

collected as part of the terrestrial component of the field program

. Water quality sampling related to the issue of methyl mercury. Methyl mercury is an issue for reservoirs where areas of organic soils and vegetation become submerged during drawdown. Recent work on Carpenter Lake by BC Hydro suggests it may also be a reservoir with regular drawdown and refill, in the case of Carpenter Lake this happens annually and involves hundreds of hectares (2,340 ha actually). Chapman involved a much smaller area (at -8 m the exposed area would be 15 ha) and for a short 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 annually. We are 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 slow drawdown. Substrate observation/sampling is part of the program and this info will be 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 cross transects to develop a map of the underwater substrate and vegetation which will include re-creating 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 assessment; b) what kind of habitat data will be collected from potential spawning streams; c) will habitat immediately downstream of dam be part of assessment. RISC standard methods followed for habitat assessment. We will note the spawning condition of char during the sampling program. In order to identify a specific spawning time we would likely need 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

. 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 Interform 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

. Rare or medicinal plant surveys: because rare plants may not be identifiable at all scales, rare plant survey standards recommend sampling areas several times during the project 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

. Amphibians: how will herptiles be surveyed? Surveys for coastal tailed frogs downstream of 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.

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

s.22

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DUPLICATE

## FW: Chapman Lake Field Program

Thursday, October 12, 2017

11:35 AM

|         |                                          |
|---------|------------------------------------------|
| Subject | <b>FW: Chapman Lake Field Program</b>    |
| From    | Hirner, Joanna ENV:EX                    |
| To      | Dalziel, Rod ENV:EX; Platz, Chris ENV:EX |
| Sent    | Tuesday, August 16, 2016 10:18 AM        |

Hi Rod and Chris,

In advance of our conference call this afternoon, just thought I would forward some text that I started to draft on Friday and discussed and reviewed with Jennie, regarding some outstanding questions and concerns re. the Chapman Lake field sampling. This text could be part of a response back to AECOM this week. If AECOM/SCRD can't/won't schedule additional sampling at lower water that may or may not occur this fall, I think there are a couple of key sources of uncertainty regarding project impacts that may not be resolved prior to BC Parks having to make a permit decision. These are related to 1) water quality at low water levels, and 2) char access to spawning tributaries.

They will need to address these two key sources of uncertainty with additional sampling next year and in the future, for the purposes of designing mitigation as needed. This will likely come after a decision is made regarding the broader project PUP. As such, additional sampling/monitoring would need to be a requirement of any PUP issued. But for the purposes of the field work next week and the impact assessment prepared in support of the broader project PUP application, I thought we should provide the following comments (or something similar) back to Brett et al this week prior to their field trip:

"Hi Brett,

If additional sampling is not possible this year due to an absence of lower water conditions, limited budget and/or other constraints, we feel there are two key sources of uncertainty regarding project impacts that may not be resolved until next year or later. These are related to 1) water quality at low water levels, and 2) char spawning timing and access to spawning tributaries during low water conditions. In the absence of additional field data beyond that collected in August, we ask that the assessment use any other means available to reduce uncertainty about impacts. Some specific information requested that we think will help address uncertainty:

- For water quality, literature from other reservoirs about the effects drawdown typically has on water quality that can be extrapolated or applied in this case.
- For char, follow the recommendations provided to us by FLNRO fish biologist Mike Willcox, which were provided in our last email. Specifically:
  - Installation of one or more temperature data loggers should be considered to track the timing of when water reaches temperatures most suitable for spawning and migration from the lake. It seems possible that loggers could be installed during the August trip and left over the winter. Tracking temperature may be less important if spawning and/or spawning migration is observed during the August field work, but would still be helpful to understand temperature trends under lower water conditions (if they occur) through the fall.
  - Use lake bathymetry to help determine the likelihood that char will have difficulty accessing spawning streams during drawdown.
  - Use the presence/absence of juvenile char in tributary streams to help infer spawning."

Talk to you more this afternoon.

Best regards,

Joanna

Joanna Hirner (MRM, RPBio)

Conservation Specialist

South Coast Region, BC Parks

604-924-2228

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

**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; Platz, Chris 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 discussions. The focus for the week of August 22<sup>nd</sup> 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 22<sup>nd</sup>. 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 22<sup>nd</sup> 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 22<sup>nd</sup>? 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](mailto: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  
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 ☎: Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-2445  
 ✉: [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)  
 Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks

**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](mailto:Bryan.Shoji@scrd.ca)); Dave Crosby ([Dave.Crosby@scrd.ca](mailto: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  
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[bruce.ford@aecom.com](mailto:bruce.ford@aecom.com)



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## Re: Chapman Lake Field Progra

Monday, October 16, 2016

11:14 AM

|         |                                      |
|---------|--------------------------------------|
| Subject | <b>Re: Chapman Lake Field Progra</b> |
| From    | Platz, Chris ENV:EX                  |
| To      | Hirner, Joanna ENV:EX                |
| Cc      | Dalziel, Rod ENV:EX                  |
| Sent    | Tuesday, August 16, 2016 11:36 AM    |

Thank you for this Joanna. I will not be able to be on the call today, please discuss and connect with Rod later today or tomorrow morning to provide any assistance I can.

Cheers Chris

On Aug 16, 2016, at 10:18 AM, Hirner, Joanna ENV:EX <Joanna.Hirner@gov.bc.ca>

Hi Rod and Chris,

In advance of our conference call this afternoon, just thought I would forward the draft started to draft on Friday and discussed and reviewed with Jennie, regarding outstanding questions and concerns re. the Chapman Lake field sampling. This is part of a response back to AECOM this week. If AECOM/SCRD can't/won't schedule sampling at lower water that may or may not occur this fall, I think there are sources of uncertainty regarding project impacts that may not be resolved prior to having to make a permit decision. These are related to 1) water quality at low

water. They will need to address these two key sources of uncertainty with additional sampling next year and in the future, for the purposes of designing mitigation as needed. This is after a decision is made regarding the broader project PUP. As such, additional sampling/monitoring would need to be a requirement of any PUP issued. But in the context of the field work next week and the impact assessment prepared in support of the project PUP application, I thought we should provide the following comments:

"Hi Brett,

If additional sampling is not possible this year due to an absence of lower water levels, limited budget and/or other constraints, we feel there are two key sources of uncertainty regarding project impacts that may not be resolved until next year or later. These are related to 1) water quality at low water levels, and 2) char spawning timing and access to tributaries during low water conditions. In the absence of additional field data collected in August, we ask that the assessment use any other means available to address this uncertainty about impacts. Some specific information requested that we think

- For water quality, literature from other reservoirs about the effects drawdown has on water quality that can be extrapolated or applied in this case.
- For char, follow the recommendations provided to us by FLNRO fish biologist Willcox, which were provided in our last email. Specifically:
  - Installation of one or more temperature data loggers should be coordinated to track the timing of when water reaches temperatures most suitable for spawning and migration from the lake. It seems possible that loggers could be installed during the August trip and left over the winter. Tracking temperature is important if spawning and/or spawning migration is observed during field work, but would still be helpful to understand temperature trends.
  - Use lake bathymetry to help determine the likelihood that char will be accessing spawning streams during drawdown.

- Use the presence/absence of juvenile char in tributary streams to spawning."

Talk to you more this afternoon.

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, J Platz, Chris ENV:EX; 'Bryan Shoji'; Dave Crosby (Dave.Crosby@scrd.ca); Shan

**Subject:** RE: Chapman Lake Field Program

Rod:

Further to the below note, it seems like there might be some "mixing" of the focus for the week of August 22<sup>nd</sup> is to collect additional aquatic and terrestrial benchmark any significant or noteworthy changes from the conclusions with the report. We are not planning to answer every possible question with the field planned for the week of August 22<sup>nd</sup>. This is not practical.

It is our understanding that it has already been agreed that additional enviro will be completed in the future during a low water level in Chapman Lake so unlikely that Chapman Lake will reach -3 m from full pool. The timing of the collection will be subject to the weather and may not occur for several years. For example see the attached graph that shows the minimum level in Chapman

Some other comments are:

1. Regarding the detailed questions about fish spawning we are looking for observing the actual flows in the small creeks entering Chapman Lake or when the level in Chapman Lake is dropping. We suspect that the drive spawning is more related to the availability of water in the small creeks would be best to review the physical conditions during the week of August 22<sup>nd</sup>.
2. Methyl mercury analysis will be completed
3. We plan to complete a pre-construction survey for environment features prior to construction starting next spring. This is assumed to be standard. Bruce can provide more explanation if required, however, we need to know if going to be provided. There are many details and commitments that need to be for the completion of a significant field investigation. Can you confirm if the pre can be provided to complete the field investigation during the week of August 22<sup>nd</sup>?

**Brett deWynter, P.Eng.**

D 250.980.7104

C 250.869.7126

**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; 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 some further follow-up and detail on a few points.

- **Fish:** a) not clear how the sampling and assessment will be used to determine location of spawning by char, which is a key piece of information for impact assessment; what kind of habitat data will be collected from potential spawning streams; assessment for fish immediately downstream of dam be part of assessment.

RISC standard methods will be followed for habitat assessment. We will note condition of char caught during the sampling program. In order to identify a suitable time we would likely have to make multiple trips to site over the expected spawning period to determine specific timing. Potential spawning habitat will be assumed based

- The information provided does not adequately answer the question whether the proposed lake drawdown will impact char spawning success. It would have been better to see a more detailed description of what the collection of the information they propose to collect will address the concern.
- We would like to reiterate that our main concern is whether unnatural drawdown during drought periods will prevent access to spawning habitat during the spawning period and thus impact spawning success. Determining spawning requires knowledge of the char spawning period, including the upstream migration timing (i.e. when they migrate into the streams from the lake bottom profile in the vicinity of the stream outlets. In regard to this issue, a steep profile at the drawdown elevations would be of concern.
- It may be difficult, if not impossible, to “note the spawning conditions of char caught during the sampling program” based on external observations. Although you will be better able to observe the sexual maturity of the fish, you 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 presence/absence of juvenile char in the tributary streams - presence.
- As to other ways to gather information, note that stream temperature is a spawning cue for bull trout (McPhail and Baxter 1996) with spawning triggered when stream temperatures drop to around 9C (as stream temperatures vary slightly from year to year, spawning times will vary accordingly). In 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 drought conditions may occur could be used to determine if the drawdown impacts char spawning – i.e. whether the stream temperature drops during the potential drawdown period. This would take two trips but would require little field time for installation and retrieval. Further, they should do
  - Reference (attached): McPhail, J.D. and J.S. Baxter. 1996. A review of the life-history and habitat use in rearing of bull trout (*Salvelinus confluentus*) life-history and habitat use in rearing compensation and improvement opportunities. BC Environment 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 a drought challenging. However, if significantly lower water conditions do occur later than planned, it would be advantageous to use this opportunity to collect data for key variables that may be influenced by low water, especially those related to fish and water quality. The advantage of lower water conditions (if they occur) could also reduce the need for baseline data collection next year at low water. So we suggest that if significant drought 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
- **On methyl mercury:** Although the analysis you present suggests methyl mercury may be a problem at Chapman Lake, given that fish mortality will result from other factors than 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 about the habitat at the construction site and the known range and distribution in the region should be used to provide an assessment of the likelihood that they occur undetected at the site. If that likelihood is high, it may make sense to conduct follow up sampling next spring to confirm rare plants do not occur, and the area.

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

Regarding joining field crew onsite. Joanna would like to join on the first or second (August 23 or 24). I would like to join as well but I am open to which day was 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

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✉: Rod.Dalziel@gov.bc.ca

**Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)**

**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 your email of August 3rd. Attached is a revised work plan that addresses the 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 additional assessments of different values. BC Parks expects that appropriate Professionals (e.g. RPBios with expertise in the areas they are working on) are planning and conducting the various aspects of the work. The people involved their certifications/qualifications should be information included in the work assessment report. **The AECOM team consists of biologists experienced in conducting**

**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 of fish or wildlife (ie. Scientific Fish Collection (SFC) Permit from FLNRO). Please **have applied for SFC permit over 30 days before start of work so if FLNRO is their timelines we expect to have the permit before start of work on August 1st plan on conducting any trapping or handling of other wildlife.**

I would like to reinforce the importance of sampling during low water and temperature sampling even this fall for certain aspects (especially fish and water quality) is appropriate if we have a dry fall and lower water conditions after they do the trip. **We have had this conversation with Joanna and she agreed it is not a problem if levels do not drop this summer/fall, we currently have no budget for any research the fall and frankly a couple of meters difference in lake level will not change Current weather patterns suggest that water demand will not draw the lake**

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

. Geotechnical testing and assessment of potential for acid rock drainage. **Roc collected during the site visit in May and are with the lab for analysis. Cauti samples may be of limited value in characterizing all the rock that may be e lifting a drill rig to the site is expensive. Geotechnical investigations to deter of the bedrock will be conducted this month to provide a better estimate of rock that will have to be excavated. During construction a geotechnical asse made when the rock is excavated and if the geology of the rock suggests po additional samples can be sent for analysis and if rated as ARD then the app management plan will be followed. Options for management of ARD rock w**

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

. Water quality sampling related to the issue of methyl mercury. **Methyl merc an issue for reservoirs where areas of organic soils and vegetation become reservoir creation. Recent work on Carpenter Lake by BC Hydro suggests it i issue for reservoirs with regular drawdown and refill, in the case of Carpent something that happens annually and involves hundreds of hectares (2,340 Chapman lake drawdown involved a much smaller area (at -8 m the expose 15 ha) and for a much shorter period of time. Methyl mercury is an unlikely drawing Chapman lake down from -3 to -8 m during periods of drought whi expected to occur annually. If one is concerned that there is currently a me**

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

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

. Fish: a) not clear how the sampling and assessment will be used to determin location of spawning by char, which is a key piece of information for impact a what kind of habitat data will be collected from potential spawning streams; assessment for fish immediately downstream of dam be part of assessment. **I methods will be followed for habitat assessment. We will note the spawnin char caught during the sampling program. In order to identify a specific spa would likely have to make multiple trips to site over the expected spawning determine specific timing. Potential spawning habitat will be assumed base**

. Ecosystem mapping: what standards and methods will be used to update th mapping for the area? The surveys and mapping should include identificatio ecological communities that occur. It looks like we can get the BEI data, but t mapping looks like it excludes the park. **Ecosystem mapping will be based oi for terrestrial ecosystem mapping in BC for the area surrounding Chapman construction footprint. Rare ecological communities will be identified as pa**

. Rare or medicinal plant surveys: because rare plants may not be identifiable year, rare plant survey standards recommend sampling areas several times di season to increase likelihood of detecting rare plants. The assessment should

account, including the need for additional visits to confirm findings prior to c  
 have not been provided a budget for multiple trips. The medicinal/rare plan  
 focus on the construction areas as there are no plans to impact plant comm  
 this area. The assessment will address the issue of potential impacts to surr

. Amphibians: how will herptiles be surveyed? Surveys for coastal tailed frog  
 the dam are not mentioned. Although amphibians don't necessarily need to  
 around the lake, consideration of the amount and distribution of suitable an  
 throughout the riparian areas of Chapman Lake should be part of the assessi  
 these areas could be negatively affected by additional drawdown. **Amphibia**  
**will be opportunistically surveyed during ecosystem mapping and potentia**  
**documented. There is no plan to conduct any species specific wildlife surve**

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

Senior Environmental Biologist

Phone: 604-444-6449

s.22

[bruce.ford@aeacom.com](mailto:bruce.ford@aeacom.com)

3292 Production Way, 4<sup>th</sup> Floor

Burnaby BC V5A 4R4

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

**From:** [Aikman, Jennie S ENV:EX](#)  
**To:** [Dalziel, Rod ENV:EX](#); [Hirner, Joanna ENV:EX](#)  
**Subject:** Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision  
**Start:** Thursday, August 18, 2016 3:00:00 PM  
**End:** Thursday, August 18, 2016 3:30:00 PM  
**Location:** Dial-in Number: 1-877-353-9184; Participant Conference ID **S.17**

---

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 Field Program

Monday, October 16, 2016

11:13 AM

|         |                                                                                                                                                                |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subject | <b>RE: Chapman Lake Field Program</b>                                                                                                                          |
| From    | Dalziel, Rod ENV:EX                                                                                                                                            |
| To      | 'dewynter, Brett'                                                                                                                                              |
| Cc      | Ford, Bruce; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; Platz, Chris ENV:EX; 'Bry<br>Crosby (Dave.Crosby@scrd.ca); Shane Walkey; Hirner, Joanna ENV:EX |
| Sent    | Tuesday, August 16, 2016 4:01 PM                                                                                                                               |

Hello Brett,

Please continue with your planned field work preparation for next week as Joanna is our expectation you will have an approved Research permit in place for this work this year that the water levels have not receded to levels in recent years but unfortunately it is more difficult to get the field data we are hoping for to help reduce any uncertainty in our decision on the PUP amendment application has to be considered. As you have indicated at this point it seems almost inevitable that additional field study will be required next year.

If additional sampling is not possible this year due to an absence of lower water conditions budget and/or other constraints, we feel there are two key sources of uncertainty in our assessment of impacts that may not be resolved until next year or later. These are related to 1) water levels, and 2) char spawning timing and access to spawning tributaries during drawdown conditions. In the absence of additional field data beyond that collected in August, we will use any other means available to reduce uncertainty about impacts. So

- For water quality, literature from other reservoirs about the effects drawdown on water quality that can be extrapolated or applied in this case.
- For char, follow the recommendations provided to us by FLNRO fish biologist Mike were provided in our last email. Specifically:
  - Installation of one or more temperature data loggers should be considered. Timing of when water reaches temperatures most suitable for spawning from the lake. It seems possible that loggers could be installed during the drawdown and left over the winter. Tracking temperature may be less important if spawning migration is observed during the August field work, but it will be helpful to understand temperature trends under lower water conditions.
  - Use lake bathymetry to help determine the likelihood that char will have access to spawning streams during drawdown.
  - Use the presence/absence of juvenile char in tributary streams to help

Regarding Bruce's question about the use of the motor boat on Chapman Lake. If you can ensure that motorized power will not be possible we can approve the use of the boat proposer. We will ensure a spill plan is in place including a spill kit. As well please ensure your CGL insurance for the vessel proposed, if not watercraft liability insurance will be required as this will be required for the permit.

If there are any updates to your Field Study work plan please provide them to me.

Regards,

*Rod Dalziel*

Sunshine Coast Area Supervisor

BC Parks - South Coast Region - Ministry of Environment

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BC Parks

**From:** Hirner, Joanna ENV:EX

**Sent:** Friday, August 12, 2016 4:33 PM

**To:** 'dewynter, Brett'; Dalziel, Rod ENV:E

**Cc:** Ford, Bruce; Willcox, Michael FLNR:EX; Aikman, Jennie S ENV:EX; Platz, Chris 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). Howe 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 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](mailto: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 22<sup>nd</sup> is to collect additional aquatic and terrestrial data to look for significant or noteworthy changes from the conclusions within the Whitehead re-planning to answer every possible question with the field investigation planned for August 22<sup>nd</sup>. This is not practical.

It is our understanding that it has already been agreed that additional environment monitoring 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 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 lake 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 22<sup>nd</sup> 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 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 information can be provided. There are 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 completed to complete the field investigation during the week of August 22<sup>nd</sup>? 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 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 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 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 of spawning habitat 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 habitat. 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 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 risk of impact.
  - 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, if they 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 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 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 monitoring of stream temperature during the spawning period.
  - 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 difficult.

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 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 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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Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



**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 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 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. 1 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 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 conversation with Joanna and she agreed it is not a problem if water levels do not 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 intrusive/lethal sampling. Please provide FN consultation update on this and overall have not had a specific consultation on this and the use of lethal sampling will not. Permit issued by FLNRO. SCRD will be contacting the shíshálh Nation regarding the possibility of 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, 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 developed. The management of ARD rock will be provided in the environmental report (i.e. details on

. 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 in various areas. This information is important to develop site mitigation and restoration plan and 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 a concern in reservoirs where areas of organic soils and vegetation become submerged during drawdown. Recent work on Carpenter Lake by BC Hydro suggests it may also be an issue in reservoirs with regular drawdown and refill, in the case of Carpenter Lake this happens annually and involves hundreds of hectares (2,340 ha actually). Chapman Island involved a much smaller area (at -8 m the exposed area would be 15 ha) and for a short period of time. Methyl mercury is an unlikely consequence of drawing Chapman Island from -3 to -8 m during periods of drought which are not expected to occur annually. SCRD is 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 slow 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 method as used by Whitehead in 1999? And/or some other method? We will be using primarily the transect method and develop a map of the underwater substrate and vegetation which will include re-creating 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 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. RISC standard methods will be followed for habitat assessment. We will note the spawning condition of char as part of the sampling program. In order to identify a specific spawning time we would likely need 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

. Ecosystem mapping: what standards and methods will be used to update the ecosystem

for the area? The surveys and mapping should include identification of any rare 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 for ecological communities will be identified as part of this work and the legend for**

. 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 grow to increase likelihood of detecting rare plants. The assessment should take this into account 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 area. there are no plans to impact plant communities outside this area. The assessment**

. 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 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 are negatively affected by additional drawdown. **Amphibians and reptiles will be opportunistically surveyed during ecosystem mapping and potential habitat will be documented. The**

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

Senior Environmental Biologist

Phone: 604-444-6449

s.22

[bruce.ford@aecom.com](mailto:bruce.ford@aecom.com)

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before printing

**From:** [Aikman, Jennie S ENV:EX](#)  
**To:** [Dalziel, Rod ENV:EX](#); [Hirner, Joanna ENV:EX](#)  
**Subject:** Canceled: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision  
**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: A couple questions about Chapman Lake field work fish sampling

Friday, October 13, 2017  
9:32 AM

|                |                                                                           |
|----------------|---------------------------------------------------------------------------|
| <b>Subject</b> | <b>Re: A couple questions about Chapman Lake field work fish sampling</b> |
| <b>From</b>    | Hirner, Joanna ENV:EX                                                     |
| <b>To</b>      | dewynter, Brett                                                           |
| <b>Cc</b>      | Dalziel, Rod ENV:EX; Aikman, Jennie S ENV:EX; Ford, Bruce                 |
| <b>Sent</b>    | Friday, August 19, 2016 9:51 AM                                           |

Thanks Brett, sounds good. If it helps at all with planning, my main objective for the day I am there is to generally get a better sense of the habitat around the entire lake, in particular spend some time looking at the wetlands around the end of the lake opposite the outlet. Otherwise, I can also assist with any of the sampling if that is helpful (extra set of hands).  
Best regards,  
Joanna

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

**From:** dewynter, Brett <Brett.dewynter@aecom.com>  
**Sent:** Friday, August 19, 2016 8:38 AM  
**To:** Hirner, Joanna ENV:EX  
**Cc:** Dalziel, Rod ENV:EX; Aikman, Jennie S ENV:EX; Ford, Bruce  
**Subject:** RE: A couple questions about Chapman Lake field work fish sampling

Joanna:  
Thanks for the note. We are in the final stages of planning for next week and will get back to you later today regarding the best days to be on-site, helicopter rides, etc.

