



# Environmental Appeal Board

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## **DECISION NO. EAB-WSA-21-A012(a)**

In the matter of an appeal under the *Water Sustainability Act*, S.B.C. 2014, c. 15

<b>BETWEEN:</b>	Christian Friedinger	<b>APPELLANT</b>
<b>AND:</b>	Water Manager	<b>RESPONDENT</b>
<b>BEFORE:</b>	A Panel of the Environmental Appeal Board Cynthia Lu, Panel Chair	
<b>DATE:</b>	Conducted by way of written submissions concluding on July 11, 2022	
<b>APPEARING:</b>	For the Appellant: Self-represented	
	For the Respondent: Amanda Macdonald, Counsel Livia Meret, Counsel	

## **FINAL DECISION**

### **APPEAL**

[1] This is an appeal by Christian Friedinger (the "Appellant") of a decision made by Cali Melnechenko, a Water Manager (the "Respondent") under the *Water Sustainability Act*, S.B.C. 2014, c. 15 (the "Act"), regarding Water Licence Application Job Number 117107.

[2] The Appellant's water licence application sought authorization to withdraw water from a groundwater well (the "Well") drilled on his property in the Saanich area, to irrigate a vegetable farm and hay field.

[3] In her decision dated July 19, 2021 (the "Decision"), the Water Manager refused the Appellant's water licence application.

[4] The Environmental Appeal Board (the "Board") has the authority under section 105(6) of the *Act* to:

- a. send the matter back, with directions, to the comptroller, water manager or engineer who made the order being appealed.
- b. confirm, reverse or vary the order being appealed, or
- c. make any order that the person whose order is being appealed could have made and that the board considers appropriate in the circumstances.

[5] In his notice of appeal, the Appellant asks the Board to dismiss the Water Manager's decision and grant the application. The Appellant asks the Board to approve a water licence authorizing the use of 10 cubic metres (m<sup>3</sup>) of water per day from the Well for irrigation.

**BACKGROUND**

[6] The Appellant owns a property described as Lot 1, Section 5, Range 3 East, South Saanich District, Plan 17189, in the Saanichton area on southern Vancouver Island. Hagan Creek flows southwest through the Appellant's property before it converges with several small creeks and then discharges into Brentwood Bay. Hagan Creek is known to support fish habitat. Kroesing Spring is also located on the Appellant's property, about 150 metres ("m") east of Hagan Creek.

[7] The property is used to produce organic vegetables and hay. Currently, the Appellant irrigates those crops using municipal water and water diverted and stored from Kroesing Spring. The use of water from Kroesing Spring is authorized under conditional water licence 107800 ("CWL 107800"), held by the Appellant. CWL 107800 authorizes the diversion of water for storage in a dugout<sup>1</sup> from November 1 to March 31 annually. It also authorizes the use of the stored water for irrigation from April 1 to September 30 annually. A maximum of 2.75 acre feet (or approximately 3,390 m<sup>3</sup> of water may be stored and used for irrigation per year. CWL 107800 also contains a clause requiring that the overflow from Kroesing Spring must be diverted directly into Hagan Creek from May through October each year.

[8] In March 2019, the Appellant applied for a water licence that would authorize the use of 60,000 m<sup>3</sup> of water per year from April to October to irrigate crops over a 2 hectare, or approximately 5 acre, area. The water would be drawn from the Well, which is identified by Well Tag Number 116718 and was drilled on the property in 2018. Hagan Creek is located approximately 120 meters east of the Well.

[9] Following a review of the initial water licence application, the staff at then Ministry of Forests, Lands, Natural Resource Operations and Rural Development (the "Ministry") engaged the Appellant in a series of emails and phone calls to confirm the amount of water applied for, its intended use, and the timing of water use. The Appellant confirmed that the initial application volume of 60,000 m<sup>3</sup> was not based on his needs or use, but rather, on an application fee threshold.

[10] In December 2019, the Appellant revised the water volume requested in the application to 16,300 m<sup>3</sup> per year. In February 2020, following further correspondence between the Ministry and the Appellant on the Appellant's water needs and use, the application volume was revised again. During the December 2019 to February 2020 correspondence, Ministry staff informed the Appellant of the potential need for further technical assessments and well pumping tests to be conducted.

