



September 13, 2018

Shawn West
Manager
Eagle Pass Heliskiing Ltd.
Box 2555
Revelstoke BC V0E 2S0

**RE: Evaluation of New Drinking Water Source (BC Well Id. Plate # 39453) and Inspection Report
Eagle Pass Day Base water system (IHA Facility # F-2018-30548)
Location: 3451 Trans-Canada Hwy BC, Revelstoke (within CSRD Electoral Area B)**

As part of the approval process, I am sending this letter in response to a request for an evaluation of the new drinking water source (BC Well Identification Plate # 39453) for the water supply system serving the Eagle Pass Day Base water system (IHA Facility # F-2018-30548). This letter also includes an inspection report regarding compliance with the [Drinking Water Protection Act](#) (DWPA) and [Drinking Water Protection Regulation](#) (DWPR).

Water Supply System Background Information:

The water supplier submitted a "Request for New Drinking Water Source Evaluation" (dated August 20, 2018) for their well (BC Well Identification Plate # 39453) which was constructed October 29, 2014.

Based on the BC Water Resource Atlas, the well is located about 2.7 kilometers west of the City of Revelstoke boundary, about 17 metres south of Trans-Canada Highway, 135 metres west of Back Road and 300 metres west of Alan Frontage Road. The water system has one connection (a building with an office and 7 bedrooms; one bed in each bedroom). The Total Population served by the water system is approximately 10. You stated "we do have clients that use the building for an hour in the am and pm each day for 4 months of the year. The staff portion of the building which is the apartment on the second floor is used for only 4 months per year from Dec 1 to April 1. The rest of the year the building is rented out to a single family for the remaining 8 months plus or minus depending on the year."

New Water Source (Well Id. Plate 39453) and Water Quality Information:

Our standard procedure is to do an evaluation of the drinking water source before our Public Health Engineer reviews a proposed treatment system and before an Environmental Health Officer issues a Permit to Operate a water supply system (for new or unpermitted water systems).

Well Data

The well (BC Well Id. Plate # 39453) was completed October 29, 2014 according to the Well Construction Report (WCR) completed by Logan Flett. The WCR states that the well was drilled to a depth of 139 feet and it has a bentonite surface seal. It is equipped with a proper vermin-proof cap. The final well stickup was measured to be 30 inches. The stainless steel screen is set from 135 feet (the intake) to 139 feet. The static water level was 92 feet below the top of the steel casing. Estimated well yield was 40 USGPM.

The lithology was reported to be: "Brown Clay & Rocks" from 0 to 27 feet, "Grey Sand & Silt" from 27 to 29 feet, "Blue Clay" from 29 to 36 feet, "Blue Clay & Rocks" from 36 to 45 feet, "Boulder" from 45 to 48 feet, "Brown Sand, Gravel & Silt" from 45 to 82 feet, "Boulder" from 82 to 85 feet, "Brown Sand, Gravel & Silt" from 85 to 110 feet and "Brown Sand & Gravel" from 110 to 139 feet. It appears the well is located in a confined aquifer.

Bus: (250) 833-4170 Fax: (250) 833-4170
brian.gregory@interiorhealth.ca
www.interiorhealth.ca

POPULATION HEALTH
P.O. Box 627, 851 – 16 Street NE
Salmon Arm, BC, V1E 4N7

The BC Aquifer Classification data indicates that the well is within an aquifer that is unmapped. However, Aquifer 8011IC(8) is located about 207 metres east of Well Identification Plate 39453 and this adjacent aquifer is confined with low vulnerability to contamination (it has been ranked as a "C" aquifer). Highly vulnerable aquifers are designated as "A" aquifers under the BC Aquifer Classification System.

Bacteriological and Chemical Quality of the Water Source (Well Id. Plate 39453)

I referred to the Interior Health *Parameter List for New Drinking Water Sources* (Sept. 2016) in my review of the water analyses for Well Identification Plate # 39453 (raw well water sampled June 11, 2018). With reference to the chemical/physical parameters of the [Guidelines for Canadian Drinking Water Quality](#) (GCDWQ), no "Maximum Acceptable Concentration" (MAC) was exceeded. Only the iron (0.539 mg/L) exceeded the "Aesthetic Objective" (AO) of the GCDWQ.

Please note that Health Canada is proposing a health-based MAC for manganese (refer to their document published June 3, 2016). A MAC of 0.1 mg/L (100 µg/L) is proposed for total manganese in drinking water. An AO of 0.02 mg/L (20 µg/L) is proposed for total manganese in drinking water. The total manganese in your well water was 0.00611 mg/L and this would not exceed either the proposed MAC or the proposed AO.

