

From: [Dalziel, Rod ENV:EX](#)
To: [Aikman, Jennie S ENV:EX](#); [Welstead, Kym FLNR:EX](#); [Platz, Chris ENV:EX](#); [Jensen, Sandra L.S. FLNR:EX](#); [Willcox, Michael FLNR:EX](#); ["McBain, Grant"](#); [Malt, Joshua FLNR:EX](#); [Hirner, Joanna ENV:EX](#); [Robbins, Kristina FLNR:EX](#)
Cc: [Robinson, Bryan FLNR:EX](#)
Subject: SCRD PUP ammendment application Chapman Lake

Opps Sorry folks I just noticed the times were PM not AM. I hope most are still available for a quick update call.

Thanks for the meeting on Wednesday everyone. The next scheduled meeting will be June 15th to provide updates and further discussion

Call 1-877-353-9184
 Paticipan **S.17**

Taking another crack at scheduling a meeting where more can attend. Tough to find a time with minimal conflicts so I hope this works.

If you are unable to attend in person we can arrange to have you attend by conference call (I will provide call in details if required).

Some of you are aware that the Sunshine Coast Regional District (SCRD) has hired a consulting company, AECOM, to oversee a project proposal to increase drawdown of Chapman Lake, located in the Class A Tetrahedron Provincial Park, to supply domestic water for residents of the Sunshine Coast. This is likely a grandfathered allowable use within the park (awaiting legal opinion). They have submitted a Park Use Permit amendment application on 29 April 16 to authorize this. They are relying on a EIA completed in 1999 as their requirement for an Impact Assessment. BC Parks is in the process of adjudicating the proposal. You are invited to provide comment and raise potential concerns with the proposal.

If you require further documents or information please let Rod Dalziel know.

RE: SCRD PUP ammendment application Chapman Lake

Friday, October 13, 2017

2:28 PM

Subject	RE: SCRD PUP ammendment application Chapman Lake
From	Aikman, Jennie S ENV:EX
To	Dalziel, Rod ENV:EX
Sent	Wednesday, June 15, 2016 8:46 AM

Thanks Rod.

From: Dalziel, Rod ENV:EX
 Sent: Wednesday, June 15, 2016 8:46 AM
 To: Aikman, Jennie S ENV:EX
 Subject: RE: SCRD PUP ammendment application Chapman Lake

No problem, Jennie, take your other call. I can communicate that with Sandra. Other than the BC Parks group it appears only Sandra will be on the call.

From: Aikman, Jennie S ENV:EX
 Sent: Wednesday, June 15, 2016 8:44 AM
 To: Dalziel, Rod ENV:EX
 Subject: RE: SCRD PUP ammendment application Chapman Lake

Hi Rod,

Do you need me to attend this call? I have another meeting scheduled at the same time, but can adjust if necessary.

For me, the important piece I wanted to understand is process and timing around the water licence/Section 11 as I have tried several times now to connect with Remko with no result. I think we should also let Sandra know that we have agreed to extend their siphon permit to October 31, 2017 as I know they had some issues with extending the licence beyond one additional year.

Jennie

-----Original Appointment-----

From: Dalziel, Rod ENV:EX
 Sent: Monday, May 16, 2016 1:39 PM
 To: Dalziel, Rod ENV:EX; Aikman, Jennie S ENV:EX; Welstead, Kym FLNR:EX; Platz, Chris ENV:EX; Jensen, Sandra L.S. FLNR:EX; Willcox, Michael FLNR:EX; 'McBain, Grant'; Malt, Joshua FLNR:EX; Hirner, Joanna ENV:EX; Robbins, Kristina FLNR:EX
 Cc: Robinson, Bryan FLNR:EX
 Subject: SCRD PUP ammendment application Chapman Lake
 When: Wednesday, June 15, 2016 9:00 AM-10:00 AM (UTC-08:00) Pacific Time (US & Canada).
 Where: conference call

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Participant s.17

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If you require further documents or information please let Rod Dalziel know.

Coupar, Meghan FLNR:EX

From: Dalziel, Rod ENV:EX
Sent: Wednesday, June 15, 2016 9:26 AM
To: Jensen, Sandra L.S. FLNR:EX; Robinson, Bryan FLNR:EX; grant.mcbain@dfo-mpo.gc.ca
Cc: Hirner, Joanna ENV:EX
Subject: Fwd: Chapman Lake Water Supply Improvement - BC Parks Meeting
Attachments: SCRD - Chapman Lake proposal - TAC meeting summary.pdf; ATT00001.htm

Thanks for the call attached is the additional impact assessment works required as identified by BC Parks.

Sent from my iPad

Begin forwarded message:

From: "Hirner, Joanna ENV:EX" <Joanna.Hirner@gov.bc.ca>
To: "dewynter, Brett" <Brett.dewynter@aecom.com>, "Aikman, Jennie S ENV:EX" <Jennie.Aikman@gov.bc.ca>, "Dalziel, Rod ENV:EX" <Rod.Dalziel@gov.bc.ca>
Cc: "Platz, Chris ENV:EX" <Chris.Platz@gov.bc.ca>, "Mathewson, Andrew" <Andrew.Mathewson@aecom.com>, "Dave Crosby" <Dave.Crosby@scrd.ca>, "Shane Walkey (Shane.Walkey@scrd.ca)" <Shane.Walkey@scrd.ca>, "Ford, Bruce" <Bruce.Ford@aecom.com>, "Bryan Shoji" <Bryan.Shoji@scrd.ca>
Subject: Re: Chapman Lake Water Supply Improvement - BC Parks Meeting

Hello Brett,

Further to Jennie's letter yesterday, attached are detailed comments on the current Park Use Permit application. Note that many of the comments attached include requests for additional information to update the current application, so although these comments can be considered complete for the information that was presented in the April 2016 Park Use Permit application, BC Parks will want the opportunity to provide further comments as additional information about the project is developed and provided.

Also, here are some further responses that hopefully address the rest of the outstanding items as discussed during the May 26, 2016 meeting:

Please find attached summary of Tetrahedron Advisory Committee meeting, prepared by Rod. A PUP amendment application will need to be submitted to extend the current amendment "short term siphon option" to 31 Oct 17.

Stakeholders that have reached out to BC Parks and whom wish to be included in consultation process: Tetrahedron Advisory Committee, Tetrahedron Alliance, Sunshine Coast Conservation Association, Tetrahedron Outdoor Club, Ruby Lake Lagoon Society.

Best regards,

Joanna

Joanna Hirner (RPBio)

Conservation Specialist

BC Parks, South Coast Region

604-924-2228

From: dewynter, Brett <Brett.dewynter@aecom.com>
Sent: Monday, June 06, 2016 9:01 AM
To: Aikman, Jennie S ENV:EX; Dalziel, Rod ENV:EX; Hirner, Joanna ENV:EX
Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey (Shane.Walkey@scrd.ca); Ford, Bruce; Bryan Shoji
Subject: RE: Chapman Lake Water Supply Improvement - BC Parks Meeting

Jennie/Rod/Joanna:

Further to the below notes, please confirm the status of Items 2, 5, 6, 7 and 9. We would appreciate these items today or tomorrow as there is a meeting with the SCRD Board on the morning of June 9th, 2016.

Thanks for your help.

Brett deWynter, P.Eng.

s.22

From: dewynter, Brett
Sent: Monday, May 30, 2016 8:58 AM
To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; Jennie.Aikman@gov.bc.ca; Rod.Dalziel@gov.bc.ca; Hirner, Joanna ENV:EX (Joanna.Hirner@gov.bc.ca); Shane Walkey (Shane.Walkey@scrd.ca)
Cc: Chris.Platz@gov.bc.ca
Subject: RE: Chapman Lake Water Supply Improvement - BC Parks Meeting

All: Provided below are the notes and key action items from our meeting on May 26, 2016. Please review and let me know if you have any comments or concerns.

Meeting Date: May 26, 2016 at the SCRD Office

Meeting Attendees: Joanne Hirner, Rod Dalziel, Bryan Shoji, Dave Crosby, Shane Walkey, Bruce Ford, Andrew Mathewson, Brett deWynter.

Meeting Notes:

1. Meeting Overview: Due to the scheduled site visit to Chapman Lake being cancelled (low cloud level), an impromptu meeting was held at the Regional District Office. This meeting was held between BC Parks, the Regional District and AECOM.
2. It was verbally confirmed that a Park Use Permit to construct the permanent solution to allow for the surface of Chapman Lake to be lowered by an additional 5 m will not be provided for the 2016 construction season. Joanna confirmed that written notification of where additional information is required for the current Park Use application will be provided by June 3rd, 2016. This letter will include comments from Rod Dalziel regarding concerns from the Stakeholder meetings and any other functional concerns. It is envisioned that the letter provided by June 3rd,

2016 will be a complete set of comments from BC Parks regarding the current Park Use permit application.

3. One of the primary concerns noted by BC Parks were potential changes to the Chapman Lake site since the Whitehead report was published. Shane from the Regional District stated that he will search the archive for pictures (preferably aerial pictures) of Chapman at the time when the Whitehead report was published. The historical pictures can be used to visually note any changes in the Chapman Lake site during the past 15+ years.
4. Detailed bathometric survey and level data for Chapman Lake exists for the past few years. This data will be compiled to establish an estimate of the drawdown durations in the recent past and make projections about the future lake drawdown frequency and durations.
5. BC Parks will investigate and provide written notification confirming if the temporary syphon application needs to be re-submitted. It is preferable for the current permit to be extended. To minimize the chance of water shortages again this summer, the syphon may need to be installed this summer. Additionally the syphon will be needed next summer for the construction of the permanent solution meaning the temporary syphon permit needs to be extended to October 31, 2017.
6. It is expected that environmental field work and geotechnical investigations will need to be completed this summer to address the comments provided by BC Parks. It will be confirmed by BC Parks if a research permit needs to be completed for the field work that will occur during the summer of 2016 at the Chapman Lake site.
7. Rod noted that some Stakeholders have suggested that they have not been well informed about the project. It was requested that Rod provide a list of Stakeholders since it is the intension to meet with all the major park Stakeholders. It was also noted that the consultation efforts to date have been more heavily focused on the First Nation consultation and support prior to completing a broader communication effort. The First Nation consultation has been delayed due to the political challenges at the Sechelt Band.
8. It was confirmed that the consultation in the future will be focused meetings with the specific Stakeholders. It was also noted that the SCRD held open meetings with the community at several different locations during the week of May 16th and 25th, 2016. Drinking water supply issues were a major discussion item during the community meetings.
9. It was requested that a separate letter be provided from BC Parks stating that the permanent water supply solution for Chapman Lake can not be constructed during 2016. The delay to the project will be a significant concern for the Regional District Board. A separate letter stating that the project can not be constructed this summer is being requested for the communication to the Regional District Board. This letter is being requested by June 3rd, 2016, since there is a presentation to the Board scheduled for June 9th, 2016.
10. Rod noted that Ranger Training starts on the week of June 6th and continues for the next 2-weeks. It was also noted that BC Parks staff would like to attend the site prior to confirming all the notes regarding the planned Chapman Lake construction. This means we need to find a day during the week of May 30th, 2016 to complete the site visit to ensure the project is not further delayed. After the meeting the weather forecast was reviewed and the morning of Tuesday, May 31, 2016 was picked for the site visit.

Brett deWynter, P.Eng.

Water Group, Canada West

s.22

brett.deWynter@aecom.com

From: dewynter, Brett
Sent: Monday, April 25, 2016 10:54 AM
To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; Chris.Platz@gov.bc.ca; Jennie.Aikman@gov.bc.ca; Hirner, Joanna ENV:EX (Joanna.Hirner@gov.bc.ca)
Cc: Rod.Dalziel@gov.bc.ca
Subject: FW: Chapman Lake Water Supply Improvement - BC Parks Meeting

All:

Thanks for the meeting on Friday, April 8, 2016. Further to the meeting we confirm the following items:

1. Bryan Shoji of the Sunshine Coast Regional District confirmed that acceptance of the temporary syphon Park Use Permit was provided via e-mail to BC Parks on April 6, 2016.
2. The preliminary Park Use Plan that was submitted to BC Parks prior to the meeting was discussed. The indication from BC Parks was that the plan is acceptable however, it was noted that only a preliminary review of the documents had been completed. The areas where it was requested that AECOM focus prior to submitting the final documents to Front Corner BC is explaining the potential impacts of the construction activities complete with the mitigation plans.
3. It was noted that BC Parks has reached-out to other government agencies to obtain initial comments. One of the key comments received from DFO is to ensure minimum fish flows are maintained in the Chapman Creek. The minimum fish flow rate suggested in the meeting was roughly double the flow rate suggested in the Dave Bates report. The issue of the minimum low in Chapman Creek will only be improved with the completion of the proposed project at Chapman Lake, however, the debate about the minimum flow required in Chapman Creek is independent of this project. The Dave Bates report will be forwarded to BC Parks for information.
4. The consultation effort spent to date was summarized and provided in a document to BC Parks prior to the meeting. During the discussion it was indicated that the public consultation efforts spent to date seemed reasonable. BC Parks would prefer that the consultant/SCRD obtains a letter of non-objection from the Sechelt and Squamish First Nation communities. The consultation completed to date needs to continue and be documented. Once the letters of non-objection are obtained from the First Nations and the consultation with the community is completed the current indication is that this will be satisfactory for BC Parks. During the Park Use Permit review BC Parks would continue to reach-out to other government agencies and local governments.
5. BC Parks completed their own internal review of the documentation and currently hold the opinion that they have the legal ability to issue a Park Use Permit; however, this item is

currently under review by the internal government lawyer. If there are any changes resulting in BC Parks not being able to issue the construction permit this year, BC Parks will inform the SCRD as soon as possible.

6. The tentatively planned schedule is:

- a. AECOM will submit the Park Use Permit application during the week of April 11th, 2016;
- b. AECOM will confirm the water license submission required and then make the application during the week of April 11th, 2016;
- c. BC Parks will continue to review the construction plans and then the application once it is submitted. The internal review will be ongoing with a focus on the potential environmental impacts and the associate mitigation plan. BC Parks was invited to reach-out to AECOM or the SCRD during their document review if they have any questions and we would be happy to provide responses.
- d. Depending on the rate of snow melt the plan is to complete a site visit. This site visit is tentatively planned for the second week of May 9th, 2016. The site visit will include 2 – 3 representatives from BC Parks, the SCRD, AECOM and a representative from In-situ (i.e. the Sechelt Band arch. consultant). The goal is to coordinate the site visit so everyone can be on-site together. This will allow any concerns to be reviewed and discussed while on-site.

Let us know if you have any further comments or concerns with the above notes. Please note that the Park-Use Permit application and Water License Amendment have been submitted to Front Counter BC. Thanks.

Brett deWynter, P.Eng.

s.22

From: dewynter, Brett
Sent: Thursday, April 07, 2016 11:06 AM
To: 'Platz, Chris ENV:EX'; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; Aikman, Jennie S ENV:EX; Hirner, Joanna ENV:EX; Rod.Dalziel@gov.bc.ca
Cc: Dave Crosby (Dave.Crosby@scrd.ca); Shane Walkey (Shane.Walkey@scrd.ca)
Subject: RE: Chapman Lake Water Supply Improvement - BC Parks Meeting

All:

Further to our meeting planned for tomorrow we offer the following comments and discussion items:

1. It was discussed that the temporary permit issued last summer needs to be signed-off and finalized. This will be completed and an original signed copy hand delivered tomorrow.

2. The preferred plan is to complete the construction of the proposed works at Chapman Lake this summer to support the installation of the diversion of water to a total depth of 8.0 m. To support the efforts shown in the preliminary design drawing provided during the March 16, 2016 meeting a DRAFT Park Use-Permit application and the supporting documentation has been prepared. These DRAFT document are attached.
3. Revision to the water license are ongoing. There is currently some debate about the need to complete a new water license application versus an amendment to the existing license. There are active discussion with FLNR to clarify this item. For your information a DRAFT amendment application has been prepared.
4. The need for stakeholder consultation was discussed to meet the obligations of the BC Parks process. These efforts have been ongoing. The background documents are provided to summarize the consultation efforts completed to date with a summary of some of the key issues. A couple specific areas that we would like to discuss are:
 - a. what specific areas of interest we should explore further in order to fulfil BC Parks First Nations and Public Participation requirements / expectations for a “comprehensive public consultation process” mentioned in the Tetrahedron Park Management Plan.
 - b. Other groups to consult / encourage participation.
5. BC Parks was going to investigate their files and documents to determine if the planned scope of work at Chapman Lake could be completed with an amendment. The results of this investigation will be shared with the project team.

Once the background documents are reviewed and discussed we are hoping to reach consensus regarding the plan to advance the project.

Let us know if you have any further comments, otherwise we look forward to the meeting planned for tomorrow. Thanks.

Brett deWynter, P.Eng.

s.22

-----Original Appointment-----

From: Platz, Chris ENV:EX [<mailto:Chris.Platz@gov.bc.ca>]

Sent: Wednesday, April 06, 2016 8:02 AM

To: Platz, Chris ENV:EX; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; dewynter, Brett; Aikman, Jennie S ENV:EX; Hirner, Joanna ENV:EX

Subject: Chapman Lake Water Supply Improvement - BC Parks Meeting

When: Friday, April 08, 2016 10:30 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada).

Where: ENV R North Van. 1610 Mount Seymour Road Main Fl RM N. Van (seats 10-20)
ENV:EX

Good morning,

I am canvassing for agenda topics. Please send me your items and I will formulate an agenda for our meeting.

Chris

Hi all,

As discussed during our first meeting I am looking to book a follow-up meeting in early April; please let me know if this date works and if there is anyone else you would like invited to the meeting.

I will call for agenda items a few days ahead of the meeting but if you have any items now please send them along.

Chris

SCRD – Chapman Lake additional drawdown proposal

Summary of concerns raised by Tetrahedron Advisory Committee meeting 09 May 16

Attendance: Michel Frenette ((Tetrahedron Outdoor Club) (TOC)), Philip Gaulin (TOC), Vic Bonaguru (TOC), Duane Sept, Daniel Bouman (Tetrahedron Alliance), Cindy Harlow ((Sunshine Coast Conservation Association (SCCA)), Barry Janyk, Jason Hertz (SCCA), Rod Dalziel (BC Parks), George Smith ((unable to attend but provided comment (see below))

- 1999 Whitehead IA
 - 17 year old report is out of date and cannot be confidently relied on
 - What has changed since report?
 - Climate changes – wetter winters, drier summers, less and higher snowpack
 - Science has improved
 - Ecosystem classification advancements
 - Improved age class mapping
 - Updated Species at Risk data
- Limited Mountain Hemlock (MH) forests on the Sunshine Coast
 - Sensitive to disturbance
 - Difficult to maintain and rehab this zone
- Concerns around stability of lakeshore after drawdown (3-8m)
 - Turbidity and siltation
 - Sections of steep sided shoreline in proposed 8m drawdown
 - Referred to Tyson Lake IPP project as example of lake sedimentation
 - Noted that Whitehead did not adequately assess
- What should be included in further study and research
 - BC Parks not SCRD should commission IA and provide aspects of report
 - A soil specialist should assess area (shoreline, upland and drawdown area)
 - Testing bedrock depth and composition
 - Current and detailed analysis of fisheries values
 - Aquatic invertebrates
 - Hydrology
 - Adjacent forest water table
 - Aquatic vegetation
 - Long-term growth and development in the SCRD
 - Forest fire concern/threat
- Temporary siphon system
 - As is already approved should be tested this year to provide more time for application review
- SCRD decision and process
 - Should have referendum

- Strong opinion from most that alternate source options have not been adequately investigated
- Greater study into existing aquifers in region
- Feel SCRD is moving ahead with easiest and cheapest option not the best for the communities
- Most identified need multiple water sources outside of Chapman watershed
- BC Parks mandate
 - Emphasized BC Parks must balance protection of park values and water needs as stated in Management Planning
- Public consultation
 - The intent of public consultation has changed from time described in Management Plan
 - Should be thorough public consultation
 - Not telling public what is being done and not considering public input
 - Public consultation is far from adequate thus far (09 May 16)
- Terms of Reference being requested
 - For 1999 IA
 - Current AECOM contract
 - What was scope of SCRD investigation for of options for additional municipal water source
- Consensus on final points
 1. Need current, improved Impact Assessment
 2. There is temporary short term solution in the siphon system
 3. Need more time to properly investigate other water sources

"My overriding concern is that the prime directive of BC Parks is to protect representative components of the ecological matrix of our province and that here in the Sunshine Coast Forest District the government has protected less than 3% of our land base. Thus the Tetrahedron has particular importance for biodiversity in BC and for the Sunshine Coast. Chapman Lake is the largest lake in Tetrahedron Park and at the heart of the little remaining unlogged forest. The water quality of Chapman Lake is dependent upon the natural land and water system within which Chapman sits. It is accurate that the park was created knowing full well that there was a small dam on Chapman and that the lake was central to the water supply for the SCRD, and that there was the capacity to draw down the lake up to 3 metres a year in years of drought. Further the management plan envisioned that at some point, modifications could be made to deal with future water requirements, if there was no option and if several steps were taken first to ensure responsible analysis, public involvement and appropriate management.

In the meantime, climate change, essentially unbridled development and population growth have increased the summer draw on water supply. Unfortunately the SCRD has done virtually nothing of real substance to create a long term water supply and management system that moves beyond dependency on one creek, which has experienced serious slope stability issues, the Chapman. They have done no real population growth analysis, no substantive aquifer analysis (like Gibsons, which discovered that they

have the aquifer capacity to provide water to 10,000 people per year in perpetuity), no real consideration of reservoir creation outside the Chapman watershed, no subsidizing of back yard water collection, no annual automatic summer prohibition of lawn and driveway watering, etc. They have initiated the water metering project, but as yet they have developed no real redundancy in their supply system. Increasing the dependency on one Chapman system seems a shortsighted engineering solution based on achieving the cheapest short term fix to a serious long term problem.

If I had confidence that the trenching of Chapman Lake was truly the only remaining option following consideration of all options by competent consultants aware of the full range of modern options and the importance of maintaining biodiversity, then I would agree with the trenching. Unfortunately, potentially annually dropping the water level 8 metres (that's 25 feet folks) will reduce a significant portion of the lake surface due to the rather conical bathymetry of the lake. From my point of view, this will turn a largely intact lake into nothing but a more sterile reservoir which will expose serious amounts of silt into the system, which will have serious impacts on the fish and wildlife and forest ecosystem that depend on the health of the lake.

Thus, I feel that Parks BC needs to ensure that the ecological impact analysis done before this project is approved, must be done to the highest standards. The earlier 1999 analysis is far from satisfactory; an in-depth update is necessary. Having a firm contracted by the proponent, the SCRD, is not sufficient. Parks must ensure that the study, the public review and the consultations with the shíshálh Nation are at the highest and fully transparent level. Parks must also be satisfied that the SCRD has truly conducted full analysis of options for long term water supply security that extend beyond the cheap Chapman Watershed options and build redundancy into the system.

Meanwhile, there is a real alternative means of resolving this situation rationally. The SCRD has already purchased the hardware for their proposed syphon system. They could install this "temporary" means of securing water supply during the peak of the potential summer drought for several years. At the same time, the SCRD could utilize the trenching budget to engage competent experts to examine the potential for alternate, long term means of providing water, such as: a full analysis of the aquifer potential in the SCRD area within and well beyond the Chapman watershed; analysis of where lower elevation impoundment reservoirs could be situated, within and outside the Chapman; the practicality of providing subsidies for backyard water collection systems; mandatory summer restrictions on watering lawns and driveways; conduct a regional growth management analysis, etcetera."

George Smith (email dated 29 April 16)

RE: Chapman Lake Water Supply Improvement - BC Pa

Monday, October 16, 2016

2:30 PM

Subject	RE: Chapman Lake Water Supply Improvement - BC Pa
From	Robinson, Bryan FLNR:EX
To	Dalziel, Rod ENV:EX; Jensen, Sandra L.S. FLNR:EX; grant.mcbain@df
Cc	Hirner, Joanna ENV:EX
Sent	Wednesday, June 15, 2016 9:29 AM

Hi Rod,

Thanks for sending this message. Unfortunately I cannot open the pdf attachment. Can you please resend it.

Thank you

Cheers

Bryan

Bryan Robinson M.Sc., P.Geo.

Section Head, Surface Water

Ministry of Forests, Lands and Natural Resource Oper

South Coast Natural Resource Region

Phone: (604) 586-5629



From: Dalziel, Rod ENV:EX

Sent: Wednesday, June 15, 2016 9:26 AM

To: Jensen, Sandra L.S. FLNR:EX; Robinson, Bryan FLNR:EX; grant.mcbain@df

Cc: Hirner, Joanna ENV:EX

Subject: Fwd: Chapman Lake Water Supply Improvement - BC Parks

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Sent from my iPad

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To: "dewynter, Brett" <Brett.dewynter@aecom.com>, "Aikman, Jenni" <Jennie.Aikman@gov.bc.ca>, "Dalziel, Rod ENV:EX" <Rod.Dalziel@gov.bc.ca>

Cc: "Platz, Chris ENV:EX" <Chris.Platz@gov.bc.ca>, "Mathewson, Andrew" <Andrew.Mathewson@aecom.com>, "Dave Crosby" <Dave.Crosby@scrd.ca>, "Shane Walkey (Shane.Walkey@scrd.ca)" <Shane.Walkey@scrd.ca>, "Ford, Bruce" <Bruce.Ford@aecom.com>, "Bryan Shoji" <Bryan.Shoji@scrd.ca>

Subject: Re: Chapman Lake Water Supply Improvement - BC Pa

Hello Brett,

Further to Jennie's letter yesterday, attached are detailed comments on the

Use Permit application. Note that many of the comments attached include additional information to update the current application, so although the application can be considered complete for the information that was presented in the Park Use Permit application, BC Parks will want the opportunity to provide

Also, here are some further responses that hopefully address the rest of the items as discussed during the May 26, 2016 meeting:

Please find attached summary of Tetrahedron Advisory Committee meeting. A PUP amendment application will need to be submitted to extend the current "short term siphon option" to 31 Oct 17.

Stakeholders that have reached out to BC Parks and whom wish to be included in the process: Tetrahedron Advisory Committee, Tetrahedron Alliance, Sunshine Coast Association, Tetrahedron Outdoor Club, Ruby Lake Lagoon Society.

Best regards,

Joanna

Joanna Hirner (RPBio)
Conservation Specialist
BC Parks, South Coast Region
604-924-2228

From: dewynter, Brett <Brett.dewynter@aecom.com>

Sent: Monday, June 06, 2016 9:01 AM

To: Aikman, Jennie S ENV:EX; Dalziel, Rod ENV:EX; Hirner, Joanna

Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey (Shane.Walkey@scrd.ca); Ford, Bruce; Bryan Shoji

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks N

Jennie/Rod/Joanna:

Further to the below notes, please confirm the status of Items 2, 5, 6, 7 & 8. We appreciate these items today or tomorrow as there is a meeting with the Regional District on the morning of June 9th, 2016.

Thanks for your help.

Brett deWynter, P.Eng.

s.22

From: dewynter, Brett

Sent: Monday, May 30, 2016 8:58 AM

To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; Jennie.Aikman@scrd.ca; Rod.Dalziel@gov.bc.ca; Hirner, Joanna ENV:EX (Joanna.Hirner@gov.bc.ca); Shane.Walkey@scrd.ca

Cc: Chris.Platz@gov.bc.ca

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All: Provided below are the notes and key action items from our meeting on May 26, 2016. Please review and let me know if you have any comments or corrections. Meeting Date: May 26, 2016 at the SCRD Office

Meeting Attendees: Joanne Hirner, Rod Dalziel, Bryan Shoji, Dave Crosby, Shane Walkey, Bruce Ford, Andrew Mathewson, Brett deWynter.

Meeting Notes:

1. Meeting Overview: Due to the scheduled site visit to Chapman Lake (low cloud level), an impromptu meeting was held at the Regional District Office. A meeting was held between BC Parks, the Regional District and AECOM.

2. It was verbally confirmed that a Park Use Permit to construct the perimeter fence to allow for the surface of Chapman Lake to be lowered by an additional 1.5m will be provided for the 2016 construction season. Joanna confirmed that written notification of where additional information is required for the current Permit application will be provided by June 3rd, 2016. This letter will include comments from Rod Dalziel regarding concerns from the Stakeholder meetings and any other concerns. It is envisioned that the letter provided by June 3rd, 2016 will

3. One of the primary concerns noted by BC Parks were potential change Chapman Lake site since the Whitehead report was published. Shane fir District stated that he will search the archive for pictures (preferably aer Chapman at the time when the Whitehead report was published. The his can be used to visually note any changes in the Chapman Lake site durin

4. Detailed bathometric survey and level data for Chapman Lake exists years. This data will be compiled to establish an estimate of the drawdo the recent past and make projections about the future lake drawdown fr durations.

5. BC Parks will investigate and provide written notification confirming temporary syphon application needs to be re-submitted. It is preferable permit to be extended. To minimize the chance of water shortages agai the syphon may need to be installed this summer. Additionally the sypl needed next summer for the construction of the permanent solution me

6. It is expected that environmental field work and geotechnical investig to be completed this summer to address the comments provided by BC I confirmed by BC Parks if a research permit needs to be completed for tl that will occur during the summer of 2016 at the Chapman Lake site.

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8. It was confirmed that the consultation in the future will be focused m specific Stakeholders. It was also noted that the SCR D held open meetin community at several different locations during the week of May 16th an Drinking water supply issues were a major discussion item during the c meetings.

9. It was requested that a separate letter be provided from BC Parks sta permanent water supply solution for Chapman Lake can not be constru 2016. The delay to the project will be a significant concern for the Reg Board. A separate letter stating that the project can not be constructed being requested for the communication to the Regional District Board. being requested by June 3rd, 2016, since there is a presentation to the E

10. Rod noted that Ranger Training starts on the week of June 6th and cc next 2-weeks. It was also noted that BC Parks staff would like to attend confirming all the notes regarding the planned Chapman Lake construct we need to find a day during the week of May 30th, 2016 to complete the ensure the project is not further delayed. After the meeting the weather I

Brett deWynter, P.Eng.
Water Group, Canada West

s.22

brett.deWynter@aecom.com

From: dewynter, Brett

Sent: Monday, April 25, 2016 10:54 AM

To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; Chris.Platt@bc.ca; Jennie.Aikman@gov.bc.ca; Hirner, Joanna ENV:EX (Joanna.Hirner@gov.bc.ca)

Cc: Rod.Dalziel@gov.bc.ca

Subject: FW: Chapman Lake Water Supply Improvement - BC Parks

All:

Thanks for the meeting on Friday, April 8, 2016. Further to the meeting following items:

1. Bryan Shoji of the Sunshine Coast Regional District confirmed that a temporary syphon Park Use Permit was provided via e-mail to BC Parks 2016.
2. The preliminary Park Use Plan that was submitted to BC Parks prior was discussed. The indication from BC Parks was that the plan is accepted it was noted that only a preliminary review of the documents had been areas where it was requested that AECOM focus prior to submitting the documents to Front Corner BC is explaining the potential impacts of the
3. It was noted that BC Parks has reached-out to other government agencies initial comments. One of the key comments received from DFO is to ensure fish flows are maintained in the Chapman Creek. The minimum fish flow suggested in the meeting was roughly double the flow rate suggested in the report. The issue of the minimum flow in Chapman Creek will only be in the completion of the proposed project at Chapman Lake, however, the minimum flow required in Chapman Creek is independent of this project
4. The consultation effort spent to date was summarized and provided to BC Parks prior to the meeting. During the discussion it was indicated that consultation efforts spent to date seemed reasonable. BC Parks would provide a consultant/SCRD obtains a letter of non-objection from the Sechelt and Nation communities. The consultation completed to date needs to continue documented. Once the letters of non-objection are obtained from the First the consultation with the community is completed the current indication will be satisfactory for BC Parks. During the Park Use Permit review BC Parks
5. BC Parks completed their own internal review of the documentation and hold the opinion that they have the legal ability to issue a Park Use Permit; this item is currently under review by the internal government lawyer. If changes resulting in BC Parks not being able to issue the construction permit BC Parks will inform the SCRDC as soon as possible.
6. The tentatively planned schedule is
 - a. AECOM will submit the Park Use Permit application during April 11th, 2016;
 - b. AECOM will confirm the water license submission requirements make the application during the week of April 11th, 2016;
 - c. BC Parks will continue to review the construction plans and application once it is submitted. The internal review will be on focus on the potential environmental impacts and the associated plan. BC Parks was invited to reach-out to AECOM or the SCRDC their document review if they have any questions and we would
 - d. Depending on the rate of snow melt the plan is to complete This site visit it tentatively planned for the second week of May. The site visit will include 2 – 3 representatives from BC Parks, AECOM and a representative from In-situ (i.e. the Sechelt Bay consultant). The goal is to coordinate the site visit so everyone is at the site together. This will allow any concerns to be reviewed and

Let us know if you have any further comments or concerns with the above note that the Park-Use Permit application and Water License Amendment submitted to Front Counter BC. Thanks.

Brett deWynter, P.Eng.
s.22

From: dewynter, Brett

Sent: Thursday, April 07, 2016 11:06 AM

To: 'Platz, Chris ENV:EX'; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; Aikman, Jennie S ENV:EX; Hirner, Joanna ENV:EX; Rod.Dalziel@gov.bc.ca

Cc: Dave Crosby (Dave.Crosby@scrd.ca); Shane Walkey (Shane.Walkey@scrd.ca)

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All:

Further to our meeting planned for tomorrow we offer the following discussion items:

1. It was discussed that the temporary permit issued last summer needs to be reviewed and finalized. This will be completed and an original signed copy handed over tomorrow.
2. The preferred plan is to complete the construction of the proposed water diversion at Chapman Lake this summer to support the installation of the diversion of water to 8.0 m. To support the efforts shown in the preliminary design drawing from the March 16, 2016 meeting a DRAFT Park Use-Permit application and documentation has been prepared. These DRAFT documents are attached.
3. Revision to the water license are ongoing. There is currently some discussion on the need to complete a new water license application versus an amendment to the current license. There are active discussions with FLNR to clarify this item. For information a DRAFT amendment application has been prepared.
4. The need for stakeholder consultation was discussed to meet the obligations of the BC Parks process. These efforts have been ongoing. The background document provided to summarize the consultation efforts completed to date with some of the key issues. A couple specific areas that we would like to discuss are:
 - a. what specific areas of interest we should explore further in order to meet the BC Parks First Nations and Public Participation requirements / obligations for a "comprehensive public consultation process" mentioned in the Tetrahedron Park Management Plan.
 - b. Other groups to consult / encourage participation from.
5. BC Parks was going to investigate their files and documents to determine if the planned scope of work at Chapman Lake could be completed with an existing water license. Results of this investigation will be shared with the project team. Once the background documents are reviewed and discussed we are hopeful that there will be a consensus regarding the plan to advance the project. Let us know if you have any further comments, otherwise we look forward to our meeting planned for tomorrow. Thanks.

