.
Mechanical Dredging	Physically picking up sediments up by means of excavator or clamshell buckets and unloading on shore. This method is popular because it requires only conventional construction equipment, is a fast process, and can accurately remove material. If the body of water can be isolated and drained, excavator access can be significantly improved. If the lagoon is not fully dewatered, this may require additional access measures such as building sand bars across the water body. Mechanical dredging has been the preferred method for dredging the lagoon in the past.	• Requires dry space on the water's edge for an excavator to operate. • Most suitable for smaller water bodies or locations where rock is of concern. • Limited by the reach of an excavator and may require temporary structures such as sand bars in the water body. • Temporary isolation structures required to facilitate draining or dewatering of the water body.

Disposal of Dredged Material

Dredged material should be disposed of on land and at an off site location. Disposal must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites Regulation and Hazardous Waste Regulation, and with any appropriate local government bylaws regarding the removal and deposition of spoil and dredged material.

3.3 Dewatering and Water Management

Isolation Measures

The isolation measures will be constructed according to the EM and will be designed to safely hold back water from entering the lagoon when fully dewatered without failure. This may be accomplished with an aqua-dam, sandbag dam, coffer dam, or other suitable method.

The knife valve on at the diversion structure from the Eagle River will be closed to isolate the lagoon from the river prior to fish salvage.

The contractor will keep a silt curtain on site and use it if necessary when installing or removing the dam to prevent silt from entering Shuswap Lake.

Pumping Capacity

The contractor shall ensure that they have sufficient pumping capacity to dewater the lagoon as quickly as possible.

Discharge Location

During dewatering, discharge water should be managed and directed to an area where it will not cause erosion or carry sediment-laden water into Shuswap Lake. If discharge water becomes turbid (likely near the end of dewatering), a silt curtain should be placed between the discharge location and the rest of Shuswap Lake. The contractor should ensure that they have adequate length of pipe or hoses so that the intakes can be situated in the deepest part of the lagoon and the discharge hose can be situated in an appropriate area as outlined above.

3.4 Dredging Frequency/Schedule

Dredging should be carried out only when necessary to ensure residents can navigate safely. If dredging is required frequently (i.e., annually), the Lot 46 Management Society should investigate the source and mechanism of the sedimentation and take steps to reduce the rate of accumulation of sediment within the lagoon so that the frequency of dredging can be reduced.

4. Environmental Impacts and Mitigation

4.1 Potential Environmental Impacts

The dredging operations may have the following environmental impacts (DFO 2010a):

- Removal or change in aquatic plants, leading to change in food supply, nutrients concentrations, and habitat structure;
- Sediment being suspended in water, leading to change in sediment concentrations and contaminant concentrations;
- Modification of channel or shoreline shape leading to change in stability and hydraulics, influencing substrate, leading to a change in food supply and habitat structure; and
- Direct injury to fish, amphibians, reptiles, or other aquatic organisms from machinery or materials. The Society shall be responsible to notify DFO of direct injury to fish, amphibians, reptiles, or other aquatic organisms under S.38(4) of the Fisheries Act.

4.2 Environmental Protection and Mitigation Measures

To mitigate the potential impacts listed above, dredging works should follow provincial Standards and Best Practices for Instream Works (MFLNRO and DFO 2010a, MFLNRO and DFO 2010b), including any document issued in substitution thereof. These and other guidelines to follow are listed below.

Project Planning

- Notify consultants with the intention to dredge at least three months before the expected start date, to allow enough time for a QEP to obtain fish salvage permits.
- FLNRORD should also be notified of the intention to dredge 3 months before the expected start date. This is intended as an informal, courtesy notification only and will allow time to resolve any unexpected complications or changes in regulations and best management practices if necessary.

  Phone (1-877-855-3222) or Email (FrontCounterBC@gov.bc.ca) attn: Water Stewardship Officer.

Timing

- Dredging is anticipated at low water levels, typically seen in late summer to fall.
- Works in the lagoon should be completed from July 22 to April 1, the reduced risk timing window for instream works in Shuswap Lake for areas with no sockeye of char spawning (MFLNRO 2015).
- Timing of the works shall also take into account any QEP recommendations from the fish, shellfish, and amphibian survey report as outlined in Section 5.2.
- The nesting window for migratory birds in Sicamous is April 1 to August 17 (Environment and Climate Change Canada 2016). Machinery should not drive through grass or shrub areas where migratory birds may be nesting during this period, and no clearing of vegetation should occur during this period. If disturbance of vegetation is required during this period, a QEP must conduct a breeding bird survey. Any areas where there are active or suspected nests must be flagged off and not disturbed during works.

Erosion and Sediment Control

- The contractor should use appropriate erosion and sediment control measures to intercept and manage runoff and reduce the likelihood for soils to erode and the potential for sediment to enter nearby waterbodies. Set up measures before beginning other work, following any recommendations made by the QEP. Measures may include but are not limited to:
  - Using a silt curtain when installing or removing isolation measures to prevent silt from entering Shuswap Lake;
  - During dewatering, using a silt curtain between the discharge location and the rest of Shuswap lake to keep sediment from moving into the lake;
  - Covering spoil/dredged material with plastic sheeting and set up silt fencing around piles, if material is being stored temporarily;
  - Placing spoil/dredged material where it will not erode into a waterbody or storm sewer;
  - Keeping additional erosion and sediment control supplies on site in case of an unexpected storm or other event;
  - Regular inspection of measures and modification/repair when necessary; and
  - Maintenance of effective erosion and sediment control measures on any disturbed upland banks until banks are revegetated.

Site Access

- Machinery should access the site using existing roads, trails, and boat ramp to avoid disturbance to vegetation (see Figure 1).
- Avoid disturbance to the riparian area along the shoreline and protect trees, shrubs and grasses. Note that any harmful alteration, disruption or destruction of habitat is a violation of S.35(1) of the Fisheries Act.

Weather

- The contractor should monitor weather forecasts and avoid work during periods of heavy rain.
- Avoid construction or removal of isolation dam when Shuswap Lake has large waves or when high wind is in the forecast.

Environmental Monitoring

- Dredging activities should be monitored by a QEP for the duration of the project, and full-time during sensitive works. Sensitive works include the installation and removal of the isolation measures, dewatering, and initial excavation.
- Water quality monitoring will be required during sensitive works, particularly where return water is being discharged into Shuswap Lake, and as otherwise directed by the QEP. At a minimum, turbidity shall be monitored and recorded per BC Water Quality Guidelines. Other parameters such as pH shall be monitored at the discretion of the EM.

Protection of Fish and Other Aquatic Organisms

- Before starting work, the QEP should survey the site for any fish, shellfish, reptiles, or amphibians, especially Western Painted Turtles. If any are found, they should be moved to a safe location away from the work site according to provincial best management practices. They should also look for signs of Western Painted Turtle mating or nesting. If a nest or potential nest is discovered, it should be flagged off and should not be disturbed during dredging operations. Ideally, the EM should survey the site in late summer/early fall at least 1 week prior to works.
- Based on the survey, the QEP shall prepare a report outlining any additional mitigation measures, the appropriate timing window for the work, and the recommended isolation measures to be used.
- A QEP should complete a fish and amphibian salvage according to provincial best practices prior to any works below the high water mark.
- Salvage methods should be appropriate for the depth of water in the lagoon.
- Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.
- All dewatering pump intakes must have fish screens with a maximum screen opening of 2.54 mm (0.10 inches) to prevent fish impingement.
- The contractor should make every effort to dewater the lagoon as quickly as possible. The contractor shall ensure that they have sufficient pumping capacity. This will minimize the time that fish may be isolated within the lagoon in water with no flow.
- The dewatering pump intakes should be situated in the deepest location of the lagoon before dewatering, so that the intake does not need to be moved multiple times. This will minimize the disturbance of sediment and fish that may still be in the lagoon during dewatering.
- The salvage crew should stay on site from the beginning of dewatering until the lagoon is completely dewatered. If fish, amphibians, or reptiles remain in the lagoon during or after dewatering, they should be captured using dip nets and moved to a safe location outside the work area as quickly as possible.
- After partial dewatering, the EM should survey the banks and soft substrate of the exposed lagoon for Rocky Mountain Ridged Mussells (*Gonidea angulata*). If found, work should cease immediately and the client should contact DFO for guidance on how to proceed.

Dredged Material

- Return water (water draining from saturated sediment that has been dredged and placed on land temporarily) should be treated with settling basins or other appropriate means so that the concentration of total suspended solids is minimized before returning to the lagoon or Shuswap Lake.
- Return water should not enter the Eagle River.
- Dredged material must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites and Hazardous Waste regulations, and with any appropriate local government bylaws regarding spoil.
- Dredged material should not be used to infill the shoreline or adjacent wetland areas.

Operation of Machinery

- Beside and within the lagoon, operate machinery in a manner that minimizes the disturbance to the banks and upland areas around the lagoon.
- Only use the existing boat access ramp to move machinery from the access path into the lagoon.

Contamination and Spill Management

- Prevent the discharge of silt, sediment, sediment-laden water, or any other deleterious substance into the lagoon, Eagle River, Shuswap Lake, or any ditch or storm sewer that flows into these waterbodies.
- Ensure machinery is clean (power washed), in good working condition, and free of leaks, excess oil, grease, and seeds or tissue of noxious weeds.
- Do not refuel or service equipment within 30 m of a water body, including the lagoon.
- Keep a spill containment kit on site and ensure all staff are trained it its use. Immediately report any substance of reportable quantities that is harmful to aquatic life to the Environmental Emergency Management Plan Incident Reporting Hotline at 1-800-663-3456 and DFO's Observe, Record and Report hotline at 1-800-465-4336.
- Place generators and pumps inside fuel containment trays to contain any accidental spills of fuel or oil.

Post-operation

- If the banks of the lagoon are disturbed during construction, restore them to their original grade and condition.
- Stabilize any exposed areas such as shoreline by planting and seeding with native trees, shrubs, and/or grasses and mulching to prevent erosion. Grass can be planted by hydro-seeding or broadcast seeding and mulching.

5. Reporting

The following reporting is the responsibility of the Society to retain and must be completed each time dredging is undertaken. The Society will be prepared to provide a copy of the completion reporting and EMR to regulatory officials, if requested.

5.1 Completion Report

The Society will prepare a completion report outlining the following:

- Start and end date of works, including dates of work sequence tasks in Section 3.1;
- Extent of dredging;
- Depth (with location) of lagoon prior to and after dredging;
- Specific construction methods used (e.g., isolation methods);
- Volume of dredged materials; and
- Location and details about where dredged materials were disposed of.

5.2 Environmental Monitoring Report

Upon completion of the work, the EM should prepare an environmental monitoring report outlining the following:

- Description of works;
- Timing of works;
- Surface area below the high water mark affected;
- Dates of monitoring;
- Any non-compliance with this management plan, the water licence, or relevant provincial or federal best management practices or guidance documents;
- Description of any incidents, difficulties, or spills, and how they were addressed and reported;
- Dates and details of any fish or wildlife salvages, including time of day, location, capture methods, location of release, species and number of animals captured and released, any fatalities, and the numbers of the required licences to capture fish and/or wildlife;
- A record of all water quality measurements and any deviations from BC Water Quality Guidelines;
- A summary of any other actions taken; and
- Recommended updates or amendments for this Water Management Plan.