[11] On February 17, 2020, the Appellant agreed to a final application volume of 2,307 m<sup>3</sup> per year, or 12.6 m<sup>3</sup> per day. Ministry staff revised the water volume amount using the BC Agriculture Water Calculator<sup>2</sup> tool.

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<sup>1</sup> The evidence provided by the parties indicates that there is a pond on the property, but it is unclear whether the pond is the dugout authorized by CWL 107800. The Appellant says the "holding pond ... has no connection the Kroesing springs".

<sup>2</sup> The BC Agriculture Water Calculator helps agriculture water users in British Columbia estimate the annual irrigation water demand for a farm. Irrigation water demand estimates are made based on the geographic location of the farm, as well as its soil type, crop type and type of irrigation.

[12] Ministry staff conducted a technical review of the application and prepared a Water Licence Technical Report dated July 16, 2021 (the "Technical Report"), based on the revised volume of 12.6 m<sup>3</sup> per day. The Technical Report indicates that the Well accesses groundwater from Aquifer 608, which is found in a layer of fractured bedrock 3 to 84 m below ground surface. The Technical Report states that the Well construction report indicates a 2.1 m layer of clay overlies the bedrock. Water-bearing fractures were noted in the bedrock at 67, 212, and 260 feet (approximately 20, 64, and 79 metres) below ground surface, and the static water level at the time of drilling was 8 feet (roughly 2.5 metres) below ground surface.

[13] Under section 15(1) of the *Act*, when considering most types of water licence applications in relation to a stream or aquifer the decision maker considers to be reasonably likely to be hydraulically connected to a stream, the decision maker must consider the environmental flow needs<sup>3</sup> ("EFN") of the stream. During the technical review in this case, the potential impacts of the proposed water licence on hydraulically connected surface water sources emerged as the primary concern.

[14] As part of the technical review process, the application was referred to the Ministry's then Regional Hydrogeologist, Jessica Doyle, P.Geo., who completed a desktop review on March 2, 2020, her preliminary report dated April 7, 2020. In this review, Ms. Doyle created four cross-section profiles of the surface and subsurface using the best available information found government databases and drilled well records on ground elevation, water depths, and lithology (the characteristics of rocks). Based on these cross-sections, Ms. Doyle found the hydraulic gradient (a term in hydrology that describes the flow of groundwater in a certain direction) in bedrock Aquifer 608 is towards the well and Hagan Creek.

[15] The preliminary review concluded that there is a high likelihood of hydraulic connectivity between the Well and surface water sources including Hagan Creek. Groundwater in this part of Aquifer 608 likely provides baseflow to streams in the area. The Regional Hydrogeologist concluded that a technical assessment completed by a professional hydrogeologist is recommended to determine the potential impacts to base flow.

[16] The application was also referred to the Ministry's Senior Aquatic Ecologist, Jaroslaw Szczot, R.P.Bio. Mr. Szczot provided comments on March 23, 2020. He noted that Hagan Creek has resident cutthroat trout and coho populations, and already experiences low summer flows that endanger the fish. Mr. Szczot advised that low summer flows do not warrant any increased consumptive withdrawals from Hagan Creek during the summer irrigation period.

[17] The Technical Report also notes that Hagan Creek and its tributaries are subject to the water allocation notation "fully recorded" for all purposes. According to the Respondent's submissions, "fully recorded" means that there is insufficient unrecorded water for further water use authorizations. According to previous Board decisions, a "fully recorded" notation provides advisory guidance to decision-makers, based on information available when the notation was made, that the water source is at its capacity for licensed water use, but it does not bind decision-makers (e.g., see *Kenneth and Dawn Olynyk, et al v. Assistant Water Manager*,

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<sup>3</sup> Section 1(1) of the *Act* states that "environmental flow needs", in relation to a stream, means the volume and timing of water flow required for the proper functioning of the aquatic ecosystem of the stream.

Decision Nos. EAB-WSA-20-A009(b) & EAB-WSA-20-A012(b), July 30, 2021, at paras. 75 and 100 to 102).

[18] On March 27, 2020, Ministry staff held a conference call with the Appellant to inform him that a technical assessment would be required for his application to be approved. Staff informed the Appellant that mitigation strategies are required to address impacts to the EFNs of streams that are likely hydraulically connected to the Aquifer 608. Such strategies might include withdrawing water in the winter and storing it for use during the irrigation season. The Technical Report indicates that the Appellant declined to have a qualified professional conduct a technical assessment, and he did not provide sufficient mitigation options. He also did not conduct a well pumping test.