While no guideline has been established, the hardness (at 100 mg/L CaCO₃), is considered to be in the optimum range. Hardness levels between 80 and 100 mg/L provide an acceptable balance between corrosion and incrustation (as stated in the GCDWQ). The turbidity level for this well was 5.04 NTU which exceeds the Operational Guidance Value (OG) of 1.0 NTU. Turbidity is more significant for surface water sources. The GCDWQ states "for systems that use groundwater, turbidity should generally be below 1.0 NTU". The UV Transmittance (unfiltered) was 97.6% at a wavelength of 254 nm. Regarding other parameters of interest, the pH was 7.11, the Total Alkalinity was 83.8 mg/L as CaCO₃, the Nitrate (as N) was 0.070 mg/L, the Total Organic Carbon was 0.52 mg/L, the Total Dissolved Solids was 117 mg/L and the Ammonia was 0.030 mg/L.

The bacteriological sample collected June 11, 2018, indicated that there was < 1 (less than one) Total Coliform bacteria and < 1 E. coli bacteria. The WCR states that the well was disinfected.

Site Inspection:

I inspected the site of the existing well on the subject property on August 22, 2018. I took photos of the wellhead Well Identification Plate # 39453 (**WIN 39453**) and surrounding area. I also referred to our sewerage records and the site plan (submitted by Shawn West on Aug. 22, 2018) that shows the location of the well (WIN 39453) buildings and potential sources of contamination. Based on my observations, iMapBC, the submitted site plan and documents on file, the well is located approximately:

- 84 metres from the jet fueling station and jet fuel barrels;
- 17 metres from the south boundary of the Trans-Canada Highway;
- 24 metres (80 feet) from the west side of the Eagle Pass heliski office and residence;
- 32 metres (105 feet) from the septic tank (based on the sewage Letter of Certification in our records)
- 57 metres (188 feet) from the west end of the sewage dispersal field;
- 105 metres north of the CPR railroad tracks (from the submitted site plan and iMapBC);
- 13 metres from the driveway and
- 220 metres north of the bank of a small un-named stream (shown on iMapBC).

I observed that the well had a 0.9 metre (3 feet) stickup and a proper vermin-proof cap. The area around the well appeared to be graded such that the well would not be prone to surface water drainage.

Water Source Evaluation (WIN 39453):

With reference to Section 18 of the [Drinking Water Protection Act](#) (DWPA), I've reviewed your request (dated August 20, 2018) for a new drinking water source evaluation. In my evaluation, I have considered:

- the Well Construction Report (Well Completed Date: Oct. 29, 2014),
- the water analyses,

- Version 3 (Sept/2017) of the BC [Guidance Document for Determining Ground Water at Risk of Containing Pathogens](#) (GARP),
- the [Drinking Water Treatment Objectives \(Microbiological\) for Ground Water Supplies in British Columbia](#) (Nov/2015),
- the requirements of the *Groundwater Protection Regulation* (BC Reg. 39/2016) under the *Water Sustainability Act*,
- the sewerage system information (in our records) and
- the site plan submitted by the applicant.

Based on the information available and my observations; the locations of the potential sources of contamination (including sewerage systems) appear to meet separation distance requirements (to a well) of [Section 8 of the BC Health Hazards Regulation](#) (BC Reg. 216/2011) under the Public Health Act.

In my opinion, the ground water source (BC Well Identification Plate # 39453) appears to be acceptable and it is “ground water at low risk of containing pathogens” based on my review and my GARP Determination Field Form dated September 12, 2018. This water source, in my opinion, does not require disinfection treatment to meet the *Drinking Water Treatment Objectives (Microbiological) for Ground Water Supplies in British Columbia* (Nov. 2015).

The *Drinking Water Treatment Objectives (Microbiological) for Ground Water Supplies in British Columbia* were developed to provide guidance on the treatment objectives expected to be achieved before a ground water source is considered potable. If new information becomes available (from site visits, water tests, watershed assessments, hydrogeological reports, etc.) concerning the water source, we will assess the new information and provide a revised response regarding an evaluation of the drinking water source and the required microbiological treatment objectives. We support Health Canada’s recommendation of a minimum of one form of disinfection treatment even for deep secure ground water sources as part of the Multi-Barrier Approach to safe drinking water. Please consult with our Public Health Engineer (PHE) regarding [Applications for Construction Permits](#) (CP), treatment objectives and requirements with respect to this evaluation of the water source.

