

From: [Hogan, Dan ENV:EX](#)
To: [Hays-Byl, Winn ENV:EX](#); [Chew, Luanne C ENV:EX](#)
Subject: RE: Meagher Creek - conclusions
Date: Thursday, September 27, 2012 10:39:05 AM

I have this to do (retrieve past correspondence) but haven't done it yet. Working on station classification now, as a higher priority. Will get to the Pemberton issue soon.

From: Hays-Byl, Winn ENV:EX
Sent: Thursday, September 27, 2012 10:35 AM
To: Hogan, Dan ENV:EX; Chew, Luanne C ENV:EX
Subject: Meagher Creek - conclusions

Hi there,

I had a brief chat with Fern about the Meagher Creek issue /dike concerns, and asked who would have access to the Minister referral letters (CLIFF notes). She thought there was something on file that essentially concluded our involvement in the issue in terms of hydrometric monitoring. However, she did recommend that we check with Neil Peters first before sending out any further correspondence to those involved, as he would be the best source of info on this particular issue and how it played out.

Luanne,

Can you please follow up with Neil to discuss the issue and where it currently sits, and perhaps ask if he has some correspondence he can share, that would be great.

Best Regards,

Winn

Winn Hays-Byl, MSc Int., RPF, RPBio

winn.haysbyl@gov.bc.ca

Knowledge Management Branch

Ministry of Environment

Tel: 250-387-9385

Cell: 250-588-8825

From: [Chew, Luanne C ENV:EX](#)
To: [Hogan, Dan ENV:EX](#)
Subject: RE: Lillooet River at Hurley
Date: Wednesday, October 31, 2012 2:27:00 PM

yes

From: Hogan, Dan ENV:EX
Sent: Wednesday, October 31, 2012 2:27 PM
To: Chew, Luanne C ENV:EX
Subject: RE: Lillooet River at Hurley
Was this the Pemberton flooding issue, and dealings with EP?

From: Chew, Luanne C ENV:EX
Sent: Wednesday, October 31, 2012 2:25 PM
To: Hogan, Dan ENV:EX
Subject: Lillooet River at Hurley

Hi,

I recall that I was supposed to follow up with Neil Peters about what happened with this proposed new station. Were you going to send me some info on it first?

Luanne

From: [Hogan, Dan ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#)
Subject: RE: Lillooet River at Hurley
Date: Wednesday, October 31, 2012 2:27:21 PM

Was this the Pemberton flooding issue, and dealings with EP?

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Sent: Wednesday, October 31, 2012 2:25 PM
To: Hogan, Dan ENV:EX
Subject: Lillooet River at Hurley

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Luanne

From: [Hogan, Dan ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#)
Subject: RE: Lillooet River at Hurley
Date: Wednesday, October 31, 2012 2:28:31 PM

OK, I'll start searching. Probably won't get back to you until tomorrow though.

From: Chew, Luanne C ENV:EX
Sent: Wednesday, October 31, 2012 2:28 PM
To: Hogan, Dan ENV:EX
Subject: RE: Lillooet River at Hurley
yes

From: Hogan, Dan ENV:EX
Sent: Wednesday, October 31, 2012 2:27 PM
To: Chew, Luanne C ENV:EX
Subject: RE: Lillooet River at Hurley
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Subject: Lillooet River at Hurley
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Luanne

From: [Chew, Luanne C ENV:EX](#)
To: [Peters, Neil J FLNR:EX](#)
Subject: Proposed hydrometric station - Lillooet River at Hurley FSR Bridge
Date: Wednesday, November 14, 2012 4:32:00 PM
Attachments: [FW Proposed Lillooet River Flood Warning System.msg](#)

Hi Neil,

Fern Schultz has asked that I follow up with you regarding the above proposed hydrometric station. I believe the proposal was initiated with Bill Kuhnke. This station was on the proposed s.13

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f

As a result, we are planning to inform WSC to remove this item from their construction list. If you are aware of any reason for it to remain, can you please let me know?

Thanks,

Luanne

Luanne Chew, P.Geo.
Hydrometric Specialist
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1
ph: 250-387-1817
fx: 250-356-5496

From: [Flint-Petersen, Lotte FLNR:EX](#)
To: [Chew, Luanne C ENV:EX](#)
Subject: FW: Water level gauges on Lillooet and Birkenhead rivers
Date: Wednesday, July 3, 2013 4:28:41 PM

Hi Luanne,

I am doing some sleuthing regarding 2 water level gauges:

- WSC Station 08MG008 Birkenhead River at Mount Currie (operational 1945 to 1971);
- Emergency warning system water level gauge on Lillooet River to provide warning for a slide event on Meager Creek (PVDD would like a gauge installed but hasn't funds for annual maintenance).

Do you have any information that you can share on either of these? I haven't called WSC yet.

Regards,

Lotte

Lotte Flint-Petersen M.Eng., MBA., P.Eng
Senior Flood Hazard Management Engineer
Ministry of Forests, Lands and Natural Resource Operations
Suite 200 - 10428 153rd Street
Surrey, BC
V3R 1E1
Phone: (604) 586-3721

Lotte.Flint-Petersen@gov.bc.ca
http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/safety_index.html
Water for BC Safe, Sustainable and Valued by all.



Please consider the environment before printing this email

From: Flint-Petersen, Lotte FLNR:EX
Sent: Wednesday, July 3, 2013 11:24 AM
To: 'MMannerstrom@nhcweb.com'
Subject: Water level gauges FW: Birkenhead River Risk Assessment and Mitigation Options
Hi Monica,

Further to my voice message on your cell this morning, when you have a chance I'd like to hear your point of view of two gauges:

WSC Station 08MG008 Birkenhead River at Mount Currie;

Emergency warning system water level gauge on Lillooet River to provide warning for a slide event on Meager Creek.

I am looking for information/opinion before approaching WSC and MOE on the possibility of adding these to the provincial network.

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V3R 1E1

From: [Chew, Luanne C ENV:EX](#)
To: [Flint-Petersen, Lotte FLNR:EX](#)
Subject: RE: Water level gauges on Lillooet and Birkenhead rivers
Date: Wednesday, July 3, 2013 4:50:00 PM
Attachments: [FW Proposed Lillooet River Flood Warning System.msg](#)

Hi Lotte,

I don't have any information on the Birkenhead station. The Federal-Provincial hydrometric partnership didn't start until 1975, so I'm guessing that station was a federal station that for whatever reason they decided to shut down. You would have to inquire to WSC to get the story, but since it was over 40 years ago, I'm not sure who might know the answer. For the latter, the proposed gauge on the Lillooet River was to be funded by EMBC, but they decided not to fund it (see attached). I think it was because the effectiveness of the station for that early warning system could not be guaranteed by WSC, and for that same reason the hydrometric program could not justify funding the annual operations and maintenance. I had sent an inquiry to Neil Peters last fall asking whether there was any reason to keep this proposal going, and he didn't respond, so it has been dropped.

Regards,
Luanne

From: Flint-Petersen, Lotte FLNR:EX
Sent: Wednesday, July 3, 2013 4:29 PM
To: Chew, Luanne C ENV:EX
Subject: FW: Water level gauges on Lillooet and Birkenhead rivers
Hi Luanne,

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Sent: Wednesday, July 3, 2013 11:24 AM
To: 'MMannerstrom@nhcweb.com'

From: [Flint-Petersen, Lotte FLNR:EX](#)
To: [Chew, Luanne C ENV:EX](#)
Subject: RE: Water level gauges on Lillooet and Birkenhead rivers
Date: Wednesday, July 3, 2013 5:04:59 PM

Hi Luanne,

Thank you for the information and for your promptness. Much Appreciated!

If you see or hear anything further please loop me in on correspondence.

I will update you on what I learn regarding the WSC Station 08MG008 Birkenhead River at Mount Currie (operational 1945 to 1971).

Regards,

Lotte

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From: Chew, Luanne C ENV:EX
Sent: Wednesday, July 3, 2013 4:50 PM
To: Flint-Petersen, Lotte FLNR:EX
Subject: RE: Water level gauges on Lillooet and Birkenhead rivers
Hi Lotte,

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From: [Flint-Petersen, Lotte FLNR:EX](#)
To: [Hutchinson, David \[PYR\]](#)
Cc: [Chew, Luanne C ENV:EX](#)
Subject: WSC Station 08MG008 Birkenhead River at Mount Currie (operational 1945 to 1971)
Date: Wednesday, July 3, 2013 5:21:21 PM

Hi David,

I am doing some "fact finding" on the WSC Station 08MG008 Birkenhead River at Mount Currie (operational 1945 to 1971) and seeking information why the gauge was decommissioned in 1971 and whether there are plans to reactivate it. I understand that there is a staff gauge there now.

By way of background:

The province recently assisted with funding and approval of the Emergency Works for the Birkenhead River Training Berm to reduce flooding pressure on private, FN property and Hwy 99. A recommendation that came out of the flood hazard assessment work was to reactivate the gauge.

Any information you may have is appreciated.

Thanks.

Regards,

Lotte

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From: [Flint-Petersen, Lotte FLNR:EX](#)
To: [Loski, Carol FLNR:EX](#); [Chew, Luanne C ENV:EX](#); [Morrison, Andrew TRAN:EX](#)
Subject: Lillooet River Early Warning System
Date: Monday, July 29, 2013 3:14:49 PM
Attachments: [Debris Slide Early Warning System.pdf](#)
[Lillooet River Water Level Monitoring Station Proposal.pdf](#)

Hi Carol, Luanne and Andrew,

I apologise for wading in on a subject that I am not directly involved in but I hope that you can update me on the status of this early warning system for detecting slide activity on the Meagre Creek complex affecting the Lillooet River and downstream residents. I think this early warning system is really important so I hope I can be of assistance in moving this project along.

Carol, is EMBC able to fund the installation?

Luanne, can the maintenance costs be paid for under the MOE partnership with WSC?

Luanne, would it be WSC who would operate the system?

Andrew, would it be the River Forecast Centre who would monitor the water level data and provide the warning alert to Village of Pemberton if there were a sudden drop in water levels?

I recently received the attached proposal (from KWL March 27, 2013) and Letter (to Shirley Bond, March 2012) from Greig Garland (who used to be with District of Squamish). I know that this work is a priority for Steve Flynn (PVDD) and all the stakeholders in Pemberton.

Please let me know how I can assist.

Thanks.

Regards,

Lotte

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FlowWorks Service Agreement



BY AND BETWEEN:

FlowWorks Inc. ("FlowWorks")	Address:	606 Maynard Ave. S, Suite #201 Seattle, WA 98104
Representative: Timothy Hicks	Telephone:	(206) 859-6999
Email: timothy@FlowWorks.com	Facsimile:	(206) 320-9939

AND:

	("Client") Address:	
Representative:	Telephone:	
Email:	Facsimile:	
File No.:		

Effective Date: XX XXX, 2012**End Date:** (enter if applicable)

TERMS OF AGREEMENT**Services**

FlowWorks will perform the services set out as shown in Appendix A to this Agreement. The scope of services may be changed from time to time by mutual written agreement of the parties.

Effective Date

The Services are to be performed from and after the date written above as the Effective Date of this Agreement.

End Date

The Services will be provided through the date written above as the End Date of this Agreement, or until cancelled in writing, with 30 days notice, if blank.

Compensation

Client will pay FlowWorks for Services provided in accordance with Appendix A of this Agreement. Both unit and hourly rates are subject to adjustment upon thirty (30) days notice.

Terms and Conditions

The terms and conditions of this Agreement are set out in this Agreement, the attached Terms and Conditions, and Appendix A.

By signing this Agreement, you acknowledge receipt of the Terms and Conditions, and Appendix A, and agree to their terms.

PLEASE NOTE THAT WE DO NOT PROVIDE WARRANTIES FOR THE FLOWWORKS SERVICE. THE AGREEMENT ALSO LIMITS OUR LIABILITY. THESE TERMS ARE IN SECTIONS 1 AND 7 OF THE ATTACHED TERMS AND CONDITIONS, AND WE ASK USER TO READ THEM CAREFULLY.

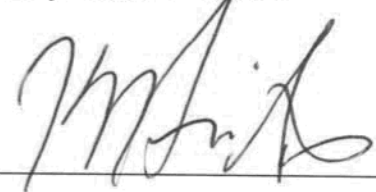
CLIENT:**FlowWorks Inc.**

Per: _____
(Name)

(Title)

x
(Signature)

Per: Timothy Hicks, President



(Signature)

FLOWWORKS TERMS AND CONDITIONS – SERVICE AGREEMENT USERS

1. Terms of Service. FlowWorks, Inc. (FlowWorks), a provider of proprietary data management tools (hereinafter referred to as FlowWorks Data Service or FlowWorks Service), hereby grants Users access to and use of the FlowWorks Service for the purchase prices specified in your Service Agreement. This Agreement shall be effective from the Effective Date set forth in the executed Service Agreement and shall remain in effect until terminated as set forth in this Agreement. **FlowWorks does not guarantee the accuracy or timeliness of information available from the FlowWorks Service.**

Please note that FlowWorks does not do engineering or flow analysis. FlowWorks provides data warehousing, data management, publishing and analysis tools, and alarming functions only.

2. Users. The FlowWorks Service, which includes all data, calculation functions, tools and other information available on the www.FlowWorks.com website is for the exclusive use and benefit of users and their designated personnel (collectively "Users"). Only Users may use their FlowWorks Service account. Users are responsible for all activity that takes place with their service account. Users may not authorize any third party to access and/or use the FlowWorks Service on their behalf except where Users and FlowWorks agree to providing a mechanism for third parties to access the service on Users behalf.

3. Protection of Data.

A. FlowWorks Security. While FlowWorks shall use commercially reasonable means to protect its servers from security breaches, it does not warrant that its site, its servers, and/or information received from FlowWorks are free of viruses or other harmful components, nor does it warrant that data on the FlowWorks site is safe from data theft and/or republishing by third parties.

B. Users Security Obligations/Back Up Data. An Interruption of FlowWorks Services, or termination or cancellation of the FlowWorks Service by Users or FlowWorks for any reason will result in a loss of data to Users. FlowWorks Services shall provide redundant server services to backup all data stored by User under this Agreement.

4. Interruptions. Users may from time to time experience interruptions of service or availability or a degradation of functionality of FlowWorks Services or some of its features, including, but not limited to, interruptions or degradation in data collection, due to Internet outages, equipment failures, power failures, or similar events beyond the control of FlowWorks ("Interruptions"). FlowWorks shall use commercially reasonable means to minimize and mitigate any loss of data during such Interruptions. FlowWorks shall accurately restore at no cost to User all data properly transmitted to FlowWorks 60 minutes or more prior to the Interruption and lost due to the Interruption .

Users agree to report any suspected Interruptions to FlowWorks Inc. within 24 hours and to provide a detailed description of the situation surrounding the detection of the Interruption. FlowWorks shall use commercially reasonable means to diagnose the Interruption and to correct it. FlowWorks is not responsible for retrieving or reentering any data not properly transmitted to FlowWorks 60 minutes or more prior to the Interruption and lost due to the Interruption.

"Properly transmitted" is hereby defined as adhering to a transfer protocol established and approved by FlowWorks in advance of the transmission.

5. Maintenance. FlowWorks may also be temporarily unavailable due to maintenance, repairs or upgrades ("Maintenance"). While FlowWorks will make commercially reasonable efforts to notify Users in advance of such Maintenance, it is not always possible to give notice of every Maintenance event. Monthly fees are not pro-rated due to Interruptions or Maintenance, unless FlowWorks is unavailable for more than 5% of any given month.

6. No Infringement. FlowWorks represents the product and services offered hereunder are owned or are the properly licensed property of FlowWorks. FlowWorks further represents the products, services and software furnished under this Agreement are free and clear of infringement in the U.S. of any patent or copyright covering the structure or composition of such articles.

In the event of a claim, suit or action against User alleging such infringement, FlowWorks shall indemnify and save User harmless from liability as finally determined by a court of competent jurisdiction, for such infringement.

7. LIABILITY LIMITATION. Users can recover from the FlowWorks parties only direct damages. Users cannot recover any other damages, including consequential, lost profits, special, indirect, incidental or punitive damages. This limitation applies to anything related to:

- the FlowWorks Service,

- viruses or other disabling features that affect Users access to or use of the FlowWorks Service,
- incompatibility between the FlowWorks Service and other services, software and hardware,
- delays or failures Users may have in initiating, conducting, or completing any transmissions or transactions in connection with the FlowWorks Service in an accurate or timely manner, and
- claims for breach of contract, breach of warranty, guarantee or condition, strict liability, negligence or other tort,

and

It also applies if:

- this remedy does not fully compensate Users for any losses, or fails of its essential purpose; or
- FlowWorks knew or should have known about the possibility of damages.