5.2.1 Fish, Shellfish, and Amphibian Survey

Prior to completing any isolation or dredging works, the QEP is required to perform a fish, shellfish, and amphibian survey (refer to Section 4.2). A summary report should be prepared by the QEP, covering the findings of this survey and impacts on the dredging operation:

- Any additional mitigation measures required;
- Appropriate timing window for the work;
- Recommended isolation method to be used.

5.2.2 Fish and Amphibian Salvage Data

If a fish and amphibian salvage is conducted, the EM should report the results of the salvage to DFO and the MFLNRO in the appropriate format required by the ministry.

5.2.3 Conservation Data Centre Report

If any Species at Risk (those outlined in Section 2.2 or otherwise) are observed or salvaged during dredging or as a result of associated monitoring, these should be reported to the BC Conservation Data Centre.

5.3 Archaeological Findings

The provincial *Heritage Conservation Act* protects archaeological sites within BC. The Archaeology Branch of MFLNRO oversees the enforcement of the Act. Because the lagoon is man-made, it is unlikely that archaeological sites will be discovered during dredging as long as it does not disturb sediment below the depth of the original excavation. If, while dredging, a potential archaeological site is found, work should cease immediately, and the contractor should contact the Archaeology Branch at 250-953-3334. A professional archaeologist will be required to assess the site and determine if further investigation or permitting is required.

6. Monitoring and Maintenance

The depth of the lagoon should be monitored by the Society annually in at least four locations (mouth, middle, head, under specific docks, etc.) and the depths recorded. These depths should be reported in the completion report following subsequent dredging.

The Society should also monitor the diversion structure and piping to ensure that it is operating in a manner to minimize the amount of sediment entering the lagoon from the Eagle River.

7. Closure

We trust that this Water Management Plan meets your requirements at present. Please do not hesitate to contact KWL at DMeredith@kwl.ca or 250-503-5817 if you have any questions or concerns.

Report Submission

Prepared by:

KERR WOOD LEIDAL ASSOCIATES LTD.

Patrick Lilley, M.Sc., R.P.Bio.
Senior Biologist

January 21, 2021

Dwayne Meredith, B.Sc., P.Ag.
Project Manager
Sector Leader – Water Resources

Statement of Limitations

This document has been prepared by Kerr Wood Leidal Associates Ltd. (KWL) for the exclusive use and benefit of LOT 46 MANAGEMENT SOCIETY for the Water Management Plan. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document.

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.

Copyright Notice

These materials (text, tables, figures and drawings included herein) are copyright of Kerr Wood Leidal Associates Ltd. (KWL). LOT 46 MANAGEMENT SOCIETY is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to Water Management Plan. Any other use of these materials without the written permission of KWL is prohibited.

Revision History

Revision #	Date	Status	Revision	Author
1	January 20, 2021	Revised	Incorporated input from MFLNRO and DFO reviews	PIC
0	May 11, 2017	Final	Issued for Use	DWM
A	January 18, 2017	Draft	Issued for client review	LTW/PL

OQM | Organizational Quality Management Program

References

Conservation Data Centre (CDC). 2016. Species and Ecosystems at Risk – Publically Available Occurances. iMapBC Provincial Layer. Available at: http://maps.gov.bc.ca/ess/sv/imapbc//. Accessed: December 2016.

COSEWIC. 2003. COSEWIC assessment and update status report on the chiselmouth *Acrocheilus alutaceus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 22 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

COSEWIC. 2006. COSEWIC assessment and status report on the Western Painted Turtle *Chrysemys picta bellii* (Pacific Coast population, Intermountain-Rocky Mountain population and Prairie/Western Boreal - Canadian Shield population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 40 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2012. COSEWIC assessment and status report on the White Sturgeon *Acipenser transmontanus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxvii + 75 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

Environment and Climate Change Canada. 2016. General Nesting Periods of Migratory Birds in Canada. Available at: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4f39a78f-1. Accessed: January 2017.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Canada, Smithsonian Institution Press, Washington, D.C.

Fisheries and Oceans Canada (DFO). 2005. Shuswap Lake System and Adams Lake Lake Char and Sockeye Spawning Atlas Overview Map. Available at: http://www.shim.bc.ca/shuswap/. Accessed: December 2016.

Fisheries and Oceans Canada (DFO). 2010a. Management Plan for the Rocky Mountain Ridged Mussel (*Gonidea angulata*) in Canada [Final]. Species at Risk Act Management Plan Series. Fisheries and Oceans Canada, Vancouver. iv + 52 pp.

Fisheries and Oceans Canada (DFO). 2010b. Pathways of Effects – Dredging. Available at: http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/dredging-dragage-eng.html. Accessed: December 2016.

Gist, D.H., J.A. Michaelson, and J.M. Jones. 1990. Autumn mating in the painted turtle, Chrysemys picta. Herpetologica 46:331-336.

Gregory, P.T. and R.W. Campbell. 1987. The Reptiles of British Columbia. British Columbia Provincial Museum Handbook. Ministry of Provincial Secretary and Government Services, Victoria, B.C. 102 pp.

Ministry of Environment (MOE). 2016a. BC Species and Ecosystem Explorer. Available at: http://a100.gov.bc.ca/pub/eswp/. Accessed: December 2016.

Ministry of Environment (MOE). 2016b. Habitat Wizard Stream and Lake Reports. Available at: http://maps.gov.bc.ca/ess/sv/habwiz/. Accessed: December 2016.

Ministry of Environment (MOE). 2016c. Consultative Area Database Public Map Service. Available at: http://maps.gov.bc.ca/ess/sv/cadb/. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2015. Regional Terms & Conditions & Timing Windows for Thompson Region. Available at: http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/work_windows_thompson.pdf. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010a. Standards and Best Practices for Instream Works General BMPs & Standard Project Considerations. Version 1.0.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010b. Standards and Best Practices for Instream Works Channel Maintenance. Version 1.0.

Nussbaum, R.A., E.D. Brodie and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow, ID. 332 pp.

Rosenfeld, J.S, B. Wicks, M. Porter, and P. VanDishoek. 1998. Habitat Use by Chiselmouth (*Acrocheilus alutaceus*) in the Blackwater River. Prov. of BC Fish. Proj. Rep. RD 76.

Rosenfeld, J.S., M. Porter, M. Pearson, B. Wicks, P. Van Dishoeck, T. Patton, E. Parkinson, G. Hass, and J. D. McPhail. 2001. The influence of temperature and habitat on the distribution of chiselmouth *Acrocheilus alutaceus* in British Columbia. Environmental Biology of Fishes 62:401-413.

Rosenfeld, Jordan. 2003. Update COSEWIC status report on the chiselmouth, *Acrocheilus alutaceus*, in Canada. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Ottawa. 1-22 pp.

Schwarzkopf L., and R.J. Brooks. 1987. Nest-site selection and offspring sex ratio in painted turtles, Chrysemys picta. Copeia 1987:53-61.

St. John, A. 2002. Reptiles of the Northwest: British Columbia to California. Lone Pine Publishing, Edmonton, AB. 272 pp.

Weisrock, D.W. and F.J. Janzen. 1999. Thermal and fitness-related consequences of nest location in painted turtles (*Chrysemys picta*). Functional Ecology 13(2): 94-101.

Appendix A

Site Photographs

Appendix A – Site Photographs

Date Photographs Taken: October 26, 2016

Photo 1: Looking west from the access gate of the lagoon towards the mouth, with Shuswap Lake in the background (see Figure 1).

Photo 2: Looking north from the shore of the lagoon towards its head.

Appendix A – Site Photographs

Photo 3: Looking northeast from left bank of Eagle River at the Point of Diversion (PD 52869), showing knife valve on the intake.

Photo 4: Knife valve on intake from the Eagle River at the Point of Diversion (PD 52869).

Appendix A – Site Photographs

Photo 5: Location at head of the lagoon where the diversion pipe enters.

Photo 6: Outlet of diversion pipe at the head of the lagoon.

Appendix A – Site Photographs

Photo 7: Looking northeast into the lagoon from the mouth of the lagoon.

Photo 8: Looking northwest across the mouth of the lagoon, where the temporary isolation dam will be installed.

Appendix A – Site Photographs

Photo 9: Looking southwest from mouth of lagoon at Shuswap Lake, where temporary isolation dam will be installed.

Photo 10: Looking southwest, showing site access point from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Appendix A – Site Photographs

Photo 11: Looking west, showing access gate along access path from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Photo 12: Looking northeast, showing site access from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Appendix B

Summary of Notification and Reporting Requirements

Summary of Notification and Reporting Requirements

Prior to Maintenance Works	
Notify Ministry of Forests, Lands and Natural Resource Operations and Rural Development Phone (1-877-855-3222) or Email (FrontCounterBC@gov.bc.ca)	This is intended as an informal, courtesy notification only and will allow time to resolve any unexpected complications or changes in regulations and best management practices if necessary.
Notify First Nations in Project Area • Neskonlith Indian Band; • Secwepemc First Nation; • Okanagan Indian Band; • Adams Lake Indian Band; • Little Shuswap Indian Band; and • Splatsin	In the interests of continued good relationships, the Society envisions contact with local First Nations contacts prior to any operation to learn if there are any potential conflicts with the operation. Refer to sample Notification Template in Appendix C.
Perform Fish, Shellfish, and Amphibian Survey	Prior to completing any isolation or dredging works, the Qualified Environmental Professional is required to perform a fish, shellfish, and amphibian survey

Maintenance Sequence

**Timing of the maintenance program should also take into account any Qualified Environmental Professional recommendations from the fish, shellfish, and amphibian survey report.*

1. Installation of Erosion and Sediment Control Measures
2. Isolation of Lagoon
3. Fish Salvage by Environmental Monitor or Qualified Environmental Professional
4. Dewatering
5. Excavation and Grading
6. Rewatering Lagoon and Removal of Isolation Measures
7. Resume Normal Operation of the Lagoon

Post-Maintenance Reporting	
Completion Report	Summarizing the timing, methods, and extent of the works completed during the maintenance program.
Environmental Monitoring Report	Prepared by the Environmental Monitor
Fish and Amphibian Salvage Data	A summary report should be prepared by the QEP, covering the findings and impacts of this survey.
Report to BC Conservation Data Centre	Applicable if any Species at Risk are observed/salvaged.

**Provide a copy of the reporting to regulatory officials, if requested.*

Appendix C

Sample Notification Template

Date: _____

To:

From: Lot 46 Management Society
1428 Silver Sands Road
Sicamous, BC

Notification of Dredging Maintenance

This letter is to notify your organization of upcoming dredging works at the Lot 46 Management Society Lagoon in Sicamous BC. The lot being excavated is private property owned by the Society. This maintenance is part of the licensed works covered under the Society's current water licence and will comply with all relevant Provincial and Federal regulations applicable to the works.

This notification is a courtesy on behalf of the Lot 46 Management Society intended to minimize service interruptions or conflicts to any concurrent works planned by your organization. Please contact the individual listed below if you have any questions about of the information presented herein.

Location (Legal Description): Lot A District Lot 452 Kamloops Division Yale District Plan KAP52709

Estimated Maintenance Dates: _____

Description of Maintenance Work: _____

_____

_____

_____

_____

Contact for Inquiries: _____

_____

_____

BRITISH COLUMBIA | Ministry of Forests, Lands, Natural Resource Operations and Rural Development

File: 0281845

March 2, 2021

Dear Chief and Council

Re: Application to amend water license C129749, Application #100308711

The Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) would like to notify you of the final decision for Application #100308711 to amend water licence C129749.