Brett deWynter, P.Eng.

s.22

-----Original Appointment-----

From: Platz, Chris ENV:EX [mailto:Chris.Platz@gov.bc.ca]

Sent: Wednesday, April 06, 2016 8:02 AM

To: Platz, Chris ENV:EX; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; dewynter, Brett ENV:EX; Aikman, Jennie S ENV:EX; Hirner, Joanna ENV:EX

Subject: Chapman Lake Water Supply Improvement - BC Parks Meeting

When: Friday, April 08, 2016 10:30 AM-12:00 PM (UTC-08:00) Pacific Time

Where: ENV R North Van. 1610 Mount Seymour Road Main Floor Main N. Van (s.22) ENV:EX

Good morning,

I am canvassing for agenda topics. Please send me your items and I will compile them into an agenda for our meeting.

Chris

Hi all,

As discussed during our first meeting I am looking to book a follow-up April; please let me know if this date works and if there is anyone else y invited to the meeting.

I will call for agenda items a few days ahead of the meeting but if you now please send them along.

Chris

FW: Chapman Lake Water Supply Improvement - BC Parks Meeting

Thursday, October 12, 2017
12:04 PM

Subject	FW: Chapman Lake Water Supply Improvement - BC Parks Meeting
From	Dalziel, Rod ENV:EX
To	Jensen, Sandra L.S. FLNR:EX; Robinson, Bryan FLNR:EX; 'McBain, Grant'
Cc	Hirner, Joanna ENV:EX
Sent	Wednesday, June 15, 2016 9:32 AM
Attachments	 SCRD - Chapman ...  April PUP Amendme...

Bryan indicated he was not able to open the previous email. I am at a desktop now, let me know if this works.

From: Hirner, Joanna ENV:EX

Sent: Wednesday, June 8, 2016 7:41 AM

To: dewynter, Brett; Aikman, Jennie S ENV:EX; Dalziel, Rod ENV:EX

Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey (Shane.Walkey@scrd.ca); Ford, Bruce; Bryan Shoji

Subject: Re: Chapman Lake Water Supply Improvement - BC Parks Meeting

Hello Brett,

Further to Jennie's letter yesterday, attached are detailed comments on the current Park Use Permit application. Note that many of the comments attached include requests for additional information to update the current application, so although these comments can be considered complete for the information that was presented in the April 2016 Park Use Permit application, BC Parks will want the opportunity to provide further comments as additional information about the project is developed and provided.

Also, here are some further responses that hopefully address the rest of the outstanding items as discussed during the May 26, 2016 meeting:

Please find attached summary of Tetrahedron Advisory Committee meeting, prepared by Rod.

A PUP amendment application will need to be submitted to extend the current amendment "short term siphon option" to 31 Oct 17.

Stakeholders that have reached out to BC Parks and whom wish to be included in consultation process: Tetrahedron Advisory Committee, Tetrahedron Alliance, Sunshine Coast Conservation Association, Tetrahedron Outdoor Club, Ruby Lake Lagoon Society.

Best regards,

Joanna

Joanna Hirner (RPBio)

Conservation Specialist

BC Parks, South Coast Region

604-924-2228

From: dewynter, Brett <Brett.dewynter@aecom.com>

Sent: Monday, June 06, 2016 9:01 AM

To: Aikman, Jennie S ENV:EX; Dalziel, Rod ENV:EX; Hirner, Joanna ENV:EX

Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey (Shane.Walkey@scrd.ca); Ford, Bruce; Bryan Shoji

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks Meeting

Jennie/Rod/Joanna:

Further to the below notes, please confirm the status of Items 2, 5, 6, 7 and 9. We would appreciate these items today or tomorrow as there is a meeting with the SCRD Board on the morning of June 9th, 2016.

Thanks for your help.

Brett deWynter, P.Eng.

s.22

From: dewynter, Brett

Sent: Monday, May 30, 2016 8:58 AM

To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; Jennie.Aikman@gov.bc.ca; Rod.Dalziel@gov.bc.ca;

Hirner, Joanna ENV:EX (Joanna.Hirner@gov.bc.ca); Shane Walkey (Shane.Walkey@scrd.ca)

Cc: Chris.Platz@gov.bc.ca

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks Meeting

All: Provided below are the notes and key action items from our meeting on May 26, 2016. Please review and let me know if you have any comments or concerns.

Meeting Date: May 26, 2016 at the SCRD Office

Meeting Attendees: Joanne Hirner, Rod Dalziel, Bryan Shoji, Dave Crosby, Shane Walkey, Bruce Ford, Andrew Mathewson, Brett deWynter.

Meeting Notes:

1. Meeting Overview: Due to the scheduled site visit to Chapman Lake being cancelled (low cloud level), an impromptu meeting was held at the Regional District Office. This meeting was held between BC Parks, the Regional District and AECOM.

2. It was verbally confirmed that a Park Use Permit to construct the permanent solution to allow for the surface of Chapman Lake to be lowered by an additional 5 m will not be provided for the 2016 construction season. Joanna confirmed that written notification of where additional information is required for the current Park Use application will be provided by June 3rd, 2016. This letter will include comments from Rod Dalziel regarding concerns from the Stakeholder meetings and any other functional concerns. It is envisioned that the letter provided by June 3rd, 2016 will be a complete set of comments from BC Parks regarding the current Park Use permit application.

3. One of the primary concerns noted by BC Parks were potential changes to the Chapman Lake site since the Whitehead report was published. Shane from the Regional District stated that he will search the archive for pictures (preferably aerial pictures) of Chapman at the time when the Whitehead report was published. The historical pictures can be used to visually note any changes in the Chapman Lake site during the past 15+ years.

4. Detailed bathometric survey and level data for Chapman Lake exists for the past few years. This data will be compiled to establish an estimate of the drawdown durations in the recent past and make projections about the future lake drawdown frequency and durations.

5. BC Parks will investigate and provide written notification confirming if the temporary syphon application needs to be re-submitted. It is preferable for the current permit to be extended. To minimize the chance of water shortages again this summer, the syphon may need to be installed this summer. Additionally the syphon will be needed next summer for the construction of the permanent solution meaning the temporary syphon permit needs to be extended to October 31, 2017.

6. It is expected that environmental field work and geotechnical investigations will need to be completed this summer to address the comments provided by BC Parks. It will be confirmed by BC Parks if a research permit needs to be completed for the field work that will occur during the summer of 2016 at the Chapman Lake site.

7. Rod noted that some Stakeholders have suggested that they have not been well informed about the project. It was requested that Rod provide a list of Stakeholders since it is the intension to meet with all the major park Stakeholders. It was also noted that the consultation efforts to date have been more heavily focused on the First Nation consultation and support prior to completing a broader communication effort. The First Nation consultation has been delayed due to the political challenges at the Sechelt Band.

8. It was confirmed that the consultation in the future will be focused meetings with the specific Stakeholders. It was also noted that the SCRD held open meetings with the community at several different locations during the week of May 16th and 25th, 2016. Drinking water supply issues were a major discussion item during the community meetings.

9. It was requested that a separate letter be provided from BC Parks stating that the permanent water supply solution for Chapman Lake can not be constructed during 2016. The delay to the project will be a significant concern for the Regional District Board. A separate letter stating that the project can not be constructed this summer is being requested for the communication to the Regional District Board. This letter is being requested by June 3rd, 2016, since there is a presentation to the Board scheduled for June 9th, 2016.

10. Rod noted that Ranger Training starts on the week of June 6th and continues for the next 2-weeks. It was also noted that BC Parks staff would like to attend the site prior to confirming all the notes regarding the planned Chapman Lake construction. This means we need to find a day during the week of May 30th, 2016 to complete the site visit to ensure the project is not further delayed. After the meeting the weather forecast was reviewed and the morning of Tuesday, May 31, 2016 was picked for the site visit.

Brett deWynter, P.Eng.
Water Group, Canada West

s.22

brett.deWynter@aecom.com

From: dewynter, Brett

Sent: Monday, April 25, 2016 10:54 AM

To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; Chris.Platz@gov.bc.ca; Jennie.Aikman@gov.bc.ca; Hirner, Joanna ENV:EX (Joanna.Hirner@gov.bc.ca)

Cc: Rod.Dalziel@gov.bc.ca

Subject: FW: Chapman Lake Water Supply Improvement - BC Parks Meeting

All:

Thanks for the meeting on Friday, April 8, 2016. Further to the meeting we confirm the following items:

1. Bryan Shoji of the Sunshine Coast Regional District confirmed that acceptance of the temporary syphon Park Use Permit was provided via e-mail to BC Parks on April 6, 2016.
2. The preliminary Park Use Plan that was submitted to BC Parks prior to the meeting was discussed. The indication from BC Parks was that the plan is acceptable however, it was noted that only a preliminary review of the documents had been completed. The areas where it was requested that AECOM focus prior to submitting the final documents to Front Corner BC is explaining the potential impacts of the construction activities complete with the mitigation plans.
3. It was noted that BC Parks has reached-out to other government agencies to obtain initial comments. One of the key comments received from DFO is to ensure minimum fish flows are maintained in the Chapman Creek. The minimum fish flow rate suggested in the meeting was roughly double the flow rate suggested in the Dave Bates report. The issue of the minimum low in Chapman Creek will only be improved with the completion of the proposed project at Chapman Lake, however, the debate about the minimum flow required in Chapman Creek is independent of this project. The Dave Bates report will be forwarded to BC Parks for information.
4. The consultation effort spent to date was summarized and provided in a document to BC Parks prior to the meeting. During the discussion it was indicated that the public consultation efforts spent to date seemed reasonable. BC Parks would prefer that the consultant/SCRD obtains a letter of non-objection from the Sechelt and Squamish First Nation communities. The consultation completed to date needs to continue and be documented. Once the letters of non-objection are obtained from the First Nations and the consultation with the community is completed the current indication is that this will be satisfactory for BC Parks. During the Park Use Permit review BC Parks would continue to reach-out to other government agencies and local governments.
5. BC Parks completed their own internal review of the documentation and currently hold the opinion that they have the legal ability to issue a Park Use Permit; however, this item is currently under review by the internal government lawyer. If there are any changes resulting in BC Parks not being able to issue the construction permit this year, BC Parks will inform the SCRD as soon as possible.
6. The tentatively planned schedule is:
 - a. AECOM will submit the Park Use Permit application during the week of April 11th, 2016;
 - b. AECOM will confirm the water license submission required and then make the application during the week of April 11th, 2016;
 - c. BC Parks will continue to review the construction plans and then the application once it is submitted. The internal review will be ongoing with a focus on the potential environmental impacts and the associate mitigation plan. BC Parks was invited to reach-out to AECOM or the SCRD during their document review if they have any questions and we would be happy to provide responses.
 - d. Depending on the rate of snow melt the plan is to complete a site visit. This site visit is tentatively planned for the second week of May 9th, 2016. The site visit will include 2 – 3 representatives from BC Parks, the SCRD, AECOM and a representative from In-situ (i.e. the Sechelt Band arch. consultant). The goal is to coordinate the site visit so everyone can be on-site together. This will allow any concerns to be reviewed and discussed while on-site.

Let us know if you have any further comments or concerns with the above notes. Please note that the Park-Use Permit application and Water License Amendment have been submitted to Front Counter BC. Thanks.

Brett deWynter, P.Eng.

s.22

From: dewynter, Brett

Sent: Thursday, April 07, 2016 11:06 AM

To: 'Platz, Chris ENV:EX'; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; Aikman, Jennie S ENV:EX; Hirner, Joanna ENV:EX; Rod.Dalziel@gov.bc.ca

Cc: Dave Crosby (Dave.Crosby@scrd.ca); Shane Walkey (Shane.Walkey@scrd.ca)

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks Meeting

All:

Further to our meeting planned for tomorrow we offer the following comments and discussion items:

1. It was discussed that the temporary permit issued last summer needs to be signed-off and finalized. This will be completed and an original signed copy hand delivered tomorrow.
2. The preferred plan is to complete the construction of the proposed works at Chapman Lake this summer to support the installation of the diversion of water to a total depth of 8.0 m. To support the efforts shown in the preliminary design drawing provided during the March 16, 2016 meeting a DRAFT Park Use-Permit application and the supporting documentation has been prepared. These DRAFT document are attached.
3. Revision to the water license are ongoing. There is currently some debate about the need to complete a new water license application versus an amendment to the existing license. There are active discussion with FLNR to clarify this item. For your information a DRAFT amendment application has been prepared.
4. The need for stakeholder consultation was discussed to meet the obligations of the BC Parks process. These efforts have been ongoing. The background documents are provided to summarize the consultation efforts completed to date with a summary of some of the key issues. A couple specific areas that we would like to discuss are:
 - a. what specific areas of interest we should explore further in order to fulfil BC Parks First Nations and Public

Participation requirements / expectations for a “comprehensive public consultation process” mentioned in the Tetrahedron Park Management Plan.

b. Other groups to consult / encourage participation.

5. BC Parks was going to investigate their files and documents to determine if the planned scope of work at Chapman Lake could be completed with an amendment. The results of this investigation will be shared with the project team. Once the background documents are reviewed and discussed we are hoping to reach consensus regarding the plan to advance the project.

Let us know if you have any further comments, otherwise we look forward to the meeting planned for tomorrow.

Thanks.

Brett deWynter, P.Eng.

s.22

-----Original Appointment-----

From: Platz, Chris ENV:EX [<mailto:Chris.Platz@gov.bc.ca>]

Sent: Wednesday, April 06, 2016 8:02 AM

To: Platz, Chris ENV:EX; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; dewynter, Brett; Aikman, Jennie S ENV:EX; Hirner, Joanna ENV:EX

Subject: Chapman Lake Water Supply Improvement - BC Parks Meeting

When: Friday, April 08, 2016 10:30 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada).

Where: ENV R North Van. 1610 Mount Seymour Road Main Fl RM N. Van (seats 10-20) ENV:EX

Good morning,

I am canvassing for agenda topics. Please send me your items and I will formulate an agenda for our meeting.

Chris

Hi all,

As discussed during our first meeting I am looking to book a follow-up meeting in early April; please let me know if this date works and if there is anyone else you would like invited to the meeting.

I will call for agenda items a few days ahead of the meeting but if you have any items now please send them along.

Chris

SCRD – Chapman Lake additional drawdown proposal

Summary of concerns raised by Tetrahedron Advisory Committee meeting 09 May 16

Attendance: Michel Frenette ((Tetrahedron Outdoor Club) (TOC)), Philip Gaulin (TOC), Vic Bonaguru (TOC), Duane Sept, Daniel Bouman (Tetrahedron Alliance), Cindy Harlow ((Sunshine Coast Conservation Association (SCCA)), Barry Janyk, Jason Hertz (SCCA), Rod Dalziel (BC Parks), George Smith ((unable to attend but provided comment (see below))

- 1999 Whitehead IA
 - 17 year old report is out of date and cannot be confidently relied on
 - What has changed since report?
 - Climate changes – wetter winters, drier summers, less and higher snowpack
 - Science has improved
 - Ecosystem classification advancements
 - Improved age class mapping
 - Updated Species at Risk data
- Limited Mountain Hemlock (MH) forests on the Sunshine Coast
 - Sensitive to disturbance
 - Difficult to maintain and rehab this zone
- Concerns around stability of lakeshore after drawdown (3-8m)
 - Turbidity and siltation
 - Sections of steep sided shoreline in proposed 8m drawdown
 - Referred to Tyson Lake IPP project as example of lake sedimentation
 - Noted that Whitehead did not adequately assess
- What should be included in further study and research
 - BC Parks not SCRD should commission IA and provide aspects of report
 - A soil specialist should assess area (shoreline, upland and drawdown area)
 - Testing bedrock depth and composition
 - Current and detailed analysis of fisheries values
 - Aquatic invertebrates
 - Hydrology
 - Adjacent forest water table
 - Aquatic vegetation
 - Long-term growth and development in the SCRD
 - Forest fire concern/threat
- Temporary siphon system
 - As is already approved should be tested this year to provide more time for application review
- SCRD decision and process
 - Should have referendum

- Strong opinion from most that alternate source options have not been adequately investigated
 - Greater study into existing aquifers in region
 - Feel SCRD is moving ahead with easiest and cheapest option not the best for the communities
 - Most identified need multiple water sources outside of Chapman watershed
- BC Parks mandate
 - Emphasized BC Parks must balance protection of park values and water needs as stated in Management Planning
- Public consultation
 - The intent of public consultation has changed from time described in Management Plan
 - Should be thorough public consultation
 - Not telling public what is being done and not considering public input
 - Public consultation is far from adequate thus far (09 May 16)
- Terms of Reference being requested
 - For 1999 IA
 - Current AECOM contract
 - What was scope of SCRD investigation for of options for additional municipal water source
- Consensus on final points
 1. Need current, improved Impact Assessment
 2. There is temporary short term solution in the siphon system
 3. Need more time to properly investigate other water sources

"My overriding concern is that the prime directive of BC Parks is to protect representative components of the ecological matrix of our province and that here in the Sunshine Coast Forest District the government has protected less than 3% of our land base. Thus the Tetrahedron has particular importance for biodiversity in BC and for the Sunshine Coast. Chapman Lake is the largest lake in Tetrahedron Park and at the heart of the little remaining unlogged forest. The water quality of Chapman Lake is dependent upon the natural land and water system within which Chapman sits. It is accurate that the park was created knowing full well that there was a small dam on Chapman and that the lake was central to the water supply for the SCRD, and that there was the capacity to draw down the lake up to 3 metres a year in years of drought. Further the management plan envisioned that at some point, modifications could be made to deal with future water requirements, if there was no option and if several steps were taken first to ensure responsible analysis, public involvement and appropriate management.

In the meantime, climate change, essentially unbridled development and population growth have increased the summer draw on water supply. Unfortunately the SCRD has done virtually nothing of real substance to create a long term water supply and management system that moves beyond dependency on one creek, which has experienced serious slope stability issues, the Chapman. They have done no real population growth analysis, no substantive aquifer analysis (like Gibsons, which discovered that they

have the aquifer capacity to provide water to 10,000 people per year in perpetuity), no real consideration of reservoir creation outside the Chapman watershed, no subsidizing of back yard water collection, no annual automatic summer prohibition of lawn and driveway watering, etc. They have initiated the water metering project, but as yet they have developed no real redundancy in their supply system. Increasing the dependency on one Chapman system seems a shortsighted engineering solution based on achieving the cheapest short term fix to a serious long term problem.

If I had confidence that the trenching of Chapman Lake was truly the only remaining option following consideration of all options by competent consultants aware of the full range of modern options and the importance of maintaining biodiversity, then I would agree with the trenching. Unfortunately, potentially annually dropping the water level 8 metres (that's 25 feet folks) will reduce a significant portion of the lake surface due to the rather conical bathymetry of the lake. From my point of view, this will turn a largely intact lake into nothing but a more sterile reservoir which will expose serious amounts of silt into the system, which will have serious impacts on the fish and wildlife and forest ecosystem that depend on the health of the lake.

Thus, I feel that Parks BC needs to ensure that the ecological impact analysis done before this project is approved, must be done to the highest standards. The earlier 1999 analysis is far from satisfactory; an in-depth update is necessary. Having a firm contracted by the proponent, the SCRD, is not sufficient. Parks must ensure that the study, the public review and the consultations with the shíshálh Nation are at the highest and fully transparent level. Parks must also be satisfied that the SCRD has truly conducted full analysis of options for long term water supply security that extend beyond the cheap Chapman Watershed options and build redundancy into the system.

Meanwhile, there is a real alternative means of resolving this situation rationally. The SCRD has already purchased the hardware for their proposed syphon system. They could install this "temporary" means of securing water supply during the peak of the potential summer drought for several years. At the same time, the SCRD could utilize the trenching budget to engage competent experts to examine the potential for alternate, long term means of providing water, such as: a full analysis of the aquifer potential in the SCRD area within and well beyond the Chapman watershed; analysis of where lower elevation impoundment reservoirs could be situated, within and outside the Chapman; the practicality of providing subsidies for backyard water collection systems; mandatory summer restrictions on watering lawns and driveways; conduct a regional growth management analysis, etcetera."

George Smith (email dated 29 April 16)

Review and Comment

Sunshine Coast Regional District (SCRD)'s Park Use Permit Amendment Application to Install Gravity-fed Withdrawal System to Access Additional Water from Chapman Lake (submitted April 2016)

Comments prepared by Joanna Hirner, Conservation Specialist, South Coast Region, BC Parks
June 8, 2016

Comments specific to the current PUP Amendment Application ("the Application"):

- a) **Rationale for the project:** The background and rationale justifying why this project is needed are not clearly described. Although the introduction of the Application describes that the SCRD Board approved the proposed project in the fall of 2015, details of previous processes and information considered leading up to this decision are not provided. The application should include a clear rationale for the project, including description and results of processes and studies that led to development of the proposed plan, and a description of the benefits of the project. The application should also provide information on alternative options that were considered, and why the proposal to withdraw additional water from Chapman Lake using a gravity-fed water system is the preferred option for dealing with long-term water scarcity issues.
- b) **Other water supply and demand management options:** The introduction states that the proposed additional capacity to drawdown water from Chapman Lake will "only be utilized during periods of drought and until the long term source development projects specified in the Comprehensive Regional Water Plan are constructed." What long-term source development projects are being referred to here, and what is the timeline for their construction? Are there demand management options (other than water metering) being considered or implemented that could further reduce the need for drawdown of Chapman Lake?
- c) **Information on past and future "drawdown regime":** The nature of the past and future "drawdown regime" (i.e. parameters such as frequency of drawdown to and below -3 m, maximum depth of annual drawdown, timing, duration and rate of drawdown, etc.) has important implications for assessment of impacts. More information about the past drawdown regime (particularly in the last 10 years), and clearer information about predicted drawdown regime in the future, is requested.

Specific comments/questions:

- i. We understand that extensive data from monitoring of drawdown is available from recent years. Can this information be presented to provide a better understanding of existing conditions? For example, over the past 10 or 20 years, what has been the duration (start/end) and timing of drawdown below 0 m? What is the average and range of depth of maximum drawdown?
- ii. The application states that the SCRD Board has passed a resolution committing to only draw water from below -3 m to avoid Stage 4 water restrictions (i.e. when Stage 3 restrictions are required). What are the criteria

that trigger Stage 3 and Stage 4 restrictions? Are data available on the timing and frequency of these restrictions in the past, and are there predictions about timing and frequency in the future?

- iii. Predictions about future water needs and drawdown appear to rely primarily on the Opus DaytonKnight (2013) assessment and Staats (2014). Information from these two studies is discussed separately in several parts of the application. Clarity about predicted drought frequency and “drawdown regime” could be improved if the results of both studies and how they relate to predicted drawdown regime were both discussed in detail the same section (i.e. Section 3.2.3 Water Quantity).
 - iv. According to the application, the Opus DaytonKnight (2013) analysis predicts that the current water supply is sufficient to support a 1 in 21 year low water return period, and taking into account predicted population growth and demand management (water metering), a 1 in 15 year drought return period by 2036. Does this mean that the probability of drawdown below -3 m is once every 21 years now, and once every 15 years by 2036?
 - v. Can the findings of the Staats (2014) report be further interpreted to make some specific predictions about drawdown regime in the lake? For example, the Staats (2014) report predicts that annual snow pack will be diminished and will melt earlier and more rapidly. Does this then mean that drawdown to -3 or lower is more likely to occur earlier and last longer in the future?
 - vi. Does Staats (2014) provide more quantitative predictions than those presented in the application? E.g. water scarcity issues are predicted to be more **frequent** in the near future; does Staats (2014) make more specific predictions about how frequently and how soon will this change occur? As another example, the Staats (2014) study apparently predicted that total water consumption during summer could **regularly** exceed the equivalent to the available water supply in the next 10 years if: 1) water demand does not change, 2) snow pack continues to decrease in winter, 3) summer temperatures increase by an average of 1 to 2°C, and 4) prolonged droughts become more common. What is meant by **regularly**, and how likely are the four factors listed here, that would cause the regular exceedance of the available water supply?
 - vii. The analysis done by Staats (2014) appears to indicate that climate change effects will cause the need for drawdown to be greater and more frequent (by some unknown quantity) than predicted in the Opus DaytonKnight (2013) assessment. Is our interpretation correct?
- d) **Hydrology of the Chapman Lake watershed:** The application should include an updated analysis of the hydrodynamics and recharge rates of Chapman Lake, as described in Section 3.2.1 of the application. Currently Section 3.2.1 relies on information from Whitehead (1999) which may now be out of date, especially because of changes in climate. In particular, the results of Staats (2014) suggest that recharge rates may have changed. As summarized in the application, “decreasing trends in precipitation were resulting in less recharge to storage reservoirs” and other changes may be resulting in

changes to “the entire water holding dynamic of the watershed”. Is there a danger of multiple years of drought and drawdown permanently lowering the water table?

- e) **Project description and construction plans:** There are many details still to be developed regarding the design and construction of the project, including footprint, schedule, construction techniques and design, etc. Many of these details have implications for the potential impacts of the project. BC Parks requests to review more detailed designs and plans as they are developed.

Some specific comments/questions:

- i) **Temporary construction area:** During the site visit on May 31, 2016, sensitive wetland and drainage features were observed in much of the temporary construction area identified in the current application. Environmental features observed included relatively large areas of moss and other vegetation characteristic of wetlands, small streams, small pools with egg masses of Northern Pacific Treefrog, Long-toed Salamander, and Northwestern Salamander, adult Long-toed Salamanders and Northern Pacific Treefrogs, and a fish (likely Dolly Varden) within a small stream reach. Within the temporary construction area, the area subject to previous disturbance during the original construction appears quite small and limited to higher ground (e.g. where the helicopter pad is located and higher ground to the northeast). The footprint of the construction area needs to be very carefully managed and minimized in order to protect the above mentioned sensitive values. Site clearing should be kept to a minimum and limited to previously disturbed areas. Strategies may include keeping equipment on exposed lakebed wherever possible, using raised platforms for structures or equipment that must be kept on land, building boardwalks to limit traffic to defined paths and minimize impacts to ground and vegetation, etc. BC Parks would like to see a plan detailing a more refined project footprint and mitigation measures to prevent impacts prior to construction.
- ii) **Equipment and machinery to be involved in project:** Related to the last comment regarding temporary construction area, BC Parks would like construction plans to identify the amount and types of equipment/machinery that will be involved in the project and where it will be placed on site.
- iii) **Determination of geotechnical information:** During the May 31, 2016, site visit there was some discussion of tests to be used to determine the nature of the rock in the trench and at the dam. There was some indication that if certain conditions of the rock were not met, the project would become infeasible. Is our interpretation of the discussion correct? If so, what is the likelihood that rock conditions could render this project infeasible? Testing to determine geotechnical conditions should occur early enough in the project to prevent unnecessary impacts (e.g. associated with set up of the construction area) if the project is determined infeasible.
- iv) **Site restoration:** The application references that site restoration/remediation/reclamation plans will be developed for temporary construction areas and for dealing with rock generated through construction. These plans would be a requirement of the permit, and BC Parks will require time to conduct a review and approve these plans prior to construction. The restoration plan should

include preservation and replacement of existing habitat features such as on-site large woody debris, and even vegetation if possible.

- v) **Other environmental management plans for construction and operations:** In addition to a site restoration plan, the application refers to several other environmental management plans, including spill prevention and response plans, wildlife and waste management plan for camp and construction site, water management plan for dealing with water during trenching, and sediment/erosion control plans. BC Parks will need to review and approve these plans and appreciates that a commitment has been made to provide them in Section 5 of the application. Plans should be provided for review as early as possible to allow BC Parks staff time to review and comment prior to construction.
- vi) **Invasive plants:** Environmental management plans must include measures to prevent introduction and spread of invasive plants. This should include ensuring all equipment and tools being brought to the site are clean and free of invasive plant parts. The site restoration plan should also include monitoring for invasive plants and immediate removal of any invasive plants detected.
- i) **Placement of intake:** The current design drawing shows that the bottom of the intake pipe is actually 9.2 m below high water. Would this then make it possible for drawdown below -8 m, either on purpose or through some kind of malfunction?
- f) **Sensitive species and ecosystems:** The lists of sensitive species and ecosystems is a list of species with potential to occur in the area, and does not include interpretation of the likelihood of occurrence in or around Chapman Lake, what the potential impacts might be to these species/ecosystems, and how impacts might be mitigated. This additional analysis needs to be added to the application.
- g) **Acid rock drainage:** Assessment of the potential for acid rock drainage resulting from blasting and installation of the gravity fed pipe is not mentioned in the application. Information on steps taken to ensure acid rock drainage does not occur should be provided.
- h) **Flows and fish in lower sections of Chapman Creek:** Although there may be fish immediately downstream of the dam in Chapman Creek within the park, the majority of fish and fish habitat values in Chapman Creek, including all anadromous species, are outside of the park. However, determination of appropriate flows for fish in the lower section of Chapman Creek is relevant to the impacts of this project in the park in the sense that the amount of flow required for fish will affect the amount of drawdown required from Chapman Lake. The higher the minimum flow requirements for fish, the more drawdown may be required from Chapman Lake if other sources of water or demand side management are not used to reduce water requirements from Chapman Lake. This increase in drawdown requirements would have implications for future drawdown regimes and associated impacts in the park during operations. There appears to be disagreement around what minimum flow is required to sustain fish in Chapman Creek. To clarify future flow requirements for fish, BC Parks would like to see some further analysis and discussion around this issue, in particular comparing work done by DFO in the 1990s which suggested a minimum flow of 0.3 m³/s, to the more recent work

by Dr. Dave Bates which suggests that current minimum flows of $0.22 \text{ m}^3/\text{s}$ set by the SCRD for fish may be acceptable. What would the implications of a $0.3 \text{ m}^3/\text{s}$ minimum flow requirement to the drawdown regime at Chapman Lake? It is important to note that Bates (2015) recommended further study and monitoring of salmonids and their habitat in the lower sections of Chapman Creek to confirm that $0.22 \text{ m}^3/\text{s}$ is acceptable. These studies should help clarify the issue of flow requirements, although the studies would not be a requirement for the permit application. The Bates (2015) report also identifies three locations in Chapman Creek where adult passage may be hampered at flows around $0.2 \text{ m}^3/\text{s}$, and suggests strategically timed water releases to help adult fish migrate upstream during low flows. The implications of such releases on drawdown regime should also be considered.

Comments regarding the Whitehead (1999) assessment and appropriateness of relying heavily on Whitehead (1999) for assessing impacts of current project:

- a) Whitehead (1999) based much of his impact assessment and its conclusions on the fact that Chapman Lake was already subject to seasonal disturbance through summer drawdown, and that under the "existing drawdown regime", no significant negative effects had been observed. The absence of negative effects under the existing regime was used to extrapolate that although increased drawdown would increase the severity of drawdown effects, the "seasonal timing and duration of drawdown (would) not change significantly relative to the existing regime without pumping", and thus Whitehead (1999) considered significant negative effects unlikely under increased drawdown.
- b) Existing conditions (drawdown regime, climate variables, etc.) most likely have changed between 1999 and the present. The fact that existing conditions were a key part of Whitehead's (1999) conclusions about impacts, and existing conditions have very likely changed since 1999, calls into question the appropriateness of using the Whitehead (1999) assessment of impacts for the current project.
- c) Field data included in Whitehead's (1999) assessment was limited. Field work done in support of the Whitehead (1999) assessment was done over a three day period in September 1998. For some values likely to be affected by drawdown, such as fish and water quality, the limited field data collected by Whitehead (1999) was the only recent field data available for assessing the status of these values.
- d) Whitehead (1999) acknowledged uncertainty in his conclusions about impacts, and recommended baseline (1999 growing season) and post-construction monitoring to allow for detection of unexpected impacts of increased drawdown. If impacts were detected, Whitehead (1999) recommended that adaptive management be used to mitigate impacts, including exploration of other water sources and demand management options to reduce drawdown. Presumably the limited amount of field data available was another reason why Whitehead (1999) recommended further baseline field sampling of several values prior to construction, and post-construction monitoring during operations.

- e) **In summary:** existing conditions of climate, drawdown regime, and/or environmental values have likely changed since 1999. Even if conditions have not changed, Whitehead's (1999) recommendation to conduct further field sampling both pre- and post-construction to support adaptive management and prevent unexpected negative impacts during operations still has merit. **Thus additional field sampling prior to project construction is recommended. The results of field sampling should be used to update the impact assessment provided as part of the current Park Use Permit application, and provided to BC Parks for further review and comment. The following section provides recommendations for additional field sampling and impact assessment.**

Comments and recommendations for additional field sampling and impact assessment:

- a) **Water quality:** Whitehead (1999) included a preliminary list of water quality parameters that should be monitored. A professional with expertise in limnology and water quality monitoring, especially as it relates to aquatic life values such as fish, should review Whitehead's (1999) recommendations and be involved in determining the appropriate baseline water quality parameters. Field visits should also be used to assess for evidence of sloughing of exposed sediments during drawdown and lake recharge, particularly after a large rain event. Further assessment of water quality parameters should also consider water quality issues specific to reservoirs with large drawdown. For example, high levels of methylmercury are known to be generated in newly created reservoirs but evidence also suggests that large drawdown in established reservoirs may also lead to increases in methylmercury formation (see Azimuth (2015)¹ and references therein, particularly from section 2.6.3). The implications of releases of hydrogen sulfide as observed by Whitehead (1999) should also be considered in assessing potential water quality impacts. Finally, Whitehead's (1999) assessment of potential impacts on water quality and aquatic resources included interpretation of bathymetric and hydrology information available at the time, as it related to lake drying, sloughing of lake bed sediments, etc. The assessment should be updated with the more recent bathymetry mapping that is now available and updated information about recent and future predicted hydrology.
- b) **Fish and fish habitat:**
- i) **General:** Whitehead (1999) recommended several parameters to be monitored to assess impacts on fish pre- and post-project. A professional with expertise in monitoring fish populations and habitat use should review Whitehead's (1999) recommendations and be involved in determining the appropriate parameters to be monitored. Important aspects of fish habitat should also be assessed. For example, monitoring of water quality parameters such as nitrogen and phosphorus can indicate lake productivity, as can monitoring of invertebrates. Temperature and oxygen profiles are also important for assessment of impacts on fish. Finally, drawdown over many years can change the substrate composition in the drawdown zone, which may

¹ <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/environment-sustainability/water-use-planning/lower-mainland/brgmon-12-yr2-2015-03-01.pdf>

have implications for fish habitat and productivity. Thus the current conditions of the substrate in areas of fish habitat should also be assessed.