8. Indemnification. Each party shall indemnify and hold harmless the other party and their respective shareholders, directors, officers employees and agents (each an "Indemnified Party") from and against any and all third party suits or proceedings, claims, demands, causes of action, damages, expenses (including without limitation reasonable attorneys' fees and other legal expenses), liabilities and other losses resulting from or arising out of the wrongful acts or omissions of the offending party, or any person acting on Users behalf, in connection with Users use of the FlowWorks Service, including without limitation (i) a breach of any provision, representation or warranty of this contract, or (ii) the negligence or willful misconduct (whether by act or omission of either party or any person under the party's control or acting on the party's behalf. or (iii) any use of the FlowWorks Service by Users, or a third party within Users control or behalf, that is not in accord with this Agreement.

9. Ownership of Intellectual Property. Users acknowledge and agree that (a) the FlowWorks Data Service, and all intellectual property rights (such as copyrights, patents, and trade secrets) pertaining to the FlowWorks Data Service are owned exclusively by FlowWorks, and are protected under U.S. patent, copyright, trademark and trade secret laws of general applicability; and (b) all right, title and interest in and to the FlowWorks Data Service, together with all modifications, enhancements, and derivative works, and all intellectual property rights such as copyrights, patents and trade secrets, pertaining to the FlowWorks Data Service are and shall remain owned exclusively by FlowWorks.

10. Protection of Intellectual Property. Users agree to establish reasonable precautions and use commercially reasonable efforts, no less rigorous than those Users use to protect their own confidential information, to protect and maintain the confidentiality and security of the FlowWorks Data Service in Users control and to which Users have access. Without limiting the generality of the foregoing, Users shall use reasonable measures to protect the FlowWorks Data Service from unauthorized copying, dissemination, or disclosure and from other unauthorized use.

11. Assignment. Users may not assign or dispose of any rights or obligations under this contract, without FlowWorks prior written consent.

12. No Third Party Beneficiaries. This contract is solely for Users, its designated customer and FlowWorks benefit. It is not for the benefit of any other person, except for permitted successors and assigns under this contract.

13. Claims Must Be Filed Within One Year. Any claim related to this Agreement or the FlowWorks Service may not be brought unless brought within one year. The one-year period begins on the date when the claim first could be filed. If it is not filed in time, then that claim is permanently barred.

14. Severability. If any term or condition is determined by the court having jurisdiction to be overbroad or unenforceable, the smallest possible part of the Term or Condition shall be severed, with the remainder of these Terms and Conditions fully enforceable.

15. Modifications to These Terms and Conditions. We may change the Terms and Conditions related to use of the FlowWorks Service from time to time by updating this posting. Please visit the Terms and Conditions area each time you visit the FlowWorks website to keep up to date with the current terms and conditions regarding your use of the FlowWorks Service. Your continued use of the FlowWorks Service constitutes an affirmative: (1) acknowledgment by you of the Terms and Conditions and any modifications thereof, and (2) your agreement to abide by and be bound by the Terms and Conditions as modified.

16. No Modification of Agreement. Except as set forth in Section 15 above, this Agreement may not be modified or amended, except in writing signed by the parties to this Agreement.

17. Arbitration. All claims, disputes, and/or issues arising under, arising out of, or relating to the Agreement between FlowWorks and Users, without exception, will be settled by arbitration in Seattle, Washington, by a sole arbitrator, in accordance with the commercial arbitration rules of the American Arbitration Association ("AAA") then in effect, except that the arbitrator shall

deliver to the parties a reasoned award in writing, whether or not otherwise required or permitted by AAA rules. A judgment upon the award entered by the arbitrator may be entered in any court having jurisdiction thereof. The successful or prevailing party in any arbitration proceeding shall be entitled to an award which includes its reasonable attorneys' fees, costs and expenses. The arbitration shall be decided under and in accordance with the laws of the State of Washington, without reference to Washington State's choice of law principles.

18. Notices. All notices permitted or required under this Agreement shall be in writing and will be deemed given upon actual delivery. Any notice will be addressed to the party at the address set forth in the Service Agreement.

19. Entire Agreement. This Agreement consists of the Service Agreement, Terms and Conditions, and referenced Appendix A, which contain the entire agreement of the parties hereto concerning the subject matter hereof. All previous oral and/or written agreements concerning this subject matter are superseded hereby.

APPENDIX A: SCOPE OF SERVICES AND COSTS

PART A:

Set Up Charges

<u>Task</u>	<u>Unit Cost</u>	<u>Quantity</u>	<u>Total</u>
Set up (XX) data sites (1-time cost)	\$150.00 each	TBD	As required
Reconnect (XX) previously inactive (non-reporting) data sites in same location (1-time cost)	\$100.00 each	TBD	As required
Total Set Up Charges:			\$XX.00

Optional Items

<u>Task</u>	<u>Unit Cost</u>	<u>Quantity</u>	<u>Total</u>
Import historic data from (XX) data sites (assumes site data files in consistent format)	\$25.00 each	TBD	As required
Set up additional sites including SCADA sites (1-time cost)	\$150.00 each	TBD	As required
Set up (XX) historic (non-reporting) sites (1-time cost)	\$150.00 each	TBD	As required
Set up (XX) local USGS and NOAA sites and display on overlay (1-time cost)	\$150.00 each	TBD	As required
Custom Programming: adjustments to forms etc. (to be estimated prior to commencing work)	\$115.00 / hour	TBD	As required
Total Optional Items:			\$XX.00

Monthly Service Charges

<u>Task</u>	<u>Unit Cost</u>	<u>Quantity</u>	<u>Total</u>
Site monthly service fees (including SCADA sites)	\$25.00 / month	TBD	As required
Site monthly service fees for historic (inactive/non-reporting) sites		TBD	No charge
Site monthly service fees for local USGS and NOAA sites		TBD	No charge
Total Monthly Service Charges:			\$XX.00

PART B:

1. Set Up means the initial server configuration to allow a new or reactivated site to accept incoming data and be displayed by the FlowWorks data service (i.e. site name, location, channel names, file format, etc.). Set Up includes time for FlowWorks staff to be available via phone and email support to confirm with User's field staff that a site is successfully connecting to FlowWorks. Set Up also covers basic set up of calculations in the FlowWorks systems (basic flow parameters, etc. supplied by User) as required.
2. Custom Programming means additional programming beyond Set Up (defined in 1, above) intended to allow the User to use FlowWorks to meet specific needs. By adding business and application-specific reporting, analysis and display functions to the basic FlowWorks interface, FlowWorks developers can deliver the precise system required.
3. Data Sites include active sites and deactivated sites. An Active Site is a site set up on the FlowWorks data service and available to receive data from the FlowWorks Service. A site is deemed to be Active from the time it is set up until such time as the User notifies FlowWorks management in writing that the site is to be deactivated. A Deactivated Site, also known as an "Inactive", "Historic" or "Non-Reporting" site, is a site that has been disconnected from the FlowWorks Service.
4. FlowWorks Charges for Active Sites. The monthly service fee applies to all sites active for any part of a given month.
5. Deactivated Site Data is available to Users if:
 - a. Users have one or more active sites on FlowWorks and are current in payment of FlowWorks fees, or
 - b. Users do not have an active site but have contracted to pay FlowWorks an agreed upon monthly data maintenance charge.

In the event Users do not comply with either 5.a or 5.b, FlowWorks may, at its sole discretion, remove Users' login accounts, block access to Users' data and purge Users' data from the FlowWorks servers.
6. Data Back Up is provided by FlowWorks using both onsite and offsite systems, as part of Users monthly fees, but **FlowWorks does not provide warranties for the FlowWorks Service and it limits its liability for data loss (see Terms and Conditions, Sections 1 and 7). FlowWorks recommends that Users back up data from FlowWorks routinely to their own systems.** FlowWorks will consult with you on data back-up procedures during the Set Up phase of the FlowWorks Service.

From: [Chew, Luanne C ENV:EX](#)
To: [Hays-Byl, Winn ENV:EX](#)
Cc: [Hogan, Dan ENV:EX](#)
Subject: FW: Lillooet River Early Warning System
Date: Tuesday, August 6, 2013 1:59:00 PM
Attachments: [Debris Slide Early Warning System.pdf](#)
[RE Water level gauges on Lillooet and Birkenhead rivers.msg](#)

Winn,

Lotte is inquiring about the proposal for a hydrometric station on the upper Lillooet River to serve as a warning system for a large Meagre Creek landslide. The idea was proposed after the last big slide in 2010. From what I understand from Dan, EMBC was going to fund the station install, and I am assuming that Bill Kuhnke was willing to fund the annual operations and maintenance as a Provincial station.

Since that time, EMBC declined to fund the station construction, and after my inquiry from Neil Peters went unanswered, we dropped the station construction from the Proposed construction list last fall. Dan stated that the effectiveness of the station as an early warning system was not sufficiently proven, which is probably why EMBC withdrew their support. It appears the local community is again raising the issue, and Lotte is making inquiries.

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Luanne

From: Flint-Petersen, Lotte FLNR:EX
Sent: Monday, July 29, 2013 3:15 PM
To: Loski, Carol JAG:EX; Chew, Luanne C ENV:EX; Morrison, Andrew JAG:EX
Subject: Lillooet River Early Warning System

Hi Carol, Luanne and Andrew,

I apologise for wading in on a subject that I am not directly involved in but I hope that you can update me on the status of this early warning system for detecting slide activity on the Meagre Creek complex affecting the Lillooet River and downstream residents. I think this early warning system is really important so I hope I can be of assistance in moving this project along.

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Please let me know how I can assist.

Thanks.

Regards,

Lotte

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http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/safety_index.html

Water for BC Safe, Sustainable and Valued by all.



Please consider the environment before printing this email

From: [Chew, Luanne C ENV:EX](#)
To: [Flint-Petersen, Lotte FLNR:EX](#)
Subject: RE: Water level gauges on Lillooet and Birkenhead rivers
Date: Wednesday, July 3, 2013 4:50:00 PM
Attachments: [FW Proposed Lillooet River Flood Warning System.msg](#)

Hi Lotte,

I don't have any information on the Birkenhead station. The Federal-Provincial hydrometric partnership didn't start until 1975, so I'm guessing that station was a federal station that for whatever reason they decided to shut down. You would have to inquire to WSC to get the story, but since it was over 40 years ago, I'm not sure who might know the answer.

For the latter, the proposed gauge on the Lillooet River was to be funded by EMBC, but they decided not to fund it (see attached). I think it was because the effectiveness of the station for that early warning system could not be guaranteed by WSC, and for that same reason the hydrometric program could not justify funding the annual operations and maintenance. I had sent an inquiry to Neil Peters last fall asking whether there was any reason to keep this proposal going, and he didn't respond, so it has been dropped.

Regards,
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Sent: Wednesday, July 3, 2013 4:29 PM
To: Chew, Luanne C ENV:EX
Subject: FW: Water level gauges on Lillooet and Birkenhead rivers

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Do you have any information that you can share on either of these? I haven't called WSC yet.

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From: Flint-Petersen, Lotte FLNR:EX

Sent: Wednesday, July 3, 2013 11:24 AM

To: 'MMannerstrom@nhcweb.com'

Subject: Water level gauges FW: Birkenhead River Risk Assessment and Mitigation Options

Hi Monica,

Further to my voice message on your cell this morning, when you have a chance I'd like to hear your point of view of two gauges:

WSC Station 08MG008 Birkenhead River at Mount Currie;

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I am looking for information/opinion before approaching WSC and MOE on the possibility of adding these to the provincial network.

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Please consider the environment before printing this email

From: Ryan Wainwright [<mailto:RWainwright@slrd.bc.ca>]

Sent: Friday, June 21, 2013 11:41 AM

To: 'Bettina Falloon'; Morwood, Jesse TRAN:EX; Curt Walker (Curt.Walker@lilwat.ca);

'Lucinda.phillips@lilwat.ca' (lucinda.phillips@lilwat.ca); calvin.jameson@lilwat.ca; 'Steve Flynn'

(steve@pvdd.ca); Susie Gimse; Oakley, John JAG:EX; Lynda Flynn; Patricia Heintzman; Morrison,

Andrew JAG:EX; Veronica Woodruff (vwoodruff@ecofishresearch.com); Don Burns (Don.Burns@aandc-aadnc.gc.ca); Ewanyshyn, Ron JAG:EX; Flint-Petersen, Lotte FLNR:EX; Bristol, Mike FLNR:EX;

Rosenboom, Remko FLNR:EX; mrichman@pemberton.ca; trustees@pvdd.ca; tcraddock@pemberton.ca

From: [Hays-Byl, Winn ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#); [Hogan, Dan ENV:EX](#)
Subject: RE: Lillooet River Early Warning System
Date: Tuesday, August 6, 2013 2:41:05 PM

Hi Luanne,

Given our current budget, we're not in a position to fund the annual operations and maintenance for this new station. We need sufficient lead time to either secure third party funding OR to make adjustments within the network, and we need to coordinate this with our WSC partners.

That doesn't mean we shouldn't examine the request further. We absolutely need to examine what's changed since the original requests in 2011, and bring our info up to date. Therefore, I would like you to gather all the current facts on this request, including recommendations from Dan and WSC on the effectiveness of a station for an early warning system, before making any inquiries with EMB. The main reason is that I don't want to be raising anyone's expectations unnecessarily.

We need to determine the utility/effectiveness of the proposed station as an early warning system before endorsing it further, regardless of who is willing to pay for its' installation and operations. Find out from WSC on why they stopped operating the station.

I would also like some clarity, for example, on why Lotte is requesting this. What is FLNR's role in this? Neil Peters needs to be part of this discussion.

My expectation is that: If it is suitable and feasible, then the proponent (Lotte? EMBC? District of Pemberton?) would need to explore funding arrangements. If EMBC (or someone else) pays for the install, who will have the operating \$ and be responsible for ongoing costs/decommissioning?

If there are NO third party funding sources, Dan will need to examine the strategic stations within the network to determine if we (the Province) have any flexibility to accommodate this request, in light of increasing demands for monitoring in other (more northerly) parts of the province. We will need to wait for Dan's return to work in September, and sufficient time for him to do the analysis and consult with others regarding priorities/risk.

Once you have the full history, then we can discuss options further – with Dan and our WSC partners.

If the information indicates that it is unsuitable, we need to convey that message clearly to Lotte, Pemberton and EMBC.

If it is not suitable and they proceed with an install, we can advise on standards but we need to be clear about not being involved.

In terms of responding to Lotte, please let her know we'll verify the current information and will need at least 4-6 weeks to get back to her (given Dan's schedule).

We can discuss further if you want.

From: Chew, Luanne C ENV:EX
Sent: Tuesday, August 6, 2013 1:59 PM
To: Hays-Byl, Winn ENV:EX
Cc: Hogan, Dan ENV:EX

Subject: FW: Lillooet River Early Warning System

Winn,

Lotte is inquiring about the proposal for a hydrometric station on the upper Lillooet River to serve as a warning system for a large Meagre Creek landslide. The idea was proposed after the last big slide in 2010. From what I understand from Dan, EMBC was going to fund the station install, and I am assuming that Bill Kuhnke was willing to fund the annual operations and maintenance as a Provincial station.

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Luanne

From: Flint-Petersen, Lotte FLNR:EX

Sent: Monday, July 29, 2013 3:15 PM

To: Loski, Carol JAG:EX; Chew, Luanne C ENV:EX; Morrison, Andrew JAG:EX

Subject: Lillooet River Early Warning System

Hi Carol, Luanne and Andrew,

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Please let me know how I can assist.

Thanks.

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From: [Chew, Luanne C ENV:EX](#)
To: [Flint-Petersen, Lotte FLNR:EX](#)
Subject: FW: Water level gauges on Lillooet and Birkenhead rivers
Date: Wednesday, August 7, 2013 4:35:00 PM
Attachments: [FW Proposed Lillooet River Flood Warning System.msg](#)

Hi Lotte,

Here's the email response that I sent you in early July. The attached email provides the discourse between Steve Flynn, Dan Hogan and EMBC from late 2011 on this subject.

