

Submission on the referral of Bylaw No. 726

620 Laura Road, Bowen Island. BIM file RZ-2026-0014

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August 20, 2026.

What this record shows

Eight findings. Each is set out below, with sources, in the section named.

One. Three rezoning applications sit in sequence down one creek. Two were held back on water grounds and filed technical studies. The third (the one in this bylaw), upstream of both and the only one generating process effluent, has never been required to assess the water it uses or its process effluent. *Section 2, page 4.*

Two. Four independent records identify this ground as sensitive for water: the Municipality's own Development Permit Area, the Islands Trust's recharge mapping presented to Bowen Council in 2023, the regional sensitive ecosystem inventory, and the Municipality's conduct on the neighbouring applications. The freshwater directives were recorded as not applicable. *Section 4, page 9.*

Three. What stands in place of a water assessment is a pathogen screening of one well. Inside that assessment's appendix is the Provincial record of heavy development, a downward trend in water levels needing investigation, and advice that further development be carefully assessed, on a classification resting on eight to fourteen well records. *Section 4, page 9.*

Four. In 2019 the Municipality's planner proposed two linked changes to Bowen's Land Use Bylaw: remove the vineyard definition, and amend the winery definition so it expressly included cider. Bylaw No. 528 did the first and not the second. The Committee was told the bylaw would not change permitted uses. The applicants now rely on that removal as the footing of their application. *Section 7, page 28.*

Five. The waste streams of a fermentation process, liquid and solid, have never been characterised, sampled or assessed by anyone in over five years. Three inconsistent accounts of the liquid handling exist. *Section 8, page 28.*

Six. Across five staff reports, from February 2021 to July 2026, not one cites an Official Community Plan policy on water, groundwater, aquifers or industrial use. *Section 9, page 35.*

Seven. The checklist is the Municipality's own statement of which directives it considers engaged, and the starting point for the Islands Trust staff report on the referral. Three of its statements about what this application contains are not correct, and all three are checkable against the package it travels with. *Sections 3, 4 and 10, pages 8, 9 and 37.*

Eight. That checklist was not in the report Council considered. Another property's was. A replacement was tabled at the meeting, Council reworded its referral motion to point at it, and the report was afterwards republished with a checklist inside it and no note of the change. Whether that is the document Council referred cannot be established from the public record. *Section 3, page 8.*

Appendix A is the first reading report as published for the meeting of 27 July 2026, and is the report Council considered. **Appendix B** is the version the Municipality published after that meeting, not by the route its own published procedure provides.

1. What the bylaw does

- Rezones 620 Laura Road from RR2 to a site-specific variation, RR2(a), and adds "cidery" as a permitted principal use.
- Inserts a definition of "cidery" into section 1.1 of the Land Use Bylaw. That is the general definitions section, so the meaning applies throughout the bylaw. The definition reads:

CIDERY means the use of buildings and structures for the production of cider, at a cidery facility licensed by the Liquor and Cannabis Regulation Branch, where at least 25% of the cider production comes from fruit grown on the same lot, or from another lot which is part of the same business. Imported British Columbia fruit used in the cidery shall be limited to no more than 75% of cider production. A cidery may include cidery tours, cider tasting, cider sales, a picnic area, lounge endorsement, and the sale of cidery promotional products.
- Adds a parking rate for cideries in all zones.
- Makes permanent a use that has run since March 2021 under a temporary use permit, renewed in December 2023.
- Provides that a lounge endorsement is not a permitted use at this property, although the definition it inserts at section 1.1 states that a cidery may include one.

That last is the only substantive change the bylaw makes to the definition already in use in the TUP. The cidery definition in the temporary use permit of 2021 and the definition Bylaw No. 726 inserts are identical except that the bylaw adds the words "lounge endorsement". The permit carried a condition that no lounge area be developed, and the site-specific clause of the bylaw says a lounge endorsement is not a permitted use here. So the words added are the words then withheld at this property, in a definition that sits in the general definitions section and applies throughout the bylaw.

Presenting the bylaw to Council, the planner explained why a lounge endorsement is defined at all: "And then we felt like if we were calling it out as something that's not allowed, we wanted a definition." That accounts for defining a lounge endorsement. It does not account for putting the words inside the definition of cidery. The temporary use permit prohibited a lounge without any such wording, by a condition that no lounge area may be developed. Bylaw No. 726 instead writes the words into the general meaning of cidery, as something a cidery may include, and then withholds the thing at this property alone.

2. Three properties and water

Three rezoning applications are before the Municipality on the same watercourse, Murray Creek. All three sit inside the same Development Permit Area.

Property	Application	Proposed use	Position
620 Laura Road	RZ-2026-0014	Cidery, made permanent. Commercial, effluent generating	Upstream
1355 Westside Road	OCP/RZ-2025-0113	34 modular homes	Midstream
Lot 7 Adams Road	RZ-2025-0015	Subdivision into four lots	Downstream

The three properties lie in a single run along the creek. Measured boundary to boundary on the Province's parcel fabric:

- 620 Laura Road to 1355 Westside Road: 23 metres. Only the West Side Road allowance lies between them, with a culvert carrying the creek under that roadway. PID 015-026-701 and PID 015-026-841, adjoining lots on the same subdivision plan, VAP22501.
- 1355 Westside Road to Lot 7 Adams Road: zero. They share a boundary. PID 005-486-564, 4.38 hectares.
- 620 Laura Road to Lot 7 Adams Road: 203 metres.

So the three lie along about 400 metres of one creek, from where it enters at Laura Road to the Adams Road parcel below.

The fall matters more than the distance. Those are horizontal distances on a plan. What links the three properties is that they sit in sequence down one slope, off the flank of Mount Gardner to the valley floor at Adams Road. Murray Creek runs through all three because it runs downhill through all three.

On the Municipality's contour mapping, which draws contours at one metre intervals and labels them every ten, the cidery buildings stand above the 190 metre contour. The two ponds on the creek lie between 190 and 180. The 170 metre contour runs along West Side Road at the southern edge of the property. Where the creek reaches the Bowen Brook system on the Adams Road land, the 160 metre contour runs immediately beside it. So there is about 20 metres of fall across 620 Laura Road, and about 30 metres from the cidery buildings down to that confluence.

The lot is not uniform ground. The land falls about 20 metres across it, and on the Municipality's contour mapping that fall is not spread evenly. The contours are widely spaced across the eastern block between the creek and the road, closer around the ponds, and closest of all along the creek corridor, where they run tight together over a short

distance. So on a parcel of 19,512.975 square metres there is high ground and low ground within a few tens of metres of each other, and the steepest ground is beside the creek.

Where the water goes. Murray Creek runs from 620 Laura Road, through 1355 Westside Road, to Lot 7 Adams Road. There it meets Bowen Brook and Buckingham Creek. At that junction the systems divide. Bowen Brook runs to Grafton Lake, the source for the Cove Bay water system. That is the Municipality's largest water system, a surface water system supplying at least 667 connections, recorded by the health authority as 515 residential and 134 commercial on 2018 figures, the latest it cites. Buckingham Creek runs to Explosives Creek, terminating in the ocean in Tunstall Bay.

On the Municipality's own mapping Murray Creek is a tributary to a fish bearing stream. Bylaw No. 301 lists the streams and lakes known to have fish present, and that list includes Grafton Lake, Bowen Brook and Explosives Creek, and their tributaries. So both waters this creek feeds are named in the Municipality's own bylaw covering riparian protection.

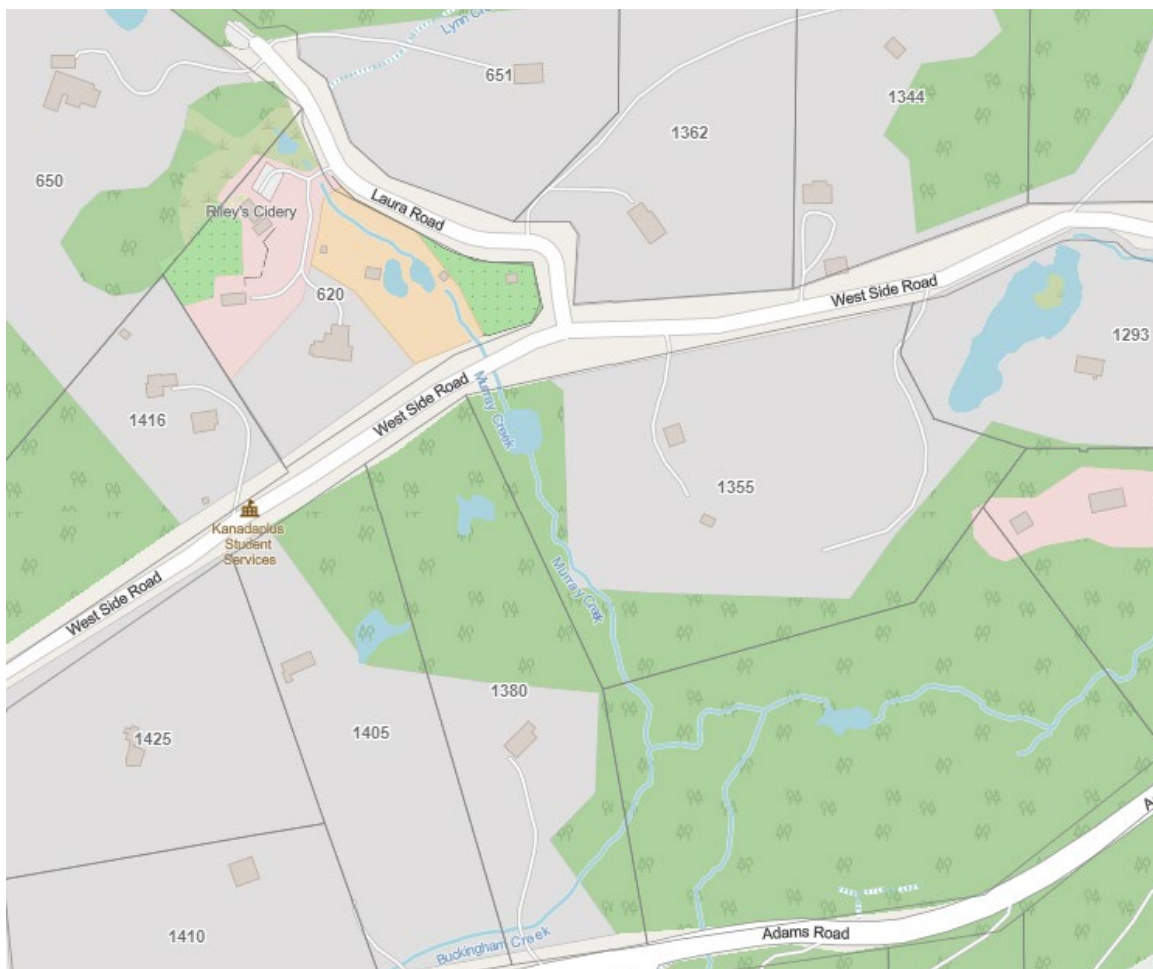


Figure 1. BowMap, Bowen Island Municipality, accessed August 17, 2026. Watercourses layer, Development Permit Area overlay off. 620 Laura Road at upper left, marked Riley's Cidery. Murray Creek runs south from it, through 1355 Westside Road, and on toward Adams Road at lower right. Buckingham Creek joins from the west. Black lines are parcel boundaries.

The Adams Road wetland is a groundwater recharge area. It is also where the watersheds of two municipal water systems meet.

The Province's 2006 classification of Aquifer 749 records it as an important source for individual properties and for community supplies *"including Bowen Bay Water System and Tunstall Bay Water System"*. The property at 620 Laura Road is mapped by the Province as on Aquifer 749. The applicants' own assessment says the same. Bowen Bay and Tunstall Bay are named as examples, not as a complete list of what draws on that ground.

Naming Bowen Bay understates it, in two ways. Bowen Bay is a bay as well as a water system, and the Province's 2006 classification worksheet uses the name both ways: it also records groundwater moving *"from eastern upland areas towards the west discharging into Tunstall Bay and Bowen Bay"*, and those are the bays. And the Bowen Bay water system does not stand alone. The Municipality groups it with two others under the heading *"Westside Water Systems"*: Bluewater Park at 147 connections, King Edward Bay at 41 and Bowen Bay at 60. Its own words are that *"All three systems are connected in ways explained below, but they are separate local service areas funded by their own user fees and reserve funds"*. That is 248 connections. Tunstall Bay serves a further 132 homes and one commercial connection. The Municipality's current Water Quality Advisory covers all four together, as section 4 sets out.

The Province maps the ground Murray Creek traverses across two aquifers, 749 at 620 Laura Road and 746 at 1355 Westside Road and Lot 7 Adams Road. The Province does not treat that division as a hydrological one. Each of the five bedrock aquifer worksheets prepared for Bowen in 2006 carries the same sentence: *"The aquifer forms part of the larger fractured crystalline bedrock aquifer system that underlies Bowen Island."* The hydrogeologist retained for the application at 1355 Westside Road says the same, describing the boundary between 746 and 749 as mainly administrative and not representative of a hydraulic boundary. No hydrogeological work has been filed for 620 Laura Road.

Between the municipal systems fed from these creek systems and this ground, smaller private systems and private wells drawing on the same aquifer, and small private surface water systems or households, this is water reaching something in excess of a thousand households.

How the three have been treated.

- Lot 7 Adams Road. The Advisory Planning Commission reserved support pending hydrogeological testing, septic design, water supply adequacy and covenant protection of the watershed. The Parks, Environment and Climate Action Advisory Committee awaited hydrogeological reporting and assurance that the recharge

area, the wetlands and the Grafton Lake watershed would be protected. A watercourse assessment and a well report were filed with the application.

- 1355 Westside Road. Sixteen technical documents were filed, including a groundwater letter of engagement, an environmental report and wastewater plans. The Advisory Planning Commission recommended deferral. Council so resolved on 9 March 2026, by motion 26-97, until the Official Community Plan is updated and the Grafton Lake Watershed Management Plan is complete.
- 620 Laura Road. No hydrogeological, water supply or watershed assessment has been required at any stage. No technical study of water has been filed in over five years.

The Grafton Lake watershed is the subject of a funded Municipal project. The Municipality put out a request for proposals for a Grafton Lake Watershed Management Plan in November 2025 and awarded the contract to Urban Systems on 26 January 2026 at \$100,000. Announcing the project on 5 August 2025 it said the plan would include an assessment of values and threats and regular monitoring for wastewater contamination. It followed a study which found 125 contaminants of 587 tested and ranked Grafton Lake eighth most contaminated of twenty-one source water sites in the province, and the Municipality's own release says the presence of sucralose, pharmaceuticals and other human-sourced contaminants "*suggests that the primary source of contamination is likely septic system overflow or leaching from properties within the watershed*".

The Advisory Planning Commission recommended that consideration of this rezoning be deferred until that plan is complete. Presenting the alternatives to Council on 27 July, the planner said the plan was "*likely to be the end of this year*", and noted that taking the Commission's course "*would mean that TUP has expired before the Grafton Lake Management Plan is anticipated to be complete*".

So the Municipality has commissioned work on whether waste is reaching a drinking water source, and has resolved to take no further action on the rezoning at 1355 Westside Road until that work is complete. On this property, upstream on the same creek system, it is making a use permanent without ever having established what its waste is.