**Brett deWynter, P.Eng.**

s.22

**From:** Hirner, Joanna ENV:EX [<mailto:Joanna.Hirner@gov.bc.ca>]  
**Sent:** Thursday, August 18, 2016 2:44 PM  
**To:** dewynter, Brett; Ford, Bruce  
**Cc:** Dalziel, Rod ENV:EX; Aikman, Jennie S ENV:EX  
**Subject:** A couple questions about Chapman Lake field work fish sampling

Hi Brett and Bruce,

Two questions for you, both related to fish sampling at Chapman Lake:

-We are working through finalizing your research permit for next week, and in reviewing the work plan just want to confirm that you will be doing an overnight net set for fish. That was my understanding but Jennie thought it was not 100% clear in the latest version of the work plan you submitted. Just want to confirm that an overnight set is definitely part of the plan.

-Two FLNRO fisheries biologists (Iain Lunn and Duane Jesson) will be doing some work on the

Sunshine Coast next week and one or both of them are interested in joining the field crew at Chapman Lake if that was possible. They would be most interested to attend during the gill-netting session (especially when they “pull” the net to sample fish). Would it be possible for one or both of them to attend on the day when the nets would be pulled?

Regarding Rod and I joining the field crew, I would like to come out for one day, either the 23 or 24 (I can't make it the 25<sup>th</sup>). Rod also previously indicated that he would also like to join for one day, and was flexible about dates based on availability of helicopter seats.

Thanks,  
Joanna

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

Page 244 of 401

Withheld pursuant to/removed as

s.13; s.14; s.22

Page 245 of 401 to/à Page 249 of 401

Withheld pursuant to/removed as

s.14

## FW: Chapman Lake Site Visit - August 25, 2016

Thursday, October 12, 2017

11:30 AM

|         |                                                      |
|---------|------------------------------------------------------|
| Subject | <b>FW: Chapman Lake Site Visit - August 25, 2016</b> |
| From    | Hirner, Joanna ENV:EX                                |
| To      | Dalziel, Rod ENV:EX                                  |
| Sent    | Tuesday, August 30, 2016 2:54 PM                     |

Hi Rod,

Thanks again for following up with Duane, and sorry if I seemed a bit distracted on the phone earlier today. I was out in Alice Lake with Zsana and there was a fair bit of action going on around me.

Even though Duane discussed all of the below with AECOM in the field, I think it would still be good to forward Duane's bullet points on to Bruce, Brett et al. just to formally capture them. Given our phone conversation earlier today I think this was probably still your intent, but thought I would mention my thoughts on this.

While in the field I made some incidental wildlife observations and had some further thoughts on monitoring of the wetlands in particular. I will capture these in writing in the next couple of days, similar to how Duane summarized his observations. I think Duane's comment regarding the importance of the small meandering channels for rearing relates to the wetlands, because I observed several of these types of channels draining out of wetlands adjacent to the lake. I think monitoring wetland water levels, perhaps by adapting the LTEM water level protocol to install some loggers in these wetlands, would help monitor how the wetlands change with lake drawdown generally but also provide data to help address Duane's question as well.

Bye for now,  
Joanna

**From:** Jesson, Duane A FLNR:EX  
**Sent:** Tuesday, August 30, 2016 1:22 PM  
**To:** Dalziel, Rod ENV:EX  
**Cc:** Lunn, Iain C FLNR:EX; Willcox, Michael FLNR:EX; Hirner, Joanna ENV:EX  
**Subject:** RE: Chapman Lake Site Visit - August 25, 2016

I passed on my thoughts, as indicated below, verbally to Bruce Ford while on-site. Everything below was covered during our time together.

**From:** Dalziel, Rod ENV:EX  
**Sent:** Tuesday, August 30, 2016 12:24 PM  
**To:** Jesson, Duane A FLNR:EX  
**Cc:** Lunn, Iain C FLNR:EX; Willcox, Michael FLNR:EX; Hirner, Joanna ENV:EX  
**Subject:** RE: Chapman Lake Site Visit - August 25, 2016

Hello Duane,

Thanks for being available and conducting the site visit last week. That is a monster a fish they pulled out there. We will pass this info on to AECOM/SCRD. How much of your notes below were communicated with AECOM when onsite last week?

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  
 ✉: Rod.Dalziel@gov.bc.ca  
 Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks

**From:** Jesson, Duane A FLNR:EX  
**Sent:** Friday, August 26, 2016 1:45 PM  
**To:** Dalziel, Rod ENV:EX; Hirner, Joanna ENV:EX  
**Cc:** Lunn, Iain C FLNR:EX; Willcox, Michael FLNR:EX  
**Subject:** Chapman Lake Site Visit - August 25, 2016

Folks,

Below are some initial impressions following a site visit with AECOM personnel to Chapman Lake on August 25, 2016. AECOM staff included Bruce Ford, Heather Leech and Melissa Mukai. FLNRO staff included Iain Lunn and Duane Jesson. The purpose of the visit was to become familiar with Chapman Lake and retrieve gillnets and minnow traps that were set the day before.

#### Impressions:

- Chapman is a small headwater lake. Upstream fish access is restricted due to the presence of a downstream set of waterfalls on the outlet stream (Chapman Creek).
- Gillnetting and minnow trap results (previous and present) indicate that the lake supports a relatively robust population of stunted char which are likely Dolly Varden (DV); however, one exceptionally large individual was caught (Forklength>50cm). Species will be confirmed through DNA analysis according to Bruce Ford. I recommended the Rick Taylor lab at UBC, if available, to conduct the analysis.
- No additional sampling is recommended to determine fish species presence. I am satisfied that the lake supports one species of fish only - char (DV).
- The DV mature at a relatively small size (approx. 15cm Forklength) as determined through gonad development at capture.
- The lake has low recreational fisheries value due to the small size of the fish present; however, the presence of a mono-culture headwater population of genetically isolated DV is likely of high conservation value. Databases should be reviewed to determine whether or not this situation is unique (within the Sunshine Coast and greater species range). Rick Taylor may be able to comment with respect to the genetic importance/connection of this to other Sunshine Coast DV populations.
- Minnow trapping confirms that small, meandering channels located in close proximity (50-100 meters) to the lake support rearing DV young of the year. These important rearing channels should be investigated as to water source (i.e. groundwater fed?) and risk of dewatering at lower lake levels determined.
- Additional life history study is required to properly assess risk to migrating DV spawners at lower lake levels. If spawner migration (to stream spawning locations) occurs prior to fall rains and lake recharge, fish may be required to migrate through channels in open mud flats exposing them to possible sedimentation and predation – given the presence and location of the main spawning stream.

- At this time, the DV population of Chapman Lake appears to be large and healthy enough to be sustainable through infrequent drought year events (as per summer 2015); however, char are a cold water species and longer term global warming and more frequent drought events will increase risk especially to an isolated population with no incoming gene flow.

Please let me know if you require clarification or need to discuss any of my comments. I've attach two photos showing 1.) a comparison between the large and typical DV specimens 2.) important rearing channels.

Best regards  
Duane Jesson  
Fish & Wildlife  
South Coast Region

## RE: Chapman Lake Site Visit - August 25, 2016

Monday, October 16, 2016

3:18 PM

|         |                                                      |
|---------|------------------------------------------------------|
| Subject | <b>RE: Chapman Lake Site Visit - August 25, 2016</b> |
| From    | Hirner, Joanna ENV:EX                                |
| To      | Jesson, Duane A FLNR:EX; Dalziel, Rod ENV:EX         |
| Cc      | Lunn, Iain C FLNR:EX; Willcox, Michael FLNR:EX       |
| Sent    | Tuesday, August 30, 2016 3:03 PM                     |

Thanks Duane and Iain for attending in the field and for the great follow-up notes.  
Mike/Duane/Iain: Your expertise and experience with fish has been very helpful a  
value to our review. Much appreciated!

Best regards,

Joanna

**From:** Jesson, Duane A FLNR:EX

**Sent:** Tuesday, August 30, 2016 1:22 PM

**To:** Dalziel, Rod ENV:EX

**Cc:** Lunn, Iain C FLNR:EX; Willcox, Michael FLNR:EX; Hirner, Joanna

**Subject:** RE: Chapman Lake Site Visit - August 25, 2016

I passed on my thoughts, as indicated below, verbally to Bruce Ford while on-site.  
was covered during our time together.

**From:** Dalziel, Rod ENV:EX

**Sent:** Tuesday, August 30, 2016 12:24 PM

**To:** Jesson, Duane A FLNR:EX

**Cc:** Lunn, Iain C FLNR:EX; Willcox, Michael FLNR:EX; Hirner, Joanna

**Subject:** RE: Chapman Lake Site Visit - August 25, 2016

Hello Duane,

Thanks for being available and conducting the site visit last week. That is a monster  
pulled out there. We will pass this info on to AECOM/SCRD. How much of your notes  
communicated with AECOM when onsite last week?

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) 885-6

📧 [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)

**From:** Jesson, Duane A FLNR:EX

**Sent:** Friday, August 26, 2016 1:45 PM

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

**Cc:** Lunn, Iain C FLNR:EX; Willcox, Michael FLNR:

**Subject:** Chapman Lake Site Visit - August 25, 2016

Folks,

Below are some initial impressions following a site visit with AECOM personnel to Chapman Lake on August 25, 2016. AECOM staff included Bruce Ford, Heather Leech and Melissa M. The purpose of the visit was to become familiar with Chapman Lake and retrieve gillnets and minnow traps that were set the day before.

Impressions:

- Chapman is a small headwater lake. Upstream fish access is restricted due to a downstream set of waterfalls on the outlet stream (Chapman Creek).
- Gillnetting and minnow trap results (previous and present) indicate that the relatively robust population of stunted char which are likely Dolly Varden (DV) exceptionally large individual was caught (Forklength>50cm). Species will be confirmed through DNA analysis according to Bruce Ford. I recommended the Rick Taylor be made available, to conduct the analysis.
- No additional sampling is recommended to determine fish species presence that the lake supports one species of fish only - char (DV).
- The DV mature at a relatively small size (approx. 15cm Forklength) as determined by gonad development at capture.
- The lake has low recreational fisheries value due to the small size of the fish and the presence of a mono-culture headwater population of genetically isolated high conservation value. Databases should be reviewed to determine whether the situation is unique (within the Sunshine Coast and greater species range). Rick Taylor is able to comment with respect to the genetic importance/connection of this to the larger population.
- Minnow trapping confirms that small, meandering channels located in close proximity (meters) to the lake support rearing DV young of the year. These important rearing channels should be investigated as to water source (i.e. groundwater fed?) and risk of lower lake levels determined.
- Additional life history study is required to properly assess risk to migrating DV from lower lake levels. If spawner migration (to stream spawning locations) occurs and lake recharge, fish may be required to migrate through channels in open areas exposing them to possible sedimentation and predation – given the presence of the main spawning stream.
- At this time, the DV population of Chapman Lake appears to be large and healthy and may be sustainable through infrequent drought year events (as per summer 2015). As they are a cold water species and longer term global warming and more frequent drought will increase risk especially to an isolated population with no incoming gene flow.

Please let me know if you require clarification or need to discuss any of my comments. I have attached two photos showing 1.) a comparison between the large and typical DV specimen and 2.) the rearing channels.

Best regards  
Duane Jesson  
Fish & Wildlife

## Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Timing of Permit Decision

Monday, October 16, 2016  
10:25 AM

|                |                                                                                              |
|----------------|----------------------------------------------------------------------------------------------|
| <b>Subject</b> | <b>Re: Chapman Lake - Discussion re: Requirements for Field Sampling and Permit Decision</b> |
| <b>From</b>    | Dalziel, Rod ENV:EX                                                                          |
| <b>To</b>      | Aikman, Jennie S ENV:EX                                                                      |
| <b>Cc</b>      | Hirner, Joanna ENV:EX                                                                        |
| <b>Sent</b>    | Friday, August 12, 2016 5:04 PM                                                              |

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](mailto:Jennie.Aikman@gov.bc.ca)>

Hi Rod,

I don't want you to have to postpone your trip in to Princess Louisa to do the field sampling since you are back on Tuesday, I think it's best for you and Joanna to connect 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 Monday.

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 re: field sampling 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](mailto:Jennie.Aikman@gov.bc.ca)> wrote:

Hi Rod,

Joanna and I were discussing the latest correspondence with AECC regarding the field sampling and we thought it is important for us to discuss the need for additional field sampling during low water conditions in particular in relation to the timing of a decision on the permit. Given that they will likely

water conditions when they are conducting their field work and it i  
we may not have low water conditions this fall, I need to be prepar  
decision on the permit in the absence of data collected during low  
conditions. Joanna and I discussed where there will be uncertainty  
(e.g., water quality and char spawning) and so we will need to let /

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>

## Chapman Lake: Field notes and photos Joanna Hirner

Thursday, October 12, 2017  
8:47 AM

|             |                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------|
| Subject     | <b>Chapman Lake: Field notes and photos Joanna Hirner</b>                                                          |
| From        | Hirner, Joanna ENV:EX                                                                                              |
| To          | 'Leech, Heather'; Ford, Bruce                                                                                      |
| Cc          | Dalziel, Rod ENV:EX                                                                                                |
| Sent        | Thursday, September 1, 2016 3:41 PM                                                                                |
| Attachments | <br>2016 August<br>24 JHirner ... |

Hi Heather and Bruce,

Attached are some field notes from last Wednesday when I joined you at Chapman Lake. Included in these notes I also recorded some thoughts regarding long term monitoring of wetland change.

The notes reference some photos which I have put on the following FTP site <ftp://ftp.env.gov.bc.ca/pub/incoming/Joanna/>. On the FTP site you can also find a KMZ file with points linked to many of the same photos for geo-reference, as well some raw field notes (which should be captured in the Word document). Once you have the KMZ open in Google Earth, click on the points to see the photos and notes.

I also went back to my field notes from the May 31 field visit to Chapman Lake and can provide the following notes:

- The visit was limited to visiting the helipad, weir, and outlet channel, and the shoreline, forest and wetlands immediately adjacent.
- The following wildlife were observed on May 31, 2016:
  - Bald eagle
  - American dipper
  - Bear scat
  - Egg masses of long-toed salamander, northwestern salamander, and northern Pacific treefrog in wetland pools
  - Adult long-toed salamander and northern pacific treefrog
  - Lots of spiders, aquatic insects and butterflies
  - One fish (likely Dolly Varden) in small channel draining wetland (channel located adjacent to helipad)

Thanks,  
Joanna

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

## Field Notes Tetrahedron Chapman Lake Site Visit August 24 2016

Prepared by Joanna Hirner, Conservation Specialist, South Coast Region, BC Parks

Time: 7:15 am to 4:45 pm (travel via Airspan Helicopter)

Present: Joanna Hirner (BC Parks), Dave Bates (consultant), Melissa Mukai, Bruce Ford, Heather Leech (AECOM); [Note helicopter pilot <sup>s.22</sup> from Airspan; technician Travis(?) from SCR D also joined for morning flight only to make observations of drawdown and weir conditions]

Activities: Bruce Ford and Melissa Mukai conducted aquatic sampling (checking minnow traps set the night before, putting out gill nets, limnological and water quality sample collection); Dave Bates conducted general survey and observations of habitat (terrestrially from lakeshore and inland) and provided some assistance to aquatic team. Heather Leech conducted terrestrial ecosystem mapping with assistance from Joanna.

Areas of lake visited by Joanna: First travelled by boat from just east of helipad to northeastern corner of lake. Walked entire eastern shoreline and adjacent wetlands with Heather to southeast corner of lake. Headed slightly inland into open forest, then walked throughout large inland boggy wetland including walking from wetland to lakeshore. From large inland wetland Heather and Joanna headed further inland and upslope into forest to forest vegetation plot location (IMG\_0515). From there headed towards lake and followed trail west until it headed further inland. Then accessed lake shore near western end and walked shoreline back to the lake outlet and weir and helipad area.

Weather: clear and warm

Lake conditions: According to SCR D technician (Travis?), lake was drawn down to approximately 49% of capacity

### Overall observations:

#### *Lakeshore and exposure of lake bottom:*

- Large wetland area at eastern end of lake. Northern eastern portion sedge/rush dominated with willows and trees. Otherwise wetlands at this end of lake are boggy with small mud bottomed pools, some dry and some still with water. Wetlands extend to lake shore. See photos IMG\_0474-IMG\_0489.
- The largest amount of exposure of lake bottom from drawdown was along eastern shore of lake.
- Northeastern corner of lake and eastern shore: exposed lake bottom quite muddy/silty. Evidence of wildlife use (elk and bear tracks). See photos IMG\_0463, IMG\_0469-IMG\_0473, IMG\_0484-IMG\_0486.
- Southeastern corner of lake: wetland vegetation on south end of eastern side extends closer to lake (e.g. IMG\_0488)

- South shore at eastern end of lake:
  - Also lots of exposed lake bottom but more rocky (IMG\_0490, IMG\_0493).
  - Large wetland just inland from lakeshore; vegetation along lakeshore open forest mixed with wetland vegetation (see photos IMG\_0499-IMG\_0514). Vegetation similar to that found in boggy wetlands that dominate the eastern end of lake.
  - Some areas of large inland wetland very wet, others drier including raised hummocks dominated by heather.
- Lake profile shallower thus more exposure of lake bottom toward east end.
- Southern shore of lake west of large inland wetland: ground slopes up, west end steeper drop off of lake bathymetry thus less exposed lake bottom. Areas of southern shore observed were all fairly rocky underlain by mud/silt. See photos IMG\_0517 and IMG\_0519.
- Northern lake shore: did not observe closely, viewed from boat and looking across from the south. Generally appeared relatively steep with not too much lakeshore exposed. See IMG\_0518 as example. More exposure at eastern end.
- Drawdown channel: see photos IMG\_0520 to IMG\_0526.

#### ***Tributaries flowing into Chapman Lake***

- Most of those I observed had low water levels or were dry (e.g. photos IMG\_0484, IMG\_0497-IMG\_0498, IMG\_0510 and IMG\_0511). Main exception: The large inflow at northeast corner of lake that still maintains flow directly into Chapman Lake (see photo IMG\_0464).

#### **Incidental observations**

##### ***Eastern end of lake:***

- Lots of elk tracks, looked fairly recent
- Bear tracks (black bears *Ursus americanus*)
- Belted kingfisher (*Ceryle alcyon*)
- Large unidentified shorebirds (approximately 3) using shoreline
- Neotenus northwestern salamanders (*Ambystoma gracile*) in large flowing tributary northeast corner lake; caught in minnow traps
- Evidence of elk browsing of sedges and rushes on shoreline northeast corner of the lake
- Rufous hummingbird (*Selasphorus rufus*)
- Large group of swallows or swifts soaring high above east end of lake
- Long toed salamander larvae (*Ambystoma macrodactylum*) in drying up pool in wetland east end of lake
- Old northwestern salamander egg mass in another pool same area
- Steller's jays (*Cyanocitta stelleri*)
- Lots of bees and dragonflies, other flies flying around wetlands
- Water beetles, caddis flies, water striders in wetland pools
- Lots of tree frog tadpoles (*Pseudacris regilla*; later stages of development) and long toed salamander larvae (most also in later stages of development) in two wetland pools at

east end of lake (towards mid to southern end of large boggy wetland at east end of lake)

- Small adult treefrog (transformed this year?) in large wetland area on lakeshore in southeast corner Chapman Lake

**South side of Chapman Lake:**

- In the large boggy wetland located a bit inland from lake on south side one small fish (likely Dolly Varden *Salvelinus malma*) seen in gravelly bottom pool; took shelter in shade provided by overhanging bog vegetation
- Common ravens (*Corvus corax*)
- Old northwestern salamander egg mass on southern lakeshore towards western end of lake; stranded well above waterline attached to log in drawdown zone

**Observations related to options for monitoring long term change in wetlands:**

- Question remains about how wetlands will be affected by more frequent/prolonged/deeper drawdown of Chapman Lake. Would be helpful to understand the water source for these wetlands (groundwater versus surface flow). Because of shallow profile of lake at eastern end exposure of lake bottom and distance of wetlands from lake shore will be greater than elsewhere; wetlands in this area extend to natural lakeshore. Meandering pools in wetlands appear to provide direct habitat for Dolly Varden and indirectly as water source for stream habitat of Dolly Varden.
- Water level of pools in boggy wetlands could be monitored for long term change:
  - Regular monitoring of water level could be correlated with lake drawdown data
  - Could adapt BC Parks LTEM (long term ecological monitoring) water level gauge monitoring protocol, using HOBO data logger, for this purpose? Wetlands are relatively shallow (deepest pools 50 cm or less) which is shallower than typically called for in LTEM protocol, but many appear relatively stable and unlikely to completely dry up (another requirement of LTEM protocol). Others pools have already dried up. HOBO loggers appear to have high data storage capacity and long battery life which could allow for data downloading on a low frequency (i.e. as infrequent as once a year). Remote downloading not possible using HOBO loggers used in LTEM protocol but may be available with more expensive logger system? For investigation.
- Could also establish some permanent vegetation plots or permanent transects to monitor vegetation change in these wetlands.
- Candidate locations for monitoring:
  - Wetlands at east end of lake: some pools appear suitable for water level monitoring.
  - Large inland wetland southeast corner of lake: some pools appear suitable for water level monitoring.
  - Wetland adjacent to helipad and weir: pools are particularly shallow (30 cm or less?) but some still have water, could also possibly be used for monitoring of water levels or at least vegetation.

## Chapman Lake expansion - Public and FN consultation

Thursday, October 12, 2017

8:43 AM

|         |                                                            |
|---------|------------------------------------------------------------|
| Subject | <b>Chapman Lake expansion - Public and FN consultation</b> |
| From    | Dalziel, Rod ENV:EX                                        |
| To      | 'Andrew.Mathewson@aecom.com'                               |
| Sent    | Friday, September 2, 2016 10:07 AM                         |

Hello Andrew,

Are you able to provide an update on the public and the First Nation consultation for the proposed Chapman Lake expansion project as I know there were some delays earlier due to the issues at the Sechelt band office including any scheduled meetings planned.