[19] The Technical Report was provided to the Water Manager prior to the Decision. In the Technical Report, Ministry staff recommended the water licence application be refused because, based on the available information, the Well was likely hydraulically connected to Hagan Creek and there was insufficient flow to meet EFN for Hagan Creek.

### *The Decision*

[20] On July 19, 2021, the Water Manager issued the Decision. In the Decision, the Water Manager provided the following reasons for refusing the application:

- there is insufficient flow in Hagan Creek (a nearby surface water source, or stream), which is reasonably likely to be hydraulically connected to the well, to maintain EFNs,
- the Appellant did not provide a proposal for mitigation measures to prevent significant adverse impacts to the aquatic ecosystem of Hagan Creek, and
- the Appellant failed to comply with timelines to provide additional information in support of the water licence application.

### *The Appeal*

[21] On August 24, 2021, the Board received the Appellant's Notice of Appeal.

[22] On March 4, 2022, the Board wrote to the parties. The Board confirmed that it had received two expert reports from the Respondent on February 25, 2022. The Board also set the schedule for the parties to provide their written submissions on the appeal. The Appellant was to provide his initial written submissions and documentary evidence by no later than May 20, 2022.

[23] The Appellant provided no written submissions or documentary evidence by the May 20, 2022 deadline. The Board sent an email to the Appellant on May 24, 2022, to confirm when the Appellant would be providing his submissions.

[24] By May 30, 2022, the Appellant had provided no submissions or evidence, and had not responded to the Board's May 24 email. That same day, the Respondent requested that the Board dismiss the appeal as abandoned.

[25] On May 31, 2022, the Board acknowledged receipt of the Respondent's request, and offered the Appellant an opportunity to provide submissions in response by June 6, 2022. The Board notified the Appellant that if he did not provide a written response, the Board may dismiss the appeal.

[26] On June 6, 2022, the Appellant provided his written submissions on the appeal. That same day, the Board wrote to the parties, acknowledging the

Appellant's late submissions and continuing with the remainder of the submission schedule, subject to any objection from the Respondent. The Respondent did not file an objection.

[27] On June 27, 2022, the Respondent provided written submissions and documentary evidence.

[28] The Appellant was given to July 11, 2022 to provide reply submissions. He did not provide any.

## **ISSUES**

[29] The issue in this appeal is whether the Board should direct the Water Manager to issue a water licence as requested by the Appellant.

[30] To decide this central issue, two primary questions must be answered. First, is the Well hydraulically connected to Hagan Creek, a nearby stream? Second, have sufficient mitigation measures been proposed?

## **RELEVANT LEGISLATION**

[31] The *Act* together with its regulations provides the statutory framework regulating the management and use of surface water and groundwater in British Columbia. Under the *Act*, a person is required to have an authorization for the diversion or use of water from a stream or aquifer, unless the diversion or use of water is authorized under regulations to the *Act*. The *Act* specifies considerations the decision-maker must account for when deciding an application, including the EFNs of a stream.

[32] The following sections of the *Act* are relevant to this appeal

### **Use of water**

**6** (1) Subject to this section, a person must not divert water from a stream or an aquifer, or use water diverted from a stream or an aquifer by the person, unless

- (a) the person holds an authorization authorizing the diversion or use, or
- (b) the diversion or use is authorized under the regulations.

...

### **Application and decision maker initiative procedures**

**12** (1) An applicant may apply to a decision maker by

- (a) complying with any requirements prescribed in respect of the application, and
- (b) within the period, if any, prescribed by regulation,
  - ...(iii) providing in the form and manner specified by the decision maker any plans, specifications, reports of assessments and other information the decision maker requests, ...

(2) For the purposes of subsection (1) (b) (iii), the decision maker may require that a specified assessment be performed, and a report of the assessment

be prepared, by a person with the qualifications specified by the decision maker.

...