- ii) **Dolly Varden:** There is limited information about fish in Chapman Lake, but Whitehead's (1999) sampling confirmed that there are Dolly Varden char in the lake. Although it is apparently unlikely that the fish are Bull Trout, an experienced fish biologist should visually confirm the fish in Chapman Lake are Dolly Varden. Recent discussions with fish biologists from the Ministry of Forests, Lands and Natural Resource Operations suggest that Dolly Varden char may be prevented from accessing their spawning streams during the drawdown period. Ad-fluvial char (i.e. those that spawn in tributary streams but otherwise sub-adults/adults live in lake) within the South Coast region have been documented migrating to spawning inlet streams in mid to late July and return to lake to overwinter as late as mid-November. In addition, Dolly Varden in cold water/high elevation systems such as Chapman Lake tend to migrate to spawning streams earlier in the summer than in warmer systems, increasing the probability that the period of greatest drawdown will overlap with spawning migrations. To understand the implications of drawdown on spawning, additional fish surveys should be designed to narrow down the timing and location of spawning char.
- iii) **Fish in Chapman Creek downstream of dam:** The assessment and field sampling regime should consider fish values immediately downstream of the dam, in terms of potential construction impacts but also in terms of potential temperature effects related to the pipe drawing water from below surface, which is known to lead to temperature effects in water released from reservoirs.
- c) **Amphibians:** Aquatic-breeding amphibians may be using the lake shore for breeding, and observations during the May 31, 2016 site visit confirm that amphibians are using adjacent wetlands for breeding. The presence of aquatic breeding amphibians and their habitat, and potential impacts of the project on these values, should be assessed. The potential for Chapman Creek to contain Coastal Tailed Frogs immediately downstream of the dam, and potential impacts to this species from construction and/or operations, should also be considered.
- d) **Other potential wildlife impacts:** Whitehead's (1999) assessment of potential impacts of drawdown related to wildlife and their access to water during drawdown should be re-evaluated based on current conditions observed during field visits. Construction and environmental management plans should include consideration of timing of sensitive periods for wildlife observed during field studies or suspected to be affected by project.
- e) **Vegetation and ecological community assessment and mapping:** Vegetation and ecological communities in the riparian and littoral areas of the lake are assumed to be sensitive to changes in climate and drawdown regime, including changes that may have occurred since 1999, and changes that may occur in the future.
 - i) The Whitehead (1999) assessment included mapping of different riparian habitat types, surficial materials, and "ecosystem units" (now called "ecological communities") around the lake. Given that the classification of ecological communities and the distribution of habitat types may have changed since the

Whitehead (1999) assessment was completed, this mapping and classification of ecological communities should be updated. The update is important in part because changes since the last assessment may reflect effects of changes in climate and drawdown regime since 1998. Changes in distribution of habitat types and ecological communities can also be used for monitoring ecological changes following implementation of the proposed project. In particular, the extent and distribution of wetland communities should be mapped and monitored because they are likely to be particularly sensitive to longer and deeper drawdown of Chapman Lake.

- ii) Whitehead (1999) surveyed several environmental parameters, including vegetation species and distribution, along nine transects perpendicular to the lakeshore. Transect locations were chosen to represent the diversity of riparian and littoral habitat conditions in the lake. These transect locations could be resampled to detect changes in since 1999, and to allow for continued monitoring post-project implementation. Alternatively, a new monitoring protocol could be developed involving different transect locations. The transects should include enough riparian area above the high water mark to detect changes in terrestrial vegetation that could be a result of more prolonged and/or deeper drawdown of the lake following implementation of the proposed project.
- iii) Pre-construction rare plant survey of construction footprint is proposed in section 4.1.1 and BC Parks supports surveying for rare plants within the temporary and permanent construction footprint.
- f) **Invertebrate monitoring:** As noted under “Fish and fish habitat” above, invertebrates are the main food source of fish and are indicators of lake productivity and water quality. Thus invertebrate sampling may be valuable as part of the pre- and post-project monitoring.
- g) **Post-construction monitoring plans:** Whitehead (1999) recommended monitoring of key parameters post-construction to allow for detection of unexpected or unacceptable impacts, and adaptive management. A plan for post-construction monitoring designed for this purpose should be developed and added to the current application.
- h) **Workplan for field study:** BC Parks would like to see a work plan for field studies planned as part of the updated impact assessment work.

RE: Chapman Lake Water Supply Improvement - BC Pa

Monday, October 16, 2016

2:39 PM

Subject	RE: Chapman Lake Water Supply Improvement - BC Par
From	Robinson, Bryan FLNR:EX
To	Dalziel, Rod ENV:EX; Jensen, Sandra L.S. FLNR:EX; 'McBain, Gr
Cc	Hirner, Joanna ENV:EX
Sent	Wednesday, June 15, 2016 9:33 AM

Hi Rod,

The attachments open perfectly this time

Thanks!

Cheers

Bryan

Bryan Robinson M.Sc., P.Geo.

Section Head, Surface Water

Ministry of Forests, Lands and Natural Resource Oper

South Coast Natural Resource Region

Phone: (604) 586-5629



From: Dalziel, Rod ENV:EX

Sent: Wednesday, June 15, 2016 9:33 AM

To: Jensen, Sandra L.S. FLNR:EX; Robinson, Bryan FLNR:EX; 'McBair

Cc: Hirner, Joanna ENV:EX

Subject: FW: Chapman Lake Water Supply Improvement - BC Parks

Bryan indicated he was not able to open the previous email. I am at a desktop now and this works.

From: Hirner, Joanna ENV:EX

Sent: Wednesday, June 8, 2016 7:41 AM

To: dewynter, Brett; Aikman, Jennie S ENV:EX; Dalziel, Rod E

Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey ([Shane](#)), Ford, Bruce; Bryan Shoji

Subject: Re: Chapman Lake Water Supply Improvement - BC Parks

Hello Brett,

Further to Jennie's letter yesterday, attached are detailed comments on the Use Permit application. Note that many of the comments attached include additional information to update the current application, so although these may be considered complete for the information that was presented in the April Permit application, BC Parks will want the opportunity to provide further comments.

Also, here are some further responses that hopefully address the rest of the items as discussed during the May 26, 2016 meeting:

Please find attached summary of Tetrahedron Advisory Committee meeting, prep A PUP amendment application will need to be submitted to extend the current air term siphon option" to 31 Oct 17.

Stakeholders that have reached out to BC Parks and whom wish to be included in process: Tetrahedron Advisory Committee, Tetrahedron Alliance, Sunshine Coast

Association, Tetrahedron Outdoor Club, Ruby Lake Lagoon Society.

Best regards,

Joanna

Joanna Hirner (RPBio)

Conservation Specialist

BC Parks, South Coast Region

604-924-2228

From: dewynter, Brett <Brett.dewynter@aecom.co

Sent: Monday, June 06, 2016 9:01 AM

To: Aikman, Jennie S ENV:EX; Dalziel, Rod ENV:EX; Hirner, Joanna

Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey ([Shane.](#))

Ford, Bruce; Bryan Shoji

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

Jennie/Rod/Joanna:

Further to the below notes, please confirm the status of Items 2, 5, 6, 7 and 9. We need these items today or tomorrow as there is a meeting with the SCRD Board on the 9th, 2016.

Thanks for your help.

Brett deWynter, P.Eng.

s.22

From: dewynter, Brett

Sent: Monday, May 30, 2016 8:58 AM

To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; [Jennie Aikmar](#)

[Rod.Dalziel@gov.bc.ca](#); Hirner, Joanna ENV:EX ([Joanna.Hirner@gov.bc.ca](#)); Shane

([Shane.Walkey@scrd.ca](#))

Cc: [Chris.Platz@gov.bc.ca](#)

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All: Provided below are the notes and key action items from our meeting on May 26, 2016. Please review and let me know if you have any comments or concerns.

Meeting Date: May 26, 2016 at the SCRD Office

Meeting Attendees: Joanne Hirner, Rod Dalziel, Bryan Shoji, Dave Crosby, Shane Walkey, Andrew Mathewson, Brett deWynter.

Meeting Notes:

1. Meeting Overview: Due to the scheduled site visit to Chapman Lake being cancelled (due to low water level), an impromptu meeting was held at the Regional District Office. This meeting was attended by representatives from BC Parks, the Regional District and AECOM.

2. It was verbally confirmed that a Park Use Permit to construct the permanent road on the surface of Chapman Lake to be lowered by an additional 5 m will not be provided for the current construction season. Joanna confirmed that written notification of where additional road is required for the current Park Use application will be provided by June 3rd, 2016. The meeting also included comments from Rod Dalziel regarding concerns from the Stakeholder meeting and other functional concerns. It is envisioned that the letter provided by June 3rd, 2016 will address these concerns.

3. One of the primary concerns noted by BC Parks were potential changes to the C-100 since the Whitehead report was published. Shane from the Regional District stated that he would search the archive for pictures (preferably aerial pictures) of Chapman Lake at the time the Whitehead report was published. The historical pictures can be used to visually confirm the location of the Chapman Lake site during the past 15+ years.

4. Detailed bathymetric survey and level data for Chapman Lake exists for the past 15 years. This data will be compiled to establish an estimate of the drawdown durations in the lake and to make projections about the future lake drawdown frequency and durations.

5. BC Parks will investigate and provide written notification confirming if the temporary permit application needs to be re-submitted. It is preferable for the current permit to be re-submitted to minimize the chance of water shortages again this summer, the syphon may need to be replaced.

summer. Additionally the syphon will be needed next summer for the construction solution meaning the temporary syphon permit needs to be extended to October 31.

6. It is expected that environmental field work and geotechnical investigations will be completed this summer to address the comments provided by BC Parks. It will be Parks if a research permit needs to be completed for the field work that will occur this summer of 2016 at the Chapman Lake site.

7. Rod noted that some Stakeholders have suggested that they have not been well informed about the project. It was requested that Rod provide a list of Stakeholders since it is the responsibility of the project to engage with all the major park Stakeholders. It was also noted that the consultation effort has been more heavily focused on the First Nation consultation and support prior to the current broader communication effort. The First Nation consultation has been delayed due to the weather.

8. It was confirmed that the consultation in the future will be focused meetings with the Stakeholders. It was also noted that the SCRD held open meetings with the community at different locations during the week of May 16th and 25th, 2016. Drinking water supply was a major discussion item during the community meetings.

9. It was requested that a separate letter be provided from BC Parks stating that the water supply solution for Chapman Lake can not be constructed during 2016. The water supply project will be a significant concern for the Regional District Board. A separate letter stating that the project can not be constructed this summer is being requested for the communication to the Regional District Board. This letter is being requested by June 3rd, 2016, since there is a meeting with the Board on June 3rd.

10. Rod noted that Ranger Training starts on the week of June 6th and continues for 4 weeks. It was also noted that BC Parks staff would like to attend the site prior to the training. Rod notes regarding the planned Chapman Lake construction. This means we need to complete the site visit to ensure the project is not delayed. After the meeting the weather forecast was reviewed and the morning of Tuesday, June 7th, 2016, was clear.

Brett deWynter, P.Eng.
Water Group, Canada West

s.22

brett.deWynter@aecom.com

From: dewynter, Brett

Sent: Monday, April 25, 2016 10:54 AM

To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; Chris.Platz@gov.bc.ca; Jennie.Aikman@gov.bc.ca; Hirner, Joanna ENV:EX (Joanna.Hirner@gov.bc.ca)

Cc: Rod.Dalziel@gov.bc.ca

Subject: FW: Chapman Lake Water Supply Improvement - BC Parks

All:

Thanks for the meeting on Friday, April 8, 2016. Further to the meeting we confirmed the following items:

1. Bryan Shoji of the Sunshine Coast Regional District confirmed that acceptance of the temporary syphon Park Use Permit was provided via e-mail to BC Parks on April 6, 2016.

2. The preliminary Park Use Plan that was submitted to BC Parks prior to the meeting was acceptable. The indication from BC Parks was that the plan is acceptable however, it was noted that a preliminary review of the documents had been completed. The areas where it was noted that AECOM focus prior to submitting the final documents to Front Corner BC is explain the impacts of the construction activities complete with the mitigation plans.

3. It was noted that BC Parks has reached-out to other government agencies to obtain comments. One of the key comments received from DFO is to ensure minimum fish flow is maintained in the Chapman Creek. The minimum fish flow rate suggested in the report is to roughly double the flow rate suggested in the Dave Bates report. The issue of the Chapman Creek will only be improved with the completion of the proposed project. At Chapman Lake, however, the debate about the minimum flow required in Chapman Creek is ongoing.

4. The consultation effort spent to date was summarized and provided in a document prior to the meeting. During the discussion it was indicated that the public consultation to date seemed reasonable. BC Parks would prefer that the consultant/SCRD obtain an objection from the Sechelt and Squamish First Nation communities. The consultation date needs to continue and be documented. Once the letters of non-objection are received from the First Nations and the consultation with the community is completed the current plan that this will be satisfactory for BC Parks. During the Park Use Permit review BC Parks will be able to provide a response.

5. BC Parks completed their own internal review of the documentation and current opinion that they have the legal ability to issue a Park Use Permit; however, this is currently under review by the internal government lawyer. If there are any changes resulting in being able to issue the construction permit this year, BC Parks will inform the SCRD as soon as possible.

6. The tentatively planned schedule is:

- a. AECOM will submit the Park Use Permit application during the week of April 11th, 2016;
- b. AECOM will confirm the water license submission required and then submit the application during the week of April 11th, 2016;
- c. BC Parks will continue to review the construction plans and then the application when it is submitted. The internal review will be ongoing with a focus on the potential environmental impacts and the associated mitigation plan. BC Parks was in contact with AECOM or the SCRD during their document review if they have any questions and we would be happy to provide responses.
- d. Depending on the rate of snow melt the plan is to complete a site visit tentatively planned for the second week of May 9th, 2016. The site visit will have 3 representatives from BC Parks, the SCRD, AECOM and a representative from the Sechelt Band arch. consultant). The goal is to coordinate the site visit so that everyone can be on-site together. This will allow any concerns to be reviewed and addressed.

Let us know if you have any further comments or concerns with the above notes. The Park-Use Permit application and Water License Amendment have been submitted to Counter BC. Thanks.

Brett deWynter, P.Eng.

s.22

From: dewynter, Brett

Sent: Thursday, April 07, 2016 11:06 AM

To: 'Platz, Chris ENV:EX'; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; Aikman, Hirner, Joanna ENV:EX; Rod.Dalziel@gov.bc.ca

Cc: Dave Crosby (Dave.Crosby@scrd.ca); Shane Walkey (Shane.Walkey@scrd.ca)

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All:

Further to our meeting planned for tomorrow we offer the following comments and items:

1. It was discussed that the temporary permit issued last summer needs to be signed and finalized. This will be completed and an original signed copy hand delivered tomorrow.
2. The preferred plan is to complete the construction of the proposed works at Chapman Lake this summer to support the installation of the diversion of water to a total depth of 8. The efforts shown in the preliminary design drawing provided during the March 16th DRAFT Park Use-Permit application and the supporting documentation has been provided. The DRAFT document are attached.
3. Revision to the water license are ongoing. There is currently some debate about whether to complete a new water license application versus an amendment to the existing license. There is an active discussion with FLNR to clarify this item. For your information a DRAFT amendment application has been prepared.

4. The need for stakeholder consultation was discussed to meet the obligations of the process. These efforts have been ongoing. The background documents are provided. The consultation efforts completed to date with a summary of some of the key issues in specific areas that we would like to discuss are:

- a. what specific areas of interest we should explore further in order to fulfil First Nations and Public Participation requirements / expectations for a “public consultation process” mentioned in the Tetrahedron Park Management Plan
- b. Other groups to consult / encourage participation

5. BC Parks was going to investigate their files and documents to determine if the project work at Chapman Lake could be completed with an amendment. The results of this will be shared with the project team.

Once the background documents are reviewed and discussed we are hoping to re-engage regarding the plan to advance the project.

Let us know if you have any further comments, otherwise we look forward to the meeting for tomorrow. Thanks.

Brett deWynter, P.Eng.

s.22

-----Original Appointment-----

From: Platz, Chris ENV:EX [mailto:Chris.Platz@gov.bc.ca]

Sent: Wednesday, April 06, 2016 8:02 AM

To: Platz, Chris ENV:EX; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; dewynter, Jennie S ENV:EX; Hirner, Joanna ENV:EX

Subject: Chapman Lake Water Supply Improvement - BC Parks Meeting

When: Friday, April 08, 2016 10:30 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada)

Where: ENV R North Van. 1610 Mount Seymour Road Main Floor N. Van (seats 100)
Good morning,

I am canvassing for agenda topics. Please send me your items and I will formulate a meeting.

Chris

Hi all,

As discussed during our first meeting I am looking to book a follow-up meeting in May. Please let me know if this date works and if there is anyone else you would like invited to the meeting. I will call for agenda items a few days ahead of the meeting but if you have any items to send them along.

Chris

RE: SCRD PUP ammendment application Chapman Lake

Friday, October 13, 2017
2:13 PM

Subject	RE: SCRD PUP ammendment application Chapman Lake
From	Hirner, Joanna ENV:EX
To	Willcox, Michael FLNR:EX
Cc	Dalziel, Rod ENV:EX
Sent	Wednesday, June 15, 2016 10:43 AM
Attachments	 April PUP Amendme...

Hi Mike,

I sent the attached comments to the SCRD last week. Hopefully they reflect what we discussed but if you have time to take a look at them and notice that I missed anything important, please let me know. Thanks!

Joanna

-----Original Message-----

From: Willcox, Michael FLNR:EX
 Sent: Wednesday, June 15, 2016 5:46 AM
 To: Dalziel, Rod ENV:EX
 Cc: Hirner, Joanna ENV:EX
 Subject: Re: SCRD PUP ammendment application Chapman Lake

Hi Rod,

I won't be participating today as I'll be out in the field. I'm still our point man for technical fish issues and trust Joanna will be in touch if and when our input is necessary.

Regards,

Mike

Sent from my iPhone

> On Jun 14, 2016, at 8:26 AM, Dalziel, Rod ENV:EX <Rod.Dalziel@gov.bc.ca> wrote:

>

> Opps Sorry folks I just noticed the times were PM not AM. I hope most are still available for a quick update call.

>

>

> Thanks for the meeting on Wednesday everyone. The next scheduled meeting will be June 15th to provide updates and further discussion.

>

> Call 1-877-353-9184

> Participant **s.17**

>

>

> -----

> -----

> ----- Taking another crack at scheduling a meeting where

> more can attend. Tough to find a time with minimal conflicts so I hope this works.

>

>

>

> -----

> -----

> ----- If you are unable to attend in person we can arrange to have

> you attend by conference call (I will provide call in details if required).

>

> Some of you are aware that the Sunshine Coast Regional District (SCRD) has hired a consulting company, AECOM, to

oversee a project proposal to increase drawdown of Chapman Lake, located in the Class A Tetrahedron Provincial Park, to supply domestic water for residents of the Sunshine Coast. This is likely a grandfathered allowable use within the park (awaiting legal opinion). They have submitted a Park Use Permit amendment application on 29 April 16 to authorize this. They are relying on a EIA completed in 1999 as their requirement for an Impact Assessment. BC Parks is in the process of adjudicating the proposal. You are invited to provide comment and raise potential concerns with the proposal.

>

> If you require further documents or information please let Rod Dalziel know.

>

>

> <meeting.ics>

RE: Chapman Lake Water Supply Improvement - BC Pa

Monday, October 16, 2016

2:47 PM

Subject	RE: Chapman Lake Water Supply Improvement - BC Par
From	Ford, Bruce
To	Hirner, Joanna ENV:EX; Dalziel, Rod ENV:EX
Sent	Tuesday, June 28, 2016 5:04 PM

Joanna/Rod:

We are preparing a work plan for approval by the SCRD for a 2016 field program to address the items you identified in your June 8 email. It appears that there are two sources of mapping for the Chapman Lake area. The first is a Broad Ecosystem Inventory Layer in iMap but is apparently available to internal users and not available to the public. Is there any process that would be available for AECOM or the SCRD to request access to this layer? The second is terrestrial ecosystem mapping of the Chapman Lake area developed by the BC Parks in 1997. I assume they did this as part of their planning process before the area was designated as a Park. By any chance would Parks have a copy of this mapping? If not we will try to

We are hoping to get a Park Use Permit for Research into FrontCounter before the end of the summer and we hope to be able to do the field work in early to mid-August. Do you think it is possible to have a permit to work in the park in that time frame?

Thanks

Bruce S. Ford, MRM, R.P.Bio
Senior Environmental Biologist
Phone: 604-444-6449
Cell: 604-787-3011

-----Original Message-----

From: Hirner, Joanna ENV:EX [mailto:Joanna.Hirner@gov.bc.ca]
Sent: Wednesday, June 08, 2016 7:41 AM
To: dewynter, Brett; Aikman, Jennie S ENV:EX; Dalziel, Rod E
Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey (Shane Walkey); Ford, Bruce; Bryan Shoji
Subject: Re: Chapman Lake Water Supply Improvement - BC Parks

Hello Brett,

Further to Jennie's letter yesterday, attached are detailed comments on the current application. Note that many of the comments attached include requests for additions to update the current application, so although these comments can be considered as additional information that was presented in the April 2016 Park Use Permit application, BC Parks has the opportunity to provide further comments as additional information about the project.

Also, here are some further responses that hopefully address the rest of the outs discussed during the May 26, 2016 meeting:

Please find attached summary of Tetrahedron Advisory Committee meeting, prep

A PUP amendment application will need to be submitted to extend the current air term siphon option" to 31 Oct 17.

Stakeholders that have reached out to BC Parks and whom wish to be included in process: Tetrahedron Advisory Committee, Tetrahedron Alliance, Sunshine Coast Association, Tetrahedron Outdoor Club, Ruby Lake Lagoon Society.

Best regards,
Joanna

Joanna Hirner (RPBio)
Conservation Specialist
BC Parks, South Coast Region
604-924-2228

From: dewynter, Brett <Brett.dewynter@aecom.co>
Sent: Monday, June 06, 2016 9:01 AM
To: Aikman, Jennie S ENV:EX; Dalziel, Rod ENV:EX; Hirner, Joanna
Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey (Shane.)
Ford, Bruce; Bryan Shoji
Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

Jennie/Rod/Joanna:

Further to the below notes, please confirm the status of Items 2, 5, 6, 7 and 9. We review these items today or tomorrow as there is a meeting with the SCRD Board on the 9th, 2016.

Thanks for your help.

Brett deWynter, P.Eng.
s.22

From: dewynter, Brett
Sent: Monday, May 30, 2016 8:58 AM
To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; Jennie.Aikman
Rod.Dalziel@gov.bc.ca; Hirner, Joanna ENV:EX (Joanna.Hirner@gov.bc.ca); Shane
(Shane.Walkey@scrd.ca)
Cc: Chris.Platz@gov.bc.ca
Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All: Provided below are the notes and key action items from our meeting on May 26, 2016. Please review and let me know if you have any comments or concerns.

Meeting Date: May 26, 2016 at the SCRD Office Meeting Attendees: Joanne Hirner, Bryan Shoji, Dave Crosby, Shane Walkey, Bruce Ford, Andrew Mathewson, Brett deWynter

Meeting Notes:

1. Meeting Overview: Due to the scheduled site visit to Chapman Lake being cancelled, an impromptu meeting was held at the Regional District Office. This meeting was between BC Parks, the Regional District and AECOM.

2. It was verbally confirmed that a Park Use Permit to construct the permanent siphon on the surface of Chapman Lake to be lowered by an additional 5 m will not be provided this construction season. Joanna confirmed that written notification of where additional siphon required for the current Park Use application will be provided by June 3rd, 2016. This will include comments from Rod Dalziel regarding concerns from the Stakeholder meeting and other functional concerns. It is envisioned that the letter provided by June 3rd, 2016.

3. One of the primary concerns noted by BC Parks were potential changes to the landscape since the Whitehead report was published. Shane from the Regional District stated that he will search the archive for pictures (preferably aerial pictures) of Chapman at the time the Whitehead report was published. The historical pictures can be used to visually note changes to the Chapman Lake site during the past 15+ years.

4. Detailed bathometric survey and level data for Chapman Lake exists for the past 15 years. This data will be compiled to establish an estimate of the drawdown durations in the future. This will make projections about the future lake drawdown frequency and durations.

5. BC Parks will investigate and provide written notification confirming if the temporary siphon application needs to be re-submitted. It is preferable for the current permit to be extended to minimize the chance of water shortages again this summer, the siphon may need to be installed this summer. Additionally the siphon will be needed next summer for the construction of the permanent solution meaning the temporary siphon permit needs to be extended to October 31st.

6. It is expected that environmental field work and geotechnical investigations will be completed this summer to address the comments provided by BC Parks. It will be confirmed with BC Parks if a research permit needs to be completed for the field work that will occur this summer of 2016 at the Chapman Lake site.

7. Rod noted that some Stakeholders have suggested that they have not been well informed about the project. It was requested that Rod provide a list of Stakeholders since it is the responsibility of the Regional District with all the major park Stakeholders. It was also noted that the consultation effort has been more heavily focused on the First Nation consultation and support prior to a broader communication effort. The First Nation consultation has been delayed due to the project.

8. It was confirmed that the consultation in the future will be focused meetings with the Stakeholders. It was also noted that the SCRDP held open meetings with the community at different locations during the week of May 16th and 25th, 2016. Drinking water supply was a major discussion item during the community meetings.

9. It was requested that a separate letter be provided from BC Parks stating that the permanent water supply solution for Chapman Lake can not be constructed during 2016. The project will be a significant concern for the Regional District Board. A separate letter stating that the project can not be constructed this summer is being requested for the communication to the Regional District Board. This letter is being requested by June 3rd, 2016, since there is a deadline for the project.

10. Rod noted that Ranger Training starts on the week of June 6th and continues for 4 weeks. It was also noted that BC Parks staff would like to attend the site prior to the training to take notes regarding the planned Chapman Lake construction. This means we need to complete the site visit by the week of May 30th, 2016 to ensure the project is not delayed. After the meeting the weather forecast was reviewed and the morning of Tuesday June 7th, 2016.

Brett deWynter, P.Eng.
Water Group, Canada West

<??

brett.deWynter@aecom.com<mailto:brett.deWynter@aecom.com>

From: dewynter, Brett
Sent: Monday, April 25, 2016 10:54 AM
To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce;
Chris.Platz@gov.bc.ca<mailto:Chris.Platz@gov.bc.ca>;
Jennie.Aikman@gov.bc.ca<mailto:Jennie.Aikman@gov.bc.ca>; Hirner, Joanna EN'
(Joanna.Hirner@gov.bc.ca<mailto:Joanna.Hirner@gov.bc.ca>)
Cc: Rod.Dalziel@gov.bc.ca<mailto:Rod.Dalziel@gov.bc.ca>
Subject: FW: Chapman Lake Water Supply Improvement - BC Parks I

All;

Thanks for the meeting on Friday, April 8, 2016. Further to the meeting we confirm the following items:

1. Bryan Shoji of the Sunshine Coast Regional District confirmed that acceptance of the Park Use Permit was provided via e-mail to BC Parks on April 6, 2016.
2. The preliminary Park Use Plan that was submitted to BC Parks prior to the meeting. The indication from BC Parks was that the plan is acceptable however, it was noted that a preliminary review of the documents had been completed. The areas where it was noted that AECOM focus prior to submitting the final documents to Front Corner BC is explain impacts of the construction activities complete with the mitigation plans.
3. It was noted that BC Parks has reached-out to other government agencies to obtain comments. One of the key comments received from DFO is to ensure minimum fish flow maintained in the Chapman Creek. The minimum fish flow rate suggested in the report is roughly double the flow rate suggested in the Dave Bates report. The issue of the Chapman Creek will only be improved with the completion of the proposed project. However, the debate about the minimum flow required in Chapman Creek is ongoing.
4. The consultation effort spent to date was summarized and provided in a document prior to the meeting. During the discussion it was indicated that the public consultation to date seemed reasonable. BC Parks would prefer that the consultant/SCRD obtain objection from the Sechelt and Squamish First Nation communities. The consultation needs to continue and be documented. Once the letters of non-objection are received from the First Nations and the consultation with the community is completed the current status of the Park Use Permit will be satisfactory for BC Parks. During the Park Use Permit review BC Parks will be able to issue the construction permit this year, BC Parks will inform the SCRD of the status of the permit.
5. BC Parks completed their own internal review of the documentation and current status of the permit. BC Parks has the legal ability to issue a Park Use Permit; however, this is currently under review by the internal government lawyer. If there are any changes resulting from the review, BC Parks will inform the SCRD of the status of the permit.
6. The tentatively planned schedule is:
 - a. AECOM will submit the Park Use Permit application during the week of April 11, 2016.

- b. AECOM will confirm the water license submission required and then make the a the week of April 11th, 2016;
- c. BC Parks will continue to review the construction plans and then the application submitted. The internal review will be ongoing with a focus on the potential envirc and the associate mitigation plan. BC Parks was invited to reach-out to AECOM or their document review if they have any questions and we would be happy to prov
- d. Depending on the rate of snow melt the plan is to complete a site visit. This site planned for the second week of May 9th, 2016. The site visit will include 2 - 3 repre BC Parks, the SCRd, AECOM and a representative from In-situ (i.e. the Sechelt Ban consultant). The goal is to coordinate the site visit so everyone can be on-site toge allow any concerns to be reviewed and discussed while on-site.

Let us know if you have any further comments or concerns with the above notes. the Park-Use Permit application and Water License Amendment have been submi Counter BC. Thanks.

Brett deWynter, P.Eng.

s.22

From: dewynter, Brett
 Sent: Thursday, April 07, 2016 11:06 AM
 To: 'Platz, Chris ENV:EX'; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; Aikman, . Hirner, Joanna ENV:EX; Rod.Dalziel@gov.bc.ca<mailto:Rod.Dalziel@gov.bc.ca>
 Cc: Dave Crosby (Dave.Crosby@scrd.ca<mailto:Dave.Crosby@scrd.ca>); Shane W (Shane.Walkey@scrd.ca<mailto:Shane.Walkey@scrd.ca>)
 Subject: RE: Chapman Lake Water Supply Improvement - BC Parks 1

All:

Further to our meeting planned for tomorrow we offer the following comments a items:

1. It was discussed that the temporary permit issued last summer needs to be sigl finalized. This will be completed and an original signed copy hand delivered tomo
2. The preferred plan is to complete the construction of the proposed works at Ch summer to support the installation of the diversion of water to a total depth of 8. the efforts shown in the preliminary design drawing provided during the March 16 DRAFT Park Use-Permit application and the supporting documentation has been p DRAFT document are attached.
3. Revision to the water license are ongoing. There is currently some debate abou complete a new water license application versus an amendment to the existing li active discussion with FLNR to clarify this item. For your information a DRAFT am application has been prepared.
4. The need for stakeholder consultation was discussed to meet the obligations o process. These efforts have been ongoing. The background documents are provid the consultation efforts completed to date with a summary of some of the key iss specific areas that we would like to discuss are:

a. what specific areas of interest we should explore further in order to fulfil BC Pa and Public Participation requirements / expectations for a "comprehensive public process" mentioned in the Tetrahedron Park Management Plan.

b. Other groups to consult / encourage participati

5. BC Parks was going to investigate their files and documents to determine if the work at Chapman Lake could be completed with an amendment. The results of this will be shared with the project team.

Once the background documents are reviewed and discussed we are hoping to re regarding the plan to advance the project.

Let us know if you have any further comments, otherwise we look forward to the for tomorrow. Thanks.

Brett deWynter, P.Eng.

s.22

-----Original Appointment-----

From: Platz, Chris ENV:EX [<mailto:Chris.Platz@gov.bc>]

Sent: Wednesday, April 06, 2016 8:02 AM

To: Platz, Chris ENV:EX; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; dewynter, Jennie S ENV:EX; Hirner, Joanna ENV:EX

Subject: Chapman Lake Water Supply Improvement - BC Parks IV

When: Friday, April 08, 2016 10:30 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada)

Where: ENV R North Van. 1610 Mount Seymour Road Main Fl RM N. Van (seats 1

Good morning,

I am canvassing for agenda topics. Please send me your items and I will formulate a meeting.

Chris

Hi all,

As discussed during our first meeting I am looking to book a follow-up meeting in May. Please let me know if this date works and if there is anyone else you would like invited to

I will call for agenda items a few days ahead of the meeting but if you have any items please send them along.

Chris

RE: Chapman Lake Water Supply Improvement - BC Pa

Monday, October 16, 2016

2:49 PM

| | |
|----------------|---|
| Subject | RE: Chapman Lake Water Supply Improvement - BC Par |
| From | Dalziel, Rod ENV:EX |
| To | Hirner, Joanna ENV:EX |
| Cc | Platz, Chris ENV:EX; Aikman, Jennie S ENV:EX |
| Sent | Tuesday, July 19, 2016 9:37 AM |

Hello Joanna,

With our considerable wet summer I have been having concerns with the fact that Chapman Lake will not be dropping as it has in the past years. Which it seems to me an assessment of low water levels can not be conducted and that they may not be able to run the siphon pump. I raised this with Chris before he left and seemed to share my concerns.

Also FYI...I noticed this post from the SCRD on social media

[http://www.scrd.ca/files/File/Infrastructure/Water/2016-JUL-13-Chapman Lake Expansion Project FAQ.pdf](http://www.scrd.ca/files/File/Infrastructure/Water/2016-JUL-13-Chapman_Lake_Expansion_Project_FAQ.pdf)

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environment

: PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N

0: Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885

5: Rod.Dalziel@gov.bc.ca

Visit the BC Parks website @ bcparks.ca

-----Original Message-----

From: dewynter, Brett [<mailto:Brett.dewynter@aecom.ca>]

Sent: Tuesday, July 19, 2016 9:23 AM

To: Hirner, Joanna ENV:EX

Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dalziel, Rod ENV:EX; Aikman, Jennie Crosby; Shane Walkey (Shane.Walkey@scrd.ca); Ford, Bruce; Bryan Shoji

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

Joanna:

Further to the below note we have been working on trying to advance the program with additional field monitoring. The plan is to hopefully be on-site by mid-August. Based on the current water level in Chapman Lake and the weather expected over the next few weeks it is likely that the minimum water level will be some level greater than 3 m below full. We are closely monitoring the weather and the water level in Chapman Lake and may delay the investigation 1-week to optimize the on-site data collection, but can not delay any longer.

From a water supply perspective draining Chapman Lake to optimize the data collection for the environmental field monitoring program is too risky. It is still our opinion that we will use our professional judgement to compare the data collected this summer to the legal Whitehead report. Using the two sets of data we intend to provide responses to them in your letter dated June 8, 2016.

We do not know the exact water depth that will be present in Chapman Lake during the summer.

field investigations, but it is not expected to be 3 m below full pool. Given this please now if you have any concerns regarding the planned approach (i.e. Completing the investigations and data collection is expensive. It would be disappointing if the expectation but the data collected does not meet the expectations of the BC Parks review team.

We look forward to your comments. Thank:

Brett deWynter, P.Eng.

s.22

-----Original Message-----

From: Hirner, Joanna ENV:EX [mailto:Joanna.Hirner@gov.bc.ca]

Sent: Wednesday, June 08, 2016 7:41 AM

To: dewynter, Brett; Aikman, Jennie S ENV:EX; Dalziel, Rod E

Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey (Shane.)

Ford, Bruce; Bryan Shoji

Subject: Re: Chapman Lake Water Supply Improvement - BC Parks

Hello Brett,

Further to Jennie's letter yesterday, attached are detailed comments on the current application. Note that many of the comments attached include requests for additions to update the current application, so although these comments can be considered information that was presented in the April 2016 Park Use Permit application, BC Parks has the opportunity to provide further comments as additional information about the project.