Thanks,

*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](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks

Friday, October 13, 2017  
2:45 PM

|         |  |
|---------|--|
| Subject |  |
| From    |  |
| To      |  |
| Sent    |  |

It has come to my attention that the SCRD has conducted numerous flights into Tetrahedron Park during 2016 for which BC Parks was not notified. As flight access into Tetrahedron Park is a prohibited activity Special Provision 6.(a) of Park Use Permit (PUP) #102714 authorizes the Permittee to access the permit area with a condition to notify BC Parks prior to any flights. Therefore these flights are in of the conditions of PUP #102714.

*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

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Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks

## FW: Tetrahedron flights

Thursday, October 12, 2017  
3:25 PM

|             |                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------|
| Subject     | <b>FW: Tetrahedron flights</b>                                                                                |
| From        | <a href="#">Shane Walkey</a>                                                                                  |
| To          | Dalziel, Rod ENV:EX                                                                                           |
| Cc          | Janette Loveys                                                                                                |
| Sent        | Tuesday, November 29, 2016 4:53 PM                                                                            |
| Attachments | <br>SCRD PUP<br>#102714 n... |

Rod,

In our attempt to fit into weather windows I do believe we overlooked contacting BC Parks when we winterized our communication equipment in the Tetrahedron Provincial Park. I apologize for this indiscretion and have reminded staff of this requirement prior to flying in for future trips.

Until further notice please address future correspondence relating to PUP # 102714 to; Janette Loveys, Chief Administrative Officer. [Janette.loveys@scrd.ca](mailto:Janette.loveys@scrd.ca)

Shane Walkey  
Manager, Utility Services  
Sunshine Coast Regional District  
604-885-6821  
[shane.walkey@scrd.ca](mailto:shane.walkey@scrd.ca)

Visit us: [www.scrd.ca](http://www.scrd.ca)  
Follow us on Twitter at [sunshinecoastrd](#)  
Like us on [Facebook](#)

**From:** Dalziel, Rod ENV:EX [<mailto:Rod.Dalziel@gov.bc.ca>]  
**Sent:** Tuesday, November 29, 2016 11:41 AM  
**To:** Dave Crosby <[Dave.Crosby@scrd.ca](mailto:Dave.Crosby@scrd.ca)>  
**Subject:** FW: Tetrahedron flights

Hello Dave,

I received auto reply that Bryan s.22 is the contact I am forwarding to you. Bryan was the contact representative for PUP #102714. Please let me know who I should be addressing correspondence to and who will now be the contact for this PUP.

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](mailto:Rod.Dalziel@gov.bc.ca)  
Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



**From:** Dalziel, Rod ENV:EX  
**Sent:** Tuesday, November 29, 2016 11:30 AM  
**To:** 'Bryan Shoji'

**Subject:** Tetrahedron flights

Hello Bryan,

Please find attached non-compliance letter in relation to PUP #102714.

*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](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks



29 November 2016

Method of Delivery (**VIA EMAIL**)

Bryan Shoji  
Sunshine Coast Regional District  
1975 Field RD  
Sechelt, BC V0N 3A1

Dear Mr. Bryan Shoji

RE: unauthorized flight access in Tetrahedron Provincial Park

It has come to BC Parks attention that the Sunshine Coast Regional District (SCRD) has conducted numerous flights into Tetrahedron Park during 2016 for which BC Parks was not notified. The SCRD has been informally warned for similar infractions in the past. As flight access into Tetrahedron Park is a prohibited activity, Park Use Permit (PUP) #102714 provides a Special Provision 6.(a) to authorize the Permittee to access the permit area with a condition to notify BC Parks prior to any flights. With the lack of notification to BC Parks these flights were in non-compliance with the conditions of PUP #102714.

Please consider this letter a formal warning of non-compliance of the conditions of PUP #102714.

Sincerely,

Rod Dalziel  
Sunshine Coast Area Supervisor

**Balsom, Tami CSNR:EX**

---

**Subject:** Call to Discuss the SCRD's Chapman Lake Applications - Status and Timelines  
**Location:** Conference Call Line: 1-877-353-9184; Participant ID **s.17**

**Start:** Thu 2016-12-15 1:30 PM  
**End:** Thu 2016-12-15 2:30 PM

**Recurrence:** (none)

**Meeting Status:** Accepted

**Organizer:** Aikman, Jennie S ENV:EX  
**Required Attendees:** Janette Loveys; Johnsrude, Allan N FLNR:EX; Rosenboom, Remko FLNR:EX; Anderson, Wade R ENV:EX; Dalziel, Rod ENV:EX; Hirner, Joanna ENV:EX

Hi Folks,

Due to a scheduling conflict in the morning, I am moving our call to 1:30PM on Thursday.

Thanks,  
 Jennie

---

Hi All,

Please confirm your availability for a call next Thursday at 11AM to discuss the Chapman Lake water withdrawal expansion project, status of applications, and timings. Please forward this invitation to any staff you would like to have participate on the call.

Conference Call Line: 1-877-353-9184; Participant ID: **s.17**

Janette will be providing an agenda to focus the discussion.

With regards,  
 Jennie

**Jennie Aikman**  
 Regional Director  
 South Coast Region, BC Parks  
 Ministry of Environment  
 Office phone: (604) 924-2227  
 Cell phone: (778) 875-8494

**From:** [Aikman, Jennie S ENV:EX](#)  
**To:** [Janette Loveys](#); [Johnsrude, Allan N FLNR:EX](#); [Rosenboom, Remko FLNR:EX](#); [Anderson, Wade R ENV:EX](#); [Dalziel, Rod ENV:EX](#); [Hirner, Joanna ENV:EX](#)  
**Subject:** Call to Discuss the SCRD's Chapman Lake Applications - Status and Timelines

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With regards,  
Jennie

Jennie Aikman  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment  
Office phone: (604) 924-2227  
Cell phone: (778) 875-8494

**From:** [Aikman, Jennie S ENV:EX](#)  
**To:** [Janette Loveys](#); [Johnsrude, Allan N FLNR:EX](#); [Rosenboom, Remko FLNR:EX](#); [Anderson, Wade R ENV:EX](#); [Dalziel, Rod ENV:EX](#); [Hirner, Joanna ENV:EX](#)  
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Regional Director  
South Coast Region, BC Parks  
Ministry of Environment  
Office phone: (604) 924-2227  
Cell phone: (778) 875-8494

**From:** [Aikman, Jennie S ENV:EX](#)  
**To:** [Janette Loveys; Dave Crosby; Dalziel, Rod ENV:EX; Hirner, Joanna ENV:EX; Johnsrude, Allan N FLNR:EX; Rosenboom, Remko FLNR:EX](#)  
**Cc:** [Anderson, Wade R ENV:EX](#)  
**Subject:** SCRD Chapman Lake Proposal - Update Call  
**Start:** Monday, January 16, 2017 10:00:00 AM  
**End:** Monday, January 16, 2017 11:00:00 AM  
**Location:** Conference Call Line: 1-877-353-9184; Participant ID: **s.17**

---

Hi All,

As discussed, I am scheduling a teleconference call for Monday, January 16th for an update on the Chapman Lake proposal.

Time: 10:00 – 11:00

Teleconference info: 1-877-353-9184; Participant ID **s.17**

Happy holidays all. Talk to you in the New Year.

Jennie

**Balsom, Tami CSNR:EX**

---

**Subject:** Canceled: SCRD Chapman Lake Proposal - Update Meeting  
**Location:** North Vancouver - 1610 Mount Seymour Road

**Start:** Tue 2017-01-17 10:00 AM  
**End:** Tue 2017-01-17 11:00 AM  
**Show Time As:** Free

**Recurrence:** (none)

**Meeting Status:** Tentatively accepted

**Organizer:** Aikman, Jennie S ENV:EX  
**Required Attendees:** Janette Loveys; Dave Crosby; Dalziel, Rod ENV:EX; Hirner, Joanna ENV:EX; Johnsrude, Allan N FLNR:EX; Rosenboom, Remko FLNR:EX  
**Optional Attendees:** Anderson, Wade R ENV:EX

**Importance:** High

Hi All,

As SCRD staff are not available tomorrow morning, I am cancelling this meeting and will reschedule to another day if required.

Jennie

---

Hi All,

As discussed, I am scheduling a teleconference call for Monday, January 16<sup>th</sup> for an update on the Chapman Lake proposal.

Time: 10:00 – 11:00  
Teleconference info: 1-877-353-9184; Participant ID<sup>s.17</sup>

Happy holidays all. Talk to you in the New Year.

Jennie

## 2016 Park Use Permit 102714 Annual Report

Thursday, October 12, 2017  
8:20 AM

|             |                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------|
| Subject     | <b>2016 Park Use Permit 102714 Annual Report</b>                                                                 |
| From        | <a href="#">Lynda Fyfe</a>                                                                                       |
| To          | Dalziel, Rod ENV:EX                                                                                              |
| Cc          | Shane Walkey                                                                                                     |
| Sent        | Wednesday, January 11, 2017 11:04 AM                                                                             |
| Attachments | <br>2017-JAN-1<br>0 2016 Par... |

Hi Rod,

My name is Lynda and I'm the new Environmental Technician at the Sunshine Coast Regional District, carrying on from Beth Brooks. I'm looking forward to meeting you – perhaps when we conduct snow survey in Tetrahedron Park. This is planned for the first week of February and I'll be able to pin it down closer to the date.

Please find the 2016 Park Use Permit Annual Report for Tetrahedron Park attached. Feel free to contact me with any questions or comments.

Sincerely,  
Lynda

**Lynda Fyfe, Environmental Technician**  
*Infrastructure Services, Sunshine Coast Regional District*  
Phone: 604.885.6800 ext 6489  
Fax: 604.885.7909  
[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)



January 10, 2017

Ministry of Environment  
 PASB – Park Use Permits  
 PO Box 9371 Stn Prov Govt  
 Victoria, BC V8W 9M3  
 Fax: 250-387-1695

**Re: Annual Reporting for Park Use Permit # 102714 (2016)**

---

As a requirement of the Sunshine Coast Regional Districts Park Use Permit (#102714), please see the enclosed Park Use Activity Report for a summary of activities in 2016.

Work completed in the Tetrahedron included valve work at the Edwards Lake control, snow surveys, initial phase of the weather station installation, and an environmental assessment completed by AECOM for the Chapman Lake Supply Expansion Project.

If you have any questions in regards to the information provided the attached report, please contact the undersigned.

Yours Truly,

*Lynda Fyfe*

Lynda Fyfe, RB Tech  
 Environmental Technician, Infrastructure Services  
**SUNSHINE COAST REGIONAL DISTRICT**  
 604-885-6800

**Sunshine Coast Regional District**

1975 Field Road  
Sechelt, British Columbia  
Canada V0N 3A1

P 604.885.6800  
F 604.885.7909  
Toll free 1.800.687.5753

info@scrd.ca  
www.scrd.ca

**Sunshine Coast Regional District - Tetrahedron Park Use Activity Report**

Prepared by: Lynda Fyfe

Year: 2016

Permit no.: 102714

Transportation: Airspan Helicopters

| Date       | Flight Hours | Location                   | Activities                                                                           |
|------------|--------------|----------------------------|--------------------------------------------------------------------------------------|
| 3/4/2016   | 0.7          | Chapman Lake, Edwards Lake | Snow surveys                                                                         |
| 4/4/2016   | 0.7          | Chapman Lake, Edwards Lake | Snow surveys                                                                         |
| 5/12/2016  | 0.8          | Chapman Lake               | Lake control                                                                         |
| 8/4/2016   | 0.6          | Chapman Lake, Edwards Lake | Lake controls                                                                        |
| 8/11/2016  | 1.4          | Chapman Lake               | SCRD Chapman Lake Project – AECOM environmental assessment?                          |
| 8/23/2016  | 1.5          | Chapman Lake, Edwards Lake | SCRD Chapman Lake Project – AECOM environmental assessment?                          |
| 8/24/2016  | 1.2          | Chapman Lake               | SCRD Chapman Lake Project – AECOM environmental assessment?                          |
| 8/25/2016  | 0.9          | Chapman Lake               | SCRD Chapman Lake Project – AECOM environmental assessment?                          |
| 8/30/2016  | 1.3          | Edwards Lake               | Lake control valve work                                                              |
| 9/8/2016   | 2.6          | Above Chapman Lake         | Tetrahedron weather station installation                                             |
| 9/12/2016  | 0.7          | Edwards Lake               | Lake control valve work                                                              |
| 9/13/2016  | 1.3          | Edwards Lake               | Lake control valve work                                                              |
| 9/15/2016  | 0.6          | Edwards Lake               | Lake control valve work                                                              |
| 9/20/2016  | 0.7          | Chapman Lake, Edwards Lake | WHO/WHY? – signed by Bryan                                                           |
| 10/6/2016  | 0.6          | Edwards Lake               | Lake control upgrade                                                                 |
| 10/28/2016 | 0.8          | Chapman Lake, Edwards Lake | Chapman Lake, Edwards Lake – lake controls, Chapman Lake – snow survey course locate |

# RE: 2016 Park Use Permit 102714 Annual Report

Friday, October 13, 2017

9:30 AM

|         |                                                      |
|---------|------------------------------------------------------|
| Subject | <b>RE: 2016 Park Use Permit 102714 Annual Report</b> |
| From    | <a href="#">Lynda Fyfe</a>                           |
| To      | Dalziel, Rod ENV:EX                                  |
| Sent    | Thursday, January 12, 2017 10:25 AM                  |

Yes, will do. I look forward to meeting you also.

**Lynda Fyfe, Environmental Technician, RB Tech, RPP**  
 Infrastructure Services, Sunshine Coast Regional District  
 Phone: 604.885.6800 ext 6489  
 Fax: 604.885.7909  
[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

**From:** Dalziel, Rod ENV:EX [<mailto:Rod.Dalziel@gov.bc.ca>]  
**Sent:** Wednesday, January 11, 2017 2:29 PM  
**To:** Lynda Fyfe <[Lynda.Fyfe@scrd.ca](mailto:Lynda.Fyfe@scrd.ca)>  
**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Hello Lynda,

It is a pleasure to meet you over email and look forward to meeting you in person in the future as well. Thanks for the submission of the Annual Report. Thanks for keeping me posted on the proposed snow survey flight. Please keep me posted on a confirmed date because as you may be aware it is a requirement of the PUP and I may be interested in joining if space is available.

## **SPECIAL PROVISIONS**

### **6. Flight Access**

(a) The use of a helicopter for access to the structures is acceptable. The Permittee shall notify BC Parks as early as feasibly possible prior to any flights into Tetrahedron Park so that BC Parks may utilize available space or service of the helicopter for park operation purposes.

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  
 ✉ [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)  
 Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



**From:** Lynda Fyfe [<mailto:Lynda.Fyfe@scrd.ca>]  
**Sent:** Wednesday, January 11, 2017 11:05 AM  
**To:** Dalziel, Rod ENV:EX  
**Cc:** Shane Walkey  
**Subject:** 2016 Park Use Permit 102714 Annual Report

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Sincerely,  
Lynda

**Lynda Fyfe, Environmental Technician**  
*Infrastructure Services, Sunshine Coast Regional District*  
Phone: 604.885.6800 ext 6489  
Fax: 604.885.7909  
[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

# RE: 2016 Park Use Permit 102714 Annual Report

Friday, October 13, 2017

9:30 AM

|         |                                                      |
|---------|------------------------------------------------------|
| Subject | <b>RE: 2016 Park Use Permit 102714 Annual Report</b> |
| From    | <a href="#">Lynda Fyfe</a>                           |
| To      | Dalziel, Rod ENV:EX                                  |
| Sent    | Thursday, January 12, 2017 11:01 AM                  |

I'll take a look at our files and get back to you on this.

Lynda

**Lynda Fyfe, Environmental Technician, RB Tech, RPP**  
 Infrastructure Services, Sunshine Coast Regional District  
 Phone: 604.885.6800 ext 6489  
 Fax: 604.885.7909  
[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

**From:** Dalziel, Rod ENV:EX [<mailto:Rod.Dalziel@gov.bc.ca>]  
**Sent:** Wednesday, January 11, 2017 2:36 PM  
**To:** Lynda Fyfe <[Lynda.Fyfe@scrd.ca](mailto:Lynda.Fyfe@scrd.ca)>  
**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Hello Lynda,

I was just uploading your report to the PUP file and noticed we did not receive the 2015 report. Are you able to provide?

Thanks,

*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  
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 ✉ [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)  
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BC Parks - South Coast Region - Ministry of Environment

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✉ Rod.Dalziel@gov.bc.ca

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks

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**Sent:** Wednesday, January 11, 2017 11:05 AM

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**Cc:** Shane Walkey

**Subject:** 2016 Park Use Permit 102714 Annual Report

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Infrastructure Services, Sunshine Coast Regional District

Phone: 604.885.6800 ext 6489

Fax: 604.885.7909

[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

## FW: 2016 Park Use Permit 102714 Annual Report

Thursday, October 12, 2017  
11:12 AM

|             |                                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------|
| Subject     | <b>FW: 2016 Park Use Permit 102714 Annual Report</b>                                                              |
| From        | <a href="#">Lynda Fyfe</a>                                                                                        |
| To          | Dalziel, Rod ENV:EX                                                                                               |
| Sent        | Thursday, January 12, 2017 1:56 PM                                                                                |
| Attachments | <br>2016-FEB-15<br>2015 Park ... |

Hi Nathan,  
Please see attached.

Lynda

**Lynda Fyfe, Environmental Technician, RB Tech, RPP**  
 Infrastructure Services, Sunshine Coast Regional District  
 Phone: 604.885.6800 ext 6489  
 Fax: 604.885.7909  
[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

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**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

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*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

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✉: [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks

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**Sent:** Wednesday, January 11, 2017 11:05 AM

**To:** Dalziel, Rod ENV:EX

**Cc:** Shane Walkey

**Subject:** 2016 Park Use Permit 102714 Annual Report

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Lynda

**Lynda Fyfe, Environmental Technician**

Infrastructure Services, Sunshine Coast Regional District

Phone: 604.885.6800 ext 6489

Fax: 604.885.7909

[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)



February 15, 2016

Ministry of Environment  
PASB – Park Use Permits  
PO Box 9371 Stn Prov Govt  
Victoria, BC V8W 9M3  
Fax: 250-387-1695

**Re: Annual Reporting for Park Use Permit # 102714 (2015)**

---

As a requirement of the Sunshine Coast Regional Districts Park Use Permit (#102714), please see the enclosed Park Use Activity Report for a summary of activities in 2015.

The number of trips to Chapman and Edwards Lakes was higher than in previous years due to small capital projects and the severe drought conditions experienced on the Sunshine Coast this past summer. An amendment to the existing permit was approved (August, 2015) to temporarily increase the Chapman Lake Permit area to install an emergency siphon. Other works included an upgrade of an existing helipad to improve structural stability and the Edwards Lake control upgrade.

If you have any questions in regards to the information provided the attached report, please contact the undersigned.

Yours Truly,

**SUNSHINE COAST REGIONAL DISTRICT**

Beth Brooks  
Environmental Technician, Infrastructure Services  
604-885-6800

**Sunshine Coast Regional District**

1975 Field Road  
Sechelt, British Columbia  
Canada V0N 3A1

P 604.685.6800  
F 604.685.7909  
Toll free 1.800.687.5753

info@scrtd.ca  
www.scrtd.ca


**Sunshine Coast Regional District - Tetrahedron Park Use Activity Report**

Prepared by: Beth Brooks

Year: 2015

Permit no.: 102714

Transportation: Airspan Helicopters

| Date       | Flight Hours | Location                                 | Activities                                                     |
|------------|--------------|------------------------------------------|----------------------------------------------------------------|
| 12/3/2015  | 1.0          | Chapman Lake, Edwards Lake               | Repeater sites check                                           |
| 4/30/2015  | 1.0          | Chapman Lake, McNair Lake/cabin          | Snow survey locates, potential weather station sites           |
| 5/21/2015  | 1.0          | Chapman Lake, Edwards Lake               | Lake control upgrade                                           |
| 6/1/2015   | 1.2          | Chapman Lake, Edwards Lake               | Snow course prep                                               |
| 6/1/2015   | 1.2          | Chapman Lake                             | Helipad upgrade (WO 23904)                                     |
| 6/8/2015   | 1.0          | Chapman Lake                             | Helipad upgrade                                                |
| 6/8/2015   | 0.6          | Chapman Lake                             | Helipad upgrade - sling load                                   |
| 6/8/2015   | 1.0          | Chapman Lake, Mount Steele, McNair cabin | Finalize weather station location (w/ Rod Dalziel, Bill Floyd) |
| 6/9/2015   | 0.4          | Chapman Lake                             | Helipad upgrade                                                |
| 6/9/2015   | 1.0          | Chapman Lake                             | Helipad upgrade - sling load                                   |
| 6/10/2015  | 0.4          | Chapman Lake                             | Helipad upgrade                                                |
| 6/15/2015  | 1.4          | Edwards Lake                             | Lake control upgrade                                           |
| 6/22/2015  | 1.0          | Chapman Lake, Edwards Lake               | Lake control upgrade                                           |
| 7/13/2015  | 1.0          | Edwards Lake                             | Lake control upgrade                                           |
| 7/20/2015  | 0.8          | Edwards Lake                             | Lake control upgrade                                           |
| 7/21/2015  | 0.9          | Edwards Lake, Chapman Lake               | Lake control upgrade                                           |
| 8/7/2015   | 0.7          | Edwards Lake, Chapman Lake               | Lake control upgrade                                           |
| 8/12/2015  | 0.6          | Chapman Lake, Edwards Lake               | Siphon install planning                                        |
| 8/17/2015  | 0.7          | Chapman Lake, Edwards Lake               | Siphon install planning                                        |
| 8/20/2015  | 0.7          | Chapman Lake, Edwards Lake               | Siphon install, lake controls check                            |
| 8/25/2016  | 1.1          | Edwards Lake                             | Lake control upgrade                                           |
| 8/26/2015  | 0.8          | Edwards Lake                             | Lake control upgrade                                           |
| 8/27/2015  | 0.5          | Edwards Lake, Chapman Lake               | Lake control upgrade                                           |
| 10/23/2015 | 0.5          | Chapman Lake                             | Weather station location archeology assessment                 |
| 10/27/2015 | 0.6          | Edwards Lake, Chapman Lake               | Survey work review                                             |
| 11/5/2015  | 0.8          | Chapman Lake                             | Works planning                                                 |

# RE: 2016 Park Use Permit 102714 Annual Report

Friday, October 13, 2017

9:30 AM

|         |                                                      |
|---------|------------------------------------------------------|
| Subject | <b>RE: 2016 Park Use Permit 102714 Annual Report</b> |
| From    | Dalziel, Rod ENV:EX                                  |
| To      | 'Lynda Fyfe'                                         |
| Sent    | Thursday, January 12, 2017 2:24 PM                   |

Thanks Lynda.