Regards,

Luanne

From: Chew, Luanne C ENV:EX
Sent: Wednesday, July 3, 2013 4:50 PM
To: Flint-Petersen, Lotte FLNR:EX
Subject: RE: Water level gauges on Lillooet and Birkenhead rivers

Hi Lotte,

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From: Flint-Petersen, Lotte FLNR:EX
Sent: Wednesday, July 3, 2013 4:29 PM
To: Chew, Luanne C ENV:EX
Subject: FW: Water level gauges on Lillooet and Birkenhead rivers

Hi Luanne,

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From: Flint-Petersen, Lotte FLNR:EX

Sent: Wednesday, July 3, 2013 11:24 AM

To: 'MMannerstrom@nhcweb.com'

Subject: Water level gauges FW: Birkenhead River Risk Assessment and Mitigation Options

Hi Monica,

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From: Ryan Wainwright [<mailto:RWainwright@slrd.bc.ca>]

Sent: Friday, June 21, 2013 11:41 AM

To: 'Bettina Falloon'; Morwood, Jesse TRAN:EX; Curt Walker (Curt.Walker@lilwat.ca);

'Lucinda.phillips@lilwat.ca' (lucinda.phillips@lilwat.ca); calvin.jameson@lilwat.ca; 'Steve Flynn'

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Andrew JAG:EX; Veronica Woodruff (vwoodruff@ecofishresearch.com); Don Burns (Don.Burns@aandc-aadnc.gc.ca); Ewanyshyn, Ron JAG:EX; Flint-Petersen, Lotte FLNR:EX; Bristol, Mike FLNR:EX;

Rosenboom, Remko FLNR:EX; mrichman@pemberton.ca; trustees@pvdd.ca; tcaddock@pemberton.ca

Subject: Birkenhead River Risk Assessment and Mitigation Options

Hi folks –

Please find attached the Risk Assessment and Mitigation Options report prepared by Northwest Hydraulic Consultants (NHC) for the Birkenhead River as part of the multi-agency project that was undertaken in April. As most of you are no doubt aware, the SLRD constructed an emergency dyke under task during freshet this year, along the Birkenhead at the rear of Continental Pole Yard. This project, in addition to the mitigation work completed in April under the guidance of this group, protected our community from severe impact during Birkenhead River flooding.

Please review the attached document. NHC is in the process of coming up with some dollar amounts associated with the mitigation measures in the report. When those are available, I will be recalling the group to meet and discuss next steps.

Thanks again for your participation in this important work!

Cheers - Ryan



Ryan Wainwright
Emergency Program Manager

rwainwright@slrd.bc.ca

P: 604-567-5663

F: 604-894-6526

C: 604-698-6442

1-800-298-7753

www.slrd.bc.ca

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From: [Chew, Luanne C ENV:EX](#)
To: [Hays-Byl, Winn ENV:EX](#); [Hogan, Dan ENV:EX](#)
Subject: RE: Lillooet River Early Warning System
Date: Friday, August 9, 2013 3:14:00 PM

Winn and Dan,

I spoke with Lotte yesterday and she provided more info on this topic. Sounds like the regional district is keen on the monitoring, but expect the Province to be responsible (cost and liability) for it. On her original email there was an attached proposal from KWL to install the monitoring, but the maintenance was to be done by the local government. Lotte clarified that the local government don't want to take on the liability.

I asked a few questions about whether there were any alternative warning/monitoring systems explored, and she wasn't aware of any. We also spoke about her comments that she hoped the River Forecast Centre would do the monitoring, but I clarified that when I was at the RFC, we were not in the landslide business. I don't expect the position to have changed, but she said she would look into it. If there's no one to do the monitoring, then that is an additional negative with this proposal.

I could ask WSC to provide an updated quote on the cost of the station install and monitoring, but it's still uncertain if EMBC will fund construction. When Dan returns from holidays, we can discuss further.

Luanne

From: Hays-Byl, Winn ENV:EX
Sent: Tuesday, August 6, 2013 2:41 PM
To: Chew, Luanne C ENV:EX; Hogan, Dan ENV:EX
Subject: RE: Lillooet River Early Warning System
Hi Luanne,

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That doesn't mean we shouldn't examine the request further. We absolutely need to examine what's changed since the original requests in 2011, and bring our info up to date. Therefore, I would like you to gather all the current facts on this request, including recommendations from Dan and WSC on the effectiveness of a station for an early warning system, before making any inquiries with EMB. The main reason is that I don't want to be raising anyone's expectations unnecessarily.

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We can discuss further if you want.

From: Chew, Luanne C ENV:EX

Sent: Tuesday, August 6, 2013 1:59 PM

To: Hays-Byl, Winn ENV:EX

Cc: Hogan, Dan ENV:EX

Subject: FW: Lillooet River Early Warning System

Winn,

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From: Flint-Petersen, Lotte FLNR:EX
Sent: Monday, July 29, 2013 3:15 PM
To: Loski, Carol JAG:EX; Chew, Luanne C ENV:EX; Morrison, Andrew JAG:EX
Subject: Lillooet River Early Warning System

Hi Carol, Luanne and Andrew,

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Please let me know how I can assist.

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From: [Hays-Byl, Winn ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#); [Hogan, Dan ENV:EX](#)
Subject: RE: Lillooet River Early Warning System
Date: Friday, August 9, 2013 4:19:14 PM

Luanne,

Thanks for the additional info. I'll look forward to discussing this further in September when Dan's back.

From: Chew, Luanne C ENV:EX
Sent: Friday, August 9, 2013 3:14 PM
To: Hays-Byl, Winn ENV:EX; Hogan, Dan ENV:EX
Subject: RE: Lillooet River Early Warning System
Winn and Dan,

I spoke with Lotte yesterday and she provided more info on this topic. Sounds like the regional district is keen on the monitoring, but expect the Province to be responsible (cost and liability) for it. On her original email there was an attached proposal from KWL to install the monitoring, but the maintenance was to be done by the local government. Lotte clarified that the local government don't want to take on the liability.

I asked a few questions about whether there were any alternative warning/monitoring systems explored, and she wasn't aware of any. We also spoke about her comments that she hoped the River Forecast Centre would do the monitoring, but I clarified that when I was at the RFC, we were not in the landslide business. I don't expect the position to have changed, but she said she would look into it. If there's no one to do the monitoring, then that is an additional negative with this proposal.

I could ask WSC to provide an updated quote on the cost of the station install and monitoring, but it's still uncertain if EMBC will fund construction. When Dan returns from holidays, we can discuss further.

Luanne

From: Hays-Byl, Winn ENV:EX
Sent: Tuesday, August 6, 2013 2:41 PM
To: Chew, Luanne C ENV:EX; Hogan, Dan ENV:EX
Subject: RE: Lillooet River Early Warning System

Hi Luanne,

Given our current budget, we're not in a position to fund the annual operations and maintenance for this new station. We need sufficient lead time to either secure third party funding OR to make adjustments within the network, and we need to coordinate this with our WSC partners.

That doesn't mean we shouldn't examine the request further. We absolutely need to examine what's changed since the original requests in 2011, and bring our info up to date. Therefore, I would like you to gather all the current facts on this request, including recommendations from Dan and WSC on the effectiveness of a station for an early warning system, before making any inquiries with EMB. The main reason is that I don't want to be raising anyone's expectations unnecessarily.

We need to determine the utility/effectiveness of the proposed station as an early warning system before endorsing it further, regardless of who is willing to pay for its' installation

and operations. Find out from WSC on why they stopped operating the station.

I would also like some clarity, for example, on why Lotte is requesting this. What is FLNR's role in this? Neil Peters needs to be part of this discussion.

My expectation is that: If it is suitable and feasible, then the proponent (Lotte? EMBC? District of Pemberton?) would need to explore funding arrangements. If EMBC (or someone else) pays for the install, who will have the operating \$ and be responsible for ongoing costs/decommissioning?

If there are NO third party funding sources, Dan will need to examine the strategic stations within the network to determine if we (the Province) have any flexibility to accommodate this request, in light of increasing demands for monitoring in other (more northerly) parts of the province. We will need to wait for Dan's return to work in September, and sufficient time for him to do the analysis and consult with others regarding priorities/risk.

Once you have the full history, then we can discuss options further – with Dan and our WSC partners.

If the information indicates that it is unsuitable, we need to convey that message clearly to Lotte, Pemberton and EMBC.

If it is not suitable and they proceed with an install, we can advise on standards but we need to be clear about not being involved.

In terms of responding to Lotte, please let her know we'll verify the current information and will need at least 4-6 weeks to get back to her (given Dan's schedule).

We can discuss further if you want.

From: Chew, Luanne C ENV:EX
Sent: Tuesday, August 6, 2013 1:59 PM
To: Hays-Byl, Winn ENV:EX
Cc: Hogan, Dan ENV:EX
Subject: FW: Lillooet River Early Warning System
Winn,

Lotte is inquiring about the proposal for a hydrometric station on the upper Lillooet River to serve as a warning system for a large Meagre Creek landslide. The idea was proposed after the last big slide in 2010. From what I understand from Dan, EMBC was going to fund the station install, and I am assuming that Bill Kuhnke was willing to fund the annual operations and maintenance as a Provincial station.

Since that time, EMBC declined to fund the station construction, and after my inquiry from Neil Peters went unanswered, we dropped the station construction from the Proposed construction list last fall. Dan stated that the effectiveness of the station as an early warning system was not sufficiently proven, which is probably why EMBC withdrew their support. It appears the local community is again raising the issue, and Lotte is making inquiries.

In a previous email to Lotte (attached), I already answered Lotte's second question below, but she's asking again. For her third question below, if the station is installed by WSC, then obviously they would operate it. However, the second attached PDF is a proposal from a consultant to install a private station. This option appears to be cheaper (minimal annual fees for monitoring, and operations and maintenance conducted by the local authorities) as the station would not have to be maintained according to the national standards. However, I don't know if the local authority have the capacity to do the maintenance. There would be no involvement with us for this second

option.

Do you want me to inquire with EMBC on their position with this station, before responding to Lotte? If EMBC had the funds to install the station, would we be willing to fund the annual operations and maintenance? I estimate the annual cost to be about \$10k. The first PDF attachment makes reference to the Premier and EMBC Minister's support for an early warning system, but there's no mention of direct support from MOE.

Luanne

From: Flint-Petersen, Lotte FLNR:EX

Sent: Monday, July 29, 2013 3:15 PM

To: Loski, Carol JAG:EX; Chew, Luanne C ENV:EX; Morrison, Andrew JAG:EX

Subject: Lillooet River Early Warning System

Hi Carol, Luanne and Andrew,

I apologise for wading in on a subject that I am not directly involved in but I hope that you can update me on the status of this early warning system for detecting slide activity on the Meagre Creek complex affecting the Lillooet River and downstream residents. I think this early warning system is really important so I hope I can be of assistance in moving this project along.

Carol, is EMBC able to fund the installation?

Luanne, can the maintenance costs be paid for under the MOE partnership with WSC?

Luanne, would it be WSC who would operate the system?

Andrew, would it be the River Forecast Centre who would monitor the water level data and provide the warning alert to Village of Pemberton if there were a sudden drop in water levels?

I recently received the attached proposal (from KWL March 27, 2013) and Letter (to Shirley Bond, March 2012) from Greig Garland (who used to be with District of Squamish). I know that this work is a priority for Steve Flynn (PVDD) and all the stakeholders in Pemberton.

Please let me know how I can assist.

Thanks.

Regards,

Lotte

Lotte Flint-Petersen M.Eng., MBA., P.Eng

Senior Flood Hazard Management Engineer

Ministry of Forests, Lands and Natural Resource Operations

Suite 200 - 10428 153rd Street

Surrey, BC

V3R 1E1

Phone: (604) 586-3721

Lotte.Flint-Petersen@gov.bc.ca

http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/safety_index.html

Water for BC Safe, Sustainable and Valued by all.



Please consider the environment before printing this email

From: [Flint-Petersen, Lotte FLNR:EX](#)
To: [Loski, Carol FLNR:EX](#)
Cc: [Berardinucci, Julia F ENV:EX](#); [Hamod, Wendy D FLNR:EX](#); [Chew, Luanne C ENV:EX](#)
Subject: FW: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
Date: Tuesday, September 3, 2013 1:04:40 PM
Importance: High

Hi Carol,

s.13,s.17

Do you have documents outlining estimated installation costs and maintenance costs?

Any information you can provide would be really helpful. I think the timeline on the UBCM brief is 4 Sept (tomorrow).

By copy to Luanne, this is FYI.

Thanks.
Regards,
Lotte

Lotte Flint-Petersen M.Eng., MBA., P.Eng
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Please consider the environment before printing this email

From: Hamod, Wendy D FLNR:EX
Sent: Friday, August 30, 2013 8:05 AM
To: Berardinucci, Julia F FLNR:EX; Flint-Petersen, Lotte FLNR:EX
Subject: RE: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD

Hi Julia,

SLRD's only topics last year were Riverside Park and the Hurley Road. I don't recall this topic previously, but if you have any other thoughts, I am happy to do another search.

Wendy Hamod
Regional Executive Administrator, South Coast Region
Ministry of Forests, Lands and Natural Resource Operations
200-10428 153 Street, Surrey BC V3R 1E1
Phone: (604) 586-4401 Facsimile: (604) 586-4419

From: Berardinucci, Julia F FLNR:EX
Sent: Thursday, August 29, 2013 5:26 PM
To: Flint-Petersen, Lotte FLNR:EX; Hamod, Wendy D FLNR:EX
Subject: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD

Hi Wendy, SLRD UBCM note from last year...for some reason it feels like we wrote one up – can you share if we did? Note new ask will be coming to us.

Hi Lotte,

- I think this ties into trips you and Mike have taken over the last few months up there...this will be happening alot until UBCM...we just need to barrel through it all these unplanned requests.
- Template for this year; hopefully there is a note from last year to cut away from and rebuild.
- I don't know any more about this particular issue than you so I won't be too much help – but feel free to try me!
- PS1 I learned that in section IV, we have to write our final comments as if the Minister is saying them...not as if we are providing advice (this is more like an estimates note) (IV SPEAKING/RESPONSE POINTS)
- Consolation thought Lotte – if you didn't do such important work, no one would be asking you for INs! ☺
- PS2...this is all we got as meeting subject matter:
“regarding the Mt. Meager and Upper Lillooet River Flood Early Warning System. Installation of a flood warning/river monitoring system on the Upper Lillooet River would also provide notice of major events at the Meager Complex.”

Julia

From: Berardinucci, Julia F FLNR:EX
Sent: Thursday, August 29, 2013 5:17 PM
To: Davidson, Glen W FLNR:EX; Morrison, Trevor FLNR:EX
Subject: RE: UBCM Meeting - Squamish-Lillooet RD

Hello

We can probably write up something regarding the flood warning system.

Trevor, it is easier for tracking purposes for the RED if this gets redirected through the big communication chain (as opposed to this email covering a redirect).

But in the interim, staff will start working on it and we will anticipate it coming to us (Regional Operations, South Coast, Resource Management, Surrey).

Our Exec assistant to the RED will need to see it asked for as she is keeping track of all the requests in.

Thanks,
J

From: Davidson, Glen W FLNR:EX
Sent: Thursday, August 29, 2013 5:06 PM
To: Morrison, Trevor FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX
Subject: Re: UBCM Meeting - Squamish-Lillooet RD

Trevor,

I am not sure., however my branch has not been involved with this issue. Why don't you try Julia Berardinucci in our Surrey office and she may be able to confirm if it is us or EMBC.

Glen

From: Morrison, Trevor FLNR:EX
Sent: Thursday, August 29, 2013 3:25 PM
To: Davidson, Glen W FLNR:EX
Subject: UBCM Meeting - Squamish-Lillooet RD

Glen,

SLRD has added a topic concerning early warning systems for river flooding to their UBCM meeting with Minister Thomson. Please let

me know whether this belongs to us or EMBC.

Regards,

Trevor

s.13

538	Squamish-Lillooet Regional District

From: [Loski, Carol FLNR:EX](#)
To: [Flint-Petersen, Lotte FLNR:EX](#); [Kryzanowski, Kelli JAG:EX](#)
Cc: [Berardinucci, Julia F ENV:EX](#); [Hamod, Wendy D FLNR:EX](#); [Chew, Luanne C ENV:EX](#)
Subject: RE: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
Date: Tuesday, September 3, 2013 1:42:10 PM

s.13,s.17

Let me know if you need more. Carol

From: Flint-Petersen, Lotte FLNR:EX
Sent: Tuesday, September 3, 2013 1:05 PM
To: Loski, Carol JAG:EX
Cc: Berardinucci, Julia F FLNR:EX; Hamod, Wendy D FLNR:EX; Chew, Luanne C ENV:EX
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By copy to Luanne, this is FYI.

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Phone: (604) 586-4401 Facsimile: (604) 586-4419

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	s.13
538	Squamish-Lillooet Regional District

From: [Kryzanowski, Kelli JAG:EX](#)
To: [Loski, Carol FLNR:EX](#); [Flint-Petersen, Lotte FLNR:EX](#)
Cc: [Berardinucci, Julia F ENV:EX](#); [Hamod, Wendy D FLNR:EX](#); [Chew, Luanne C ENV:EX](#); [Tomaz, David C TRAN:EX](#)
Subject: RE: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
Date: Tuesday, September 3, 2013 2:21:36 PM

Good afternoon all,

David Tomaz and his team in the South West are currently working on the note. I will ensure EMBC forwards the note to Lotte ASAP.