Also, here are some further responses that hopefully address the rest of the outstanding issues discussed during the May 26, 2016 meeting:

Please find attached summary of Tetrahedron Advisory Committee meeting, prepared by me.

A PUP amendment application will need to be submitted to extend the current "at term siphon option" to 31 Oct 17.

Stakeholders that have reached out to BC Parks and whom wish to be included in the process: Tetrahedron Advisory Committee, Tetrahedron Alliance, Sunshine Coast Association, Tetrahedron Outdoor Club, Ruby Lake Lagoon Society.

Best regards,
Joanna

Joanna Hirner (RPBio)
Conservation Specialist
BC Parks, South Coast Region
604-924-2228

From: dewynter, Brett <Brett.dewynter@aecom.com>

Sent: Monday, June 06, 2016 9:01 AM

Chapman Lake fish sampling

Thursday, October 12, 2017

8:55 AM

| | |
|---------|-----------------------------------|
| Subject | Chapman Lake fish sampling |
| From | Dalziel, Rod ENV:EX |
| To | Willcox, Michael FLNR:EX |
| Cc | Hirner, Joanna ENV:EX |
| Sent | Monday, July 25, 2016 3:09 PM |

Hello Mike,

As you are aware BC Parks has requested additional research and field study prior to making a decision on the SCRD's PUP amendment application and you have had some discussions with Joanna. I have received their application for a Research PUP to conduct this work. I am hoping for your opinion on the adequacy on the fish and habitat section they submitted (see below).

"

3. Fish and Fish Habitat Assessment:

- Fish sampling would follow the protocol used by Whitehead to collect comparable data. Whitehead used a net similar to the standard gill net prescribed in provincial guidelines for lake surveys. We propose to use the BC RISC standard lake survey gill nets, one floating and one sinking set perpendicular to the shore. However, rather than an overnight set used by Whitehead we will use a 2 – 3 hour set. If not fish are caught in that time the nets will be redeployed for another 2 – 3 hours. Minnow traps would be used along the shoreline of the lake. Minnow traps and electrofishing would be used to sample fish in the streams flowing into the lake and to sample for fish immediately downstream of the dam. Scale samples will be collected from up to 15 fish per species caught (various sizes to develop an understanding of the growth rate and age range of fish in the lake).
- Fish habitat for the lake will be collected as part of the limnology program as described above. Habitat data will also be collected from the inlet streams that are likely used for spawning by the trout and char found in the lake. The habitat survey will extend 500 m upstream from the lake or to the closest impassable barrier if it is less than 500 m from lake. "

Please let me know if you have any questions.

Cheers,

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environment

PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N 3A0

Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-2445

Email: Rod.Dalziel@gov.bc.ca

Visit the BC Parks website @ bcparks.ca



BC Parks

RE: AECOM Research PUP application

Friday, October 13, 2017

9:37 AM

| | |
|---------|--|
| Subject | RE: AECOM Research PUP application |
| From | Dalziel, Rod ENV:EX |
| To | Hirner, Joanna ENV:EX |
| Cc | Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX |
| Sent | Monday, July 25, 2016 3:59 PM |

Hello Joanna and Jennie,

I have completed a review of the Research PUP application. My first impression is that it is very poor layout and light/limited in the scope of the additional field sampling.

My comments and concerns:

- How much say do we have in who they hire to conduct the Environmental Impact Assessment (EIA)? As I assume it would certainly be a conflict if AECOM were to conduct the research.
 - ie. the professionals required and appropriate certification
 - do we require a Qualified Environmental Professional (QEP)?
 - Fisheries, water quality, limnology specialists
- They failed to complete, sign and date Part 4 (Certification) of application
- We will need to adjust dates requested (Aug 1-12)
- We will need confirmation of Wildlife Act permits for sampling and collection
- As we have not heard an update on FN consultation we will need to request where this is at? **Jennie** will we need a separate consultation on the Research PUP application?
- They indicate they anticipate incorporating the results into the report with the April PUP application. Should we request a separate EIA report as well?
- At the end of the first paragraph in their "workplan" document it states "...the following is a brief description of the proposed work." Should this not be a detailed description of scope of work?
- Geotechnical testing was not mentioned in "workplan".
- In Joanna's review pg.6 a) it requests further assessment of methylmercury etc.. which is not mentioned in "workplan".
- Nothing mentioned in "workplan" about JH review pg.7 b)iii) downstream fish and creek (in park)
- Is AECOM "workplan" 4. – using 1997 Interfor ecosystem mapping sufficient?
- In "workplan" 4. – it notes survey of rare and medicinal plants. Should this be expanded to include sensitive plant species and ecosystems?
- I will assume there is considerably more scientific info that I did not identify that was not included in the "workplan".

As this additional field study is potentially expensive and difficult to coordinate it seems we would want to ensure that as much as possible of we are hoping for is collected during their sampling window.

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environment

✉: PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N 3A0

☎: Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-2445

✉: Rod.Dalziel@gov.bc.ca

Visit the BC Parks website @ bcparks.ca



From: Dalziel, Rod ENV:EX
Sent: Thursday, July 21, 2016 1:33 PM
To: Hirner, Joanna ENV:EX
Subject: AECOM Research PUP application

Hello Joanna,

Here are the documents associated with the application. I have stored them here V:\1_PPA Files\S
Coast Region\PPA Ops\Areas\Sunshine Coast Area\Park Use Permits (PUPs)\Sunshine Coast Regional
District\PUP 102714 Chapman Lake water infrastructure\Research PUP

Happy reading.

Rod Dalziel

Sunshine Coast Area Supervisor
BC Parks - South Coast Region - Ministry of Environment
✉: PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N 3A0
☎: Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-2445
✉: Rod.Dalziel@gov.bc.ca
Visit the BC Parks website @ bcparks.ca



7RE: Chapman Lake Water Supply Improvement - BC Pa

Monday, October 16, 2016

2:50 PM

| | |
|----------------|---|
| Subject | RE: Chapman Lake Water Supply Improvement - BC Par |
| From | Dalziel, Rod ENV:EX |
| To | Hirner, Joanna ENV:EX |
| Sent | Monday, July 25, 2016 4:27 PM |

Hello Joanna,

Sorry I meant to respond last week. I don't quite understand why they can't delay lower water may be expected. They are only planning 4-5 days of field work. The have is from your first point it would be good or it would be required to complete low water and a range of water levels.

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environm

*: PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N

(: Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885

7: HYPERLINK "mailto:Rod.Dalziel@gov.bc.ca" Rod.Dalziel@gov

Visit the BC Parks website @ HYPERLINK "http://bcparks.ca/" bcp

From: Hirner, Joanna ENV:EX

Sent: Monday, July 25, 2016 3:51 PM

To: Dalziel, Rod ENV:EX

Subject: FW: Chapman Lake Water Supply Improvement - BC Parks I

Hi Rod,

Does this look okay to you too? Sorry, I wasn't sure after our phone conversation were okay with my draft email, or if you wanted to take a closer look first. Thanks
Joanna

From: Aikman, Jennie S ENV:EX

Sent: Thursday, July 21, 2016 12:04 PM

To: Hirner, Joanna ENV:EX; Dalziel, Rod ENV:I

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks I

Response looks good to me Joanna.

I made one addition to your last recommendation to let them know that the poten field work in future years can be addressed in the permit conditions, and would no on the permit decision.

-----Original Message-----

From: Hirner, Joanna ENV:EX

Sent: Thursday, July 21, 2016 11:50 AM

To: Dalziel, Rod ENV:EX; Aikman, Jennie S ENV:

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

Hi Rod and Jennie,

I have drafted the following response to Brett's email. Does it look okay to you guys?
Joanna

Hi Brett,

Thanks for the message.

I took another look at our comments from June 8 and the questions we asked be a field work this summer. The ones that would be most influenced by drawdown could be the following:

- 1) Water quality: it would be good to get some sampling of water quality parameters at various water depths, including low water conditions in particular, because water quality presumably could be most pronounced under low water.
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From: dewynter, Brett [<mailto:Brett.dewynter@aecom.ca>]
 Sent: Tuesday, July 19, 2016 9:23 AM
 To: Hirner, Joanna ENV:EX
 Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dalziel, Rod ENV:EX; Aikman, Jennie Crosby; Shane Walkey ([HYPERLINK "mailto:Shane.Walkey@scrd.ca"](mailto:Shane.Walkey@scrd.ca)) Shane.Walkey@scrd.ca; Bruce; Bryan Shoji
 Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

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We look forward to your comments. Thank!

Brett deWynter, P.Eng.

s.22

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Hello Brett,

Further to Jennie's letter yesterday, attached are detailed comments on the current application. Note that many of the comments attached include requests for additions to update the current application, so although these comments can be considered as additional information that was presented in the April 2016 Park Use Permit application, BC Parks has the opportunity to provide further comments as additional information about the project.

Also, here are some further responses that hopefully address the rest of the outs discussed during the May 26, 2016 meeting:

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A PUP amendment application will need to be submitted to extend the current air term siphon option" to 31 Oct 17.

Stakeholders that have reached out to BC Parks and whom wish to be included in process: Tetrahedron Advisory Committee, Tetrahedron Alliance, Sunshine Coast Association, Tetrahedron Outdoor Club, Ruby Lake Lagoon Society.

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Joanna

Joanna Hirner (RPBio)
Conservation Specialist
BC Parks, South Coast Region
604-924-2228

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Jennie/Rod/Joanna:

Further to the below notes, please confirm the status of Items 2, 5, 6, 7 and 9. We need these items today or tomorrow as there is a meeting with the SCRD Board on the 9th, 2016.

Thanks for your help.

Brett deWynter, P.Eng.
s.22

From: dewynter, Brett
Sent: Monday, May 30, 2016 8:58 AM
To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; HYPERLINK "<mailto:Jennie.Aikman@gov.bc.ca>" Jennie.Aikman@gov.bc.ca; HYPERLINK "<mailto:Rod.Dalziel@gov.bc.ca>" Rod.Dalziel@gov.bc.ca; Hirner, Joanna ENV:EX (HYPERLINK "<mailto:Joanna.Hirner@gov.bc.ca>" Joanna.Hirner@gov.bc.ca); Shane Walkey (HYPERLINK "<mailto:Shane.Walkey@scrd.ca>" Shane.Walkey@scrd.ca)
Cc: HYPERLINK "<mailto:Chris.Platz@gov.bc.ca>" Chris.Platz@gov.bc.ca
Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All: Provided below are the notes and key action items from our meeting on May 26, 2016. Please review and let me know if you have any comments or concerns.

Meeting Date: May 26, 2016 at the SCRD Office Meeting Attendees: Joanne Hirner

Bryan Shoji, Dave Crosby, Shane Walkey, Bruce Ford, Andrew Mathewson, Brett C

Meeting Notes:

1. Meeting Overview: Due to the scheduled site visit to Chapman Lake being cancelled (due to the lake being at a lower level), an impromptu meeting was held at the Regional District Office. This meeting was held between BC Parks, the Regional District and AECOM.

2. It was verbally confirmed that a Park Use Permit to construct the permanent siphon on the surface of Chapman Lake to be lowered by an additional 5 m will not be provided this summer. Joanna confirmed that written notification of where additional construction is required for the current Park Use application will be provided by June 3rd, 2016. The letter will include comments from Rod Dalziel regarding concerns from the Stakeholder meeting and other functional concerns. It is envisioned that the letter provided by June 3rd, 2016.

3. One of the primary concerns noted by BC Parks were potential changes to the lake level since the Whitehead report was published. Shane from the Regional District stated that he would search the archive for pictures (preferably aerial pictures) of Chapman Lake at the time the Whitehead report was published. The historical pictures can be used to visually note changes to the Chapman Lake site during the past 15+ years.

4. Detailed bathymetric survey and level data for Chapman Lake exists for the past 15 years. The data will be compiled to establish an estimate of the drawdown durations in the lake. This data will make projections about the future lake drawdown frequency and durations.

5. BC Parks will investigate and provide written notification confirming if the temporary siphon application needs to be re-submitted. It is preferable for the current permit to be extended to minimize the chance of water shortages again this summer, the siphon may need to be installed this summer. Additionally the siphon will be needed next summer for the construction of the permanent solution meaning the temporary siphon permit needs to be extended to October 31st.

6. It is expected that environmental field work and geotechnical investigations will be completed this summer to address the comments provided by BC Parks. It will be confirmed by BC Parks if a research permit needs to be completed for the field work that will occur this summer of 2016 at the Chapman Lake site.

7. Rod noted that some Stakeholders have suggested that they have not been well informed about the project. It was requested that Rod provide a list of Stakeholders since it is the responsibility of the Regional District with all the major park Stakeholders. It was also noted that the consultation effort has been more heavily focused on the First Nation consultation and support prior to the current project, a broader communication effort. The First Nation consultation has been delayed due to the current project.

8. It was confirmed that the consultation in the future will be focused meetings with the Stakeholders. It was also noted that the SCRD held open meetings with the community at different locations during the week of May 16th and 25th, 2016. Drinking water supply was a major discussion item during the community meetings.

9. It was requested that a separate letter be provided from BC Parks stating that the permanent water supply solution for Chapman Lake can not be constructed during 2016. The permanent project will be a significant concern for the Regional District Board. A separate letter stating that the permanent project can not be constructed this summer is being requested for the communication to the Regional District Board. This letter is being requested by June 3rd, 2016, since there is a deadline for the letter.

10. Rod noted that Ranger Training starts on the week of June 6th and continues through the week of June 13th.

weeks. It was also noted that BC Parks staff would like to attend the site prior to the meeting to review the notes regarding the planned Chapman Lake construction. This means we need to complete the site visit to ensure the project is not delayed until the week of May 30th, 2016. After the meeting the weather forecast was reviewed and the morning of Tuesday, April 26, 2016 was confirmed.

Brett deWynter, P.Eng.
Water Group, Canada West

s.22

HYPERLINK "<mailto:brett.deWynter@aecom.com><<mailto:brett.deWynter@aecom.com>>

From: dewynter, Brett
Sent: Monday, April 25, 2016 10:54 AM
To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; HYPERLINK "<mailto:Chris.Platz@gov.bc.ca><<mailto:Chris.Platz@gov.bc.ca>>"
Chris.Platz@gov.bc.ca<<mailto:Chris.Platz@gov.bc.ca>>; HYPERLINK "<mailto:Jennie.Aikman@gov.bc.ca><<mailto:Jennie.Aikman@gov.bc.ca>>"
Jennie.Aikman@gov.bc.ca<<mailto:Jennie.Aikman@gov.bc.ca>>; Hirner, Joanna EN "<mailto:Joanna.Hirner@gov.bc.ca><<mailto:Joanna.Hirner@gov.bc.ca>>"

Cc: HYPERLINK "<mailto:Rod.Dalziel@gov.bc.ca><<mailto:Rod.Dalziel@gov.bc.ca>>"
Rod.Dalziel@gov.bc.ca<<mailto:Rod.Dalziel@gov.bc.ca>>
Subject: FW: Chapman Lake Water Supply Improvement - BC Parks I

All:

Thanks for the meeting on Friday, April 8, 2016. Further to the meeting we confirm the following items:

1. Bryan Shoji of the Sunshine Coast Regional District confirmed that acceptance of the Park Use Permit was provided via e-mail to BC Parks on April 6, 2016.

2. The preliminary Park Use Plan that was submitted to BC Parks prior to the meeting was reviewed. The indication from BC Parks was that the plan is acceptable however, it was noted that a preliminary review of the documents had been completed. The areas where it was noted that AECOM focus prior to submitting the final documents to Front Corner BC is explain the impacts of the construction activities complete with the mitigation plans.

3. It was noted that BC Parks has reached-out to other government agencies to obtain comments. One of the key comments received from DFO is to ensure minimum fish flow maintained in the Chapman Creek. The minimum fish flow rate suggested in the report is roughly double the flow rate suggested in the Dave Bates report. The issue of the Chapman Creek will only be improved with the completion of the proposed project. Chapman Lake, however, the debate about the minimum flow required in Chapman Creek is ongoing.

4. The consultation effort spent to date was summarized and provided in a document prior to the meeting. During the discussion it was indicated that the public consultation to date seemed reasonable. BC Parks would prefer that the consultant/SCRD obtain a letter of objection from the Sechelt and Squamish First Nation communities. The consultation needs to continue and be documented. Once the letters of non-objection are received from the First Nations and the consultation with the community is completed the current status of the project will be satisfactory for BC Parks. During the Park Use Permit review BC Parks will be satisfied with the status of the project.

5. BC Parks completed their own internal review of the documentation and current opinion that they have the legal ability to issue a Park Use Permit; however, this is under review by the internal government lawyer. If there are any changes resulting from being able to issue the construction permit this year, BC Parks will inform the SCR as soon as possible.

6. The tentatively planned schedule is:

- a. AECOM will submit the Park Use Permit application during the week of April 11th, 2016;
- b. AECOM will confirm the water license submission required and then make the submission during the week of April 11th, 2016;
- c. BC Parks will continue to review the construction plans and then the application submitted. The internal review will be ongoing with a focus on the potential environmental impacts and the associated mitigation plan. BC Parks was invited to reach-out to AECOM or their document review if they have any questions and we would be happy to provide assistance.
- d. Depending on the rate of snow melt the plan is to complete a site visit. This site visit is planned for the second week of May 9th, 2016. The site visit will include 2 - 3 representatives from BC Parks, the SCRDP, AECOM and a representative from In-situ (i.e. the Sechelt Band consultant). The goal is to coordinate the site visit so everyone can be on-site together to allow any concerns to be reviewed and discussed while on-site.

Let us know if you have any further comments or concerns with the above notes. The Park-Use Permit application and Water License Amendment have been submitted to Counter BC. Thanks.

Brett deWynter, P.Eng.

s. 22

From: dewynter, Brett
Sent: Thursday, April 07, 2016 11:06 AM
To: 'Platz, Chris ENV:EX'; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; Aikman, Hirner, Joanna ENV:EX; HYPERLINK "<mailto:Rod.Dalziel@gov.bc.ca><<mailto:Rod.Dalziel@gov.bc.ca>>
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Cc: Dave Crosby (HYPERLINK "<mailto:Dave.Crosby@scrd.ca><<mailto:Dave.Crosby@scrd.ca>>
Dave.Crosby@scrd.ca<<mailto:Dave.Crosby@scrd.ca>>); Shane Walkey
(<mailto:Shane.Walkey@scrd.ca><<mailto:Shane.Walkey@scrd.ca>>
Shane.Walkey@scrd.ca<<mailto:Shane.Walkey@scrd.ca>>)
Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All:

Further to our meeting planned for tomorrow we offer the following comments and items:

1. It was discussed that the temporary permit issued last summer needs to be signed and finalized. This will be completed and an original signed copy hand delivered tomorrow.
2. The preferred plan is to complete the construction of the proposed works at C&D this summer to support the installation of the diversion of water to a total depth of 8.5 feet. The efforts shown in the preliminary design drawing provided during the March 16, 2023 DRAFT Park Use-Permit application and the supporting documentation has been reviewed and approved.

DRAFT document are attached.

3. Revision to the water license are ongoing. There is currently some debate about complete a new water license application versus an amendment to the existing license. There is an active discussion with FLNR to clarify this item. For your information a DRAFT amendment application has been prepared.

4. The need for stakeholder consultation was discussed to meet the obligations of the public process. These efforts have been ongoing. The background documents are provided to show the consultation efforts completed to date with a summary of some of the key issues and specific areas that we would like to discuss are:

a. what specific areas of interest we should explore further in order to fulfil BC Parks and Public Participation requirements / expectations for a "comprehensive public process" mentioned in the Tetrahedron Park Management Plan.

b. Other groups to consult / encourage participation

5. BC Parks was going to investigate their files and documents to determine if the work at Chapman Lake could be completed with an amendment. The results of this work will be shared with the project team.

Once the background documents are reviewed and discussed we are hoping to re-convene the meeting regarding the plan to advance the project.

Let us know if you have any further comments, otherwise we look forward to the meeting for tomorrow. Thanks,

Brett deWynter, P.Eng.

s.22

-----Original Appointment-----

From: Platz, Chris ENV:EX [mailto:Chris.Platz@gov.bc.ca]

Sent: Wednesday, April 06, 2016 8:02 AM

To: Platz, Chris ENV:EX; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; dewynter, Jennie S ENV:EX; Hirner, Joanna ENV:EX

Subject: Chapman Lake Water Supply Improvement - BC Parks Meeting

When: Friday, April 08, 2016 10:30 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada)

Where: ENV R North Van. 1610 Mount Seymour Road Main Floor N. Van (seats 10)

Good morning,

I am canvassing for agenda topics. Please send me your items and I will formulate the agenda for the meeting.

Chris

Hi all,

As discussed during our first meeting I am looking to book a follow-up meeting in May. Please let me know if this date works and if there is anyone else you would like invited to the meeting.

I will call for agenda items a few days ahead of the meeting but if you have any items please send them along.

RE: Chapman Lake Water Supply Improvement - BC Pa

Monday, October 16, 2016

3:15 PM

| | |
|-----------------|---|
| Subject: | RE: Chapman Lake Water Supply Improvement - BC Par |
| From: | Hirner, Joanna ENV:EX |
| To: | Dalziel, Rod ENV:EX |
| Sent: | Tuesday, July 26, 2016 10:33 AM |

Thanks Rod, and hope I didn't rush you. I just couldn't remember if I should expect comments from you.

I am really surprised that their research permit application has such an early time implied in Brett's email, even). Thanks for the comments on the research permit - I will take a more detailed look soon but it sounds like it needs lots of work and comments. I have a regular check-in meeting with Jennie in 30 minutes and will discuss the email.

Thanks!

Joanna

From: Dalziel, Rod ENV:EX

Sent: Monday, July 25, 2016 4:27 PM

To: Hirner, Joanna ENV:EX

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

Hello Joanna,

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Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environm

*: PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N

(: Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885

7: HYPERLINK "mailto:Rod.Dalziel@gov.bc.ca" Rod.Dalziel@gov

Visit the BC Parks website @ HYPERLINK "http://bcparks.ca/" bcp

<< OLE Object: Picture (Device Independent Bitmap)

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Joanna Hirner (RPBio)
 Conservation Specialist
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Cc: HYPERLINK "mailto:Chris.Platz@gov.bc.ca" Chris.Platz@gov

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All: Provided below are the notes and key action items from our meeting on May 26, 2016. Please review and let me know if you have any comments or concerns.

Meeting Date: May 26, 2016 at the SCR D Office Meeting Attendees: Joanne Hirner, Bryan Shoji, Dave Crosby, Shane Walkey, Bruce Ford, Andrew Mathewson, Brett deWynter

Meeting Notes:

1. Meeting Overview: Due to the scheduled site visit to Chapman Lake being cancelled (due to inclement weather), an impromptu meeting was held at the Regional District Office. This meeting was attended by representatives from BC Parks, the Regional District and AECOM.

2. It was verbally confirmed that a Park Use Permit to construct the permanent surface of Chapman Lake to be lowered by an additional 5 m will not be provided for the current construction season. Joanna confirmed that written notification of where additional construction is required for the current Park Use application will be provided by June 3rd, 2016. This will include comments from Rod Dalziel regarding concerns from the Stakeholder meeting. It is envisioned that the letter provided by June 3rd, 2016 will address the other functional concerns.

3. One of the primary concerns noted by BC Parks were potential changes to the lake level since the Whitehead report was published. Shane from the Regional District stated that he would search the archive for pictures (preferably aerial pictures) of Chapman Lake at the time the Whitehead report was published. The historical pictures can be used to visually compare the lake level at the Chapman Lake site during the past 15+ years.

4. Detailed bathymetric survey and level data for Chapman Lake exists for the past 15+ years. This data will be compiled to establish an estimate of the drawdown durations in the lake. This will allow for projections about the future lake drawdown frequency and durations.

5. BC Parks will investigate and provide written notification confirming if the temporary permit application needs to be re-submitted. It is preferable for the current permit to be extended to minimize the chance of water shortages again this summer, the syphon may need to be replaced this summer. Additionally the syphon will be needed next summer for the construction of the permanent solution meaning the temporary syphon permit needs to be extended to October 31st, 2016.

6. It is expected that environmental field work and geotechnical investigations will be completed this summer to address the comments provided by BC Parks. It will be confirmed by BC Parks if a research permit needs to be completed for the field work that will occur this summer of 2016 at the Chapman Lake site.

7. Rod noted that some Stakeholders have suggested that they have not been well

the project. It was requested that Rod provide a list of Stakeholders since it is the with all the major park Stakeholders. It was also noted that the consultation effort been more heavily focused on the First Nation consultation and support prior to a broader communication effort. The First Nation consultation has been delayed due

8. It was confirmed that the consultation in the future will be focused meetings with Stakeholders. It was also noted that the SCRD held open meetings with the community at different locations during the week of May 16th and 25th, 2016. Drinking water supply was a major discussion item during the community meetings.

9. It was requested that a separate letter be provided from BC Parks stating that the water supply solution for Chapman Lake can not be constructed during 2016. The project will be a significant concern for the Regional District Board. A separate letter stating the project can not be constructed this summer is being requested for the communication to the Regional District Board. This letter is being requested by June 3rd, 2016, since the

10. Rod noted that Ranger Training starts on the week of June 6th and continues for several weeks. It was also noted that BC Parks staff would like to attend the site prior to the construction. Notes regarding the planned Chapman Lake construction. This means we need to complete the site visit to ensure the project is not delayed. After the meeting the weather forecast was reviewed and the morning of Tuesday

Brett deWynter, P.Eng.
Water Group, Canada West

s.22

HYPERLINK "<mailto:brett.deWynter@aecom.com><<mailto:brett.deWynter@aecom.com>>

From: dewynter, Brett
Sent: Monday, April 25, 2016 10:54 AM
To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; HYPERLINK "<mailto:Chris.Platz@gov.bc.ca><<mailto:Chris.Platz@gov.bc.ca>>"
Chris.Platz@gov.bc.ca<<mailto:Chris.Platz@gov.bc.ca>>; HYPERLINK "<mailto:Jennie.Aikman@gov.bc.ca><<mailto:Jennie.Aikman@gov.bc.ca>>"
Jennie.Aikman@gov.bc.ca<<mailto:Jennie.Aikman@gov.bc.ca>>; Hirner, Joanna EN "<mailto:Joanna.Hirner@gov.bc.ca><<mailto:Joanna.Hirner@gov.bc.ca>>"

Cc: HYPERLINK "<mailto:Rod.Dalziel@gov.bc.ca><<mailto:Rod.Dalziel@gov.bc.ca>>"
Rod.Dalziel@gov.bc.ca<<mailto:Rod.Dalziel@gov.bc.ca>>
Subject: FW: Chapman Lake Water Supply Improvement - BC Parks I

All:

Thanks for the meeting on Friday, April 8, 2016. Further to the meeting we confirmed the following items:

1. Bryan Shoji of the Sunshine Coast Regional District confirmed that acceptance of the Park Use Permit was provided via e-mail to BC Parks on April 6, 2016.

2. The preliminary Park Use Plan that was submitted to BC Parks prior to the meeting. The indication from BC Parks was that the plan is acceptable however, it was noted that a preliminary review of the documents had been completed. The areas where it was AECOM focus prior to submitting the final documents to Front Corner BC is explained

impacts of the construction activities complete with the mitigation plans.

3. It was noted that BC Parks has reached-out to other government agencies to o comments. One of the key comments received from DFO is to ensure minimum fi maintained in the Chapman Creek. The minimum fish flow rate suggested in the r roughly double the flow rate suggested in the Dave Bates report. The issue of the Chapman Creek will only be improved with the completion of the proposed proje Lake, however, the debate about the minimum flow required in Chapman Creek i

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5. BC Parks completed their own internal review of the documentation and curre opinion that they have the legal ability to issue a Park Use Permit; however, this i under review by the internal government lawyer. If there are any changes resultir being able to issue the construction permit this year, BC Parks will inform the SCR possible.

6. The tentatively planned schedule is:

- a. AECOM will submit the Park Use Permit application during the week of April 1
- b. AECOM will confirm the water license submission required and then make the a the week of April 11th, 2016;
- c. BC Parks will continue to review the construction plans and then the application submitted. The internal review will be ongoing with a focus on the potential envirc and the associate mitigation plan. BC Parks was invited to reach-out to AECOM or their document review if they have any questions and we would be happy to prov
- d. Depending on the rate of snow melt the plan is to complete a site visit. This site planned for the second week of May 9th, 2016. The site visit will include 2 - 3 repre BC Parks, the SCRD, AECOM and a representative from In-situ (i.e. the Sechelt Ban consultant). The goal is to coordinate the site visit so everyone can be on-site toge allow any concerns to be reviewed and discussed while on-site.

Let us know if you have any further comments or concerns with the above notes. the Park-Use Permit application and Water License Amendment have been submi Counter BC. Thanks.

Brett deWynter, P.Eng.

s.22

From: dewynter, Brett

Sent: Thursday, April 07, 2016 11:06 AM

To: 'Platz, Chris ENV:EX'; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; Aikman,

Hirner, Joanna ENV:EX; HYPERLINK "<mailto:Rod.Dalziel@gov.bc.ca><<mailto:Rod.Dalziel@gov.bc.ca>>

Cc: Dave Crosby (HYPERLINK "<mailto:Dave.Crosby@scrd.ca><<mailto:Dave.Crosby@scrd.ca>>

Dave.Crosby@scrd.ca<<mailto:Dave.Crosby@scrd.ca>>); Shane Walkey
(<mailto:Shane.Walkey@scrd.ca><<mailto:Shane.Walkey@scrd.ca>>

Shane.Walkey@scrd.ca<<mailto:Shane.Walkey@scrd.ca>>)

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All:

Further to our meeting planned for tomorrow we offer the following comments & items:

1. It was discussed that the temporary permit issued last summer needs to be signed & finalized. This will be completed and an original signed copy hand delivered tomorrow.
2. The preferred plan is to complete the construction of the proposed works at Chapman Lake this summer to support the installation of the diversion of water to a total depth of 8. The efforts shown in the preliminary design drawing provided during the March 16 DRAFT Park Use-Permit application and the supporting documentation has been prepared. The DRAFT document are attached.
3. Revision to the water license are ongoing. There is currently some debate about whether to complete a new water license application versus an amendment to the existing license. We are in active discussion with FLNR to clarify this item. For your information a DRAFT amendment application has been prepared.
4. The need for stakeholder consultation was discussed to meet the obligations of the public process. These efforts have been ongoing. The background documents are provided. The consultation efforts completed to date with a summary of some of the key issues & specific areas that we would like to discuss are:
 - a. what specific areas of interest we should explore further in order to fulfil BC Parks and Public Participation requirements / expectations for a "comprehensive public process" mentioned in the Tetrahedron Park Management Plan.
 - b. Other groups to consult / encourage participation
5. BC Parks was going to investigate their files and documents to determine if the work at Chapman Lake could be completed with an amendment. The results of this will be shared with the project team.

Once the background documents are reviewed and discussed we are hoping to re-meet regarding the plan to advance the project.

Let us know if you have any further comments, otherwise we look forward to the meeting for tomorrow. Thanks.

Brett deWynter P Eng
s.22

-----Original Appointment-----

From: Platz, Chris ENV:EX [<mailto:Chris.Platz@gov.bc.ca>]

Sent: Wednesday, April 06, 2016 8:02 AM

To: Platz, Chris ENV:EX; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; deWynter, Jennie S ENV:EX; Hirner, Joanna ENV:EX

Subject: Chapman Lake Water Supply Improvement - BC Parks IV
When: Friday, April 08, 2016 10:30 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada)
Where: ENV R North Van. 1610 Mount Seymour Road Main Fl RM N. Van (seats 10)

Good morning,

I am canvassing for agenda topics. Please send me your items and I will formulate a meeting.

Chris

Hi all,

As discussed during our first meeting I am looking to book a follow-up meeting in May. Please let me know if this date works and if there is anyone else you would like invited to the meeting.

I will call for agenda items a few days ahead of the meeting but if you have any items please send them along.

Chris

RE: Chapman Lake Water Supply Improvement - BC Pa

Monday, October 16, 2016

3:17 PM

| | |
|----------------|--|
| Subject | RE: Chapman Lake Water Supply Improvement - BC Parks M |
| From | Hirner, Joanna ENV:EX |
| To | 'dewynter, Brett' |
| Cc | Platz, Chris ENV:EX; Mathewson, Andrew; Dalziel, Rod ENV:EX; Aikman, Jennie S. ENV:EX; I Walkey (Shane.Walkey@scrd.ca); Ford, Bruce; Bryan Shoji |
| Sent | Thursday, July 28, 2016 11:20 AM |

Hi Brett,

Thanks for the email message and phone message, and sorry for the slc

I took another look at our comments from June 8 and the questions we asked be a field work this summer. The ones that would be most influenced by drawdown co be the following:

- 1) Water quality: sampling of water quality parameters should include low water water depths, including low water conditions in particular because water quality presumably could be most pronounced under low water.
- 2) Potential for and evidence of sloughing of reservoir banks during drawdown (als quality).
- 3) Fish and fish habitat: a) substrate composition in the drawdown zone in relative accessibility of spawning streams to Dolly Varden during low water.
- 4) Wildlife: accessibility of water to wildlife during drawd
- 5) Vegetation: transect sampling of vegetation and littoral habitat conditions in the

Ideally observations and sampling will be made/done during maximum drawdown you mention this is likely not be possible this year. So a few different approaches I recommend:

- Wherever possible work related to the above questions be done during the lowes that occur this season.
- Interpretation of bathymetry mapping may help with assessment of items 2
- Literature on conditions required for passage of Dolly Varden may help with asse
- We may require additional field work next summer and/or in future years for the above to account for the lack of sampling at low water conditions this year. Please that if some additional field work is required, we will include this work as a requir park use permit so this should not delay a permit decision.

Thank you for the offer to join you in the field. I would be interested in joining you you mentioned the week of August 15-19, and I would be available any day Mond Wednesday that week (15-17). If the work is pushed later to capture lower water c reasons, my schedule is still relatively free later in August/early September.

We are working on reviewing your research permit application and will get back t questions/comments.