In recommending deferral of 1355 Westside Road, the Advisory Planning Commission asked that the Official Community Plan consider "*whether there should be limits on the types or intensity of development allowed in watershed areas island-wide, not just on a case-by-case basis*".

Bylaw No. 726 is before the Committee on its own.

3. The checklist

The Islands Trust Policy Statement Directives Checklist is the Municipality's own statement of which directives it considers engaged, and the starting point for the Islands Trust staff report on the referral. Its history here:

- The report published for the 27 July 2026 meeting carried the checklist for Bylaw No. 723, a different bylaw on a different property, 1658 and 1639 Mount Gardner Road.
- A replacement was tabled at the meeting. The Corporate Officer listed it among the on-table items: *"In relation to item 7.2, there is a replaced attachment to the staff report, and that is the amended Island's Trust Policy Checklist."*
- Staff acknowledged the error in open Council: *"the one in the published agenda was the duplicate of Mount Gardner Road."*
- The Acting Mayor asked, *"Do you have a revised Island's Trust Checklist in our package?"* She was told, *"It's in the on-table package."* She replied, *"Okay, because that wasn't clear, I guess."*
- Council amended the referral motion to match. The motion as carried refers the checklist *"included in the on table items package of the July 27 regular council meeting"*.
- After the meeting, the report was republished with a checklist inserted into it as an attachment. The revision note on that report reads only *"Revised July 24, 2026 to include recommendation made by the Advisory Planning Commission at its July 23, 2026 meeting."*

Every quotation from the checklist in this submission is taken from that republished version, because it is the only one publicly available. Whether it is the document Council referred is not established, and this submission does not assume it is.

I hold every version as published. Their file properties, set out in the note on method, record that the version published for the meeting was last modified before it, and that the version published afterwards was last modified at 19:43 on 27 July 2026, some hours after the meeting began at 1:00 pm. The meeting was adjourned at 4:30 pm.

The Municipality's published procedure provides for on-table items to be included in a further revised agenda after the meeting. No such record exists for this item. Instead a staff report already in the package was altered.

Two consequences:

- Clause 9 of the 2014 Protocol Agreement provides that the Municipality will have its staff complete a current copy of the checklist before giving first reading. Clause 10

provides that it will send copies of any staff reports it considered, including the completed checklist.

- Council referred the document tabled at the meeting, not an attachment to the report. If the Committee receives the republished report, it will not be able to see that the report before Council was defective, that a separate document had to be tabled, or that the motion was reworded because of it.

In plain terms, this is what the Committee has.

- A staff report that was amended after the meeting it went to, in order to insert a checklist.
- A report that records its own revisions. It is dated 15 July 2026 and carries a note that it was revised on 24 July. It carries no note of the change made on 27 July.
- No record that the checklist now inside that report was ever before Council in the form it now has.
- A checklist that states the application includes protective covenants. It does not. None was before Council. What Council did was direct staff to seek protection, and the councillor who moved that wording said it need not be a covenant.
- No covenant in existence when Council referred the bylaw. Anything of that kind now in the Committee's hands was made afterwards.
- A Council that asked, on the preceding bylaw that evening, whether what comes back to it would need further consideration and a further referral to the Islands Trust, and was told no, and then yes.
- All of it inside a timetable the Municipality has said should be shortened with second and third reading intended to be taken together at the meeting immediately after the Committee's response is due.

4. Policy 4.4.2, freshwater quantity and demand

This is known ground on four separate records, and the directive was recorded as not applicable.

The directive applies where the density or intensity of land use is increased in areas known to have a problem with the quality or quantity of freshwater. It requires that existing, anticipated and seasonal demands are considered and allowed for.

Four records establish that this is known ground.

The Municipality's own bylaw. 620 Laura Road lies within the Watershed, Aquifer and Stream Protection Development Permit Area, designated under OCP Bylaw No. 282, 2010, with guidelines under Land Use Bylaw Amendment No. 301, 2011. On the Municipality's

mapping the property carries the watershed designation, and the riparian stream buffer along Murray Creek, which runs through it. Murray Creek is not the only watercourse here. The Municipality's mapping shows a second one running down Laura Road, and its stream buffer reaches the property from there, so the buffers overlap along that boundary. That second system takes in Lynn Creek and Peggy's Creek and is associated with a wetland area on 1355 Westside Road. On Bowen these watercourses are not continuous open channels. A creek runs in the open, then into a ditch, then out of it, then perhaps back into another, and the mapping treats it as a watercourse throughout. This submission deals with Murray Creek because that is the watercourse crossing 620 Laura Road. But it is one strand of a connected and moving system: surface water and groundwater exchanging along its length, creeks running open, then buried, then open again, wetlands holding and releasing, and two named systems meeting below this property. What is put into it here does not stay here.

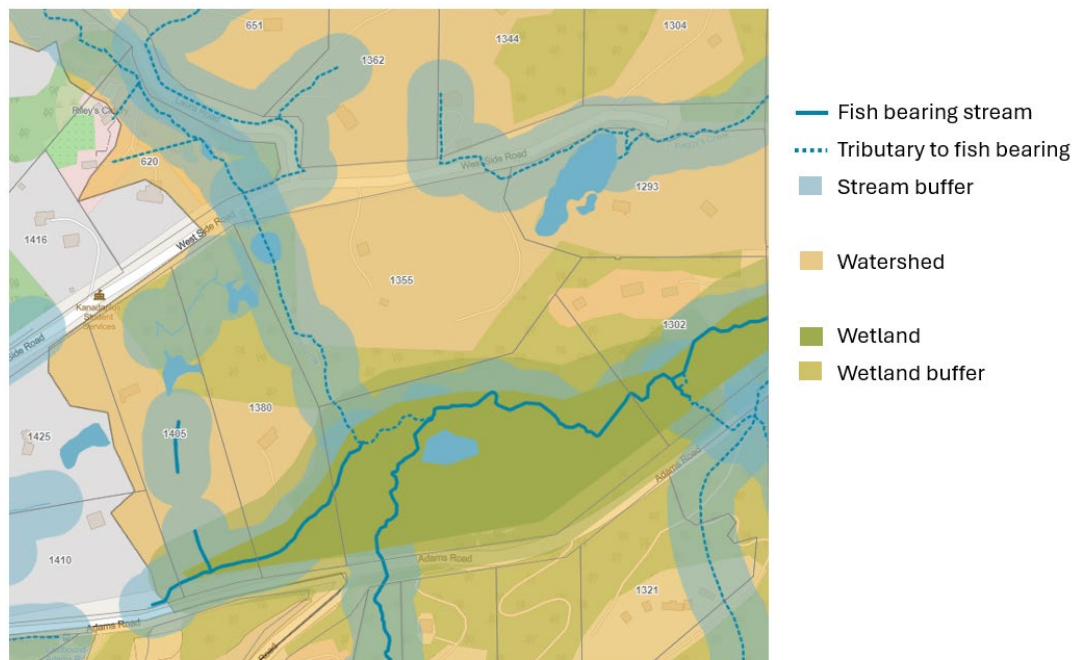


Figure 2. BowMap, Bowen Island Municipality, accessed August 17, 2026. Watershed, Aquifer and Stream Protection Development Permit Area overlay on, with its legend as displayed. 620 Laura Road at upper left, marked Riley's Cidery. Murray Creek is mapped as a tributary to a fish bearing stream, with its stream buffer, running south from the cidery past 1355 Westside Road. The fish bearing stream and the wetland complex lie along Adams Road at lower right. The watershed designation covers the whole of the ground between them.

The Islands Trust's own work. On 11 December 2023 the Islands Trust Senior Freshwater Specialist appeared as a delegation before Bowen Island Council and presented Howe Sound Aquifer Conceptualization and Groundwater Recharge Mapping. The recharge potential map is at page 21 of that agenda package. It classifies recharge potential in three classes. The corridor running from 620 Laura Road down Murray Creek to the Adams Road

wetland falls in the higher classes. Well symbols on the same map show the density of wells drawing on that ground. His closing slide asked that critical recharge areas be protected. In discussion the Municipality's Chief Administrative Officer described Bowen as having *"quite an extensive and robust DPA network. Including aquifer recharge areas."*

The regional inventory. Metro Vancouver's Sensitive Ecosystem Inventory maps ecologically significant areas across the region, with the stated intent of informing official community plans, development permits and stream setbacks. Four polygons cover this ground and the creek, mapped as wetland and riparian. The detail is in *"Aquifer, groundwater and watershed evidence: 620 Laura Road cidery rezoning"*, already before the Committee in the agenda package for 29 July 2026. That inventory shows wetland extending further than the Municipality's current mapping does, and the polygons on the draft Plan's Environmentally Sensitive Development Permit Area map, Schedule B-1, follow the same inventory.

The Municipality's own conduct on the same creek. Council stopped the 1355 Westside Road application until a watershed management plan is complete. The Advisory Planning Commission asked about well locations, water supply adequacy and long-term monitoring at Lot 7 Adams Road.

What intensity means here

The directive speaks of density or intensity. They are different measures and only one of them has been engaged.

Density is countable. It is dwelling units on a parcel, and this rezoning adds none. That is the answer the record has given whenever the question has arisen on this island, and it is the answer that closed the freshwater directives on the referral of Bylaw No. 581 in 2022.

Intensity is the other measure. It is what the land is being asked to carry, and it is the one this submission is about. Comparative work on how wells and settlement are actually distributed across the Trust islands is in progress and will be put to the Islands Trust and to the Municipality separately. It is not relied on here.

- A dwelling on a rural parcel draws domestic water and returns domestic sewage.
- A cidery on the same parcel further draws water for irrigation and to wash vessels, lines and bottles, and returns a fermentation waste stream.
- The Municipality's own engineers have measured the difference. Assessing distillery effluent at Snug Cove in 2017, they found that 850 litres of it a day carried the organic load of forty-two to fifty-six people while adding the volume of about four. Section 8 sets out that study and a second one in 2020.

That is the density question answered in the Municipality's own figures. The same volume of water carried ten to fourteen times the load. A use that adds no dwelling can still put on the ground what forty or fifty residents would.

So the change proposed at 620 Laura Road is not a change in the number of things on the land. It is a change in what the land receives. And it is the same step in the process, fermentation, that makes the use manufacturing and that produces the stream.

The Land Use Bylaw makes the same distinction in its own way. Section 3.18 sets a 30 metre setback from the natural boundary of any watercourse. In the Industrial Medium and Industrial Commercial zones that becomes 50 metres. The bylaw does not raise it because more buildings are expected on industrial land. It does so because of what industrial activity is.

Intensity is the route into 4.4.2 that fits this application, and no report on it has engaged that route.

Demand is already dense, and already restricted

- Provincial well records show 13 wells within 300 metres of 620 Laura Road, 30 within 500 metres, and 86 within one kilometre, measured from an approximated centre point of the property.

The mapping, the provincial well records and the sensitive ecosystem panels are set out with their sources in *"Aquifer, groundwater and watershed evidence: 620 Laura Road cidery rezoning"*, already before the Committee at page 105 of the agenda package for 29 July 2026.

- Those figures are a floor. Well registration was voluntary until 2016, springs and diversions are recorded only where licensed, and some private systems serve several homes from one or two wells. All three move the figure the same way.
- The Municipality's Water Conservation page states that restrictions run for all municipal systems from 1 May to 31 October under its Water Conservation Bylaw.
- Stages 1, 2 and 4 read *"None at this time."* Stage 3 lists Cove Bay, Bluewater Park, Bowen Bay, Eagle Cliff, Hood Point, King Edward Bay and Tunstall Bay. Cove Bay is the only one drawing solely on surface water. Every other system on that list depends on groundwater. The page states that all water systems are currently on Stage 3.
- The Municipality's Alerts page gives the date: *"Bowen Island is at Stage 3 water use restrictions effective June 8, 2026."*
- The same page advises private well owners to follow the conservation stages, *"as doing so supports the long-term sustainability of local groundwater sources"*.

- It also states: *"Bowen Island's water comes from rainfall collected in the aquifers and water sheds. We do not have a unlimited amount of water."*
- And the Municipality has said that one of the Westside systems cannot meet demand from its own wells. Its project page for the Bluewater Park water system replacement states that the four drilled wells supplying that system *"do not supply enough water to adequately meet the needs of BWP residents"*, and that a connection to the King Edward Bay system was built so that water *"is now supplied year-round from the KEB wells"*.
- Three current Water Quality Advisories are listed. One covers Bowen Bay, King Edward Bay, Bluewater Park and Tunstall Bay. Its stated cause is that GARP assessments *"have identified several risk factors for contamination, so additional water treatment is required"*.

So the Municipality restricts every one of its own systems seasonally. It has all of them at Stage 3. It advises private well users on how to cope with a dry well. On this application it recorded the freshwater directives as not applicable, and required no assessment of demand.

And anticipated demand runs the same way

4.4.2 does not stop at existing demand. It requires that anticipated demand is considered and allowed for.

- The draft Official Community Plan puts 620 Laura Road and the surrounding area, including Laura Road and Westside Road, in a Rural Residential Transition designation.
- That designation sets an average parcel size of 2 hectares, against 4 hectares under Rural Residential, and sets no minimum lot size at all. Individual parcels may be reduced below the average where, in the opinion of the Municipality, there is community benefit in clustering, with watershed protection named as one possible benefit among others including viewsapes and fewer driveways.
- So the direction of travel for this ground is more parcels, on land already settled and already served by private wells, on the aquifer this submission concerns.
- The draft sets its other residential densities by reference to whether a community water system serves the land, a term that is not defined in the plan. In the Rural Residential Transition designation it does not.
- Correspondence to Mayor and Council of 9 July 2026 put the point that whole neighbourhoods on this island depend on private wells *"with no realistic prospect of connection to a municipal or other large system, now or in the future"*, and asked what consideration had been given to households with no connection option. No answer has been given.

Bowen is already the most densely settled island in the Islands Trust Area. At the 2021 census it held 4,256 people on 50.12 square kilometres, about 85 people per square kilometre. The next is Gabriola at 77, and Salt Spring, with nearly three times the population, is at 61.

And the growth is anticipated without much to anticipate it against:

- Groundwater on Bowen is monitored through two provincial observation wells. Two, for an island with seven mapped aquifers, five of them bedrock, and both recent.
- Neither aquifer has a water budget. The classification of 749 rests on fourteen well records and that of 746 on nineteen.

Those records are not a count of the wells. Two different figures are involved and they are twenty years apart. The first is how many well records were available when the aquifer was delineated in 2006: fourteen for 749, nineteen for 746. The second is how many wells in the Province's register are correlated to each aquifer today: thirteen for 749 and eighteen for 746. Neither is a count of the wells that are there. The register now holds 102 wells inside the 749 polygon and 125 inside 746, and those are not all the wells either. Submission of well records was voluntary until 2016, and the Province's own guidance says the register does not reflect the present status of well use. It is a record of what has been reported.