### **Environmental flow needs**

- 15** (1) Except in relation to an application exempted under the regulations, the decision maker must consider the environmental flow needs of a stream in deciding an application in relation to the stream or an aquifer the decision maker considers is reasonably likely to be hydraulically connected to that stream.
- (2) For an application in respect of which the decision maker must consider, or decides under subsection (4) to consider, the environmental flow needs of a stream,
- (a) the applicant must provide to the decision maker the information and reports of assessments the decision maker directs for the purposes of paragraph (b) of this subsection, and
- (b) the decision maker must determine, in accordance with any applicable regulations, the environmental flow needs of the applicable stream.
- (3) For the purposes of subsection (2) (a), the decision maker may require that a specified assessment be performed, and a report of the assessment be prepared, by a person with the qualifications specified by the decision maker.
- (4) Despite subsection (1), a decision maker may take into account the environmental flow needs of any stream the decision maker considers may be affected by granting the application.

### **Mitigation measures**

- 16** (1) If the decision maker considers that the diversion and use of water, or changes in and about a stream, proposed by an application for an authorization ... are likely to have a significant adverse impact on the water quality, water quantity or aquatic ecosystem of a stream or aquifer, a stream channel or other uses of water from the stream or aquifer to which the application relates, the decision maker may
- (a) require that the applicant submit a proposal for mitigation measures to address those effects, which mitigation measures must meet prescribed criteria, if any, ....

...

## **SUMMARY OF THE PARTIES' SUBMISSIONS**

### *Appellant's Submissions*

[33] The Appellant submits that the irrigation amounts requested in his application are approximate. The growing area is over a heavy layer of clay with excellent water-holding capabilities. Half of the crops are grown in greenhouses and drip irrigation is used, and both of those practices limit evaporation. Furthermore, the Appellant says they grow with a cover crop to further reduce the impact of their agriculture. The expected period of irrigation is June to mid-September, or

approximately 3 months, and not approximately 6 months as indicated by the Ministry.

[34] The Appellant submits that water from the Well is required because the certified organic vegetable farm production on site needs to be irrigated and washed by potable water. As such, the water from existing sources (CWL 107800, the pond, and/or stored water) is not adequate. The Appellant submits that the surface water and groundwater in neighbouring Aquifer 611 are contaminated and not suitable for this purpose.

[35] The Appellant disagrees with the Regional Hydrogeologist's methodology for selecting neighbouring wells to determine the composition of the bedrock and permeable layers below the Well. He submits that the assessment did not consider "wells with data probably not fitting" the assumed bedrock layer. The Appellant submits that the cross-sections created in this assessment use assumed bedrock layer depths, but wells with data that do not fit the assumed bedrock layer were not factored into the assessment. The Appellant submits that the permeable layers are also not indicated in the assessment.

[36] The Appellant submits that the dense layer of impermeable clay followed by dense granite from the surface of the Well to the main fracture, at a depth of 67 feet, means that the top of the Well has no connection to surface water. Hagan Creek, in fact, contacts Aquifer 611, which is distinct from Aquifer 608. Additionally, if Aquifer 608 were hydraulically connected to Hagan Creek, contaminated water from Hagan Creek would have infiltrated the Well.

[37] The Appellant also argues that static water levels taken during well drilling cannot be used to infer groundwater flow or flow direction because of imprecision in measurements and variability of the depth of the water table. Furthermore, Aquifer 608 does not fit with the assumptions relied upon by the Respondent, that the aquifer was homogeneous, isotropic, of uniform thickness, and with infinite aerial extent. Furthermore, other wells in the area are downstream from the Well by a significant distance, and therefore, they are irrelevant to the considerations related to this Well.

[38] The Appellant states that although the Regional Hydrogeologist concludes there is a high likelihood of hydraulic connectivity between the Well and surface water (Hagan Creek), there should just as well be a high "non-likelihood" of connectivity due to the layer of clay and layer of granite bedrock with no fractures in the upper approximately 50 m.

[39] The Appellant submits that the Ministry's proposal for a hydrologic technical assessment, possibly including drilling and pumping tests, is cost prohibitive.

[40] The Appellant submits that he did provide an alternative mitigation option, that is for the summer overflow from a large pond on the Appellant's property with a volume of about 10 liters per minute in exchange for the use of water from the Well. In addition to this pond water, the Appellant submits that the run-off water from hay field irrigation, vegetable crop irrigation, and vegetable washing, except evaporated amounts, would seep and flow back into Hagan Creek, therefore increasing the summer flow. The farm provides additional water inputs to the system from irrigation water sourced from municipal water. The Appellant also queries how a withdraw of groundwater could impact Hagan Creek in the summer months, given that Mr. Szczot noted its flow at that time to be nearly zero. The Appellant also took issue with water use by another farm bordering Hagan Creek.