*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](mailto:Rod.Dalziel@gov.bc.ca)

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BC Parks

**From:** Lynda Fyfe [<mailto:Lynda.Fyfe@scrd.ca>]

**Sent:** Thursday, January 12, 2017 1:56 PM

**To:** Dalziel, Rod ENV:EX

**Subject:** FW: 2016 Park Use Permit 102714 Annual Report

Hi Nathan,

Please see attached.

Lynda

**Lynda Fyfe, Environmental Technician, RB Tech, RPP**

Infrastructure Services, Sunshine Coast Regional District

Phone: 604.885.6800 ext 6489

Fax: 604.885.7909

[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

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

**Sent:** Wednesday, January 11, 2017 2:36 PM

**To:** Lynda Fyfe <[Lynda.Fyfe@scrd.ca](mailto:Lynda.Fyfe@scrd.ca)>

**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Hello Lynda,

I was just uploading your report to the PUP file and noticed we did not receive the 2015 report. Are you able to provide?

Thanks,

*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](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



**From:** Dalziel, Rod ENV:EX  
**Sent:** Wednesday, January 11, 2017 2:29 PM  
**To:** 'Lynda Fyfe'  
**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Hello Lynda,

It is a pleasure to meet you over email and look forward to meeting you in person in the future as well. Thanks for the submission of the Annual Report. Thanks for keeping me posted on the proposed snow survey flight. Please keep me posted on a confirmed date because as you may be aware it is a requirement of the PUP and I may be interested in joining if space is available.

**SPECIAL PROVISIONS**

**6. Flight Access**

(a) The use of a helicopter for access to the structures is acceptable. The Permittee shall notify BC Parks as early as feasibly possible prior to any flights into Tetrahedron Park so that BC Parks may utilize available space or service of the helicopter for park operation purposes.

Cheers,

*Rod Dalziel*

Sunshine Coast Area Supervisor  
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 ☎: Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-2445  
 ✉: [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)  
 Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



**From:** Lynda Fyfe [<mailto:Lynda.Fyfe@scrd.ca>]  
**Sent:** Wednesday, January 11, 2017 11:05 AM  
**To:** Dalziel, Rod ENV:EX  
**Cc:** Shane Walkey  
**Subject:** 2016 Park Use Permit 102714 Annual Report

Hi Rod,

My name is Lynda and I'm the new Environmental Technician at the Sunshine Coast Regional District, carrying on from Beth Brooks. I'm looking forward to meeting you – perhaps when we conduct snow survey in Tetrahedron Park. This is planned for the first week of February and I'll be able to pin it down closer to the date.

Please find the 2016 Park Use Permit Annual Report for Tetrahedron Park attached. Feel free to contact me with any questions or comments.

Sincerely,  
 Lynda

**Lynda Fyfe, Environmental Technician**  
 Infrastructure Services, Sunshine Coast Regional District  
 Phone: 604.885.6800 ext 6489  
 Fax: 604.885.7909  
[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

**From:** [Aikman, Jennie S ENV:EX](#)  
**To:** [Janette Loveys](#); [Dave Crosby](#); [Dalziel, Rod ENV:EX](#); [Hirner, Joanna ENV:EX](#); [Johnsrude, Allan N FLNR:EX](#); [Rosenboom, Remko FLNR:EX](#)  
**Cc:** [Anderson, Wade R ENV:EX](#)  
**Subject:** SCRD Chapman Lake Proposal - Update Meeting  
**Importance:** High

---

Hi Folks,

Sorry for the short notice, but I would like rescheduling our call to a meeting at the North Vancouver office on Tuesday morning at 10AM.

Janette and Dave, I have left you both messages – Remko and I are hoping you are able to join us in the Mount Seymour office, and Allan may be joining us by phone.

Wade, Rod and Joanna, you are welcome to join the meeting in person or alternately I will follow up with you afterwards.

Thanks.  
Jennie

Jennie Aikman  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment  
Office phone: (604) 924-2227  
Cell phone: (778) 875-8494

Hi All,

As discussed, I am scheduling a teleconference call for Monday, January 16th for an update on the Chapman Lake proposal.

Time: 10:00 – 11:00  
Teleconference info: 1-877-353-9184; Participant ID **S.17**

Happy holidays all. Talk to you in the New Year.

Jennie

**From:** [Dalziel, Rod ENV:EX](#)  
**To:** [Aikman, Jennie S ENV:EX](#)  
**Subject:** Tentative: SCRD Chapman Lake Proposal - Update Meeting

---

Could I attend by conference call?

## RE: SCRD Chapman Lake Proposal - Update Meeting

Friday, October 13, 2017

1:06 PM

|         |                                                        |
|---------|--------------------------------------------------------|
| Subject | <b>RE: SCRD Chapman Lake Proposal - Update Meeting</b> |
| From    | Aikman, Jennie S ENV:EX                                |
| To      | Dalziel, Rod ENV:EX                                    |
| Sent    | Friday, January 13, 2017 4:11 PM                       |

Yes, we can arrange that Rod. Allan will likely call in too. I just wanted to emphasise to SCRD that we want them here in person.

I will call you to fill you in on Monday, <sup>s.14</sup>  
<sup>s.14</sup> and so hence the need for a face-to-face meeting with SCRD.

Jennie

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

From: Dalziel, Rod ENV:EX

Sent: Friday, January 13, 2017 4:06 PM

To: Aikman, Jennie S ENV:EX

Subject: Tentative: SCRD Chapman Lake Proposal - Update Meeting

When: Tuesday, January 17, 2017 10:00 AM-11:00 AM (UTC-08:00) Pacific Time (US & Canada),

Where: North Vancouver - 1610 Mount Seymour Road

Could I attend by conference call?

# RE: 2016 Park Use Permit 102714 Annual Report

Friday, October 13, 2017

9:29 AM

|         |                                                      |
|---------|------------------------------------------------------|
| Subject | <b>RE: 2016 Park Use Permit 102714 Annual Report</b> |
| From    | Dalziel, Rod ENV:EX                                  |
| To      | 'Lynda Fyfe'                                         |
| Sent    | Monday, January 16, 2017 11:47 AM                    |

Hello Lynda,

Thanks for the update on your planned site visit to conduct snow surveys as part of PUP # 108105. Unfortunately I am unavailable those dates. I hope the weather cooperates and you have a great flight in.

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

✉: [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks

**From:** Lynda Fyfe [<mailto:Lynda.Fyfe@scrd.ca>]

**Sent:** Monday, January 16, 2017 10:27 AM

**To:** Dalziel, Rod ENV:EX

**Subject:** FW: 2016 Park Use Permit 102714 Annual Report

Hi Rod,

I've booked the flight for the snow survey in Tetrahedron for Wednesday Feb 1 at 10AM, flying with Airspan Helicopters.

Backup days are Feb 2 or 3 if the weather doesn't cooperate on the 1<sup>st</sup>.

Cheers,

Lynda

**Lynda Fyfe, Environmental Technician, RB Tech, RPP**

Infrastructure Services, Sunshine Coast Regional District

Phone: 604.885.6800 ext 6489

Fax: 604.885.7909

[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

**From:** Lynda Fyfe

**Sent:** Thursday, January 12, 2017 10:26 AM

**To:** 'Dalziel, Rod ENV:EX' <[Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)>

**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Yes, will do. I look forward to meeting you also.

**Lynda Fyfe, Environmental Technician, RB Tech, RPP**

Infrastructure Services, Sunshine Coast Regional District

Phone: 604.885.6800 ext 6489

Fax: 604.885.7909

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**Sent:** Wednesday, January 11, 2017 2:29 PM

**To:** Lynda Fyfe <[Lynda.Fyfe@scrd.ca](mailto:Lynda.Fyfe@scrd.ca)>

**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

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#### **SPECIAL PROVISIONS**

##### **6. Flight Access**

(a) The use of a helicopter for access to the structures is acceptable. The Permittee shall notify BC Parks as early as feasibly possible prior to any flights into Tetrahedron Park so that BC Parks may utilize available space or service of the helicopter for park operation purposes.

Cheers,

*Rod Dalziel*

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**Cc:** Shane Walkey

**Subject:** 2016 Park Use Permit 102714 Annual Report

Hi Rod,

My name is Lynda and I'm the new Environmental Technician at the Sunshine Coast Regional District, carrying on from Beth Brooks. I'm looking forward to meeting you – perhaps when we conduct snow survey in Tetrahedron Park. This is planned for the first week of February and I'll be able to pin it down closer to the date.

Please find the 2016 Park Use Permit Annual Report for Tetrahedron Park attached. Feel free to contact me with any questions or comments.

Sincerely,

Lynda

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Infrastructure Services, Sunshine Coast Regional District

Phone: 604.885.6800 ext 6489

Fax: 604.885.7909

[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

## RE: SCRD Chapman Lake Proposal - Update Meeting

Friday, October 13, 2017

1:06 PM

|         |                                                        |
|---------|--------------------------------------------------------|
| Subject | <b>RE: SCRD Chapman Lake Proposal - Update Meeting</b> |
| From    | Dalziel, Rod ENV:EX                                    |
| To      | Aikman, Jennie S ENV:EX                                |
| Sent    | Monday, January 16, 2017 1:16 PM                       |

Hello Jennie,

Wow that is certainly a change. Yes I would like an update and as that is the case now I may like to be present at the meeting.

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

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

Visit the BC Parks website @ <http://bcparks.ca/> bcparks.ca

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From: Aikman, Jennie S ENV:EX  
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 To: Dalziel, Rod ENV:EX  
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Yes, we can arrange that Rod. Allan will likely call in too. I just wanted to emphasise to SCRD that we want them here in person.

I will call you to fill you in on Monday, <sup>s.14</sup>

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

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Sent: Friday, January 13, 2017 4:06 PM

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Subject: Tentative: SCRD Chapman Lake Proposal - Update Meeting

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Could I attend by conference call?

# RE: 2016 Park Use Permit 102714 Annual Report

Friday, October 13, 2017

9:29 AM

|         |                                                      |
|---------|------------------------------------------------------|
| Subject | <b>RE: 2016 Park Use Permit 102714 Annual Report</b> |
| From    | <a href="#">Lynda Fyfe</a>                           |
| To      | Dalziel, Rod ENV:EX                                  |
| Sent    | Monday, January 16, 2017 2:54 PM                     |

Thanks Rod,  
Hopefully I'll catch up with you on the March snow survey.

Lynda

**Lynda Fyfe, Environmental Technician, RB Tech, RPP**  
Infrastructure Services, Sunshine Coast Regional District  
Phone: 604.885.6800 ext 6489  
Fax: 604.885.7909  
[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

**From:** Dalziel, Rod ENV:EX [<mailto:Rod.Dalziel@gov.bc.ca>]  
**Sent:** Monday, January 16, 2017 11:48 AM  
**To:** Lynda Fyfe <[Lynda.Fyfe@scrd.ca](mailto:Lynda.Fyfe@scrd.ca)>  
**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Hello Lynda,

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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  
✉: [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)  
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**Subject:** FW: 2016 Park Use Permit 102714 Annual Report

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**To:** 'Dalziel, Rod ENV:EX' <[Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)>  
**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

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BC Parks

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**Cc:** Shane Walkey  
**Subject:** 2016 Park Use Permit 102714 Annual Report

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[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

## MINISTRY OF ENVIRONMENT MEETING INFORMATION NOTE

May 18, 2016  
File: 280-20  
Previous CLIFF#: 289031  
CLIFF/tracking #: 298046

**PREPARED FOR: Jim Standen, Assistant Deputy Minister, BC Parks and Conservation Officer Service**

**DATE AND TIME OF MEETING: Thursday, May 19<sup>th</sup> 3:30 – 4:00 PM**

**ATTENDEES:**

Garry Nohr, Board Chair, Sunshine Coast Regional District  
Janette Loveys, Chief Administration Officer, Sunshine Coast Regional District  
Jennie Aikman, Regional Director, South Coast Region, BC Parks  
Rod Dalziel, Area Supervisor, Sunshine Coast Area, BC Parks

**ISSUE(S): Sunshine Coast Regional District's request for a meeting to discuss their park use permit application for the Chapman Lake Supply Expansion Project in Tetrahedron Park.**

**BACKGROUND:**

Gray and Chapman creeks, both of which have headwaters in Tetrahedron Park, are the principle sources of domestic drinking water to coastal communities within the SCRD, including Sechelt and Gibsons. Water is drawn from a system of alpine lakes that are within the park, including Chapman Lake and Edwards Lake.

Tetrahedron Park was established in part to preserve the watershed and community water supply. The park management plan supported the continued use of the park's alpine lakes for this purpose. Consistent with the park management plan, the SCRD maintains infrastructure on Chapman and Edwards Lakes in Tetrahedron Park under a park use permit (land use occupancy). They also have a water license under the *Water Act* which authorises the volume of their water removal.

In August 2015, the Sunshine Coast Regional District (SCRD) advanced to Level 4 water restrictions due to the extreme drought conditions and water shortages on the Sunshine Coast. SCRD approached the Water Stewardship Branch (FLNRO) and BC Parks for emergency amendments to their water license and park use permit, to expand their infrastructure in the park. Specifically, SCRD proposed to install and employ a siphon system, to be installed on a float in Chapman Lake, to draw additional water from the lake system. They also applied for a temporary amendment to their water license to remove an additional 1,000,000 m<sup>3</sup>, through a *Water Act*, Section 8 Approval for short term use of water.

In August 2015, BC Parks issued a park use permit amendment to the SCRD for temporary (one year) authorization to install the emergency siphon system. The permit

term mirrored the temporary water licence issued to the SCRD under the *Water Act*, with an additional two weeks to allow time to remove the siphon infrastructure from the park. Following the issuance of the permit, BC Parks sent a letter to the SCRD emphasizing that the amendment was a temporary emergency measure and encouraging the SCRD to develop a long-term solution to the water supply issue on the Sunshine Coast to avoid emergency measures being required in the future. A few days after the permit was issued, rains recharged the lake to full pool so the SCRD never proceeded with the install of the siphon system.

## **DISCUSSION:**

In February 2016, BC Parks learned that the SCRD Board had approved moving forward with a new proposal to construct a trench to install permanent piping in Chapman Lake to allow for the drawdown of the lake the full 8 metres. Staff requested a meeting with the SCRD to get a better understanding of their proposal and timings. We arranged an initial meeting with SCRD staff and their consulting firm, AECOM, in early March during which they outlined their proposal and timelines. Their timeline is for a permit to be in place to allow for construction to start in July 2016. At that meeting and again at a subsequent meeting in early April, we indicated their timeline would be very difficult to meet, particularly if field study was required.

The SCRD has commenced consultation on their application with First Nations (Sechelt Nation and Squamish Nation) and stakeholder groups. Regional staff have recently received letters and calls from local stakeholders with whom the SCRD is consulting (Tetrahedron Advisory Committee, Sunshine Coast Conservation Association) and these groups are very concerned about the SCRD's proposal and the timeline. They are particularly concerned that the SCRD is relying on an impact assessment from 1999 (which was for the siphon proposal) and that the SCRD is not planning any additional assessments related to this new proposal.

BC Parks staff have completed a review of the SCRD's most recent application and the 1999 impact assessment to determine if there are gaps in the information that will require further study. This preliminary assessment reveals that there are limitations and gaps to the impact assessment that will require further assessment. SCRD will need this year to complete the assessment work and so will not likely have a permit in place for construction in 2016.

If the SCRD encounters drought conditions this summer they have a permit amendment in place which allows them to employ the siphon system. Region may extend the term of the siphon permit to give the SCRD full comfort they can use the siphon if needed while they undertake a full study and complete consultation on the trench option.

## **SUGGESTED RESPONSE:**

BC Parks staff have conducted a preliminary assessment of the SCRD's application and has determined that additional study is required. As well, the SCRD will need to complete consultation with First Nations and stakeholders. This means that the SCRD will not have a permit in place by July 2016. Given the construction window and schedule, it is unlikely they will have a permit in place to complete installation of the

pipe system in 2016. Region is willing to extend the terms of their current permit amendment to allow use of the siphon system in the interim until a decision on the piping proposal can be made.

**Attachments:**

**Contact:**

*Bob Austad, Executive  
Director  
BC Parks, Regional  
Operations Branch  
(250) 356-9241*

**Alternate Contact:**

*Jennie Aikman, Regional  
Director  
South Coast Region  
(604) 924-2227*

**Prepared by:**

| <b>Reviewed by</b> | <b>Initials</b> | <b>Date</b> |
|--------------------|-----------------|-------------|
| DM                 |                 |             |
| DMO                |                 |             |
| ADM                |                 |             |
| Dir./Mgr.          |                 |             |
| Author             |                 |             |

**From:** [Aikman, Jennie S ENV:EX](#)  
**To:** [Janette Loveys](#); [Dave Crosby](#); [Dalziel, Rod ENV:EX](#); [Hirner, Joanna ENV:EX](#); [Johnsrude, Allan N FLNR:EX](#); [Rosenboom, Remko FLNR:EX](#)  
**Cc:** [Anderson, Wade R ENV:EX](#)  
**Subject:** Canceled: SCRD Chapman Lake Proposal - Update Meeting  
**Importance:** High

---

Hi All,

As SCRD staff are not available tomorrow morning, I am cancelling this meeting and will reschedule to another day if required.

Jennie

Hi All,

As discussed, I am scheduling a teleconference call for Monday, January 16th for an update on the Chapman Lake proposal.

Time: 10:00 – 11:00

Teleconference info: 1-877-353-9184; Participant IDs: 17

Happy holidays all. Talk to you in the New Year.

Jennie

## FW: SCRD Follow Up - Electronic Copy

Thursday, October 12, 2017  
1:59 PM

|             |                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------|
| Subject     | <b>FW: SCRD Follow Up - Electronic Copy</b>                                                                   |
| From        | Aikman, Jennie S ENV:EX                                                                                       |
| To          | Hirner, Joanna ENV:EX; Dalziel, Rod ENV:EX                                                                    |
| Cc          | Anderson, Wade R ENV:EX                                                                                       |
| Sent        | Monday, January 30, 2017 12:17 PM                                                                             |
| Attachments | <br>2016-NOVE<br>MBER AEC... |

FYI

**From:** Janette Loveys [<mailto:Janette.Loveys@scrd.ca>]  
**Sent:** Monday, January 30, 2017 11:59 AM  
**To:** Aikman, Jennie S ENV:EX; Rosenboom, Remko FLNR:EX  
**Cc:** Johnsrude, Allan N FLNR:EX; Dave Crosby  
**Subject:** SCRD Follow Up - Electronic Copy

Good Morning:

As requested at our Friday, January 27 meeting, please note the attached electronic copy of the Chapman Lake Water Supply Expansion Project Environmental Assessment Report.

This report will be on the February 16, 2017 Infrastructure Services Committee agenda.

Thank you, Janette

Janette Loveys  
 Chief Administrative Officer  
**Sunshine Coast Regional District**  
 1975 Field Road Sechelt, BC V0N 3A1  
 Phone: 604-885-6811  
 Fax: 604-885-7909

Visit us: [www.scrd.ca](http://www.scrd.ca)  
 Follow us on Twitter at [sunshinecoastrd](#)  
 Like us on [Facebook](#)

**Sunshine Coast Regional District**

1975 Field Road  
Sechelt, British Columbia  
Canada V0N 3A1

P 604.885.6800  
F 604.885.7909  
Toll free 1.800.687.5753

info@scrd.ca  
www.scrd.ca



January 31, 2017

Jim Standen  
Assistant Deputy Minister  
Ministry of Environment  
PO Box 9339 Stn Prov Govt  
Victoria, BC V9W 9M1

Dear Jim Standen:

**Re: Chapman Lake Expansion Project on the Sunshine Coast**

I am writing to you to express my concerns with the Ministry's handling of the Chapman Lake Expansion Project on the Sunshine Coast.

Since at least 2015, BC Parks staff have been involved and provided guidance to the Sunshine Coast Regional District (SCRD) with respect to the regulatory permitting process. It would be an obvious conclusion in that Ministry staff ought to have known the BC Parks Act and how the legislation interacts with the decisions of local government. At no time did the Ministry state there was a legislative risk for the project not moving forward.

In fact, in the June 7, 2016 correspondence, the Ministry requested additional environmental assessment work completed in order to properly understand the impacts and mitigation of the project. On July 7, 2016 the Sunshine Coast Regional District Board approved an additional \$125,425 to conduct this work.

With the meeting of Friday, January 27, 2017, to which I still have not had anything in writing to confirm the Ministry's position, the SCRD is now required to re-evaluate options and strategies to address the communities concerns with water supply. This will create an unprecedented financial impact for the SCRD and local taxpayers.

Please note that I plan to report to February 16, 2017 Infrastructure Services Committee. The SCRD Board will provide direction to staff at that time. I look forward to working with the Province to address the concerns of the Sunshine Coast community.

Sincerely,

**SUNSHINE COAST REGIONAL DISTRICT**

  
Janette Loveys  
Chief Administrative Officer

CC: Jennie Aikman, Regional Director, BC Parks South Coast Region

/sh

**ELECTORAL AREAS:** A - Egmont, Pender Harbour B - Halfmoon Bay D - Roberts Creek E - Elphinstone F - West Howe Sound

**MUNICIPALITIES:** District of Sechelt / Sechelt Indian Government District / Town of Gibsons

# RE: Sunshine Coast Regional District Chapman Lake Water Supply Expansion

Friday, October 13, 2017  
2:12 PM

|         |                                                                                 |
|---------|---------------------------------------------------------------------------------|
| Subject | <b>RE: Sunshine Coast Regional District Chapman Lake Water Supply Expansion</b> |
| From    | Galand, Lise FLNR:EX                                                            |
| To      | Hirner, Joanna ENV:EX                                                           |
| Cc      | Dalziel, Rod ENV:EX                                                             |
| Sent    | Wednesday, February 8, 2017 10:04 AM                                            |

Hi Joanna,

Thanks for your email! I think we may have met a couple of times in passing outside the Surrey office while I was walking with Malissa, but I'm not entirely sure! Anyways, yes I am planning to review the latest EA for the Chapman Lake water supply expansion project and was planning to get to it relatively soon as we also want to determine if we need to request any further information from the SCRD.