Requirements:

- Submit follow-up wellhead samples for Turbidity and Iron (Fe) as the June 11, 2018 levels exceed the OG (for Turbidity) and the AO (for Iron).
- You informed me that the water supply system has been in use since 2014. Please note that Section 7 of the DWPA requires a person to obtain a Construction Permit (CP) from a PHE prior to the construction, installation, alteration or extension of a “water supply system”. A CP should have been obtained prior to construction (the construction of waterworks without a CP is a contravention of the DWPA).

For any future alterations to the water system, ensure that you obtain a CP from a PHE prior to the construction, installation, alteration or extension of a water supply system. All plans and specifications must be submitted with an Application for a CP. For more information, contact *Engineering Direct* at:

Phone: 1-855-743-3550

Email: EngineeringDirect@interiorhealth.ca

(see IHA web site: <http://www.interiorhealth.ca/YourEnvironment/DrinkingWater/Pages/Permits.aspx>)

- Maintain the ground around the well such that it is sloped away from the well to protect the well from surface drainage or flooding and install a barrier(s) to prevent vehicles damaging the well.
- Collect further raw wellhead water bacteriological samples on a regular basis (monthly during the 8 to 12 week well commissioning period and quarterly thereafter). This will provide more information on the bacteriological raw water quality of Well Identification Plate # 39453. The drinking water at the tap must be tested (bacteriological) weekly during the commissioning period and at least monthly thereafter. Comprehensive (physical/chemical) analyses should be done at least every 5 years on well sources.
- Prepare an [Emergency Response and Contingency Plan](#) (ERCP). Under Section 10 of the [Drinking Water Protection Act](#), an ERCP is required and “*must be implemented in the event of an emergency or abnormal operational circumstances affecting its water supply system or drinking water source.*” The required annual

revisions to the ERCP enable you to: i) review the risks to the water system, ii) update contact information and iii) ensure that procedures are still valid (if requested, we can send you an ERCP template). The ERCP should be completed prior to operating a water supply system.

Best Management Practices:

- Install treatment if follow-up samples show the Iron is above the AO (to reduce the Fe to ≤ 0.3 mg/L).
- Maintain an intake/well protection zone of at least 100 metres radius. Where you've identified potential contamination sources within the 100 metres, prepare a Source Protection Plan (SPP) to mitigate the health hazards. For reference, the practice of using an intake/well protection zone (e.g. 100 metres) is discussed in BC's [Comprehensive Drinking Water Source-to-Tap Assessment Guideline – Module 1 – Delineate and Characterize Drinking Water Source\(s\)](#). The SPP doesn't necessarily have to be a detailed comprehensive plan.
- While it is recommended that all water suppliers consider secondary/distribution system disinfection (primary disinfection would entail achieving the required chlorine contact time), I understand that you have a very short distribution system and secondary disinfection may not be necessary depending on further bacteriological testing.
- To ensure that the water system operator has adequate training, we recommend that all operators obtain a certificate by completing either the [WaterSafeBC](#) course (offered online or by correspondence through Thompson Rivers University) or a "[Small Water Systems](#)" course certified by the [Environmental Operators Certification Program](#). The latter course is the preferred course for the operators of small water systems and it is offered by Thompson Rivers University, MTS Inc. and the BC Water and Waste Association.
- As is best practice for all water supply systems, you should develop a *Water Quality Monitoring Plan* (include bacteriological, physical and chemical testing) and an *Operation and Maintenance Plan* (this latter plan should include procedures on how to operate the disinfection system and measures to prevent cross connections).
- All water suppliers should complete the [Drinking Water Source-to-Tap Screening Tool](#) or the [Water System Assessment User's Guide](#) which help water suppliers and operators assess their water system's vulnerabilities and security (from 'source to tap'). Proper source protection is one of the components of the Multi-Barrier Approach and it will help you provide clean, safe and reliable drinking water to your water users.

While I have no objection to the issuance of the Permit to Operate a water supply system, the above "Requirements" must be met and the ERCP must be submitted by November 30, 2018.

All the above-mentioned plans should be reviewed and updated annually. Copies of all the above-mentioned documents need to be provided to the Environmental Health Officer for our records. If you have any questions regarding this source evaluation and inspection report, please contact me (see the footer of the first page).

Sincerely,



Brian Gregory
Environmental Health Officer
Drinking Water Systems Program
Environmental Public Health, Population Health, IHA
BG/bg

cc: Rob Birtles, Team Leader, Small Water Systems, Drinking Water Systems Program, IHA
Engineering Direct, IHA

Att. GARP Determination Field Form for Eagle Pass Day Base water system (Sept. 12, 2018)