[41] The Appellant asks the Board to approve the application for use of 10 m<sup>3</sup> of water per day from the Well. I note that this is a different amount than the 12.6 m<sup>3</sup> per day considered in the water licence application and the Decision.

#### *Respondent's Submissions*

[42] The Respondent's submissions include written correspondence between Ministry staff and the Appellant during the course of the application review, and three sworn affidavits provided by: the Respondent; Megan Wainwright, P.Ag, a Licensed Authorizations Officer with the Ministry and the author of the Technical Report; and Jessica Doyle, P.Geo, currently a Water Protection Section Head with the Ministry. Additionally, the Respondent submits two expert reports: one from Ms. Doyle; and one from Mr. Szczot. A summary of the Respondent's submissions is provided below.

[43] The Respondent submits that the email exchanges between Ministry staff and the Appellant following the initial review of the water licence application submission were required to confirm the appropriate volume of water required for irrigation purposes at the property. The Respondent described how Ministry staff revised the water volume amount, using the BC Agriculture Water Calculator tool. According to that tool, irrigating 2.5 acres of vegetable crops on the Appellant's property from April 1 to September 30 (183 days, or 6 months) would require 2,310 m<sup>3</sup> of water. Following a series of phone calls and emails, the Ministry got the Appellant to agree with a revised water volume of 2,307 m<sup>3</sup> or 12.6 m<sup>3</sup> per day.

[44] The Respondent submits that the Appellant has not satisfied the burden of proof required to overturn the Decision. The Respondent adds that the Appellant's evidence should not be given the weight of expert opinion, due to the lack of supporting documentation and evidence as to his professional qualifications and technical background. The Respondent's expert reports were completed by registered professionals who are required to follow professional standards.

[45] The Respondent points to the fact that the Appellant has existing sources of water, from the municipality and from CWL 107800. Regarding the Appellant's proposed mitigation measures, the Respondent submits that water diverted from CWL 107800 is within the same system as Hagan Creek, so any reintroduction of the stored water to the creek, assuming this is what the Appellant is referring to, would be reintroducing water taken from the same system.

[46] The Respondent adds that Hagan Creek is fully recorded, and the Province has no ability under the *Act* to revoke existing water licences. Water licences may be reviewed after 30 years and their conditions may be amended.

#### *Respondent's Factual Evidence*

[47] In her affidavit, Ms. Wainwright chronicles her correspondence with the Appellant, from the initial review of his application to the final steps prior to completing her Technical Report. This includes a description of the correspondence related to determining an accurate understanding of the water volume being applied for. Ms. Wainwright goes on to describe the steps she took in her technical review of the application, including use of provincial aquifer mapping and Ministry stream depletion tools. She then referred the application to the Regional Hydrogeologist and the Senior Aquatic Ecologist for their professional opinions on



hydraulic connectivity and environmental flow needs, respectively. Their advice is described later in this summary of Respondent's submissions.

[48] Ms. Wainwright recalls the details of a call held with the Appellant to explain the necessity of a technical assessment by a qualified professional in order to proceed with the application to use water during low flow periods. She notes that other options, such as developing water storage, were suggested. Ms. Wainwright states that the Appellant did not undertake a technical assessment or provide any acceptable mitigation options. Therefore, in her Technical Report, she recommended that the water licence application be refused.

[49] In her affidavit, Ms. Doyle describes her role as Regional Hydrogeologist with the Ministry. She summarizes the findings presented in her report to the Respondent, before the Decision was issued. Ms. Doyle provides her response to the Appellant's submissions as they relate to her professional expertise in hydrogeology. Ms. Doyle explains her methodology in creating geological cross-sections and the selection of wells for these cross-sections. She states that the cross-sections were prepared to capture all aspects of the subsurface and as many wells as possible. She adds that not all wells have detailed lithology descriptions on record. Ms. Doyle also points out that the BC Agriculture Water Calculator used to estimate the water volume needed for irrigation takes into consideration evapotranspiration. She says that during the summer months, after irrigation and evaporation are considered, there is typically not excess water available to return to the system.