We will focus on impacts downstream on Chapman Creek and outside of the park, and will also look to see if the short set of comments we sent SCRD in June 2016 have been addressed in the report.

I am aware that Duane visited the lake last year and provided comments on the fish population in the lake and I have discussed Chapman Lake with him as well so it would be great if you could keep me in the loop of any further discussions 😊

I agree that it would be great to compare notes and discuss any outstanding questions/comments, the only issue is the timeline. Unfortunately **s.22**  
**s.22** I can try to get some of the review completed as quickly as possible when I get back and I can let you know my progress on the review at that point and then we can go from there?

Thanks for contacting me and good luck with your review. It's nice to see that you're a REMmer too! 😊

Cheers,  
Lise

**Lise Galand | MRM | RPBio**  
Aquatic Ecologist  
Ministry of Forests, Lands and Natural Resource Operations  
South Coast Natural Resource Region  
604-586-5416  
Lise.Galand@gov.bc.ca

**From:** Hirner, Joanna ENV:EX  
**Sent:** Tuesday, February 7, 2017 4:47 PM  
**To:** Galand, Lise FLNR:EX  
**Cc:** Dalziel, Rod ENV:EX  
**Subject:** Sunshine Coast Regional District Chapman Lake Water Supply Expansion

Hi Lise,

I am getting in touch with you because I was told by Remko that you are leading review of the latest environmental assessment associated with the Sunshine Coast Regional District (SCRD)'s Chapman Lake water supply expansion project. I am a biologist with BC Parks and am also reviewing this document over the next few weeks. As you probably know well, Chapman Lake and the dam are in Tetrahedron Provincial Park and will require a park use permit before construction and operations, in addition to the required water license. Given that we will both be reviewing the report, I thought I should introduce myself and let you know my plans and timeline for review.

Although a park use permit decision is not happening in the near future, I've been asked to review this latest assessment relatively quickly, mainly to ensure that information we requested previously has been provided and in particular to determine if we need to request further information from the SCRD. My understanding from Remko is that you've been asked to review this assessment report in the near future for similar reasons.

I'll be focusing my review on potential impacts to Chapman Lake and other values in the park, including immediately downstream of the dam at the outlet of Chapman Lake and within the park. Otherwise, my understanding is that BC Parks will be deferring to Water Authorizations to lead review on impacts downstream on Chapman Creek and outside of the park.

The timeline I'm working with is to try and complete my review by February 24<sup>th</sup>. Remko suggested that you are working on a similar timeline.

I will likely be contacting biologists within the Fish and Aquatic Wildlife Resources group with some questions, in particular Duane Jesson and Mike Wilcox who have provided me with advice earlier on this project (Duane actually visited Chapman Lake with the SCRD's consultants this past summer). I'm not sure if you will be working with biologists from this group as well on this file. Please let me know if you would like me to keep you in the loop on any questions or discussions I have with them.

Hopefully all of the above matches what you might have already heard regarding the BC Parks process and coordination with the Water Authorizations process. If you have any questions or want to discuss any aspects of the assessment please don't hesitate to get in touch. When we have both completed our review it may make sense to compare notes and schedule a meeting or conference call to discuss.

I have cc'ed Rod Dalziel who is the BC Parks Area Supervisor for the Sunshine Coast including Tetrahedron Park. He's been away so I haven't had a chance to check in with him recently but I suspect he may be starting to review the latest assessment as well.

Thanks Lise!

Best regards,  
Joanna

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

# RE: 2016 Park Use Permit 102714 Annual Report

Friday, October 13, 2017

9:28 AM

|         |                                                      |
|---------|------------------------------------------------------|
| Subject | <b>RE: 2016 Park Use Permit 102714 Annual Report</b> |
| From    | Dalziel, Rod ENV:EX                                  |
| To      | 'Lynda Fyfe'                                         |
| Sent    | Wednesday, February 15, 2017 12:31 PM                |

Hello Lynda,

Thanks for the notice. Please keep me updated as if space is available I may wish to attend. How long would the trip take?

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

✉: [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



**From:** Lynda Fyfe [<mailto:Lynda.Fyfe@scrd.ca>]

**Sent:** Wednesday, February 15, 2017 11:23 AM

**To:** Dalziel, Rod ENV:EX

**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Hello Rod,

This is to let you know that the next snow survey in Tetrahedron Park is booked tentatively for Tuesday February 28 at 10 am with two SCRD staff.

Thanks,

Lynda

**Lynda Fyfe, Environmental Technician, RB Tech, RPP**

Infrastructure Services, Sunshine Coast Regional District

Phone: 604.885.6800 ext 6489

Fax: 604.885.7909

[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

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

**Sent:** Wednesday, January 11, 2017 2:29 PM

**To:** Lynda Fyfe <[Lynda.Fyfe@scrd.ca](mailto:Lynda.Fyfe@scrd.ca)>

**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Hello Lynda,

It is a pleasure to meet you over email and look forward to meeting you in person in the future as well. Thanks for the submission of the Annual Report. Thanks for keeping me posted on the proposed snow survey flight. Please keep me posted on a confirmed date because as you may be aware it is a requirement of the PUP and I may be interested in joining if space is available.

## SPECIAL PROVISIONS

### 6. Flight Access

(a) The use of a helicopter for access to the structures is acceptable. The Permittee shall notify BC Parks as early as feasibly possible prior to any flights into Tetrahedron Park so that BC Parks may utilize available space or service of the helicopter for park operation purposes.

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

✉: [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks

**From:** Lynda Fyfe [<mailto:Lynda.Fyfe@scrd.ca>]

**Sent:** Wednesday, January 11, 2017 11:05 AM

**To:** Dalziel, Rod ENV:EX

**Cc:** Shane Walkey

**Subject:** 2016 Park Use Permit 102714 Annual Report

Hi Rod,

My name is Lynda and I'm the new Environmental Technician at the Sunshine Coast Regional District, carrying on from Beth Brooks. I'm looking forward to meeting you – perhaps when we conduct snow survey in Tetrahedron Park. This is planned for the first week of February and I'll be able to pin it down closer to the date.

Please find the 2016 Park Use Permit Annual Report for Tetrahedron Park attached. Feel free to contact me with any questions or comments.

Sincerely,

Lynda

**Lynda Fyfe, Environmental Technician**

Infrastructure Services, Sunshine Coast Regional District

Phone: 604.885.6800 ext 6489

Fax: 604.885.7909

[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)



Reference: 307554

**FEB 16 2017**

Janette Loveys  
Chief Administrative Officer  
Sunshine Coast Regional District  
1975 Field Road  
Sechelt BC V0N 3A1

Dear Ms. Loveys:

Thank you for your letter of January 31, 2017, regarding the Chapman Lake expansion project on the Sunshine Coast.

In August 2015, the Sunshine Coast Regional District (SCRD) advanced to Level 4 water restrictions due to the extreme drought conditions and water shortages on the Sunshine Coast. The SCRD approached the Water Authorization Branch (Ministry of Forests, Lands and Natural Resource Operations) and BC Parks for emergency amendments to their water license and park use permit to expand their infrastructure in the park. The SCRD proposed to employ a siphoning system, to be installed on a float in Chapman Lake, to draw additional water from the lake. The SCRD also applied for a short-term authorization to remove an additional 1,000,000 m<sup>3</sup>, through a *Water Act* Section 8 approval, for the short-term use of water. BC Parks issued a park use permit amendment to the SCRD in August 2015 for a temporary (one year) authorization to install the emergency siphon system. At the time, BC Parks assessed its authorities to make a decision to issue a park use permit, and was under the opinion that the rights being sought were not inconsistent with the rights granted under the original water licence and Crown land permit, which were grandfathered under Section 30 of the *Park Act*.

In April 2016, the SCRD made application to BC Parks for an amendment to the park use permit to construct a trench to install permanent piping in Chapman Lake to allow for an additional drawdown of the lake by 5 metres, to a total drawdown of 8 metres (their current permit allows for a drawdown of 3 metres). They also applied for a new water license under the *Water Sustainability Act* to allow for the removal of an additional 1,000,000 m<sup>3</sup> of water from the lake. As you point out, BC Parks reviewed the park use permit application at that time, and identified additional environmental assessment work required which the SCRD completed in August 2016.

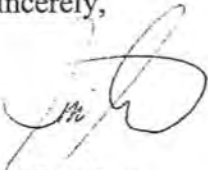
...2

- 2 -

Around this time, BC Parks received a letter from West Coast Environmental Law (WCEL) challenging the Province's legal authority to issue the park use permit authorization, arguing the decision would be inconsistent with the *Park Act*. Further legal review conducted subsequent to the receipt of that letter, and a WCEL letter sent to the Water Authorizations Branch, has identified a legal risk with issuance of the authorizations, as the rights for water under the *Water Sustainability Act* are considered new rights, and therefore not considered grandfathered under Section 30 of the *Park Act*. This would jeopardise any further authorizations that may be issued to the SCRD under the *Park Act* or *Water Sustainability Act*.

We understand the SCRD's critical need to secure a sustainable, long term water supply for the community, and we recognise the efforts the SCRD has made to date in this regard. We will continue to work with the SCRD to identify options for how to move forward to avoid future emergencies, and ensure a continued supply of water to the community.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jim Standen', with a stylized flourish at the end.

Jim Standen  
Assistant Deputy Minister  
BC Parks and Conservation Officer Service Division

## Balsom, Tami CSNR:EX

---

**Subject:** Canceled: SCRD's Chapman Lake Application - Next Steps  
**Location:** 1-877-353-9184; <sup>s.17</sup>  
**Start:** Thu 2017-03-02 1:30 PM  
**End:** Thu 2017-03-02 2:30 PM  
**Show Time As:** Free  
**Recurrence:** (none)  
**Meeting Status:** Accepted  
**Organizer:** Aikman, Jennie S ENV:EX  
**Required Attendees:** Janette Loveys; Morrison, Ken ENV:EX; Rosenboom, Remko FLNR:EX  
**Optional Attendees:** Standen, Jim ENV:EX

Hi All,

I have moved the meeting up to 1:30 to accommodate schedules. It looks like this time slot should work for all.

Jennie

---

Hi Janette,

We would like to meet with you to go over the next steps for the SCRD's Chapman Lake application and the boundary amendment process.

Please confirm your availability for this Thursday, March 2 from 3:00 – 4:00PM. The conference call-in details are provided above.

Thanks.

Jennie

**Jennie Aikman**  
 Regional Director  
 South Coast Region, BC Parks  
 Ministry of Environment  
 Office phone: (604) 924-2227  
 Cell phone: (778) 875-8494

**Balsom, Tami CSNR:EX**

---

**Subject:** SCRD Chapman Lake Proposal - Update and Next Steps  
**Location:** 1-877-353-9184 s.17

**Start:** Thu 2017-03-02 10:00 AM  
**End:** Thu 2017-03-02 10:30 AM

**Recurrence:** (none)

**Meeting Status:** Accepted

**Organizer:** Aikman, Jennie S ENV:EX  
**Required Attendees:** Rosenboom, Remko FLNR:EX; Dalziel, Rod ENV:EX; Hirner, Joanna ENV:EX  
**Optional Attendees:** Anderson, Wade R ENV:EX; Morrison, Ken ENV:EX; Johnsrude, Allan N FLNR:EX

Hi All,

Please confirm your availability for a conference call this Thursday at 10AM to discuss the Sunshine Coast RD applications for Chapman Lake. Conference call details provided above.

I would like to give you an update on the BC Parks process and discuss timelines for the initial review to the updated permit application so I can advise Janette Loveys.

Remko, I did not have Lise's contact information so please forward this invite to her.

Thanks.  
Jennie

**Jennie Aikman**  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment  
Office phone: (604) 924-2227  
Cell phone: (778) 875-8494

**From:** [Aikman, Jennie S ENV:EX](#)  
**To:** [Rosenboom, Remko FLNR:EX](#); [Dalziel, Rod ENV:EX](#); [Hirner, Joanna ENV:EX](#)  
**Cc:** [Anderson, Wade R ENV:EX](#); [Morrison, Ken ENV:EX](#); [Johnsrude, Allan N FLNR:EX](#)  
**Subject:** SCRD Chapman Lake Proposal - Update and Next Steps

---

Hi All,

Please confirm your availability for a conference call this Thursday at 10AM to discuss the Sunshine Coast RD applications for Chapman Lake. Conference call details provided above.

I would like to give you an update on the BC Parks process and discuss timelines for the initial review to the updated permit application so I can advise Janette Loveys.

Remko, I did not have Lise's contact information so please forward this invite to her.

Thanks.  
Jennie

Jennie Aikman  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment  
Office phone: (604) 924-2227  
Cell phone: (778) 875-8494

**From:** [Aikman, Jennie S ENV:EX](#)  
**To:** [Janette Loveys](#); [Morrison, Ken ENV:EX](#); [Dalziel, Rod ENV:EX](#); [Rosenboom, Remko FLNR:EX](#)  
**Cc:** [Standen, Jim ENV:EX](#)  
**Subject:** SCRD's Chapman Lake Application - Next Steps

---

Hi Janette,

We would like to meet with you to go over the next steps for the SCRD's Chapman Lake application and the boundary amendment process.

Please confirm your availability for this Thursday, March 2 from 3:00 – 4:00PM. The conference call-in details are provided above.

Thanks.

Jennie

Jennie Aikman  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment  
Office phone: (604) 924-2227  
Cell phone: (778) 875-8494

# Re: Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment

Monday, October 16, 2017  
3:51 PM

|                |                                                                                   |
|----------------|-----------------------------------------------------------------------------------|
| <b>Subject</b> | <b>Re: Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment</b> |
| <b>From</b>    | Aikman, Jennie S ENV:EX                                                           |
| <b>To</b>      | Dalziel, Rod ENV:EX                                                               |
| <b>Sent</b>    | Tuesday, February 28, 2017 3:33 PM                                                |

Thanks for running this by me Rod. The request originally came in to me so I was aware, and so thank you for drafting the response. I made a few small tweaks - if you can add the date we received the updated application (i.e. the date of Janette's email to me when she provided the application) that will be information the reporter will likely be looking for. They may request timing for a decision but let's provide that if/when requested.

I will let Janette know we have received the request, and the nature of our response.

Thanks.

Jennie

Sent from my iPhone

On Feb 28, 2017, at 2:56 PM, Dalziel, Rod ENV:EX <[Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)> wrote:

Hello Jennie,

Thought I better just run this past you first.

-----  
Hello Launa,

There has **not** been a decision made on the Sunshine Coast Regional District PUP #102714 amendment application. BC Parks received an updated application from the Sunshine Coast Regional District on [DATE] and is in the process of reviewing the PUP #102714 amendment application to access additional water from Chapman Lake.

*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](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)

<image001.png>

**From:** Murai, Launa Y ENV:EX

**Sent:** Tuesday, February 28, 2017 1:32 PM

**To:** Dalziel, Rod ENV:EX

**Cc:** Karn, David GCPE:EX; Bell, Danielle L GCPE:EX

**Subject:** Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment

Rod, media request regarding SCRD's PUP amendment denial. If you would please provide response to the media request, we would appreciate it. Need this as soon as possible please.

Thanks.

L

Launa Murai

W) 250-387-3979 C) 250-208-5933

**From:** Karn, David GCPE:EX  
**Sent:** Tuesday, February 28, 2017 1:20 PM  
**To:** Murai, Launa Y ENV:EX  
**Cc:** Bell, Danielle L GCPE:EX  
**Subject:** Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment

Launa,

**Reporter**

Sean Eckford, Reporter  
Coast Reporter (Powell River)  
[sean@coastreporter.net](mailto:sean@coastreporter.net)  
604-885-4811 x 229 c: 604-740-4665  
**Deadline** Wednesday, March 1, 2017 11:00 AM

**Request**

trying to confirm whether the Sunshine Coast Regional District's application for an amendment to their Park Use Permit to construct a deeper channel to draw water from Chapman Lake in Tetrahedron Park has been denied.

It's my understanding the decision may have been made by your office late last month.

**Background**

**Recommendation**

# RE: Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment

Monday, October 16, 2017  
3:50 PM

|                |                                                                                   |
|----------------|-----------------------------------------------------------------------------------|
| <b>Subject</b> | <b>RE: Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment</b> |
| <b>From</b>    | Murai, Launa Y ENV:EX                                                             |
| <b>To</b>      | Dalziel, Rod ENV:EX                                                               |
| <b>Cc</b>      | Karn, David GCPE:EX; Bell, Danielle L GCPE:EX; Aikman, Jennie S ENV:EX            |
| <b>Sent</b>    | Tuesday, February 28, 2017 3:52 PM                                                |

Thanks!

Launa Murai  
W) 250-387-3979 C) 250-208-5933

**From:** Dalziel, Rod ENV:EX  
**Sent:** Tuesday, February 28, 2017 3:47 PM  
**To:** Murai, Launa Y ENV:EX  
**Cc:** Karn, David GCPE:EX; Bell, Danielle L GCPE:EX; Aikman, Jennie S ENV:EX  
**Subject:** Re: Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment

Hello Launa,

There has **not** been a decision made on the Sunshine Coast Regional District PUP # 102714 amendment application. BC Parks received an updated application from the Sunshine Coast Regional District on 30 Jan 17 and is in the process of reviewing the PUP #102714 amendment application to access additional water from Chapman Lake.

Regards,

Rod Dalziel  
 Sunshine Coast Area Supervisor  
 BC Parks

On Feb 28, 2017, at 1:32 PM, Murai, Launa Y ENV:EX <[Launa.Murai@gov.bc.ca](mailto:Launa.Murai@gov.bc.ca)> wrote:

Rod, media request regarding SCRD's PUP amendment denial. If you would please provide response to the media request, we would appreciate it. Need this as soon as possible please.

Thanks.  
 L

Launa Murai  
 W) 250-387-3979 C) 250-208-5933

**From:** Karn, David GCPE:EX  
**Sent:** Tuesday, February 28, 2017 1:20 PM  
**To:** Murai, Launa Y ENV:EX  
**Cc:** Bell, Danielle L GCPE:EX  
**Subject:** Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment

Launa,

**Reporter**

Sean Eckford, Reporter

Coast Reporter (Powell River)

[sean@coastreporter.net](mailto:sean@coastreporter.net)

604-885-4811 x 229 c: 604-740-4665

**Deadline** Wednesday, March 1, 2017 11:00 AM

**Request**

trying to confirm whether the Sunshine Coast Regional District's application for an amendment to their Park Use Permit to construct a deeper channel to draw water from Chapman Lake in Tetrahedron Park has been denied.

It's my understanding the decision may have been made by your office late last month.

**Background****Recommendation**

# Re: RD Approval Required: Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment

Friday, October 13, 2017  
1:06 PM

|                |                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------|
| <b>Subject</b> | <b>Re: RD Approval Required: Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment</b> |
| <b>From</b>    | Aikman, Jennie S ENV:EX                                                                                 |
| <b>To</b>      | Murai, Launa Y ENV:EX                                                                                   |
| <b>Cc</b>      | Karn, David GCPE:EX; Bell, Danielle L GCPE:EX; Dalziel, Rod ENV:EX                                      |
| <b>Sent</b>    | Tuesday, February 28, 2017 4:01 PM                                                                      |

Approved.

Sent from my iPhone

On Feb 28, 2017, at 3:55 PM, Murai, Launa Y ENV:EX <[Launa.Murai@gov.bc.ca](mailto:Launa.Murai@gov.bc.ca)> wrote:

Jennie, over to you for approval, please.

Thanks.

Launa Murai  
W) 250-387-3979 C) 250-208-5933

**From:** Dalziel, Rod ENV:EX  
**Sent:** Tuesday, February 28, 2017 3:47 PM  
**To:** Murai, Launa Y ENV:EX  
**Cc:** Karn, David GCPE:EX; Bell, Danielle L GCPE:EX; Aikman, Jennie S ENV:EX  
**Subject:** Re: Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment

Hello Launa,

There has **not** been a decision made on the Sunshine Coast Regional District PUP #102714 amendment application. BC Parks received an updated application from the Sunshine Coast Regional District on 30 Jan 17 and is in the process of reviewing the PUP #102714 amendment application to access additional water from Chapman Lake.

Regards,

Rod Dalziel  
Sunshine Coast Area Supervisor  
BC Parks

On Feb 28, 2017, at 1:32 PM, Murai, Launa Y ENV:EX <[Launa.Murai@gov.bc.ca](mailto:Launa.Murai@gov.bc.ca)> wrote:

Rod, media request regarding SCRD's PUP amendment denial. If you would please provide response to the media request, we would appreciate it. Need this as soon as possible please.

Thanks.  
L

Launa Murai  
W) 250-387-3979 C) 250-208-5933

**From:** Karn, David GCPE:EX  
**Sent:** Tuesday, February 28, 2017 1:20 PM  
**To:** Murai, Launa Y ENV:EX  
**Cc:** Bell, Danielle L GCPE:EX  
**Subject:** Media request - Coast Reporter - Sunshine Coast RD's PUP app amendment

Launa,

**Reporter**

Sean Eckford, Reporter  
Coast Reporter (Powell River)  
[sean@coastreporter.net](mailto:sean@coastreporter.net)  
604-885-4811 x 229 c: 604-740-4665  
**Deadline** Wednesday, March 1, 2017 11:00 AM

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It's my understanding the decision may have been made by your office late last month.

**Background**

**Recommendation**

## RE: Draft Letter to SCRD

Monday, October 16, 2017  
3:50 PM

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Subject     | <b>RE: Draft Letter to SCRD</b>                                                                                |
| From        | Dalziel, Rod ENV:EX                                                                                            |
| To          | Aikman, Jennie S ENV:EX                                                                                        |
| Sent        | Wednesday, March 1, 2017 10:04 AM                                                                              |
| Attachments | <br>Letter to<br>SCRD Conf... |

Jennie: please find draft letter attached.

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  
P: Desk (604) 885-6755 Mobile (604) 741-1967 Fax (604) 885-2445  
D: Rod.Dalziel@gov.bc.ca  
Visit the BC Parks website @ bcparks.ca

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

From: Aikman, Jennie S ENV:EX  
Sent: Wednesday, March 1, 2017 8:26 AM  
To: Dalziel, Rod ENV:EX  
Cc: Anderson, Wade R ENV:EX  
Subject: Draft Letter to SCRD

Hi Rod,

Can you please draft a letter under my name and for my review, to SCRD (attn Janette Lovey) confirming we have not made a decision on the park use permit, and are reviewing the updated application. We will also need to provide this to the Tetrahedron Advisory Committee to correct the record, as they have emailed the board indicating a decision has been made.