A couple of other comments regarding the broader impact assessment for th

- The updated assessment should specifically and explicitly discuss potential impact Murrelets for a number of reasons: Critical Habitat has been mapped for this speci (although not adjacent to Chapman Lake), and this species has come up in comme discussions with stakeholders and other government biologists. My sense is that tl

unlikely to affect this species: timing of construction should avoid potential noise i birds, no removal of large trees is planned, and Critical Habitat (that could possibly affected by long term drought) has not been identified close to the lake. FYI, you c Critical Habitat data from Environment Canada here:

-In my June 8 comments I noted that visual observations could be used to confirm Chapman Lake are Dolly Varden and not Bull Trout. Mike Wilcox (fish biologist with informed me that they recommend visual and DNA analysis to confirm species for From Mike: "Although there are some morphological differences, our policy is to n analysis also be used for confirmation. The attached bull trout fact sheet provides description of differentiation between the two. The species can interbreed too, thi

Thanks Brett,
Joanna

Joanna Hirner (MRM, RPBio)
Conservation Specialist
South Coast Region, BC Parks
604-924-2228

-----Original Message-----

From: dewynter, Brett [<mailto:Brett.dewynter@aecom.c>]
Sent: Tuesday, July 19, 2016 9:23 AM
To: Hirner, Joanna ENV:EX
Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dalziel, Rod ENV:EX; Aikman, Jennie Crosby; Shane Walkey (Shane.Walkey@scrd.ca); Ford, Bruce; Bryan Shoji
Subject: RE: Chapman Lake Water Supply Improvement - BC Parks ↑

Joanna:

Further to the below note we have been working on trying to advance the program additional field monitoring. The plan is to hopefully be on-site by mid-August. Base water level in Chapman Lake and the weather expected over the next few weeks it likely that the minimum water level will be some level greater than 3 m below full closely monitoring the weather and the water level in Chapman Lake and may dela investigation 1-week to optimize the on-site data collection, but can not delay any

From a water supply perspective draining Chapman Lake to optimize the data colle environmental field monitoring program is too risky. It is still our opinion that we v our professional judgement to compare the data collected this summer to the lega Whitehead report. Using the two sets of data we intend to provide responses to th in your letter dated June 8, 2016.

We do not know the exact water depth that will be present in Chapman Lake duri field investigations, but it is not expected to be 3 m below full pool. Given this ple now if you have any concerns regarding the planned approach (i.e. Completing th investigations and data collection is expensive. It would be disappointing if the ex but the data collected does not meet the expectations of the BC Parks review tea

We look forward to your comments. Thank:

Brett deWynter, P.Eng.

s.22

-----Original Message-----

From: Hirner, Joanna ENV:EX [mailto:Joanna.Hirner@gov.bc.ca]

Sent: Wednesday, June 08, 2016 7:41 AM

To: dewynter, Brett; Aikman, Jennie S ENV:EX; Dalziel, Rod E

Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey (Shane.)
Ford, Bruce; Bryan Shoji

Subject: Re: Chapman Lake Water Supply Improvement - BC Parks

Hello Brett,

Further to Jennie's letter yesterday, attached are detailed comments on the current application. Note that many of the comments attached include requests for additions to update the current application, so although these comments can be considered information that was presented in the April 2016 Park Use Permit application, BC Parks has an opportunity to provide further comments as additional information about the project.

Also, here are some further responses that hopefully address the rest of the outstanding issues discussed during the May 26, 2016 meeting:

Please find attached summary of Tetrahedron Advisory Committee meeting, preparation for a PUP amendment application will need to be submitted to extend the current air term siphon option" to 31 Oct 17.

Stakeholders that have reached out to BC Parks and whom wish to be included in the process: Tetrahedron Advisory Committee, Tetrahedron Alliance, Sunshine Coast Association, Tetrahedron Outdoor Club, Ruby Lake Lagoon Society.

Best regards,
Joanna

Joanna Hirner (RPBio)
Conservation Specialist
BC Parks, South Coast Region
604-924-2228

From: dewynter, Brett <Brett.dewynter@aecom.com>

Sent: Monday, June 06, 2016 9:01 AM

To: Aikman, Jennie S ENV:EX; Dalziel, Rod ENV:EX; Hirner, Joanna

Cc: Platz, Chris ENV:EX; Mathewson, Andrew; Dave Crosby; Shane Walkey (Shane.)
Ford, Bruce; Bryan Shoji

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

Jennie/Rod/Joanna:

Further to the below notes, please confirm the status of Items 2, 5, 6, 7 and 9. We need to discuss these items today or tomorrow as there is a meeting with the SCRD Board on the 9th, 2016.

Thanks for your help.

Brett deWynter, P.Eng.
s.22

From: dewynter, Brett
Sent: Monday, May 30, 2016 8:58 AM
To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; Jennie.Aikman
Rod.Dalziel@gov.bc.ca; Hirner, Joanna ENV:EX (Joanna.Hirner@gov.bc.ca); Shane
(Shane.Walkey@scrd.ca)
Cc: Chris.Platz@gov.bc.ca
Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All: Provided below are the notes and key action items from our meeting on May 26, 2016. Please review and let me know if you have any comments or concerns.

Meeting Date: May 26, 2016 at the SCRD Office Meeting Attendees: Joanne Hirner, Bryan Shoji, Dave Crosby, Shane Walkey, Bruce Ford, Andrew Mathewson, Brett deWynter

Meeting Notes:

1. Meeting Overview: Due to the scheduled site visit to Chapman Lake being cancelled (due to low water level), an impromptu meeting was held at the Regional District Office. This meeting was attended by representatives from BC Parks, the Regional District and AECOM.

2. It was verbally confirmed that a Park Use Permit to construct the permanent siphon on the surface of Chapman Lake to be lowered by an additional 5 m will not be provided during the construction season. Joanna confirmed that written notification of where additional siphon required for the current Park Use application will be provided by June 3rd, 2016. This will include comments from Rod Dalziel regarding concerns from the Stakeholder meeting. Other functional concerns. It is envisioned that the letter provided by June 3rd, 2016.

3. One of the primary concerns noted by BC Parks were potential changes to the lake level since the Whitehead report was published. Shane from the Regional District stated that he will search the archive for pictures (preferably aerial pictures) of Chapman Lake at the time the Whitehead report was published. The historical pictures can be used to visually compare the Chapman Lake site during the past 15+ years.

4. Detailed bathymetric survey and level data for Chapman Lake exists for the past 15+ years. This data will be compiled to establish an estimate of the drawdown durations in the lake. This will make projections about the future lake drawdown frequency and durations.

5. BC Parks will investigate and provide written notification confirming if the temporary siphon application needs to be re-submitted. It is preferable for the current permit to be re-submitted to minimize the chance of water shortages again this summer, the siphon may need to be replaced this summer. Additionally the siphon will be needed next summer for the construction of the permanent solution meaning the temporary siphon permit needs to be extended to October 31st.

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7. Rod noted that some Stakeholders have suggested that they have not been well informed about the project. It was requested that Rod provide a list of Stakeholders since it is the same with all the major park Stakeholders. It was also noted that the consultation effort has been more heavily focused on the First Nation consultation and support prior to a broader communication effort. The First Nation consultation has been delayed during the summer.

8. It was confirmed that the consultation in the future will be focused meetings with Stakeholders. It was also noted that the SCRD held open meetings with the community at different locations during the week of May 16th and 25th, 2016. Drinking water supply was a major discussion item during the community meetings.

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10. Rod noted that Ranger Training starts on the week of June 6th and continues for several weeks. It was also noted that BC Parks staff would like to attend the site prior to the construction. Rod's notes regarding the planned Chapman Lake construction. This means we need to complete the site visit to ensure the project is not delayed. After the meeting the weather forecast was reviewed and the morning of Tuesday, June 7th, 2016, was clear.

Brett deWynter, P.Eng.
Water Group, Canada West

s.22

brett.deWynter@aecom.com<mailto:brett.deWynter@aecom.com>

From: dewynter, Brett
Sent: Monday, April 25, 2016 10:54 AM
To: 'Bryan Shoji'; 'Dave Crosby'; Mathewson, Andrew; Ford, Bruce; Chris.Platz@gov.bc.ca<mailto:Chris.Platz@gov.bc.ca>; Jennie.Aikman@gov.bc.ca<mailto:Jennie.Aikman@gov.bc.ca>; Hirner, Joanna EN' (Joanna.Hirner@gov.bc.ca<mailto:Joanna.Hirner@gov.bc.ca>)
Cc: Rod.Dalziel@gov.bc.ca<mailto:Rod.Dalziel@gov.bc.ca>
Subject: FW: Chapman Lake Water Supply Improvement - BC Parks I

All:

Thanks for the meeting on Friday, April 8, 2016. Further to the meeting we confirmed the following items:

1. Bryan Shoji of the Sunshine Coast Regional District confirmed that acceptance of the Park Use Permit was provided via e-mail to BC Parks on April 6, 2016.

2. The preliminary Park Use Plan that was submitted to BC Parks prior to the meeting. The indication from BC Parks was that the plan is acceptable however, it was noted that a preliminary review of the documents had been completed. The areas where it was noted that AECOM focus prior to submitting the final documents to Front Corner BC is explain impacts of the construction activities complete with the mitigation plans.

3. It was noted that BC Parks has reached-out to other government agencies to obtain comments. One of the key comments received from DFO is to ensure minimum fish habitat is maintained.

maintained in the Chapman Creek. The minimum fish flow rate suggested in the report is roughly double the flow rate suggested in the Dave Bates report. The issue of the Chapman Creek will only be improved with the completion of the proposed project. Chapman Lake, however, the debate about the minimum flow required in Chapman Creek is ongoing.

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5. BC Parks completed their own internal review of the documentation and current opinion is that they have the legal ability to issue a Park Use Permit; however, this is currently under review by the internal government lawyer. If there are any changes resulting from the review, BC Parks will be able to issue the construction permit this year, BC Parks will inform the SCRD as soon as possible.

6. The tentatively planned schedule is:

- a. AECOM will submit the Park Use Permit application during the week of April 11th, 2016;
- b. AECOM will confirm the water license submission required and then make the application during the week of April 11th, 2016;
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- d. Depending on the rate of snow melt the plan is to complete a site visit. This site visit is planned for the second week of May 9th, 2016. The site visit will include 2 - 3 representatives from BC Parks, the SCRD, AECOM and a representative from In-situ (i.e. the Sechelt Band consultant). The goal is to coordinate the site visit so everyone can be on-site together to allow any concerns to be reviewed and discussed while on-site.

Let us know if you have any further comments or concerns with the above notes. The Park-Use Permit application and Water License Amendment have been submitted to the Counter BC. Thanks.

Brett deWynter, P.Eng.

s.22

From: dewynter, Brett

Sent: Thursday, April 07, 2016 11:06 AM

To: 'Platz, Chris ENV:EX'; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; Aikman, Hirner, Joanna ENV:EX; Rod.Dalziel@gov.bc.ca<mailto:Rod.Dalziel@gov.bc.ca>

Cc: Dave Crosby (Dave.Crosby@scrd.ca<mailto:Dave.Crosby@scrd.ca>); Shane Walkey (Shane.Walkey@scrd.ca<mailto:Shane.Walkey@scrd.ca>)

Subject: RE: Chapman Lake Water Supply Improvement - BC Parks

All:

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b. Other groups to consult / encourage participation

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Once the background documents are reviewed and discussed we are hoping to re-convene regarding the plan to advance the project.

Let us know if you have any further comments, otherwise we look forward to the meeting for tomorrow. Thanks.

Brett deWynter, P.Eng.

s.22

-----Original Appointment-----

From: Platz, Chris ENV:EX [mailto:Chris.Platz@gov.bc.ca]

Sent: Wednesday, April 06, 2016 8:02 AM

To: Platz, Chris ENV:EX; Bryan Shoji; Mathewson, Andrew; Ford, Bruce; dewynter, Jennie S ENV:EX; Hirner, Joanna ENV:EX

Subject: Chapman Lake Water Supply Improvement - BC Parks Meeting

When: Friday, April 08, 2016 10:30 AM-12:00 PM (UTC-08:00) Pacific Time (US & Canada)

Where: ENV R North Van. 1610 Mount Seymour Road Main Floor N. Van (seats 10)

Good morning,

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Chris

Hi all,

As discussed during our first meeting I am looking to book a follow-up meeting in , let me know if this date works and if there is anyone else you would like invited to

I will call for agenda items a few days ahead of the meeting but if you have any items send them along.

Chris

RE: SCRD News - Chapman Lake Supply Expansion Project to Proceed With Elector Approval

Friday, October 13, 2017
1:07 PM

| | |
|----------------|---|
| Subject | RE: SCRD News - Chapman Lake Supply Expansion Project to Proceed With Elector Approval |
| From | Aikman, Jennie S ENV:EX |
| To | 'dewynter, Brett'; Hirner, Joanna ENV:EX; Dalziel, Rod ENV:EX |
| Cc | Bryan Shoji; Dave Crosby (Dave.Crosby@scrd.ca); Ford, Bruce; Mathewson, Andrew |
| Sent | Tuesday, August 2, 2016 2:04 PM |

Thank you for the update Brett.

From: dewynter, Brett [<mailto:Brett.dewynter@aecom.com>]

Sent: Thursday, July 28, 2016 5:59 PM

To: Aikman, Jennie S ENV:EX; Hirner, Joanna ENV:EX; Dalziel, Rod ENV:EX

Cc: Bryan Shoji; Dave Crosby (Dave.Crosby@scrd.ca); Ford, Bruce; Mathewson, Andrew

Subject: FW: SCRD News - Chapman Lake Supply Expansion Project to Proceed With Elector Approval

Jennie/Joanna/Rod:

For you information, the public supported the request to borrow the money to construct the Chapman Lake improvements next summer. Click the "News Release" link for more information.

Thanks.

Brett deWynter, P.Eng.

s.22

From: Bryan Shoji [<mailto:Bryan.Shoji@scrd.ca>]

Sent: Thursday, July 28, 2016 4:10 PM

To: dewynter, Brett; Mathewson, Andrew; Ford, Bruce

Cc: Dave Crosby

Subject: SCRD News - Chapman Lake Supply Expansion Project to Proceed With Elector Approval

FYI.

Bryan

Chapman Lake Supply Expansion Project to Proceed With Elector Approval
[News Release](#)

RE: Chapman Lake fish samplin

Monday, October 16, 2016 9:42 AM

| | |
|---------|------------------------------------|
| Subject | RE: Chapman Lake fish sampl |
| From | Willcox, Michael FLNR:EX |
| To | Dalziel, Rod ENV:EX |
| Cc | Hirner, Joanna ENV:EX |
| Sent | Wednesday, August 3, 2016 10:21 |

Hi again Rod,

My focus during discussions to date has been on the quality of information being g impacts can be adequately assessed. I have, unfortunately, overlooked that the pr (gill netting, gee trapping and electrofishing) require a Scientific Fish Collection (S FLNRO. This would be in addition to the Research PUP. Iain Lunn has advised that t process is "months behind".

Can you check into whether the person(s) who will be carrying out the fish samplin permit or have submitted an application for one.

Mike

From: Willcox, Michael FLNR:EX
Sent: Tuesday, August 2, 2016 9:21 AM
To: Dalziel, Rod ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: RE: Chapman Lake fish samplin

Hi Rod,

From the very general description of the program, it appears as though they'll be e techniques to gather the additional info Joanna asked for. I would, however, like to will determine the timing of char migration into the inlet spawning streams for the assessing whether lake drawdown will adversely impact char spawning.

Regards,

Mike

From: Dalziel, Rod ENV:EX
Sent: Monday, July 25, 2016 3:09 PM
To: Willcox, Michael FLNR:EX
Cc: Hirner, Joanna ENV:EX
Subject: Chapman Lake fish sampling

Hello Mike,

As you are aware BC Parks has requested additional research and field study prior decision on the SCRD's PUP amendment application and you have had some disc Joanna. I have received their application for a Research PUP to conduct this work your opinion on the adequacy on the fish and habitat section they submitted (see "

3. Fish and Fish Habitat Assessment:

· Fish sampling would follow the protocol used by Whitehead to collect comparable used a net similar to the standard gill net prescribed in provincial guidelines for lake propose to use the BC RISC standard lake survey gill nets, one floating and one si perpendicular to the shore. However, rather than an overnight set used by Whitehead 2 – 3 hour set. If not fish are caught in that time the nets will be redeployed for ano Minnow traps would be used along the shoreline of the lake. Minnow traps and ele be used to sample fish in the streams flowing into the lake and to sample for fish ir downstream of the dam. Scale samples will be collected from up to 15 fish per spe

· Fish habitat for the lake will be collected as part of the limnology program as desc Habitat data will also be collected from the inlet streams that are likely used for spa and char found in the lake. The habitat survey will extend 500 m upstream from the closest impassable barrier if it is less than 500 m from lake. “

Please let me know if you have any question

Cheers,

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environme

PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N 3

Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-2

Rod.Dalziel@gov.bc.ca

Visit the BC Parks website @ bcparks.ca



BC Parks

RE: Chapman Lake fish samplin

Monday, October 16, 2016 9:42 AM

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|---------|------------------------------------|
| Subject | RE: Chapman Lake fish sampl |
| From | Dalziel, Rod ENV:EX |
| To | Willcox, Michael FLNR:EX |
| Sent | Wednesday, August 3, 2016 2:14 |

Thanks Mike. I will.

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environment

PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N 3

Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-

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BC Parks

From: Willcox, Michael FLNR:EX

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Cc: Hirner, Joanna ENV:EX

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- Fish sampling would follow the protocol used by Whitehead to collect comparable data. We will use a net similar to the standard gill net prescribed in provincial guidelines for lake surveys. We propose to use the BC RISC standard lake survey gill nets, one floating and one set perpendicular to the shore. However, rather than an overnight set used by Whitehead, we will use a 2 – 3 hour set. If no fish are caught in that time the nets will be redeployed for another 2 – 3 hour set. Minnow traps would be used along the shoreline of the lake. Minnow traps and electrofishing will be used to sample fish in the streams flowing into the lake and to sample for fish in the lake downstream of the dam. Scale samples will be collected from up to 15 fish per species.

- Fish habitat for the lake will be collected as part of the limnology program as described in the application. Habitat data will also be collected from the inlet streams that are likely used for spawning and char found in the lake. The habitat survey will extend 500 m upstream from the closest impassable barrier if it is less than 500 m from lake. "

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 Visit the BC Parks website @ bcparks.ca



BC Parks

Memorandum

To **Brett Dewynter** Page **1**

CC

Subject **Additional Studies to Support the Chapman Lake Park Use Amendment Application (Rev 1)**

From **Bruce Ford**

Date **August 4, 2016** Project Number **60485918**

The following work plan has been developed to address the comments received from BC Parks on June 8th with regard to additional information BC Parks has requested in order for them to complete the review of the proposal to install a gravity fed withdrawal system to provide more water from Chapman Lake during periods of drought. Essentially BC Parks has asked for the data provided in the Whitehead Report (dated 1999) to be updated to reflect existing conditions of Chapman Lake and surrounding areas and to address the concern of global warming and potential changes in the frequency of drought conditions. Based on a review of the June 8th comments received from BC Parks, the following is a brief description of the proposed work.

1. Review of watershed hydrodynamics that includes updated estimates of the frequency and extent of drawdown below the current -3 m level. This will be a desktop analysis with the addition of any new analysis on run-off coefficients based on data collected by the SCRD (i.e. precipitation and lake level data collected at the outlet of the lake) and existing scenarios of the effect of global warming on the south coast of BC. Metro Vancouver has conducted studies of global warming on their drinking water reservoirs and initial indication is that SCRD should be able to obtain that information (currently a draft report).
2. Limnology of Chapman Lake. BC Parks has asked that this information be updated including:
 - the use of more current bathymetry (collected by SCRD in 2013)
 - *In situ* sampling of temperature and dissolved oxygen using a calibrated meter. This will be used to develop a profile from surface to bottom to determine the depth of the thermocline. Other *in situ* data will include secchi readings assessing water clarity
 - Current water chemistry data: this will include multiple samples collected from the deepest part of Chapman Lake including 1 m below surface, at the thermocline and 1 m above the bottom. Parameters to be analyzed in a lab are provided below:

| Water Quality Parameters | | |
|--------------------------|------------------|----------------------|
| Nitrogen | TDS | Ortho-Phosphate |
| Nitrate-N | TSS | Total Phosphorus |
| Nitrite-N | Alkalinity | Total Organic Carbon |
| Ammonia | Conductivity | Total Metals |
| Total Kjeldahl | Hydrogen Sulfide | Chlorophyll a |
| pH | | |

riparian vegetation communities. A review of the provincial government on-line databases indicates that there is also a Broad Ecosystem Inventory Layer for the Chapman Lake area, however this data is only available for internal use. We will ask BC Parks if this data can be made available for this study.

- Building on existing ecosystem mapping, the field program will follow RISC standards for ecosystem mapping. Rare ecological communities will be identified as part of this work. This field program will include digging small pits to collect data on soil types. These holes will be filled in once the observations have been recorded.
- Survey for rare or medicinal plants will be focused on the areas that could be disturbed during the construction phase. Additional information will be collected as part of the ecosystem mapping.
- Survey of herptiles around Chapman Lake. This will focus on the area disturbed by installing the pipe and the associated camp and laydown areas. A less intensive, opportunistic survey will be carried out in other areas around the lake in association with the ecosystem mapping survey. The fisheries crew will report any amphibian siting's in the tributary streams or in the survey area downstream of the lake.

5. Data Analysis and Reporting:

- The data collected will be compiled and analyzed. Currently we anticipate that we would incorporate the information from the 2016 studies into the original report issued to parks in April, however, we should confirm this approach with BC Parks to ensure they get the information in a form that is easiest for them to review.

The results of these studies will be used to update the existing conclusions and will support the development of more detailed information that BC Parks has asked for including:

- Update of Chapman Lake hydrology.
- clarity on the drawdown regime and how this could be affected by climate change.
- update of sensitive ecosystems and species in Chapman lake and within the project footprint.
- development of a site restoration plan based on ecosystem type in the area
- assessment of potential for slumping and other possible earth movements within the lake that could affect water quality.

The review comments from BC Parks also indicates that they also want additional details on flows downstream of the lake, in particular, flows that support spawning salmon migration into the lower 17 km of Chapman Creek. While this may be a valid concern we understand that the SCRDP will be conducting a separate study of low flow requirements for salmonids in the lower reaches of Chapman Creek which will be provided to FLNRO for their review of the application for a new water licence to withdraw the water from -3 to -8 m.

At this time we anticipate flying into the lake by helicopter on a daily basis to carry out this study. We anticipate that the study will take approximately four days and a small motorized aluminium boat will be used. We are planning to mobilize for this field program in mid-August assuming the appropriate permits to work in the park and to collect samples are in place. This field program is of short duration, will collect small volumes of sediment and water and fish sampling will be carefully monitored to avoid catching more fish than necessary. While the field team's presence over a four day period may be disruptive to some park users, once the field program is complete there should be no noticeable environmental impact.

*prepare a summary
report of 2016 studies
as well as incorporate
into Detailed Proposal
submitted with RFP
Amendment application*

Memorandum

To Brett Dewynter Page 1

CC

Subject Additional Studies to Support the Chapman Lake Park Use Amendment Application

From Bruce Ford - *Senior Biologist*

Date June 26, 2016 Project Number 60485918

The following work plan has been developed to address the comments received from BC Parks on June 8th with regard to additional information BC Parks has requested in order for them to complete the review of the proposal to install a gravity fed withdrawal system to provide more water from Chapman Lake during drought events. Essentially BC Parks has asked for the data provided in the Whitehead Report (dated 1999) to be updated to reflect existing conditions of Chapman Lake and surrounding areas and to address the concern of global warming and potential changes in the frequency of drought conditions. Based on a review of the June 8th comments received from BC Parks, the following is a brief description of the proposed work *why only brief?*

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- update on sensitive ecosystems and species in Chapman lake and within the project footprint
- development of a site restoration plan based on ecosystem type in the area
- update on potential for slumping and other possible earth movements within the lake that could affect water quality

The review comments from BC Parks also indicates that they also want additional details on flows downstream of the lake, in particular, flows that support spawning salmon migration into the lower 17 km of Chapman Creek. While this may be a valid concern we understand that the SCRD will be conducting a separate study of low flow requirements for salmonids in the lower reaches of Chapman Creek.

At this time we anticipate flying into the lake by helicopter on a daily basis to carry out this study. We anticipate that the study will take approximately four days. We are planning to mobilize for this field program in early August pending appropriate permits to work in the park are in place by August 1. This field program is of short duration, will collect small volumes of sediment and water and fish sampling will be carefully monitored to avoid catching more fish than necessary. While the field team's presence over a four day period may be disruptive to some park users, once the field program is complete there should be no noticeable environmental impact.

Chapman Lake Field Program

Thursday, October 12, 2017

8:54 AM

| | |
|-------------|---|
| Subject | Chapman Lake Field Program |
| From | Ford, Bruce |
| To | Dalziel, Rod ENV:EX; dewynter, Brett |
| Cc | Hirner, Joanna ENV:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; Bryan Shoji (Bryan.Shoji@scrd.ca); Dave Crosby (Dave.Crosby@scrd.ca) |
| Sent | Friday, August 5, 2016 1:25 PM |
| Attachments | 
MEM
Chapman ... |

Rod,

Provided below are specific responses to your review of the research PUP application provided in your email of August 3rd. Attached is a revised work plan that addresses the comments relative to the field program. I hope this addresses your concerns.

. The work plan does not identify who will be conducting the field work and associated additional assessments of different values. BC Parks expects that appropriately Qualified Professionals (e.g. RPBios with expertise in the areas they are working on) are involved in planning and conducting the various aspects of the work. The people involved in the work and their certifications/qualifications should be information included in the work plan and assessment report. **The AECOM team consists of biologists experienced in conducting aquatic and terrestrial surveys and includes:**

Bruce Ford, MRM, R.P.Bio Program Lead

Melissa Mukai, B.Sc, R.P.Bio. Aquatic Biologist

Keith Bell, B.Sc. RPF Vegetation ecologist, terrestrial lead

Heather Leech, M.Sc. Terrestrial ecologist

Brian McGill, B.Sc., Aquatic biologist

With support from David Bates, Ph.D., FSCI Biological Consultants

. Please ensure required Wildlife Act permits are in place for work involving trapping/handling of fish or wildlife (ie. Scientific Fish Collection (SFC) Permit from FLNRO). Please provide. **We have applied for SFC permit over 30 days before start of work so if FLNRO is able to meet their timelines we expect to have the permit before start of work on August 23rd. We do not plan on conducting any trapping or handling of other wildlife.**

. I would like to reinforce the importance of sampling during low water and that additional sampling even this fall for certain aspects (especially fish and water quality) may be appropriate if we have a dry fall and lower water conditions after they do their main sampling trip. **We have had this conversation with Joanna and she agreed it is not a problem if water levels do not drop this summer/fall, we currently have no budget for any return trip later in the fall and frankly a couple of meters difference in lake level will not change the results. Current weather patterns suggest that water demand will not draw the lake down to the -3 level this year. SCRD will not is not planning on installing the siphons and drawing the lake down just for this study**

. Consultation with First Nation's will be required on the research permit application if work involves intrusive/lethal sampling. Please provide FN consultation update on this and overall project. **We have not had a specific consultation on this and the use of lethal sampling will depend on the SFC Permit issued by FLNRO. SCRD will be contacting the sháshálh Nation regarding the project and inviting them to send an observer/participant.**

. Geotechnical testing and assessment of potential for acid rock drainage. **Rock samples were collected during the site visit in May and are with the lab for analysis. Caution, surface samples may be of limited value in characterizing all the rock that may be excavated but lifting a drill rig to the site is expensive. Geotechnical investigations to determine the depth of the bedrock will be conducted this month to provide a better estimate of the volume of rock that will have to be excavated. During construction a geotechnical assessment will be made when the rock is excavated and if the geology of the rock suggests potential for ARD additional samples can be sent for analysis and if rated as ARD then the appropriate management plan will be followed. Options for management of ARD rock will be provided in the environmental report (i.e. different scenarios for different volumes of rock).**

. Detailed characterization of area of impact during construction, including information about vegetation, species and habitat at site and how it will be affected by construction and lay down areas. This information is important to develop site mitigation and restoration plans, and for general environmental management planning for the site. **The information required to do this will be collected as part of the terrestrial component of the field program**

. Water quality sampling related to the issue of methyl mercury. **Methyl mercury is primarily an issue for reservoirs where areas of organic soils and vegetation become submerged by reservoir creation. Recent work on Carpenter Lake by BC Hydro suggests it may also be an issue for reservoirs with regular drawdown and refill, in the case of Carpenter Lake this is something that happens annually and involves hundreds of hectares (2,340 ha actually). Chapman lake drawdown involved a much smaller area (at -8 m the exposed area would be 15 ha) and for a much shorter period of**

time. Methyl mercury is an unlikely consequence of drawing Chapman lake down from -3 to -8 m during periods of drought which are not expected to occur annually. If one is concerned that there is currently a methyl mercury problem in the lake then fish tissue should be collected and analyzed.

. Field assessment aimed at determining risks to water quality associated with sloughing during drawdown. **Substrate observation/sampling is part of the program and this information will be used to evaluate this potential.**

. Littoral area sampling of aquatic vegetation and substrate: is this using transect sampling as done by Whitehead in 1999? And/or some other method? **We will be using primarily observation to develop a map of the underwater substrate and vegetation which will include revisiting Whitehead's transects.**

. Fish: a) not clear how the sampling and assessment will be used to determine the timing and location of spawning by char, which is a key piece of information for impact assessment; b) what kind of habitat data will be collected from potential spawning streams; c) will habitat assessment for fish immediately downstream of dam be part of assessment. **RISC standard methods will be followed for habitat assessment. We will note the spawning condition of char caught during the sampling program. In order to identify a specific spawning time we would likely have to make multiple trips to site over the expected spawning time to determine specific timing. Potential spawning habitat will be assumed based on habitat conditions such as access and presence of suitable substrate.**

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Bruce S. Ford, MRM, R.P.Bio

Senior Environmental Biologist

Phone: 604-444-6449

s.22

bruce.ford@aecom.com

AECOM

3292 Production Way, 4th Floor

Burnaby BC V5A 4R4

Phone: 604-444-6400 Fax: 604-294-8597



please consider the environment
before printing

Dalziel, Rod ENV:EX

From: Ford, Bruce <Bruce.Ford@aecom.com>
Sent: Friday, August 5, 2016 1:25 PM
To: Dalziel, Rod ENV:EX; dewynter, Brett
Cc: Hirner, Joanna ENV:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; Bryan Shoji (Bryan.Shoji@scrd.ca); Dave Crosby (Dave.Crosby@scrd.ca)
Subject: Chapman Lake Field Program
Attachments: MEM Chapman Lk Field Program_Rev 1_2016-08-04_60485918.pdf

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AECOM

3292 Production Way, 4th Floor
Burnaby BC V5A 4R4

RE: Chapman Lake Field Program

Monday, October 16, 2016
9:43 AM

| | |
|-------------|--|
| Subject | RE: Chapman Lake Field Program |
| From | dewynter, Brett |
| To | Dalziel, Rod ENV:EX |
| Cc | Hirner, Joanna ENV:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; Ford, Bruce; Bryan Shoji (Bryan.Shoji@scrd.ca); Dave Crosby (Dave.Crosby@scrd.ca) |
| Sent | Monday, August 8, 2016 8:08 AM |
| Attachments | 
FW Field program t... |

Rod:

Further to the below note, please be aware that the Sunshine Coast Regional District invited participation of the Sechelt First Nation during the additional field work planned at Chapman Lake. However, the offer is detailed in the attached note.

Thanks.

Brett deWynter, P.Eng.

s.22

From: Ford, Bruce

Sent: Friday, August 05, 2016 1:25 PM

To: Dalziel, Rod ENV:EX (Rod.Dalziel@gov.bc.ca); dewynter,

Cc: Hirner, Joanna ENV:EX (Joanna.Hirner@gov.bc.ca); Jennie.Aikman@gov.bc.ca; Chris.Platz@gov.bc.ca; Bryan.Shoji@scrd.ca; Dave Crosby (Dave.Crosby@scrd.ca)

Subject: Chapman Lake Field Program

Rod,

Provided below are specific responses to your review of the research PUP application provided in 3rd . Attached is a revised work plan that addresses the comments relative to the field program. I hope this addresses your concerns.

. The work plan does not identify who will be conducting the field work and associated additional costs. BC Parks expects that appropriately Qualified Professionals (e.g. RPBios with experience are working on) are involved in planning and conducting the various aspects of the work. The people doing the work and their certifications/qualifications should be information included in the work plan and as the AECOM team consists of biologists experienced in conducting aquatic and terrestrial surveys and

Bruce Ford, MRM, R.P.Bio Program Lead

Melissa Mukai, B.Sc, R.P.Bio. Aquatic Biologist

Keith Bell, B.Sc. RPF Vegetation ecologist, terrestrial

Heather Leech, M.Sc. Terrestrial ecologist

Brian McGill, B.Sc., Aquatic biologist

With support from David Bates, Ph.D., FSCI Biological Consultant

. Please ensure required Wildlife Act permits are in place for work involving trapping/handling of fish (Scientific Fish Collection (SFC) Permit from FLNRO). Please provide. **We have applied for SFC permit start of work so if FLNRO is able to meet their timelines we expect to have the permit before start of 23rd. We do not plan on conducting any trapping or handling of other wildlife.**

. I would like to reinforce the importance of sampling during low water and that additional sampling of certain aspects (especially fish and water quality) may be appropriate if we have a dry fall and low water after they do their main sampling trip. **We have had this conversation with Joanna and she agreed that if water levels do not drop this summer/fall, we currently have no budget for any return trip later in the fall. A couple of meters difference in lake level will not change the results. Current weather patterns and demand will not draw the lake down to the -3 level this year. SCRD will not be planning on it.**

. Consultation with First Nation's will be required on the research permit application if work involves sampling. Please provide FN consultation update on this and overall project. **We have not had an update on this and the use of lethal sampling will depend on the SFC Permit issued by FLNRO. SCRD will be consulting with the Shíshálh Nation regarding the project and inviting them to send an observer/participant.**

. Geotechnical testing and assessment of potential for acid rock drainage. **Rock samples were collected in May and are with the lab for analysis. Caution, surface samples may be of limited value in the future as rock that may be excavated but lifting a drill rig to the site is expensive. Geotechnical investigations**

depth of the bedrock will be conducted this month to provide a better estimate of the volume of rock to be excavated. During construction a geotechnical assessment will be made when the rock is exposed. The geology of the rock suggests potential for ARD additional samples can be sent for analysis and if the appropriate management plan will be followed. Options for management of ARD rock will be discussed.