The Province's Groundwater Team has explained why so few are correlated: correlation exists to support licensing under the Water Sustainability Act and is a recent practice, wells exempt from licensing are correlated only through broader aquifer mapping, and Bowen was last mapped in 2006, which is why so many of its wells are uncorrelated. The same correspondence confirms how uncorrelated wells are counted, by subtracting the correlated wells from the wells falling inside the polygon. So the published well density for 749 is 3.2 per square kilometre and the density actually present is about 25. For 746 the published figure is 1.2 and the actual is about 8.4.

Three artesian wells sit within about 550 metres of this property, one at Evergreen Phase 4 and two on Adams Road. All three are uncorrelated, so none appears in the provincial figures either. Artesian conditions mean groundwater confined under enough pressure to rise to the surface on its own.

And the document relied on to close the water question is a finding that the ground is open. A GARP assessment asks whether the groundwater at a source is at risk of containing pathogens, which is to say whether what is at the surface can reach the water below. At 620 Laura Road the answer was yes. Two of the thirteen screening hazards were found present: hydraulic connection to surface water, and an intake less than fifteen metres below ground surface. The report's own figure draws a 150 metre radius around the

well and labels the band a *"Zone of Risk for contamination by hydraulic connection to surface water"*. It records surface casing to 6.4 metres with the shallowest water-bearing fracture at 12.2, material over the bedrock that is coarse-grained with limited capacity to restrict infiltration, and no confining unit above it. On the same property the applicants' assessment records Frank Spring as the point where groundwater daylights at surface. The Permit to Operate issued that September requires continuous chlorination and ultraviolet disinfection.

So the one document standing in place of a water assessment establishes that this is ground where what is put on the surface reaches the groundwater, and that the groundwater there was already judged at risk. It was not asked, and does not say, what this operation puts on the surface.

- The Province's Aquifer Stress Index, the one provincial instrument that sets demand against recharge, returns *"method not applicable"* for every one of Bowen's seven aquifers.
- In the dataset behind that index, derived groundwater withdrawal by rural private domestic users is recorded as zero for all seven. Across British Columbia, 916 of 1,130 aquifers carry a figure greater than zero.
- The Official Community Plan of 1982 listed a comprehensive water supply study under *"further studies required"*. It said the provincial surface water study *"should be supplemented by a study of groundwater supply"*, and underlined that *"these Studies are necessary and should be done in the near future"*. The island's estimated population when the plan was written was 900. It is now 4,256, and the aquifer under this property is still classified on those eight to fourteen well records.
- A 2021 report prepared for the Municipality's Manager of Planning and Development, to support two draft bylaws, states that *"none of the streams are gauged, and so little information is available regarding streamflow"*.
- The same report proposed that a development permit should be triggered by *"activities that would alter the natural water table such as but not limited to, ditching, intensive drawdown from groundwater wells, or impoundment structures"*.

And wells running dry on Bowen is not new. The Municipality gives its advice to private well users on a separate page under Water and Sewer, in a document titled *"Tips for Private Well Users"*. It is headed *"Attention Private Well-Users"* and begins: *"Recently, Bowen Island Municipality has received reports of wells running dry in the community. You can take steps to protect your water supply and to deal with a dry well."* It goes on to advise well depth monitors, coordinating tanker deliveries with neighbours, and storage tanks sized to the natural recharge capacity of the well.

The notice carries no date. It still describes the Water Sustainability Act as something that "will come into effect", and the file the Municipality serves it from is titled 2015.

It ends: *"Bowen Island Municipality has all necessary procedures in place for our municipal water systems. Private wells and water systems, however, are outside municipal jurisdiction and are the responsibility of the Province."*

Two things follow. Wells running dry on Bowen was a reported matter before 2016. And the Municipality's response was to advise individual owners how to cope, rather than to assess the aquifer. The same notice is the advice the Municipality offers today, on its current water conservation page.

So anticipated demand is rising on this ground by design. Reports of failing wells were arriving before 2016. Neither has been measured.

How much water this operation uses is not stated anywhere

Not in the application. Not in the temporary use permit or its renewal. Not in any of the five staff reports. No design figure, no measured figure, no estimate.

The only statement of any kind about quantity came from the applicants themselves, in a delegation to Council on 11 March 2024. They said the site uses very little water, that the biggest demand is irrigation, and that they have four thousand gallons of storage to help mitigate that demand.

Storage is not use. Four thousand gallons describes the buffer between the source and the tap. It says nothing about how much is drawn from the source over a season or a year.

The property holds conditional water licence C107480 on Frank Spring, issued 31 August 2000 with a priority date of 25 November 1993. The Province's Water Rights database records it as current. Its purpose is irrigation. Its maximum is 2.5 acre feet a year, it may be used only from 1 April to 30 September, and it covers 2.5 acres of the lot. The works it authorises are "*diversion structure, pipe and sprinkler system*". It is expressly subject to restriction or prohibition by order of an engineer to maintain a minimum flow for fish life. Nothing in the record identifies any licence or authorisation for the water this operation uses in production.

The question was raised by a public health engineer five years ago

- On 27 May 2021 a Vancouver Coastal Health Public Health Engineer wrote to the applicants and their consultants. Given other wells and users within the aquifer, a water licence should be obtained. It should confirm no adverse impact on those wells, and that extraction would not affect the flow of Frank Spring.

- On 23 July 2021 a Vancouver Coastal Health environmental health officer recommended that the applicant consult the ministry about the correct water licence. The applicant replied the same day that they would look into it.
- In their letter to Council of 21 July 2026, the applicants say they are seeking provincial clarification on whether a groundwater licence is required, and will apply if directed.
- Five years have passed. The operation has run throughout.
- That thread began with a report from a neighbouring property. On 8 April 2021 Vancouver Coastal Health was told of a drop in flow in the creek fed by Frank Spring. The reply the next day was that the matter belonged to the provincial Water Management Branch. Six weeks later its own engineer reached the aquifer and spring conclusion in his technical review.
- Frank Spring is Murray Creek. The applicants' assessment records Frank Spring as the point *"where groundwater daylights at surface"*, and says its flow *"has been captured in a ditch, locally called Murray Creek"*.
- The Province has confirmed that no Environmental Flow Needs are established for Murray Creek or Bowen Brook.
- On spring flow, the Province advises that it is not aware of any spring flow measurement from Bowen Island.

What stands in place of an assessment

The Water section of the staff report rests on one document, which staff describe as a Hydrogeologist Report. Its own title is *"GARP Hazard Assessment"*, prepared by a consulting firm for Riley's Cidery, Revision 0, 30 April 2021, sealed by a Professional Engineer. Nothing in it claims to be a hydrogeological report or the work of a hydrogeologist.

- A GARP assessment screens whether a groundwater source is at risk of containing pathogens. It is a well-source screening tool.
- It does not address quantity, drawdown, effects on neighbouring wells, or the creek. It excludes chemical contaminants by its own terms.
- The Parks, Environment and Climate Action Advisory Committee asked on 7 July 2026 for an assessment by a professional hydrogeologist covering cumulative impacts and climate change. The staff report answers that request by citing this document.
- The report was revised on 24 July 2026 only to record the Advisory Planning Commission's recommendations. Nothing in the discussion responds to them.

When these documents entered the record. The three documents the Municipality now relies on for water and waste are all dated 2021: the GARP assessment 30 April, and the two sewerage filings 24 and 25 June. They surface in this application in July 2026, as

attachments to the first reading report of 15 July and on the Advisory Planning Commission's agenda of 23 July. The reports of 13 April and 25 May 2026 list their own attachments, and none of the three is among them. They did not come from the Municipality. Presenting the report to Council on 27 July the planner said that *"the Riley Cidery provided a hydrogeologist report that was completed in 2021 as part of the application for a permit from Vancouver Coastal Health"*.

Two further documents this submission relies on reached the public record by another route again. The Certificate of Occupancy classifying this building as low hazard industrial is known from release PSS-2021-11208, published by the Province on its Open Information site in April 2023. The 2021 correspondence from Vancouver Coastal Health's Public Health Engineer is known from release 2021-F-208 by that authority. Neither came to Council or to its committees through the application.

What the Province recorded about this aquifer in 2006

Appendix D carries the Province's 2006 Aquifer Classification Work Sheet for Aquifer 749:

- Level of development: *"Heavy - High level of demand in relationship to moderate level of aquifer productivity and water availability. Additional development of the aquifer should be carefully assessed."*
- Quantity concerns: *"Downward trend reported in water levels in some wells, (Bowen Island Municipality, 2005a). This may need further investigation."*
- Reliance: an important source for individual properties and for community supplies including the Bowen Bay and Tunstall Bay water systems.
- Vulnerability: moderate, on fractured bedrock.

That vulnerability rating is for fractured crystalline bedrock, and the setting matters. Bowen is a steep Howe Sound island, not one of the flatter sedimentary islands of the Strait of Georgia. Its slopes shed a high proportion of rainfall to runoff, and its settlement sits on the lower ground where the water is received. Work done on the sedimentary islands does not carry across.

5. Policies 4.4.3 and 3.3.2, in-stream uses, watercourses, wetlands and riparian zones

The creek runs through the property, the reports place it on the boundary, and only the riparian half of the Development Permit Area has ever been taken up.

- The staff reports place Murray Creek *"along the eastern border"*. That phrase puts it at the margin of the site.

- The Municipality's own mapping shows otherwise. The property extends well east of the creek, and there are multiple ponds on the creek within the property.
- Planted ground lies on both sides of the creek. The cidery buildings stand west of it, on higher ground. So the creek is not a feature at the edge of the operation. The operation sits on both sides of it.
- The site maps in the staff reports do not show the creek at all.
- The applicants' own assessment places the creek on the property rather than at its edge. It records the creek as running parallel to Laura Road and passing *"through the Site adjacent to the roadway"*.
- Below the property the creek passes under West Side Road in a culvert and continues south. It is one continuous watercourse from this property to the wetland at Adams Road.

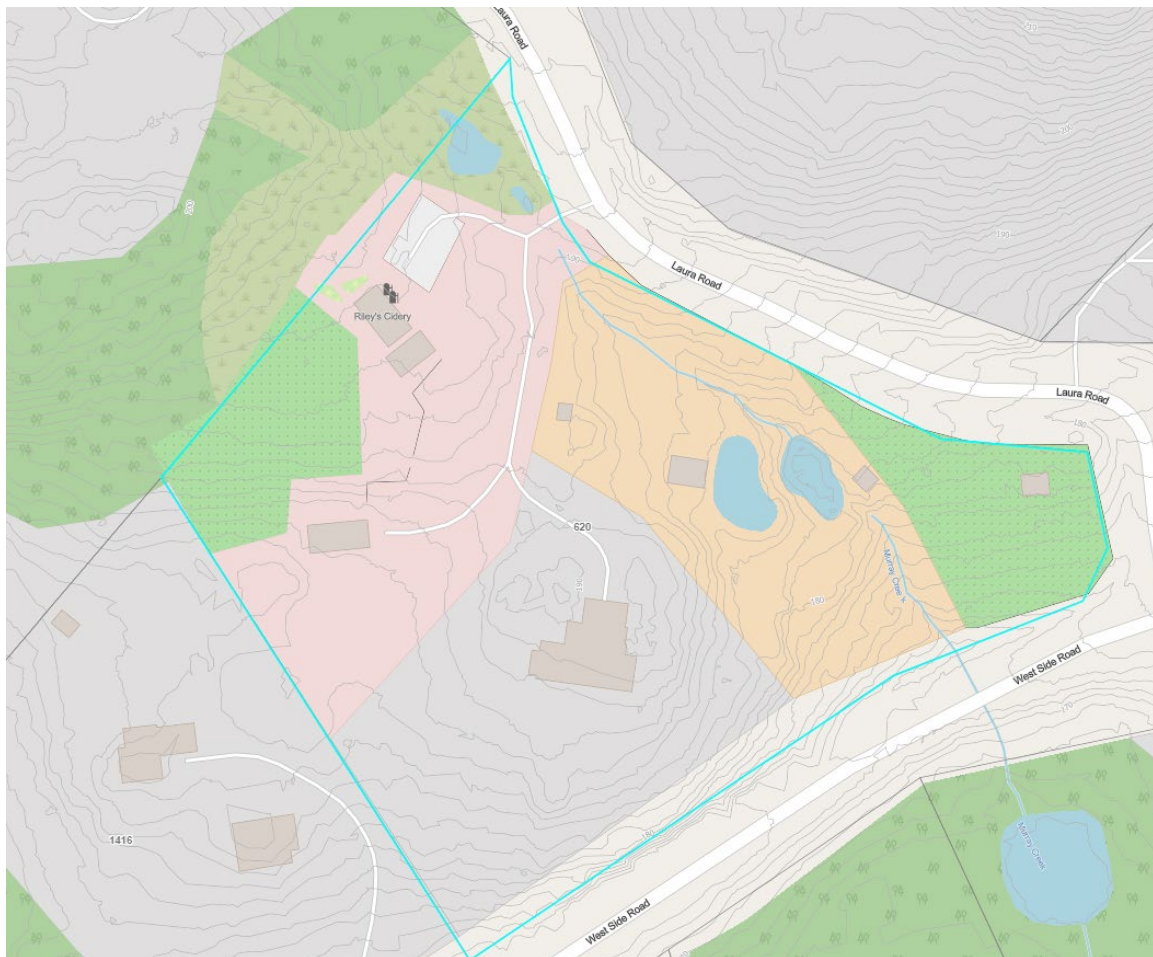


Figure 3. BowMap, Bowen Island Municipality, accessed August 17, 2026, with contours. 620 Laura Road, parcel boundary in blue, with Riley's Cidery marked. Murray Creek enters beside Laura Road at the top, runs down through the eastern half of the property past the two ponds, and leaves at the south east corner. The contours show the creek in the low ground, with the cidery buildings on higher ground to the west. Planted ground lies on both sides of the creek.



Figure 4. BowMap, Bowen Island Municipality, accessed August 17, 2026. The same parcel and the same boundary, on aerial photography. The cidery building and its tanks are the top of the area, with a block of young orchard planting left of them. The heritage orchard occupies the right hand extension of the lot. The main dwelling stands on a rock knoll at the centre, with left of that a barn/residence below the young orchard. The parcel boundary shown is the Province's cadastral line. Where the built area sits in relation to it is not a question this submission addresses.

The Development Permit Area carries two regimes under Bylaw No. 301, 2011:

- The stream and riparian regime.
- A Water Resources regime. It calls for the location of all wells and water intakes, an assessment of groundwater recharge areas, and an impact statement on the maintenance of water supplies. It provides that disturbance to recharge areas be avoided, and that protection extend to a 30 metre radius around an existing well.