Kelli

From: Loski, Carol JAG:EX
Sent: Tuesday, September 3, 2013 13:42 PM
To: Flint-Petersen, Lotte FLNR:EX; Kryzanowski, Kelli JAG:EX
Cc: Berardinucci, Julia F FLNR:EX; Hamod, Wendy D FLNR:EX; Chew, Luanne C ENV:EX
Subject: RE: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD

s.13,s.17

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Cc: Berardinucci, Julia F FLNR:EX; Hamod, Wendy D FLNR:EX; Chew, Luanne C ENV:EX
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s.13

538	Squamish-Lillooet Regional District

From: [Flint-Petersen, Lotte FLNR:EX](#)
To: [Loski, Carol FLNR:EX](#); [Hays-Byl, Winn ENV:EX](#)
Cc: [Chew, Luanne C ENV:EX](#); [Morrison, Andrew TRAN:EX](#)
Subject: Lillooet River Early Warning System FW: UBCM Meeting - Squamish-Lillooet RD
Date: Wednesday, September 4, 2013 9:19:17 AM
Attachments: [Debris Slide Early Warning System.pdf](#)
[UBCM 2013 SLRD.docx](#)
Importance: High

Hi Carol and Winn,

I expect that you might be preparing a UBCM on this issue. For efficiencies let's share our information.

Attached is information you might want to use that is being sent up through FLNRO.

Please share your final versions with me.

Thanks.

Regards,

Lotte

Lotte Flint-Petersen M.Eng., MBA., P.Eng
Acting Section Head Flood and Groundwater Section and
Senior Flood Hazard Management Engineer
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From: Berardinucci, Julia F FLNR:EX
Sent: Wednesday, September 4, 2013 8:51 AM
To: Hamod, Wendy D FLNR:EX
Cc: Flint-Petersen, Lotte FLNR:EX
Subject: UBCM Meeting - Squamish-Lillooet RD
Importance: High
Approved version.
julia

MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

BRIEFING NOTE FOR 2013 UBCM CONVENTION

I PREPARED FOR:

Minister Thomson's Meeting with Squamish/Lillooet Regional District (SLRD)

II ISSUE: Request for Province to fund a Mt. Meager and Upper Lillooet River Flood Early Warning System.

III BACKGROUND / DISCUSSION:

The local government is requesting the Province install a flood warning/river monitoring system on the Upper Lillooet River to warn Village of Pemberton of impending flooding from a slide event from the Mount Meager Complex.

Jurisdiction over flood management in the Lillooet River includes many organizations: SLRD, Pemberton Valley Diking District (PVDD), Village of Pemberton (VOP), Lil'Wat Nation (Mount Currie Indian Band) and others. Through legislative changes in 2003, the responsibility for providing flood protection to people and property became the responsibility of Local Governments.

The Lillooet River floods can arise from a number of different natural mechanisms including rainfall and snowmelt events as well as outburst events from debris jams or landslide events. In 2010 a landslide dam event on Capricorn Creek blocked Meager Creek and partially blocked Lillooet River. The subsequent breach created a flood wave that reached downstream communities.

Engineering studies recommend the installation of a near real time water level monitoring system on the Hurley Forestry Service Road Bridge crossing the Lillooet River to provide downstream residents 2 hours of advanced warning of an impending flood wave. The system would be similar to those typically operated by Water Survey of Canada (WSC) to monitor river levels in BC, funded in partnership by MOE and Environment Canada but would have one additional level of redundancy to perform as an early warning system. For WSC operated water level systems, maintenance costs are typically funded in partnership with MOE and WSC.

s.13,s.17

s.13,s.17

IV SPEAKING/RESPONSE POINTS

- Responsibility for providing adequate flood protection to people and property became the responsibility of Local Governments in 2003.
- The ongoing support for the operation and maintenance of an early warning system is currently not within the Provincial mandate.
- FLNRO is pleased to continue to work with SLRD on Dike and Water Act items which are within the responsibility of FLNRO.
- Installation and equipment costs for flood protection infrastructure is supported on a priority basis by EMBC, as part of their Flood Protection Program.
- Support for provincial river water level monitoring systems is a shared responsibility with MOE and Environment Canada and FLNR can provide assistance with directing the request to MOE.
- In light of governments' current fiscal circumstances, it is necessary to remain focussed on those engineering works that fall in the realm of flood mitigation for Public Safety. While an early warning system on the Upper Lillooet River clearly falls within a Public Safety mandate, it is necessary to have adequate policy in place to guide these choices. FLNRO will continue to explore this policy development with EMBC and MOE.

Lotte Flint-Petersen

4 September 2013

Attachment:

2012 03 01 Letter to Hon. Shirley Bond

From: [Chew, Luanne C ENV:EX](#)
To: [Hogan, Dan ENV:EX](#)
Subject: FW: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
Date: Wednesday, September 4, 2013 10:14:00 AM

Good morning. Hope you had a great month on your island.

The Lillooet warning system issue has come up again. I'm forwarding this note, plus one other for you to check out. I'll call you to discuss this afternoon.

Cheers,

Luanne

From: Kryzanowski, Kelli JAG:EX
Sent: Tuesday, September 3, 2013 2:22 PM
To: Loski, Carol JAG:EX; Flint-Petersen, Lotte FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX; Hamod, Wendy D FLNR:EX; Chew, Luanne C ENV:EX; Tomaz, David C JAG:EX
Subject: RE: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
Good afternoon all,

David Tomaz and his team in the South West are currently working on the note. I will ensure EMBC forwards the note to Lotte ASAP.

Kelli

From: Loski, Carol JAG:EX
Sent: Tuesday, September 3, 2013 13:42 PM
To: Flint-Petersen, Lotte FLNR:EX; Kryzanowski, Kelli JAG:EX
Cc: Berardinucci, Julia F FLNR:EX; Hamod, Wendy D FLNR:EX; Chew, Luanne C ENV:EX
Subject: RE: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
s.13,s.17

Let me know if you need more. Carol

From: Flint-Petersen, Lotte FLNR:EX
Sent: Tuesday, September 3, 2013 1:05 PM
To: Loski, Carol JAG:EX
Cc: Berardinucci, Julia F FLNR:EX; Hamod, Wendy D FLNR:EX; Chew, Luanne C ENV:EX
Subject: FW: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
Importance: High
Hi Carol,
s.13,s.17

Do you have documents outlining estimated installation costs and maintenance costs?

Any information you can provide would be really helpful. I think the timeline on the UBCM brief is 4 Sept (tomorrow).

By copy to Luanne, this is FYI.

Thanks.

Regards,

Lotte

Lotte Flint-Petersen M.Eng., MBA., P.Eng
Acting Section Head Flood and Groundwater Section and
Senior Flood Hazard Management Engineer
Ministry of Forests, Lands and Natural Resource Operations
Suite 200 - 10428 153rd Street
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Phone: (604) 586-3721

Lotte.Flint-Petersen@gov.bc.ca
http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/safety_index.html



Please consider the environment before printing this email

From: Hamod, Wendy D FLNR:EX
Sent: Friday, August 30, 2013 8:05 AM
To: Berardinucci, Julia F FLNR:EX; Flint-Petersen, Lotte FLNR:EX
Subject: RE: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD

Hi Julia,

SLRD's only topics last year were Riverside Park and the Hurley Road. I don't recall this topic previously, but if you have any other thoughts, I am happy to do another search.

Wendy Hamod

Regional Executive Administrator, South Coast Region
Ministry of Forests, Lands and Natural Resource Operations
200-10428 153 Street, Surrey BC V3R 1E1
Phone: (604) 586-4401 Facsimile: (604) 586-4419

From: Berardinucci, Julia F FLNR:EX
Sent: Thursday, August 29, 2013 5:26 PM
To: Flint-Petersen, Lotte FLNR:EX; Hamod, Wendy D FLNR:EX
Subject: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD

Hi Wendy, SLRD UBCM note from last year...for some reason it feels like we wrote one up – can you share if we did? Note new ask will be coming to us.

Hi Lotte,

- I think this ties into trips you and Mike have taken over the last few months up there...this will be happening alot until UBCM...we just need to barrel through it all these unplanned requests.
- Template for this year; hopefully there is a note from last year to cut away from and rebuild.
- I don't know any more about this particular issue than you so I won't be too much help – but feel free to try me!
- PS1 I learned that in section IV, we have to write our final comments as if the Minister is saying them...not as if we are providing advice (this is more like an estimates note) (IV SPEAKING/RESPONSE POINTS)
- Consolation thought Lotte – if you didn't do such important work, no one would be asking you for INs! ☺
- PS2...this is all we got as meeting subject matter:

“regarding the Mt. Meager and Upper Lillooet River Flood Early Warning System. Installation of a flood warning/river monitoring system on the Upper Lillooet River would also provide notice of major events at the Meager Complex.”

Julia

From: Berardinucci, Julia F FLNR:EX
Sent: Thursday, August 29, 2013 5:17 PM
To: Davidson, Glen W FLNR:EX; Morrison, Trevor FLNR:EX
Subject: RE: UBCM Meeting - Squamish-Lillooet RD

Hello

We can probably write up something regarding the flood warning system.

Trevor, it is easier for tracking purposes for the RED if this gets redirected through the big communication chain (as opposed to this email covering a redirect).

But in the interim, staff will start working on it and we will anticipate it coming to us (Regional Operations, South Coast, Resource Management, Surrey).

Our Exec assistant to the RED will need to see it asked for as she is keeping track of all the requests in.

Thanks,

J

From: Davidson, Glen W FLNR:EX
Sent: Thursday, August 29, 2013 5:06 PM
To: Morrison, Trevor FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX
Subject: Re: UBCM Meeting - Squamish-Lillooet RD

Trevor,

I am not sure., however my branch has not been involved with this issue. Why don't you try Julia Berardinucci in our Surrey office and she may be able to confirm if it is us or EMBC.

Glen

From: Morrison, Trevor FLNR:EX
Sent: Thursday, August 29, 2013 3:25 PM
To: Davidson, Glen W FLNR:EX
Subject: UBCM Meeting - Squamish-Lillooet RD

Glen,

SLRD has added a topic concerning early warning systems for river flooding to their UBCM meeting with Minister Thomson. Please let me know whether this belongs to us or EMBC.

Regards,

Trevor

538	Squamish-Lillooet Regional District	s.13
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From: [Loski, Carol FLNR:EX](#)
To: [Flint-Petersen, Lotte FLNR:EX](#)
Cc: [Morrison, Andrew TRAN:EX](#); [Hays-Byl, Winn ENV:EX](#); [Chew, Luanne C ENV:EX](#)
Subject: UBCM 2013 SLRD - CJL edits
Date: Wednesday, September 4, 2013 10:18:02 AM
Attachments: [UBCM 2013 SLRD - CJL edits.docx](#)

Hi Lotte, I have made some wording changes to your note to better reflect EMBC's position.
I will also send along the response to the letter referenced.
Carol

Page 051 to/à Page 052

Withheld pursuant to/removed as

s.13

From: [Flint-Petersen, Lotte FLNR:EX](#)
To: [Hamod, Wendy D FLNR:EX](#)
Cc: [Berardinucci, Julia F ENV:EX](#); [Loski, Carol FLNR:EX](#); [Chew, Luanne C ENV:EX](#)
Subject: FW: UBCM 2013 SLRD - CJL edits
Date: Wednesday, September 4, 2013 11:01:14 AM
Attachments: [Debris Slide Early Warning System.pdf](#)
[UBCM 2013 SLRD - CJL edits.docx](#)
Importance: High

Hi Wendy,

If you are able, within the deadline, please submit this more recent version as our response. Also there is an additional attachment coming to be added to the notes which will be provided by Carol. Many thanks Carol for your review and edits.

Thanks.

Regards,

Lotte

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Senior Flood Hazard Management Engineer
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Sent: Wednesday, September 4, 2013 10:18 AM
To: Flint-Petersen, Lotte FLNR:EX
Cc: Morrison, Andrew JAG:EX; Hays-Byl, Winn ENV:EX; Chew, Luanne C ENV:EX
Subject: UBCM 2013 SLRD - CJL edits
Hi Lotte, I have made some wording changes to your note to better reflect EMBC's position.
I will also send along the response to the letter referenced.
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Page 054 to/à Page 055

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s.13

From: [Loski, Carol FLNR:EX](#)
To: [Flint-Petersen, Lotte FLNR:EX](#); [Hamod, Wendy D FLNR:EX](#); [Morrison, Andrew TRAN:EX](#)
Cc: [Berardinucci, Julia F ENV:EX](#); [Chew, Luanne C ENV:EX](#); [Kryzanowski, Kelli JAG:EX](#); [Tomaz, David C TRAN:EX](#)
Subject: RE: UBCM 2013 SLRD - CJL edits
Date: Wednesday, September 4, 2013 11:05:52 AM
Attachments: [June 2013 Letter MSB SLRD Early Warning System Request - response.pdf](#)

Here is the response letter that provides the clarity

From: Flint-Petersen, Lotte FLNR:EX
Sent: Wednesday, September 4, 2013 11:01 AM
To: Hamod, Wendy D FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX; Loski, Carol JAG:EX; Chew, Luanne C ENV:EX
Subject: FW: UBCM 2013 SLRD - CJL edits
Importance: High

Hi Wendy,

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Regards,

Lotte

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To: Flint-Petersen, Lotte FLNR:EX
Cc: Morrison, Andrew JAG:EX; Hays-Byl, Winn ENV:EX; Chew, Luanne C ENV:EX
Subject: UBCM 2013 SLRD - CJL edits

Hi Lotte, I have made some wording changes to your note to better reflect EMBC's position.

I will also send along the response to the letter referenced.

Carol

From: [Chew, Luanne C ENV:EX](#)
To: [Hogan, Dan ENV:EX](#)
Subject: FW: UBCM 2013 SLRD - CJL edits
Date: Wednesday, September 4, 2013 11:07:00 AM
Attachments: [Debris Slide Early Warning System.pdf](#)
[UBCM 2013 SLRD - CJL edits.docx](#)
Importance: High

Hi,

The attached documents are drafts. There appears to be a deadline for their submission, but not sure when that is. An October 2012 Construction spreadsheet estimates the WSC station install cost at \$24k, but their document states \$32k. Perhaps the extra cost is for the warning system to accompany the station? Also, they have an annual O&M cost of \$17k. I had intended to ask WSC for a revised cost estimate, but didn't get to it before I went on holidays.

Luanne

From: Flint-Petersen, Lotte FLNR:EX
Sent: Wednesday, September 4, 2013 11:01 AM
To: Hamod, Wendy D FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX; Loski, Carol JAG:EX; Chew, Luanne C ENV:EX
Subject: FW: UBCM 2013 SLRD - CJL edits
Importance: High

Hi Wendy,

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Thanks.

Regards,

Lotte

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Sent: Wednesday, September 4, 2013 10:18 AM
To: Flint-Petersen, Lotte FLNR:EX
Cc: Morrison, Andrew JAG:EX; Hays-Byl, Winn ENV:EX; Chew, Luanne C ENV:EX
Subject: UBCM 2013 SLRD - CJL edits
Hi Lotte, I have made some wording changes to your note to better reflect EMBC's position. I will also send along the response to the letter referenced.
Carol

Page 058 to/à Page 059

Withheld pursuant to/removed as

s.13

From: [Chew, Luanne C ENV:EX](#)
To: ["Hutchinson,David \[PYR\]"](#)
Cc: [Hogan, Dan ENV:EX](#)
Subject: Proposed water level gauge on the Upper Lillooet River
Date: Wednesday, September 4, 2013 1:33:00 PM

Hi Dave,

As discussed, could you please forward information regarding the installation of a proposed water level gauge on the Upper Lillooet River at Hurley Pass. If you possible, could please include the following information:

- Installation cost estimate
- Annual operations and maintenance cost estimate
- Recommended equipment
- Comments on the suitability of the station to serve as an early warning system for a future Mount Meager Complex landslide
- Any other comments you feel relevant

Thanks,

Luanne

Luanne Chew, P.Geo.
Hydrometric Specialist
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1
ph: 250-387-1817
fx: 250-356-5496

From: [Chew, Luanne C ENV:EX](#)
To: [Schultz, Fern ENV:EX](#); [Hays-Byl, Winn ENV:EX](#)
Cc: [Hogan, Dan ENV:EX](#)
Subject: Upper Lillooet River Proposed Hydrometric Station decision note
Date: Wednesday, September 4, 2013 1:59:00 PM
Attachments: [Debris Slide Early Warning System.pdf](#)
[June 2013 Letter MSB SLRD Early Warning System Request - response.pdf](#)
[UBCM 2013 SLRD - CIL edits.docx](#)
Importance: High

Fern and Winn,

FYI - A Decision note is being drafted for Steve Thomson with respect to the renewed request by the various Local Government groups for a water level gauge on the upper Lillooet River to serve as an early warning system in the event of a future Mount Meager Complex landslide. Attached is the latest draft of the note, which outlines the FLNRO/EMBC response with respect to cost and responsibility.