[50] In her affidavit, the Respondent affirms that she came to the Decision after reviewing and considering the application, comments from Ministry staff after the application was referred to them, and other information including the Technical Report. She decided to refuse the licence application because there is insufficient flow in Hagan Creek to maintain EFNs, and it is reasonably likely to be hydraulically connected to the Well. The Respondent states that following a review of the Appellant's mitigation measures proposed in his submissions in this appeal, she still did not have enough information to grant the licence.

*Respondent's Expert Opinion Evidence – Report Prepared by J. Doyle*

[51] The Respondent submits an expert report by Ms. Doyle, dated February 24, 2022. Ms. Doyle says, in preparing her report, she conducted an office-based analysis using the best available information. Four cross-sections depicting local geology were created using existing data from drilled wells with lithology information and wells drilled to deepest depths and into bedrock. Based on these cross-sections, Ms. Doyle thought it highly probable that the Aquifer 608 provides baseflow to streams incised into the bedrock or incised into permeable deposits connected to Aquifer 608. The hydraulically connected sections of Hagan Creek likely occur where there is exposed bedrock along the creek, where confining clay or till is absent, or where the unconsolidated layers of adjacent Aquifer 611 are thin. The report recommends that streambed materials be verified upstream and downstream of the Well.

[52] The report estimates the potential decrease to streamflow, if the application was granted, based on a streamflow depletion model. According to the model, assuming pumping an average of 12.6 m<sup>3</sup>/day of groundwater from the Well (the application volume) for 120 days (the assumed 4-month irrigation window), the

streamflow would decrease by roughly 2.8 m<sup>3</sup>/day. The report recommends a pumping test to validate the model's results.

[53] The report notes that Hagan Creek and its tributaries are "fully recorded", meaning surface water is not likely available during the low flow summer season. Therefore, the depletion of 2.8 m<sup>3</sup>/day after 120 days could potentially impact Hagan Creek's EFNs and existing water users.

[54] The report finds that groundwater from Aquifer 608 near the Well is likely hydraulically connected to nearby streams, and the requested groundwater use has the potential to impact baseflows of connected streams (including Hagan Creek). The report recommends that a technical assessment be completed by a professional hydrogeologist to obtain and interpret site-specific information regarding impacts to stream baseflow. The report adds that water storage can be considered to alleviate potential impacts during the low-flow season.

*Respondent's Expert Opinion Evidence – Report Prepared by J. Szczot*

[55] Mr. Szczot's report, dated February 25, 2022, describes Hagan Creek as having moderate fisheries values and good spawning and rearing habitat near its estuary. Hagan Creek is classified as "Very Sensitive" with an EFN Risk Management Level 3, which is the highest risk category under the provincial Environmental Flow Needs Risk Assessment Policy. The report finds that aquatic habitat in Hagan Creek may be impacted by summer water withdrawals due to the high likelihood of hydraulic connectivity between Aquifer 608 and surface water.

[56] The report includes historical flow data for Hagan Creek and one of its tributaries, Graham Creek. There is only one year of flow on record, from 1996, for Hagan Creek, and the lowest flows were observed from June to September. The report goes on to say that summertime flow sensitivity is common in unregulated watersheds on the east coast of Vancouver Island, and precipitation patterns due to climate change mean that future flows are likely to remain the same or decrease in these watersheds, from June to September each year.

[57] The report recommends that to protect the EFNs of Hagan Creek, consumptive withdrawals of water from hydraulically connected sources should only be made from October 1 to May 31 of each year, and not during June 1 to September 30.

## **ANALYSIS**

[58] As noted above, there are two primary questions in deciding this appeal.

### **1. Is the Well hydraulically connected to Hagan Creek?**

[59] The findings from Ms. Doyle's preliminary assessment dated April 7, 2020 were provided to the Appellant. The substance and conclusions of this April 7, 2020 preliminary assessment are generally the same as the information provided in Ms. Doyle's February 24, 2022 expert report. I make note of both documents because the Appellant's submissions refer to the April 7, 2020 preliminary assessment but not the February 24, 2022 expert report.

[60] Ms. Doyle is a registered Professional Geoscientist in good standing with the Engineers and Geoscientists of British Columbia. Ms. Doyle's curriculum vitae is included in the Respondent's submission. Based on Ms. Doyle's registration as a

Professional Geoscientist, and her documented work and educational experience, I find her to be a reliable expert on the technical matters related to hydraulic connectivity in this appeal.