A water licence to divert 0.28317 cubic metres of water per second from the Eagle River into the lagoon on Shuswap Lake was first issued in 1970. Since then, the licensee has regularly dredged the lagoon to remove accumulated sediment.

In 2014, the licensee applied for a Section 9 approval under the *Water Act* to dredge the lagoon (now Section 11 under the *Water Sustainability Act*). A 2014 letter from FLNRORD to the licensee refused the application stating that the licensee may remove (dredge) accumulated sediment from the licenced channel. Based on information included in the original licence, the "channel" was determined to be the lagoon from the point where water enters at the northern end to where it exists into Shuswap Lake. A copy of this letter is attached.

In 2017, the licensee applied for an amendment to C129749 to dredge the constructed lagoon and reverse the flow of water from the channel into the Eagle River to prevent future sediment accumulation. A notification letter was sent to the SWAP portal dated November 22, 2017. On February 8, 2018 representatives from FLNRORD met with the licensee and Ray Cormie of Splatsin First Nation. The licensee chose to abandon this application before a final decision was reached.

In January 2020, the licensee again applied for an amendment to C129749. The application requests an amendment to include the management plan as a clause in the water licence. A notification was sent to the SWAP portal on January 28, 2020. FLNRORD has not received a response from Splatsin First Nation as of writing this letter.

Water licence C129749 has been superseded by conditional water licence 502036. Licence 502036 maintains the same conditions as C129749, with the addition of a clause that references maintenance and dredging procedures in the Water Management Plan (WMP) prepared by Kerr Wood Leidal Associates Ltd. dated January 2021. A copy of the WMP is attached.

Some of the key topics discussed in the 2018 meeting which have been considered in this decision include:

Change in Direction of Flow
The application no longer includes requests to change the direction of flow in the channel. The amendment will not give the licensee right to change the licensed works or direction of flow.

The lagoon has been dredged every few years on a regular basis since the 1960s. This application does not suggest a change in use from the past 50 years. Environmental impacts have likely already been realised by lagoon, Shuswap Lake, and the larger watershed.

Sediment Control

No water from the lagoon will be discharged into the Eagle River. The diversion channel will be closed off prior to dewatering and only reopened after the lagoon has been refilled. Discharge of turbid waters into Shuswap Lake will be prevented using a silt curtain during installation of the dam, dewatering, and removal of the dam. Turbidity will be monitored during sensitive work.

Archaeology

s.16; s.18

Based upon the above information, it is the office's opinion that consultation has been effectively performed and concluded with reference to this application.

If you have any questions or concerns regarding this correspondence, please contact the indicated below.

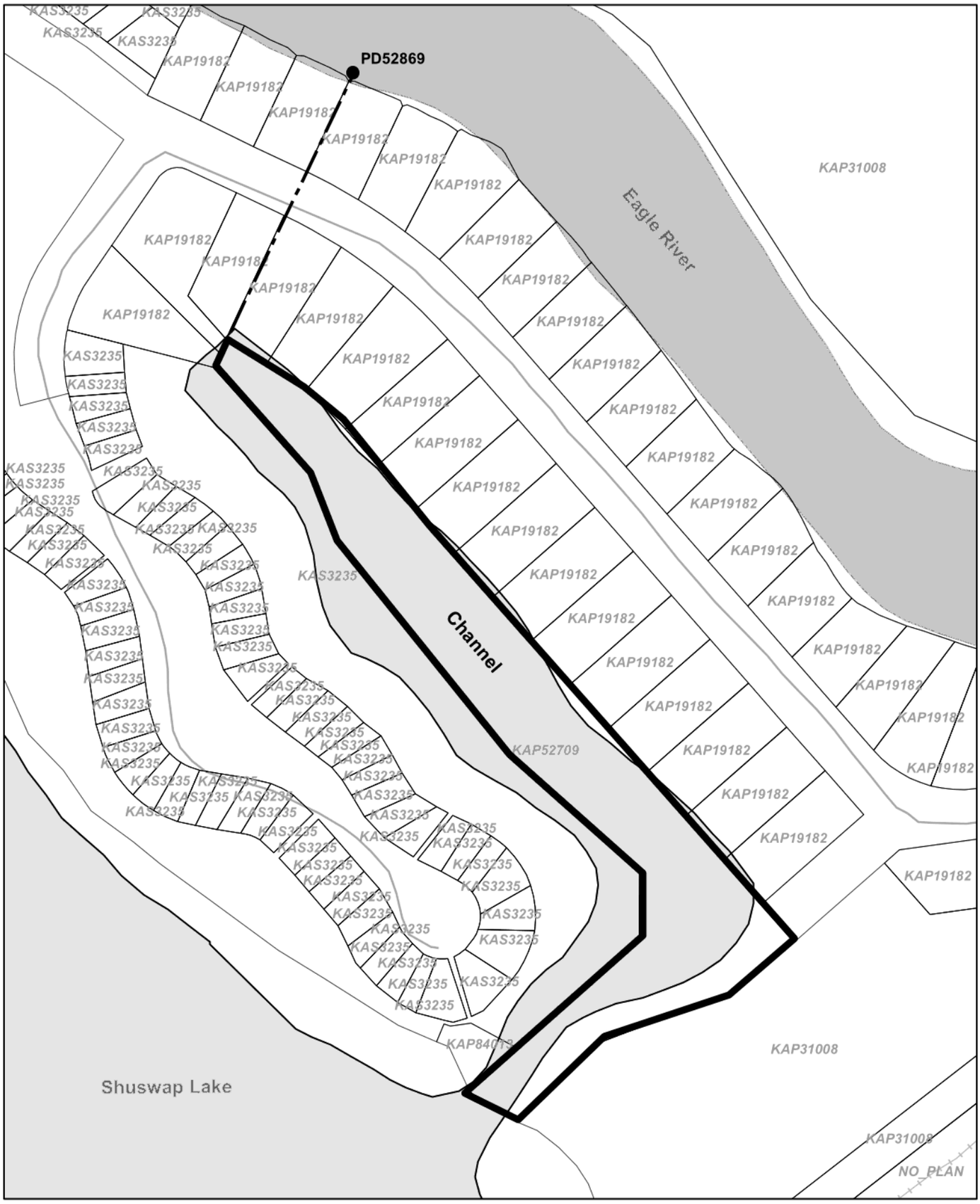
Regards,

Carrie Koch

Carrie Koch
Water Stewardship Officer
Carrie.Koch@gov.bc.ca
778-943-6871

BRITISH COLUMBIA

WATER SUSTAINABILITY ACT



Water District: Kamloops

Precinct: Sicamous

Land District: KDYD

Scale: 1:1,968

Signature: CARRIE KOCH

Date: March 4, 2021

Licence: 502036 for C129749, in full

File: 0281845

LEGEND:

Point of Diversion: ●

Pipe: - - — · — · —

The boundaries of the land to which this licence is appurtenant are shown thus: ———

April 06, 2021

File: 0281845
vFCBC Tracking #: 100308711

Lot 46 Management Society
1424 Silver Sands Road
Sicamous, BC V0E 2V4

Dear Sir or Madam:

Re: Water Licence Amendment 113332

Please read the documents carefully. Any error(s) in these documents should be brought to the attention of this office as soon as possible.

The investigation of the above application has been completed. Enclosed is a copy of your Conditional Water Licence.

The water licence attached to this letter is issued in substitution of Water Licence C129749.

This licence has been issued based on an understanding that water will normally be available for this licence in the authorized quantity. However, in the event of a water shortage the quantity of water allocated by the licence may not be available. During such an event you may be instructed to cease diverting water.

You should be aware all archaeological sites are protected under the *Heritage Conservation Act*. Archaeological sites may exist that have not been identified or documented. Please note it is an offence to alter, damage, dig in or excavate an archaeological site, except if authorized by a permit issued under the *Heritage Conservation Act*. If an archaeological site or potential archaeological material is encountered at any time, all activities must cease and you must contact the Archaeology Branch at (250) 953-3334 for direction.

Please note the following:

1) Water licences do not authorize entry on privately owned land for the construction of works, or flooding. Permission of the affected landowner must be obtained or an easement expropriated. For your protection, permission should be in writing and registered with the appropriate Land Title Office.

2) Permission for installing works on lands or roadways which are under the jurisdiction of any government agency, must be obtained from the agency concerned.

Ministry of Forests, Lands, Natural Resource Operations, and Rural Development
Thompson Okanagan Region

Mailing Address:
2501 14th Avenue
Vernon BC V1T 8Z1

Location:
2501 14th Avenue
Vernon BC V1T 8Z1

Phone: (250) 558-1700
Web:
http://www.frontcounterbc.gov.bc.ca/index.html

Please contact FrontCounter BC to assist you with notifications and any applications required if:

a) there is any change in your mailing address;
b) you sell the land to which the licence is appurtenant;
c) you propose to subdivide the land to which the licence is appurtenant; or
d) you propose to alter the works authorized under the licence.

In order for you to keep your water licence in good standing, the following must be observed:

a) continued beneficial use of water, as authorized under your licence;
b) payment of annual rentals;
c) compliance with the terms of your licence; and
d) compliance with the terms of the *Water Sustainability Act*.

One of the obligations of a water licence is the payment of annual rentals and fees to the Crown for the authorization to exercise the rights granted under the licence. Failure to pay water rental invoices by a specified date may result in late-payment penalties, collection action or cancellation of the licence. Any questions in regards to invoices, statements or billing procedures should be directed to the Water Revenue Unit at 1 (800) 361-8866. Callers from the Victoria area should dial (250) 387-9445.

The *Water Sustainability Act* gives the recipient of this notice the right to appeal my decision. Information on filing an appeal can be found on the Environmental Appeal Board Website at: http://www.eab.gov.bc.ca/.

If you have any questions or concerns, please contact this office.

Regards,

Jeff Nitychoruk
Assistant Water Manager
Cc:
Enclosure(s)

Province of British Columbia
Water Sustainability Act

CONDITIONAL WATER LICENCE

The owner(s) of the land to which this licence is appurtenant is/are hereby authorized to divert and use water as follows:

a) The stream on which the rights are granted is the Eagle River.

b) The point of diversion is located as shown on the attached plan.

c) The date from which this licence shall have precedence is October 11, 1968.

d) The purpose for which this licence is issued is Land Improvement.

e) The maximum quantity of water which may be diverted for Land Improvement is 0.28317 cubic meters per second.

f) The period of the year during which the water may be used is January 1 to December 31.

g) The land upon which the water is to be used and to which this licence is appurtenant is the land improvement project of the licensee within Lot A District Lot 452 KDYD Plan KAP52709.

h) The authorized works are a diversion structure, pipe, and channel which shall be located approximately as shown on the attached plan.

i) The construction of the said works has been completed and the water is being beneficially used. The licensee shall continue to make regular beneficial use of the water in a manner authorized herein.

j) This Licence is issued in substitution of Water Licence C129749, in full.

k) The diversion of water authorized under this licence may be restricted or prohibited at any time by an Order in writing under the *Water Sustainability Act*, in order to maintain a minimum flow in a stream.

l) The rights hereby granted shall expire twelve months after the Comptroller of Water Rights notifies the licensee that the water of Eagle River is required for any purpose of higher rank than land improvement.

m) During all phases of sediment removal and channel maintenance, the holder of this licence is subject to the Water Management Plan, dated January 2021, as attached to this water licence. These terms and conditions of the Water Management Plan, are hereby incorporated into this licence as if written herein as licence conditions, which requirements must be implemented by the licensee.

n) This licence is issued under the *Water Sustainability Act* (the Act). The exercise of rights under the licence is subject to the Act and its regulations, the terms and conditions of the licence, orders under the Act and the rights of licensees whose rights have precedence on the stream or on an aquifer. The licensee must comply with all such requirements, as well as the provisions of all other applicable enactments. In exercising rights under the licence, the licensee must exercise reasonable care to avoid damaging land, works, trees or other property, and must make full compensation to the owners for damage or loss resulting from construction, maintenance, use, operation or failure of the works.

o) During all phases of construction and maintenance of the licenced works and related activities, the holder of this licence is subject to the habitat protection requirements, described in the document entitled *"Terms and Conditions for Construction and Maintenance of Licensed Works"* (dated March 1, 2017). Those habitat protection requirements are hereby incorporated into this licence as if written herein as licence conditions, which requirements must be implemented by the licensee in conjunction with any guidance provided by a Water Manager or Habitat Officer.