I will need this by end of day

Thanks.  
Jennie

Sent from my iPhone



March 1, 2017

File No: PUP #102714/Tetrahedron Park

**VIA EMAIL**

Janette Loveys  
Chief Administrative Officer  
Sunshine Coast Regional District  
1975 Field Road  
Sechelt, BC V0N 3A1

Dear Ms. Loveys:

**RE: Park Use Permit (PUP) #102714 amendment application**

I understand that you have recently received comment from the public stating that they believe there has been a decision to not approve the Sunshine Coast Regional District PUP #102714 amendment application to access additional water from Chapman Lake. I am writing to confirm with you that there has **not** been a decision made on the Sunshine Coast Regional District PUP #102714 amendment application. BC Parks received the updated application from the Sunshine Coast Regional District on 30 January 17 and is currently in the process of reviewing the PUP #102714 amendment application.

Sincerely,

Jennie Aikman  
Regional Director  
South Coast Region, BC Parks

**Comment [RD1]:** Jennie: Do you want to include this statement or leave it simply without?

**Comment [RD2]:** This was the date Jennie received the digital copy from Janette which is the date provided for the media request. Do we want the date of the hard copy instead?

Ministry of Environment  
BC Parks and Conservation Officer Service Division  
South Coast Region

Mailing Address:  
1610 Mount Seymour Road  
North Vancouver BC V7G 2R0

Telephone: (604) 924-2200  
Facsimile: (604) 924-2244  
<http://www.gov.bc.ca/>  
<http://www.gov.bc.ca/evr/>

## Re: SCRD's Chapman Lake Application - Next Steps

Friday, October 13, 2017

2:10 PM

|         |                                                         |
|---------|---------------------------------------------------------|
| Subject | <b>Re: SCRD's Chapman Lake Application - Next Steps</b> |
| From    | Aikman, Jennie S ENV:EX                                 |
| To      | Dalziel, Rod ENV:EX                                     |
| Sent    | Wednesday, March 1, 2017 6:56 AM                        |

Hi Rod,

There was a request to keep this meeting amongst managers only, so I will update you afterwards.

Jennie

Jennie Aikman  
Regional Director, South Coast Region  
BC Parks

**From:** Aikman, Jennie S ENV:EX  
**Sent:** March-01-17 6:43 AM  
**To:** Dalziel, Rod ENV:EX  
**Subject:** Canceled: SCRD's Chapman Lake Application - Next Steps  
**When:** March-02-17 1:30 PM-2:30 PM.  
**Where:** 1-877-353-9184;[s.17](#)

Hi All,

I have moved the meeting up to 1:30 to accommodate schedules. It looks like this time slot should work for all.

Jennie

---

Hi Janette,

We would like to meet with you to go over the next steps for the SCRD's Chapman Lake application and the boundary amendment process.

Please confirm your availability for this Thursday, March 2 from 3:00 – 4:00PM. The conference call-in details are provided above.

Thanks.

Jennie

**Jennie Aikman**  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment  
Office phone: (604) 924-2227  
Cell phone: (778) 875-8494

**From:** [Aikman, Jennie S ENV:EX](#)  
**To:** [Dalziel, Rod ENV:EX](#)  
**Subject:** Canceled: SCRD's Chapman Lake Application - Next Steps

---

Hi All,

I have moved the meeting up to 1:30 to accommodate schedules. It looks like this time slot should work for all.

Jennie

---

Hi Janette,

We would like to meet with you to go over the next steps for the SCRD's Chapman Lake application and the boundary amendment process.

Please confirm your availability for this Thursday, March 2 from 3:00 – 4:00PM. The conference call-in details are provided above.

Thanks.  
Jennie

Jennie Aikman  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment  
Office phone: (604) 924-2227  
Cell phone: (778) 875-8494

## FW: RE: Chapman Lake expansion project on the Sunshine Coast and its permitting process as it relates to the Park Act

Thursday, October 12, 2017  
2:34 PM

|             |                                                                                                                                                                                                                              |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subject     | <b>FW: RE: Chapman Lake expansion project on the Sunshine Coast and its permitting process as it relates to the Park Act</b>                                                                                                 |
| From        | Aikman, Jennie S ENV:EX                                                                                                                                                                                                      |
| To          | Dalziel, Rod ENV:EX                                                                                                                                                                                                          |
| Cc          | Anderson, Wade R ENV:EX                                                                                                                                                                                                      |
| Sent        | Friday, March 3, 2017 11:04 AM                                                                                                                                                                                               |
| Attachments | <br>307554 - Loveys - IN...<br><br>307554 - Loveys - FI... |

Hi Rod,

Attached is the incoming and response to Janette Loveys from February 16.

FYI – I have saved it in the “SCRD” file in your area. Can you move this whole folder over into the “Major Projects” file (Z: \1\_PPA Files\S Coast Region\Major Projects)? That will make it more readily available for all involved to access.

Thanks.

Jennie

**From:** Correspondence Unit ENV:EX

**Sent:** Friday, March 3, 2017 10:38 AM

**To:** Aikman, Jennie S ENV:EX

**Subject:** FW: RE: Chapman Lake expansion project on the Sunshine Coast and its permitting process as it relates to the Park Act

As requested ☺

Greg

**From:** Visco, Greg ENV:EX **On Behalf Of** ENVMail ENV:EX

**Sent:** Thursday, February 16, 2017 4:49 PM

**To:** 'info@scrd.ca'

**Subject:** RE: Chapman Lake expansion project on the Sunshine Coast and its permitting process as it relates to the Park Act

Please find the attached letter from Mr. Jim Standen, Assistant Deputy Minister for BC Parks with the Ministry of Environment, in response to the attached incoming letter from Ms. Janette Loveys, Chief Administrative Officer for the Sunshine Coast Regional District on the above noted subject.

Hard copy to follow by mail.

Thank you

**Sunshine Coast Regional District**

1975 Field Road  
Sechelt, British Columbia  
Canada V0N 3A1

P 604.885.6800  
F 604.885.7909  
Toll free 1.800.687.5753

info@scrd.ca  
www.scrd.ca



January 31, 2017

Jim Standen  
Assistant Deputy Minister  
Ministry of Environment  
PO Box 9339 Stn Prov Govt  
Victoria, BC V9W 9M1

Dear Jim Standen:

**Re: Chapman Lake Expansion Project on the Sunshine Coast**

I am writing to you to express my concerns with the Ministry's handling of the Chapman Lake Expansion Project on the Sunshine Coast.

Since at least 2015, BC Parks staff have been involved and provided guidance to the Sunshine Coast Regional District (SCRD) with respect to the regulatory permitting process. It would be an obvious conclusion in that Ministry staff ought to have known the BC Parks Act and how the legislation interacts with the decisions of local government. At no time did the Ministry state there was a legislative risk for the project not moving forward.

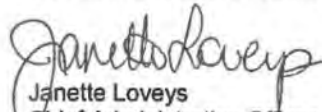
In fact, in the June 7, 2016 correspondence, the Ministry requested additional environmental assessment work completed in order to properly understand the impacts and mitigation of the project. On July 7, 2016 the Sunshine Coast Regional District Board approved an additional \$125,425 to conduct this work.

With the meeting of Friday, January 27, 2017, to which I still have not had anything in writing to confirm the Ministry's position, the SCRD is now required to re-evaluate options and strategies to address the communities concerns with water supply. This will create an unprecedented financial impact for the SCRD and local taxpayers.

Please note that I plan to report to February 16, 2017 Infrastructure Services Committee. The SCRD Board will provide direction to staff at that time. I look forward to working with the Province to address the concerns of the Sunshine Coast community.

Sincerely,

**SUNSHINE COAST REGIONAL DISTRICT**

  
Janette Loveys  
Chief Administrative Officer

CC: Jennie Aikman, Regional Director, BC Parks South Coast Region

/sh

**ELECTORAL AREAS:** A - Egmont, Pender Harbour B - Halfmoon Bay D - Roberts Creek E - Elphinstone F - West Howe Sound  
**MUNICIPALITIES:** District of Sechelt / Sechelt Indian Government District / Town of Gibsons



Reference: 307554

**FEB 16 2017**

Janette Loveys  
Chief Administrative Officer  
Sunshine Coast Regional District  
1975 Field Road  
Sechelt BC V0N 3A1

Dear Ms. Loveys:

Thank you for your letter of January 31, 2017, regarding the Chapman Lake expansion project on the Sunshine Coast.

In August 2015, the Sunshine Coast Regional District (SCRD) advanced to Level 4 water restrictions due to the extreme drought conditions and water shortages on the Sunshine Coast. The SCRD approached the Water Authorization Branch (Ministry of Forests, Lands and Natural Resource Operations) and BC Parks for emergency amendments to their water license and park use permit to expand their infrastructure in the park. The SCRD proposed to employ a siphoning system, to be installed on a float in Chapman Lake, to draw additional water from the lake. The SCRD also applied for a short-term authorization to remove an additional 1,000,000 m<sup>3</sup>, through a *Water Act* Section 8 approval, for the short-term use of water. BC Parks issued a park use permit amendment to the SCRD in August 2015 for a temporary (one year) authorization to install the emergency siphon system. At the time, BC Parks assessed its authorities to make a decision to issue a park use permit, and was under the opinion that the rights being sought were not inconsistent with the rights granted under the original water licence and Crown land permit, which were grandfathered under Section 30 of the *Park Act*.

In April 2016, the SCRD made application to BC Parks for an amendment to the park use permit to construct a trench to install permanent piping in Chapman Lake to allow for an additional drawdown of the lake by 5 metres, to a total drawdown of 8 metres (their current permit allows for a drawdown of 3 metres). They also applied for a new water license under the *Water Sustainability Act* to allow for the removal of an additional 1,000,000 m<sup>3</sup> of water from the lake. As you point out, BC Parks reviewed the park use permit application at that time, and identified additional environmental assessment work required which the SCRD completed in August 2016.

...2

---

**Ministry of Environment**

Office of the Assistant Deputy Minister  
BC Parks and Conservation Officer  
Service Division

Mailing Address:  
PO Box 9339  
Stn Prov Govt  
Victoria BC V8W 9M1

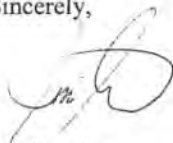
Telephone: 250 387-1288  
Facsimile: 250 387-5669  
Website: [www.gov.bc.ca/env](http://www.gov.bc.ca/env)

- 2 -

Around this time, BC Parks received a letter from West Coast Environmental Law (WCEL) challenging the Province's legal authority to issue the park use permit authorization, arguing the decision would be inconsistent with the *Park Act*. Further legal review conducted subsequent to the receipt of that letter, and a WCEL letter sent to the Water Authorizations Branch, has identified a legal risk with issuance of the authorizations, as the rights for water under the *Water Sustainability Act* are considered new rights, and therefore not considered grandfathered under Section 30 of the *Park Act*. This would jeopardise any further authorizations that may be issued to the SCRD under the *Park Act* or *Water Sustainability Act*.

We understand the SCRD's critical need to secure a sustainable, long term water supply for the community, and we recognise the efforts the SCRD has made to date in this regard. We will continue to work with the SCRD to identify options for how to move forward to avoid future emergencies, and ensure a continued supply of water to the community.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jim Standen', with a stylized flourish at the end.

Jim Standen  
Assistant Deputy Minister  
BC Parks and Conservation Officer Service Division

## FW: Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake

Thursday, October 12, 2017  
11:10 AM

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Subject     | <b>FW: Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake</b>                                   |
| From        | Aikman, Jennie S ENV:EX                                                                                        |
| To          | Dalziel, Rod ENV:EX                                                                                            |
| Cc          | Anderson, Wade R ENV:EX; Hirner, Joanna ENV:EX                                                                 |
| Sent        | Monday, March 6, 2017 10:57 AM                                                                                 |
| Attachments | <br>Ltr to G<br>Nohr - SCR... |

Hi Rod,

Please see the attached letter to the SCRD Board Chair, Garry Nohr, regarding the park use permit and need for boundary amendment or re-designation. Please do not distribute this letter further at this time.

Now that this information is with the Board, I would like to discuss with you how we are going to manage the messaging to the TAC and other stakeholders. I am around today, so please give me a call if you are available.

Jennie

**Jennie Aikman**  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment  
Office phone: (604) 924-2227  
Cell phone: (778) 875-8494

**From:** Aikman, Jennie S ENV:EX  
**Sent:** Monday, March 6, 2017 10:47 AM  
**To:** 'Garry.Nohr@scrd.ca'  
**Cc:** Janette Loveys; Standen, Jim ENV:EX; Morrison, Ken ENV:EX; Rosenboom, Remko FLNR:EX  
**Subject:** Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake

Dear Mr. Nohr,

Please see the attached letter regarding the Sunshine Coast Regional District's park use permit amendment application for Chapman Lake in Tetrahedron Park.

With regards,  
Jennie

**Jennie Aikman**  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment



March 6, 2017

File No: PUP #102714/Tetrahedron Park

**VIA EMAIL**

Garry Nohr, Chair  
Board of Directors  
Sunshine Coast Regional District  
1975 Field Road  
Sechelt, BC V0N 3A1

Dear Mr. Nohr:

**RE: Park Use Permit (PUP) #102714 Amendment Application**

On January 30, Janette Loveys, Chief Administration Officer, submitted an updated permit amendment application on behalf of the Sunshine Coast Regional District (SCRD) for the construction of a trenching system to allow additional draw-down of Chapman Lake for the purpose of maintaining the Sunshine Coast community water supply.

BC Parks staff are in the process of reviewing the permit application to ensure the information provided is complete and addresses BC Parks' June 8, 2016 comments submitted to the SCRD. We anticipate having a response to you regarding the completeness of the updated application by March 17, 2017.

As outlined in the February 16, 2017 letter from Jim Standen, Assistant Deputy Minister, to Ms. Loveys, BC Parks has conducted further legal review and identified a legal risk with issuance of a park use permit as the rights for water under the *Water Sustainability Act* are new rights and therefore not considered grandfathered under Section 30 (3) of the *Park Act* which allows for continuation of rights that pre-existed establishment of a park under Schedule D of the *Park Act*. As a result, BC Parks has determined we will need to pursue either a park boundary modification or a re-designation of the park area before a decision on the permit amendment application can be made.

The Tetrahedron Provincial Park Management Plan (1997) recognizes the role of the park in maintaining and enhancing the supply of water for the local community. The management plan indicates that "[w]here regional water supply improvements are proposed, an impact assessment and comprehensive public consultation process will be developed." The management plan also states that "[a] number of designation options will be prepared and a decision will be sought that will enable BC Parks to authorize the SCRD to enhance and manage the Chapman/Gray Creek watersheds within the park for future population needs. A public consultation process to review any options proposed by government that may affect the existing park status will be

implemented.” Consistent with the management plan, BC Parks will be reviewing options that will enable BC Parks to authorize the SCRD to maintain the community water supply. A park boundary amendment or using a different designation for the park area both require an Act of the Legislature. The process will also involve consultation with the public and First Nations, and BC Parks will work with the SCRD through this process.

We will continue to work with Ms. Loveys on the process, timelines, and to clarify roles and responsibilities as we move forward. We understand the Regional District’s critical need for an expedient resolution in order to secure a sustainable water supply for the community. In the case any potential water shortage emergencies may emerge in the interim, we will work with the SCRD to provide authorization for temporary measures such as deployment of the siphon system.

Sincerely,



Jennie Aikman  
Regional Director, South Coast Region

Cc: Janette Loveys, Chief Administration Officer, Sunshine Coast Regional District  
Jim Standen, Assistant Deputy Minister, BC Parks and Conservation Officer Service  
Ken Morrison, Manager, Planning and Land Administration Section, BC Parks  
Remko Rosenboom, Manager, Water Authorizations, Ministry of Forests, Lands and Natural Resource Operations

# RE: Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake

Monday, October 16, 2017  
3:49 PM

|         |                                                                       |
|---------|-----------------------------------------------------------------------|
| Subject | RE: Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake |
| From    | Dalziel, Rod ENV:EX                                                   |
| To      | Aikman, Jennie S ENV:EX                                               |
| Sent    | Tuesday, March 7, 2017 10:04 AM                                       |

Sorry I somehow missed seeing your email yesterday while I was in a meeting. Please give me a call when you are available today.

*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](mailto:Rod.Dalziel@gov.bc.ca)  
Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



**From:** Aikman, Jennie S ENV:EX  
**Sent:** Monday, March 6, 2017 10:58 AM  
**To:** Dalziel, Rod ENV:EX  
**Cc:** Anderson, Wade R ENV:EX; Hirner, Joanna ENV:EX  
**Subject:** FW: Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake

Hi Rod,

Please see the attached letter to the SCRD Board Chair, Garry Nohr, regarding the park use permit and need for boundary amendment or re-designation. Please do not distribute this letter further at this time.

Now that this information is with the Board, I would like to discuss with you how we are going to manage the messaging to the TAC and other stakeholders. I am around today, so please give me a call if you are available.

Jennie

**Jennie Aikman**  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment  
Office phone: (604) 924-2227  
Cell phone: (778) 875-8494

**From:** Aikman, Jennie S ENV:EX  
**Sent:** Monday, March 6, 2017 10:47 AM  
**To:** 'Garry.Nohr@scrd.ca'  
**Cc:** Janette Loveys; Standen, Jim ENV:EX; Morrison, Ken ENV:EX; Rosenboom, Remko FLNR:EX  
**Subject:** Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake

Dear Mr. Nohr,

Please see the attached letter regarding the Sunshine Coast Regional District's park use permit amendment application for Chapman Lake in Tetrahedron Park.

With regards,  
Jennie

**Jennie Aikman**  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment

## RE: 2016 Park Use Permit 102714 Annual Report

Friday, October 13, 2017

9:25 AM

|         |                                                      |
|---------|------------------------------------------------------|
| Subject | <b>RE: 2016 Park Use Permit 102714 Annual Report</b> |
| From    | Dalziel, Rod ENV:EX                                  |
| To      | 'Lynda Fyfe'                                         |
| Sent    | Tuesday, March 7, 2017 1:12 PM                       |

Hello Lynda,

Thanks for the notice. I have put it in my calendar and will let you know if I am available.

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

✉: [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks

**From:** Lynda Fyfe [<mailto:Lynda.Fyfe@scrd.ca>]

**Sent:** Tuesday, March 7, 2017 11:27 AM

**To:** Dalziel, Rod ENV:EX

**Subject:** FW: 2016 Park Use Permit 102714 Annual Report

Hi Rod,

I've booked the April snow survey for April 5<sup>th</sup> at 10am. There is room for you if you are available.

The last survey took 3 hours including travel.

Cheers,

Lynda

**Lynda Fyfe, RB Tech, RPP**

**Environmental Technician**

Infrastructure Services, Sunshine Coast Regional District

Phone: 604.885.6800 ext 6489

Fax: 604.885.7909

[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

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

**Sent:** Wednesday, February 15, 2017 12:32 PM

**To:** Lynda Fyfe <[Lynda.Fyfe@scrd.ca](mailto:Lynda.Fyfe@scrd.ca)>

**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Hello Lynda,

Thanks for the notice. Please keep me updated as if space is available I may wish to attend. How long would the trip take?

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  
 ✉: [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)  
 Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



**From:** Lynda Fyfe [<mailto:Lynda.Fyfe@scrd.ca>]  
**Sent:** Wednesday, February 15, 2017 11:23 AM  
**To:** Dalziel, Rod ENV:EX  
**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Hello Rod,  
 This is to let you know that the next snow survey in Tetrahedron Park is booked tentatively for Tuesday February 28 at 10 am with two SCRD staff.

Thanks,  
 Lynda

**Lynda Fyfe, Environmental Technician, RB Tech, RPP**  
*Infrastructure Services, Sunshine Coast Regional District*  
 Phone: 604.885.6800 ext 6489  
 Fax: 604.885.7909  
[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

**From:** Dalziel, Rod ENV:EX [<mailto:Rod.Dalziel@gov.bc.ca>]  
**Sent:** Wednesday, January 11, 2017 2:29 PM  
**To:** Lynda Fyfe <[Lynda.Fyfe@scrd.ca](mailto:Lynda.Fyfe@scrd.ca)>  
**Subject:** RE: 2016 Park Use Permit 102714 Annual Report

Hello Lynda,

It is a pleasure to meet you over email and look forward to meeting you in person in the future as well. Thanks for the submission of the Annual Report. Thanks for keeping me posted on the proposed snow survey flight. Please keep me posted on a confirmed date because as you may be aware it is a requirement of the PUP and I may be interested in joining if space is available.

#### **SPECIAL PROVISIONS**

##### **6. Flight Access**

(a) The use of a helicopter for access to the structures is acceptable. The Permittee shall notify BC Parks as early as feasibly possible prior to any flights into Tetrahedron Park so that BC Parks may utilize available space or service of the helicopter for park operation purposes.

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  
 ✉: [Rod.Dalziel@gov.bc.ca](mailto:Rod.Dalziel@gov.bc.ca)  
 Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



**From:** Lynda Fyfe [<mailto:Lynda.Fyfe@scrd.ca>]  
**Sent:** Wednesday, January 11, 2017 11:05 AM  
**To:** Dalziel, Rod ENV:EX  
**Cc:** Shane Walkey  
**Subject:** 2016 Park Use Permit 102714 Annual Report

Hi Rod,

My name is Lynda and I'm the new Environmental Technician at the Sunshine Coast Regional District, carrying on from Beth Brooks. I'm looking forward to meeting you – perhaps when we conduct snow survey in Tetrahedron Park. This is planned for the first week of February and I'll be able to pin it down closer to the date.

Please find the 2016 Park Use Permit Annual Report for Tetrahedron Park attached. Feel free to contact me with any questions or comments.