. Detailed characterization of area of impact during construction, including information about vegetation and habitat at site and how it will be affected by construction and lay down areas. This information is required for site mitigation and restoration plans, and for general environmental management planning for the project. **Information required to do this will be collected as part of the terrestrial component of the field program.**

. Water quality sampling related to the issue of methyl mercury. **Methyl mercury is primarily an issue in areas where areas of organic soils and vegetation become submerged by reservoir creation. Recent work by BC Hydro suggests it may also be an issue for reservoirs with regular drawdown and refill, in that in Lake this is something that happens annually and involves hundreds of hectares (2,340 ha actual drawdown involved a much smaller area (at -8 m the exposed area would be 15 ha) and for a much shorter time. Methyl mercury is an unlikely consequence of drawing Chapman lake down from -3 to -8 m during drought which are not expected to occur annually. If one is concerned that there is currently a methyl mercury issue, it should be addressed as part of the water quality monitoring program.**

. Field assessment aimed at determining risks to water quality associated with sloughing during drawdown. **Observation/sampling is part of the program and this information will be used to evaluate this risk.**

. Littoral area sampling of aquatic vegetation and substrate: is this using transect sampling as done in 1999? And/or some other method? **We will be using primarily observation to develop a map of substrate and vegetation which will include revisiting Whitehead's transects.**

. Fish: a) not clear how the sampling and assessment will be used to determine the timing and location of spawning, which is a key piece of information for impact assessment; b) what kind of habitat data will be collected to identify potential spawning streams; c) will habitat assessment for fish immediately downstream of dam be done? **RISC standard methods will be followed for habitat assessment. We will note the spawning conditions during the sampling program. In order to identify a specific spawning time we would likely have multiple trips to site over the expected spawning time to determine specific timing. Potential spawning locations will be identified as part of the habitat assessment.**

. Ecosystem mapping: what standards and methods will be used to update the ecosystem mapping surveys and mapping should include identification of any rare ecological communities that occur. The BEI data, but the Interfor mapping looks like it excludes the park. **Ecosystem mapping will be done using the standards for terrestrial ecosystem mapping in BC for the area surrounding Chapman lake and the dam footprint. Rare ecological communities will be identified as part of this work and the legend from the BEI data will be used.**

. Rare or medicinal plant surveys: because rare plants may not be identifiable at all times of year, standards recommend sampling areas several times during the growing season to increase likelihood of identifying plants. The assessment should take this into account, including the need for additional visits to construction areas. **We have not been provided a budget for multiple trips. The medicinal/rare plant surveys will be done in the construction areas as there are no plans to impact plant communities outside this area. The surveys will be done as part of the ecosystem mapping program.**

. Amphibians: how will herptiles be surveyed? Surveys for coastal tailed frogs downstream of the dam are mentioned. Although amphibians don't necessarily need to be surveyed all around the lake, consider the location and distribution of suitable amphibian habitat throughout the riparian areas of Chapman Lake shoreline. **Amphibian surveys will be done as part of the ecosystem mapping program. Amphibians will be opportunistically surveyed during ecosystem mapping and potential habitat will be documented.**

Bruce S. Ford, MRM, R.P.Bio
Senior Environmental Biologist
Phone: 604-444-6449

s.22

bruce.ford@aecom.com

3292 Production Way, 4th Floor
Burnaby BC V5A 4R4
Phone: 604-444-6400 Fax: 604-294-8597

Goulet, Giselle CSNR:EX

To: dewynter, Brett; Bryan Shoji

FYI

Dave Crosby
Manager of Utility Services
Special Projects
Sunshine Coast Regional District
Tel: 604 885 6800 Ext.6494
dave.crosby@scrd.ca

s.16

From: Dave Crosby [<mailto:Dave.Crosby@scrd.ca>]
Sent: August-05-16 1:34 PM
To: Jasmine Paul <jpaul@sechelnation.net>
Cc: 'dewynter, Brett' <Brett.dewynter@aecom.com>
Subject: FW: Field program table

Hi Jasmine

Just following up on my phone call regarding attendance at one of the field study days at Chapman
your staff interested in attending one of the days?
Please let me know.

Thanks!!

Dave Crosby
Manager of Utility Services
Special Projects
Sunshine Coast Regional District

Cc: Ford, Bruce <Bruce.Ford@aecom.com>; Bryan Shoji <Bryan.Shoji@scrd.ca>; Dave Crosby <Dave.Crosby@scrd.ca>;
Dave Bates <dbates@fsci-biological.ca>

Subject: FW: Field program table

Joanna (Rod and Jennie):

Provided below in **Table 1** is a summary of the people and activities planned while at Chapman Lake field investigations. Please review the below table and let us know which days(s) you would like to join the crew. Thanks.

Brett deWynter, P.Eng.

s.22

Table 1 – Chapman Lake Project, Field Activity Plan

| | Monday, Aug 22 | Tuesday, Aug 23 | Wednesday, Aug 24 | Thursday, Aug 25 | Friday, Aug 26 |
|----------------------------------|--|--|---|---|----------------|
| AECOM Personnel | Keith Bell,
Heather Leech,
Melissa Mukai
Brian McGill | Keith Bell,
Heather Leech,
Melissa Mukai
Brian McGill | Keith Bell,
Heather Leech,
Melissa Mukai
Brian McGill | Keith Bell,
Heather Leech,
Melissa Mukai
Brian McGill | |
| Aquatic Scope of Work | | Limnology,
plankton,
Benthic,
Littoral zone
Set minnow
traps | Gill netting
(floating/sinking),
Finalize work
from 23 rd , Start
stream survey
and
electrofishing | Stream survey
(tribs and
downstream),
Electrofishing
and finalize any
outstanding
items | |
| Terrestrial Scope of Work | | Ecosystem
Mapping,
Wildlife habitat
assessments and
Rare Plant
survey | Ecosystem
Mapping,
Wildlife habitat
assessments and
Rare Plant survey | Ecosystem
Mapping,
Wildlife habitat
assessments and
Rare Plant
survey | |
| Gear Required | | Standard
Field/Safety
Gear (+-30lbs
each) | Standard
Field/Safety Gear
(+-30lbs each) | Standard
Field/Safety
Gear (+-30lbs
each) | |
| Schedule | Travel to Sechelt
(afternoon) | 7:00 am (leave
Airspan) to 3:30
pm | 7:00 am (leave
Airspan) to 3:30
pm | 7:00 am (leave
Airspan) to 3:30
pm, return to
the mainland | N
p |
| Other People | | | | | |

This electronic communication (email) is intended for the use the of addressee(s) and may contain privileged and confidential. If you are not the intended recipient, you are hereby notified any dissemination or copying of this communication is strictly prohibited. If you have received this communication in the Sechelt Nation at 1-866-885-2275. Thank-you.

RE: Chapman Lake fish samplin

Monday, October 16, 2016
9:43 AM

| | |
|-------------|---|
| Subject | RE: Chapman Lake fish samplin |
| From | Hirner, Joanna ENV:EX |
| To | Willcox, Michael FLNR:EX; Dalziel, Rod I |
| Sent | Tuesday, August 9, 2016 10:52 AM |
| Attachments | 
MEM
Chapman ... |

Hi Mike,

Thanks for your comments!

AECOM has sent us some additional information on the research Park Use Permit in response to sc which may or may not answer your outstanding questions.

Regarding timing of char spawning:

We asked a question similar to yours about how they will determine the timing and location of cha their response: **"We will note the spawning condition of char caught during the sampling prograr a specific spawning time we would likely have to make multiple trips to site over the expected sp determine specific timing. Potential spawning habitat will be assumed based on habitat conditic presence of suitable substrate."**

Note that they are planning to do their sampling August 23-25, and currently don't have plans to following year. Also note that the lake levels have stayed quite high this year and this is unlikely to sampling dates, so the lake will not be fully drawn down to 3 m below full pool during their visit.

We'd appreciate your thoughts on their response. It seems to me that potential impacts on char sp most important risks of negative impacts associated with this project, and understanding timing w mitigating impacts in the future (i.e. potentially reservoir drawdown could be managed to ensure c their spawning areas within their preferred timing window). However, the team seems resistant to the site due to budget and scheduling constraints. I'm thinking that we should respond that if th spawning timing based on spawning condition and other observations during the August 23-25 fie return later this fall to confirm spawning timing. Or is there a way they can gather enough informa

One other question: does the timing of char spawning vary much from year to year at a given loca consistent?

Regarding a fish collection permit:

We asked them if they had applied for or hold any applicable permits under the *Wildlife Act*. Here **We have applied for SFC permit over 30 days before start of work so if FLNRO is able to meet th expect to have the permit before start of work on August 23rd. We do not plan on conducting handling of other wildlife.**

Also note that they have provided a slightly more detailed and modified description of the samplin fish. It is the same as previous, but now includes setting nets overnight, and thus fish mortality. See the attached memo.

Thanks again very much for your help with this f

Best regards,
Joanna

Joanna Hirner (MRM, RPBio)
Conservation Specialist

South Coast Region, BC Parks
604-924-2228

From: Willcox, Michael FLNR:EX
Sent: Wednesday, August 3, 2016 10:22 A
To: Dalziel, Rod ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: RE: Chapman Lake fish samplin

Hi again Rod,

My focus during discussions to date has been on the quality of information being gathered so tha adequately assessed. I have, unfortunately, overlooked that the proposed activities (gill netting, g electrofishing) require a Scientific Fish Collection (SFC) Permit from FLNRO. This would be in addi PUP. Iain Lunn has advised that the SFC permitting process is "months behind".

Can you check into whether the person(s) who will be carrying out the fish sampling have a valid submitted an application for one.

Mike

From: Willcox, Michael FLNR:EX
Sent: Tuesday, August 2, 2016 9:21 AM
To: Dalziel, Rod ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: RE: Chapman Lake fish samplin

Hi Rod,

From the very general description of the program, it appears as though they'll be employing suita gather the additional info Joanna asked for. I would, however, like to know how they will determi migration into the inlet spawning streams for the purpose of assessing whether lake drawdown w char spawning.

Regards,

Mike

From: Dalziel, Rod ENV:EX
Sent: Monday, July 25, 2016 3:09 PM
To: Willcox, Michael FLNR:EX
Cc: Hirner, Joanna ENV:EX
Subject: Chapman Lake fish sampling

Hello Mike,

As you are aware BC Parks has requested additional research and field study prior to making a de PUP amendment application and you have had some discussions with Joanna. I have received the Research PUP to conduct this work. I am hoping for your opinion on the adequacy on the fish and submitted (see below).

"

3. Fish and Fish Habitat Assessment:

· Fish sampling would follow the protocol used by Whitehead to collect comparable data. Whitehead the standard gill net prescribed in provincial guidelines for lake surveys. We propose to use the BC survey gill nets, one floating and one sinking set perpendicular to the shore. However, rather than a by Whitehead we will use a 2 – 3 hour set. If not fish are caught in that time the nets will be redeploy hours. Minnow traps would be used along the shoreline of the lake. Minnow traps and electrofishing sample fish in the streams flowing into the lake and to sample for fish immediately downstream of th will be collected from up to 15 fish per species caught (various sizes to develop an understanding of

· Fish habitat for the lake will be collected as part of the limnology program as described above. He collected from the inlet streams that are likely used for spawning by the trout and char found in the survey will extend 500 m upstream from the lake or to the closest impassable barrier if it is less tha

Please let me know if you have any question

Cheers,

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environme

PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N 3

Desk (604) 885-6735 Mobile (604) 741-1967 Fax (604) 885-2

Rod.Dalziel@gov.bc.ca

Visit the BC Parks website @ bcparks.ca



BC Parks



AECOM
3292 Production Way, Floor 4
Burnaby, BC, Canada V5A 4R4
www.aecom.com

004 4
004 2

Memorandum

| | | |
|---------|---|-------------------------|
| To | Brett Dewynter | Page |
| CC | | |
| Subject | Additional Studies to Support the Chapman Lake Park Use Amendm Application (Rev 1) | |
| From | Bruce Ford | |
| Date | August 4, 2016 | Project Number 60485918 |

The following work plan has been developed to address the comments received from BC I June 8th with regard to additional information BC Parks has requested in order for them to the review of the proposal to install a gravity fed withdrawal system to provide more water Chapman Lake during periods of drought. Essentially BC Parks has asked for the data pri the Whitehead Report (dated 1999) to be updated to reflect existing conditions of Chapma surrounding areas and to address the concern of global warming and potential changes in frequency of drought conditions. Based on a review of the June 8th comments received fro Parks, the following is a brief description of the proposed work.

1. Review of watershed hydrodynamics that includes updated estimates of the frequ extent of drawdown below the current -3 m level. This will be a desktop analysis v addition of any new analysis on run-off coefficients based on data collected by the precipitation and lake level data collected at the outlet of the lake) and existing sce the effect of global warming on the south coast of BC. Metro Vancouver has cond studies of global warming on their drinking water reservoirs and initial indication is should be able to obtain that information (currently a draft report).
2. Limnology of Chapman Lake. BC Parks has asked that this information be update including:
 - the use of more current bathymetry (collected by SCRD in 2013)
 - *In situ* sampling of temperature and dissolved oxygen using a calibrated n will be used to develop a profile from surface to bottom to determine the d thermocline. Other *in situ* data will include secchi readings assessing wat
 - Current water chemistry data: this will include multiple samples collected f deepest part of Chapman Lake including 1 m below surface, at the thermc 1 m above the bottom. Parameters to be analyzed in a lab are provided b

| |
|--------------------------|
| Water Quality Parameters |
|--------------------------|

- Survey of the littoral area of the lake to determine the types of substrate found around the lake and confirm the distribution of aquatic vegetation identified in the Whitehead report. This will include re sampling the transects established in the Whitehead.
- Grab samples of sediment and benthic invertebrates at several locations around the lake that would be representative of the substrates observed. The sediment will be used to assess the potential for sloughing of material during drawdown.
- Vertical plankton hauls from three locations around the lake to gather data on the primary productivity level of the lake.

Note: BC Parks suggested that methyl mercury could be an issue that should be investigated. It is well known that methyl mercury is an issue in newly created reservoirs as a result of vegetation and organic soils, however, recent studies by BC Hydro have indicated that it is an issue for older reservoirs where large areas are dewatered on a regular basis. The question was Carpenter Lake and the area that is part of the drawdown and annually covers 2,340 ha. The Chapman Lake drawdown from -3 to -8 m will expose a total of 15 ha annually but only during periods of drought (every few years). Because mercury bioaccumulates up the food chain it would be more effective to determine if mercury is in the system by sampling fish for tissue analysis than trying to determine if, what are likely to be, very low concentrations of methyl mercury (which are hard to measure) will cause effects up the food chain.

3. Fish and Fish Habitat Assessment

- Fish sampling will follow the protocol used by Whitehead to collect comparable data. Whitehead used a net similar to the standard gill net prescribed in provincial guidelines for lake surveys. We propose to use the BC RISC standard lake gill nets, one floating and one sinking set perpendicular to the shore. To collect data that can be directly compared to Whitehead we would leave the nets in place overnight which will result in fish mortality. The alternative is to use a 2 – 3 hour set where fish are caught in that time the nets will be redeployed for another 2 – 3 hours which would reduce or eliminate mortality, however, the catch per unit effort would not be comparable to the Whitehead results. Minnow traps will be used along the shoreline of the lake. Minnow traps and electrofishing will be used to sample fish in streams flowing into the lake and to sample for fish immediately downstream of the dam. Scale samples will be collected from up to 15 fish per species caught to develop an understanding of the growth rate and age range of fish in the lake).
- Fish habitat for the lake will be collected as part of the limnology program described above. Habitat data will also be collected from the inlet stream: likely used for spawning by the trout and char found in the lake. The habitat survey will extend 500 m upstream from the lake or to the closest impassable bar less than 500 m from lake. Stream habitat data will also be collected immediately downstream of the dam. BC RISC 1:20000 stream inventory standards will be followed for collecting stream data. Locations of potential spawning habitat will be determined by identifying suitable habitat conditions including water depth

riparian vegetation communities. A review of the provincial government of databases indicates that there is also a Broad Ecosystem Inventory Layer Chapman Lake area, however this data is only available for internal use. BC Parks if this data can be made available for this study.

- Building on existing ecosystem mapping, the field program will follow RISC for ecosystem mapping. Rare ecological communities will be identified as work. This field program will include digging small pits to collect data on s. These holes will be filled in once the observations have been recorded.
- Survey for rare or medicinal plants will be focused on the areas that could be disturbed during the construction phase. Additional information will be collected as part of the ecosystem mapping.
- Survey of herptiles around Chapman Lake. This will focus on the area distal to installing the pipe and the associated camp and laydown areas. A less intensive opportunistic survey will be carried out in other areas around the lake in addition to the ecosystem mapping survey. The fisheries crew will report any anadromous fish sightings in the tributary streams or in the survey area downstream of the lake.

5. Data Analysis and Reporting:

- The data collected will be compiled and analyzed. Currently we anticipate we would incorporate the information from the 2016 studies into the original report to BC Parks in April, however, we should confirm this approach with BC Parks to ensure they get the information in a form that is easiest for them to review.
- The results of these studies will be used to update the existing conclusion to support the development of more detailed information that BC Parks has requested, including:
 - Update of Chapman Lake hydrology.
 - clarity on the drawdown regime and how this could be affected by climate change.
 - update of sensitive ecosystems and species in Chapman lake and within the project footprint.
 - development of a site restoration plan based on ecosystem type in the lake.
 - assessment of potential for slumping and other possible earth movements around the lake that could affect water quality.

The review comments from BC Parks also indicates that they also want additional details on the lake, in particular, flows that support spawning salmon migration into the lower reaches of Chapman Creek. While this may be a valid concern we understand that the SCRDP is conducting a separate study of low flow requirements for salmonids in the lower reaches of Chapman Creek which will be provided to FLNRO for their review of the application for a new water right to withdraw the water from -3 to -8 m.

At this time we anticipate flying into the lake by helicopter on a daily basis to carry out this study. We anticipate that the study will take approximately four days and a small motorized aluminium boat will be used. We are planning to mobilize for this field program in mid-August assuming the appropriate permits to work in the park and to collect samples are in place. This field program is of short duration and will collect small volumes of sediment and water and fish sampling will be carefully monitored to avoid catching more fish than necessary. While the field team's presence over a four day period may be disruptive to some park users, once the field program is complete there should be no noticeable environmental impact.

RE: Chapman Lake Field Program

Monday, October 16, 2016
9:44 AM

| | |
|---------|---------------------------------------|
| Subject | RE: Chapman Lake Field Program |
| From | Dalziel, Rod ENV:EX |
| To | Hirner, Joanna ENV:EX |
| Cc | Willcox, Michael FLNR:EX |
| Sent | Tuesday, August 9, 2016 2:41 PM |

Thanks Joanna.

I picked up on a few of these points as well and feel they misinterpreted your point on water sampling. I agree that we should again emphasize the need for additional sampling water and for spawning timing which will likely require further site visits.

I will prepare a response to Brett and Bruce but I will wait for a response from Michael on fish concerns first.

That makes good sense for you to arrange your visit on the first day. I would like to see some point depending on seat availability.

Cheers,

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environment

✉ PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N 3

☎ Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-7

✉ Rod.Dalziel@gov.bc.ca

Visit the BC Parks website @ bcparks.ca



BC Parks

From: Hirner, Joanna ENV:EX

Sent: Tuesday, August 9, 2016 12:16 PM

To: Dalziel, Rod ENV:EX

Cc: Aikman, Jennie S ENV:EX

Subject: FW: Chapman Lake Field Program

Hi Rod,

I think some of the responses below and in the attached address our questions and some responses deserve some follow up. Here are some thoughts on some follow up that could provide to AECOM's responses to our questions below and in the attached. **Regarding sampling at low water**, I feel like we should clarify this issue. With the email I sent on July 28 (which Bruce is referring to below), I meant to convey that if low water doesn't occur this year, sampling should still go ahead, but additional sampling would be required next year to further establish a baseline for variables most likely to change under different conditions, especially those related to fish and water quality. I think they understood that. I think what wasn't clear enough in that initial response is our preference that they do the sampling this year for lowest possible water. I also should have noted earlier that if lower water conditions occur after their August 23-25 sampling, I think it likely may require some additional sampling this year for key variables (i.e. fish and water quality). The

I discussed this issue with Jennie yesterday, and she raised the question of how much additional sampling later this fall at lower water (if it occurs) would be to making the permit more secure, but I do think that sampling at lower water will add data that should reduce some of the uncertainties about potential impacts of additional draw down, which will help in the decision. So here is a suggested response back to AECOM on this issue: "Regarding sampling at lower water, we understand there are constraints associated with budget and schedules for sampling after August 25 in the event of lower water challenging. However, if signi

to collect data for key variables most likely to be influenced by low water, especially fish and water quality. Taking advantage of lower water conditions (if they occur) could be the need for additional baseline data collection next year at low water. So we suggest that if significantly lower water conditions occur this fall, the assessment takes advantage

On methyl mercury: Although their analysis seems to suggest methyl mercury is a problem, given that it now sounds like their sampling will result in some fish mortality, it is reasonable that they could collect and send some fish tissue for analysis to confirm the assessment. Suggested response: "Although the analysis you present suggests methyl mercury is unlikely to be a problem at Chapman Lake, given that fish mortality will result from the sampling being planned, it seems reasonable to request that some fish tissue be collected ;

On rare plants: Needs a bit more clarification too. Suggested response: "Given that we are not planned to assess for rare plants, knowledge about the habitat at the construction site, the known range and distribution of rare plants in the region should be used to provide an estimate of the likelihood that rare plants could occur undetected at the site. If that likelihood is high, it makes sense to conduct some follow up sampling next spring to confirm rare plants

On fish: I am concerned that their sampling may not provide enough information on the timing and location of char spawning. It seems to me that potential impact on char spawning is one of the most important risks of negative impacts associated with lower drawdown, and understanding the timing will also help with mitigating impacts in the future (i.e. potentially reservoir drawdown can be managed to ensure char are able to access their spawning areas within their pre-spawning window). I received Rod on a message to Mike Wilcox requesting his opinion on whether the sampling they have planned will allow them to estimate timing in particular. We can discuss this, but I'm thinking that perhaps we should respond that if they can't estimate spawning timing based on spawning condition and other observations during the August 23-25 field

Regarding joining them in the field: I am available and interested and am thinking for me to go out the first or second day (August 23 or 24), so if there are tweaks to their sampling to better address our concerns I can perhaps help them make those adjustments. If on the last day when it may be too late. Does this sound okay? Rod are you also planning to go out one day? Should we plan to go on the same day or different ones? That's it for now. Don't hesitate to call if you want to discuss further.

Joanna

From: Ford, Bruce [<mailto:Bruce.Ford@aecom.ca>]

Sent: Friday, August 5, 2016 1:25 PM

To: Dalziel, Rod ENV:EX; dewynter, Bret

Cc: Hirner, Joanna ENV:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; Bryan (Bryan.Shoji@scrd.ca); Dave Crosby (Dave.Crosby@scrd.ca)

Subject: Chapman Lake Field Program

Rod,

Provided below are specific responses to your review of the research PUP application in response to your email of August 3rd. Attached is a revised work plan that addresses the concerns raised in the field program. I hope this addresses your concerns.

The work plan does not identify who will be conducting the field work and associated assessments of different values. BC Parks expects that appropriately Qualified Professional (Qualified Professional with expertise in the areas they are working on) are involved in planning and conducting various aspects of the work. The people involved in the work and their certification should be information included in the work plan and assessment report. The AEC

Bruce Ford, MRM, R.P.Bio Program Leader
Melissa Mukai, B.Sc, R.P.Bio. Aquatic Biologist
Keith Bell, B.Sc. RPF Vegetation ecologist, terrestrial
Heather Leech, M.Sc. Terrestrial ecologist
Brian McGill, B.Sc., Aquatic biologist

With support from David Bates, Ph.D., FSCI Biological Consl

. Please ensure required Wildlife Act permits are in place for work involving trapping or wildlife (ie. Scientific Fish Collection (SFC) Permit from FLNRO). Please provide. **I for SFC permit over 30 days before start of work so if FLNRO is able to meet their expect to have the permit before start of work on August 23rd. We do not plan c trapping or handling of other wildlife.**

. I would like to reinforce the importance of sampling during low water and that at even this fall for certain aspects (especially fish and water quality) may be appropriate dry fall and lower water conditions after they do their main sampling trip. **We hav conversation with Joanna and she agreed it is not a problem if water levels do n summer/fall, we currently have no budget for any return trip later in the fall and of meters difference in lake level will not change the results. Current weather pa that water demand will not draw the lake down to the -3 level this year. SCRD w**

. Consultation with First Nation's will be required on the research permit applicatio intrusive/lethal sampling. Please provide FN consultation update on this and overa **have not had an specific consultation on this and the use of lethal sampling will c Permit issued by FLNRO. SCRD will be contacting the sháshálh Nation regarding t inviting them to send an observer/participant.**

. Geotechnical testing and assessment of potential for acid rock drainage. **Rock sar collected during the site visit in May and are with the lab for analysis. Caution, st may be of limited value in characterizing all the rock that may be excavated but l the site is expensive. Geotechnical investigations to determine the depth of the l conducted this month to provide a better estimate of the volume of rock that wil excavated. During construction a geotechnical assessment will be made when th excavated and if the geology of the rock suggests potential for ARD additional sa for analysis and if rated as ARD then the appropriate management plan will be fc for management of ARD rock will be provided in the environmental report (i.e. d**

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. Field assessment aimed at determining risks to water quality associated with slo drawdown. **Substrate observation/sampling is part of the program and this info used to evaluate this potential.**

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. Fish: a) not clear how the sampling and assessment will be used to determine the location of spawning by char, which is a key piece of information for impact assess kind of habitat data will be collected from potential spawning streams; c) will habit fish immediately downstream of dam be part of assessment. **RISC standard methc followed for habitat assessment. We will note the spawning condition of char ca**

multiple trips to site over the expected spawning time to determine specific timing. Spawning habitat will be assumed based on habitat conditions such as access and water quality.

. Ecosystem mapping: what standards and methods will be used to update the ecosystem map for the area? The surveys and mapping should include identification of any rare ecological communities that occur. It looks like we can get the BEI data, but the Interfor map excludes the park. **Ecosystem mapping will be based on RISC standards for terrestrial mapping in BC for the area surrounding Chapman lake and the construction footprint. Ecological communities will be identified as part of this work and the legend for the map will be updated.**

. Rare or medicinal plant surveys: because rare plants may not be identifiable at all rare plant survey standards recommend sampling areas several times during the growing season to increase likelihood of detecting rare plants. The assessment should take this into account and the need for additional visits to confirm findings prior to construction. **We have no budget for multiple trips. The medicinal/rare plant survey will focus on the construction footprint. There are no plans to impact plant communities outside this area. The assessment will identify rare or medicinal plants within the construction footprint.**

. Amphibians: how will herptiles be surveyed? Surveys for coastal tailed frogs down to the dam are not mentioned. Although amphibians don't necessarily need to be surveyed in the lake, consideration of the amount and distribution of suitable amphibian habitat throughout the riparian areas of Chapman Lake should be part of the assessment, because these areas could be negatively affected by additional drawdown. **Amphibians and reptiles will be opportunistically surveyed during ecosystem mapping and potential habitat will be documented. The assessment will identify suitable habitat for amphibians and reptiles within the construction footprint.**

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please consider the environment
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RE: Chapman Lake fish samplin

Monday, October 16, 2016
9:23 AM

| | |
|---------|------------------------------------|
| Subject | RE: Chapman Lake fish sampl |
| From | Dalziel, Rod ENV:EX |
| To | Willcox, Michael FLNR:EX |
| Cc | Hirner, Joanna ENV:EX |
| Sent | Tuesday, August 9, 2016 3:41 PM |

Thanks for the quick follow up, Mike. I will provide this info to the client and ask for their field work plan to address these concerns.

Rod Dalziel

Sunshine Coast Area Supervisor
BC Parks - South Coast Region - Ministry of Environment
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BC Parks

From: Willcox, Michael FLNR:EX
Sent: Tuesday, August 9, 2016 3:05 PM
To: Hirner, Joanna ENV:EX
Cc: Dalziel, Rod ENV:EX
Subject: RE: Chapman Lake fish samplin

Hi Joanna,

The information they provided does not adequately answer the question of how the timing and location of char spawning in order to determine whether the proposed drawdown will impact char spawning success. It would have been better to see a more detailed description of what the concern is and how the information they propose to collect will address the concern.

Just to be clear, I would like to reiterate that our main concern is whether unnatural drawdowns during drought periods will prevent access to spawning streams during the spawning period, thus impact spawning success. Determination of this requires knowledge of the char spawning period, including the upstream migration timing (i.e. when they migrate into the stream lake), and the lake bottom profile in the vicinity of the stream outlets. In regard to the steep profile at the drawdown elevations would be of concern whereas a low gradient would be less of a concern.

With respect to their response that you provided, I note that their plan originally included spawning time from the condition of the caught fish. It may be difficult, if not impossible, to "note the spawning condition of the sampling program" based on external observations. You state, however, that their plan to include lethal overnight gill netting in the lake. Although they will be able to observe the sexual maturity of dead fish, I don't know how well they will be able to determine spawning time from the condition of the caught fish. Also, instead of relying on a habitat assessment to determine which tributaries are used for spawning, I suggest their focus be on providing more detailed information on the spawning process.

As to other ways to gather information, I note that stream temperature is a spawn trout (McPhail and Baxter 1996) with spawning activities triggered when stream te to around 9C (as stream temperatures vary slightly from year to year, spawning tin accordingly). As Dolly Varden and Bull trout hybridization is known to occur, it is lik temperature triggers spawning in Dolly Varden in a similar manner. Installing a ten logger in a spawning stream for the period when possible drought conditions may used to determine if the drawdown might impact char spawning – i.e. whether the temperature drops to 9C during the potential drawdown period. This would take t potentially very little field time for installation and retrieval. Further, they should c

Please do not hesitate to contact me if you have any questions or need additi

Cheers,

Mike

Reference (attached): McPhail, J.D. and J.S. Baxter. 1996. A review of bull trout (C confluentus) life-history and habitat use in relation to compensation and improve opportunities. BC Environment, Fisheries Branch, Fisheries Management Report 1

From: Hirner, Joanna ENV:EX
Sent: Tuesday, August 9, 2016 10:53 AM
To: Willcox, Michael FLNR:EX; Dalziel, Rod ENV:
Subject: RE: Chapman Lake fish samplin

Hi Mike,

Thanks for your comments!

AECOM has sent us some additional information on the research Park Use Permit some questions we had, which may or may not answer your outstanding questior

Regarding timing of char spawning:

We asked a question similar to yours about how they will determine the timing an spawning. Here is their response: **"We will note the spawning condition of char c sampling program. In order to identify a specific spawning time we would likely multiple trips to site over the expected spawning time to determine specific timi spawning habitat will be assumed based on habitat conditions such as access an**

Note that they are planning to do their sampling August 23-25, and currently don't return until the following year. Also note that the lake levels have stayed quite high this is unlikely to change before their sampling dates, so the lake will not be fully d below full pool during their visit.

We'd appreciate your thoughts on their response. It seems to me that potential im spawning is one of the most important risks of negative impacts associated with th understanding timing will also help with mitigating impacts in the future (i.e. poter drawdown could be managed to ensure char are able to access their spawning are preferred timing window). However, the team seems resistant to make multiple t

to budget and scheduling constraints. I'm thinking that we should respond that if spawning timing based on spawning condition and other observations during the trip, they should return later this fall to confirm spawning timing. Or is there a way

One other question: does the timing of char spawning vary much from year to year location? Or is it pretty consistent?

Regarding a fish collection permit:

We asked them if they had applied for or hold any applicable permits under the WIA, their response:

We have applied for SFC permit over 30 days before start of work so if FLNRO is ; timelines we expect to have the permit before start of work on August 23rd. We conducting any trapping or handling of other wildlife.

Also note that they have provided a slightly more detailed and modified description they plan to do for fish. It is the same as previous, but now includes setting nets on fish mortality. See item #3 on page 2 of the attached memo.

Thanks again very much for your help with this f

Best regards,
Joanna

Joanna Hirner (MRM, RPBio)
Conservation Specialist
South Coast Region, BC Parks
604-924-2228

From: Willcox, Michael FLNR:EX
Sent: Wednesday, August 3, 2016 10:22 A
To: Dalziel, Rod ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: RE: Chapman Lake fish samplin

Hi again Rod,

My focus during discussions to date has been on the quality of information being gathered so that impacts can be adequately assessed. I have, unfortunately, overlooked that the projects (gill netting, gee trapping and electrofishing) require a Scientific Fish Collection (SFC) permit from FLNRO. This would be in addition to the Research PUP. Iain Lunn has advised that the process is "months behind".

Can you check into whether the person(s) who will be carrying out the fish sampling permit or have submitted an application for one.

Mike

From: Willcox, Michael FLNR:EX
Sent: Tuesday, August 2, 2016 9:21 AM
To: Dalziel, Rod ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: RE: Chapman Lake fish samplin

Hi Rod,

From the very general description of the program, it appears as though they'll be using techniques to gather the additional info Joanna asked for. I would, however, like to determine the timing of char migration into the inlet spawning streams for the assessing whether lake drawdown will adversely impact char spawning.

Regards,

Mike

From: Dalziel, Rod ENV:EX
Sent: Monday, July 25, 2016 3:09 PM
To: Willcox, Michael FLNR:EX
Cc: Hirner, Joanna ENV:EX
Subject: Chapman Lake fish sampling

Hello Mike,

As you are aware BC Parks has requested additional research and field study prior to a decision on the SCRD's PUP amendment application and you have had some discussion with Joanna. I have received their application for a Research PUP to conduct this work and would like your opinion on the adequacy on the fish and habitat section they submitted (see attached).

3. Fish and Fish Habitat Assessment:

- Fish sampling would follow the protocol used by Whitehead to collect comparable data. The protocol used a net similar to the standard gill net prescribed in provincial guidelines for lake surveys. I propose to use the BC RISC standard lake survey gill nets, one floating and one set perpendicular to the shore. However, rather than an overnight set used by Whitehead, I propose a 2 – 3 hour set. If no fish are caught in that time the nets will be redeployed for another 2 – 3 hour set. Minnow traps would be used along the shoreline of the lake. Minnow traps and electrofishing would be used to sample fish in the streams flowing into the lake and to sample for fish in the lake downstream of the dam. Scale samples will be collected from up to 15 fish per species.

- Fish habitat for the lake will be collected as part of the limnology program as described in the application. Habitat data will also be collected from the inlet streams that are likely used for spawning and char found in the lake. The habitat survey will extend 500 m upstream from the closest impassable barrier if it is less than 500 m from lake. "

Please let me know if you have any question

Cheers,

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environment

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RE: Chapman Lake Field Program

Monday, October 16, 2016 9:14 AM

| | |
|-------------|---|
| Subject | RE: Chapman Lake Field Program |
| From | dewynter, Brett |
| To | Dalziel, Rod ENV:EX |
| Cc | Hirner, Joanna ENV:EX; Ford, Bruce; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; 'Bryan Shoji'; Dave Crosby (Dave.Crosby@scrd.ca); Shane Walkey |
| Sent | Wednesday, August 10, 2016 9:03 PM |
| Attachments | 
Chapman Lake Water... |

Rod:

Further to the below note, it seems like there might be some "mixing" of the discussion for the week of August 22nd is to collect additional aquatic and terrestrial data to look for significant or noteworthy changes from the conclusions within the Whitehead report planning to answer every possible question with the field investigation planned for August 22nd. This is not practical.

It is our understanding that it has already been agreed that additional environment data will be completed in the future during a low water level in Chapman Lake since this year in Chapman Lake will reach -3 m from full pool. The timing of the future data collection is dependent on the weather and may not occur for several years into the future. For example see the graph that shows the minimum level in Chapman Lake during 2014 being about -2

Some other comments are:

1. Regarding the detailed questions about fish spawning we are looking forward to collecting actual flows in the small creeks entering Chapman Lake during a time when the water level in Chapman Lake is dropping. We suspect that the driver for fish spawning is more the availability of water in the small creeks. We think it would be best to review the conditions during the week of August 22nd and then engage in further debate.
2. Methyl mercury analysis will be completed.
3. We plan to complete a pre-construction survey for environment features immediately after construction starting next spring. This is assumed to be standard practice.