From our Program's perspective, a station was proposed to be installed by WSC sometime after the last large landslide in August 2010, and was placed on the Proposed Hydrometric Construction list. A funding request to EMBC for the station installation was declined in June 2012 (attached). I sent an email to Neil Peters in November 2012 to determine if there was any interest in pursuing the project from the Surrey FLNRO office and received no response, so the proposed station was removed from the Proposed Hydrometric Construction list in December 2012.

In the meantime, the local government has also received a quote for a privately installed water level gauge. However, this proposal entails the local government doing the station operation, maintenance, and monitoring; something that they do not want to undertake for liability purposes. I have contacted Dave Hutchinson to request an updated WSC cost estimate for the proposed water level gauge, in addition to their comments on the suitability of such a gauge to serve as an early warning system.

Regards,

Luanne

Luanne Chew, P.Geo.
Hydrometric Specialist
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1
ph: 250-387-1817
fx: 250-356-5496

From: Flint-Petersen, Lotte FLNR:EX
Sent: Wednesday, September 4, 2013 11:01 AM
To: Hamod, Wendy D FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX; Loski, Carol JAG:EX; Chew, Luanne C ENV:EX
Subject: FW: UBCM 2013 SLRD - CIL edits
Importance: High

Hi Wendy,

If you are able, within the deadline, please submit this more recent version as our response. Also there is an additional attachment coming to be added to the notes which will be provided by Carol. Many thanks Carol for your review and edits.

Thanks.

Regards,

Lotte

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From: Loski, Carol JAG:EX
Sent: Wednesday, September 4, 2013 10:18 AM
To: Flint-Petersen, Lotte FLNR:EX
Cc: Morrison, Andrew JAG:EX; Hays-Byl, Winn ENV:EX; Chew, Luanne C ENV:EX
Subject: UBCM 2013 SLRD - CJL edits
Hi Lotte, I have made some wording changes to your note to better reflect EMBC's position.
I will also send along the response to the letter referenced.
Carol

Page 063

Withheld pursuant to/removed as

s.13

Page 064

Withheld pursuant to/removed as

DUPLICATE;s.13

From: [Schultz, Fern ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#); [Hays-Byl, Winn ENV:EX](#)
Cc: [Hogan, Dan ENV:EX](#)
Subject: RE: Upper Lillooet River Proposed Hydrometric Station decision note
Date: Wednesday, September 4, 2013 2:28:48 PM

Thanks for this information, Luanne. I see this is being prepared for UBCM. I'll make sure this is flagged for the MoE preparation which is currently underway.

Fern

From: Chew, Luanne C ENV:EX
Sent: Wednesday, September 4, 2013 2:00 PM
To: Schultz, Fern ENV:EX; Hays-Byl, Winn ENV:EX
Cc: Hogan, Dan ENV:EX
Subject: Upper Lillooet River Proposed Hydrometric Station decision note
Importance: High

Fern and Winn,

FYI - A Decision note is being drafted for Steve Thomson with respect to the renewed request by the various Local Government groups for a water level gauge on the upper Lillooet River to serve as an early warning system in the event of a future Mount Meager Complex landslide. Attached is the latest draft of the note, which outlines the FLNRO/EMBC response with respect to cost and responsibility.

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Regards,
Luanne

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Hydrometric Specialist
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ph: 250-387-1817
fx: 250-356-5496

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Sent: Wednesday, September 4, 2013 11:01 AM
To: Hamod, Wendy D FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX; Loski, Carol JAG:EX; Chew, Luanne C ENV:EX
Subject: FW: UBCM 2013 SLRD - CJL edits
Importance: High

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Many thanks Carol for your review and edits.

Thanks.
Regards,
Lotte

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From: Loski, Carol JAG:EX
Sent: Wednesday, September 4, 2013 10:18 AM
To: Flint-Petersen, Lotte FLNR:EX
Cc: Morrison, Andrew JAG:EX; Hays-Byl, Winn ENV:EX; Chew, Luanne C ENV:EX
Subject: UBCM 2013 SLRD - CJL edits

Hi Lotte, I have made some wording changes to your note to better reflect EMBC's position.

I will also send along the response to the letter referenced.

Carol

From: [Chew, Luanne C ENV:EX](#)
To: [Flint-Petersen, Lotte FLNR:EX](#); [Loski, Carol FLNR:EX](#)
Subject: RE: UBCM 2013 SLRD - CJL edits
Date: Wednesday, September 4, 2013 3:04:00 PM

Lotte and Carol,

Thank you for keeping me in the loop with respect to the drafting of this note. I was wondering if either of you could provide more information on the reference to the engineering studies that recommend the water level monitoring?

Engineering studies recommend the installation of a near real time water level monitoring system on the Hurley Forestry Service Road Bridge crossing the Lillooet River to provide downstream residents 2 hours of advanced warning of an impending flood wave.

Thanks,

Luanne

Luanne Chew, P.Geo.
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Cc: Berardinucci, Julia F FLNR:EX; Loski, Carol JAG:EX; Chew, Luanne C ENV:EX
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Importance: High

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To: Flint-Petersen, Lotte FLNR:EX

Cc: Morrison, Andrew JAG:EX; Hays-Byl, Winn ENV:EX; Chew, Luanne C ENV:EX

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To: [Chew, Luanne C ENV:EX](#); [Flint-Petersen, Lotte FLNR:EX](#)
Cc: [Morrison, Andrew TRAN:EX](#)
Subject: RE: UBCM 2013 SLRD - CJL edits
Date: Wednesday, September 4, 2013 3:16:11 PM

Andrew, can you assist Luanne if Lotte is not available? thanks, Carol

From: Chew, Luanne C ENV:EX
Sent: Wednesday, September 4, 2013 3:04 PM
To: Flint-Petersen, Lotte FLNR:EX; Loski, Carol JAG:EX
Subject: RE: UBCM 2013 SLRD - CJL edits
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To: Flint-Petersen, Lotte FLNR:EX

Cc: Morrison, Andrew JAG:EX; Hays-Byl, Winn ENV:EX; Chew, Luanne C ENV:EX

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Subject: RE: UBCM 2013 SLRD - CJL edits
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fx: 250-356-5496

From: Flint-Petersen, Lotte FLNR:EX
Sent: Wednesday, September 4, 2013 11:01 AM
To: Hamod, Wendy D FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX; Loski, Carol JAG:EX; Chew, Luanne C ENV:EX
Subject: FW: UBCM 2013 SLRD - CJL edits
Importance: High

Hi Wendy,

If you are able, within the deadline, please submit this more recent version as our response. Also there is an additional attachment coming to be added to the notes which will be provided by Carol. Many thanks Carol for your review and edits.

Thanks.

Regards,

Lotte

Lotte Flint-Petersen M.Eng., MBA., P.Eng
Acting Section Head Flood and Groundwater Section and
Senior Flood Hazard Management Engineer
Ministry of Forests, Lands and Natural Resource Operations
Suite 200 - 10428 153rd Street
Surrey, BC
V3R 1E1
Phone: (604) 586-3721

Lotte.Flint-Petersen@gov.bc.ca
http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/safety_index.html
Water for BC Safe, Sustainable and Valued by all.



Please consider the environment before printing this email

From: Loski, Carol JAG:EX

Sent: Wednesday, September 4, 2013 10:18 AM

To: Flint-Petersen, Lotte FLNR:EX

Cc: Morrison, Andrew JAG:EX; Hays-Byl, Winn ENV:EX; Chew, Luanne C ENV:EX

Subject: UBCM 2013 SLRD - CJL edits

Hi Lotte, I have made some wording changes to your note to better reflect EMBC's position.

I will also send along the response to the letter referenced.

Carol

Page 074 to/à Page 076

Withheld pursuant to/removed as

s.13

From: [Chew, Luanne C ENV:EX](#)
To: [Morrison, Andrew TRAN:EX](#)
Subject: RE: UBCM 2013 SLRD - CJL edits
Date: Wednesday, September 4, 2013 4:05:00 PM
Attachments: [image001.png](#)

Thank you Andrew.

Regards,
Luanne

From: Morrison, Andrew JAG:EX
Sent: Wednesday, September 4, 2013 4:00 PM
To: Flint-Petersen, Lotte FLNR:EX; Chew, Luanne C ENV:EX
Cc: Loski, Carol JAG:EX
Subject: RE: UBCM 2013 SLRD - CJL edits
For your reference, attached are the latest estimates (Aug 2013) from the PVDD.
Andrew Morrison
Regional Manager, Southwest Region



Emergency
ManagementBC

14292 Green Timbers Way
Surrey, BC V3T 0J4
CANADA

www.embc.gov.bc.ca

Phone 604.586.4380

Fax 604.586.4334

24 Hour Emergency Reporting 1.800.663.3456

From: Flint-Petersen, Lotte FLNR:EX
Sent: Wednesday, September 4, 2013 15:55 PM
To: Chew, Luanne C ENV:EX
Cc: Morrison, Andrew JAG:EX; Loski, Carol JAG:EX
Subject: RE: UBCM 2013 SLRD - CJL edits

Hi Luanne,

Attached is the KWL proposal. See page 1 paragraph 3. I received the proposal from Greig Garland. It was sent to him while he worked for District of Squamish.

I will try to track down the KWL "Large Woody Debris Assessment and Mitigation Plan" June 2011 report.

Hope this helps.

Regards,
Lotte

Lotte Flint-Petersen M.Eng., MBA., P.Eng
Acting Section Head for Flood and Groundwater
Senior Flood Hazard Management Engineer
Ministry of Forests, Lands and Natural Resource Operations
Suite 200 - 10428 153rd Street
Surrey, BC
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http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/safety_index.html

Water for BC Safe, Sustainable and Valued by all.



Please consider the environment before printing this email

From: Loski, Carol JAG:EX

Sent: Wednesday, September 4, 2013 3:16 PM

To: Chew, Luanne C ENV:EX; Flint-Petersen, Lotte FLNR:EX

Cc: Morrison, Andrew JAG:EX

Subject: RE: UBCM 2013 SLRD - CJL edits

Andrew, can you assist Luanne if Lotte is not available? thanks, Carol

From: Chew, Luanne C ENV:EX

Sent: Wednesday, September 4, 2013 3:04 PM

To: Flint-Petersen, Lotte FLNR:EX; Loski, Carol JAG:EX

Subject: RE: UBCM 2013 SLRD - CJL edits

Lotte and Carol,

Thank you for keeping me in the loop with respect to the drafting of this note. I was wondering if either of you could provide more information on the reference to the engineering studies that recommend the water level monitoring?

Engineering studies recommend the installation of a near real time water level monitoring system on the Hurley Forestry Service Road Bridge crossing the Lillooet River to provide downstream residents 2 hours of advanced warning of an impending flood wave.

Thanks,

Luanne

Luanne Chew, P.Geo.

Hydrometric Specialist

BC Ministry of Environment

PO Box 9341 Stn Prov Govt

Victoria, BC V8W 9M1

ph: 250-387-1817

fx: 250-356-5496

From: Flint-Petersen, Lotte FLNR:EX

Sent: Wednesday, September 4, 2013 11:01 AM

To: Hamod, Wendy D FLNR:EX

Cc: Berardinucci, Julia F FLNR:EX; Loski, Carol JAG:EX; Chew, Luanne C ENV:EX

Subject: FW: UBCM 2013 SLRD - CJL edits

Importance: High

Hi Wendy,

If you are able, within the deadline, please submit this more recent version as our response. Also there is an additional attachment coming to be added to the notes which will be provided by Carol. Many thanks Carol for your review and edits.

Thanks.

Regards,

Lotte

Lotte Flint-Petersen M.Eng., MBA., P.Eng

Acting Section Head Flood and Groundwater Section and

Senior Flood Hazard Management Engineer

Ministry of Forests, Lands and Natural Resource Operations

Suite 200 - 10428 153rd Street

Surrey, BC

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Phone: (604) 586-3721

Lotte.Flint-Petersen@gov.bc.ca

http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/safety_index.html

Water for BC Safe, Sustainable and Valued by all.



Please consider the environment before printing this email

From: Loski, Carol JAG:EX

Sent: Wednesday, September 4, 2013 10:18 AM

To: Flint-Petersen, Lotte FLNR:EX

Cc: Morrison, Andrew JAG:EX; Hays-Byl, Winn ENV:EX; Chew, Luanne C ENV:EX

Subject: UBCM 2013 SLRD - CJL edits

Hi Lotte, I have made some wording changes to your note to better reflect EMBC's position.

I will also send along the response to the letter referenced.

Carol

Cc: Hogan, Dan ENV:EX

Subject: Proposed water level gauge on the Upper Lillooet River

Hi Dave,

As discussed, could you please forward information regarding the installation of a proposed water level gauge on the Upper Lillooet River at Hurley Pass. If you possible, could please include the following information:

- Installation cost estimate
- Annual operations and maintenance cost estimate
- Recommended equipment
- Comments on the suitability of the station to serve as an early warning system for a future Mount Meager Complex landslide
- Any other comments you feel relevant

Thanks,

Luanne

Luanne Chew, P.Geo.
Hydrometric Specialist
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1
ph: 250-387-1817
fx: 250-356-5496

Page 081 to/à Page 091

Withheld pursuant to/removed as

s.13;s.17

FlowWorks Service Agreement



BY AND BETWEEN:

FlowWorks Inc. ("FlowWorks")	Address:	606 Maynard Ave. S, Suite #201 Seattle, WA 98104
Representative: Timothy Hicks	Telephone:	(206) 859-6999
Email: timothy@FlowWorks.com	Facsimile:	(206) 320-9939

AND:

	("Client") Address:	
Representative:	Telephone:	
Email:	Facsimile:	
File No.:		

Effective Date: XX XXX, 2012**End Date:** (enter if applicable)

TERMS OF AGREEMENT**Services**

FlowWorks will perform the services set out as shown in Appendix A to this Agreement. The scope of services may be changed from time to time by mutual written agreement of the parties.

Effective Date

The Services are to be performed from and after the date written above as the Effective Date of this Agreement.

End Date

The Services will be provided through the date written above as the End Date of this Agreement, or until cancelled in writing, with 30 days notice, if blank.

Compensation

Client will pay FlowWorks for Services provided in accordance with Appendix A of this Agreement. Both unit and hourly rates are subject to adjustment upon thirty (30) days notice.

Terms and Conditions

The terms and conditions of this Agreement are set out in this Agreement, the attached Terms and Conditions, and Appendix A.

By signing this Agreement, you acknowledge receipt of the Terms and Conditions, and Appendix A, and agree to their terms.

PLEASE NOTE THAT WE DO NOT PROVIDE WARRANTIES FOR THE FLOWWORKS SERVICE. THE AGREEMENT ALSO LIMITS OUR LIABILITY. THESE TERMS ARE IN SECTIONS 1 AND 7 OF THE ATTACHED TERMS AND CONDITIONS, AND WE ASK USER TO READ THEM CAREFULLY.

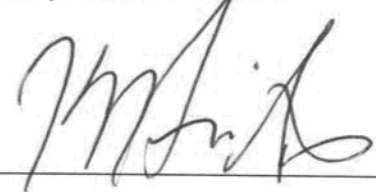
CLIENT:**FlowWorks Inc.**

Per: _____
(Name)

(Title)

x
(Signature)

Per: Timothy Hicks, President



(Signature)

FLOWWORKS TERMS AND CONDITIONS – SERVICE AGREEMENT USERS

1. Terms of Service. FlowWorks, Inc. (FlowWorks), a provider of proprietary data management tools (hereinafter referred to as FlowWorks Data Service or FlowWorks Service), hereby grants Users access to and use of the FlowWorks Service for the purchase prices specified in your Service Agreement. This Agreement shall be effective from the Effective Date set forth in the executed Service Agreement and shall remain in effect until terminated as set forth in this Agreement. **FlowWorks does not guarantee the accuracy or timeliness of information available from the FlowWorks Service.**

Please note that FlowWorks does not do engineering or flow analysis. FlowWorks provides data warehousing, data management, publishing and analysis tools, and alarming functions only.