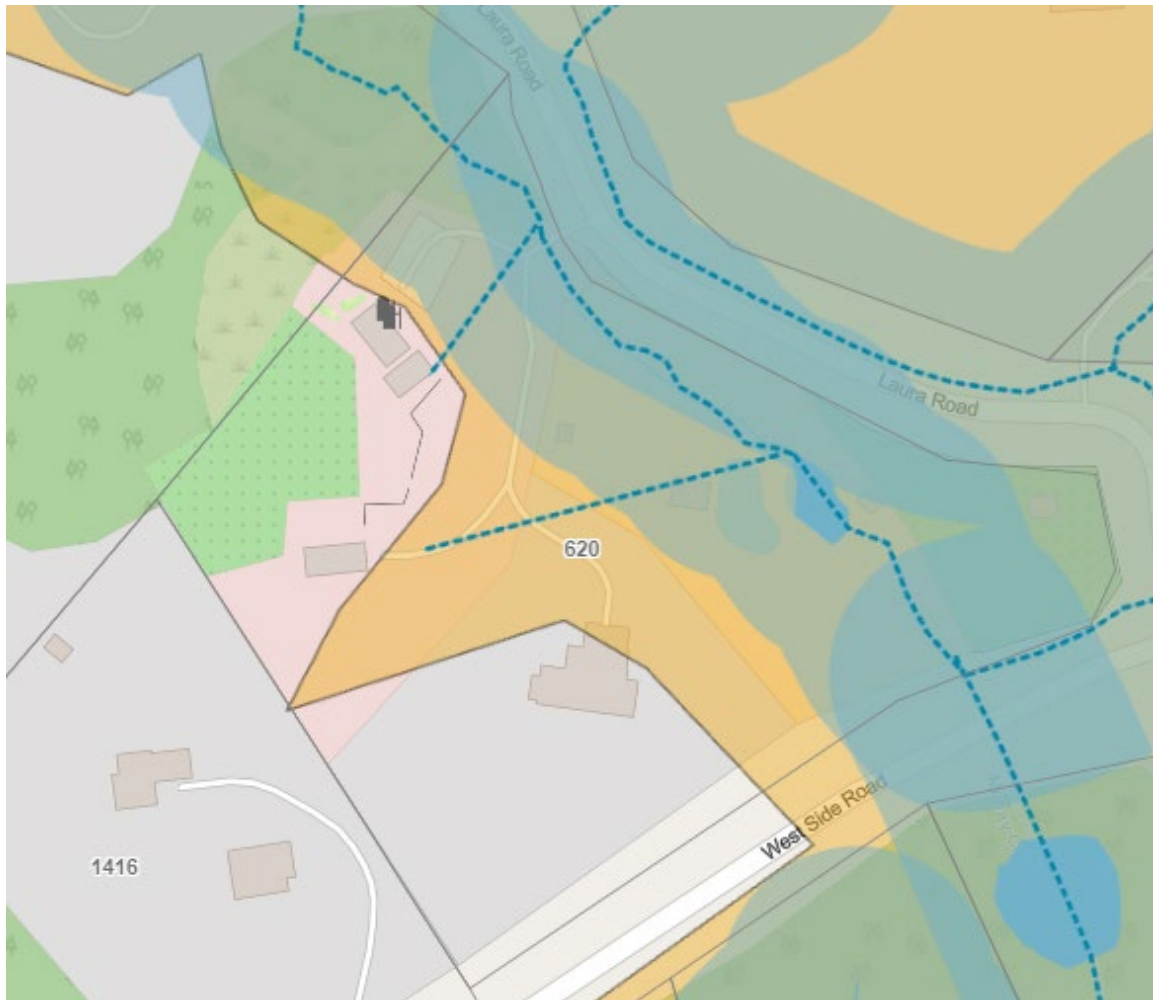


Figure 5. BowMap, Bowen Island Municipality, accessed August 17, 2026. 620 Laura Road, Watershed, Aquifer and Stream Protection Development Permit Area overlay on. The dotted line is Murray Creek, mapped as a tributary to a fish bearing stream. The pale blue band along it is the stream buffer, which is the 30 metre setback under Land Use Bylaw section 3.18, and it crosses the property. The orange fill is the watershed designation. Laura Road at top, West Side Road at lower right, parcel 1416 at lower left.

The buffer on the map is 30 metres

The Land Use Bylaw sets a general setback and then departs from it for industrial land.

- Section 3.18: *"No building or structure shall be sited within thirty (30) metres from the natural boundary of any watercourse or wetland unless otherwise provided for in this Bylaw."*
- In the Industrial Medium and Industrial Commercial zones, the setback table reads *"From a Watercourse. Minimum setback despite Section 3.18 (metres): 50."* The same 50 metre figure appears in the CD 13 zone.

So the general setback is 30 metres, and where the bylaw zones land for industrial use it raises that to 50, saying so expressly despite section 3.18. That is the bylaw's own judgement about the distance industrial activity requires from a watercourse.

Two things follow from that, and the first is the one that matters.

The bylaw contains the judgement. Its drafters considered what distance industrial activity requires from a watercourse and concluded that the ordinary 30 metres is not enough. That view is written into the bylaw, and it is written in the only places the bylaw contemplates industrial activity happening.

The second is that the judgement is keyed to the zone, not to the use. 620 Laura Road is zoned RR2, a residential zone, so the 50 metre setback has no application to it. The buffers on the Municipality's mapping are the 30 metre ones, and the operation stands inside them.

Industrial uses are provided for in the Industrial Medium, Industrial Commercial and comprehensive development zones. They are not permitted uses in RR2. So the position is not that a rule has been broken. It is that a use the bylaw locates in industrial zones is being carried into a residential one, and the setback the bylaw attaches to industrial activity beside a watercourse is left behind with the zoning.

The bylaw does carry one use-based provision, and it applies whatever the zone. Section 3.21 prohibits a list of specified activities within thirty metres of the natural boundary of any watercourse or wetland. The list includes the storage of solid waste, fuels, chemicals and construction materials, the storage of agricultural waste, and the storage or repair of industrial machinery.

Which protection area applies has never been determined. The Development Permit Area does not measure its protection area from the creek in every case. Its definition of a water resource protection area measures 30 metres from the top of bank where the watercourse is not in a ravine; 30 metres beyond the top of the ravine bank where the ravine is less than 60 metres wide; and 10 metres beyond the top of the ravine bank where the ravine is 60 metres or wider.

Those three measurements appear twice in the bylaw. They are in the definition of a water resource protection area, and the same three set the riparian assessment area in the fish and riparian half of the designation. So the question arises under either half.

The bylaw also says who must answer it. Where there is uncertainty or a discrepancy regarding the width of ravine, that *"shall be determined by a qualified environmental professional (QEP) and a licensed British Columbia Land Surveyor at the expense of the applicant"*. It is not a matter of staff judgement and it is not at public cost.

So the area protected turns on whether any part of Murray Creek at this property is in a ravine, and on where the top of the ravine bank runs. Neither is answerable from a contour

map. A creek cut a few metres into its own banks sits between the labelled contours and does not appear at all. It is a question for someone on the ground.

What the mapping does show is the reason to ask. As section 2 sets out, the contours on this property are closest together along the creek corridor. The land falls about 20 metres across the lot, the creek lies in the low ground, and the ground beside it changes over a short distance. That is the ordinary occasion for establishing which measurement applies.

Nothing in the record shows the question being asked. The riparian half is the half that has been taken up on this property, and it carries the same three measurements; no determination by a qualified environmental professional and a land surveyor appears anywhere. The water resources half has never been engaged at all. The buffer shown on the Municipality's mapping is the 30 metre one, and the Steep Slope Development Permit Area the Official Community Plan identified was never enacted. I do not say the creek is in a ravine. I say the bylaw makes it a question, names who must answer it and at whose expense, the ground makes it a live one, and it has not been answered.

The aquifer is in the title and nowhere on the map

The designation is Watershed, **Aquifer** and Stream Protection. The legend at Figure 2 is the Municipality's own. It carries fish bearing stream, tributary to fish bearing, stream buffer, watershed, wetland and wetland buffer. There is no aquifer class in it.

So the aquifer is not identified anywhere as a thing with an extent. It is treated as captured by the watershed and stream layers, which are surface features. Groundwater recharge is not the same as surface drainage, and the Islands Trust's own recharge mapping, presented to Council in December 2023, exists precisely because it is not.

That is the same shape as the two regimes below. The aquifer survives in the title of the designation and in the text of the Water Resources guidelines, and disappears everywhere the designation is actually applied.

A rezoning does not itself trigger a development permit. The occasions on which the designation was engaged on this property are the building permit for the cidery building, the temporary use permit of 2021 and its renewal in 2023.

On the record of those occasions, only the riparian regime has been taken up. In the December 2023 renewal the Development Permit Area is named once, to be set aside, because no work within it was proposed. The exemption relied on is for an *"orchard regardless of size"*. It applies only *"provided that water resources are not adversely affected"*. That is the matter never assessed.

And in the rezoning reports it is not mentioned at all. Across the three 2026 reports, of 13 April, 25 May and 27 July, the designation does not appear. In the whole series of five reports the words "*Development Permit*" occur six times: three in the report of February 2021, which refers only to "*a Development Permit area*" without naming it; two in the December 2023 renewal; and one inside the applicants' own attached letter, describing bylaw complaints from 2021. So a reader coming to this referral from the papers on this bylaw would not learn from them that the property lies within the Watershed, Aquifer and Stream Protection Development Permit Area at all.

That matters here because this rezoning proceeds on the footing that the temporary use permit was unproblematic and needs only to be made permanent. The Water section of the first reading report carries that forward, and the health authority's position is relied on in the same way. Both are set out in sections 4 and 8. Neither footing was ever tested against the water resources half of the designation.

6. Policies 4.1.5 and 4.1.8, farming and agricultural land

The application rests on the cidery keeping the heritage orchard viable. That is the land use 4.1.8 attaches a condition to, and the condition has not been examined.

- 4.1.8 requires that municipalities address "*land uses and activities that support the economic viability of farms without compromising the agriculture capability of agricultural land*".
- 4.1.5 requires that they address "*the preservation, protection and encouragement of farming, the sustainability of farming, and the relationship of farming to other land uses*".
- The applicants' letter to Council of 21 July 2026 rests their case on sustainability, and on the cidery keeping the heritage orchard viable. That is a land use said to support the economic viability of a farm. 4.1.8 attaches a condition to it.

What the definition permits

The cidery definition inserted into section 1.1 has three features that matter:

- **Nothing need be grown on the lot.** At least 25 percent of production must come from fruit grown on the same lot "*or from another lot which is part of the same business*". All of the 25 percent may come by the second route. The definition does not say how many lots, or where.
- **No ceiling.** It states a ratio, not a volume. Production may run to four times the fruit the business grows, wherever it grows it. A ratio to a figure the operator sets is not a limit.

- **No tie to a harvest.** The definition says nothing about when fruit is grown, or whether what arrives is fresh, stored or frozen. It does not mention juice.

Whether that is a use supporting the viability of a farm without compromising the capability of agricultural land is the question 4.1.8 poses. No report has asked it.

The checklist answers 4.1.8 with: *"Rezoning application includes a protective covenant for agriculture land that it be used for that purpose."* As section 10 sets out, no such covenant exists.

What the committees and Council were told

- To the Parks, Environment and Climate Action Advisory Committee, 7 July 2026: *"in the cidery definition, it's that 25% have to come from the property, and 75% can be imported."*
- To the Advisory Planning Commission, 23 July 2026, asked to confirm that a covenant requiring 25 percent from the site was unnecessary because the definition already required it: *"That's in the proposed cidery definition, 25% to come from on site."* The commissioner who had proposed that covenant withdrew it.
- To Council, 27 July 2026, presenting the report at first reading: *"the current definition limits production to that produced on the lot"*.
- The words *"or from another lot which is part of the same business"* were not put to either committee, or to Council.

Cider production is not agriculture

Planning staff's position, given to both committees, is that cider production is agriculture. No report states a basis for it. The Municipality's own records put the use elsewhere.

The question was put to the Municipality before the temporary use permit was issued, and repeatedly afterwards. It has never been answered.

- The classification is in a public submission of 15 March 2021, which appears in the Council agenda package for 22 March 2021, the meeting at which the permit was granted.
- It was put in writing to the Manager of Planning on 16 March 2021, again before that meeting. That letter also records that the staff report reasoned from a sawmill comparator to defend the use without naming it as light industry.
- On 9 May 2021 the Official Community Plan's light-industrial water policy was quoted to him verbatim, under an explicit light industry heading, copied to the Chief Administrative Officer.

- On 25 April 2021 a further submission to Mayor and Council stated that a cidery is legally and functionally a winery, that cider production is a light industrial process producing contaminated wastewater, and that the vineyard prohibition existed to protect against that harm.
- Asked directly at the Advisory Planning Commission on 23 July 2026 whether the application had been looked at from the light industry angle, the planner said that in his view it is not, because *"It's the same as a farm use that's permitted in the ALR."*

Five years, and the answer has not moved beyond a comparison to a different statutory scheme.

- **The Municipality certified this building as industrial.** On 2 October 2020, under Building Bylaw No. 489 section 10.55, it issued a Certificate of Occupancy for the building at 620 Laura Road built under Building Permit 20200165, described on the permit as *"Change of Use - Cidery"*. Approved occupancy: *"Group F, Division 3, Low Hazard Industrial"*. Approved use: *"Distillery -- Accessory Building"*.

It made that classification while holding its own engineering report of May 2017 on the effect of distillery effluent from Snug Cove on the treatment plant, and it had that effluent sampled independently in 2020. Those records concern a different operation. What they show is that the Municipality knew what a fermentation waste stream was when it certified this building as a distillery. Sections 4 and 8 set out what those studies found.

The word distillery is the Municipality's. The Building Code defines a distillery as a process plant producing distilled beverage alcohols, and defines those as beverages above 20 per cent alcohol by volume. That threshold is the Code drawing the same line every other instrument draws, between alcohol production and beverage production generally. Cider sits below that threshold. Distilling is a further step applied after fermentation, and this operation does not take it, so what the certificate describes is not the operation that was certified. The Code's own list of examples places distilleries in Group F Division 1, high hazard, not the Division 3 certified here. So the description does not fit the operation, and it does not fit the classification it sits beside.

The certificate is dated 2 October 2020, and the Municipality said so before Council decided. Answering questions in writing on 17 March 2021, five days before the temporary use permit was granted, the Manager of Planning and Development wrote: *"We issued a building permit for the work to the building August 2020."* The classification question was put to the Municipality in writing three times in the months that followed, as set out above. No staff report on this property, then or since, mentions the Certificate of Occupancy or the classification it records.

- **The Municipality codes this business as alcohol manufacturing.** Its business licence register applies an industry code supplied by the Municipality. Beverage Manufacturing in the North American Industry Classification System separates non-alcoholic production from alcohol production: soft drink and ice manufacturing on one side, breweries, wineries and distilleries on the other. All three of the island's alcohol producers are coded on the alcohol side. The code that covers a cidery is 312130, Wineries, which sits under Manufacturing and whose illustrative example is "*alcoholic cider, manufacturing*". The same code covers growing grapes and making wine together, so producing from one's own fruit does not move the activity into agriculture.
- **The assessment roll splits the title.** 620 Laura Road carries residential, farm and light industrial classes at once. The Municipality levies its property taxes from that roll by class. Under B.C. Reg. 411/95, the Schedule at section 1(h) makes fruit production a qualifying agricultural use. The Schedule at section 2(a) makes "*the production of manufactured derivatives from agricultural raw materials*" an excluded use. Fruit in, cider out.

The contrary proposition, on which the application rests, has never been stated with a basis, and it is contradicted by the Municipality's own certificate for this building.