Sincerely,  
Lynda

**Lynda Fyfe, Environmental Technician**  
*Infrastructure Services, Sunshine Coast Regional District*  
Phone: 604.885.6800 ext 6489  
Fax: 604.885.7909  
[lynda.fyfe@scrd.ca](mailto:lynda.fyfe@scrd.ca)

# FW: Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake

Thursday, October 12, 2017  
11:10 AM

|                |                                                                              |
|----------------|------------------------------------------------------------------------------|
| <b>Subject</b> | <b>FW: Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake</b> |
| <b>From</b>    | Aikman, Jennie S ENV:EX                                                      |
| <b>To</b>      | Dalziel, Rod ENV:EX                                                          |
| <b>Cc</b>      | Haberl, Vicki ENV:EX; Anderson, Wade R ENV:EX                                |
| <b>Sent</b>    | Thursday, March 9, 2017 3:05 PM                                              |

FYI

**From:** Janette Loveys [<mailto:Janette.Loveys@scrd.ca>]

**Sent:** Thursday, March 9, 2017 3:00 PM

**To:** Aikman, Jennie S ENV:EX

**Cc:** Standen, Jim ENV:EX; Morrison, Ken ENV:EX; Rosenboom, Remko FLNR:EX; Garry Nohr

**Subject:** RE: Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake

Good Afternoon Jennie,

Thank you for your correspondence.

Please note that it will be placed on the March 23 - SCRD Committee meeting agenda under Correspondence (to be received).

Thank you, Janette

Janette Loveys

Chief Administrative Officer

**Sunshine Coast Regional District**

1975 Field Road Sechelt, BC V0N 3A1

Phone: 604-885-6811

Fax: 604-885-7909

Visit us: [www.scrd.ca](http://www.scrd.ca)

Follow us on Twitter at [sunshinecoastrd](https://twitter.com/sunshinecoastrd)

Like us on [Facebook](https://www.facebook.com/sunshinecoastrd)

**From:** Aikman, Jennie S ENV:EX [<mailto:Jennie.Aikman@gov.bc.ca>]

**Sent:** Monday, March 06, 2017 10:47 AM

**To:** Garry Nohr <[Garry.Nohr@scrd.ca](mailto:Garry.Nohr@scrd.ca)>

**Cc:** Janette Loveys <[Janette.Loveys@scrd.ca](mailto:Janette.Loveys@scrd.ca)>; Standen, Jim ENV:EX <[Jim.Standen@gov.bc.ca](mailto:Jim.Standen@gov.bc.ca)>;

Morrison, Ken ENV:EX <[Ken.Morrison@gov.bc.ca](mailto:Ken.Morrison@gov.bc.ca)>; Rosenboom, Remko FLNR:EX

<[Remko.Rosenboom@gov.bc.ca](mailto:Remko.Rosenboom@gov.bc.ca)>

**Subject:** Park Use Permit (PUP) #102714 Amendment Application, Chapman Lake

Dear Mr. Nohr,

Please see the attached letter regarding the Sunshine Coast Regional District's park use permit amendment application for Chapman Lake in Tetrahedron Park.

With regards,  
Jennie

**Jennie Aikman**  
Regional Director  
South Coast Region, BC Parks  
Ministry of Environment

## MINISTRY OF ENVIRONMENT INFORMATION NOTE

January 17, 2017

File: 280-20

CLIFF/tracking #: 306778

**PREPARED FOR:** Jim Standen, Assistant Deputy Minister, BC Parks and Conservation Officer Service

**ISSUE:** Sunshine Coast Regional District's application for Park Use Permit and Water License to install infrastructure to withdraw water from Chapman Lake in Tetrahedron Park.

### **BACKGROUND:**

Gray and Chapman creeks, both of which have headwaters in Tetrahedron Park, are the principle sources of domestic drinking water to coastal communities within the Sunshine Coast Regional District (SCRD), including Sechelt. Water is drawn from a system of alpine lakes that are within the Class A provincial park, including Chapman Lake and Edwards Lake.

Tetrahedron Park was established in part to preserve the watershed and community water supply. The park management plan supported the continued use of the park's alpine lakes for this purpose. Consistent with the park management plan, the SCRD maintains infrastructure on Chapman Lake in Tetrahedron Park under a park use permit. They also have several water licenses under the *Water Act* which authorize limited storage on Chapman Lake and a volume of water withdrawal.

In August 2015, the Sunshine Coast Regional District (SCRD) advanced to Level 4 water restrictions due to the extreme drought conditions and water shortages on the Sunshine Coast. SCRD approached the Water Authorization Branch (FLNRO) and BC Parks for emergency amendments to their water license and park use permit to expand their infrastructure in the park. Specifically, SCRD proposed to employ a siphoning system, to be installed on a float in Chapman Lake, to draw additional water from the lake. They also applied for a short term authorization to remove an additional 1,000,000 m<sup>3</sup>, through a *Water Act* Section 8 approval for the short-term use of water.

In August 2015, BC Parks issued a park use permit amendment to the SCRD for a temporary (one year) authorization to install the emergency siphon system. The permit term mirrored the temporary water license issued to the SCRD under the *Water Act*, with an additional two weeks to allow time to remove the siphon infrastructure from the park. A few days after the permit was issued, rains recharged the lake to full pool and so the SCRD never proceeded with the install of the siphon system.

In April 2016, the SCRD made application to BC Parks for a park use permit amendment to construct a trench to install permanent piping in Chapman Lake to allow for an additional drawdown of the lake by 5 metres, to a total drawdown of 8 metres (their current permit allows for a drawdown of 3 metres). They also applied for a new water

license under the *Water Sustainability Act* to allow for the removal of an additional 1,000,000 m<sup>3</sup> of water from the lake.

#### **DISCUSSION:**

In August 2016, the SCRD completed additional field work for an environmental impact and environmental flow needs assessment. In October 2016, FLNRO amended the approval for the installation and use of the siphon with an additional one year term and included a requirement to release an additional amount of water towards the downstream section of Chapman Creek to protect the salmon runs in that reach.

The SCRD is preparing to submit updated park use permit and water license applications. As part of the tenuring process they have undertaken consultation with First Nations, local stakeholder groups, and the local community.

The SCRD is anticipating a permit decision by early April 2017 so that they may complete procurement of a contractor to complete construction of the trenching system in summer 2017. They have received a \$5.5M grant for the project from the Ministry of Community, Sport and Cultural Development (MCSCD).

s.13,s.14

#### **NEXT STEPS:**

s.13,s.16

**Contact:**

*Jennie Aikman, Regional  
Director  
BC Parks, South Coast Region  
(604)924-2227*

**Alternate Contact:****Prepared by:**

*Jennie Aikman, Regional Director  
BC Parks, South Coast Region  
(604)924-2227*

| <b>Reviewed by</b> | <b>Initials</b> | <b>Date</b> |
|--------------------|-----------------|-------------|
| DM                 |                 |             |
| DMO                |                 |             |
| ADM                |                 |             |
| Dir./Mgr.          |                 |             |
| Author             |                 |             |

# Fwd: Re: Chapman Lake Project/ BC Parks, permit refused?

Thursday, October 12, 2017  
3:24 PM

|         |                                                                 |
|---------|-----------------------------------------------------------------|
| Subject | <b>Fwd: Re: Chapman Lake Project/ BC Parks, permit refused?</b> |
| From    | <a href="#">vel anderson</a>                                    |
| To      | Dalziel, Rod ENV:EX                                             |
| Sent    | Wednesday, March 15, 2017 9:02 AM                               |

March 15, 2017

Rod Dalziel, Senior Park Ranger,  
Sunshine Coast

Good morning Rod,

These statement-

*"BC Parks explained this to the SCRD's CAO in a conference call on January 27, 2017"*

*"Yes, I was at the Tetrahedron Advisory Committee (TAC) meeting last Thursday evening at Chaster House. These meetings are chaired by Rod Dalziel of BC Parks. He informed us about the conference call on January 27 in which the SCRD was informed that they wouldn't be getting a Park Use Permit for the Chapman Lake project. The TAC meeting are not confidential or "in camera". I specifically asked if the information was confidential and got the answer back that the info is "public".*

*are from people who attended the meeting you chaired. When questioning our SCRD Chair on when was he informed and why secrecy around "no permit" for the Chapman expansion you can read his answer below.*

Please tell us what is happening here. I'm sure there is a reasonable explanation.,

s.22, but I can phone you, if you wish.....what number?

Vel Anderson, Director, Acting Chair

Elphinstone Electors' (Community) Association

\*\*\*\*\*

\*\*\*\*\*

s.22

Garry Nohr  
Sunshine Coast Regional District  
Chair and Director Area B  
Halfmoon Bay BC  
1-604-741-2427

----- Original message -----

From: vel anderson s.22  
Date: 07-03-2017 8:46 PM (GMT-08:00)  
To: Garry Nohr <Garry.Nohr@scrd.ca>  
Subject: Fwd: Chapman Lake Project/ BC Parks, permit refused

Good evening Garry,

As our Elphinstone Electors' (Community) Association meeting is on the evening of Wednesday, March 9th, I would appreciate a response to my questions below, so that the information would be available for that meeting.

Thanks,

Vel

----- Forwarded Message -----

Subject: Chapman Lake Project/ BC Parks, permit refused  
Date: Wed, 1 Mar 2017 05:21:07 -0800  
From: vel anderson s.22  
To: Garry Nohr <Garry.Nohr@scrd.ca><mailto:Garry.Nohr@scrd.ca>  
CC: s.22

s.22

Ian Winn <ian.winn@scrd.ca>

<mailto:ian.winn@scrd.ca> s.22

s.22 . Garrv Nohr <Garrv.Nohr@scrd.ca><mailto:Garry.Nohr@scrd.ca>,  
s.22 , Frank Mauro <frank.mauro@scrd.ca>  
<mailto:frank.mauro@scrd.ca>, Mayor Bruce Milne <milne@sechelt.ca><mailto:milne@sechelt.ca> s.22  
s.22 , Christopher August <Caugust@secheltnation.net>  
<mailto:Caugust@secheltnation.net>

March 1, 2017

Dear Chair Nohr,

Re: BC Parks refusal of permit for work on Chapman Lake Project.

At the February 23rd Tetrahedron Advisory Committee (TAC) meeting at Chaster House, chaired by Rod Dalziel of BC Parks, the attendees were informed about the conference call on January 27 in which the SCRD was informed that they would not be getting a Park Use Permit for the Chapman Lake project.

"BC Parks explained this to the SCRD's CAO in a conference call on January 27, 2017" , however SCRD Board had not been informed of this.

No secrecy on BC Parks part, as they stated that this was public information.

So, please explain, by whose authorization was this information kept from the SCRD Board?

When did you, as Chair of the SCRD, learn of this?

Was there a reason to keep this very contentious issue from the public?

Respectfully,

Vel Anderson, Director/Acting Chair

Elphinstone Electors' (Community) Association

## RE: Re: Chapman Lake Project/ BC Parks, permit refused?

Friday, October 13, 2017

1:05 PM

|         |                                                                |
|---------|----------------------------------------------------------------|
| Subject | <b>RE: Re: Chapman Lake Project/ BC Parks, permit refused?</b> |
| From    | Dalziel, Rod ENV:EX                                            |
| To      | 'vel anderson'                                                 |
| Sent    | Wednesday, March 15, 2017 10:30 AM                             |

Dear Vel Anderson,

Thanks for your interest in Tetrahedron Park and the proposed Chapman Lake project. Unfortunately you have received inaccurate information. There has been no decision made on the SCRD Park Use Permit (PUP) amendment application. It was made very clear at the Feb 23<sup>rd</sup> Tetrahedron Advisory Committee (TAC) meeting that BC Parks is still currently in the process of the reviewing the application and the recently received updated Environmental Assessment.

I hope this clarifies your questions.

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](mailto:Rod.Dalziel@gov.bc.ca)

Visit the BC Parks website @ [bcparks.ca](http://bcparks.ca)



BC Parks

**From:** vel anderson, s.22

**Sent:** Wednesday, March 15, 2017 9:03 AM

**To:** Dalziel, Rod ENV:EX

**Subject:** Fwd: Re: Chapman Lake Project/ BC Parks, permit refused?

March 15, 2017

Rod Dalziel, Senior Park Ranger,

Sunshine Coast

Good morning Rod,

These statement-

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s.22

*but I can phone you, if you wish.....what number?*

Vel Anderson, Director, Acting Chair

Elphinstone Electors' (Community) Association

\*\*\*\*\*  
\*\*\*\*\*

s.22

Garry Nohr  
Sunshine Coast Regional District  
Chair and Director Area B  
Halfmoon Bay BC  
1-604-741-2427

----- Original message -----

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Subject: Chapman Lake Project/ BC Parks, permit refused  
Date: Wed, 1 Mar 2017 05:21:07 -0800  
From: vel anderson s.22  
<mailto:s.22>  
To: Garry Nohr <Garry.Nohr@scrd.ca><mailto:Garry.Nohr@scrd.ca>  
CC: s.22  
s.22 Ian Winn  
<ian.winn@scrd.ca><mailto:ian.winn@scrd.ca>, s.22  
s.22 , Garry Nohr  
<Garry.Nohr@scrd.ca><mailto:Garry.Nohr@scrd.ca>, s.22  
s.22 Frank Mauro  
<frank.mauro@scrd.ca><mailto:frank.mauro@scrd.ca>, Mayor Bruce Milne  
<milne@sechelt.ca><mailto:milne@sechelt.ca>, s.22  
s.22 , Christopher August <Caugust@secheltnation.net>  
<mailto:Caugust@secheltnation.net>

March 1, 2017

Dear Chair Nohr,

Re: BC Parks refusal of permit for work on Chapman Lake Project.

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When did you, as Chair of the SCRD, learn of this?

Was there a reason to keep this very contentious issue from the public?

Respectfully,

Vel Anderson, Director/Acting Chair

Elphinstone Electors' (Community) Association

## 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  $0.3 \text{ m}^3/\text{s}$ , 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)<sup>1</sup> 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

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<sup>1</sup> <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.

## 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. **Introduction and analysis in Section 2.0 provide this.** 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. **Introduction does not provide this information. Assumed that this information is part of the CRWP but not sure without reviewing the CRWP. The Chapman Lake Water Supply Expansion Project FAQ's available on SCRD website provides this information plus additional rationale.**
- 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? Still not provided. Assumed these are described to some extent in CRWP but don't know without reviewing the CRWP. FAQs do not address this except tangentially in a question that refers to "the Engineered Lake long term solution". This is still an important question: need assurance that other supply and demand options are being explored and developed, so that if frequency and severity of drawdown and impacts to Chapman Lake are greater than predicted (which seems plausible given uncertainty in predicting future conditions and needs), other options are available to reduce impacts to 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? Data only presented for 2014-2016 (2014 was when remote continuous monitoring was initiated). Section 2.2 presents hydrological data analysis based on water gauge data in the Chapman Creek watershed 1959-1988. These are used to make some calculations around availability of water and drawdown requirements under the lowest flow conditions observed in this 29 year data set.
- 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? Section 3.3 provides this information. See also for what is restricted under different stages: <http://www.scrd.ca/Sprinkling-Regulations>. 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? Data on past timing and frequency of Stage 4 was not provided, other than in Section 2.0 reference to the situation in 2015 where they did go to stage 4.
- 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). Addressed in Section 2.0.
- 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? Not answered, but my understanding is that this is how you would interpret this. See <https://water.usgs.gov/edu/100yearflood.html>
- 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? Not exactly answered but Section 2.4 and Appendix A address predictions about climate change and how it will influence snowpack and rainfall. Confirmed that snowpack will be smaller, and summers longer and drier extending into September. More rain predicted to fall in spring. So not sure if drawdown will occur earlier (possibly not due to high spring rains?) but appears will extend further into the fall which may have implications for Dolly Varden spawning timing.

- 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? Not answered, less reliance on Staats (2014) data in this version. Data from other studies primarily used (Metro Vancouver study as referenced in Appendix A, Opus Dayton Knight 2013).
- 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? Not answered.

- 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? Section 2 includes information on hydrology of the Chapman Creek and Chapman Lake watersheds, but primarily based on historical data that was available in 1999. So this question not answered. Generally reference is made to how Chapman Lake responds quickly to rainfall based on the fact that it refilled in 4.5 days in fall 2015. But that appears to be the extent of the discussion of recharge rates.
- 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. Still to come, committed to as part of the construction Environmental Management Plan committed to in section 7.0 of EA document.
- 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. Still to come, committed to as part of the construction Environmental Management Plan committed to in section 7.0 of EA document.
- 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. P. 15 states seismic survey was completed last summer. My question was not answered directly but no concerns raised regarding the results of seismic survey so will assume all is clear.
- 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. Still to come, committed to as part of the construction Environmental Management Plan committed to in section 7.0 of EA document.
- 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. Still to come, committed to as part of the construction Environmental Management Plan committed to in section 7.0 of EA document.
- 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. Still to come, committed to as part of the construction Environmental Management Plan committed to in section 7.0 of EA document.
- 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? Still haven't answered this question; latest version of drawing places bottom of intake pipe at 8.9 m below high water.
- 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. Done
- 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  $0.3 \text{ m}^3/\text{s}$ , 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. They addressed although we still have questions and they haven't really addressed the implications of pulsed releases on drawdown regimes.

**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)<sup>1</sup> 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

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<sup>1</sup> <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. OK; need to consider tailed frogs in CEMP mitigation related to dam and plunge pool etc. work immediately downstream of the dam (i.e. isolation and fish salvage).
- 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.

## Chapman Lake SCRD Environmental Assessment (November 2016 version)

1. p. 1 "In 2015 much of BC including the Sunshine Coast experienced a series of record conditions (low snow pack, low rainfall and high temperatures) resulting in a severe shortage of water in Chapman Creek with Chapman Lake coming within a few days of running out of accessible water."
2. p. vii, 10: There is reference to additional sources of drinking water being developed. What are these and when are they planned to be developed and operational?
3. P. 15 Section 3.2 Construction:
4. Work the schedule for construction to minimize the amount of time and degree (depth) of drawdown.
5. Fish south creek: check my notes
6. Check my requested additional information list
7. P. 37 surface water temp will be higher with lower water? How high is too high?
8. Section 5.0: The details of sampling methods, sampling locations, and data collected during the 2016 field assessment will be required to allow for comparison with future field assessments and data (e.g. monitoring environmental change). Most of this information appears to be presented in the Environmental Assessment Report and its appendices, but one dataset that cannot be provided as part of the report are the digital versions of spatial data files for sampling locations, occurrence records, Terrestrial Ecosystem Mapping (TEM), etc. Please confirm that the SCRD has been or will be provided with digital spatial data (including TEM polygons) and any other raw data or sampling information that will be required for future monitoring. BC Parks requests a copy this data, especially spatial data files.
9. Methylmercury
10. P. 5.3.1.4 Mercury in fish tissue: in four of the five fish sampled, total mercury in fish tissue was above the CCME and BC Tissue Residue Guidelines to Protect Wildlife from Mercury Toxicity. The Environmental Assessment states "there was no evidence during the 2016 field study to indicate that the elevated levels of mercury in the Dolly Varden of Chapman Lake was anything but natural." We request more details explaining why AECOM came to this conclusion. The tissue sampling for mercury was added to the 2016 sampling regime to establish a baseline for comparison to fish sampled at a future date because of concern that increasing drawdown may lead to elevated levels of methylmercury in the food web. 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)<sup>1</sup> and references therein, particularly from section 2.6.3).

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<sup>1</sup> <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>

Is it possible that mercury levels in tissue may have resulted from methylmercury formation associated with the existing drawdown regime in Chapman Lake?

11. P.
12. Total mercury in the water column (which includes methylmercury) was below criteria, but mercury accumulates in the sediment and this is primarily where methylmercury formation occurs. Analysis of metals (including mercury) in sediment should be included in future monitoring, including sampling during the summer of construction to provide a baseline before operation of the water supply expansion project.
13. Post construction monitoring must include fish tissue sampling for methylmercury.
14. P. 54 Fish habitat in south eastern stream: fish habitat was rated low to moderate in this stream in part due to no fish captured in this stream. Note that on August 24<sup>th</sup> Joanna Hirner (Conservation Specialist, BC Parks) observed a small fish (assumed to be Dolly Varden) in a pool associated with this stream.
15. p. 55 Aquatic vegetation:
16. Whitehead (1999) conducted transect surveys to characterize aquatic vegetation. However, the 2016 study was primarily observational and generated a qualitative description of the aquatic vegetation community rather than a quantitative one. Observational, qualitative data is difficult to use for monitoring because only species presence/absence and qualitative observations can be compared over time, and more subtle changes will not be detected. Presumably changes in the distribution, abundance and species composition of aquatic vegetation may result from future changes in drawdown regime and environmental conditions. For this reason we recommend some kind of quantitative sampling of aquatic vegetation (transects and/or plots) be conducted during the field season of construction to allow for repeatable sampling of the same locations in the future, in order to detect future changes in aquatic vegetation.
17. p. 56 Chapman Creek (and Appendix G): The analysis of fish habitat and environmental flow needs presented in Section 5.3.6 and Appendix G suggests that the current operating procedure of providing a minimum of 0.2 m<sup>3</sup>/s during low flows is adequate for rearing salmonids, but not necessarily adequate for adult salmonids migrating upstream. The requirement to provide adequate flow for migrating adult salmonids in the future may increase future drawdown requirements and presents a source of uncertainty around predicting the future frequency and severity of drawdown of Chapman Lake. This is quite important because most of the conclusions regarding residual effects of operations on environmental components were based on the assumption that drawdown below -3 m would be relatively infrequent and of short duration. If increased drawdown is required in the future to provide adequate flows for fish, large drawdowns may be more frequent and longer lasting than predicted, leading to larger than expected residual effects on environmental components in and around Chapman Lake.
18. Section 5.4.5 (p. 60-61) TEM results: the red-listed Sitka sedge/peat-mosses Fen community was identified in some polygons that overlap the permit area and construction temporary use area as shown in Figure 6 (p. 14). Polygons including this community also occur adjacent to the construction area. Protecting this plant community from impacts is a priority and this must be reflected in the Environmental Management Plan still to be developed for construction as described in Section 7.0 and elsewhere in the Environmental Assessment Report. Monitoring for

changes in the Sitka sedge/peat mosses Fen community that may result from extended and deeper drawdown is also a priority for monitoring during the operation phase and we recommend adding this component to the list of components to be monitored during operations in Section 7.0 (p. 86).