2. Users. The FlowWorks Service, which includes all data, calculation functions, tools and other information available on the www.FlowWorks.com website is for the exclusive use and benefit of users and their designated personnel (collectively "Users"). Only Users may use their FlowWorks Service account. Users are responsible for all activity that takes place with their service account. Users may not authorize any third party to access and/or use the FlowWorks Service on their behalf except where Users and FlowWorks agree to providing a mechanism for third parties to access the service on Users behalf.

3. Protection of Data.

A. FlowWorks Security. While FlowWorks shall use commercially reasonable means to protect its servers from security breaches, it does not warrant that its site, its servers, and/or information received from FlowWorks are free of viruses or other harmful components, nor does it warrant that data on the FlowWorks site is safe from data theft and/or republishing by third parties.

B. Users Security Obligations/Back Up Data. An Interruption of FlowWorks Services, or termination or cancellation of the FlowWorks Service by Users or FlowWorks for any reason will result in a loss of data to Users. FlowWorks Services shall provide redundant server services to backup all data stored by User under this Agreement.

4. Interruptions. Users may from time to time experience interruptions of service or availability or a degradation of functionality of FlowWorks Services or some of its features, including, but not limited to, interruptions or degradation in data collection, due to Internet outages, equipment failures, power failures, or similar events beyond the control of FlowWorks ("Interruptions"). FlowWorks shall use commercially reasonable means to minimize and mitigate any loss of data during such Interruptions. FlowWorks shall accurately restore at no cost to User all data properly transmitted to FlowWorks 60 minutes or more prior to the Interruption and lost due to the Interruption .

Users agree to report any suspected Interruptions to FlowWorks Inc. within 24 hours and to provide a detailed description of the situation surrounding the detection of the Interruption. FlowWorks shall use commercially reasonable means to diagnose the Interruption and to correct it. FlowWorks is not responsible for retrieving or reentering any data not properly transmitted to FlowWorks 60 minutes or more prior to the Interruption and lost due to the Interruption.

"Properly transmitted" is hereby defined as adhering to a transfer protocol established and approved by FlowWorks in advance of the transmission.

5. Maintenance. FlowWorks may also be temporarily unavailable due to maintenance, repairs or upgrades ("Maintenance"). While FlowWorks will make commercially reasonable efforts to notify Users in advance of such Maintenance, it is not always possible to give notice of every Maintenance event. Monthly fees are not pro-rated due to Interruptions or Maintenance, unless FlowWorks is unavailable for more than 5% of any given month.

6. No Infringement. FlowWorks represents the product and services offered hereunder are owned or are the properly licensed property of FlowWorks. FlowWorks further represents the products, services and software furnished under this Agreement are free and clear of infringement in the U.S. of any patent or copyright covering the structure or composition of such articles.

In the event of a claim, suit or action against User alleging such infringement, FlowWorks shall indemnify and save User harmless from liability as finally determined by a court of competent jurisdiction, for such infringement.

7. LIABILITY LIMITATION. Users can recover from the FlowWorks parties only direct damages. Users cannot recover any other damages, including consequential, lost profits, special, indirect, incidental or punitive damages. This limitation applies to anything related to:

- the FlowWorks Service,

- viruses or other disabling features that affect Users access to or use of the FlowWorks Service,
- incompatibility between the FlowWorks Service and other services, software and hardware,
- delays or failures Users may have in initiating, conducting, or completing any transmissions or transactions in connection with the FlowWorks Service in an accurate or timely manner, and
- claims for breach of contract, breach of warranty, guarantee or condition, strict liability, negligence or other tort,

and

It also applies if:

- this remedy does not fully compensate Users for any losses, or fails of its essential purpose; or
- FlowWorks knew or should have known about the possibility of damages.

8. Indemnification. Each party shall indemnify and hold harmless the other party and their respective shareholders, directors, officers employees and agents (each an "Indemnified Party") from and against any and all third party suits or proceedings, claims, demands, causes of action, damages, expenses (including without limitation reasonable attorneys' fees and other legal expenses), liabilities and other losses resulting from or arising out of the wrongful acts or omissions of the offending party, or any person acting on Users behalf, in connection with Users use of the FlowWorks Service, including without limitation (i) a breach of any provision, representation or warranty of this contract, or (ii) the negligence or willful misconduct (whether by act or omission of either party or any person under the party's control or acting on the party's behalf. or (iii) any use of the FlowWorks Service by Users, or a third party within Users control or behalf, that is not in accord with this Agreement.

9. Ownership of Intellectual Property. Users acknowledge and agree that (a) the FlowWorks Data Service, and all intellectual property rights (such as copyrights, patents, and trade secrets) pertaining to the FlowWorks Data Service are owned exclusively by FlowWorks, and are protected under U.S. patent, copyright, trademark and trade secret laws of general applicability; and (b) all right, title and interest in and to the FlowWorks Data Service, together with all modifications, enhancements, and derivative works, and all intellectual property rights such as copyrights, patents and trade secrets, pertaining to the FlowWorks Data Service are and shall remain owned exclusively by FlowWorks.

10. Protection of Intellectual Property. Users agree to establish reasonable precautions and use commercially reasonable efforts, no less rigorous than those Users use to protect their own confidential information, to protect and maintain the confidentiality and security of the FlowWorks Data Service in Users control and to which Users have access. Without limiting the generality of the foregoing, Users shall use reasonable measures to protect the FlowWorks Data Service from unauthorized copying, dissemination, or disclosure and from other unauthorized use.

11. Assignment. Users may not assign or dispose of any rights or obligations under this contract, without FlowWorks prior written consent.

12. No Third Party Beneficiaries. This contract is solely for Users, its designated customer and FlowWorks benefit. It is not for the benefit of any other person, except for permitted successors and assigns under this contract.

13. Claims Must Be Filed Within One Year. Any claim related to this Agreement or the FlowWorks Service may not be brought unless brought within one year. The one-year period begins on the date when the claim first could be filed. If it is not filed in time, then that claim is permanently barred.

14. Severability. If any term or condition is determined by the court having jurisdiction to be overbroad or unenforceable, the smallest possible part of the Term or Condition shall be severed, with the remainder of these Terms and Conditions fully enforceable.

15. Modifications to These Terms and Conditions. We may change the Terms and Conditions related to use of the FlowWorks Service from time to time by updating this posting. Please visit the Terms and Conditions area each time you visit the FlowWorks website to keep up to date with the current terms and conditions regarding your use of the FlowWorks Service. Your continued use of the FlowWorks Service constitutes an affirmative: (1) acknowledgment by you of the Terms and Conditions and any modifications thereof, and (2) your agreement to abide by and be bound by the Terms and Conditions as modified.

16. No Modification of Agreement. Except as set forth in Section 15 above, this Agreement may not be modified or amended, except in writing signed by the parties to this Agreement.

17. Arbitration. All claims, disputes, and/or issues arising under, arising out of, or relating to the Agreement between FlowWorks and Users, without exception, will be settled by arbitration in Seattle, Washington, by a sole arbitrator, in accordance with the commercial arbitration rules of the American Arbitration Association ("AAA") then in effect, except that the arbitrator shall

deliver to the parties a reasoned award in writing, whether or not otherwise required or permitted by AAA rules. A judgment upon the award entered by the arbitrator may be entered in any court having jurisdiction thereof. The successful or prevailing party in any arbitration proceeding shall be entitled to an award which includes its reasonable attorneys' fees, costs and expenses. The arbitration shall be decided under and in accordance with the laws of the State of Washington, without reference to Washington State's choice of law principles.

18. Notices. All notices permitted or required under this Agreement shall be in writing and will be deemed given upon actual delivery. Any notice will be addressed to the party at the address set forth in the Service Agreement.

19. Entire Agreement. This Agreement consists of the Service Agreement, Terms and Conditions, and referenced Appendix A, which contain the entire agreement of the parties hereto concerning the subject matter hereof. All previous oral and/or written agreements concerning this subject matter are superseded hereby.

APPENDIX A: SCOPE OF SERVICES AND COSTS

PART A:

Set Up Charges

<u>Task</u>	<u>Unit Cost</u>	<u>Quantity</u>	<u>Total</u>
Set up (XX) data sites (1-time cost)	\$150.00 each	TBD	As required
Reconnect (XX) previously inactive (non-reporting) data sites in same location (1-time cost)	\$100.00 each	TBD	As required
Total Set Up Charges:			\$XX.00

Optional Items

<u>Task</u>	<u>Unit Cost</u>	<u>Quantity</u>	<u>Total</u>
Import historic data from (XX) data sites (assumes site data files in consistent format)	\$25.00 each	TBD	As required
Set up additional sites including SCADA sites (1-time cost)	\$150.00 each	TBD	As required
Set up (XX) historic (non-reporting) sites (1-time cost)	\$150.00 each	TBD	As required
Set up (XX) local USGS and NOAA sites and display on overlay (1-time cost)	\$150.00 each	TBD	As required
Custom Programming: adjustments to forms etc. (to be estimated prior to commencing work)	\$115.00 / hour	TBD	As required
Total Optional Items:			\$XX.00

Monthly Service Charges

<u>Task</u>	<u>Unit Cost</u>	<u>Quantity</u>	<u>Total</u>
Site monthly service fees (including SCADA sites)	\$25.00 / month	TBD	As required
Site monthly service fees for historic (inactive/non-reporting) sites		TBD	No charge
Site monthly service fees for local USGS and NOAA sites		TBD	No charge
Total Monthly Service Charges:			\$XX.00

PART B:

1. Set Up means the initial server configuration to allow a new or reactivated site to accept incoming data and be displayed by the FlowWorks data service (i.e. site name, location, channel names, file format, etc.). Set Up includes time for FlowWorks staff to be available via phone and email support to confirm with User's field staff that a site is successfully connecting to FlowWorks. Set Up also covers basic set up of calculations in the FlowWorks systems (basic flow parameters, etc. supplied by User) as required.
2. Custom Programming means additional programming beyond Set Up (defined in 1, above) intended to allow the User to use FlowWorks to meet specific needs. By adding business and application-specific reporting, analysis and display functions to the basic FlowWorks interface, FlowWorks developers can deliver the precise system required.
3. Data Sites include active sites and deactivated sites. An Active Site is a site set up on the FlowWorks data service and available to receive data from the FlowWorks Service. A site is deemed to be Active from the time it is set up until such time as the User notifies FlowWorks management in writing that the site is to be deactivated. A Deactivated Site, also known as an "Inactive", "Historic" or "Non-Reporting" site, is a site that has been disconnected from the FlowWorks Service.
4. FlowWorks Charges for Active Sites. The monthly service fee applies to all sites active for any part of a given month.
5. Deactivated Site Data is available to Users if:
 - a. Users have one or more active sites on FlowWorks and are current in payment of FlowWorks fees, or
 - b. Users do not have an active site but have contracted to pay FlowWorks an agreed upon monthly data maintenance charge.

In the event Users do not comply with either 5.a or 5.b, FlowWorks may, at its sole discretion, remove Users' login accounts, block access to Users' data and purge Users' data from the FlowWorks servers.
6. Data Back Up is provided by FlowWorks using both onsite and offsite systems, as part of Users monthly fees, but **FlowWorks does not provide warranties for the FlowWorks Service and it limits its liability for data loss (see Terms and Conditions, Sections 1 and 7). FlowWorks recommends that Users back up data from FlowWorks routinely to their own systems.** FlowWorks will consult with you on data back-up procedures during the Set Up phase of the FlowWorks Service.

From: [Chew, Luanne C ENV:EX](#)
To: [Schultz, Fern ENV:EX](#)
Subject: FW: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
Date: Friday, September 6, 2013 2:44:00 PM

Hi Fern,

Below is the original note sent by Lotte and Carol (of EMBC) on this topic. I highlighted Lotte's comments that I was being included as an FYI.

Luanne

From: Loski, Carol JAG:EX
Sent: Tuesday, September 3, 2013 1:42 PM
To: Flint-Petersen, Lotte FLNR:EX; Kryzanowski, Kelli JAG:EX
Cc: Berardinucci, Julia F FLNR:EX; Hamod, Wendy D FLNR:EX; Chew, Luanne C ENV:EX
Subject: RE: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
s.13,s.17

Let me know if you need more. Carol

From: Flint-Petersen, Lotte FLNR:EX
Sent: Tuesday, September 3, 2013 1:05 PM
To: Loski, Carol JAG:EX
Cc: Berardinucci, Julia F FLNR:EX; Hamod, Wendy D FLNR:EX; Chew, Luanne C ENV:EX
Subject: FW: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
Importance: High
Hi Carol,
s.13,s.17

Do you have documents outlining estimated installation costs and maintenance costs?

Any information you can provide would be really helpful. I think the timeline on the UBCM brief is 4 Sept (tomorrow).

By copy to Luanne, this is FYI.

Thanks.

Regards,

Lotte

Lotte Flint-Petersen M.Eng., MBA., P.Eng
Acting Section Head Flood and Groundwater Section and
Senior Flood Hazard Management Engineer
Ministry of Forests, Lands and Natural Resource Operations
Suite 200 - 10428 153rd Street
Surrey, BC
V3R 1E1
Phone: (604) 586-3721

Lotte.Flint-Petersen@gov.bc.ca
http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/safety_index.html
Water for BC Safe, Sustainable and Valued by all.



Please consider the environment before printing this email

From: Hamod, Wendy D FLNR:EX
Sent: Friday, August 30, 2013 8:05 AM
To: Berardinucci, Julia F FLNR:EX; Flint-Petersen, Lotte FLNR:EX
Subject: RE: New Action Item to Come Time Sensitive - but start earlier UBCM Meeting - Squamish-Lillooet RD
Hi Julia,

SLRD's only topics last year were Riverside Park and the Hurley Road. I don't recall this topic previously, but if you have any other

From: [Schultz, Fern ENV:EX](#)
To: [Morrison, Trevor FLNR:EX](#); [Goad, Jennifer FLNR:EX](#)
Cc: [Berardinucci, Julia F ENV:EX](#); [Chew, Luanne C ENV:EX](#); [Day, Kristin ENV:EX](#)
Subject: MoE input to UBCM 2013 SLRD-Early Warning System-HM approved
Date: Friday, September 6, 2013 3:42:50 PM
Attachments: [SLRD Flood Early Warning System UBCM 2013.msg](#)
[UBCM 2013 SLRD-Early Warning System-HM approved.docx](#)

Hello Jennifer and Trevor,

Please find attached the UBCM note referred to in the Subject line.

I have provide changes in two places (with “track changes” ON) which address my concerns regarding implications for funding of the proposed system.

I have also attached an email with a DRAFT companion note for Minister Polak which has been prepared to ensure consistency in messaging on this matter.

Please let me know if you have any questions.

Thanks!

Fern

Fern Schultz

Executive Director, Knowledge Management

Environmental Sustainability and Strategic Policy
Ministry of Environment

From: [Schultz, Fern ENV:EX](#)
To: [Day, Kristin ENV:EX](#)
Subject: SLRD Flood Early Warning System UBCM 2013
Date: Friday, September 6, 2013 3:35:00 PM
Attachments: [SLRD Early Flood Warning System UBCM 2013.docx](#)
Importance: High

Here is my note regarding the SLRD Flood System:

I will copy you on my input to the FLNRO note.

Thanks

Fern

Page 101 to/à Page 102

Withheld pursuant to/removed as

s.13

From: [Morrison, Trevor FLNR:EX](#)
To: [Schultz, Fern ENV:EX](#); [Goad, Jennifer FLNR:EX](#)
Cc: [Berardinucci, Julia F ENV:EX](#); [Chew, Luanne C ENV:EX](#); [Day, Kristin ENV:EX](#)
Subject: RE: MoE input to UBCM 2013 SLRD-Early Warning System-HM approved
Date: Tuesday, September 10, 2013 6:17:22 PM
Attachments: [16-PM04.20-538- Squamish-Lillooet RD - Pt. 5 Flood Early Warning System.docx](#)
[16-PM04.20-538- Squamish-Lillooet RD - Pt. 5 Flood Early Warning System \(EMBC\).doc](#)
[16-PM04.20-538- Squamish-Lillooet RD - Pt. 5 Flood Early Warning System \(MOE\).docx](#)

Fern,

The final version of our note is attached; no significant changes. I've also included the companion notes provided by MOE and EMBC for comparison.

Regards,

Trevor Morrison
Manager, Executive Services
Ministry of Forests, Lands and Natural Resource Operations

From: Schultz, Fern ENV:EX
Sent: Friday, September 6, 2013 3:43 PM
To: Morrison, Trevor FLNR:EX; Goad, Jennifer FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX; Chew, Luanne C ENV:EX; Day, Kristin ENV:EX
Subject: MoE input to UBCM 2013 SLRD-Early Warning System-HM approved

Hello Jennifer and Trevor,

Please find attached the UBCM note referred to in the Subject line.