The consequence

- The cidery definition is fixed in section 1.1, the general definitions. On staff's position that a cidery is agriculture, that meaning travels with the word agriculture wherever the bylaw uses it.
- Agriculture is a permitted principal use in all three Rural Residential zones, in both Rural Commercial zones, in Transitional Commercial 1, in one industrial zone, in the Settlement Residential zone variations SR 1(a), SR 2(a) and SR 3(a), and in areas of six comprehensive development zones.
- The Islands Trust sees bylaws. A permitted use produces no bylaw, no referral, no checklist and no report.
- Planning staff told the Parks, Environment and Climate Action Advisory Committee that a cidery on land zoned for agriculture "*would never come to council. It would never come, may not come to the municipality at all beyond like business licencing.*"
- So this class of use would stop generating referrals. Bylaw No. 726 is the only bylaw on the subject the Committee will see.

7. The vineyard definition, and what the Committee was told in 2021

In 2019 the Municipality's planner proposed two linked changes to the Land Use Bylaw: remove the definition of "*vineyard*", and amend the definition of "*winery*" so that it expressly included cider. Bylaw No. 528, adopted in November 2021, did the first and not the second. It deleted the definition of "*vineyard*" and removed the term from the permitted uses lists. It deleted "*vineyard*" from the exclusions in the definition of "*agriculture*", so that agriculture no longer excluded it. It amended "*winery*" without adding cider, and removed the cap limiting imported British Columbia grapes to no more than 50 per cent of production.

The applicants rely on that removal. Their letter to the Manager of Planning and Development of 22 October 2025, filed with this application, says that since the temporary use permit was issued *"there has been a material amendment to Bowen Island's Land Use Bylaw, specifically, the removal of the definition of 'Vineyard'"*, that the former definition *"created ambiguity around how fruit-based alcohol production (including cider) related to agricultural use"*, and that with it repealed *"the only relevant definition is 'Agriculture'"*. On that basis they say the cidery *"fully meets the definition of a permitted Agricultural Use"*.

Bylaw No. 528 came to this Committee in January 2021. The staff report before it described the project as technical updates and housekeeping, and recorded that permitted uses on Bowen properties would not change. The Committee found it not contrary to the Policy Statement.

Correspondence to the Islands Trust in 2021 asked what consideration had been given to the removal of the vineyard definition. The question has been put again.

The Municipality has stated the principle itself. Explaining to Council in July 2026 why Bylaw No. 726 defines a lounge endorsement, the planner said: *"if we were calling it out as something that's not allowed, we wanted a definition."*

8. Policy 5.7.2, economic opportunities compatible with the conservation of resources

In over five years nobody has established what this operation discharges.

A cidery is an economic opportunity. The applicants present it as one. The output that bears on conservation is the effluent.

What the ground is

The applicants' own assessment describes it:

- *"The well log lithology shows that, at the Site, material overlying the bedrock is primarily coarse-grained, which has a limited capacity to restrict infiltration of surface water."*
- From the hazard table: *"There does not appear to be a confining unit over the bedrock to protect it. Soils overlying bedrock are described as sand and gravel or soil and rocks/gravel."*
- Surface casing extends to 6.4 metres below ground. The shallowest water-bearing fracture is at 12.2 metres.
- Two of the thirteen screening hazards were found present, both from the shallow intake.

That is ground with no confining layer, coarse material of limited capacity to restrict infiltration, and water-bearing fractures beginning at twelve metres. The assessment was scoped to whether the well is at risk of pathogens. It was not asked, and does not say, what happens to anything applied to that ground.

Effluent has never been characterised

- Fermentation produces a high-strength, low-pH waste stream, different in kind from domestic sewage. That is the same step in the process that makes the use manufacturing.
- In over five years of operation the effluent has never been sampled. No assessment of it appears on any public record.
- It has been handled throughout under the Sewerage System Regulation, which is the framework for domestic sewage and not for this waste stream.

That absence is not a gap in what I am putting to the Committee. It is the substance of it. No characterisation of what is discharged into this ground has ever been produced.

The filing that exists does not cover it.

- The Record of Sewerage System and the Letter of Certification are filings under the Sewerage System Regulation. That is the regime for domestic sewage. The Letter certifies estimated daily **domestic sewage** flow.
- The consultants' own memo of 25 May 2021 describes the greywater as coming from *"a handwashing station and a sanitizer, only"*.
- Cidery process effluent is not domestic sewage, and it is not a handwashing station and a sanitizer.
- So the waste stream from the manufacturing process has never been inside any filing, permit or authorisation held by anyone.

What Vancouver Coastal Health did, and what it was asked, is on the record.

- It confirmed the Letter of Certification in 2021, as a condition of interim approval to operate.
- Its own Public Health Engineer had, weeks earlier, written to the applicants about other wells and users in the aquifer and about the flow of Frank Spring.
- Its 2026 reply on whether a further letter of assurance was needed was scoped to the guest house. It says nothing about cidery process effluent, cleaning effluent or organic byproducts.
- That guest-house-scoped answer is what the staff report uses to close the waste question the Advisory Planning Commission had asked.

The provincial regimes do not close the gap either, and neither of them makes the discharge assessed.

- Under the Waste Discharge Regulation, B.C. Reg. 320/2004, the Schedule prescribes a beverage industry, but it reaches only production above 16 million litres a year, so on that heading no authorisation is issued at this scale. That threshold is a volume. It does not distinguish alcohol production from any other beverage, and it does not turn on what the effluent contains. The same Schedule separately prescribes the fruit and vegetable processing industry, which includes producers of juices and carries no volume threshold, but that heading does not reach this operation either: pressing juice here is an input to manufacturing an alcoholic product, which is the distinction B.C. Reg. 411/95 draws at section 2(a) of its Schedule when it excludes the production of manufactured derivatives from agricultural raw materials.
- Section 6(4) of the Environmental Management Act prohibits introducing waste so as to cause pollution, whether or not the activity is prescribed. Being under a threshold is not permission.
- The Code of Practice for Agricultural Environmental Management does not apply on residential-zoned land, and has no category for fermentation effluent.

The Municipality has had this kind of waste examined before, in the two studies named in section 6. The first, in May 2017, reported on the effect of distillery effluent from Snug Cove on the treatment plant's capacity, working from figures the distillery itself supplied, and produced the figures quoted in section 4. The second, in 2020, had that effluent sampled independently by an accredited laboratory.

What was sampled was the washdown of the distillery's fermenter tanks. The liquid alone came back at several times the strength of the domestic influent measured in the same study.

Fermentation is the step the two operations share. Distilling is a further step applied after it. So the stream those reports characterise is the washdown of fermentation vessels, which is what a cidery also produces, and what has never been examined here.

That distillery connects to the municipal treatment plant, so its discharge had to be examined before connection. That is why the records exist. A cidery on a private septic system triggers no such examination by anyone.

Bowen's Official Community Plan sets no threshold. Policy 207 states that all industrial waste management discharge to land and water must be authorised under the Waste Management Act. That Act was replaced by the Environmental Management Act in 2004, and the Plan still names it. The policy has never been cited in any report on this property.

The solid stream, and where it goes

Effluent is not the only output. Cider production also produces solids: pomace, the pressed skins, cores and stems left after juicing, and lees, the sediment that settles out of fermentation. Pomace is produced in bulk and seasonally, at the point of pressing.

The record carries one account of what happens to them, given by the applicant to the Advisory Planning Commission on 23 July 2026: pomace composted, three or four wheelbarrows a year, and lees mixed with dry compost and added to the same pile. He put the lees at between 25 and 400 litres a year, and said that at volume it carries a high nutrient value which would matter *"if we took that and it ended up in a waterway"*. Nothing else in the record addresses either:

- Neither is mentioned in the first reading report.
- Neither is mentioned in the temporary use permit or its renewal.
- The Sewerage System Regulation filings cover a liquid stream. Solids are outside them.
- The GARP assessment is a screening of the well. It does not address them.

The question has been asked twice. In February 2021 a member of Council asked how the waste from production would be dealt with, saying the property she used to own was the site of the Bowen Island Brewery and *"the disposition of the waste was a significant issue on that property"*. The answer was: *"There's one input into cider, a real cider, and it's fruit juice, just pure 100% so there's no water, nothing going in."* On 23 July 2026 the Advisory Planning Commission asked what happens to the waste from the cidery processing. The answer, set out above, closed: *"There's no water used in the process that ends up in the cider as well. That's an important point. Hopefully that answers your question."* The first reading report says the same, one sentence after recording that the well supplies *"wash water in its commercial operations"*. That is an answer about what goes in. The question is about what comes out, and the Commission's request for an environmental waste

management assessment covering production wastewater and cleaning effluent is unanswered.

This matters on the same ground as the effluent. Applying organic waste to land is a regulated activity in its own right in British Columbia, under codes of practice made under the Environmental Management Act dealing with composting and with the use of wastes as soil amendment. Whether any of that is engaged here cannot be established from the record, because the record does not say where the material goes. What can be said is that the property sits on ground the applicants' own assessment describes as having no confining unit above the bedrock and coarse material of limited capacity to restrict infiltration, within a Development Permit Area designated for watershed, aquifer and stream protection, with a watercourse running through it.

What was filed, and what the same works were called

Attachments 4 and 5 to the first reading report are the Record of Sewerage System, filing VCH-820082, and the Sewerage System Letter of Certification, filing VCH-822083, both June 2021.

The Record names the structure and then classifies the flow as household waste.

Under "*Other Structure (specify)*" it says "*Cidery*". What it certifies is domestic sewage flow, placed in the lowest band on the form, less than or equal to 9,100 litres a day. The Letter certifies that "*the estimated daily domestic sewage flow through the sewerage system will be less than 22,700 litres*", which is the ceiling of the regulation itself.

What else the Record records:

- No treatment method. Type 1, Type 2 and Type 3 are all left unticked.
- Standard practice: "*Other*". The form offers the Ministry of Health Standard Practice Manual or Other. Other is ticked, and what that other standard is does not appear anywhere in the package.
- Depth of native soil to the seasonal high water table or restrictive layer: 100 centimetres.
- Distance to the closest body of surface water: 50 metres.
- And the supporting documents are absent. The Record states that information on the type, depth and porosity of the soil is attached, and that a plot plan and specifications are attached. The Letter certifies that "*appended to this document is a plan of the sewerage system as it was built and a copy of the maintenance plan*". None of those documents is in the package.

The applicant described these works differently at the time. In January 2021 he told the health authority that *"waste water will be put into our recycle water system"*. The application his engineer made to the health authority that year was titled *"Riley's Cidery | Recycle Water and Water System Construction Permit Application"*. Two systems, named together, by the people who built them.

One of those two systems is documented and the other is not. The water supply system produced a construction permit, VCH-21-345, an issued Permit to Operate with nine conditions, inspection reports, sampling results, and an operational trail down to a chlorine pen calibration finding and a pump problem worked through with the supplier. For the recycle water system, release 2021-F-208 contains no permit, no completion document, and no operational record of any kind.

So the works that take this cidery's waste were described by the applicant as a recycle water system, and what exists on the public record for them is a filing about domestic sewage with no treatment type, an unnamed standard, and its attachments missing.

The consultants described the same works differently again to their professional peers. Their 2022 conference abstract submission is titled *"Reclaimed Water Made Possible on a Small Scale Cidery"*.

The abstract does not name the property, the operator or the island. It describes *"a small island cidery"*. It is identified as this operation by the applicants, who describe it as their system.

- It opens: *"This small-scale industrial application benefited from their ground water supply and its' reuse."* The apostrophe is in the original.
- It says the reclaimed water *"was used for non-potable irrigation purposes, thus reducing the demand on their potable water system"*.
- It offers to cover *"the permitting for, design, and construction of the reclaimed water system"*.

That difference is not a matter of wording:

- *"Reclaimed water"* is a defined term under the Municipal Wastewater Regulation, made under the Environmental Management Act. It is administered by the Ministry of Environment, not by the health authority.
- Irrigation reuse is one of its regulated uses.
- The Province's Reclaimed Water Guideline states that reclaimed water must not be provided, used or discharged before a registration is effective. A registration becomes effective only on written notification from the regional director.

- The Guideline requires that sub-surface disposal of surplus reclaimed water be supported by a hydrogeological assessment within an Environmental Impact Study, which *"must also consider the vulnerability of nearby aquifers"*.

I put this as a question, because it is a question nobody has been asked. If a reclaimed water system has been built and used at 620 Laura Road, the instrument is a registration under the Municipal Wastewater Regulation and an Environmental Impact Study with a hydrogeological assessment. What is in the package is a filing under the domestic sewage regulation. I have searched the Province's authorisation register and found no entry for this site.

And a third account of the same works

In January 2021 the owner told the health authority that the operation has *"a holding tank which has been signed off by our local building inspector under BC building code"*, offering to engage a Registered Onsite Wastewater Practitioner *"if necessary"*.

A building inspector cannot sign off a holding tank, and the Building Code contains no standard for one.

- The Building Act empowers a building official to decide one thing: whether a matter conforms to a building regulation. It makes no reference to sewage, to the Public Health Act, or to health authorities.
- The Building Code and the Plumbing Code govern plumbing as far as the connection point. Neither contains a holding tank standard, a siting rule, a capacity rule, a pump-out requirement, or anything on disposal of contents. *"Holding tank"* does not appear in the Plumbing Code definitions.
- Holding tanks are dealt with by Part 2 of the Sewerage System Regulation. Section 4 requires a permit issued by a health officer, on application with a fee and a maintenance plan, and the officer may issue only if satisfied the tank is adequate for the sewage from the structure and will not cause a health hazard. Operating a holding tank without that permit is an offence under section 12.
- The same regulation prohibits constructing a holding tank within 15 metres of a well, unless a hydrogeology professional advises otherwise in writing and the health officer is notified.

So there is a fork, and both routes lead to the same place. If the tank holds domestic sewage, a health officer's permit was required and a building inspector could not issue it. If it holds process water from cider production, the Sewerage System Regulation does not reach it at all, because a holding tank under that regulation is by definition a container for domestic sewage.

Either way, the sign-off relied on establishes nothing about the wastewater arrangement. And the offer to engage a Registered Onsite Wastewater Practitioner misses in the same direction: that role exists for sewerage systems under Part 3, not for holding tanks.

Whether a permit under section 4 was ever applied for or issued for this property is not established on any record I have seen.

So there are now three accounts of how the wastewater at this property is handled. Two filings under the domestic sewage regulation. A reclaimed water system described to a professional conference. And a holding tank signed off under a statute that does not reach holding tanks.

The only waste material in the package is the septic review the Advisory Planning Commission asked to go beyond.

9. Policy 5.2.3, environmental and social impacts of development

The Plan addresses these matters. The application was decided without reference to any of it.

Policy 5.2.3 requires that local trust committees and island municipalities shall, in their official community plans and regulatory bylaws, address policies related to the aesthetic, environmental and social impacts of development.

Bowen's Official Community Plan does address them. It contains a water management study requirement for industrial and large scale agricultural use of water, a burden of proof on industrial and light industrial uses to show no deleterious effect on surface and groundwater supplies, a Qualified Professional's report where a use requires water beyond a single detached home, an impact assessment provision keyed to effects on water resources, and a limit on density and type of use by the land's capacity to absorb effluent.

None of them was applied here.