19. Section 6.2 (p. 68) Valued components: Snow bramble and western toad are included as Valued Components for assessment even though they have not been detected in the Chapman Lake area, during field assessments or otherwise. It is not clear why snow bramble was included; our assumption is that it was included because it is blue listed and is associated with moist forests and glades in the montane zone. Are there other reasons it is considered particularly likely to occur in the Chapman Lake area? Similarly it is not entirely clear why western toad was included but we assume it was for similar reasons as snow bramble: western toad is blue listed and suitable habitat appears to exist. The analysis of residual effects on snow bramble as presented is not useful other than it will be targeted during rare plant surveys prior to construction. The analysis of residual effects on western toad is more useful because the analysis can be extrapolated to aquatic breeding amphibians generally, which are common in the wetlands surrounding Chapman Lake.
20. Section 6.3.1.1 (p. 68-69): The construction Environmental Management Plan (CEMP) will need the following additional details in order to protect soils and vegetation from impacts:
  - a. Detailed mapping of site layout.
  - b. Detailed description of protective measures that will limit impacts to vegetation and soil. E.g. platforms, boards or other surfaces laid down to prevent impacts; fencing or other methods to delineate the boundaries of the construction area and work camp, etc.
  - c. Fuel management and spill response plan.
  - d. Remediation and monitoring plan.
  - e. Sediment and erosion control plan.
  - f. Invasive plant prevention, monitoring and response plan.

We acknowledge that many of these plans are referred to as needing to be developed in Section 7.0 and elsewhere in the Environmental Assessment Report, but some (e.g. an Invasive Plant Plan) are not.

21. Section 6.3.1.2 Operations: In assessing the potential for residual effects on soil and vegetation during operations, AECOM considered exposure of shoreline and associated increased risk of erosion and sedimentation, and additional hydrological drawdown of wetlands during drought conditions. AECOM concluded that long term effects are not expected "given that these events are relatively infrequent and of short duration". However, as stated in other comments in this letter, there are reasons to be uncertain about the assumption that large drawdowns and associated impacts will be infrequent and short in duration.
22. Section 6.4.1 and 6.4.3 (p. 71-73): Same as comment 20 but with reference to wildlife: details of mitigation to protect wildlife during construction need to be further developed for the construction Environmental Management Plan. MERGE with Comment 20 under comments for Section 7.0.
23. Section 6.4.4.2 Residual Effects on Western Toad: Although no Western Toads have been detected in the Chapman Lake area, during field assessments or otherwise, analysis of residual

effects on western toad is still useful if the analysis is extrapolated to aquatic breeding amphibians generally, which are common and important in the wetlands surrounding Chapman Lake. The assessment of residual effects during operations suggests that potential residual effects on toads will be minimal even under increased drawdown because lowest water levels will occur late in summer once the majority of tadpoles have gone through metamorphosis. This will not be true for neotenic long-toed salamanders which have been observed in the Chapman Lake tributaries and may occur in adjacent wetlands, and note that Northern Pacific Treefrog tadpoles and Long-toed salamander larvae were still observed in wetlands at the east end of the lake in relatively large numbers during the late August 2016 field surveys. In addition, in our June 8, 2016 comments extended and deeper drawdown has never leave the aquatic environment indicates that Potential impacts on wetlands are uncertain and require monitoring (see above comment under 6.3.1.2); conclusion that tadpoles should be done breeding when lowest water conditions occur and thus amphibians should be able to cope with dry conditions is fair except for neotenic salamanders. However, if drying trends resulted in certain wetlands drying up year round in long term this would be a negative effect. QUESTIONABLE CONCLUSION, requires monitoring.

24. 6.4.4.3 Coastal tailed frogs: should have done surveys directly downstream of dam... to determine if/what mitigation will be required for this species during construction. These surveys should be done in preparation for development of the CEMP; if they are there isolation and salvage may be required, although may already be a part of the plan for fish and tailed frogs can piggy back on.
25. 6.5.1.1 Spill Prevention Plan and Water Management Plan still needs to be developed (includes water quality monitoring and environmental monitoring). Sedimentation downstream... referenced potential impacts on drinking water but not on fish or tailed frogs.
26. The
27. 6.5.1.2 Operation and 6.5.1.4 Proposed Monitoring and Follow up:
28. Turbidity and other water quality effects are unknown, requires monitoring. Any other water quality effects that would be expected in a small reservoir situation such as this? Temperature, dissolved oxygen (which could have impacts on fish)?
29. If methyl mercury is not a problem, why were the fish tissue samples so high??
30. Water quality monitoring program needs to be developed in more detail: when (time of year or lake depth trigger or both), what parameters, by who
31. Sediment slumping with increased drawdown... not clear why they conclude this is unlikely other than bathymetry is not steeply sloping. What did Whitehead (1999) conclude about this? Also look at bathymetry.
32. Residual effects assessments of Soils and Veg, Wildlife, Aquatic Resources all assume low frequency and duration of large drawdowns... but this is subject to climate change, demand changes, AND ENVIRONMENTAL FLOW REQUIREMENTS!
33. 6.5.2.1 Isolation and fish salvages downstream of dam? If so, also salvage tailed frog tadpoles frogs.
34. Stratification during construction drawdown and maintenance of suitable temperature and dissolved oxygen conditions: monitoring and management of speed of drawdown as mitigation? This could be an operational impact as well. Impacts of drawdown on stratification and

- temperature and DO profile should be closely monitored during construction to help understand potential impacts and design mitigation for operational period.
35. Dolly Varden monitoring and mitigation related to spawning during construction?
36. 6.5.1.2 and 6.5.2.2: There is additional detail about drawdown regime in the operation sections of Aquatic Resources and Fish and Fish Habitat that I don't remember seeing in earlier sections. Of particular concern is the reference to the potential for climate change and demand to lead to require drawdowns to -8 m in the late 2020s and 2030s. Even those impacts are 10 years out or more, they are still impacts of concern!!
37. 6.5.2.2
38. Stratification during construction drawdown and maintenance of suitable temperature and dissolved oxygen conditions: monitoring and management of speed of drawdown as mitigation? This could be an operational impact as well. Impacts of drawdown on stratification and temperature and DO profile should be closely monitored during construction to help understand potential impacts and design mitigation for operational period.
39. "there are also a number of smaller groundwater fed stream that outlet to the lake that appear to support some spawning and were observed to support rearing young of year fish in 2016" where are these?
40. One key rationale for why Dolly Varden will be resilient to impacts is that there are multiple age classes in the lake and if spawning is restricted in one year due to drought, there will be a cohort of spawners available to spawn the next year (which assumes that the problem won't occur two years in a row). But what if it does?? QUESTIONABLE ASSUMPTION, needs monitoring.
41. Is 2 m deep enough for the plunge pool? How do they know?
42. Fish screen conclusion: is it valid? Ask Lise/Duane/Mike Wilcox... Also ask Duane and Mike's opinions generally about section 6.5.2.
43. 6.5.2.4 Proposed monitoring and follow up must include:
44. A more detailed monitoring plan needs to be developed. Question: is the data collected in 2016 suitable for future comparative monitoring? For example, the reporting of aquatic vegetation is quite qualitative... how would this be used for future monitoring? The background data needs to be supplied, not just this summary report. The study to be conducted during the construction year must also be designed as part of a long-term monitoring plan.
45. Spawning timing and triggers in Chapman Lake: when and at what temperature.
46. Spawning locations
47. (the latter two have not been included under proposed monitoring...!)
48. 6.6.1 and 6.6.2: detailed plans for mitigating and monitoring potential impacts related to socio-cultural and archaeological resources will need to be developed for construction (EMP). Note some of the mitigation here related to helicopters and their noise applies to wildlife as well as people and should be incorporated into the CEMP.
49. Section 7 construction EMP:
50. Missing from details list:
51. Fuel and spill management
52. Invasive plant management
53. [Check above for more]

54. Given that the rock sample used for determining the potential for Acid Rock Drainage and Metal Leaching was weathered, the recommendations regarding further testing at bottom of p. 85 and top of p. 86 (Section 7.0) should be implemented.
55. Operational phase EMP:
56. "Monitoring of shoreline conditions": would this include vegetation changes?
57. Need to be done now: get all the background data associated with this report, in particular digital spatial data associated with sampling locations and results (e.g. TEM mapping, Dolly Varden occurrences, etc.).
58. Future:
59. Construction EMP, including additional baseline monitoring during the year of construction. Construction year baseline monitoring needs to be set up with future operational monitoring in mind!
60. Operations EMP, including monitoring plans for some key values.
61. QUESTION FOR JENNIE/ROD: WOULD THESE BECOME REQUIREMENTS OF THE PERMIT, OR DO WE NEED THEM BEFORE THE PERMIT?

I still need to do this week:

Check that my requests have all been addressed and identify any gaps and if any of those gaps need IMMEDIATE addressing

Need to be done now: get all the background data associated with this report, in particular digital spatial data associated with sampling locations and results (e.g. TEM mapping, Dolly Varden occurrences, etc.).

Come up with a generalized list of things we still need, and flag any that need to be addressed IMMEDIATELY. Share with Jennie and Rod and Lise.

Come up with list of questions for Duane and Mike W. and send their way.

To discuss with Lise:

**1) Not as far along as I would like. Go over where I am at and where I need to get to by end of week:**

Where I am at: I have read through the entire report and captured some draft comments and notes.

Where I need to get to by early next week:

Jennie has promised the SCRD a response "regarding the completeness of the application by March 17, 2017". She is away this week and wanted to review the response so I assume this is not happening, but assume that she will want to review and send ASAP next week. (QUESTION: what kind of timelines for response is Lise working under?) Given this here are my to-dos for this week:

1. Check that my requests in my June 8 letter have all been addressed.  
Identify any gaps and do any of those gaps need IMMEDIATE addressing
2. Based on my review and notes/comments, come up with a generalized list of outstanding information gaps and questions, and flag any that need to be addressed IMMEDIATELY.
3. Prepare some preliminary comments on the completeness of the review (more detailed comments may go to SCRD later). Share these comments with Jennie and Rod and Lise for review and editing.
4. Come up with list of questions for Duane and Mike W. and send their way.

(ASIDE: Parks process we are going through with this project?)

**2) Key comments so far and questions to discuss with Lise:**

- a) Their conclusions about residual effects of the project are heavily based on the assumption that drawdown below -3 m will be relatively infrequent. Factors that affect frequency include climate change, demand, development of other water source options and ENVIRONMENTAL FLOW REQUIREMENTS. I am interested in Lise's thoughts on the information provided on all three of these topics, but in particular the last one because it seems the most questionable and most likely to invalidate their assumption. (My thoughts on other three: analysis is still a bit confusing... what are their future plans for other water source developments, what exactly are the predictions under future climate change, etc.?)
- b) Related to last point, thoughts and comments on Dave Bates' studies and section 5.3.6 in the EA report?
- c) Methyl mercury tissue samples are higher than the tissue residue guidelines. However they are not concerned and conclude "There was no evidence during the 2016 field study to indicate that the elevated levels of mercury in the Dolly Varden of Chapman Lake was anything but natural." Need to clarify why they came to that conclusion.
- d) Confirmation from SCRD that additional CEMP and OEMP and monitoring plans as recommended in the report will be undertaken.

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Withheld pursuant to/removed as

s.13; s.16

| Reviewed by | Initials | Date |
|-------------|----------|------|
| DM          |          |      |
| DMO         |          |      |
| ADM         |          |      |
| Dir./Mgr.   |          |      |
| Author      |          |      |

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DRAFT

## RE: Sunshine Coast Regional District - Bdy. Amendment Tetrahedron Park

Thursday, October 12, 2017  
7:57 AM

|                |                                                                               |
|----------------|-------------------------------------------------------------------------------|
| <b>Subject</b> | <b>RE: Sunshine Coast Regional District - Bdy. Amendment Tetrahedron Park</b> |
| <b>From</b>    | Aikman, Jennie S ENV:EX                                                       |
| <b>To</b>      | Murai, Launa Y ENV:EX; Haberl, Vicki ENV:EX                                   |
| <b>Cc</b>      | Anderson, Wade R ENV:EX; Bell, Danielle L GCPE:EX                             |
| <b>Sent</b>    | Monday, March 20, 2017 3:30 PM                                                |

Hi Launa,

Vicki and I are divvying up efforts on the Chapman file, so while she is busy finalising the Decision Note, I have pulled together the following bullets:

- Chapman Lake in Tetrahedron Park, is the principle source of domestic drinking water to coastal communities within the Sunshine Coast Regional District (SCRD).
- The SCRD currently maintains dam infrastructure on Chapman Lake under a park use permit.
- The SCRD's rights to take water from the Tetrahedron Park pre-date the park's establishment in 1995.
- In April 2016, the SCRD made application to BC Parks for a park use permit amendment to construct a trench to install piping in Chapman Lake to allow for an additional drawdown of the lake (to a total drawdown of 8 metres; their current permit allows for a drawdown of 3 metres). The SCRD also applied for a water license under the *Water Sustainability Act* to allow for the removal of an additional 1,000,000 m<sup>3</sup> of water from the lake.
- The Tetrahedron Provincial Park Management Plan (1997) recognizes the role of the park in maintaining and enhancing the supply of water for the local community. The management plan indicates that "[w]here regional water supply improvements are proposed, an impact assessment and comprehensive public consultation process will be developed."
- In August 2016, the SCRD completed field work for an environmental impact and environmental flow needs assessment as part of their park use permit and water license applications.
- In January 2017, the SCRD submitted an updated park use permit amendment application. As part of their permit application process, the SCRD undertook consultation with First Nations, local stakeholder groups, and the local community.
- BC Parks has recently conducted further legal review and identified a legal risk with issuance of a park use permit as the rights for water under the *Water Sustainability Act* are new rights and therefore not considered grandfathered under Section 30 (3) of the *Park Act* which allows for continuation of rights that pre-existed establishment of a park under Schedule D of the *Park Act*.
- As a result, BC Parks has determined we will need to pursue either a park boundary modification or a re-designation of the park area before a decision on the permit amendment application can be made.
- The park management plan states that "[a] number of designation options will be prepared and a decision will be sought that will enable BC Parks to authorize the SCRD to enhance and manage the Chapman/Gray Creek watersheds within the park for future population needs. A public consultation process to review any options proposed by government that may affect the existing park status will be implemented."
- Consistent with the management plan, BC Parks will be reviewing options that will enable BC Parks to authorize the SCRD to maintain the community water supply. Any options proposed will require an Act of the Legislature.
- The process will also involve consultation with the public and First Nations, and BC Parks will work with the SCRD through this process.

**From:** Murai, Launa Y ENV:EX  
**Sent:** Monday, March 20, 2017 9:30 AM  
**To:** Haberl, Vicki ENV:EX  
**Cc:** Anderson, Wade R ENV:EX; Bell, Danielle L GCPE:EX; Aikman, Jennie S ENV:EX  
**Subject:** RE: Sunshine Coast Regional District - Bdy. Amendment Mount Elphinston

Vicki, is it possible for you to pull together 3 -4 bullets for messaging for GCPE in the event that we have media inquiry? It can be whatever you feel is most relevant and current. Need today, please.

Thanks.

Launa Murai  
W) 250-387-3979 C) 250-208-5933

**From:** Austad, Bob ENV:EX  
**Sent:** Tuesday, March 14, 2017 11:00 AM  
**To:** Anderson, Wade R ENV:EX; Aikman, Jennie S ENV:EX; Murai, Launa Y ENV:EX  
**Subject:** Sunshine Coast Regional District - Bdy. Amendment Mount Elphinston

Hi Wade:

RE; Mount Elphinston Water Project for SCRD

I know Jennie is not back until Monday, but in discussion with Jim Standen today, we should work with GCPE Danielle Bell through Launa Murai to get some clear messaging approved for our Minister, so she can respond to any public inquiry which can be expect to come forward once Jennie's response letter is tabled at the SCRD board on March 24<sup>th</sup>.

My advice is to work with Launa on pulling together some key messaging, which can go up the line for approval.

Let me know if you need any assistance, but I'm sure Launa can outline the process and approach.

*Robert C. Austad*  
Executive Director, Regional Operations Branch  
BC Ministry Environment  
BC Parks  
PO Box 9398 Stn. Prov. Govt.  
Victoria, B.C. V8W 9M9  
Telephone: (250) 356-9241  
Fax: (250) 387-5757  
Email: [Bob.Austad@gov.bc.ca](mailto:Bob.Austad@gov.bc.ca)  
BC Parks Website: [www.gov.bc.ca/bcparks](http://www.gov.bc.ca/bcparks)



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Withheld pursuant to/removed as

s.13; s.16

## Map of SCRD permit application for Decision Note

Friday, October 13, 2017  
9:21 AM

|             |                                                                                                                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Subject     | <b>Map of SCRD permit application for Decision Note</b>                                                                                                                                                                    |
| From        | Haberl, Vicki ENV:EX                                                                                                                                                                                                       |
| To          | Dalziel, Rod ENV:EX                                                                                                                                                                                                        |
| Sent        | Tuesday, March 21, 2017 1:59 PM                                                                                                                                                                                            |
| Attachments | <br>PUP<br>amendme...<br><br>Permit Area<br>overview ... |

Hi Rod. I'm looking for a map that I can append to the decision note about Chapman Lake.

I'm looking for a visual of where the lakes are located, and also an identification of any infrastructure inside the park boundaries as well as any future wants/needs/requirements related to the water supply. Would this need to come from the SCRD? Do we know if their current amendment application is a sort of 30-50 year casting forward vision of what their requirements would be? If we are going to recommend removing the permit area from the park and re-designating this smaller portion as protected area (as opposed to re-designating the entire park), we want to be sure to get it right with one amendment, not needing to do something similar again in the distant future. Does that make sense?

I found two maps in the files, but neither is quite right. There is this permit area overview, but it's not great. And there is a nicer style watershed map on PDF page 14 of the PUP amendment application document, but we would probably need to get the original map from SCRD. Do you think the SCRD would have anything else?

Sincerely,

*Vicki Haberl*

Vicki Haberl  
Planning Section Head  
BC Parks, South Coast Region  
Ministry of Environment  
P.O. Box 220, Brackendale BC V0N 1H0  
Phone: 604-808-3678, ext. 2227



Ministry of  
Environment

## Land Use / Occupancy Park Use Permit Application

Only applications that are considered by BC Parks to be compatible with the conservation and recreation objectives identified for the park(s), protected area(s), conservancy(ies) and recreation area(s) (collectively 'parks') involved in the proposal will be evaluated.

All applications must include completed application form, map, attachments (as indicated below) and non-refundable application fee (plus applicable taxes). Please make payment by VISA/MasterCard/American Express or by cheque, made payable to the Minister of Finance.

INFORMATION REGARDING APPLYING FOR A PARK USE PERMIT AVAILABLE AT:

<http://www.frontcounterbc.ca/index.html>

### Application Type:

- ☐ New
- ☐ Renewal (Authorization #) \_\_\_\_\_ Are you requesting changes to your authorization? ☐ Yes ☐ No
- ☒ Amendment (Authorization #) 102714

If you are requesting changes to your authorization, please clearly indicate the changes under **Part 2: List of Proposed Changes**.

Requested Period of Use (inclusive): From July 1, 2016 to January 31, 2024  
mm/dd/yy mm/dd/yy

### PART 1. NAME(S) AND MAILING ADDRESS

#### Applicant Name:

#### FULL LEGAL NAME (ENTITY):

Sunshine Coast Regional District

Contact Name(s): Bryan Shoji Age: 19 or over ☒ Yes ☐ No

☐ BC Incorporation # \_\_\_\_\_ ☐ BC Registration # \_\_\_\_\_ ☐ Society Act # \_\_\_\_\_

- ☐ Individual(s) ☐ Company ☐ Registered Society or Association
- ☐ Federal Government ☐ Provincial Government ☒ Municipal Government/Regional District
- ☐ First Nation/Indian Band ☐ University, College or Museum ☐ Private School or Public School (K-12)

#### Legal Mailing Address:

1975 Field Rd

City/Town: Sechelt

Province: BC Postal code: V0N 3A1

#### Contact Information:

Daytime Phone: 604-885-8810

Cell: \_\_\_\_\_

Fax: 604-885-7909

Email Address: bryan.shoji@scrd.ca

#### Billing Address (if different from legal mailing add.):

\_\_\_\_\_

City/Town: \_\_\_\_\_

Province: \_\_\_\_\_ Postal code: \_\_\_\_\_

#### Contact Information:

Daytime Phone: \_\_\_\_\_

Cell: \_\_\_\_\_

Fax: \_\_\_\_\_

Email Address: \_\_\_\_\_

Preferred method of contact: ☒ Phone ☐ Cell Phone ☐ Regular mail ☒ Email

|                                                                                                                                                                                       |                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Do you hold a Crown Land Tenure: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br><br>If yes, provide file number(s): <u>Water Licence for storage # C05724</u> | Have you previously held a Park Use Permit or Resource Use Permit: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br><br>If yes, provide file number(s): _____ |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## PART 2: PURPOSE, LOCATION, AREA

Name of Park(s): Tetrahedron Provincial Park

Requesting temporary use for construction including installation of a 210 m long, 1200 mm intake pipe and flow control structures and area for construction worker camp, see attached for details.

Purpose (Summary of Proposed Activity):  
Please select all that apply

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Aquaculture and mariculture<br><input type="checkbox"/> Alternative power project<br><input type="checkbox"/> Grazing<br><input type="checkbox"/> Meteorological or hydrological station<br><input type="checkbox"/> Seismic and gravity station<br><input type="checkbox"/> Navigation Aid<br><input type="checkbox"/> Trapping<br><input type="checkbox"/> Trapline cabin<br><input type="checkbox"/> Forestry Activities<br><input type="checkbox"/> Mining, sand and gravel quarry<br><input type="checkbox"/> Restoration/habitat enhancement project<br><input type="checkbox"/> Roads and Trails<br><input type="checkbox"/> Rights-of-way | <input type="checkbox"/> Privately owned structure<br><input type="checkbox"/> Cabin<br><input type="checkbox"/> Private moorage<br><input type="checkbox"/> Other: _____<br><input type="checkbox"/> Provincially owned structure<br><input type="checkbox"/> Communication sites<br><input type="checkbox"/> Hydro transmission/distribution lines<br><input type="checkbox"/> Pipelines (gas or oil)<br><input type="checkbox"/> Telephone Booths<br><input type="checkbox"/> Telephone lines<br><input type="checkbox"/> Water impoundment (dam or dyke)<br><input checked="" type="checkbox"/> Waterline/sewer |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Location of Proposed Activities:

- Is the activity proposed for any frontcountry\* areas? ☐ Yes ☒ No  
 \*\*\*"Frontcountry" means an area within one kilometre of either side of the centreline of a park road or a highway.
- Are the activities selected above the same for all parks listed on the application? ☒ Yes ☐ No  
 \*\*\*If 'No', please indicate which park(s) each activity is proposed for (if not enough space, please provide an attachment):

### List of Proposed Changes (Renewal and/or Amendment Application Types):

Installation of a gravity fed water withdrawal system to access additional water from Chapman Lake to provide water to the SCRD system during drought conditions (see Part 3 for details)