I have provide changes in two places (with "track changes" ON) which address my concerns regarding implications for funding of the proposed system.

I have also attached an email with a DRAFT companion note for Minister Polak which has been prepared to ensure consistency in messaging on this matter.

Please let me know if you have any questions.

Thanks!
Fern

<< Message: SLRD Flood Early Warning System UBCM 2013 >>
<< File: UBCM 2013 SLRD-Early Warning System-HM approved.docx >>

Fern Schultz
Executive Director, Knowledge Management
Environmental Sustainability and Strategic Policy

MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

BRIEFING NOTE FOR 2013 UBCM CONVENTION

I PREPARED FOR:

Minister Thomson's Meeting with Squamish-Lillooet Regional District

II ISSUE: Mt. Meager and Upper Lillooet River Flood Early Warning System

III BACKGROUND / DISCUSSION:

The Squamish-Lillooet Regional District (SLRD) is requesting the Province install a flood warning/river monitoring system on the Upper Lillooet River. The system would warn the Village of Pemberton (Village) if a flood occurred from a slide event at the Mount Meager Complex.

Flooding on the Lillooet River can arise from a number of different natural mechanisms including rainfall and snowmelt events as well as outburst events from debris jams or landslide events. Flooding has occurred in the past.

Jurisdiction over flood management in the Lillooet River includes many organizations: the SLRD, Pemberton Valley Diking District, the Village, Lil'Wat Nation (Mount Currie Indian Band) and others. Through legislative changes in 2003, the responsibility for providing flood protection to people and property became the responsibility of Local Governments.

Engineering studies recommend the installation of a near real-time water level monitoring system on the Hurley Forest Service Road Bridge crossing the Lillooet River. This system would provide downstream residents two hours of advanced warning of an impending flood wave. The system would be similar to those typically operated by Water Survey of Canada (WSC) within BC's hydrometric network. Installation of any new stations for operation by the WSC must include provision of ongoing operational costs as funding for the existing network is already over-subscribed.

s.13,s.17

s.13,s.17

IV SPEAKING/RESPONSE POINTS

- Responsibility for providing adequate flood protection to people and property has been the responsibility of local governments since 2003.
- The ongoing support for the operation and maintenance of an early warning system is currently not within the provincial mandate.
- FLNR will work with SLRD on *Dike and Water Act* items which are within the responsibility of FLNR.
- Installation and equipment costs for flood protection infrastructure is supported on a priority basis by EMBC as part of their Flood Protection Program.
- BC's water quantity monitoring network is co-managed by MOE and Environment Canada, with operational funding provided by a range of partners. FLNR can provide assistance with directing the request to consider any addition to the network to MOE.
- In light of government's current fiscal circumstances, it is necessary to prioritize engineering works that fall in the realm of flood mitigation for Public Safety. FLNR will continue to explore policy development with EMBC and MOE for this issue.

Lotte Flint-Petersen

September 4, 2013

Page 107 to/à Page 110

Withheld pursuant to/removed as

s.13

From: [Chew, Luanne C ENV:EX](#)
To: [Hays-Byl, Winn ENV:EX](#)
Subject: FW: MoE input to UBCM 2013 SLRD-Early Warning System-HM approved
Date: Thursday, September 12, 2013 11:04:00 AM
Attachments: [16-PM04.20-538- Squamish-Lillooet RD - Pt. 5 Flood Early Warning System.docx](#)
[16-PM04.20-538- Squamish-Lillooet RD - Pt. 5 Flood Early Warning System \(EMBC\).doc](#)
[16-PM04.20-538- Squamish-Lillooet RD - Pt. 5 Flood Early Warning System \(MOE\).docx](#)

Winn,

Attached are the final versions of the 3 notes, with yourself named as the alternative contact on the MOE one.

Luanne

From: Morrison, Trevor FLNR:EX
Sent: Tuesday, September 10, 2013 6:17 PM
To: Schultz, Fern ENV:EX; Goad, Jennifer FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX; Chew, Luanne C ENV:EX; Day, Kristin ENV:EX
Subject: RE: MoE input to UBCM 2013 SLRD-Early Warning System-HM approved

Fern,

The final version of our note is attached; no significant changes. I've also included the companion notes provided by MOE and EMBC for comparison.

Regards,

Trevor Morrison

Manager, Executive Services

Ministry of Forests, Lands and Natural Resource Operations

From: Schultz, Fern ENV:EX
Sent: Friday, September 6, 2013 3:43 PM
To: Morrison, Trevor FLNR:EX; Goad, Jennifer FLNR:EX
Cc: Berardinucci, Julia F FLNR:EX; Chew, Luanne C ENV:EX; Day, Kristin ENV:EX
Subject: MoE input to UBCM 2013 SLRD-Early Warning System-HM approved
Hello Jennifer and Trevor,

Please find attached the UBCM note referred to in the Subject line.

I have provide changes in two places (with "track changes" ON) which address my concerns regarding implications for funding of the proposed system.

I have also attached an email with a DRAFT companion note for Minister Polak which has been prepared to ensure consistency in messaging on this matter.

Please let me know if you have any questions.

Thanks!

Fern

<< Message: SLRD Flood Early Warning System UBCM 2013 >>

<< File: UBCM 2013 SLRD-Early Warning System-HM approved.docx >>

Fern Schultz

Executive Director, Knowledge Management

Environmental Sustainability and Strategic Policy

Ministry of Environment

MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

BRIEFING NOTE FOR 2013 UBCM CONVENTION

I PREPARED FOR:

Minister Thomson's Meeting with Squamish-Lillooet Regional District

II ISSUE: Mt. Meager and Upper Lillooet River Flood Early Warning System

III BACKGROUND / DISCUSSION:

The Squamish-Lillooet Regional District (SLRD) is requesting the Province install a flood warning/river monitoring system on the Upper Lillooet River. The system would warn the Village of Pemberton (Village) if a flood occurred from a slide event at the Mount Meager Complex.

Flooding on the Lillooet River can arise from a number of different natural mechanisms including rainfall and snowmelt events as well as outburst events from debris jams or landslide events. Flooding has occurred in the past.

Jurisdiction over flood management in the Lillooet River includes many organizations: the SLRD, Pemberton Valley Diking District, the Village, Lil'Wat Nation (Mount Currie Indian Band) and others. Through legislative changes in 2003, the responsibility for providing flood protection to people and property became the responsibility of Local Governments.

Engineering studies recommend the installation of a near real-time water level monitoring system on the Hurley Forest Service Road Bridge crossing the Lillooet River. This system would provide downstream residents two hours of advanced warning of an impending flood wave. The system would be similar to those typically operated by Water Survey of Canada (WSC) within BC's hydrometric network. Installation of any new stations for operation by the WSC must include provision of ongoing operational costs as funding for the existing network is already over-subscribed.

s.13,s.17

s.13,s.17

IV SPEAKING/RESPONSE POINTS

- Responsibility for providing adequate flood protection to people and property has been the responsibility of local governments since 2003.
- The ongoing support for the operation and maintenance of an early warning system is currently not within the provincial mandate.
- FLNR will work with SLRD on *Dike and Water Act* items which are within the responsibility of FLNR.
- Installation and equipment costs for flood protection infrastructure is supported on a priority basis by EMBC as part of their Flood Protection Program.
- BC's water quantity monitoring network is co-managed by MOE and Environment Canada, with operational funding provided by a range of partners. FLNR can provide assistance with directing the request to consider any addition to the network to MOE.
- In light of government's current fiscal circumstances, it is necessary to prioritize engineering works that fall in the realm of flood mitigation for Public Safety. FLNR will continue to explore policy development with EMBC and MOE for this issue.

Lotte Flint-Petersen

September 4, 2013

Page 114 to/à Page 115

Withheld pursuant to/removed as

s.13

From: [Chew, Luanne C ENV:EX](#)
To: [Morrison, Andrew TRAN:EX](#)
Subject: Mt Meager Warning system discussion
Date: Friday, October 25, 2013 3:40:00 PM

Hi Andrew,

I'm happy to participate in the call, but I think it would also be beneficial to have Dan Hogan join in. He is the technical expert with the MOE Hydrometric Program and has dealt with this initiative prior to me. He has also had more discussion with Water Survey of Canada with respect to the merits of a hydrometric station for this purpose. Is it okay if I forward the meeting invite to him?

Regards,

Luanne

Luanne Chew, P.Geo.
Hydrometric Specialist
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1
ph: 250-387-1817
fx: 250-356-5496

From: [Chew, Luanne C ENV:EX](#)
To: [Morrison, Andrew TRAN:EX](#)
Subject: RE: Mt Meager Warning system discussion
Date: Friday, October 25, 2013 3:43:00 PM

Thanks.

From: Morrison, Andrew JAG:EX
Sent: Friday, October 25, 2013 3:43 PM
To: Chew, Luanne C ENV:EX
Subject: Re: Mt Meager Warning system discussion
Hi Luanne

That would be great. I was going to ask you if others should be invited. I will forward the invite to him.

Thanks

Andrew Morrison
Regional Manager
Emergency Management BC

From: Chew, Luanne C ENV:EX
Sent: Friday, October 25, 2013 03:40 PM Pacific Standard Time
To: Morrison, Andrew JAG:EX
Subject: Mt Meager Warning system discussion
Hi Andrew,

I'm happy to participate in the call, but I think it would also be beneficial to have Dan Hogan join in. He is the technical expert with the MOE Hydrometric Program and has dealt with this initiative prior to me. He has also had more discussion with Water Survey of Canada with respect to the merits of a hydrometric station for this purpose. Is it okay if I forward the meeting invite to him?

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ph: 250-387-1817
fx: 250-356-5496

From: [Hogan, Dan ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#)
Subject: Pemberton Warning System
Date: Wednesday, November 6, 2013 6:48:17 AM

Hi, Did you send me the files re Hurley Bridge station and other info, in preparation for today's call? I can't find them on my machine, so if they're here I'll keep looking.

Thanks.

From: [Chew, Luanne C ENV:EX](#)
To: [Hays-Byl, Winn ENV:EX](#)
Cc: [Hogan, Dan ENV:EX](#)
Subject: Proposed Lillooet station early warning landslide system conference call update
Date: Wednesday, November 6, 2013 3:03:00 PM

Winn,

Dan and I just finished our call with the EMBC folks about the above. Essentially, the EMBC folks were instructed by their Minister to find a “creative solution” to make this work. Sounds like money can be found to pay for the station install and associated infrastructure, but they are looking for MOE to help with the ongoing annual O&M. The regional district might be able to come up with “some” money for this (I need to get clarification on this, but it doesn’t sound like much), but they are hoping we can kick in the rest.

We made it very clear that our budget is fully allocated, and there is no money for any new stations. As an alternative, Dan proposed that he would look at the results of the network review and determine if there might be any candidate stations to be moved to that site. He plans to discuss further with WSC to determine what might work best operationally for them.

They plan to organize another call in the next 2 weeks (Nov. 18?) to see what progress has been made. If you would like to join in on that discuss, I can have you added to the invite list.

Dan, if I’ve missed anything, please feel free to add.

Luanne

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BC Ministry of Environment
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From: [Morrison, Andrew](#) TRAN:EX
To: [Hogan, Dan](#) ENV:EX; [Oakley, John](#) JAG:EX; [Chew, Luanne C](#) ENV:EX; [Southam, Dave](#) FLNR:EX; [Flint-Petersen, Lotte](#) FLNR:EX
Subject: Mt Meager - Warning system - Staff Discussion continued
Attachments: [2013 Lillooet River Warning system summary_sf \(2\).docx](#)

When: Monday, November 18, 2013 15:30-16:30 (GMT-08:00) Pacific Time (US & Canada).
Where: Conference Call - S.17

Note: The GMT offset above does not reflect daylight saving time adjustments.

~~*~*~*~*~*~*~*

For reference, Attached is the current PVDD proposal for the warning system.

From: [Hogan, Dan ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#)
Subject: RE: Proposed Lillooet station early warning landslide system conference call update
Date: Wednesday, November 6, 2013 3:20:30 PM

I'm just hoping that Winn and Fern can see this as an example of their willingness to search for opportunities, to "find creative solutions".

From: Chew, Luanne C ENV:EX
Sent: Wednesday, November 6, 2013 3:03 PM
To: Hays-Byl, Winn ENV:EX
Cc: Hogan, Dan ENV:EX
Subject: Proposed Lillooet station early warning landslide system conference call update
Winn,

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Dan, if I've missed anything, please feel free to add.

Luanne

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From: [Hays-Byl, Winn ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#)
Cc: [Hogan, Dan ENV:EX](#)
Subject: RE: Proposed Lillooet station early warning landslide system conference call update
Date: Wednesday, November 6, 2013 4:34:47 PM

Thanks Luanne, yes I would like to join the next call. I think MoE's only option was to further examine the network review re candidate stations; that is the only flexibility that we have at this time, and it's not much – we still have the funding pressure associated with ongoing maintenance.

From: Chew, Luanne C ENV:EX
Sent: Wednesday, November 6, 2013 3:03 PM
To: Hays-Byl, Winn ENV:EX
Cc: Hogan, Dan ENV:EX
Subject: Proposed Lillooet station early warning landslide system conference call update
Winn,

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From: [Hogan, Dan ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#)
Subject: FW: Proposed Lillooet station early warning landslide system conference call update
Date: Thursday, November 7, 2013 6:16:55 AM

Nicely done, got us to where we wanted to be. Good work, thanks, eh.

From: Hays-Byl, Winn ENV:EX
Sent: Wednesday, November 6, 2013 4:35 PM
To: Chew, Luanne C ENV:EX
Cc: Hogan, Dan ENV:EX
Subject: RE: Proposed Lillooet station early warning landslide system conference call update
Thanks Luanne, yes I would like to join the next call. I think MoE's only option was to further examine the network review re candidate stations; that is the only flexibility that we have at this time, and it's not much – we still have the funding pressure associated with ongoing maintenance.

From: Chew, Luanne C ENV:EX
Sent: Wednesday, November 6, 2013 3:03 PM
To: Hays-Byl, Winn ENV:EX
Cc: Hogan, Dan ENV:EX
Subject: Proposed Lillooet station early warning landslide system conference call update
Winn,

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From: [Morrison, Andrew](#) TRAN:EX
To: [Southam, Dave](#) FLNR:EX
Cc: [Hogan, Dan](#) ENV:EX; [Chew, Luanne C](#) ENV:EX; [Hays-Byl, Winn](#) ENV:EX
Subject: RE: Meager Warning System
Date: Thursday, November 14, 2013 7:54:11 AM
Attachments: [image002.png](#)

Hi Dave

Thanks for the information. By way of CC, I have also shared this with the others for discussion on the call on Monday.

Andrew Morrison

Regional Manager, Southwest Region



14292 Green Timbers Way
Surrey, BC V3T 0J4
CANADA

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Fax 604.586.4334

24 Hour Emergency Reporting 1.800.663.3456

From: Southam, Dave FLNR:EX
Sent: Wednesday, November 13, 2013 17:51 PM
To: Morrison, Andrew JAG:EX
Cc: Oakley, John JAG:EX; Flint-Petersen, Lotte FLNR:EX
Subject:

Hi Andrew,

I had the chance to speak with both Matthias Jakob and Pierre Friele very briefly last week about installation of a water flow gauge on the Lillooet River as a means of providing some warning to Pemberton. Although outside of my area of expertise and there are lots of water experts on your call who could probably tell you this, I did take away a couple items from a practical stand point:

1. The narrowing of the Lillooet River near the confluences of North and South Creeks may be a better location than the proposed site at the "forestry bridge" (ie start of Lillooet River FSR)
 - a. The constriction of the river at this point would provide improved data.
 - b. It's located above the residents in the Pemberton meadows where as the forestry bridge location is downstream of some residents.
 - c. May provide for important data a little quicker than if the data collection point is lower down.
2. Low flow is not the only measure of concern.
 - a. A surge pulse is also a threat worth monitoring.
 - b. Not all landslides have resulted in a dam being formed across Meager Creek or the Lillooet river and restricting/stopping flow.
 - c. The 2009 Capricorn slide resulted in a surge pulse being pushed down the river where as the 2010 slide created dams across the Meager and Lillooet. The dam resulted in the low flow and then a pulse following the breach of the earth dam on the Meager. (see attached).

3. Seismic data is not necessarily a reliable surrogate for this type of threat.

- a. Most landslides are not picked up by the seismic instrumentation and thus would not serve as an adequate warning.