[61] Ms. Doyle's expert report is based on a desktop review, and she recommends a technical assessment of site-specific conditions. From the desktop review, Ms. Doyle created four cross-sections to show the ground surface profile and underground stratification of layers. The report summarizes the sources of available information and acknowledges the limitations of the best available information.

[62] From the cross-sections, Ms. Doyle interprets that the groundwater level is high (less than 10 m from the ground surface), the direction of groundwater flow in Aquifer 608 is towards Hagan Creek, bedrock is likely exposed in Hagan Creek downstream of the well, and hydraulically connected reaches of Hagan Creek most likely occur where there is exposed bedrock or an absence of confining layers. Ms. Doyle concluded it is likely that the Well is hydraulically connected to Hagan Creek.

[63] The Appellant submits that although the preliminary assessment finds a likelihood of connectivity between the Well and Hagan Creek, there is also a high "non-likelihood" of connectivity. The Appellant states this non-likelihood is based on the tight layer of clay under the creek bed and dense layer of granite with no fractures for the upper approximately 50 meters. The Appellant describes various permeable/impermeable layers and refers to a drilling record, but he did not submit any drilling records or other evidence to support his submission.

[64] Specifically, the Appellant did not submit drilling records, lithology data, scientific data, ground profiles, geological cross-sections, or expert opinion evidence to support the alleged "non-likelihood" of connectivity between the Well and Hagan Creek. The Appellant appears to be aware of the information in the drilling records for the Well, as he refers to the depths of the clay and granite layers, the main fracture where water was observed, and the static water level when the Well was drilled. He offers his own theories as to the location and movement of groundwater in the area. However, the Appellant does not make clear whether he has professional expertise or qualifications that would make his opinions reliable as expert evidence. In an appeal, an appellant is responsible for providing evidence that proves, on a balance of probabilities, the facts they are asserting. In this case, the Appellant has not met that evidentiary burden.

[65] The Appellant's submission and correspondence with Ministry staff throughout the application review process suggest that the Appellant did not seek expert advice due to financial considerations. However, the Appellant provided no further explanation or estimation of the cost to have a qualified professional conduct a technical assessment on behalf of the Appellant. As such, there is insufficient evidence to conclude that further technical studies would not be feasible in the circumstances.

[66] Under sections 12(2) and 15(3) of the *Act*, when a decision maker is considering an application for a water licence, the decision maker may require that the applicant provide specific assessments that are to be performed by a person with specified qualifications (a qualified professional in this case). Due to the limitations of the best available information, and the provisions in the *Act* for the decision maker to request specified assessments, I agree with the Respondent, that the Appellant could have assisted in this process by having a qualified professional conduct a technical assessment of site-specific conditions. Having a qualified

professional perform a site-specific assessment would provide better information than is currently available about the potential impact of the proposed groundwater use on nearby surface water bodies. If the Appellant had acquired such information, it may have either confirmed or refuted the conclusion from Ms. Doyle's desktop assessment that the Well is likely to be hydraulically connected to Hagan Creek. Because the Appellant did not provide any such assessment, Ms. Doyle's report is the best available evidence on the subject of hydrological connectivity between Aquifer 608 and Hagan Creek.

[67] In addition, I find that none of the Appellant's other arguments are supported by further documentation or evidence beyond the Appellant's written submission. The Appellant did not provide any evidence (e.g., cross-sections, drilling reports, stream measurements, stream bank and channel materials verification, rebuttal expert advice or reports, etc.) to support the claims made in his submission. The expert report filed by Ms. Doyle is the only submission regarding hydraulic connectivity with appropriate supporting and professional rationale. I find Ms. Doyle's analysis to be persuasive and reliable as expert evidence. I accept her conclusions.

[68] Based on the submissions from the parties, the available expert report, and absence of any additional site-specific information or alternative expert report, I conclude that the Well is likely to be hydraulically connected to nearby surface water including Hagan Creek.

## **2. Have sufficient mitigation measures been proposed?**

[69] In deciding the question of mitigation measures, I considered the expert report prepared by Mr. Szczot. Mr. Szczot's curriculum vitae is included in the Respondent's submission. Based on Mr. Szczot's registration as a Registered Professional Biologist, and his documented work and educational experience, I find him to be a reliable technical expert on the technical matters related to environmental flow needs in this appeal.