Jeff Nitychoruk
Assistant Water Manager

Water Licence Amendment

Tracking Number: 100308711

Applicant Information

If approved, will the authorization be issued to an Individual or Company/Organization?	Company/Organization
What is your relationship to the company/organization?	Board Member

APPLICANT COMPANY / ORGANIZATION CONTACT INFORMATION

Please enter the contact information of the Individual/Organization who is acting on behalf of the applicant.

Name:	Lot 46 Management society
Doing Business As:	
Phone:	s.22
Fax:	
Email:	todd@twinanchors.com
BC Incorporation Number:	
Extra Provincial Inc. No:	
Society Number:	S0013702
GST Registration Number:	
Contact Name:	Todd Kyllo
Mailing Address:	1450 Silversands Road Sicamous BC V0E 2V4

CORRESPONDENCE E-MAIL ADDRESS

For Business BCeID users, it is highly recommended to provide correspondence email address in this section. If left blank, all correspondence will be sent to the above given email address.

Email:	todd@twinanchors.com
Contact Name:	Todd Kyllo

TECHNICAL INFORMATION

GOVERNMENT AND FIRST NATION FEE EXEMPTION REQUEST

Do you belong to, are you applying on behalf of, or are you:

- A provincial government ministry
- The Government of Canada
- A First Nation for water use on reserve land
- A person applying to use water on Treaty Lands
- A Nisga'a citizen
- An entity applying to use water from the Nisga'a Water Reservation?

No

WATER LICENCE

Please enter your water licence number to start your application. Click 'Verify' to check the number you have entered.

Water Licence Number: C129749

LICENCE HOLDER

Name	Billing Address
Lot 46 Management Society	1424 Silver Sands Road, Sicamous BC V0E 2V4

LAND WHERE THE WATER IS USED

Lot A District Lot 452 KDYD Plan KAP52709

PURPOSES

We have the following purposes for your licence on record:

Purpose	Quantity	Irrigated Area
04A - Land Improve: General	.28317 m3/sec	0 ha

Source of Diversion

Current source of diversion: Surface water

Are you changing the source of water diversion? No

TYPE OF AMENDMENT

If you select Yes for one of the following options then you will not be able to select any other options.

Abandonment

This option allows you to request the abandonment of part of a water Licence. There is no fee to abandon part of the licence.

Do you want to abandon your water rights? No

Transfer of Appurtenancy

This option is used to request a transfer of all or part of the rights and obligations under a water licence to a different parcel of land. This application is valid only while the licensee continues to own the property described in the water licence. Application fees for a Transfer of Appurtenancy Amendment are payable upon receipt of new water rights. The recipient(s) of the new water licence(s) will be billed for the application fees and any outstanding rentals when the licence(s) are issued.

Do you want to transfer the licence to another property with a different legal land description? No

Apportionment

This option is used to request the division of the rights and obligations of a water licence between multiple parcels of land when the land to which the licence was issued for has been subdivided or is now separately owned. The land before and after the division must be the same and the licence is not being transferred to a different parcel of land. Application fees for an Apportionment Amendment are payable upon receipts of new water rights. The recipient(s) of the new water licences will be billed for the application fees and any outstanding rentals when licence(s) are issued.

Do you want to Apportion (divide) the water licence rights among 2 or more parcels of land? No

You can apply for one or more of the following options but not in combination with any of the three options above.

☑ **Change of Works**

This option is used to request a change to the works currently authorized by your water licence. Applications fees are payable upon submission of the application.

Please describe what you would like to change and why: We would like to add a Water Management Plan to the current water license.

CHANGE OF WORKS

CHANGES TO WORKS

Please add any previously approved works authorized by your water licence and specify the current status and your intention for each works. Also you may add any works that you would like to add to the existing licence under the "New Works" section.

PREVIOUSLY APPROVED WORKS

Works	Status	Intention
Canal	Fully Constructed	
Comments:		
Diversion structure	Fully Constructed	
Comments:		

Pipe Fully Constructed

Comments:

Are any new works required? No

JOINT WORKS

Are any of your works joint with another person's or group's works? No

OTHER LANDS PHYSICALLY AFFECTED

Do your works affect another private landowner's property, e.g. is a pipe running over your neighbour's land to divert the water to your land? If yes, you will need to obtain their permission. If the land is owned by a private landowner a prefilled form that can be signed by the other landowner will be provided at the Signature step later in the application process.
Please select "Yes" to the following question when one of the following applies:

- you have changed your works and they are now physically affecting someone else's property who has NOT given their permission when the licence was approved
OR
- you had previously obtained permission from a land owner who is physically affected by your works but this land owner has changed.

Are there other lands that would be physically affected by your works? No

ATTACHED DOCUMENTS

Document Type	Description	Filename
Other	Water Management Plan	20200123091402793.pdf

PRIVACY DECLARATION

PRIVACY NOTE FOR THE COLLECTION, USE AND DISCLOSURE OF PERSONAL INFORMATIONPersonal information is collected by FrontCounter BC under the legal authority of section 26 (c) and 27 (1)(a)(i) of the Freedom of Information and Protection of Privacy Act (the Act). The collection, use, and disclosure of personal information is subject to the provisions of the Act. The personal information collected by FrontCounter BC will be used to process your inquiry or application(s). It may also be shared when strictly necessary with partner agencies that are also subject to the provisions of the Act. The personal information supplied in the application package may be used for referrals or notifications as required. Personal information may be used by FrontCounter BC for survey purposes.For more information regarding the collection, use, and/or disclosure of your personal information by FrontCounter BC, please contact FrontCounter BC at 1-877-855-3222 or at:FrontCounter BC Program DirectorFrontCounter BC, Provincial Operation441 Columbia StreetKamloops, BC V2C 2T3

☑ Check here to indicate that you have read and agree to the privacy declaration stated above.

REFERRAL INFORMATION

Some applications may also be passed on to other agencies, ministries or other affected parties for referral or consultation purposes. A referral or notification is necessary when the approval of your application might affect someone else's rights or resources or those of the citizens of BC. An example of someone who could receive your application for referral purposes is a habitat officer who looks after the fish and wildlife in the area of your application. This does not apply to all applications and is done only when required.

Please enter contact information below for the person who would best answer questions about your application that may arise from anyone who received a referral or notification.

Company / Organization: Lot 46 Management society
Contact Name: Todd Kyllo
Contact Address: 1450 Silversands Road
Sicamous BC V0E 2V4

Contact Phone: s.22
Contact Email: todd@twinanchors.com

☑ **I hereby consent to the disclosure of the information contained in this application to other agencies, government ministries or other affected parties for referral or First Nation consultation purposes.**

IMPORTANT NOTICES

Please review the "Important Notices" below and then check the declaration at the bottom confirming that everything in this application is complete and accurate.

DECLARATION

☑ By submitting this application form, I declare that the information contained on this form is complete and accurate.

APPLICATION AND ASSOCIATED FEES

Item	Amount	Taxes	Total	Outstanding Balance
Groundwater Licence Amendment Fee	$125.00		$125.00	$0.00

OFFICE

Office to submit application to: Kamloops

PROJECT INFORMATION

Is this application for an activity or project which requires more than one natural resource authorization from the Province of BC? No

OFFICE USE ONLY		
Office Kamloops	**File Number**	**Project Number**
	Disposition ID	**Client Number**

From: Jones, Debra L FLNR:EX (Debra.Jones@gov.bc.ca)
To: Jones, Debra L FLNR:EX (Debra.Jones@gov.bc.ca)
Subject: Water First Nations Referral: File #281845 Application #100308711
Sent: 01/28/2020 21:09:00
Attachments: Lot 46 - iMap.pdf, Management plan.pdf, Redacted Application.pdf
Message Body:

Shortened subject line to save in directory

DJ

From: Jones, Debra L FLNR:EX <Debra.Jones@gov.bc.ca>
Sent: January 28, 2020 12:02 PM
To: Jones, Debra L FLNR:EX <Debra.Jones@gov.bc.ca>
Cc: Koch, Carrie L FLNR:EX <Carrie.Koch@gov.bc.ca>
Subject: Water First Nations Referral: File #281845 Application #100308711 (Carrie Koch)

Dear Chief and Council

Authorization type: Water Licence Amendment

Purpose: Applicant has applied to amend their existing licence to include a clause that allows dredging (on an as needed basis) of a Constructed Lagoon on Shuswap Lake as maintenance of works associated with their licence. Applicant has provided an Environmental Management Plan.

Initial referral period: 60 days

Geomark:

http://apps.gov.bc.ca/pub/geomark/geomarks/gm-4FE18E9AE28F4EF78D622A5CD1B6B7F7

Government contact:

Carrie Koch

Carrie.Koch@gov.bc.ca

250-558-1722

Water Licence Amendment

Tracking Number: 100308711

Applicant Information

If approved, will the authorization be issued to an Individual or Company/Organization? Company/Organization

What is your relationship to the company/organization? Board Member

REFERRAL / PUBLIC COMMENT CONTACT INFORMATION

Company / Organization: Lot 46 Management society
Contact Name:
Contact Address: 1450 Silversands Road
Sicamous BC V0E 2V4
Contact Phone:
Contact Email:

APPLICANT COMPANY / ORGANIZATION CONTACT INFORMATION

Please enter the contact information of the Individual/Organization who is acting on behalf of the applicant.

Name: Lot 46 Management society
Doing Business As:
Phone:
Fax:
Email:
BC Incorporation Number:
Extra Provincial Inc. No:
Society Number: S0013702
GST Registration Number:
Contact Name:
Mailing Address: 1450 Silversands Road
Sicamous BC V0E 2V4

CORRESPONDENCE E-MAIL ADDRESS

For Business BCeID users, it is highly recommended to provide correspondence email address in this section. If left blank, all correspondence will be sent to the above given email address.

Email:
Contact Name:

TECHNICAL INFORMATION

GOVERNMENT AND FIRST NATION FEE EXEMPTION REQUEST

Do you belong to, are you applying on behalf of, or are you:

- A provincial government ministry
- The Government of Canada
- A First Nation for water use on reserve land
- A person applying to use water on Treaty Lands
- A Nisga'a citizen
- An entity applying to use water from the Nisga'a Water Reservation?

No

WATER LICENCE

Please enter your water licence number to start your application. Click 'Verify' to check the number you have entered.