Bruce can provide more explanation if required, however, we need to know if the data can be provided. There are many details and commitments that need to be made to allow the completion of a significant field investigation. Can you confirm if the permit is going to be completed to complete the field investigation during the week of August 22nd? Thanks.

Brett deWynter, P.Eng.

s.22

From: Dalziel, Rod ENV:EX [<mailto:Rod.Dalziel@gov.bc.ca>]

Sent: Wednesday, August 10, 2016 10:42 AM

To: Ford, Bruce

Cc: Hirner, Joanna ENV:EX; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; Plouffe, Brett; 'Bryan Shoji'; Dave Crosby (Dave.Crosby@scrd.ca)

Subject: RE: Chapman Lake Field Program

Hello Bruce,

Thank you for the responses to our review which addresses most issues but we still need further follow-up and detail on a few points.

- **Fish:** a) not clear how the sampling and assessment will be used to determine the location of spawning by char, which is a key piece of information for impact assessment; b) what kind of habitat data will be collected from potential spawning streams; c) will habitat fish immediately downstream of dam be part of assessment. **AECOM response:** R1 methods will be followed for habitat assessment. We will note the spawning conditions observed during the sampling program. In order to identify a specific spawning time, we will have to make multiple trips to site over the expected spawning time to determine spawning. Potential spawning habitat will be assumed based on habitat conditions such as access to spawning habitat.
 - The information provided does not adequately answer the question of how we will determine the timing and location of char spawning in order to determine if the proposed lake drawdown will impact char spawning success. It would have been better to see a more detailed description of what the concern is and how the information provided propose to collect will address the concern.
 - We would like to reiterate that our main concern is whether unnatural lake level drawdown during drought periods will prevent access to spawning streams during the spawning period and thus impact spawning success. Determination of this requires knowledge of the char spawning period, including the upstream migration timing (i.e. when char migrate into the streams from the lake), and the lake bottom profile in the vicinity of stream outlets. In regard to the latter issue, a steep profile at the drawdown point would be of concern whereas a low gradient profile would indicate a low risk to spawning.
 - It may be difficult, if not impossible, to “note the spawning condition of fish” during the sampling program” based on external observations of live fish. However, we will be better able to observe the sexual maturity of dead fish, I don’t know if they will be able to estimate spawning time from the condition of the caught fish. Instead of relying on a habitat assessment to determine which tributaries are suitable for spawning, we suggest the focus be on presence/absence of juvenile char in spawning streams - presence of juvenile char can be taken as evidence of char spawning.
 - As to other ways to gather information, note that stream temperature is a key factor for bull trout (McPhail and Baxter 1996) with spawning activities triggered when stream temperatures drop to around 9C (as stream temperatures vary slightly from year to year, spawning times will vary accordingly). As Dolly Varden and Bull trout spawning is known to occur, it is likely that stream temperature triggers spawning in a similar manner. Installing a temperature data logger in a spawning stream during the spawning period when possible drought conditions may occur could be used to determine if drawdown might impact char spawning – i.e. whether the stream temperature drops below 9C during the potential drawdown period. This would take two trips but would save a lot of field time for installation and retrieval. Further, they should do some research on the effect of drawdown on spawning.
- Reference (attached): McPhail, J.D. and J.S. Baxter. 1996. A review of *Salvelinus confluentus* life-history and habitat use in relation to climate change and improvement opportunities. BC Environment, Fisheries Branch Management Report No. 104
- **Regarding sampling at low water:** We understand there are constraints associated with the current sampling schedules that may make sampling after August 25 in the event of lower water conditions difficult. However, if significantly lower water conditions do occur later this fall, we think it would be advantageous to use this opportunity to collect data for key variables most likely to be affected by low water, especially those related to fish and water quality. Taking advantage of low water conditions (if they occur) could also reduce the need for additional baseline data collection at low water. So we suggest that if significantly lower water conditions occur this fall, the assessment takes advantage of this opportunity to collect additional baseline data.
- **On methyl mercury:** Although the analysis you present suggests methyl mercury is not a problem at Chapman Lake, given that fish mortality will result from other sampling

seems reasonable to request that some fish tissue be collected and analyzed to confirm mercury is not a problem.

- **On rare plants:** Given that multiple trips are not planned to assess for rare plants, the habitat at the construction site and the known range and distribution of rare plants should be used to provide an assessment of the likelihood that rare plants could occur on the site. If that likelihood is high, it may make sense to conduct some follow up sampling to confirm rare plants do not occur, and the assessment should address this.

I did not confirm your question in #5. Data Analysis and Reporting in the first response would request AECOM to prepare a summary and report of the 2016 field studies incorporating into the Detailed Proposal submitted with the PUP #102714 amendment in April.

Regarding joining field crew onsite. Joanna would like to join on the first or second day (24). I would like to join as well but I am open to which day when seats are available on the helicopter.

Regards,

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environment

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BC Parks

From: Ford, Bruce [<mailto:Bruce.Ford@aecom.com>]

Sent: Friday, August 5, 2016 1:25 PM

To: Dalziel, Rod ENV:EX; dewynter, Bret

Cc: Hirner, Joanna ENV:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; Bryan Shoji (Bryan.Shoji@scrd.ca); Dave Crosby (Dave.Crosby@scrd.ca)

Subject: Chapman Lake Field Program

Rod,

Provided below are specific responses to your review of the research PUP application in your email of August 3rd. Attached is a revised work plan that addresses the concerns of the field program. I hope this addresses your concerns.

The work plan does not identify who will be conducting the field work and associated assessments of different values. BC Parks expects that appropriately Qualified Professional Biologists (with expertise in the areas they are working on) are involved in planning various aspects of the work. The people involved in the work and their certification information should be included in the work plan and assessment report. The AECOM

Bruce Ford, MRM, R.P.Bio Program Leader

Melissa Mukai, B.Sc, R.P.Bio. Aquatic Biologist

Keith Bell, B.Sc. RPF Vegetation ecologist, terrestrial

Heather Leech, M.Sc. Terrestrial ecologist

Brian McGill, B.Sc., Aquatic biologist

With support from David Bates, Ph.D., FSCI Biological Consultant

Please ensure required Wildlife Act permits are in place for work involving trapping or wildlife (ie. Scientific Fish Collection (SFC) Permit from FLNRO). Please provide. **We expect to have the permit before start of work on August 23rd. We do not plan on trapping or handling of other wildlife.**

I would like to reinforce the importance of sampling during low water and that at even this fall for certain aspects (especially fish and water quality) may be appropriate. **We have had a conversation with Joanna and she agreed it is not a problem if water levels do not drop in summer/fall, we currently have no budget for any return trip later in the fall and**

of meters difference in lake level will not change the results. Current weather pattern that water demand will not draw the lake down to the -3 level this year. SCRD will

. Consultation with First Nation's will be required on the research permit application for intrusive/lethal sampling. Please provide FN consultation update on this and overall. We have not had a specific consultation on this and the use of lethal sampling will require a Permit issued by FLNRO. SCRD will be contacting the Shíshálh Nation regarding this and inviting them to send an observer/participant.

. Geotechnical testing and assessment of potential for acid rock drainage. Rock samples collected during the site visit in May and are with the lab for analysis. Caution, sample may be of limited value in characterizing all the rock that may be excavated but the site is expensive. Geotechnical investigations to determine the depth of the lake will be conducted this month to provide a better estimate of the volume of rock that will be excavated. During construction a geotechnical assessment will be made when the lake is excavated and if the geology of the rock suggests potential for ARD additional samples will be collected for analysis and if rated as ARD then the appropriate management plan will be developed for management of ARD rock will be provided in the environmental report (i.e. d

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. Field assessment aimed at determining risks to water quality associated with slow drawdown. Substrate observation/sampling is part of the program and this information will be used to evaluate this potential.

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Bruce S. Ford, MRM, R.P.Bio

Senior Environmental Biologist

Phone: 604-444-6449

s.22

bruce.ford@aecom.com

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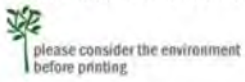


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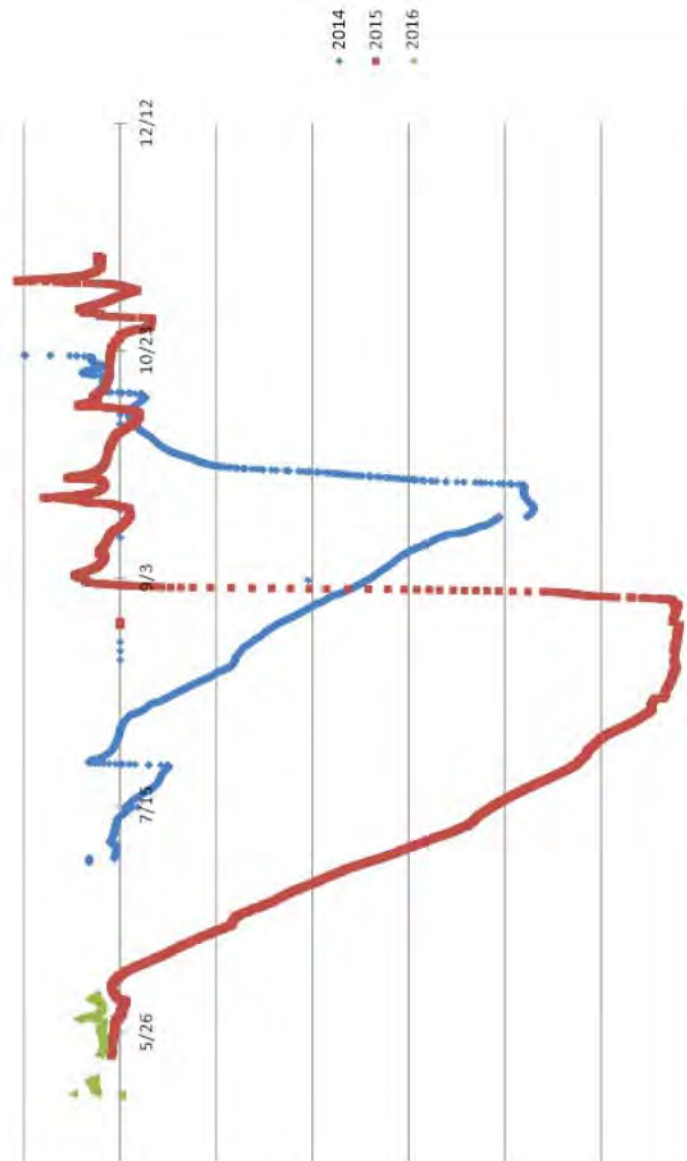
Page 180 of 401 to/à Page 183 of 401

Withheld pursuant to/removed as

DUPLICATE



Chapman Lake Water Depth 2014, 2015, 2016 (0 = Top of Weir)



Re: Chapman Lake fish samplin

Monday, October 16, 2016 9:17 AM

| | |
|---------|---|
| Subject | Re: Chapman Lake fish sampli |
| From | Hirner, Joanna ENV:EX |
| To | Dalziel, Rod ENV:EX; Willcox, Michael FLNR:EX |
| Sent | Wednesday, August 10, 2016 5:08 PM |

Just want to echo Rod's thanks Mike. Your response was very helpful and i

Thanks again!

Joanna

Joanna Hirner (RPBio)
Conservation Specialist
BC Parks, South Coast Region
604-924-2228

From: Dalziel, Rod ENV:EX
Sent: Tuesday, August 09, 2016 3:41 PM
To: Willcox, Michael FLNR:EX
Cc: Hirner, Joanna ENV:EX
Subject: RE: Chapman Lake fish sampling

Thanks for the quick follow up, Mike. I will provide this info to the client and ask for their field work plan to address these concerns.

Rod Dalziel

Sunshine Coast Area Supervisor
BC Parks - South Coast Region - Ministry of Environment
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BC Parks

From: Willcox, Michael FLNR:EX
Sent: Tuesday, August 9, 2016 3:05 PM
To: Hirner, Joanna ENV:EX
Cc: Dalziel, Rod ENV:EX
Subject: RE: Chapman Lake fish samplin

Hi Joanna,

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Just to be clear, I would like to reiterate that our main concern is whether unnatural during drought periods will prevent access to spawning streams during the spawning

thus impact spawning success. Determination of this requires knowledge of the char spawning period, including the upstream migration timing (i.e. when they migrate into the stream), and the lake bottom profile in the vicinity of the stream outlets. In regard to the steep profile at the drawdown elevations would be of concern whereas a low gradient

With respect to their response that you provided, I note that their plan originally included sampling. It may be difficult, if not impossible, to "note the spawning condition of the sampling program" based on external observations. You state, however, that their plan to include lethal overnight gill netting in the lake. Although they will be able to observe the sexual maturity of dead fish, I don't know how well they will be able to determine spawning time from the condition of the caught fish. Also, instead of relying on a fish to determine which tributaries are used for spawning, I suggest their focus be on presence of juvenile char in the tributary streams - presence of juvenile char can be taken as

As to other ways to gather information, I note that stream temperature is a spawning trigger for trout (McPhail and Baxter 1996) with spawning activities triggered when stream temperature is around 9C (as stream temperatures vary slightly from year to year, spawning time accordingly). As Dolly Varden and Bull trout hybridization is known to occur, it is likely that temperature triggers spawning in Dolly Varden in a similar manner. Installing a temperature logger in a spawning stream for the period when possible drought conditions may be used to determine if the drawdown might impact char spawning - i.e. whether the temperature drops to 9C during the potential drawdown period. This would take a potentially very little field time for installation and retrieval. Further, they should

Please do not hesitate to contact me if you have any questions or need additional

Cheers,

Mike

Reference (attached): McPhail, J.D. and J.S. Baxter. 1996. A review of bull trout (*Salvelinus confluentus*) life-history and habitat use in relation to compensation and improvement opportunities. BC Environment, Fisheries Branch, Fisheries Management Report #

From: Hirner, Joanna ENV:EX
Sent: Tuesday, August 9, 2016 10:53 AM
To: Willcox, Michael FLNR:EX; Dalziel, Rod ENV:
Subject: RE: Chapman Lake fish sampling

Hi Mike,

Thanks for your comments!

AECOM has sent us some additional information on the research Park Use Permit regarding some questions we had, which may or may not answer your outstanding question

Regarding timing of char spawning:

We asked a question similar to yours about how they will determine the timing of spawning. Here is their response: **"We will note the spawning condition of char during the sampling program. In order to identify a specific spawning time we would likely**

multiple trips to site over the expected spawning time to determine specific timing spawning habitat will be assumed based on habitat conditions such as access and

Note that they are planning to do their sampling August 23-25, and currently don't return until the following year. Also note that the lake levels have stayed quite high this is unlikely to change before their sampling dates, so the lake will not be fully drained below full pool during their visit.

We'd appreciate your thoughts on their response. It seems to me that potential impacts from spawning is one of the most important risks of negative impacts associated with timber harvesting. Understanding timing will also help with mitigating impacts in the future (i.e. potential drawdown could be managed to ensure char are able to access their spawning area preferred timing window). However, the team seems resistant to make multiple trips to budget and scheduling constraints. I'm thinking that we should respond that if timber spawning timing based on spawning condition and other observations during the trip, they should return later this fall to confirm spawning timing. Or is there a way

One other question: does the timing of char spawning vary much from year to year at this location? Or is it pretty consistent?

Regarding a fish collection permit:

We asked them if they had applied for or hold any applicable permits under the Wildlife Act. Their response:

We have applied for SFC permit over 30 days before start of work so if FLNRO is in the timelines we expect to have the permit before start of work on August 23rd. We are not conducting any trapping or handling of other wildlife.

Also note that they have provided a slightly more detailed and modified description of what they plan to do for fish. It is the same as previous, but now includes setting nets on fish mortality. See item #3 on page 2 of the attached memo.

Thanks again very much for your help with this for

Best regards,
Joanna

Joanna Hirner (MRM, RPBio)
Conservation Specialist
South Coast Region, BC Parks
604-924-2228

From: Willcox, Michael FLNR:EX
Sent: Wednesday, August 3, 2016 10:22 A
To: Dalziel, Rod ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: RE: Chapman Lake fish sampling

Hi again Rod,

My focus during discussions to date has been on the quality of information being gathered so that impacts can be adequately assessed. I have, unfortunately, overlooked that the projects (gill netting, gee trapping and electrofishing) require a Scientific Fish Collection (SFC) from FLNRO. This would be in addition to the Research PUP. Iain Lunn has advised that the

process is "months behind".

Can you check into whether the person(s) who will be carrying out the fish sampling permit or have submitted an application for one.

Mike

From: Willcox, Michael FLNR:EX
Sent: Tuesday, August 2, 2016 9:21 AM
To: Dalziel, Rod ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: RE: Chapman Lake fish sampling

Hi Rod,

From the very general description of the program, it appears as though they'll be using techniques to gather the additional info Joanna asked for. I would, however, like to determine the timing of char migration into the inlet spawning streams for the assessing whether lake drawdown will adversely impact char spawning.

Regards,

Mike

From: Dalziel, Rod ENV:EX
Sent: Monday, July 25, 2016 3:09 PM
To: Willcox, Michael FLNR:EX
Cc: Hirner, Joanna ENV:EX
Subject: Chapman Lake fish sampling

Hello Mike,

As you are aware BC Parks has requested additional research and field study prior to a decision on the SCRD's PUP amendment application and you have had some discussion with Joanna. I have received their application for a Research PUP to conduct this work and would like your opinion on the adequacy on the fish and habitat section they submitted (see attached).

3. Fish and Fish Habitat Assessment:

- Fish sampling would follow the protocol used by Whitehead to collect comparable data. The team will use a net similar to the standard gill net prescribed in provincial guidelines for lake surveys. We propose to use the BC RISC standard lake survey gill nets, one floating and one set perpendicular to the shore. However, rather than an overnight set used by Whitehead, we will use a 2 – 3 hour set. If no fish are caught in that time the nets will be redeployed for another 2 – 3 hour set. Minnow traps would be used along the shoreline of the lake. Minnow traps and electrofishing will be used to sample fish in the streams flowing into the lake and to sample for fish in the lake downstream of the dam. Scale samples will be collected from up to 15 fish per species.

- Fish habitat for the lake will be collected as part of the limnology program as described in the application. Habitat data will also be collected from the inlet streams that are likely used for spawning and where char are found in the lake. The habitat survey will extend 500 m upstream from the closest impassable barrier if it is less than 500 m from lake.

Please let me know if you have any question

Cheers,

Rod Dalziel

Sunshine Coast Area Supervisor
BC Parks - South Coast Region - Ministry of Environme
✉ PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N 3
☎ Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-2
✉ Rod.Dalziel@gov.bc.ca
Visit the BC Parks website @ bcparks.ca

Fwd: Chapman Lake Field Program

Thursday, October 12, 2017

3:26 PM

| | |
|---------|--|
| Subject | Fwd: Chapman Lake Field Program |
| From | Dalziel, Rod ENV:EX |
| To | Aikman, Jennie S ENV:EX; Hirner, Joanna ENV:EX |
| Sent | Thursday, August 11, 2016 7:23 PM |

s.13,s.16

I feel we may need a meeting to discuss this process.

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks

Begin forwarded message:

From: "dewynter, Brett" <Brett.dewynter@aecom.com>
Date: August 10, 2016 at 9:03:36 PM PDT
To: "Dalziel, Rod ENV:EX" <Rod.Dalziel@gov.bc.ca>
Cc: "Hirner, Joanna ENV:EX" <Joanna.Hirner@gov.bc.ca>, "Ford, Bruce" <Bruce.Ford@aecom.com>, "Willcox, Michael FLNR:EX" <Michael.Willcox@gov.bc.ca>, "Aikman, Jennie S ENV:EX" <Jennie.Aikman@gov.bc.ca>, "Platz, Chris ENV:EX" <Chris.Platz@gov.bc.ca>, "Bryan Shoji" <Bryan.Shoji@scrd.ca>, "Dave Crosby" <Dave.Crosby@scrd.ca>, "Shane Walkey" <Shane.Walkey@scrd.ca>
Subject: RE: Chapman Lake Field Program

Rod:

Further to the below note, it seems like there might be some "mixing" of the discussions. The focus for the week of August 22nd is to collect additional aquatic and terrestrial data to benchmark any significant or noteworthy changes from the conclusions within the Whitehead report. We are not planning to answer every possible question with the field investigation planned for the week of August 22nd. This is not practical.

It is our understanding that it has already been agreed that additional environmental review will be completed in the future during a low water level in Chapman Lake since this year it is unlikely that Chapman Lake will reach -3 m from full pool. The timing of the future data collection will be subject to the weather and may not occur for several years into the future. For example see the attached graph that shows the minimum level in Chapman Lake during 2014 being about -2m and occurring in mid-September.

Some other comments are:

1. Regarding the detailed questions about fish spawning we are looking forward to observing the actual flows in the small creeks entering Chapman Lake during a time when the level in Chapman Lake is dropping. We suspect that the driver for fish spawning is more related to the availability of water in the small creeks. We think it would be best to review the physical conditions during the week of August 22nd and then engage in further debate about the fish spawning details.
 2. Methyl mercury analysis will be completed.
 3. We plan to complete a pre-construction survey for environment features immediately prior to construction starting next spring. This is assumed to be standard practice.
- Bruce can provide more explanation if required, however, we need to know if the permit is

going to be provided. There is many details and commitments that need to be made to allow for the completion of a significant field investigation. Can you confirm if the permit is going to be provided to complete the field investigation during the week of August 22nd? Thanks.

Brett deWynter, P.Eng.

s.22

From: Dalziel, Rod ENV:EX [<mailto:Rod.Dalziel@gov.bc.ca>]

Sent: Wednesday, August 10, 2016 10:42 AM

To: Ford, Bruce

Cc: Hirner, Joanna ENV:EX; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; dewynter, Brett; 'Bryan Shoji'; Dave Crosby (Dave.Crosby@scrd.ca)

Subject: RE: Chapman Lake Field Program

Hello Bruce,

Thank you for the responses to our review which addresses most issues but we still require some further follow-up and detail on a few points.

- **Fish:** a) not clear how the sampling and assessment will be used to determine the timing and location of spawning by char, which is a key piece of information for impact assessment; b) what kind of habitat data will be collected from potential spawning streams; c) will habitat assessment for fish immediately downstream of dam be part of assessment. **AECOM response:** RISC standard methods will be followed for habitat assessment. We will note the spawning condition of char caught during the sampling program. In order to identify a specific spawning time we would likely have to make multiple trips to site over the expected spawning time to determine specific timing. Potential spawning habitat will be assumed based on habitat conditions such as access and presence of suitable substrate.
 - The information provided does not adequately answer the question of how you will determine the timing and location of char spawning in order to determine whether the proposed lake drawdown will impact char spawning success. It would have been better to see a more detailed description of what the concern is and how the information they propose to collect will address the concern.
 - We would like to reiterate that our main concern is whether unnatural lake drawdown during drought periods will prevent access to spawning streams during the spawning period and thus impact spawning success. Determination of this requires knowledge of the char spawning period, including the upstream migration timing (i.e. when they migrate into the streams from the lake), and the lake bottom profile in the vicinity of the stream outlets. In regard to the latter issue, a steep profile at the drawdown elevations would be of concern whereas a low gradient profile would indicate a lower risk of interference with fish migration.
 - It may be difficult, if not impossible, to “note the spawning condition of char caught during the sampling program” based on external observations of live fish. Although you will be better able to observe the sexual maturity of dead fish, I don’t know how well they will be able to estimate spawning time from the condition of the caught fish. Instead of relying on a habitat assessment to determine which tributaries are used for spawning, we suggest the focus be on presence/absence of juvenile char in the tributary streams - presence of juvenile char can be taken as evidence of char spawning in the stream.
 - As to other ways to gather information, note that stream temperature is a spawning cue for bull trout (McPhail and Baxter 1996) with spawning activities triggered when stream temperatures drop to around 9C (as stream temperatures vary slightly from year to year, spawning times will vary accordingly). As Dolly Varden and Bull trout hybridization is known to occur, it is likely that stream temperature triggers spawning in Dolly Varden in a similar manner. Installing a temperature data logger in a spawning stream for the period when possible drought conditions may occur could be used to determine if the drawdown might impact char spawning – i.e. whether the stream temperature drops to 9C during the potential drawdown period. This would take two trips but potentially very little field time for installation and retrieval. Further, they should do some bottom sounding to establish lake bottom profiles in the vicinity of those streams that

they find juveniles in.

- Reference (attached): McPhail, J.D. and J.S. Baxter. 1996. A review of bull trout (*Salvelinus confluentus*) life-history and habitat use in relation to compensation and improvement opportunities. BC Environment, Fisheries Branch, Fisheries Management Report No. 104
- **Regarding sampling at low water:** We understand there are constraints associated with budget and schedules that may make sampling after August 25 in the event of lower water challenging. However, if significantly lower water conditions do occur later this fall, we think it would be advantageous to use this opportunity to collect data for key variables most likely to be influenced by low water, especially those related to fish and water quality. Taking advantage of lower water conditions (if they occur) could also reduce the need for additional baseline data collection next year at low water. So we suggest that if significantly lower water conditions occur this fall, the assessment takes advantage of this opportunity to collect additional baseline data about select key variables such as water quality and fish which will help in making the permit decision.
- **On methyl mercury:** Although the analysis you present suggests methyl mercury is unlikely to be a problem at Chapman Lake, given that fish mortality will result from other sampling being planned, it seems reasonable to request that some fish tissue be collected and analyzed to confirm that methyl mercury is not a problem.
- **On rare plants:** Given that multiple trips are not planned to assess for rare plants, knowledge about the habitat at the construction site and the known range and distribution of rare plants in the region should be used to provide an assessment of the likelihood that rare plants could occur undetected at the site. If that likelihood is high, it may make sense to conduct some follow up sampling next spring to confirm rare plants do not occur, and the assessment should address this.

I did not confirm your question in #5. Data Analysis and Reporting in the first response. BC Parks would request AECOM to prepare a summary and report of the 2016 field studies as well as incorporating into the Detailed Proposal submitted with the PUP #102714 amendment application in April.

Regarding joining field crew onsite. Joanna would like to join on the first or second day (August 23 or 24). I would like to join as well but I am open to which day when seats are available on the helicopter.

Regards,

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environment

✉: PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N 3A0

☎: Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-2445

✉: Rod.Dalziel@gov.bc.ca

Visit the BC Parks website @ bcparks.ca

From: Ford, Bruce [<mailto:Bruce.Ford@aecom.com>]

Sent: Friday, August 5, 2016 1:25 PM

To: Dalziel, Rod ENV:EX; dewynter, Brett

Cc: Hirner, Joanna ENV:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; Bryan Shoji

(Bryan.Shoji@scrd.ca); Dave Crosby (Dave.Crosby@scrd.ca)

Subject: Chapman Lake Field Program

Rod,

Provided below are specific responses to your review of the research PUP application provided in your email of August 3rd . Attached is a revised work plan that addresses the comments relative to the field program. I hope this addresses your concerns.

. The work plan does not identify who will be conducting the field work and associated additional assessments of different values. BC Parks expects that appropriately Qualified Professionals (e.g. RPBios with expertise in the areas they are working on) are involved in planning and conducting the various aspects of the work. The people involved in the work and their certifications/qualifications should be information included in the work plan and assessment report. **The AECOM team consists of biologists experienced in conducting aquatic and terrestrial surveys and includes:**

Bruce Ford, MRM, R.P.Bio Program Lead
 Melissa Mukai, B.Sc, R.P.Bio. Aquatic Biologist
 Keith Bell, B.Sc. RPF Vegetation ecologist, terrestrial lead
 Heather Leech, M.Sc. Terrestrial ecologist
 Brian McGill, B.Sc., Aquatic biologist

With support from David Bates, Ph.D., FSCI Biological Consultants

. Please ensure required Wildlife Act permits are in place for work involving trapping/handling of fish or wildlife (ie. Scientific Fish Collection (SFC) Permit from FLNRO). Please provide. **We have applied for SFC permit over 30 days before start of work so if FLNRO is able to meet their timelines we expect to have the permit before start of work on August 23rd. We do not plan on conducting any trapping or handling of other wildlife.**

. I would like to reinforce the importance of sampling during low water and that additional sampling even this fall for certain aspects (especially fish and water quality) may be appropriate if we have a dry fall and lower water conditions after they do their main sampling trip. **We have had this conversation with Joanna and she agreed it is not a problem if water levels do not drop this summer/fall, we currently have no budget for any return trip later in the fall and frankly a couple of meters difference in lake level will not change the results. Current weather patterns suggest that water demand will not draw the lake down to the -3 level this year. SCRD will not is not planning on installing the siphons and drawing the lake down just for this study**

. Consultation with First Nation's will be required on the research permit application if work involves intrusive/lethal sampling. Please provide FN consultation update on this and overall project. **We have not had an specific consultation on this and the use of lethal sampling will depend on the SFC Permit issued by FLNRO. SCRD will be contacting the shíshálh Nation regarding the project and inviting them to send an observer/participant.**

. Geotechnical testing and assessment of potential for acid rock drainage. **Rock samples were collected during the site visit in May and are with the lab for analysis. Caution, surface samples may be of limited value in characterizing all the rock that may be excavated but lifting a drill rig to the site is expensive. Geotechnical investigations to determine the depth of the bedrock will be conducted this month to provide a better estimate of the volume of rock that will have to be excavated. During construction a geotechnical assessment will be made when the rock is excavated and if the geology of the rock suggests potential for ARD additional samples can be sent for analysis and if rated as ARD then the appropriate management plan will be followed. Options for management of ARD rock will be provided in the environmental report (i.e. different scenarios for different volumes of rock).**

. Detailed characterization of area of impact during construction, including information about vegetation, species and habitat at site and how it will be affected by construction and lay down areas. This information is important to develop site mitigation and restoration plans, and for general environmental management planning for the site. **The information required to do this will be collected as part of the terrestrial component of the field program**

. Water quality sampling related to the issue of methyl mercury. **Methyl mercury is primarily an issue for reservoirs where areas of organic soils and vegetation become submerged by reservoir creation. Recent work on Carpenter Lake by BC Hydro suggests it may also be an issue for reservoirs with regular drawdown and refill, in the case of Carpenter Lake this is something that happens annually and involves hundreds of hectares (2,340 ha actually). Chapman lake drawdown involved a much smaller area (at -8 m the exposed area would be 15 ha) and for a much shorter period of time. Methyl mercury is an unlikely consequence of drawing Chapman lake down from -3 to -8 m during periods of drought which are not expected to occur annually. If one is concerned that there is currently a methyl mercury problem in the lake then fish tissue should be collected and analyzed.**

. Field assessment aimed at determining risks to water quality associated with sloughing during drawdown. **Substrate observation/sampling is part of the program and this information will be used to evaluate this potential.**

. Littoral area sampling of aquatic vegetation and substrate: is this using transect sampling as done by Whitehead in 1999? And/or some other method? **We will be using primarily observation to develop a map of the underwater substrate and vegetation which will include revisiting Whitehead's transects.**

. Fish: a) not clear how the sampling and assessment will be used to determine the timing and location of spawning by char, which is a key piece of information for impact assessment; b) what kind of habitat data will be collected from potential spawning streams; c) will habitat assessment for fish immediately downstream of dam be part of assessment. **RISC standard methods will be followed for habitat assessment. We will note the spawning condition of char caught during the sampling program. In order to identify a specific spawning time we would likely have to make multiple trips to site over the expected spawning time to determine specific timing. Potential spawning habitat will be assumed based on habitat conditions such as access and presence of suitable substrate.**

. Ecosystem mapping: what standards and methods will be used to update the ecosystem mapping for the area? The surveys and mapping should include identification of any rare ecological communities that occur. It looks like we can get the BEI data, but the Interfor mapping looks like it excludes the park. **Ecosystem mapping will be based on RISC standards for terrestrial ecosystem mapping in BC for the area surrounding Chapman lake and the construction footprint. Rare ecological communities will be identified as part of this work and the legend from Interfor's TEM will be adopted.**

. Rare or medicinal plant surveys: because rare plants may not be identifiable at all times of year, rare plant survey standards recommend sampling areas several times during the growing season to increase likelihood of detecting rare plants. The assessment should take this into account, including the need for additional visits to confirm findings prior to construction. **We have not been provided a budget for multiple trips. The medicinal/rare plant survey will focus on the construction areas as there are no plans to impact plant communities outside this area. The assessment will address the issue of potential impacts to surrounding vegetation from periodic drawdown to -8 m.**

. Amphibians: how will herptiles be surveyed? Surveys for coastal tailed frogs downstream of the dam are not mentioned. Although amphibians don't necessarily need to be surveyed all around the lake, consideration of the amount and distribution of suitable amphibian habitat throughout the riparian areas of Chapman Lake should be part of the assessment, because these areas could be negatively affected by additional drawdown. **Amphibians and reptiles will be opportunistically surveyed during ecosystem mapping and potential habitat will be documented. There is no plan to conduct any species specific wildlife surveys, instead the focus will be on potential habitat.**

Bruce S. Ford, MRM, R.P.Bio

Senior Environmental Biologist

Phone: 604-444-6449

s.22

bruce.ford@aecom.com

3292 Production Way, 4th Floor

Burnaby BC V5A 4R4

Phone: 604-444-6400 Fax: 604-294-8597

RE: Chapman Lake Field Program

Friday, October 13, 2016

12:25 PM

| | |
|---------|---|
| Subject | RE: Chapman Lake Field Program |
| From | Hirner, Joanna ENV:EX |
| To | 'dewynter, Brett'; Dalziel, Rod ENV:EX |
| Cc | Ford, Bruce; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; 'Bryan Shoji'; Dave Crosby (Dave.Crosby@scrd.ca); Shane Walkey |
| Sent | Friday, August 12, 2016 4:32 PM |

Hi Brett,

Rod is adjudicating the permit and is away until next Tuesday (August 16th). However, Jennie and I wanted to let you know that it is our intent that you will have the research time for your sampling schedule during the week of August 22. The discussion back and forth we have been having by email is more about the details of what, how and when fish are collected, rather than whether or not the research permit will be approved. Discuss

Hopefully this helps clarify things.

Best regards,

Joanna

Joanna Hirner (MRM, RPBio)

Conservation Specialist

South Coast Region, BC Parks

604-924-2228

From: dewynter, Brett [<mailto:Brett.dewynter@aecom.ca>]

Sent: Wednesday, August 10, 2016 9:04 PM

To: Dalziel, Rod ENV:EX

Cc: Hirner, Joanna ENV:EX; Ford, Bruce; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; 'Bryan Shoji'; Dave Crosby (Dave.Crosby@scrd.ca); Shane Walkey

Subject: RE: Chapman Lake Field Program

Rod:

Further to the below note, it seems like there might be some "mixing" of the discussion for the week of August 22nd is to collect additional aquatic and terrestrial data to look for significant or noteworthy changes from the conclusions within the Whitehead report. We are planning to answer every possible question with the field investigation planned for August 22nd. This is not practical.