Across five staff reports on this property, not one cites a single Official Community Plan policy on water, groundwater, aquifers or industrial use. Every policy cited is an agriculture-support or permit-issuing policy. The five are:

Report	Policies cited	Any policy on water, groundwater, aquifers or industrial use?
Temporary use permit, introduced 22 February 2021, decision report 22 March 2021	Objectives 80, 83, 86; Policies 209 and 235; the Rural R1 designation	None

Temporary use permit renewal, 11 December 2023	Policy 235; Objectives 80, 83, 86	None
Rezoning report, 13 April 2026	Objectives 80, 82, 86, 88; the Conservation Development Policy	None
Revised rezoning report, 25 May 2026	No Official Community Plan policy applied to the proposal. The Conservation Development Policy is cited once, for the covenant	None
First reading report, 15 July 2026, revised 24 July 2026	Objectives 80, 82, 83, 86, 88, 89	None

A note on the numbering. The Official Community Plan objectives were renumbered in the consolidation of April 2023. The agricultural objectives moved by three. What was Objective 80 is now Objective 83, what was Objective 83 is now 86, and what was Objective 86 is now 89. The reports in the table were written under both systems, and the report of 13 April 2026 uses both at once, citing 80 and 86 in the old numbering and 82 and 88 in the current.

So the list does not grow from three objectives to six because the analysis broadened. Three of the six in the last row are the 2021 three under their new numbers. Policies were renumbered as well. The temporary use permit environmental standard appears as Policy 235 in the 2023 renewal record and as Policy 238 in the current consolidation. I cite by current numbering throughout, and identify each policy by its substance rather than by the number it carried at the time.

One consequence sits on the face of the 27 July report. In current numbering, Objective 80 is the heading objective of the Plan's Industrial Land Use Management section. The report lists it among the objectives it says speak to support for agricultural activity, and prints it with the text of Objective 83, so the same wording appears twice under two numbers. Policies 205 and 207 sit immediately after Objective 80 in that same section of the Plan. Neither is cited.

The full comparison, report by report and policy by policy, is set out in *"What each report said about the Official Community Plan, 2021 to 2026"*, already before the Committee at page 152 of the agenda package for 29 July 2026.

Among those never cited:

- **Policy 205.** Industrial and light industrial uses will prove adequate water supply and waste disposal capability to ensure that there is no deleterious effect on surface and ground-water supplies, or to the long term sustainability of these resources.
- **Policy 303.** Industrial and/or large scale agricultural or recreational use of water will not be permitted unless a water management study, as part of an environmental

impact assessment process, has been completed to the satisfaction of Bowen Island Municipality.

- **Policy 294.** A Qualified Professional's report is required where a use needs water in excess of a single detached home and is not on a community water system.
- **Policy 60.** Surface water supply impact study by a Qualified Professional, where necessary.
- **Policy 13.** Impact assessment where environmental impacts are anticipated, with effects on water resources forming a primary basis.
- **Policy 68.** The Municipality will request Vancouver Coastal Health to ensure effluent under its authority does not pollute fresh or salt water.
- **Policy 207.** All industrial waste management discharge to land and water must be authorized under the Waste Management Act.
- **Objective 127.** Density and type of land use not to exceed the capacity of the land to absorb liquid waste effluent where on-site disposal is used.

What that means for the directive. The Municipality can say its Plan addresses the matter, because the policies exist. What the record shows is that on this application they were not reached: not at the temporary use permit, not at its renewal, not at either rezoning report, and not at first reading. The instruments the Plan provides for weighing environmental impact were available throughout and were not used.

That bears on the Committee in two ways. It is the measure of what consistency with the Plan is worth on this file. Consistency with the Plan is the only condition on which a public hearing may be waived, and that is the route this bylaw was put on. As section 11 sets out, no determination of consistency appears anywhere on the record. It was not made. It was assumed. And, as section 12 sets out, several of those policies do not survive into the draft Plan now being prepared, so the answer that the Plan addresses the matter will shortly be a weaker one.

10. Covenants

The checklist tells the Islands Trust that covenants are included. None existed.

The checklist now attached to the report states, against policies 3.1.3, 3.1.4, 3.2.2 and 3.3.2: *"The rezoning application includes a protective covenant around Murray Creek riparian area."* The same sentence appears against all four, including 3.2.2, which is the forest ecosystems policy. Against 4.1.8 it states: *"Rezoning application includes a protective covenant for agriculture land that it be used for that purpose."*

- Bylaw No. 726 contains no covenant. Its four clauses insert a zone variation, a parking rate, two definitions and a zoning map change.
- The first reading report asks Council whether it *"would expect covenants in place"*.
- Council resolved that evening: *"that council direct staff to seek protection of the riparian areas as a condition of rezoning approval and that council direct staff to seek ongoing protection of the biodiversity of the heritage orchard as a condition of rezoning approval."*
- That wording was drafted during the meeting. A councillor asked to see it, was given it aloud, and said she liked it *"because it doesn't mean that it has to be a conservation covenant that could, there's other tools, potentially"*. She then moved it.
- The planner explained what it was and was not: *"in terms of ongoing protection of the biodiversity of the heritage orchard, so it's not about protection of the agricultural land."*

So the checklist tells the Islands Trust that the application includes a covenant for agricultural land. Council resolved to seek something the planner had just said was not that. On the riparian side, the checklist uses the present tense for a thing Council directed staff to go and seek.

What was moved is not a covenant. It is a direction to staff to seek one. It names no land, no terms, no grantee and no instrument, and it creates and binds nothing. The report states *"Approximate areas of the covenant are shown below:"* and nothing follows; the only map in it is the notification map. The planner had told Council the applicant *"is hesitant to encumber the property with covenants that would place further restrictions on their operations"*, and a councillor, asking about the two committees' covenant recommendations, said *"are those part of your recommendation here? I don't see them"*. The checklist before the Committee says a covenant is included.

What would happen if one were obtained was not settled either. On the preceding bylaw that same evening Council asked what becomes of referral material amended after a vote, and did not get a settled answer. Section 12 sets that out. So on the covenants the Committee is being asked about, the record holds a statement that they exist, a direction to go and look for them, and no settled account of what would follow if they were found.

Where they would apply is not stated either. Asked at the meeting why the covenants were not in the recommendation, the planner said of the riparian one: *"I think in terms of the riparian area covenant is fairly straightforward. It's a small portion of the lot that's outside the agriculture area that is riparian."* Earlier in the same presentation he had said that *"staff know areas of the property suitable for protection include riparian areas of Murray Creek and existing farmland"*, naming the two together. As section 5 sets out, planted ground lies on both sides of the creek, so the riparian area is not outside the

agricultural area. It runs through it. The lot is 19,512.975 square metres on the Province's cadastre, about 4.8 acres, and about 2.5 acres of it is planted.

And the same question arises across all three applications. On both neighbouring applications further riparian protection was proposed. Here the checklist tells the Islands Trust that a riparian covenant is included, and Bylaw No. 726 contains none. If the Watershed, Aquifer and Stream Protection Development Permit Area already protects riparian areas, the covenants proposed on those files were not needed. If it does not, then at 620 Laura Road there is nothing: no covenant in the bylaw, and the water resources half of the designation never engaged in over five years. The record does not say which of those the Municipality means.

And the covenant statements are not the only ones. The same checklist states, against the freshwater directives 4.4.2 and 4.4.3: "*Hydrogeologist report provided as part of the report outlines water sustainability.*" The document referred to is the GARP assessment described in section 4. It is a pathogen screening of one well and it addresses neither quantity nor in-stream uses.

So of the statements the checklist makes about what the application contains, three are not correct: a riparian covenant, an agricultural covenant, and a hydrogeologist report on water sustainability. All three are checkable against the package the checklist travels with.

The instrument proposed is not the instrument that was asked for

The Conservation Development Policy provides for conservation covenants. It asks first for an analysis of the natural features and environmentally sensitive areas on the site, and sets a goal that at least 50 percent of the land subject to a rezoning be protected from further development, with priority to identified sensitive areas.

- On 7 July 2026 the planner presented that Policy to the Parks, Environment and Climate Action Advisory Committee as applying, including the 50 percent goal. The chair asked where the 50 percent was on the map. Staff said they would come back with the area.
- That committee then recommended 50 percent or more protected by **conservation covenant**, to include the heritage orchard and its biodiversity, and Murray Creek and its riparian area, with the covenanted areas shown on a map provided to Council and to committees.
- On 23 July the planner told the Advisory Planning Commission something different. He raised the Policy's wording about applications that increase density, and invited the Commission to decide whether the Policy applied at all. That had not been put to the earlier committee.

- The first reading report introduces the Policy for the first time through the applicant's objection to it, and answers that objection with "*Staff believe that the use of the Conservation Development Policy is appropriate in this case.*"
- Neither the 50 percent goal nor any analysis of natural features and sensitive areas appears in the report.

What is proposed is not a conservation covenant. It is a protective covenant over the riparian area, and a covenant over the agricultural land to be used "*as either environmental protection or for agricultural uses*".

Those are different instruments doing different work. A conservation covenant identifies features and protects them. An agricultural covenant restricts land to agricultural use. And the wording proposed is disjunctive. Either purpose satisfies it.

That matters for what is said to be protected. The heritage collection is not agricultural production. It is a genetic collection: about an acre of cordon and espalier, close to a thousand apple varieties, assembled and grafted over some three decades. The applicants describe it in those terms themselves, in their letter to Council of 21 July 2026: "*It was established as a collection of historically significant apple varieties and is valued primarily for its heritage and genetic diversity.*" The production planting is separate from it, a block of freestanding cider varieties planted around 2018.

The agricultural purpose is satisfied by the production planting. The collection could go and the covenant would still be complied with.

The environmental protection purpose restricts what may be done on the land. It does not require anything to be done. That is the right instrument for a wood, a wetland or a riparian margin, all of which persist if left alone.

A collection of grafted trees does not persist if left alone. Cordon and espalier are held by annual pruning and training. Varieties are held by grafting, and stock that fails has to be regrafted from scion wood. The identity of a thousand varieties is held in records as much as in the trees. Withdraw the work and what remains is not a heritage collection but the trees that happened to survive.

So neither purpose reaches the collection.

What that collection needs is a positive obligation of active horticultural management, with someone named to carry it, fund it and enforce it. Council resolved on 27 July to direct staff to seek "*ongoing protection of the biodiversity of the heritage orchard*", which is the right object. Nothing in the record addresses how a covenant would deliver it.

Council asked whether the covenant could be left until later. The Acting Mayor asked whether, having given first reading and referred the bylaw, staff could explore a covenant and Council make it a condition at second or third reading. The planner said it could be done, and pointed to the Islands Trust: if the Trust *"comes back and says, well, our approval would be, you know, conditional on there being a covenant, which they've done for some rezoning applications"*, then *"clearly, you know, the trust's expectations, this is included as well"*.

On this bylaw the Committee does not approve anything. Bylaw No. 726 is a Land Use Bylaw amendment referred under section 15.0 of the Letters Patent, on which the Committee advises whether the bylaw may be contrary to or at variance with the Policy Statement. Approval, and conditions attached to approval, belong to the Official Community Plan track. So the assurance Council was given for leaving the covenant until later is not one this referral can supply.

Covenants that do exist

These are not incidental old charges. They are density control instruments, and the plan in force when they were made treated density as the mechanism for protecting water.

The Official Community Plan then in force was Bylaw No. 14, the consolidated plan adopted in 1982. It does not treat density and water as separate subjects.

- Its Water Supply Policy states that the type and intensity of development will be related to the supply of potable water, and that water supply is a key factor in determining the extent of new subdivision.
- Its carrying capacity section scales development to what the soils, water and vegetation can sustain, with a conservative default where data is missing.
- Its Rural subdivision districts run from about one hectare average down to a four hectare minimum in Rural 4.
- Groundwater is named in it as an outstanding study, *"necessary and should be done in the near future"*. The word aquifer does not appear in the plan at all.

In 1986 Blocks C and D of District Lot 492 were subdivided, and the Province required the covenant as a condition of granting approval. It caps how many lots may be subdivided from each remainder, and requires that a stated number of those lots be at least four hectares. That is the same four hectare figure the plan had set as the floor of its Rural 4 district, applied here to a specified number of lots rather than to all of them.

This submission does not say the covenant is about water. It does not say so, and it gives no reason. What is said here is narrower and is on the record: the covenant imposes a density limit, and that density limit was, under the plan then in force, a carrying capacity

measure tied expressly to potable water supply and septic capability. The two cannot be treated as unrelated.

Nor does that expand what the covenant restricts. The plan explains why the density cap is there. It does not convert the density cap into a water quality control the covenant does not contain.

When Bowen Island became a municipality in 2000, it inherited the covenant.

Two covenants registered at the same instant, 19 November 1986 at 15:08. Both are section 215 covenants. Both are marked "*inter alia*", so each reaches beyond the parcels named here.

- **P106531** burdens both 620 Laura Road and 1355 Westside Road. Agreement made 24 July 1986. Grantor Sunset Park Estates Ltd. Grantee the Province, as represented by the Minister of Municipal Affairs. It has since been transferred to Bowen Island Municipality under transfer number BR274847.

Its recitals record that the Grantor had subdivided Block C and Block D of District Lot 492, Plan 7107 into 14 lots and two remainders, and that the Grantee required the covenant "*as a condition to granting its approval to the subdivision*".

Its two operative clauses are these:

FIRSTLY: *That the total number of lots allowed to be subdivided from the remainder of Block "D" shall be a maximum of seven (7) with at least one lot of a minimum area of four (4) hectares.*

SECONDLY: *That the total number of lots allowed to be subdivided from the remainder of Block "C" shall be a maximum of fifteen (15) lots with at least eight (8) lots of a minimum area of four (4) hectares.*

It runs with the land and binds successors and assigns.

So it caps the number of lots, and requires that at least one of the seven permitted in Block D be four hectares or more. It sets no minimum for the others. A density control instrument in its own words, imposed as a condition of subdivision approval. 620 Laura Road is Lot 1, Block D, District Lot 492, Plan 22501, within the Block D remainder that the covenant governs. The Municipality is the registered holder of it, on the land it is rezoning, and on the adjoining land it has stopped pending a watershed management plan.

- **P106532** burdens Lot 7 Adams Road. It is registered to the Province as represented by the Minister of Environment, with the Greater Vancouver Regional District as co-grantee. The Regional District required it as a condition of subdivision approval. Every one of its operative conditions is measured from the natural boundary of "*un-named*

creek". The Municipality's own mapping shows several watercourses crossing that parcel, including Murray Creek and Bowen Brook, and a number of unlabelled tributaries. So applying the covenant requires establishing which watercourse is meant, and where its natural boundary runs now. Nothing in the record shows either being done.

Neither covenant was identified by the planning process in any of the three rezonings. P106531 was raised by a member of the public at the Advisory Planning Commission on 3 February 2026, and again in the Council package of 9 March 2026. The staff report prepared for that meeting did not address it.