Water Licence Number: C129749

LICENCE HOLDER

Name	Billing Address
Lot 46 Management Society	1424 Silver Sands Road, Sicamous BC V0E 2V4

LAND WHERE THE WATER IS USED

Lot A District Lot 452 KDYD Plan KAP52709

PURPOSES

We have the following purposes for your licence on record:

Purpose	Quantity	Irrigated Area
04A - Land Improve: General	.28317 m3/sec	0 ha

Source of Diversion

Current source of diversion: Surface water
Are you changing the source of water diversion? No

TYPE OF AMENDMENT

If you select Yes for one of the following options then you will not be able to select any other options.

Abandonment

This option allows you to request the abandonment of part of a water Licence. There is no fee to abandon part of the licence.

Do you want to abandon your water rights? No

Transfer of Appurtenancy

This option is used to request a transfer of all or part of the rights and obligations under a water licence to a different parcel of land. This application is valid only while the licensee continues to own the property described in the water licence. Application fees for a Transfer of Appurtenancy Amendment are payable upon receipt of new water rights. The recipient(s) of the new water licence(s) will be billed for the application fees and any outstanding rentals when the licence(s) are issued.

Do you want to transfer the licence to another property with a different legal land description? No

Apportionment

This option is used to request the division of the rights and obligations of a water licence between multiple parcels of land when the land to which the licence was issued for has been subdivided or is now separately owned. The land before and after the division must be the same and the licence is not being transferred to a different parcel of land. Application fees for an Apportionment Amendment are payable upon receipts of new water rights. The recipient(s) of the new water licences will be billed for the application fees and any outstanding rentals when licence(s) are issued.

Do you want to Apportion (divide) the water licence rights among 2 or more parcels of land? No

You can apply for one or more of the following options but not in combination with any of the three options above.

☑ **Change of Works**

This option is used to request a change to the works currently authorized by your water licence. Applications fees are payable upon submission of the application.

Please describe what you would like to change and why: We would like to add a Water Management Plan to the current water license.

CHANGE OF WORKS

CHANGES TO WORKS

Please add any previously approved works authorized by your water licence and specify the current status and your intention for each works. Also you may add any works that you would like to add to the existing licence under the "New Works" section.

PREVIOUSLY APPROVED WORKS

Works	Status	Intention
Canal	Fully Constructed	
Comments:		
Diversion structure	Fully Constructed	
Comments:		
Pipe	Fully Constructed	
Comments:		

Are any new works required? No

JOINT WORKS

Are any of your works joint with another person's or group's works? No

OTHER LANDS PHYSICALLY AFFECTED

Do your works affect another private landowner's property, e.g. is a pipe running over your neighbour's land to divert the water to your land? If yes, you will need to obtain their permission. If the land is owned by a private landowner a prefilled form that can be signed by the other landowner will be provided at the Signature step later in the application process.
Please select "Yes" to the following question when one of the following applies:

- you have changed your works and they are now physically affecting someone else's property who has NOT given their permission when the licence was approved
OR
- you had previously obtained permission from a land owner who is physically affected by your works but this land owner has changed.

Are there other lands that would be physically affected by your works? No

ATTACHED DOCUMENTS

Document Type	Description	Filename
Other	Water Management Plan	20200123091402793.pdf

PRIVACY DECLARATION

PRIVACY NOTE FOR THE COLLECTION, USE AND DISCLOSURE OF PERSONAL INFORMATIONPersonal information is collected by FrontCounter BC under the legal authority of section 26 (c) and 27 (1)(a)(i) of the Freedom of Information and Protection of Privacy Act (the Act). The collection, use, and disclosure of personal information is subject to the provisions of the Act. The personal information collected by FrontCounter BC will be used to process your inquiry or application(s). It may also be shared when strictly necessary with partner agencies that are also subject to the provisions of the Act. The personal information supplied in the application package may be used for referrals or notifications as required. Personal information may be used by FrontCounter BC for survey purposes.For more information regarding the collection, use, and/or disclosure of your personal information by FrontCounter BC, please contact FrontCounter BC at 1-877-855-3222 or at:FrontCounter BC Program DirectorFrontCounter BC, Provincial Operation441 Columbia StreetKamloops, BC V2C 2T3

☑ Check here to indicate that you have read and agree to the privacy declaration stated above.

IMPORTANT NOTICES

Please review the "Important Notices" below and then check the declaration at the bottom confirming that everything in this application is complete and accurate.

DECLARATION

☑ By submitting this application form, I declare that the information contained on this form is complete and accurate.

APPLICATION AND ASSOCIATED FEES

Item	Amount	Taxes	Total	Outstanding Balance
Groundwater Licence Amendment Fee	$125.00		$125.00	$0.00

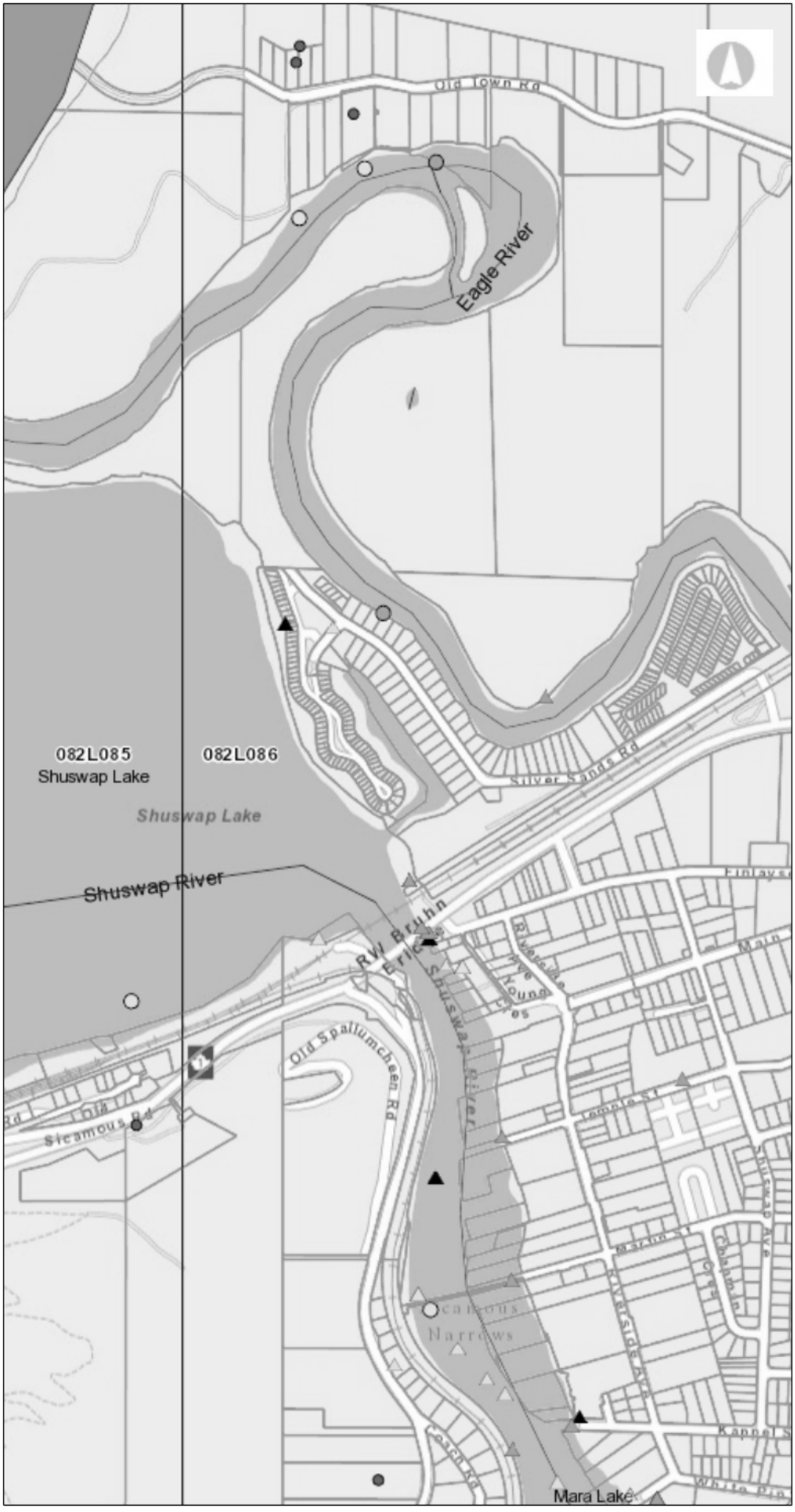
OFFICE

Office to submit application to: Kamloops

PROJECT INFORMATION

Is this application for an activity or project which requires more than one natural resource authorization from the Province of BC? No

OFFICE USE ONLY		
Office Kamloops	**File Number**	**Project Number**
	Disposition ID	**Client Number**



BRITISH COLUMBIA

iMapBC Mapping

Legend

Water Rights - Licences - Int
POD_STATUS
Active
Inactive

Water Rights - Applications
APPLICATION_STATUS
Active Application
Refused

Water Reserves - Points

Water Allocation Restrictions

Sensitive Streams - Points

Water Rights - Licences
POD_STATUS
Active
Inactive

Water Wells - All

Water Sustainability Act App Section 10 and 11 Locations
APPROVAL_STATUS
Other
Current
Expired
Refused
Unknown

Water Rights - Applications
APPLICATION_STATUS
Active Application

0 0.37 0.7 km

1: 18,055.95

Copyright/Disclaimer

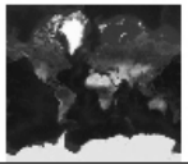
The material contained in this web site is owned by the Government of British Columbia and protected by copyright law. It may not be reproduced or redistributed without the prior written permission of the Province of British Columbia. To request permission to reproduce all or part of the material on this web site please complete the Copyright Permission Request Form which can be accessed through the Copyright Information Page.

CAUTION: Maps obtained using this site are not designed to assist in navigation. These maps may be generalized and may not reflect current conditions. Uncharted hazards may exist. DO NOT USE THESE MAPS FOR NAVIGATIONAL PURPOSES.

Datum: NAD83

Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere

Key Map of British Columbia



KERR WOOD LEIDAL
consulting engineers

Okanagan
202 - 3334 30th Avenue
Vernon, BC V1T 2C8
T 250 503 0841
F 250 503 0847

Water Management Plan

Prepared for:

Lot 46 Management Society

May 11, 2017
KWL Project No. 3691.001

Contents

1. Introduction 1-1
1.1 Project Background and Rationale 1-1
1.2 Authorizations, Permits, and Approvals 1-1
1.3 First Nations 1-2

2. Site Location and Context 2-1
2.1 Land Ownership and Land Use 2-1
2.2 Aquatic Habitat and Species 2-1

3. Dredging Operation 3-1
3.1 Sequence and Description of Works 3-1
3.2 Dredging Considerations 3-2
3.3 Dewatering and Water Management 3-2
3.4 Dredging Frequency/Schedule 3-2

4. Environmental Impacts and Mitigation 4-1
4.1 Potential Environmental Impacts 4-1
4.2 Environmental Protection and Mitigation Measures 4-1

5. Reporting 5-1
5.1 Completion Report 5-1
5.2 Environmental Monitoring Report 5-1
5.3 Fish Salvage Data 5-1
5.4 Conservation Data Centre Report 5-1
5.5 Archaeological Findings 5-2

6. Monitoring and Maintenance 6-1

7. Closure 7-1
Report Submission 7-1

References 7-1

Figures

Figure 1: Location Plan 1-3

Tables

Table 1: Fish Species Summary Table 2-2

Appendices

Appendix A: Site Photographs

1. Introduction

1.1 Project Background and Rationale

The Lot 46 Management Society (the Society) is composed of 17 homeowners who own properties on Silver Sands Road in Sicamous, BC. The properties are located along the east side of an artificial lagoon connected to Shuswap Lake, just north of the RW Bruhn Bridge (Highway 1 crossing; see Figure 1). The Society manages the lagoon and members have private docks for boat access to the lake. Sediment accumulates in the lagoon and the Society needs to dredge the lagoon to facilitate navigation of boats from private docks to the lake. This Water Management Plan provides operational guidance for the periodic dredging of the Lot 46 Lagoon, including measures to mitigate the potential impacts to water quality, aquatic habitat, fish, and other wildlife.