All for now,

Dave

Dave Southam, RPF

District Manager

Sea to Sky District

Ministry of Forests, Lands and Natural Resource Operations

Tel: (604) 898-2141

Fax: (604) 898-2191

E-mail: Dave.Southam@gov.bc.ca

Our Vision: Economic prosperity and environmental sustainability



From: [Chew, Luanne C ENV:EX](#)
To: [Hogan, Dan ENV:EX](#)
Cc: [Hays-Byl, Winn ENV:EX](#)
Subject: FW: Meager Warning System
Date: Monday, November 18, 2013 9:11:00 AM
Attachments: [image002.png](#)

Dan,

Might this proposed new location have implications for:

- Installation/maintenance costs?
- Sensor suitability (radar?)
- Power supply?
- Communications?

We can discuss during our call at 1PM.

Luanne

From: Morrison, Andrew JAG:EX
Sent: Thursday, November 14, 2013 7:54 AM
To: Southam, Dave FLNR:EX
Cc: Hogan, Dan ENV:EX; Chew, Luanne C ENV:EX; Hays-Byl, Winn ENV:EX
Subject: RE: Meager Warning System

Hi Dave

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Sent: Wednesday, November 13, 2013 17:51 PM
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 - b. It's located above the residents in the Pemberton meadows where as the forestry

bridge location is downstream of some residents.

- c. May provide for important data a little quicker than if the data collection point is lower down.

2. Low flow is not the only measure of concern.

- a. A surge pulse is also a threat worth monitoring.
- b. Not all landslides have resulted in a dam being formed across Meager Creek or the Lillooet river and restricting/stopping flow.
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E-mail: Dave.Southam@gov.bc.ca

Our Vision: Economic prosperity and environmental sustainability



From: [Chew, Luanne C ENV:EX](#)
To: [Hogan, Dan ENV:EX](#)
Subject: RE: Meager Warning System
Date: Monday, November 18, 2013 11:50:00 AM
Attachments: [image001.png](#)

Sure, we'll give you a call.

From: Hogan, Dan ENV:EX
Sent: Monday, November 18, 2013 11:50 AM
To: Chew, Luanne C ENV:EX
Subject: RE: Meager Warning System
Hi, Will you and Winn phone me at 1:00? Thanks.

From: Chew, Luanne C ENV:EX
Sent: Monday, November 18, 2013 9:12 AM
To: Hogan, Dan ENV:EX
Cc: Hays-Byl, Winn ENV:EX
Subject: FW: Meager Warning System
Dan,

Might this proposed new location have implications for:

- Installation/maintenance costs?
- Sensor suitability (radar?)
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- Communications?

We can discuss during our call at 1PM.

Luanne

From: Morrison, Andrew JAG:EX
Sent: Thursday, November 14, 2013 7:54 AM
To: Southam, Dave FLNR:EX
Cc: Hogan, Dan ENV:EX; Chew, Luanne C ENV:EX; Hays-Byl, Winn ENV:EX
Subject: RE: Meager Warning System
Hi Dave

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Cc: Oakley, John JAG:EX; Flint-Petersen, Lotte FLNR:EX
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Our Vision: Economic prosperity and environmental sustainability



From: [Chew, Luanne C ENV:EX](#)
To: [Hays-Byl, Winn ENV:EX](#)
Cc: [Hogan, Dan ENV:EX](#)
Subject: Our Mt. Meagre call is finished
Date: Monday, November 18, 2013 4:19:00 PM

Winn,

To summarize our call with EMBC etc:

- There was some discussion about the technical suitability of the second proposed site further upstream. The Pemberton Valley Diking District preferred the bridge site downstream, even though there are a few residents living upstream of that.
- We discussed why the original proposal to install the station was not funded by EMBC. The primary reason appears to be the question of ongoing operations and maintenance costs and who would pay.
- EMBC asked MOE if we could come up with the money to fund the annual operations and maintenance, and Dan and I made it clear that the funding had to come from a third party, not our budget. It sounded like they haven't fully figured out where to get the money to install the station, so that piece of it was by no means secured.
- EMBC will re-evaluate the situation and may get back to us. If they can put together third party funding, they know that I am the person to coordinate with. The directive from their Minister (Anton) was to figure out how the "royal we" could fund this, but since we had said our budget cannot accommodate this, I don't know where they will go from here.

Dan, please add any comments you have.

Luanne

Luanne Chew, P.Geo.
Hydrometric Specialist
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
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ph: 250-387-1817
fx: 250-356-5496

From: [Hays-Byl, Winn ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#)
Cc: [Hogan, Dan ENV:EX](#)
Subject: RE: Our Mt. Meagre call is finished
Date: Tuesday, November 19, 2013 9:05:56 AM

Thanks very much for the summary. Unfortunately, I was caught in traffic and unable to join the call.

Was there any interest in exploring other possible options instead of a hydrometric gauge?

From: Chew, Luanne C ENV:EX
Sent: Monday, November 18, 2013 4:19 PM
To: Hays-Byl, Winn ENV:EX
Cc: Hogan, Dan ENV:EX
Subject: Our Mt. Meagre call is finished
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- There was some discussion about the technical suitability of the second proposed site further upstream. The Pemberton Valley Diking District preferred the bridge site downstream, even though there are a few residents living upstream of that.
- We discussed why the original proposal to install the station was not funded by EMBC. The primary reason appears to be the question of ongoing operations and maintenance costs and who would pay.
- EMBC asked MOE if we could come up with the money to fund the annual operations and maintenance, and Dan and I made it clear that the funding had to come from a third party, not our budget. It sounded like they haven't fully figured out where to get the money to install the station, so that piece of it was by no means secured.
- EMBC will re-evaluate the situation and may get back to us. If they can put together third party funding, they know that I am the person to coordinate with. The directive from their Minister (Anton) was to figure out how the "royal we" could fund this, but since we had said our budget cannot accommodate this, I don't know where they will go from here.

Dan, please add any comments you have.

Luanne

Luanne Chew, P.Geo.
Hydrometric Specialist
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1
ph: 250-387-1817
fx: 250-356-5496

From: [Chew, Luanne C ENV:EX](#)
To: [Hays-Byl, Winn ENV:EX](#)
Cc: [Hogan, Dan ENV:EX](#)
Subject: RE: Our Mt. Meagre call is finished
Date: Tuesday, November 19, 2013 9:12:00 AM

It didn't really get brought up. The seismic monitoring was discounted because the consultants thought it might miss the event. No other options were discussed. I think because the ensuing flood brought on by the landslide is the perceived risk, a water level gauge is the focus. I suppose it is possible to have a landslide without a flood, so monitoring for just a landslide isn't what they are looking for.

Luanne

From: Hays-Byl, Winn ENV:EX
Sent: Tuesday, November 19, 2013 9:06 AM
To: Chew, Luanne C ENV:EX
Cc: Hogan, Dan ENV:EX
Subject: RE: Our Mt. Meagre call is finished

Thanks very much for the summary. Unfortunately, I was caught in traffic and unable to join the call.

Was there any interest in exploring other possible options instead of a hydrometric gauge?

From: Chew, Luanne C ENV:EX
Sent: Monday, November 18, 2013 4:19 PM
To: Hays-Byl, Winn ENV:EX
Cc: Hogan, Dan ENV:EX
Subject: Our Mt. Meagre call is finished
Winn,

To summarize our call with EMBC etc:

- There was some discussion about the technical suitability of the second proposed site further upstream. The Pemberton Valley Diking District preferred the bridge site downstream, even though there are a few residents living upstream of that.
- We discussed why the original proposal to install the station was not funded by EMBC. The primary reason appears to be the question of ongoing operations and maintenance costs and who would pay.
- EMBC asked MOE if we could come up with the money to fund the annual operations and maintenance, and Dan and I made it clear that the funding had to come from a third party, not our budget. It sounded like they haven't fully figured out where to get the money to install the station, so that piece of it was by no means secured.
- EMBC will re-evaluate the situation and may get back to us. If they can put together third party funding, they know that I am the person to coordinate with. The directive from their Minister (Anton) was to figure out how the "royal we" could fund this, but since we had said our budget cannot accommodate this, I don't know where they will go from here.

Dan, please add any comments you have.

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Hydrometric Specialist
BC Ministry of Environment
PO Box 9341 Stn Prov Govt
Victoria, BC V8W 9M1

ph: 250-387-1817

fx: 250-356-5496

From: [Chew, Luanne C ENV:EX](#)
To: [Chew, Luanne C ENV:EX](#)
Subject: FW: Attachments: RE: Mt Meager - Warning system - Staff Discussion
Date: Friday, December 20, 2013 3:31:03 PM

From: Flint-Petersen, Lotte FLNR:EX
Sent: Wednesday, November 6, 2013 3:29 PM
To: Morrison, Andrew JAG:EX
Cc: Hogan, Dan ENV:EX; Oakley, John JAG:EX; Chew, Luanne C ENV:EX; Southam, Dave FLNR:EX
Subject: Attachments: RE: Mt Meager - Warning system - Staff Discussion

Hi Andrew,

Thanks for hosting today's conference call.

As mentioned, attached is a map showing a possible alternate location for an early warning system (as suggested to me by P.A Friele, during the recent APEGBC Field Trip on 23 October 2013). Dave might want to discuss this location in his upcoming meeting with M. Jacob.

My high level pros and cons to this location:

Pro:

- Superior from an engineering perspective: higher up the valley and able to provide Pemberton with more warning time; located in a natural constriction of the valley.

Con:

- Might not be able to get power and communications to this site (however the 3 FLNRO water level recorders in the Fraser River main stem use a battery and solar panel and convey information via GOES satellite);
- has not been vetted with the PVDD or Village of Pemberton.
- No cost analysis done yet.

Attached FYI is the R.H. Guthrie et al, paper on "6 August 2010 Mount Meagre rock slide-debris flow...implications for hazard and risk assessment"

Regards,

Lotte

Lotte Flint-Petersen M.Eng., MBA., P.Eng
Acting Section Head for Flood and Groundwater
Senior Flood Hazard Management Engineer
Ministry of Forests, Lands and Natural Resource Operations

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Phone: (604) 586-3721

Lotte.Flint-Petersen@gov.bc.ca

http://www.env.gov.bc.ca/wsd/public_safety/flood/fhm-2012/safety_index.html

Water for BC Safe, Sustainable and Valued by all.



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

From: Morrison, Andrew JAG:EX

Sent: Friday, October 25, 2013 3:16 PM

To: Morrison, Andrew JAG:EX; Hogan, Dan ENV:EX; Oakley, John JAG:EX; Chew, Luanne C ENV:EX; Southam, Dave FLNR:EX; Flint-Petersen, Lotte FLNR:EX

Subject: Updated: Mt Meager - Warning system - Staff Discussion

When: Wednesday, November 6, 2013 1:30 PM-2:30 PM (GMT-08:00) Pacific Time (US & Canada).

Where: Conference Call - 1-877-353-9184 Conference ID: 4337659 #

Good Afternoon

As you are all aware the topic of the MT Meager Warning system came up at UBCM. Following UBCM, there was a second meeting (Sept 24) between the SLRD and Minister Anton (including EMBC staff).

From the meeting on the 24 we have been asked to look for solutions. We would like to have an internal call to discuss before we meet with the SLRD.

Any questions let us know.

Thanks

Andrew Morrison

Regional Manager, Southwest Region

<<ole0.bmp>>

14292 Green Timbers Way

Surrey, BC V3T OJ4

CANADA

www.embc.gov.bc.ca <www.gov.bc.ca/embc>

Phone 604.586.4380

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24 Hour Emergency Reporting 1.800.663.3456

<< OLE Object: Picture (Device Independent Bitmap) >>

From: [Finvers, Maija ENV:EX](#)
To: ["Waleed Elmarimi"](#)
Subject: RE: TER_Stability for Teal Jones operational areas
Date: Monday, October 22, 2012 9:03:00 AM

Hi Waleed,

It looks as if you already have all the TSM mapping available in that general area.

Terrain Stability Mapping is conducted by the forest tenure holders ahead of their operations, and submitted to us, as the provincial data custodian. If Teal Jones or any precursor tenure holders have not conducted terrain stability mapping on those watershed, or if it was conducted by not submitted to us, then we don't have it.

Maija

Maija Finvers, M.Sc., P. Geo., A.Ag.

Terrain Information Specialist, Knowledge Management Branch, MoE

Phone: (250) 387-9474

www.env.gov.bc.ca/tei/

From: Waleed Elmarimi [<mailto:welmarimi@tealjones.com>]

Sent: Monday, October 22, 2012 7:54 AM

To: Finvers, Maija ENV:EX

Subject: TER_Stability for Teal Jones operational areas

Morning Maija,

I downloaded the Terrain Stability Mapping polygons layer, TER_Stability, and found our operational areas aren't covered by this layer as shown in the attached map.

Could you please send me the TER_Stability for TJ's Ops areas?

And if possible let me know why our areas aren't covered?

Thank you.

Waleed Elmarimi

GIS Specialist

The Teal Jones Group

Surrey, BC

604-587-8791

From: Polly Uunila (Polar Geoscience Ltd.)
To: TEL_Mail_ENVC_EX
Subject: FW: digital data
Date: Monday, August 31, 2015 3:56:11 PM

Thanks for all of your help! The information I have for the projects is listed below. I found 2 names on the Ministry of Mines website that take care of digital maps according to the website – you can see their email addresses below. I love all of this data and it is great when I can get my hands on it!
Polly

From: Polly Uunila (Polar Geoscience Ltd.) [mailto:polly@pgeo.ca]
Sent: August 31, 2015 3:26 PM
To: 'Tian.Han@gov.bc.ca'; 'Yao.Cui@gov.bc.ca'
Subject: digital data

Hello,

I would like to get copies of the following maps. I would like to get them as scanned maps or in a format that can be used in ArcGIS. I am unable to figure out how to use your interactive maps online – could you please send these to me or explain how I can download them?

281	TER_145	92	G	14		1:50,000	MOE	CHEAKAMUS RIVER	SURFICIAL GEOLOGY	J. RYDER	1980
1000	TER_907	92	G	14	P	1:20,000	SRD	WHISTLER CORRIDOR	GEOLOGICAL HAZARDS	D. MAYNARD (WESTLAND RESOURCE GROUP)	1981
1001	TER_906	92	G	14	P	1:50,000	BC HYDRO	N. ROUTE, VANCOUVER I. GAS PIPELINE	GEOLOGICAL HAZARDS	D. MAYNARD (WESTLAND RESOURCE GROUP)	1982
1032	TER_905	92	G	14	P	1:6,000	MOTH	SQUAMISH-WHISTLER VILLAGE	SURFICIAL MATERIALS	R. BUCHANAN, D. LISTER & B. KERN	1991
1033	TER_785	92	G	14	E	1:25,000		GEOLOGY OF FAN (BRACKENDALE)	SURFICIAL GEOLOGY	THURBER ENG. / GOLDER ASSOC.	1992
							MOTH &				
1035	TER_904	92	G	14	P	1:50,000	EMPR	CHEAKAMUS RIVER	AGGREGATE RESOURCES	R. BUCHANAN & Z. HORA	1992

I would also like this file to, but the shape file that I downloaded was missing data like polygons: Sea to Sky Aggregate Potential Study

BCMEMP Open File 2001-12

by A.S. Hickin, E.D. Brooks, A.B. Dixon-Warren, P.T. Bobrowsky
Thank you,

Polly Uunila, P.Geo.
Senior Geoscientist & Aerial Photo Analyst
Polar Geoscience Ltd.
PO Box 5721
1005 Balsam Place
Squamish, British Columbia, V8B 0C2
Canada
Phone: 604-815-4548
Fax: 604-815-4513
Cell: 604-815-9307
Email: polly@pgeo.ca
Web: www.pgeo.ca

From: [Erwin, Corey W ENV:EX](#)
To: [Filatow, Deepa ENV:EX](#)
Subject: FW: mt meager landslide pics
Date: Thursday, August 12, 2010 9:27:32 AM

Corey Erwin

Terrestrial Ecosystems Ecologist
Ecosystems Branch, MoE
☎ (250) 387-7202

Please consider the environment before printing this email
s.22

From:
Sent: Thursday, August 12, 2010 9:15 AM
To: s.22
Subject: mt meager landslide pics

Hi there!

Thought you all would like to check out the link to some amazing photos of the recent Mt Meager landslide in Pemberton...

<http://www.flickr.com/photos/dbsteers/sets/72157624700543708/with/4874416271/>

And to think one of my old SFU profs recommended that monitoring stations should be set up to watch for small movement and shifts in that area back in 2008....

Thank goodness no one was hurt...

cheers

wm

_____ Information from ESET NOD32 Antivirus, version of virus signature database
5361 (20100812) _____

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<http://www.eset.com>