11. Timing

The public hearing

- The staff report of 13 April 2026 recommended against waiving it: staff *"recommend not waiving the Public Hearing"*.
- The revised report of 25 May 2026 introduced the route that sets it aside. It is the same report in which the hydrogeologist assessment and the wastewater letter of assurance no longer appear.
- On 25 May, by motion 26-217, Council directed that notice be given under section 467 of the Local Government Act.
- A hearing may be waived only where an official community plan is in effect and the proposed bylaw is consistent with it, under section 464(2). Notice under section 467 is the consequence of a valid waiver, not the authority for one.
- The motion cited only section 467. Consistency was not discussed, and no determination of consistency appears on the record. The first reading report returns to the hearing only as an alternative Council might take, not as a test that had been met.
- If no Official Community Plan policy on water has ever been applied to this proposal, across five reports and five years, the consistency finding that would justify removing the hearing has not been made.
- Council is not foreclosed. On 27 July the planner said staff would return for second and third reading with an alternative, and that a public hearing, if Council wanted one, would come after second reading. The Advisory Planning Commission recommended on 23 July that Council should still consider holding one.
- The Municipality's public page for this application, dated 10 February 2026, still lists only the staff reports of 30 March and 25 May 2026 and links the original application, which included the guest house use since removed. It says nothing about a hearing not

being held, and it describes the first reading meeting as one: *"Council will be considering a First Reading at its Regular Council Meeting held at 1:00 pm on Monday, July 27, 2026, to consider Amendment Bylaw No. 726, 2026. This hearing will be held at the Community Centre and online via Zoom."*

What left the report at the same time

An assessment was required once, and by staff, not only by the health authority. The staff report of 13 April 2026 set out Vancouver Coastal Health's comments: that the Municipality could require an assessment by a professional hydrogeologist of additional demand on site and of the quality of the water being used, and that it require a letter of assurance on the wastewater system. The report then says: *"Staff recommend that both these suggested and recommended reports be required of the applicant to complete concurrently with this round of referrals. The applicant has no concerns with this requirement."*

Neither appears in the revised report of 25 May 2026. In between, on 9 May, the application was amended to remove the guest house use. That accounts for the wastewater recommendation being revisited: the planner told Council he re-referred it to Vancouver Coastal Health and asked whether the recommendation still held for a cidery alone. It does not account for the water one. Nothing in the record shows the hydrogeologist assessment being re-referred, and no reason for its removal is given. The quality of the water being used on the property does not turn on a guest house.

The schedule this referral sits inside

The route was chosen on 25 May 2026 and the reasoning is on the record.

- The applicants told Council that as a seasonal business they make production decisions during harvest in early September, and asked for certainty before then.
- The planner said the applicants were *"seeking a way that this could be a more streamlined process given their TUP timing and the reduced scope of the application"*.
- He set out three routes. The full process takes seven appearances before Council: introduction, results of referrals, first reading, second reading, public hearing, third reading, adoption. The third route removes the hearing.
- On timing: *"if we're looking at referrals in June we're looking at bylaw reading in July and then we're doing island[s] trust referral in either case which they have 45 days to respond. So then they would be responding in August... Either way it would get you to second reading in September. The difference being without the public hearing you could do second and third reading in September, you could adopt it I guess at the*

following September meeting or October meeting for UBCM, whereas with a public hearing that wouldn't be possible."

- On the mechanism: *"what this requires is that we give notice instead at bylaw for first reading. So we need the Council direction to pursue this path in advance of first reading."*

So the sequence was set before the bylaw was drafted. The Municipality's adopted 2026 Council meeting schedule shows no meetings in August, and the next regular Council meeting after 27 July is 8 September. First reading therefore had to be given on 27 July, and the forty-five day window runs across August. On the planner's own account the September step is not two steps: second and third reading would be taken at the same meeting, with adoption at the meeting after. The schedule puts those two meetings on 8 and 28 September.

Two things follow:

- The forty-five days are the only interval in that schedule. The Committee's response is the last external input before second and third reading are taken together.
- The compression shows in what arrived. The checklist required before first reading was not in the report at first reading. The covenants the checklist told the Islands Trust were included did not exist. And where the report says *"Approximate areas of the covenant are shown below:"*, nothing follows, so there is no map of where a covenant would apply either.

Council said as much itself. Speaking to the referral motion, a councillor described the application as being *"rushed to a certain extent to accommodate the owners"*, said of the correspondence before Council that *"we don't have that material in front of us today"*, hoped that staff would *"ask those questions on our behalf of Vancouver Coastal Health"*, and referred on the footing that *"I don't think that our decision today to refer it to trust would necessarily change in terms of it having to going back to trust"*. That last understanding is the question the planner had answered both ways earlier that evening, on the preceding item.

There is no later stage

In June 2025, on Bylaws 673 and 675, Islands Trust staff told this Committee that more information on water availability and the proposed water source should be required before a clean finding could be made. The answer accepted was that proof of water would be required at subdivision, under Land Use Bylaw sections 6.19 and 6.20.

There is no subdivision at 620 Laura Road. There is no later stage at which that proof would be required.

12. Why this is before the Committee

I am putting these matters before the Committee in advance of the referral being determined, so that they can be reviewed and so that they are on the record.

That is also why the submission runs to the length it does. It is not advocacy at length. It is a record, set out with its sources, so that each part of it can be checked.

The referral falls between first and second reading. The Committee will form a view on whether the bylaw is contrary to or at variance with the Policy Statement. This submission sets out what the record holds on the directives that view turns on, so the material is before the Committee when it decides rather than afterwards.

Two matters have never been examined by anyone:

- Groundwater availability, and the effect of this use on the aquifer and on surrounding wells, covering quantity, drawdown and seasonal demand. That is what the Municipality's own Development Permit Area calls for, what its advisory committee asked for, and what the health authority's engineer raised in 2021.
- The process effluent, assessed for what it is, beyond the review of the domestic sewage system. That is what the Advisory Planning Commission asked for and did not receive.

And one further matter, which is not about examination but about what the Committee receives: the checklist that starts the staff report on the referral was not in the report Council considered, and the report has since been republished with a checklist inserted into it.

That last one is the only matter here the Committee can settle and this submission cannot.

What was sent to the Committee is not something this submission can establish. Council resolved on 27 July to refer the checklist included in the on-table items package of that meeting. Whether the document the Committee received is that document can be established at your end and nowhere else.

Attached is the first reading report as it stood at the meeting of 27 July 2026, downloaded before it was replaced. Its history to that point follows the Municipality's own published procedure. The report is dated 15 July and was published with the agenda on 20 July, seven days before the meeting. That version is held by the Internet Archive. The Advisory Planning Commission met on 23 July. The report was revised on 24 July to record its recommendations and republished in the late items agenda, three days before the meeting. All of that is what the procedure provides for.

What followed the meeting is not. The Municipality's website now serves a version last modified at 19:43 on 27 July. Comparing the attached copy with the document the

Committee received will show what, if anything, has been added since Council referred the bylaw.

There is a reason to look. On the preceding bylaw that same evening, the planner told Council that changes would be made to the referral material after Council had voted, including changes he would make himself. A councillor asked what that meant: whether the amended material would come back to Council for approval and then go to the Islands Trust again. The answer was no, and then, in the same answer, that it goes back before adoption. Another member said she was not following.

The plan now being written, which comes to the Committee for approval

This submission concerns one bylaw on one property. I note only that the tests it shows were not applied here are, in the draft Official Community Plan now being written, largely not there to apply at all. The water management study requirement for industrial or large scale agricultural use of water does not appear. The requirement that industrial uses prove no deleterious effect on surface and ground-water supplies has been moved inside the Industrial designation, so that it reaches businesses in that designation rather than an industrial use wherever it occurs. The impact assessment policy is narrowed to residential proposals requiring rezoning. And "*agricultural processing*" is added as a supported main use in Rural Residential, and is not defined anywhere in the draft.

I do not take that further here. Under the Letters Patent an Official Community Plan bylaw does not come to this Committee for comment. It comes for approval, on a stricter route: referred before the public hearing, with no hearing until the Committee responds or forty-five days pass, and the Committee's comments introduced into the hearing. That is the occasion for it, and I will address it then. The Terms of Reference of the Municipality's own steering committee say the revised plan will meet the central object of the Islands Trust. Not have regard to it. Meet it.

It bears on this referral in one respect only. The answer available to the Municipality on section 5.2.3 is that its Plan addresses these matters. On this application that answer was never tested. On the plan that follows it, it will be a weaker one.

What this is about

Bowen's fresh water is rainfall. It is recharged into a shared and unmetered pool, and nothing else feeds it. None of the island's streams is gauged. Groundwater is monitored through two provincial observation wells. The aquifer under this property is classified on between eight and fourteen well records, and that classification records heavy development and a downward trend in water levels needing investigation.

And the island has already grown several times over on that pool. The resident population was in the order of 800 to 900 around 1980, shortly before the Official Community Plan that named a groundwater study as necessary. It passed 1,000 in 1983, reached about 3,100 by 2002, and was 3,680 in 2016 and 4,256 in 2021. The increase between those last two censuses was 15.7 per cent, against 7.3 per cent for Metro Vancouver over the same period. Roughly 365 single detached homes were added between 2011 and 2021.

That growth happened before any densification provisions existed, and the groundwater study named in 1982 has still not been done.

Demand on that pool is set to rise, and the increase is required by statute. Provincial legislation obliged the Municipality to prepare an interim housing needs report on a twenty-year horizon, and to amend its Official Community Plan and Zoning Bylaw by 31 December 2025 to accommodate the twenty-year figure as a minimum.

That report, dated November 2024, states: *"The anticipated number of new housing units needed within the next 20 years is 1,393."* Bowen had 1,720 households in 2021. The twenty-year figure is therefore an increase of about eighty per cent on the number of households on the island.

The largest single component of it is 820 units for anticipated household growth. That figure is the average of two scenarios: a local one running Bowen from 1,720 households in 2021 to 2,601 by 2041, which is 881 units, and a regionally based one giving 759.

Where those units go is the point. The same report lists, as actions the Municipality has already taken to reduce housing need, that it has *"removed minimum lot size regulations for detached secondary suites on residential lots on Bowen"* and adopted a *"Bylaw permitting secondary suites and detached secondary suites on all residential properties on Bowen Island"*. So the capacity is being created on lots that already exist, alongside the build out of lots already subdivided. Not on new ground. On the ground where the wells already are.

That bylaw is one the Committee has seen. In June 2022, on Bylaw No. 581, the Municipality's position was that the amendment *"does not increase the density already permitted in the land use bylaw and as such is not increasing intensity or density of development"*, and Islands Trust staff concurred that the remaining directive policies did not apply. Policies 4.4.2 and 4.4.3 were marked not applicable on that referral.

Two years later the same measure appears in a report to the Province as one of the actions by which the Municipality is accommodating 1,393 additional units.

Bowen is also close to a statutory threshold. The provincial small-scale multi-unit housing requirements bind municipalities above 5,000 residents, and above that threshold the legislation requires three to six units to be permitted on many residential lots. Bowen was 4,256 at the 2021 census and 2026 is a census year. Whether and when the island crosses that threshold is a matter for the plan rather than for this bylaw, and I raise it only to show the direction of travel on the same ground.

The draft plan directs that growth to land which is already settled. That is where the wells already are, and as section 4 sets out, it puts this ground into a designation with an average parcel size of 2 hectares and no minimum lot size.

What follows from that is not speculation. It is already in the record on this island.

- Vancouver Coastal Health's inspection records for Bowen water systems record wells that no longer produce enough, and wells taken out of use for that reason.
- The same records include a private well abandoned for salt water intrusion. That observation has no route into the provincial aquifer record.
- The Province's own 2006 classification of Aquifer 749, which underlies this property, records elevated chlorides in some wells along its southern boundary. Its classification of Aquifer 747 records elevated arsenic reported locally. As section 2 sets out, the Province describes all five of Bowen's bedrock aquifers as parts of one larger fractured crystalline system, and the hydrogeologist retained on the neighbouring application describes the boundary between two of them as administrative rather than hydraulic.
- On 11 December 2023 the Islands Trust's Senior Freshwater Specialist told Bowen Island Municipal Council that new development can mobilise arsenic.

An island running short of water, or contaminating the water it has, is a foreseeable outcome here, not a remote one. Preserving and protecting fresh water is the object the Islands Trust was given. Land use is the instrument it was given to do it with. This is what that instrument is for.

I hope it is of use to the Committee in its consideration of the referral. It is with you now.

Heather Miller

NOTES

Several findings here rest on the absence of a document. This note says how that was established.

I searched the Municipality's published agendas and minutes for every meeting at which this property appears from February 2021 to July 2026; its water conservation and alerts pages; the Province's groundwater wells and aquifers register and its waste discharge authorisation register; Vancouver Coastal Health's published facility and inspection records for the systems named; the Land Title and Survey Authority; Metro Vancouver's Sensitive Ecosystem Inventory; and the Islands Trust's published agendas and reports. Where a search returned nothing, this submission says so. An absence in a register is a record of what the register holds, not proof that a thing does not exist.

I hold copies of the records relied on and can provide them. Every passage of speech quoted here is taken from the recording of the meeting named and checked against the audio.

On section 3, I hold every version of the first reading report as published. Their file properties record that the version published for the meeting was last modified before it, and that the version published afterwards was last modified at 19:43 on 27 July 2026, after the meeting. Both carry the same internal identifier, which is what one document saved twice looks like, rather than two documents prepared separately. I have also recorded, for each file, the digital fingerprint that identifies it uniquely, so that anyone holding a copy can confirm it is the same file. Those values are available.

Three things could not be established. Whether a permit under section 4 of the Sewerage System Regulation was applied for or issued for the holding tank at this property. Whether any registration exists under the Municipal Wastewater Regulation for a reclaimed water system here. And the volume of water the operation uses, on which see section 4.

What has been requested to date. Requests for records bearing on this application have been made under the Freedom of Information and Protection of Privacy Act. As at the date of this submission, none has produced records.

- Bowen Island Municipality, request of 23 June 2026, file FOI-2026-02.
- Bowen Island Municipality, request of 31 July 2026, file FOI-2026-03.
- Vancouver Coastal Health, request of 26 June 2026, file 2026-F-494.
- Liquor and Cannabis Regulation Branch, request of 6 July 2026, file AGR-2026-055627.
- Liquor Distribution Branch, request of 6 July 2026, file LDB-2026-055633.
- Islands Trust, request of 19 July 2026, file BIM-FOI-37-2026.

The list above is where that stands today, and it will grow.

Two strands of work continue and are not relied on in this submission. The first is comparative analysis of well distribution and settlement across the Islands Trust islands, bearing on how density and intensity are measured. The second is the draft Official Community Plan. That work is wider than this bylaw, and this submission touches only the part of it that bears on these directives. Both will be put to the Islands Trust and to the Municipality separately.

SOURCES

Documents relied on more than once, or which a reader could not retrieve from the description alone.