1.2 Authorizations, Permits, and Approvals

Existing Water Licence

The Society holds water licence C129749 which authorizes a maximum of 0.28 cubic metres per second (10 cubic feet per second) to be diverted through a diversion structure (point of diversion number PD52869) and pipe from the Eagle River into the constructed lagoon. See Figure 1 for a plan view of the licensed works.

A letter from the BC Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) dated February 25, 2014 determined that the Society was allowed to dredge the lagoon as maintenance of their licensed works under their water licence. As a condition, the MFLNRO Regional Water Management Branch requires the Society develop a Water Management Plan (this plan) to guide the dredging operations.

Other Permits and Approvals

A fish salvage within the lagoon is required prior to dewatering and dredging. In order to conduct a fish salvage, the Society must obtain a Licence to Fish for Scientific Purposes from Fisheries and Oceans Canada (DFO) and a Scientific Fish Collection Permit from MFLNRO.

In order for dredging to proceed without requiring a review by DFO, the following conditions must be met:

- No temporary or permanent increase in the existing area of the lagoon below the high water mark;
- Dredged material is deposited and stabilized on land;
- Dredging has occurred in the last 10 years; and
- No dredging where SARA-listed shellfish occur except where exempted in the recovery strategy for that species.

1.3 First Nations

The following First Nations have traditional territory and/or interests in or nearby the project area (MOE 2016c):

- Neskonlith Indian Band;
- Secwepemc First Nation (falls within Secwepemc Reconciliation Framework Agreement Boundary);
- Okanagan Indian Band;
- Adams Lake Indian Band;
- Little Shuswap Indian Band; and
- Splats'in First Nation.

The dredging operation is being conducted in accordance with existing rights granted under a water licence and occurs on an ongoing basis. As such, there is no expectation to consult with First Nations. However, in the interests of continued good relationships, the Society envisions contact with local First Nations contacts prior to any operation to learn if there are any potential conflicts with the operation.

Lot 46 Management Society Lagoon Water Management Support

Legend

- Extent of Dredging (Lagoon)

Parcel Ownership (from the District of Sicamous Cadastral)

- Municipal Park
- Private

Reference: Orthophoto from Bing aerial image map.

KERR WOOD LEIDAL
consulting engineers

© 2017 Kerr Wood Leidal Associates Ltd.

Copyright Notice: These materials are copyright of Kerr Wood Leidal Associates Ltd. (KWL). Lot 46 Management Society is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to the Lot 46 Management Society Lot 46 Lagoon Water Management Support. Any other use of these materials without the written permission of KWL is prohibited.

50 0 50 (m)

1:2,000

Project No.	Date
3691-001	January 2017

Location Plan

Figure 1

Path: R:\3600-36991\3691-001\430-GIS\MXD-WK\3691001_Map.mxd Date Saved: 1/16/2017 3:21:32 PM
Author: JLau

2. Site Location and Context

The following section outlines the context and characteristics of the project site.

2.1 Land Ownership and Land Use

Land use around the lagoon is a mix of single family residential and recreational. Lot A District Lot 452 Kamloops Division Yale District Plan KAP52709, the lot being excavated, is private property owned by the Society.

Adjacent land owners will be notified with sufficient time to prepare for dredging operations. It is anticipated that three (3) months would be sufficient, but there may be particular circumstances that dictate otherwise. These special circumstances will be reviewed on a case-by-case basis.

2.2 Aquatic Habitat and Species

Aquatic Habitat

The constructed lagoon is primarily used for private moorage and is approximately 320 m long and 60 m wide with a surface area of approximately 18,700 m^2. It is approximately 3 m deep at its deepest point, with an average depth of roughly 1.5 m during low water.

The lagoon is currently fed by water from Eagle River via a diversion structure and pipe. The point of diversion from the river is located 2.9 km upstream from its confluence with Shuswap Lake. At the point of diversion, the bank full channel width of the Eagle River is approximately 60 m. Due to the relatively small rate of diversion, water in the lagoon is slow-flowing to stagnant. Substrates are mainly sands and silts which contribute to the ongoing accumulation of sediment in the lagoon. The shoreline is mainly sand. There is a small amount of vegetated shore along the south end of the lagoon, where grasses and some small shrubs grow to near the high water mark. In October 2016, there were no obvious aquatic plants growing in the lagoon.

Water from the lagoon exits into Shuswap Lake through a shallow outlet (approximately 12 m wide) immediately downstream of Sicamous Narrows. Sicamous Narrows is the short canal-like channel that connects Mara Lake with Shuswap Lake.

Fish and Other Wildlife

Table 1 provides the result of a desktop study to indicate the fish species present in the waterbodies that are connected with and nearby to the lagoon: Shuswap Lake, Mara Lake (including Sicamous Narrows), the Shuswap River (upstream of Mara Lake), and the Eagle River. These species may or may not be present in the lagoon.

Table 1: Fish Species Present in Shuswap Lake, Mara Lake, Shuswap Narrows, Shuswap River, & Eagle River

Common Name	Code	Latin Name	Species at Risk Status		
			BC List	COSEWIC	SARA
Bridgelip Sucker	BSU	*Catostomus columbianus*	Yellow	-	-
Bull Trout	BT	*Salvelinus confluentus*	Blue	SC (2012)	-
Burbot	BB	*Lota lota*	Yellow	-	-
Carp	CP	*Cyprinus carpio*	Exotic	-	-
Chinook Salmon	CH	*Oncorhynchus tshawytscha*	Yellow	-	-
Chiselmouth[1]	CMC	*Acrocheilus aclutaceus*	Blue	NAR (2003)	-
Coho Salmon (Interior Fraser population)	CO	*Oncorhynchus kisutch*	Yellow	T (2016)	-
Dolly Varden	DV	*Salvelinus malma*	Yellow	-	-
Emerald Shiner	ESC	*Notropis atherinoides*	Unknown	-	-
Kokanee	KO	*Oncorhynchus nerka*	Yellow	-	-
Lake Chub	LKC	*Couesius plumbeus*	Yellow	DD	-
Lake Trout	LT	*Salvelinus namaycush*	Yellow	-	-
Largescale Sucker	CSU	*Catostomus macrocheilus*	Yellow	-	-
Leopard Dace	LDC	*Rhinichthys falcatus*	Yellow	NAR (1990)	-
Longnose Dace	LNC	*Rhinichthys cataractae*	Yellow	-	-
Longnose Sucker	LSU	*Catostomus catostomus*	Yellow	-	-
Mountain Whitefish	MW	*Prosopium williamsoni*	Yellow	-	-
Northern Pikeminnow	NSC	*Ptycheilus oregonensis*	Yellow	-	-
Peamouth Chub	PCC	*Mylocheilus caurinus*	Yellow	-	-
Pink Salmon	PK	*Oncorhynchus gorbuscha*	Yellow	-	-
Prickly Sculpin	CAS	*Cottus asper*	Yellow	-	-
Pygmy Whitefish (Pacific populations)	PW	*Prosopium coulteri*	Yellow	NAR (2016)	-
Rainbow Trout	RB	*Oncorhynchus mykiss*	Yellow	-	-
Redside Shiner	RSC	*Richardsonius balteatus*	Yellow	-	-
Slimy Sculpin	CCG	*Cottus cognatus*	Yellow	-	-
Sockeye Salmon	SK	*Oncorhynchus nerka*	Yellow	-	-
Steelhead	ST	*Oncorhynchus mykiss*	Yellow	-	-
Westslope Cutthroat Trout (Pacific populations)	WCT	*Oncorhynchus clarki lewisi*	Blue	SC (2016)	1-SC (2010)
White Sturgeon (Upper Fraser River Population)	WSG	*Acipenser transmontanus*	Yellow	E (2012)	-
White Sucker	WSU	*Catostomus commersoni*	Yellow	-	-

Sources: MOE 2016a, MOE 2016b
[1]One Chiselmouth sampled in 1964 at northern outlet of Mara Lake at the beginning of Shuswap Narrows (CDC 2016)

It is unlikely that salmon, trout, or char use the lagoon to spawn due to the accumulation of fine sediments and frequent boat traffic in the lagoon. Based on *Shuswap Lake System and Adams Lake - Lake Char and Sockeye Spawning Atlas Overview Map* (DFO 2005), there is no spawning of Sockeye or Char (i.e., Bull Trout and Dolly Varden) in the lagoon or on the adjacent shoreline of Shuswap Lake.

Five fish species present or with potential to be present in Shuswap Lake and other nearby waterbodies are federally- or provincially-listed species at risk:

- Bull Trout (Salvelinus confluentus) are a blue-listed species in BC. Blue-listed species are Species of Special Concern (formerly Vulnerable) in BC and have characteristics which make them especially sensitive or vulnerable to natural or anthropogenic events (MOE 2016a). Bull Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on habitat characteristics and the extent of known spawning areas (DFO 2005).
- Chiselmouth (*Acrocheilus aclutaceus*) are also blue-listed Species of Special Concern in BC. One Chiselmouth was sampled in 1964 at the mouth of Mara Lake as it entered Shuswap Narrows (CDC 2016). Chiselmouth are absent form sites with maximum temperatures below 20 °C (Rosenfeld et al. 2001). Adults need deep, fast flowing water with substrate that supports periphyton (i.e., boulder and cobble; Rosenfeld et al. 1998). Juveniles need slow-moving backwater habitat and are usually found where there are aquatic plants, which provide habitat for food (invertebrates) and cover from predators (COSEWIC 2003, Rosenfeld 2003). Based on these requirements, it is highly unlikely that adult Chiselmouth use the lagoon, and possible that juveniles are present.
- Interior Fraser populations of Coho Salmon (*Oncorhynchus kisutch*) were re-assessed as Threatened (downgraded from Endangered) by the Committee of the Status of Endangered Wildlife in Canada (COSEWIC) in 2016 but have not been added to Schedule 1 of the *Species at Risk Act*. Coho fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- Pacific populations of Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*) were reconfirmed as a Species of Special Concern by COSEWIC in 2016 and are a Schedule 1 Species of Special Concern of the *Species at Risk Act* (SARA). Under SARA, species of special concern are defined being particularly sensitive to human activities or natural events but are not endangered or threatened. This species is also blue-listed in BC. Westslope Cutthroat Trout fry and parr may use the lagoon for refuge and overwintering. Spawning is highly unlikely based on a lack of gravel substrate, depth, and lack of significant flow.
- The Upper Fraser River population of White Sturgeon (*Acipenser transmontanus*) was assessed as Endangered by COSEWIC in 2012. It has been recorded in Kamloops Lake, and may occasionally enter the Thompson River system. However, it is very unlikely that White Sturgeon would be present in the lagoon based on its small size and habitat characteristics (COSEWIC 2012).