It is our understanding that it has already been agreed that additional environment data will be completed in the future during a low water level in Chapman Lake since this year in Chapman Lake will reach -3 m from full pool. The timing of the future data collection is dependent on the weather and may not occur for several years into the future. For example see the graph that shows the minimum level in Chapman Lake during 2014 being about -2

Some other comments are:

1. Regarding the detailed questions about fish spawning we are looking forward to seeing actual flows in the small creeks entering Chapman Lake during a time when the water level in Chapman Lake is dropping. We suspect that the driver for fish spawning is more the availability of water in the small creeks. We think it would be best to review the conditions during the week of August 22nd and then engage in further debate.
2. Methyl mercury analysis will be completed.
3. We plan to complete a pre-construction survey for environment features immediately after construction starting next spring. This is assumed to be standard practice. Bruce can provide more explanation if required, however, we need to know if the data can be provided. There are many details and commitments that need to be made to allow

completion of a significant field investigation. Can you confirm if the permit is going to complete the field investigation during the week of August 22nd? Thanks.

Brett deWynter, P.Eng.

s.22

From: Dalziel, Rod ENV:EX [mailto:Rod.Dalziel@gov.bc

Sent: Wednesday, August 10, 2016 10:42 A

To: Ford, Bruce

Cc: Hirner, Joanna ENV:EX; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; ENV:EX; dewynter, Brett; 'Bryan Shoji'; Dave Crosby (Dave.Crosby@scrd.ca)

Subject: RE: Chapman Lake Field Program

Hello Bruce,

Thank you for the responses to our review which addresses most issues but we still have further follow-up and detail on a few points.

- **Fish:** a) not clear how the sampling and assessment will be used to determine the location of spawning by char, which is a key piece of information for impact assessment; b) what kind of habitat data will be collected from potential spawning streams; c) will habitat assessment of fish immediately downstream of dam be part of assessment. **AECOM response:** R1: The same methods will be followed for habitat assessment. We will note the spawning conditions of fish caught during the sampling program. In order to identify a specific spawning time, we will have to make multiple trips to site over the expected spawning time to determine spawning conditions. Potential spawning habitat will be assumed based on habitat conditions such as access to spawning habitat.
 - The information provided does not adequately answer the question of how to determine the timing and location of char spawning in order to determine if the proposed lake drawdown will impact char spawning success. It would have been better to see a more detailed description of what the concern is and how the information provided propose to collect will address the concern.
 - We would like to reiterate that our main concern is whether unnatural lake drawdowns during drought periods will prevent access to spawning streams during the spawning period and thus impact spawning success. Determination of this requires knowledge of the char spawning period, including the upstream migration timing (i.e. when char migrate into the streams from the lake), and the lake bottom profile in the vicinity of the stream outlets. In regard to the latter issue, a steep profile at the drawdown would be of concern whereas a low gradient profile would indicate a low risk to spawning.
 - It may be difficult, if not impossible, to “note the spawning condition of fish” during the sampling program” based on external observations of live fish. Instead of relying on a habitat assessment to determine which tributaries are suitable for spawning, we suggest the focus be on presence/absence of juvenile char in spawning streams - presence of juvenile char can be taken as evidence of char spawning.
 - As to other ways to gather information, note that stream temperature is a key factor for bull trout (McPhail and Baxter 1996) with spawning activities triggered when stream temperatures drop to around 9C (as stream temperatures vary slightly from year to year, spawning times will vary accordingly). As Dolly Varden and Bull trout spawning is known to occur, it is likely that stream temperature triggers spawning in a similar manner. Installing a temperature data logger in a spawning stream during the period when possible drought conditions may occur could be used to determine if drawdown might impact char spawning – i.e. whether the stream temperature drops below 9C during the potential drawdown period. This would take two trips but would save a lot of field time for installation and retrieval. Further, they should do some research on the spawning requirements of char.
 - Reference (attached): McPhail, J.D. and J.S. Baxter. 1996. A review of the life history and spawning requirements of the bull trout (Salvelinus gairdneri) in British Columbia.

(*Salvelinus confluentus*) life-history and habitat use in relation to c
and improvement opportunities. BC Environment, Fisheries Branch
Management Report No. 104

- **Regarding sampling at low water:** We understand there are constraints associated with schedules that may make sampling after August 25 in the event of lower water conditions. However, if significantly lower water conditions do occur later this fall, we think it advantageous to use this opportunity to collect data for key variables most likely to occur at low water, especially those related to fish and water quality. Taking advantage of low water conditions (if they occur) could also reduce the need for additional baseline data collection at low water. So we suggest that if significantly lower water conditions occur this fall, the assessment takes advantage of this opportunity to collect additional baseline data.
- **On methyl mercury:** Although the analysis you present suggests methyl mercury is a problem at Chapman Lake, given that fish mortality will result from other sampling issues, it seems reasonable to request that some fish tissue be collected and analyzed to confirm methyl mercury is not a problem.
- **On rare plants:** Given that multiple trips are not planned to assess for rare plants, the habitat at the construction site and the known range and distribution of rare plants should be used to provide an assessment of the likelihood that rare plants could occur at the site. If that likelihood is high, it may make sense to conduct some follow up sampling to confirm rare plants do not occur, and the assessment should address this. I did not confirm your question in #5. Data Analysis and Reporting in the first response would request AECOM to prepare a summary and report of the 2016 field studies incorporating into the Detailed Proposal submitted with the PUP #102714 amendment in April.

Regarding joining field crew onsite. Joanna would like to join on the first or second trip (August 24). I would like to join as well but I am open to which day when seats are available on the helicopter.

Regards,

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environment

✉ PO Box 950, 6451 Sechelt Inlet Road, Sechelt, BC V0N 3

☎ Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-2

✉ Rod.Dalziel@gov.bc.ca

Visit the BC Parks website @ bcparks.ca



BC Parks

From: Ford, Bruce [<mailto:Bruce.Ford@aecom.cc>]

Sent: Friday, August 5, 2016 1:25 PM

To: Dalziel, Rod ENV:EX; dewynter, Bret

Cc: Hirner, Joanna ENV:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; Bryan (Bryan.Shoji@scrd.ca); Dave Crosby (Dave.Crosby@scrd.ca)

Subject: Chapman Lake Field Program

Rod,

Provided below are specific responses to your review of the research PUP application in your email of August 3rd. Attached is a revised work plan that addresses the concerns with the field program. I hope this addresses your concerns.

The work plan does not identify who will be conducting the field work and associated assessments of different values. BC Parks expects that appropriately Qualified Professionals (R.P.Bios with expertise in the areas they are working on) are involved in planning and conducting various aspects of the work. The people involved in the work and their certification information should be included in the work plan and assessment report. The AECOM

Bruce Ford, MRM, R.P.Bio Program Leader

Melissa Mukai, B.Sc, R.P.Bio. Aquatic Biologist

Keith Bell, B.Sc. RPF Vegetation ecologist, terrestrial

Heather Leech, M.Sc. Terrestrial ecologist

Brian McGill, B.Sc., Aquatic biologist

With support from David Bates, Ph.D., FSCI Biological Consl

. Please ensure required Wildlife Act permits are in place for work involving trapping or wildlife (ie. Scientific Fish Collection (SFC) Permit from FLNRO). Please provide. **I for SFC permit over 30 days before start of work so if FLNRO is able to meet their expect to have the permit before start of work on August 23rd. We do not plan o trapping or handling of other wildlife.**

. I would like to reinforce the importance of sampling during low water and that ac even this fall for certain aspects (especially fish and water quality) may be appropri dry fall and lower water conditions after they do their main sampling trip. **We hav conversation with Joanna and she agreed it is not a problem if water levels do n summer/fall, we currently have no budget for any return trip later in the fall and of meters difference in lake level will not change the results. Current weather pa that water demand will not draw the lake down to the -3 level this year. SCRD w**

. Consultation with First Nation's will be required on the research permit applicatio intrusive/lethal sampling. Please provide FN consultation update on this and overa **have not had an specific consultation on this and the use of lethal sampling will c Permit issued by FLNRO. SCRD will be contacting the shíshálh Nation regarding tl inviting them to send an observer/participant.**

. Geotechnical testing and assessment of potential for acid rock drainage. **Rock sar collected during the site visit in May and are with the lab for analysis. Caution, st may be of limited value in characterizing all the rock that may be excavated but l the site is expensive. Geotechnical investigations to determine the depth of the l conducted this month to provide a better estimate of the volume of rock that wil excavated. During construction a geotechnical assessment will be made when th excavated and if the geology of the rock suggests potential for ARD additional sa for analysis and if rated as ARD then the appropriate management plan will be fo for management of ARD rock will be provided in the environmental report (i.e. d**

. Detailed characterization of area of impact during construction, including inform vegetation, species and habitat at site and how it will be affected by construction z areas. This information is important to develop site mitigation and restoration plan environmental management planning for the site. **The information required to do collected as part of the terrestrial component of the field program**

. Water quality sampling related to the issue of methyl mercury. **Methyl mercury i issue for reservoirs where areas of organic soils and vegetation become submerg creation. Recent work on Carpenter Lake by BC Hydro suggests it may also be an reservoirs with regular drawdown and refill, in the case of Carpenter Lake this is happens annually and involves hundreds of hectares (2,340 ha actually). Chapm involved a much smaller area (at -8 m the exposed area would be 15 ha) and for period of time. Methyl mercury is an unlikely consequence of drawing Chapman from -3 to -8 m during periods of drought which are not expected to occur annua concerned that there is currently a methyl mercury problem in the lake then fish**

. Field assessment aimed at determining risks to water quality associated with slo drawdown. **Substrate observation/sampling is part of the program and this info used to evaluate this potential.**

. Littoral area sampling of aquatic vegetation and substrate: is this using transect by Whitehead in 1999? And/or some other method? **We will be using primarily c develop a map of the underwater substrate and vegetation which will include r Whitehead's transects.**

. Fish: a) not clear how the sampling and assessment will be used to determine the location of spawning by char, which is a key piece of information for impact assess kind of habitat data will be collected from potential spawning streams; c) will habit fish immediately downstream of dam be part of assessment. **RISC standard methc followed for habitat assessment. We will note the spawning condition of char ca**

sampling program. In order to identify a specific spawning time we would likely make multiple trips to site over the expected spawning time to determine specific timing. Spawning habitat will be assumed based on habitat conditions such as access and water quality.

. Ecosystem mapping: what standards and methods will be used to update the ecosystem map for the area? The surveys and mapping should include identification of any rare ecological communities that occur. It looks like we can get the BEI data, but the Interfor map excludes the park. Ecosystem mapping will be based on RISC standards for terrestrial mapping in BC for the area surrounding Chapman lake and the construction footprint. Ecological communities will be identified as part of this work and the legend for the map will be developed.

. Rare or medicinal plant surveys: because rare plants may not be identifiable at all times, rare plant survey standards recommend sampling areas several times during the growing season to increase likelihood of detecting rare plants. The assessment should take this into account and the need for additional visits to confirm findings prior to construction. We have no budget for multiple trips. The medicinal/rare plant survey will focus on the construction footprint. There are no plans to impact plant communities outside this area. The assessment will identify any rare or medicinal plants that occur within the footprint.

. Amphibians: how will herptiles be surveyed? Surveys for coastal tailed frogs downstream of the dam are not mentioned. Although amphibians don't necessarily need to be surveyed, consideration of the amount and distribution of suitable amphibian habitat throughout the riparian areas of Chapman Lake should be part of the assessment, because these areas could be negatively affected by additional drawdown. Amphibians and reptiles will be opportunistically surveyed during ecosystem mapping and potential habitat will be documented. The assessment will identify any amphibians or reptiles that occur within the footprint.

Bruce S. Ford, MRM, R.P.Bio

Senior Environmental Biologist

Phone: 604-444-6449

s.22

bruce.ford@aecom.com

AECOM

3292 Production Way, 4th Floor

Burnaby BC V5A 4R4

Phone: 604-444-6400 Fax: 604-294-8591



please consider the environment
before printing.

Balsom, Tami CSNR:EX

Subject: Canceled: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

Location: Dial-in Number: 1-877-353-9184; Participant Conference ID ^{s.17}

Start: Thu 2016-08-18 3:00 PM

End: Thu 2016-08-18 3:30 PM

Show Time As: Free

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: Aikman, Jennie S ENV:EX

Required Attendees: Dalziel, Rod ENV:EX; Hirner, Joanna ENV:EX

Importance: High

Hi Rod,

Joanna and I were discussing the latest correspondence with AECOM regarding the field sampling and we thought it is important for us to discuss our request for additional field sampling during low water conditions in particular how it relates to the timing of a decision on the permit. Given that they will likely not have low water conditions when they are conducting their field work and it is possible that we may not have low water conditions this fall, I need to be prepared to make a decision on the permit in the absence of data collected during low water conditions. Joanna and I discussed where there will be uncertainties in this case (e.g., water quality and char spawning) and so we will need to let AECOM know what alternate information we would require to help reduce these uncertainties.

I am out of the office on Tuesday and Wednesday so would like to connect on Thursday if possible. Please confirm if this time works for you.

Jennie

Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

Monday, October 16, 2017
9:52 AM

| | |
|---------|---|
| Subject | Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Permit Decision |
| From | Dalziel, Rod ENV:EX |
| To | Aikman, Jennie S ENV:EX |
| Cc | Hirner, Joanna ENV:EX |
| Sent | Friday, August 12, 2016 4:51 PM |

I will need to postpone going in to Princess Louisa for the follow up remediation work as another priority.

Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

On Aug 12, 2016, at 4:43 PM, Aikman, Jennie S ENV:EX <Jennie.Aikman@gov.bc.ca>

Hi Rod,

Joanna and I were discussing the latest correspondence with AECOM regarding sampling and we thought it is important for us to discuss our request for additional sampling during low water conditions in particular how it relates to the timing of the permit. Given that they will likely not have low water conditions when they do their field work and it is possible that we may not have low water conditions when we be prepared to make a decision on the permit in the absence of data collected during low water conditions. Joanna and I discussed where there will be uncertainties in water quality and char spawning) and so we will need to let AECOM know what we

I am out of the office on Tuesday and Wednesday so would like to connect with you if possible. Please confirm if this time works for you.

Jennie

<meeting.ics>

RE: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

Monday, October 16, 2016
9:53 AM

| | |
|---------|--|
| Subject | RE: Chapman Lake - Discussion re: Requirements for Field Sampling and Permit Decision |
| From | Aikman, Jennie S ENV:EX |
| To | Dalziel, Rod ENV:EX |
| Cc | Hirner, Joanna ENV:EX |
| Sent | Friday, August 12, 2016 4:57 PM |

Hi Rod,

I don't want you to have to postpone your trip in to Princess Louisa to do the remediation. Since you are back on Tuesday, I think it's best for you and Joanna to connect then and provide a response to AECOM. Joanna and I have had the chance to discuss and she has my permission to cancel our call on Thursday, and just follow up with Joanna when I am back.

Jennie

From: Dalziel, Rod ENV:EX
Sent: Friday, August 12, 2016 4:52 PM
To: Aikman, Jennie S ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

I will need to postpone going in to Princess Louisa for the follow up remediation. Chapman is another priority.

Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

On Aug 12, 2016, at 4:43 PM, Aikman, Jennie S ENV:EX <Jennie.Aikman@bc.ca> wrote:

Hi Rod,

Joanna and I were discussing the latest correspondence with AECOM re: field sampling and we thought it is important for us to discuss our request for field sampling during low water conditions in particular how it relates to the permit decision on the permit. Given that they will likely not have low water conditions this fall, I need to be prepared to make a decision on the permit in the absence of data collected during low water conditions. Joanna and I discussed that there will be uncertainties in this case (e.g., water quality and char spaw) and we will need to let AECOM know what alternate information we would rec-

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if possible. Please confirm if this time works for you.

Jennie

<meeting.ics>

RE: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

Monday, October 16, 2016
10:27 AM

| | |
|---------|--|
| Subject | RE: Chapman Lake - Discussion re: Requirements for Field Sampling and Permit Decision |
| From | Hirner, Joanna ENV:EX |
| To | Dalziel, Rod ENV:EX; Aikman, Jennie S ENV:EX |
| Sent | Friday, August 12, 2016 5:10 PM |

Hi Rod,

Jennie just left for the day but I checked her schedule for Monday, and her and I are available during the following timeslots: 9 to 10:30 am, and 2:30 onwards. From 11-noon Jennie has a regular update call, so we could talk to you during that timeslot too if need be. Just let us know when in those times would work best for you and we can do a call then. HOWEVER, if you have holidays please don't feel obligated to do a call on your day off! Jennie and I have

Have a good weekend!!
Joanna

From: Dalziel, Rod ENV:EX
Sent: Friday, August 12, 2016 5:05 PM
To: Aikman, Jennie S ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Permit Decision

I can arrange to be available for a call on Monday.

Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

On Aug 12, 2016, at 4:57 PM, Aikman, Jennie S ENV:EX <Jennie.Aikman@bc.ca> wrote:

Hi Rod,

I don't want you to have to postpone your trip in to Princess Louisa to do the field work since you are back on Tuesday, I think it's best for you and Joanna to connect with me regarding the response to AECOM. Joanna and I have had the chance to discuss and she has her perspective. I will cancel our call on Thursday, and just follow up with Joanna on Friday.

Jennie

From: Dalziel, Rod ENV:EX
Sent: Friday, August 12, 2016 4:52 PM
To: Aikman, Jennie S ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Permit Decision

I will need to postpone going in to Princess Louisa for the follow up re: but Chapman is another priority.

Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

On Aug 12, 2016, at 4:43 PM, Aikman, Jennie S ENV:EX
<Jennie.Aikman@gov.bc.ca> wrote:

Hi Rod,

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I am out of the office on Tuesday and Wednesday so would like to Thursday if possible. Please confirm if this time works for you.

Jennie

<meeting.ics>

Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

Monday, October 16, 2016
10:28 AM

| | |
|---------|--|
| Subject | Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Permit Decision |
| From | Dalziel, Rod ENV:EX |
| To | Hirner, Joanna ENV:EX |
| Cc | Aikman, Jennie S ENV:EX |
| Sent | Friday, August 12, 2016 6:17 PM |

Let us plan for 11am during your regular call. Maybe if Chris is back he could be on am travelling that day so I will have a better idea of my timing Monday morning. Have a great weekend.

Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

On Aug 12, 2016, at 5:10 PM, Hirner, Joanna ENV:EX <Joanna.Hirner@gov.bc.ca>

Hi Rod,
Jennie just left for the day but I checked her schedule for Monday, and her availability during the following timeslots: 9 to 10:30 am, and 2:30 onwards. From Jennie and I have a regular update call, so we could talk to you during that time. Just let us know when in those times would work best for you and we can HOWEVER, if you are on holidays please don't feel obligated to do a call on your day off! Jennie and I have talked about this project a fair bit so I think I can convey the message.

Have a good weekend!!
Joanna

From: Dalziel, Rod ENV:EX
Sent: Friday, August 12, 2016 5:05 PM
To: Aikman, Jennie S ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

I can arrange to be available for a call on Monday.

Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

On Aug 12, 2016, at 4:57 PM, Aikman, Jennie S ENV:EX
<Jennie.Aikman@gov.bc.ca> wrote:

Hi Rod,

I don't want you to have to postpone your trip in to Princess Louisa to do remediation – since you are back on Tuesday, I think it's best for you and to connect then and discuss the response to AECOM. Joanna and I have had a meeting with them and they are happy to wait until you are back.

discuss and she has my perspective. I will cancel our call on Thursday, and with Joanna when I am back.

Jennie

From: Dalziel, Rod ENV:EX
Sent: Friday, August 12, 2016 4:52 PM
To: Aikman, Jennie S ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: Re: Chapman Lake - Discussion re: Requirements for Field Sampling Timing of Permit Decision

I will need to postpone going in to Princess Louisa for the follow up work but Chapman is another priority.

Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

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Hi Rod,

Joanna and I were discussing the latest correspondence with A. regarding the field sampling and we thought it is important for our request for additional field sampling during low water conditions, particularly how it relates to the timing of a decision on the permit. They will likely not have low water conditions when they are completing their field work and it is possible that we may not have low water this fall, I need to be prepared to make a decision on the permit in the absence of data collected during low water conditions. Joanna and I discussed where there will be uncertainties in this case (e.g., w

I am out of the office on Tuesday and Wednesday so would like to meet on Thursday if possible. Please confirm if this time works for

Jennie

<meeting.ics>

RE: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

Monday, October 16, 2016
10:29 AM

| | |
|---------|--|
| Subject | RE: Chapman Lake - Discussion re: Requirements for Field Sampling and Permit Decision |
| From | Hirner, Joanna ENV:EX |
| To | Dalziel, Rod ENV:EX; Aikman, Jennie S ENV:EX |
| Cc | Platz, Chris ENV:EX |
| Sent | Monday, August 15, 2016 9:50 AM |

Thanks Rod, that sounds good to me. I will check your outlook calendar, and schedule a call tomorrow. Chris, in case you want to join in, I will include you in the invite as well. I will talk to you tomorrow!
Joanna

From: Dalziel, Rod ENV:EX
Sent: Monday, August 15, 2016 9:27 AM
To: Aikman, Jennie S ENV:EX; Hirner, Joanna ENV:EX
Cc: Platz, Chris ENV:EX
Subject: Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

Hello Jennie and Joanna,

I was hoping for a quick call to clarify a few things before I got back to Brett. I have seen Joanna sent a note to Brett on Friday (thanks Joanna). I think it can wait until Tuesday when I can discuss with Joanna.

Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

On Aug 12, 2016, at 6:17 PM, Dalziel, Rod ENV:EX <Rod.Dalziel@gov.bc.ca>

Let us plan for 11am during your regular call. Maybe if Chris is back he can join as well? I am travelling that day so I will have a better idea of my timing tomorrow morning.
 Have a great weekend.

Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

On Aug 12, 2016, at 5:10 PM, Hirner, Joanna ENV:EX <Joanna.Hirner@gov.bc.ca> wrote:

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and we can do a call then. HOWEVER, if you are on holidays please don't to do a call on your day off! Jennie and I have talked about this project

Have a good weekend!!
Joanna

From: Dalziel, Rod ENV:EX
Sent: Friday, August 12, 2016 5:05 PM
To: Aikman, Jennie S ENV:EX
Cc: Hirner, Joanna ENV:EX
Subject: Re: Chapman Lake - Discussion re: Requirements for Field Sampling Timing of Permit Decision

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Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

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Sent: Friday, August 12, 2016 4:52 PM
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Cc: Hirner, Joanna ENV:EX
Subject: Re: Chapman Lake - Discussion re: Requirements for Field Sampling Timing of Permit Decision

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Rod Dalziel
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BC Parks

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Jennie

<meeting.ics>

Page 211 of 401

Withheld pursuant to/removed as

DUPLICATE

Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

Monday, October 16, 2016
10:30 AM

| | |
|---------|---|
| Subject | Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Permit Decision |
| From | Platz, Chris ENV:EX |
| To | Hirner, Joanna ENV:EX; Dalziel, Rod ENV:EX |
| Sent | Monday, August 15, 2016 10:54 AM |

Will see you both on the Tuesday call.

Cheers Chris

On Aug 15, 2016, at 9:27 AM, Dalziel, Rod ENV:EX <Rod.Dalziel@gov.bc.ca>

Hello Jennie and Joanna,

I was hoping for a quick call to clarify a few things before I got back to Brett. I have seen Joanna sent a note to Brett on Friday (thanks Joanna). I think it can wait until Tuesday when I can discuss with Joanna.

Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks

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Rod Dalziel

Sunshine Coast Area Supervisor

BC Parks

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Have a good weekend!!

Joanna

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Sent: Friday, August 12, 2016 5:05 PM

To: Aikman, Jennie S ENV:EX

Cc: Hirner, Joanna ENV:EX

Subject: Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

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BC Parks

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From: Dalziel, Rod ENV:EX
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Cc: Hirner, Joanna ENV:EX
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Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks

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Hi Rod,

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I am out of the office on Tuesday and Wednesday so to connect on Thursday if possible. Please confirm if works for you.

Jennie

<meeting.ics>

RE: Chapman Lake Field Program

Monday, October 16, 2016

11:13 AM

| | |
|---------|---|
| Subject | RE: Chapman Lake Field Program |
| From | Ford, Bruce |
| To | Hirner, Joanna ENV:EX; Dalziel, Rod ENV:EX |
| Cc | Willcox, Michael FLNR:EX; dewynter, Brett; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; Crosby (Dave.Crosby@scrd.ca); Shane Walkey |
| Sent | Monday, August 15, 2016 6:16 PM |

Joanna/Rod,

Wanted to let you know that FLNRO has issued a scientific fish collection permit for us. We noticed that the "Special Notes" regarding Tetrhedron Park indicates that we are not allowed so wanted to bring to your attention that we are planning to use a 12' aluminum boat to do the limnological sampling, fish netting and to transport and aquatic crews to sampling locations around the lake. We hope that this can be

Thanks

Bruce S. Ford, MRM, R.P.Bio

Senior Environmental Biologist

Phone: 604-444-6449

s.22



From: Hirner, Joanna ENV:EX [<mailto:Joanna.Hirner@gov.bc.ca>]

Sent: Friday, August 12, 2016 4:33 PM

To: dewynter, Brett; Dalziel, Rod ENV:EX

Cc: Ford, Bruce; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; Shoji'; Dave Crosby (Dave.Crosby@scrd.ca); Shane Walkey

Subject: RE: Chapman Lake Field Program

Hi Brett,

Rod is adjudicating the permit and is away until next Tuesday (August 16th). However, Jennie and I wanted to let you know that it is our intent that you will have the reschedule time for your sampling schedule during the week of August 22. The discussion back and forth we have been having by email is more about the details of what, how and when fish are collected, rather than whether or not the research permit will be approved. Discuss

Hopefully this helps clarify things.

Best regards,

Joanna

Joanna Hirner (MRM, RPBio)

Conservation Specialist

South Coast Region, BC Parks

604-924-2228

From: dewynter, Brett [<mailto:Brett.dewynter@aecom.ca>]

Sent: Wednesday, August 10, 2016 9:04 PM

To: Dalziel, Rod ENV:EX

Cc: Hirner, Joanna ENV:EX; Ford, Bruce; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; 'Bryan Shoji'; Dave Crosby (Dave.Crosby@scrd.ca); Shane Walkey

Subject: RE: Chapman Lake Field Program

Rod:

Further to the below note, it seems like there might be some "mixing" of the discussion for the week of August 22nd is to collect additional aquatic and terrestrial data to

significant or noteworthy changes from the conclusions within the Whitehead rep planning to answer every possible question with the field investigation planned for August 22nd. This is not practical.

It is our understanding that it has already been agreed that additional environment completed in the future during a low water level in Chapman Lake since this year if Chapman Lake will reach -3 m from full pool. The timing of the future data collection to the weather and may not occur for several years into the future. For example see graph that shows the minimum level in Chapman Lake during 2014 being about -2

Some other comments are:

1. Regarding the detailed questions about fish spawning we are looking forward to actual flows in the small creeks entering Chapman Lake during a time when the Chapman Lake is dropping. We suspect that the driver for fish spawning is the availability of water in the small creeks. We think it would be best to review the conditions during the week of August 22nd and then engage in further debate
2. Methyl mercury analysis will be completed
3. We plan to complete a pre-construction survey for environment features immediately after construction starting next spring. This is assumed to be standard practice.

Bruce can provide more explanation if required, however, we need to know if the details can be provided. There are many details and commitments that need to be made to allow completion of a significant field investigation. Can you confirm if the permit is going to complete the field investigation during the week of August 22nd? Thanks.

Brett deWynter, P.Eng.

s.22

From: Dalziel, Rod ENV:EX [<mailto:Rod.Dalziel@gov.bc>]

Sent: Wednesday, August 10, 2016 10:42 AM

To: Ford, Bruce

Cc: Hirner, Joanna ENV:EX; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; Plummer, Brett; 'Bryan Shoji'; Dave Crosby (Dave.Crosby@scrd.ca)

Subject: RE: Chapman Lake Field Program

Hello Bruce,

Thank you for the responses to our review which addresses most issues but we still have some further follow-up and detail on a few points.

- **Fish:** a) not clear how the sampling and assessment will be used to determine the timing and location of spawning by char, which is a key piece of information for impact assessment; b) what kind of habitat data will be collected from potential spawning streams; c) will habitat assessment downstream of dam be part of assessment. **AECOM response:** RI methods will be followed for habitat assessment. We will note the spawning conditions observed during the sampling program. In order to identify a specific spawning time we will have to make multiple trips to site over the expected spawning time to determine spawning conditions. Potential spawning habitat will be assumed based on habitat conditions such as access to spawning habitat.
 - The information provided does not adequately answer the question of how we will determine the timing and location of char spawning in order to determine if the proposed lake drawdown will impact char spawning success. It would have to see a more detailed description of what the concern is and how the information proposed to collect will address the concern.
 - We would like to reiterate that our main concern is whether unnatural lake drawdown during drought periods will prevent access to spawning streams during the spawning period and thus impact spawning success. Determination of this requires knowledge of the char spawning period, including the upstream migration timing (i.e. when char migrate into the streams from the lake), and the lake bottom profile in the spawning stream outlets. In regard to the latter issue, a steep profile at the drawdown would be of concern whereas a low gradient profile would indicate a low

- It may be difficult, if not impossible, to “note the spawning condition of fish during the sampling program” based on external observations of live fish. I will be better able to observe the sexual maturity of dead fish, I don’t know if they will be able to estimate spawning time from the condition of the carcass. Instead of relying on a habitat assessment to determine which tributaries are spawning, we suggest the focus be on presence/absence of juvenile char in streams - presence of juvenile char can be taken as evidence of char spawning.
 - As to other ways to gather information, note that stream temperature is critical for bull trout (McPhail and Baxter 1996) with spawning activities triggered when temperatures drop to around 9C (as stream temperatures vary slightly from year to year, spawning times will vary accordingly). As Dolly Varden and Bull trout spawning is known to occur, it is likely that stream temperature triggers spawning in a similar manner. Installing a temperature data logger in a spawning stream during a period when possible drought conditions may occur could be used to determine if drawdown might impact char spawning – i.e. whether the stream temperature drops below 9C during the potential drawdown period. This would take two trips but would save a lot of field time for installation and retrieval. Further, they should do some testing.
 - Reference (attached): McPhail, J.D. and J.S. Baxter. 1996. A review of *Salvelinus confluentus* life-history and habitat use in relation to climate change and improvement opportunities. BC Environment, Fisheries Branch Management Report No. 104
 - **Regarding sampling at low water:** We understand there are constraints associated with the current schedules that may make sampling after August 25 in the event of lower water conditions. However, if significantly lower water conditions do occur later this fall, we think it would be advantageous to use this opportunity to collect data for key variables most likely to be affected by low water, especially those related to fish and water quality. Taking advantage of low water conditions (if they occur) could also reduce the need for additional baseline data collection at low water. So we suggest that if significantly lower water conditions occur this fall, the assessment takes advantage of this opportunity to collect additional baseline data.
 - **On methyl mercury:** Although the analysis you present suggests methyl mercury is not a problem at Chapman Lake, given that fish mortality will result from other sampling issues, it seems reasonable to request that some fish tissue be collected and analyzed to confirm methyl mercury is not a problem.
 - **On rare plants:** Given that multiple trips are not planned to assess for rare plants, the habitat at the construction site and the known range and distribution of rare plants should be used to provide an assessment of the likelihood that rare plants could occur at the site. If that likelihood is high, it may make sense to conduct some follow up sampling to confirm rare plants do not occur, and the assessment should address this.
- I did not confirm your question in #5. Data Analysis and Reporting in the first response would request AECOM to prepare a summary and report of the 2016 field studies incorporating into the Detailed Proposal submitted with the PUP #102714 amendment in April.
- Regarding joining field crew onsite. Joanna would like to join on the first or second trip (24). I would like to join as well but I am open to which day when seats are available on the helicopter.
- Regards,
Rod Dalziel
Sunshine Coast Area Supervisor
BC Parks - South Coast Region - Ministry of Environment
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BC Parks

From: Ford, Bruce [mailto:Bruce.Ford@aecom.co]

Sent: Friday, August 5, 2016 1:25 PM

To: Dalziel, Rod ENV:EX; dewynter, Bret

Cc: Hirner, Joanna ENV:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; Bryan St (Bryan.Shoji@scrd.ca); Dave Crosby (Dave.Crosby@scrd.ca)

Subject: Chapman Lake Field Program

Rod,

Provided below are specific responses to your review of the research PUP application in your email of August 3rd. Attached is a revised work plan that addresses the concerns of the field program. I hope this addresses your concerns.

The work plan does not identify who will be conducting the field work and associated assessments of different values. BC Parks expects that appropriately Qualified Professional Biologists with expertise in the areas they are working on are involved in planning and various aspects of the work. The people involved in the work and their certification should be information included in the work plan and assessment report. **The AECOM**

Bruce Ford, MRM, R.P. Bio Program Leader

Melissa Mukai, B.Sc, R.P. Bio. Aquatic Biologist

Keith Bell, B.Sc. RPF Vegetation ecologist, terrestrial

Heather Leech, M.Sc. Terrestrial ecologist

Brian McGill, B.Sc., Aquatic biologist

With support from David Bates, Ph.D., FSCI Biological Consultant

Please ensure required Wildlife Act permits are in place for work involving trapping or wildlife (ie. Scientific Fish Collection (SFC) Permit from FLNRO). Please provide. **We expect to have the permit before start of work on August 23rd. We do not plan on trapping or handling of other wildlife.**

I would like to reinforce the importance of sampling during low water and that at even this fall for certain aspects (especially fish and water quality) may be appropriate dry fall and lower water conditions after they do their main sampling trip. **We have had a conversation with Joanna and she agreed it is not a problem if water levels do not drop in summer/fall, we currently have no budget for any return trip later in the fall and the difference in lake level will not change the results. Current weather patterns indicate that water demand will not draw the lake down to the -3 level this year. SCRD will**

Consultation with First Nation's will be required on the research permit application for intrusive/lethal sampling. Please provide FN consultation update on this and overall. **We have not had a specific consultation on this and the use of lethal sampling will not be a condition of the Permit issued by FLNRO. SCRD will be contacting the shíshálh Nation regarding this and inviting them to send an observer/participant.**

Geotechnical testing and assessment of potential for acid rock drainage. **Rock samples were collected during the site visit in May and are with the lab for analysis. Caution, samples may be of limited value in characterizing all the rock that may be excavated but the site is expensive. Geotechnical investigations to determine the depth of the lake will be conducted this month to provide a better estimate of the volume of rock that will be excavated. During construction a geotechnical assessment will be made when the lake is excavated and if the geology of the rock suggests potential for ARD additional samples will be collected for analysis and if rated as ARD then the appropriate management plan will be provided for management of ARD rock will be provided in the environmental report (i.e. d**

Detailed characterization of area of impact during construction, including information on vegetation, species and habitat at site and how it will be affected by construction and restoration plans. This information is important to develop site mitigation and restoration plan and environmental management planning for the site. **The information required to do**