[70] In his expert report, Mr. Szczot finds that Hagan Creek is already impacted by critically low summer flows which puts salmonid populations at risk. The report acknowledges that there are insufficient historical records of stream flows on Hagan Creek to estimate the natural long-term variability of stream flow; however, due to the predicted impacts of climate change, stream flows are expected to remain the same or decrease from the flows on record. The report recommends water from hydraulically connected sources should not be withdrawn during June 1 to September 30 each year.

[71] As with Ms. Doyle, Mr. Szczot provided preliminary findings in March 2020 during the water licence application review period. The findings and recommendations are consistent with the contents of his February 25, 2022 expert report. His preliminary findings and recommendations prompted Ministry staff to request the Appellant propose sufficient mitigation measures to reduce the impact to Hagan Creek. The Respondent submits that one of the mitigation options proposed by Ministry staff was for winter withdrawal from the Well into storage for summer irrigation. The Appellant submits this option is cost prohibitive and not feasible for irrigating his organic produce.

[72] Regarding EFNs, the Appellant recognizes the low summer flows in Hagan Creek and generally the requirement for mitigation measures. He submits that the

irrigation period is approximately 3 months, not 6 months as used by the Ministry to calculate the water licence application volume. Logically, a shorter irrigation season means less water will be required. However, the Appellant does not make any submissions on how this reduced water volume would affect or mitigate EFN's.

[73] Regarding mitigating impacts, the Appellant submits that irrigation run off from his farm would positively impact (increase) the flow of Hagan Creek. However, the Appellant provides no documentation to demonstrate the connectivity between irrigated areas and Hagan Creek, or to specify the amount of water run-off expected to enter the creek and contribute to stream flow.

[74] The need for the decision maker to consider EFNs is found in section 15 of the *Act*. The Appellant's proposed mitigation measures are vague and do not make clear that the run-off area is connected to Hagan Creek. The Appellant also does not specify the volume of water expected to be reintroduced to the stream to contribute to the EFNs of Hagan Creek. Hagan Creek already experiences very low summer flows that affect EFNs. Consequently, any withdrawals related to Hagan Creek's hydrological system should be carefully scrutinized. I find the mitigation measures proposed by the Appellant to be insufficient.

### *Conclusion*

[75] The Appellant has not provided any reliable evidence supported by measurements, data, or expert opinion, to support his assertion that the Well and Aquifer 608 is unlikely to be hydraulically connected to Hagan Creek. Additionally, the Appellant has provided no supporting information to show if, or by how much, the mitigation option he suggested, whereby pond water and municipal water run-off would be re-directed to Hagan Creek, will contribute to the EFNs of Hagan Creek.

[76] After considering all the parties' submissions and evidence, I find that it is likely that the Well is hydraulically connected to Hagan Creek, and that further withdrawals from the associated hydrological system would not support the EFNs of the creek. The Appellant's submissions and evidence are insufficient to support the approval of a water licence application for any volume of groundwater withdrawal from the Well.

[77] Moreover, I note that the Appellant already has two water sources that appear to provide enough water to irrigate his crops: a municipal water supply; and approximately 3,390 m<sup>3</sup> of water per year under CWL 107800. I recognize that the Appellant says the water from CWL 107800 comes from Aquifer 611 and is contaminated, so neither it nor water stored in the pond can be used for certified organic vegetables because they require potable water, and he also says storing water in tanks is "cost prohibitive." However, the Respondent's evidence confirms that water is supplied to the Appellant's property by not only a standard residential water service, but also an agricultural water service with a subsidized rate for water use and no cap on the amount of water that can be used for agriculture. Although the Appellant submits that "some vegetables do not like the chlorinated water," he has not clearly explained why municipal water (which is potable) is unsuitable for the crops' irrigation needs. The Appellant acknowledges that he has been using municipal water for irrigation on an "emergency basis." Consequently, I find that denying the water licence application will not prevent the Appellant from having sufficient water to irrigate crops on the property.

**DECISION**

[78] In making my decision, I have carefully considered all the relevant documents, the parties' submissions and evidence, whether or not they are specifically referenced in the reasons above.

[79] For the reasons provided above, I confirm the Water Manager's Decision. The appeal is dismissed.

"Cynthia Lu"

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Cynthia Lu, Panel Chair  
Environmental Appeal Board

November 7, 2022