Western Painted Turtle (*Chrysemys picta bellii*) has been observed on the Eagle River just north of the project site (CDC 2016). These populations are part of the Intermountain - Rocky Mountain population that was reconfirmed as a Species of Special Concern by COSEWIC in 2016 and is a Schedule 1 Species of Special Concern under SARA. It is also blue-listed in BC. Because Western Painted Turtles can move up to several hundred metres by land (Gregory and Campbell 1987, COSEWIC 2006), they have the potential to feed, mate, and nest in the lagoon. The turtles begin mating in spring soon after the end of hibernation and begin nesting in June (Schwarzkopf and Brooks 1987, Ernst et al. 1994, COSEWIC 2006). Successful mating peaks in late summer and early fall (Gist et al. 1990). Females dig 10 cm deep nests on open south-facing slopes (Schwarzkopf and Brooks 1987, Weisrock and Janzen 1999). Eggs incubate for 72–104 days in the Pacific Northwest (Nussbaum et al. 1983). After

hatching in later summer and early fall, turtle hatchlings stay in the nest until the next spring (Gregory and Campbell 1987, St. John 2002). Adults hibernate over the winter in the muddy bottoms of streams and ponds, old mammal burrows, or other shelter (Cohen 1992).

The only shellfish listed under the *Species at Risk Act* that is present in the Okanagan drainage is the Rocky Mountain Ridged Mussel (*Gonidea angulata*), listed as a Species of Special Concern. In recent searches, *Gonidea angulata* was found as far north as Okanagan Lake near Vernon (COSEWIC 2010). Portions of the Shuswap watershed have not been surveyed for *Gonidia angulata* as of 2011 (DFO 2010b).

It is possible that amphibians use the lagoon for breeding or refuge. However, due to frequent boat traffic, it is not ideal habitat.

Migratory birds may use the grass and shrub area at the south end of the lagoon for foraging and breeding. Waterfowl use the lagoon for refuge and possibly for foraging.

3. Dredging Operation

3.1 Sequence and Description of Works

Dredging operation will proceed in the following sequence:

1. Installation of Erosion and Sediment Control Measures

Erosion and sediment control measures should be installed prior to starting dredging works. Additional supplies for erosion and sediment control should be stockpiled on site in case they are required.

2. Isolation of Lagoon

Isolation methods at the mouth of the lagoon will be determined by the contractor, and may include: aqua-dams, sand-bag coffer dams, or sheet pile coffer dams. The preference is for methods that minimize the disturbance to sediment and aquatic life (i.e., aqua-dams). The diversion structure will be isolated using the knife-valve at its inlet (Appendix B, Photo 4).

3. Fish Salvage

After isolation, an initial fish salvage will be conducted by a Qualified Environmental Professional (QEP) who may also be the environmental monitor (EM). Salvage methods should be appropriate for the depth of water in the lagoon. Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.

3. Dewatering

After the initial fish salvage, dewatering should proceed immediately. Fish salvaging should continue as the lagoon is dewatered. Adequate pumping capacity should be retained in order to complete dewatering as quickly as possible. Water will be discharged over the coffer dam into Shuswap Lake.

4. Excavation and Grading

After complete salvage and dewatering, the EM will complete a review of the area to determine if there are any outstanding environmental concerns which need to be addressed.

Once the EM has approved the site for further work, dredging may begin. Dredging should commence only after the lagoon is fully isolated from flowing water and can continue only if this isolation is maintained.

Dredging will be completed by conventional equipment and be subject to review by the EM.

5. Rewatering Lagoon and Removal of Isolation Measures

The lagoon should be refilled and isolation measures removed in a manner so as to minimize the suspension of sediment in the water column and movement into Shuswap Lake.

6. Resume Normal Operation of the Lagoon

Once the lagoon has been filled to the level of the Shuswap lake, normal operation will continue.

3.2 Dredging Considerations

Engineering Specifications

The lagoon will be restored to original design parameters of a trapezoidal geometry consisting of minimum 4H:1V side slopes and flat bottom.

Machinery

The contractor shall decide what machinery is most appropriate for the works. It is assumed that conventional excavators and machinery will be used after isolation and dewatering of the lagoon is complete. The machinery will be clean and in satisfactory condition to undertake the work in a sensitive environment. The EM will review and approve equipment prior to the commencement of construction.

Disposal of Dredged Material

Dredged material should be disposed of on land and at an off site location. Disposal must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites Regulation and Hazardous Waste Regulation, and with any appropriate local government bylaws regarding the removal and deposition of spoil and dredged material.

3.3 Dewatering and Water Management

Isolation Measures

The isolation measures will be constructed according to the EM and will be designed to safely hold back water from entering the lagoon when fully dewatered without failure. This may be accomplished with an aqua-dam, sandbag dam, coffer dam, or other suitable method.

The knife valve on at the diversion structure from the Eagle River will be closed to isolate the lagoon from the river prior to fish salvage.

The contractor will keep a silt curtain on site and use it if necessary when installing or removing the dam to prevent silt from entering Shuswap Lake.

Pumping Capacity

The contractor shall ensure that they have sufficient pumping capacity to dewater the lagoon as quickly as possible.

Discharge Location

During dewatering, discharge water should be managed and directed to an area where it will not cause erosion or carry sediment-laden water into Shuswap Lake. If discharge water becomes turbid (likely near the end of dewatering), a silt curtain should be placed between the discharge location and the rest of Shuswap Lake. The contractor should ensure that they have adequate length of pipe or hoses so that the intakes can be situated in the deepest part of the lagoon and the discharge hose can be situated in an appropriate area as outlined above.

3.4 Dredging Frequency/Schedule

Dredging should be carried out only when necessary to ensure residents can navigate safely. If dredging is required frequently (i.e., annually), the Lot 46 Management Society should investigate the source and mechanism of the sedimentation and take steps to reduce the rate of accumulation of sediment within the lagoon so that the frequency of dredging can be reduced.

4. Environmental Impacts and Mitigation

4.1 Potential Environmental Impacts

The dredging operations may have the following environmental impacts (DFO 2010a):

- Removal or change in aquatic plants, leading to change in food supply, nutrients concentrations, and habitat structure;
- Sediment being suspended in water, leading to change in sediment concentrations and contaminant concentrations;
- Modification of channel or shoreline shape leading to change in stability and hydraulics, influencing substrate, leading to a change in food supply and habitat structure; and
- Direct injury to fish, amphibians, reptiles, or other aquatic organisms from machinery or materials.

4.2 Environmental Protection and Mitigation Measures

To mitigate the potential impacts listed above, dredging works should follow provincial Standards and Best Practices for Instream Works (MFLNRO and DFO 2010a, MFLNRO and DFO 2010b). These and other guidelines to follow are listed below.

Project Planning

- Notify consultants with the intention to dredge at least three months before the expected start date, to allow enough time for a QEP to obtain fish salvage permits.

Timing

- Dredging is anticipated at low water levels, typically seen in late summer to fall.
- Works in the lagoon should be completed from July 22 to April 1, the reduced risk timing window for instream works in Shuswap Lake for areas with no sockeye of char spawning (MFLNRO 2015).
- The nesting window for migratory birds in Sicamous is April 1 to August 17 (Environment and Climate Change Canada 2016). Machinery should not drive through grass or shrub areas where migratory birds may be nesting during this period, and no clearing of vegetation should occur during this period. If disturbance of vegetation is required during this period, a QEP must conduct a breeding bird survey. Any areas where there are active or suspected nests must be flagged off and not disturbed during works.

Erosion and Sediment Control

- The contractor should use appropriate erosion and sediment control measures to intercept and manage runoff and reduce the likelihood for soils to erode and the potential for sediment to enter nearby waterbodies. Set up measures before beginning other work. Measures may include but are not limited to:
    - Using a silt curtain when installing or removing isolation measures to prevent silt from entering Shuswap Lake;
    - During dewatering, using a silt curtain between the discharge location and the rest of Shuswap lake to keep sediment from moving into the lake;

- Covering spoil/dredged material with plastic sheeting and set up silt fencing around piles, if material is being stored temporarily;
- Placing spoil/dredged material where it will not erode into a waterbody or storm sewer;
- Keeping additional erosion and sediment control supplies on site in case of an unexpected storm or other event;
- Regular inspection of measures and modification/repair when necessary; and
- Maintenance of effective erosion and sediment control measures on any disturbed upland banks until banks are revegetated.

Site Access

- Machinery should access the site using existing roads, trails, and boat ramp to avoid disturbance to vegetation (see Figure 1).
- Minimize disturbance to the riparian area along the shoreline and protect trees, shrubs and grasses whenever possible.

Weather

- The contractor should monitor weather forecasts and avoid work during periods of heavy rain.
- Avoid construction or removal of coffer dam when Shuswap Lake has large waves or when high wind is in the forecast.

Environmental Monitor

- Dredging activities should be monitored by a QEP for the duration of the project, and full-time during sensitive works. Sensitive works include the installation and removal of the isolation measures, fish salvage, dewatering, and initial excavation.

Protection of Fish and Other Aquatic Organisms

- A QEP should complete a fish and amphibian salvage according to provincial best practices prior to any works below the high water mark.
- Before starting work, the EM should survey the site for any reptiles or amphibians, especially Western Painted Turtles. If any are found, they should be moved to a safe location away from the work site according to provincial best management practices. They should also look for signs of Western Painted Turtle mating or nesting. If a nest or potential nest is discovered, it should be flagged off and should not be disturbed during dredging operations. Ideally, the EM should survey the site in late summer/early fall at least 1 week prior to works.
- Salvage methods should be appropriate for the depth of water in the lagoon.
- Low impact salvage methods such as seining, minnow trapping, and dip netting should be used before electrofishing.
- All dewatering pump intakes must have fish screens with a maximum screen opening of 2.54 mm (0.10 inches) to prevent fish impingement.
- The contractor should make every effort to dewater the lagoon as quickly as possible. The contractor shall ensure that they have sufficient pumping capacity. This will minimize the time that fish may be isolated within the lagoon in water with no flow.

- The dewatering pump intakes should be situated in the deepest location of the lagoon before dewatering, so that the intake does not need to be moved multiple times. This will minimize the disturbance of sediment and fish that may still be in the lagoon during dewatering.
- The salvage crew should stay on site from the beginning of dewatering until the lagoon is completely dewatered. If fish, amphibians, or reptiles remain in the lagoon during or after dewatering, they should be captured using dip nets and moved to a safe location outside the work area as quickly as possible.
- After partial dewatering, the EM should survey the banks and soft substrate of the exposed lagoon for Rocky Mountain Ridged Mussells (*Gonidea angulata*). If found, work should cease immediately and the client should contact DFO for guidance on how to proceed.

Dredged Material

- Return water (water draining from saturated sediment that has been dredged and placed on land temporarily) should be treated with settling basins or other appropriate means so that the concentration of total suspended solids is minimized before returning to the lagoon or Shuswap Lake.
- Return water should not enter the Eagle River.
- Dredged material must comply with the provincial *Environmental Management Act* and its regulations, including the Contaminated Sites and Hazardous Waste regulations, and with any appropriate local government bylaws regarding spoil.
- Dredged material should not be used to infill the shoreline or adjacent wetland areas.

Operation of Machinery

- Beside and within the lagoon, operate machinery in a manner that minimizes the disturbance to the banks and upland areas around the lagoon.
- Only use the existing boat access ramp to move machinery from the access path into the lagoon.

Contamination and Spill Management

- Prevent the discharge of silt, sediment, sediment-laden water, or any other deleterious substance into the lagoon, Eagle River, Shuswap Lake, or any ditch or storm sewer that flows into these waterbodies.
- Ensure machinery is clean (power washed), in good working condition, and free of leaks, excess oil, grease, and seeds or tissue of noxious weeds.
- Do not refuel or service equipment within 30 m of a water body, including the lagoon.
- Keep a spill containment kit on site and ensure all staff are trained it its use. Immediately report any substance of reportable quantities that is harmful to aquatic life to the Environmental Emergency Management Plan Incident Reporting Hotline at 1-800-663-3456 and DFO's Observe, Record and Report hotline at 1-800-465-4336.
- Place generators and pumps inside fuel containment trays to contain any accidental spills of fuel or oil.

Post-operation

- If the banks of the lagoon are disturbed during construction, restore them to their original grade and condition.
- Stabilize any exposed areas such as shoreline by planting and seeding with native trees, shrubs, and/or grasses and mulching to prevent erosion. Grass can be planted by hydro-seeding or broadcast seeding and mulching.

5. Reporting

The following reporting should be completed each time dredging is undertaken.

5.1 Completion Report

The Society should prepare a completion report outlining the following:

- Start and end date of works, including dates of work sequence tasks in Section 3.1;
- Extent of dredging;
- Depth (with location) of lagoon prior to and after dredging;
- Specific construction methods used (e.g., isolation methods);
- Volume of dredged materials; and
- Location and details about where dredged materials were disposed of.

5.2 Environmental Monitoring Report

The Environmental Monitor should prepare an environmental monitoring report outlining the following:

- Description of works;
- Timing of works;
- Surface area below the high water mark affected;
- Dates of monitoring;
- Any non-compliance with this management plan, the water licence C129749, or relevant provincial or federal best management practices or guidance documents;
- Description of any incidents, difficulties, or spills, and how they were addressed and reported;
- Dates and details of any fish or wildlife salvages, including time of day, location, capture methods, location of release, species and number of animals captured and released, any fatalities, and the numbers of the required licences to capture fish and/or wildlife; and
- A summary of any other actions taken.

5.3 Fish Salvage Data

If a fish salvage is conducted, the EM should report the results of the salvage to the MFLNRO in the appropriate format required by the ministry.

5.4 Conservation Data Centre Report

If any Species at Risk (those outlined in Section 2.2 or otherwise) are observed or salvaged during dredging or as a result of associated monitoring, these should be reported to the BC Conservation Data Centre.

5.5 Archaeological Findings

The provincial *Heritage Conservation Act* protects archaeological sites within BC. The Archaeology Branch of MFLNRO oversees the enforcement of the Act. Because the lagoon is man-made, it is unlikely that archaeological sites will be discovered during dredging as long as it does not disturb sediment below the depth of the original excavation. If, while dredging, a potential archaeological site is found, work should cease immediately, and the contractor should contact the Archaeology Branch at 250-953-3334. A professional archaeologist will be required to assess the site and determine if further investigation or permitting is required.

6. Monitoring and Maintenance

The depth of the lagoon should be monitored by the Society annually in at least four locations (mouth, middle, head, under specific docks, etc.) and the depths recorded. These depths should be reported in the completion report following subsequent dredging.

The Society should also monitor the diversion structure and piping to ensure that it is operating in a manner to minimize the amount of sediment entering the lagoon from the Eagle River.

7. Closure

We trust that this Water Management Plan meets your requirements at present. Please do not hesitate to contact KWL at DMeredith@kwl.ca or 250-503-5817 if you have any questions or concerns.

Report Submission

Prepared by:

KERR WOOD LEIDAL ASSOCIATES LTD.

Luke Warkentin, B.Sc., B.I.T.
Junior Biologist

Reviewed by:

Patrick Lilley, M.Sc., R.P.Bio.
Senior Biologist

This document is a copy of the sealed and signed hard copy original retained on file. The content of the electronically transmitted document can be confirmed by referring to the filed original.

BRITISH COLUMBIA INSTITUTE OF AGROLOGISTS 2738 Dwayne W. Meredith P.Ag.

May 11, 2017

Dwayne Meredith, B.Sc., P.Ag.
Project Manager
Sector Leader – Water Resources

Statement of Limitations

This document has been prepared by Kerr Wood Leidal Associates Ltd. (KWL) for the exclusive use and benefit of LOT 46 MANAGEMENT SOCIETY for the Water Management Plan. No other party is entitled to rely on any of the conclusions, data, opinions, or any other information contained in this document.

This document represents KWL's best professional judgement based on the information available at the time of its completion and as appropriate for the project scope of work. Services performed in developing the content of this document have been conducted in a manner consistent with that level and skill ordinarily exercised by members of the engineering profession currently practising under similar conditions. No warranty, express or implied, is made.

Copyright Notice

These materials (text, tables, figures and drawings included herein) are copyright of Kerr Wood Leidal Associates Ltd. (KWL). LOT 46 MANAGEMENT SOCIETY is permitted to reproduce the materials for archiving and for distribution to third parties only as required to conduct business specifically relating to Water Management Plan. Any other use of these materials without the written permission of KWL is prohibited.

Revision History

Revision #	Date	Status	Revision	Author
0	May 11, 2017	Final	Issued for Use	DWM
A	January 18, 2017	Draft	Issued for client review	LTW/PL

OQM | Organizational Quality Management Program

References

Conservation Data Centre (CDC). 2016. Species and Ecosystems at Risk – Publically Available Occurances. iMapBC Provincial Layer. Available at: http://maps.gov.bc.ca/ess/sv/imapbc//. Accessed: December 2016.

COSEWIC. 2003. COSEWIC assessment and update status report on the chiselmouth *Acrocheilus alutaceus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 22 pp. (www.sararegistry.gc.ca/status/status_e.cfm)

COSEWIC. 2006. COSEWIC assessment and status report on the Western Painted Turtle *Chrysemys picta bellii* (Pacific Coast population, Intermountain-Rocky Mountain population and Prairie/Western Boreal - Canadian Shield population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. vii + 40 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

COSEWIC. 2012. COSEWIC assessment and status report on the White Sturgeon *Acipenser transmontanus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxvii + 75 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm).

Environment and Climate Change Canada. 2016. General Nesting Periods of Migratory Birds in Canada. Available at: http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=4f39a78f-1. Accessed: January 2017.

Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Canada, Smithsonian Institution Press, Washington, D.C.

Fisheries and Oceans Canada (DFO). 2005. Shuswap Lake System and Adams Lake Lake Char and Sockeye Spawning Atlas Overview Map. Available at: http://www.shim.bc.ca/shuswap/. Accessed: December 2016.

Fisheries and Oceans Canada (DFO). 2010a. Management Plan for the Rocky Mountain Ridged Mussel (*Gonidea angulata*) in Canada [Final]. Species at Risk Act Management Plan Series. Fisheries and Oceans Canada, Vancouver. iv + 52 pp.

Fisheries and Oceans Canada (DFO). 2010b. Pathways of Effects – Dredging. Available at: http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/dredging-dragage-eng.html. Accessed: December 2016.

Gist, D.H., J.A. Michaelson, and J.M. Jones. 1990. Autumn mating in the painted turtle, Chrysemys picta. Herpetologica 46:331-336.

Gregory, P.T. and R.W. Campbell. 1987. The Reptiles of British Columbia. British Columbia Provincial Museum Handbook. Ministry of Provincial Secretary and Government Services, Victoria, B.C. 102 pp.

Ministry of Environment (MOE). 2016a. BC Species and Ecosystem Explorer. Available at: http://a100.gov.bc.ca/pub/eswp/. Accessed: December 2016.

Ministry of Environment (MOE). 2016b. Habitat Wizard Stream and Lake Reports. Available at: http://maps.gov.bc.ca/ess/sv/habwiz/. Accessed: December 2016.

Ministry of Environment (MOE). 2016c. Consultative Area Database Public Map Service. Available at: http://maps.gov.bc.ca/ess/sv/cadb/. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2015. Regional Terms & Conditions & Timing Windows for Thompson Region. Available at: http://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/working-around-water/work_windows_thompson.pdf. Accessed: December 2016.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010a. Standards and Best Practices for Instream Works General BMPs & Standard Project Considerations. Version 1.0.

Ministry of Forests, Lands and Natural Resource Operations and Fisheries and Oceans Canada (MFLRNO and DFO). 2010b. Standards and Best Practices for Instream Works Channel Maintenance. Version 1.0.

Nussbaum, R.A., E.D. Brodie and R.M. Storm. 1983. Amphibians and Reptiles of the Pacific Northwest. University of Idaho Press, Moscow, ID. 332 pp.

Rosenfeld, J.S, B. Wicks, M. Porter, and P. VanDishoek. 1998. Habitat Use by Chiselmouth (*Acrocheilus alutaceus*) in the Blackwater River. Prov. of BC Fish. Proj. Rep. RD 76.

Rosenfeld, J.S., M. Porter, M. Pearson, B. Wicks, P. Van Dishoeck, T. Patton, E. Parkinson, G. Hass, and J. D. McPhail. 2001. The influence of temperature and habitat on the distribution of chiselmouth *Acrocheilus alutaceus* in British Columbia. Environmental Biology of Fishes 62:401-413.

Rosenfeld, Jordan. 2003. Update COSEWIC status report on the chiselmouth, *Acrocheilus alutaceus*, in Canada. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Ottawa. 1-22 pp.

Schwarzkopf L., and R.J. Brooks. 1987. Nest-site selection and offspring sex ratio in painted turtles, Chrysemys picta. Copeia 1987:53-61.

St. John, A. 2002. Reptiles of the Northwest: British Columbia to California. Lone Pine Publishing, Edmonton, AB. 272 pp.

Weisrock, D.W. and F.J. Janzen. 1999. Thermal and fitness-related consequences of nest location in painted turtles (*Chrysemys picta*). Functional Ecology 13(2): 94-101.

Appendix A

Site Photographs

Appendix A – Site Photographs

Date Photographs Taken: October 26, 2016

Photo 1: Looking west from the access gate of the lagoon towards the mouth, with Shuswap Lake in the background (see Figure 1).

Photo 2: Looking north from the shore of the lagoon towards its head.

Appendix A – Site Photographs

Photo 3: Looking northeast from left bank of Eagle River at the Point of Diversion (PD 52869), showing knife valve on the intake.

Photo 4: Knife valve on intake from the Eagle River at the Point of Diversion (PD 52869).

Appendix A – Site Photographs

Photo 5: Location at head of the lagoon where the diversion pipe enters.

Photo 6: Outlet of diversion pipe at the head of the lagoon.

Appendix A – Site Photographs

Photo 7: Looking northeast into the lagoon from the mouth of the lagoon.

Photo 8: Looking northwest across the mouth of the lagoon, where the temporary isolation dam will be installed.

Appendix A – Site Photographs

Photo 9: Looking southwest from mouth of lagoon at Shuswap Lake, where temporary isolation dam will be installed.

Photo 10: Looking southwest, showing site access point from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Appendix A – Site Photographs

Photo 11: Looking west, showing access gate along access path from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).

Photo 12: Looking northeast, showing site access from Silver Sands Rd, just southeast of Lot 44 (see Figure 1).