- Bowen Island Municipality Land Use Bylaw No. 57, 2002, consolidated November 2025.
- Bowen Island Municipality Official Community Plan Bylaw No. 282, 2010, consolidated April 2023.
- Official Community Plan Bylaw No. 14, the plan dated March 1981 and adopted 1 May 1982, for the Water Supply Policy, the carrying capacity section, the Rural subdivision districts, Appendix B on further studies required, and Appendix D on growth trends.
- Land Use Bylaw Amendment No. 301, 2011, Watershed, Aquifer and Stream Protection Development Permit Area guidelines.
- Bowen Island Municipality Building Bylaw No. 489, 2019, and the Certificate of Occupancy of 2 October 2020 under Building Permit 20200165.
- Bowen Island Municipality, draft Official Community Plan, as published for round two engagement, 2026.
- Official Community Plan Update Steering Committee, Terms of Reference.
- Bylaw No. 726, 2026, and the first reading report of 15 July 2026 revised 24 July 2026, with attachments. Two versions, as recorded in the notes.
- The five staff reports listed in section 9.
- GARP Hazard Assessment, Riley's Cidery, 620 Laura Road, Revision 0, 30 April 2021, file 2121-00776-00, with Appendices A to F, attached to the first reading report.
- Record of Sewerage System, filing VCH-820082, and Sewerage System Letter of Certification, filing VCH-822083, both June 2021.
- McElhanney, *"Reclaimed Water Made Possible on a Small Scale Cidery"*, abstract submitted to the 2022 British Columbia Water and Waste Association conference.
- Regular Council agenda, 27 July 2026, as published 20 July 2026 and archived by the Internet Archive on 21 July 2026.
- Bowen Island Municipality, 2026 Council Meeting Schedule, as published on the Municipality's Council meetings page.
- Bowen Island Municipality, *"Deadlines for Submissions to Council on a Meeting Agenda"*, as published on the Municipality's website, for the on-table items procedure.
- Correspondence to Mayor and Council, 9 July 2026, on item 3.1, Eagle Cliff and Cove Bay water systems update.
- Bowen Island Municipality, Bluewater Park Water System Replacement Project page, for the connection counts on the three west side systems and the statements on supply. Live web page, accessed 19 August 2026. Archived copy held.
- Bowen Island Municipality, Water Conservation page and Alerts page. Live web pages, accessed 18 August 2026. Archived copies held.
- Bowen Island Municipality, *"Attention Private Well-Users"*, at bowenisland.civicweb.net/document/261266, linked from the Municipality's Private Wells page as *"Tips for Private Well Users"*.
- Bowen Island Municipality, news release *"New Water Quality Study Highlights Need for Ongoing Protection of Grafton Lake"*, 5 August 2025.
- Bowen Island Municipality, Grafton Lake Watershed Management Plan procurement: the staff report on the request for proposals, November 2025, and the staff report on the contract award to Urban Systems at \$100,000, 26 January 2026.
- Mike Turley, *"Geotechnical Analysis to Identify Potentially Hazardous Areas for Development on Bowen Island"*, final report, August 2021, prepared for the Manager of Planning and Development, Bowen Island

Municipality, under the UBC Sustainability Scholars Program. At bowenisland.civicweb.net/document/330867.

- Islands Trust Policy Statement, consolidated 2023.
- Bowen Island Letters Patent, section 15.0.
- Islands Trust Council and Bowen Island Municipality Protocol Agreement, 2014.
- Islands Trust, Request for Decision and Policy Statement Directives Checklist on Bowen Island Municipality Bylaw No. 581, June 2022.
- Islands Trust, "*Howe Sound Aquifer Conceptualization and Groundwater Recharge Mapping*", presented as a delegation to Bowen Island Municipal Council, 11 December 2023, at pages 10 to 25 of the agenda package for that meeting, the recharge potential map at page 21.
- Province of British Columbia, Groundwater Wells and Aquifers register (GWELLS), apps.nrs.gov.bc.ca/gwells, for the well records, well counts, correlation status and artesian conditions cited in section 4. Accessed 16 August 2026.
- Province of British Columbia, Groundwater Team, correspondence of January and February 2026, on well correlation, the 2006 Bowen aquifer mapping, and how uncorrelated wells are counted. Held.
- Province of British Columbia, Aquifer Classification Work Sheet, Aquifer 749, 1 January 2006, reproduced at Appendix D of the GARP Hazard Assessment.
- Province of British Columbia, Aquifer Stress Index, and the dataset published with Water Science Series WSS2018-04.
- Conditional Water Licence C107480, Frank Spring, Province of British Columbia. Licence and technical plan documents downloaded from the Province's Water Rights database, which records the licence as surface water, current, issued 31 August 2000, priority 25 November 1993, file 2001777.
- Metro Vancouver Sensitive Ecosystem Inventory, polygons 62288, 62124, 62735 and 62221, read from the Metro Vancouver SEI map viewer at gis.metrovancouver.org/mvmaps/SEI, accessed 19 August 2026.
- Statistics Canada, Census Profile, 2021 Census of Population, for population, land area and population density per square kilometre. Bowen Island, Island municipality, census subdivision; and the twelve Islands Trust Area island trust designated places. Accessed 18 August 2026.
- Land Title and Survey Authority of British Columbia: Covenant P106531 and Covenant P106532, both registered 19 November 1986 at 15:08.
- Vancouver Coastal Health, FOI release 2021-F-208, 421 pages, released to the author and held. Source for the Public Health Engineer's correspondence of 27 May 2021, the creek flow exchange of 8 and 9 April 2021, the applicant's correspondence of January 2021, the construction permit and Permit to Operate for the water supply system, and the absence of any equivalent record for the recycle water system. Health authority releases are not published on the Province's Open Information site.
- Ministry of Public Safety and Solicitor General, FOI release PSS-2021-11208, responded 2021, published on the Province's Open Information site 24 April 2023. 152 pages. Source for the Certificate of Occupancy of 2 October 2020 at page 126, and for the licensing sequence for Winery Manufacturer Licence 308879.
- Environmental Management Act, S.B.C. 2003, c. 53. Water Sustainability Act, S.B.C. 2014, c. 15. Public Health Act, S.B.C. 2008, c. 28. Building Act, S.B.C. 2015, c. 2. Drinking Water Protection Act, S.B.C. 2001, c. 9.
- Sewerage System Regulation, B.C. Reg. 326/2004. Waste Discharge Regulation, B.C. Reg. 320/2004. Municipal Wastewater Regulation and the Province's Reclaimed Water Guideline, July 2013. Code of Practice for Agricultural Environmental Management, B.C. Reg. 8/2019. Classification of Land as a Farm Regulation, B.C. Reg. 411/95.
- British Columbia Building Code, for the definitions of distillery and of distilled beverage alcohols, and the Group F occupancy classifications.



To: Mayor Leonard and Council

From: Daniel Martin

Date: July 15, 2026

Meeting Date: July 27, 2026

Revised July 24, 2026 to include recommendation made by the Advisory Planning Commission at its July 23, 2026 meeting.

Subject: **620 Laura Road**
LOT 1 BLOCK D DISTRICT LOT 492 PLAN 2250
File: RZ-2026-0014

RECOMMENDATION

That Bylaw No. 726, cited as "Bowen Island Municipality Land Use Bylaw No. 57, 2002, Amendment Bylaw No. 726, 2026" be read a first time;

That Council refer Bylaw No. 726, 2026, and the attached Islands Trust Policy Statement checklist to the Islands Trust; and

That Council direct staff to return with the results of that referral.

PURPOSE

To present to Council a bylaw to amend the Land Use Bylaw at 620 Laura Road permitting *cidery use* for consideration of First Reading.

BACKGROUND

Bowen Island Municipality staff most recently presented application RZ-2026-0014, at 620 Laura Road, at [the May 25, 2026 Regular Council Meeting](#). That application sought to permit *cidery* as a zone variation at 620 Laura Road. At that meeting Council adopted the following motion:

That Council refer the revised RZ-2026-0014 (620 Laura Road) to the Advisory Planning Commission and the Parks, Environment, Climate Action Advisory Committee for a recommendation; and

That Council directs staff to prepare bylaws to amend the Land Use Bylaw to allow the development proposal in OCP/RZ-2026-0014.

Underlying details of the subject property and existing TUP can be found in the previous [staff report](#) on this application.

RESULTS OF REFERRALS

Parks, Environment, and Climate Action Advisory Committee (PECAAC)

The PECAAC met to discuss this referral at their July 7th meeting, and adopted the following recommendation:

That the Parks, Environment and Climate Action Advisory Committee recommend the following regarding RZ-2026-0014 (620 Laura Road) before formal consideration by the committee:

- *That the proponent must meet BIM's Conservation Development Policy by*
 - *Protecting 50% or greater of the property for conservation purposes*
 - *Using conservation covenants*
 - *Including the heritage orchard, its associated biodiversity, and Murray Creek and its associated riparian area in covenanted areas*
 - *Indicating where covenanted areas on a map to be provided to Council and committees*
- *That an assessment from a professional hydrogeologist be completed to investigate potential impacts on the ground watershed, including cumulative impacts and consideration of climate change.*
- *That the proponent engages a Registered Onsite Wastewater Practitioner or a suitably qualified professional to provide a Letter of Assurance that confirms that the intended use of the property will not have a negative impact on the onsite wastewater system.*
- *That clarification be provided on the quantity and composition of any solid and liquid waste that may be disposed of on the property, now or in the future, and any known impacts of such disposal.*
- *That Council consider a restriction or a limit on cidery output if deleterious effects are anticipated with a significant increase in cidery production.*

CARRIED UNANIMOUSLY

Advisory Planning Commission (APC)

The APC met to discuss this application at their July 23, 2026 meeting. At the meeting the APC adopted the following recommendation:

That the Advisory Planning Commission recommend the following regarding RZ-2026-0014 at 620 Laura Road:

- *That an environmental waste management assessment be required to evaluate production wastewater, cleaning effluent, and organic byproducts from cidery operations, ensuring waste impacts are fully assessed beyond the septic review.*
- *That consideration of the rezoning be deferred pending completion of the Grafton Lake Watershed Management Plan to ensure watershed impacts are fully assessed.*
- *That Council should give consideration to whether there is a method, either through a covenant or the application of the Conservation Development Policy, to preserve the diversity of the existing heritage orchard.*
- *That Council should still consider having a public hearing for this application.*

CARRIED. COMMISSIONER DOHMEIER IN OPPOSITION

OFFICIAL COMMUNITY PLAN

620 Laura Road is designated as “R1 – Rural 1.” This designation identifies: Properties designated as Rural 1 include large lots that provide rural resource values, such as agriculture and forestry, and properties that have been maintained for purposes of a rural lifestyle.

A number of objectives speak to support for agricultural activity.

Objective 80

To encourage commercial and domestic agriculture in suitable locations, and to encourage local food production.

Objective 82.

To preserve lands that are used or are suitable for agricultural activity

Objective 83

To encourage commercial and domestic agriculture in suitable locations, and to encourage local food production.

Objective 86 To promote sustainable active farming on lands with agricultural potential and to protect the resources necessary for such agricultural activity for:

- purposes of domestic food production;*
- preservation of open space and a rural atmosphere; and*
- to contribute to a sense of community on Bowen.*

Objective 88

To provide for the supporting infrastructure necessary to maintain and strengthen the agricultural economy.

Objective 89

To encourage land uses that are compatible with farming to be established in conjunction with agricultural activity.

As outlined above, this application, for cidery use is consistent with Bowen’s 2011 Official Community Plan. In particular, the application provides a clear case study of how to meet Objectives 88 and 89.

STAFF DISCUSSION

Water

Riley’s Cidery has provided a Hydrogeologist Report, completed in 2021 as part of the application for a permit from Vancouver Coastal Health. That report considered whether the quality of water intended for use at the Cidery is influenced by surface water and is ‘Groundwater at Risk of Pathogens’ (GARP). The report provides details on the water supply for the property, coming from a surface water license (for irrigation of the orchard) and an existing well (for wash water in its commercial operations). Water is not used in the production of cider itself.

The report concludes that the risk of pathogens is low, but not absent. The report recommends periodic testing for pathogens at the discretion of VCH. The report also recommends periodic inspections of the cistern and water conveyance system.

Septic

At the May 25th meeting, staff provided Council with a recommendation from Vancouver Coastal Health on this application, which said:

In reviewing this application, Vancouver Coastal Health recommends that the Bowen Island Municipality require that the proponent engages a Registered Onsite Wastewater Practitioner or a Professional to provide a Letter of Assurance that confirms that the intended use of the property will not have a negative impact on the onsite wastewater system and that the system can handle the proposed new use.

After the application was amended, staff re-referred the reduced application (for cidery use only) to Vancouver Coastal Health, who replied:

A ROWP letter of assurance was recommended for the guest house to confirm the potential additional flow into the septic system would not cause a negative impact. If there is no change in actual usage, no I don't think a letter of assurance from a ROWP is required.

The applicant has provided (and staff have attached to this report) records of the sewage filing associated with the Cidery opening in 2021.

Conservation Covenant

As discussed with PECAAC and in earlier Council reports, staff have recommended a protective covenant be placed on Riparian areas of Murray Creek and on agricultural land, particularly the heritage apple orchard. The Murray Creek covenant would protect the riparian area from development, while the agricultural covenant would protect that land as either environmental protection or for agricultural uses. Approximate areas of the covenant are shown below:

The applicant has questioned the applicability of the Conservation Development Policy, given its stated objective “to ensure all rezoning applications which increase density outside of the Snug Cove Village incorporate Conservation Development principles and achieve a goal of “Nature Needs Half.” Staff believe that the use of the Conservation Development Policy is appropriate in this case, for an application that is seeking additional uses on its property. Council may wish to indicate to staff whether they would expect covenants in place to protect riparian areas and/or agricultural areas as part of this rezoning application.

Cidery Definition

Bylaw No. 726, 2026 has been drafted to contain the same *cidery* definition as found in the TUP issued for the property. This definition reads:

“CIDERY” means the *use of buildings and structures* for the production of cider, at a cidery facility licensed by the Liquor and Cannabis Regulation Branch, where at least 25% of the cider production comes from fruit grown on the same *lot*, or from

another *lot* which is part of the same business. Imported British Columbia fruit used in the *cidery* shall be limited to no more than 75% of cider production. A cidery may include *cidery* tours, cider tasting, cider sales, a picnic area, *lounge endorsement*, and the sale of *cidery* promotional products.

The applicant, in a letter dated July 21, 2026, proposes an alternate definition that would match the [Liquor Distribution Brach \(LDB\) land-based winery requirements](#), which are:

- 100% of the product must be made from fruit grown or produced in British Columbia;
- at least 25% of the fruit used in production must come from acreage owned or leased by the licensee; and
- at least two acres of fruit orchard must be maintained at the licensed establishment.

The key differences seem to be:

1. There would no longer be a volume threshold of fruit coming from 620 Laura Road; and
2. There would be a requirement to maintain 2 acres of orchard to continue cidery production.

The applicant notes that this definition, aligning with the LDB criteria, removes a hurdle for Riley's Cidery to meet different standards to continue to operate. This alternate definition may also remove one misaligned incentive in the current definition. Namely that the heritage orchard on the property was planted and maintained for a wide variety of apples, rather than to maximize apple production. Under the current defection, to increase production the cidery would be incentivized to modernize the heritage orchard to prioritize increased apple production rather than maintaining the diversity of apple species. However, this definition would also mean that cidery production would no longer be tied as closely to the actual production on the site.

ISLANDS TRUST POLICY CHECKLIST

Staff have prepared the Islands Trust Policy Checklist to form part of the bylaw referral to the Islands Trust. The checklist is provided in Attachment 2.

FINANCIAL/ RESOURCE/MAINTENANCE CONSIDERATIONS

This report is not anticipated to have a financial impact.

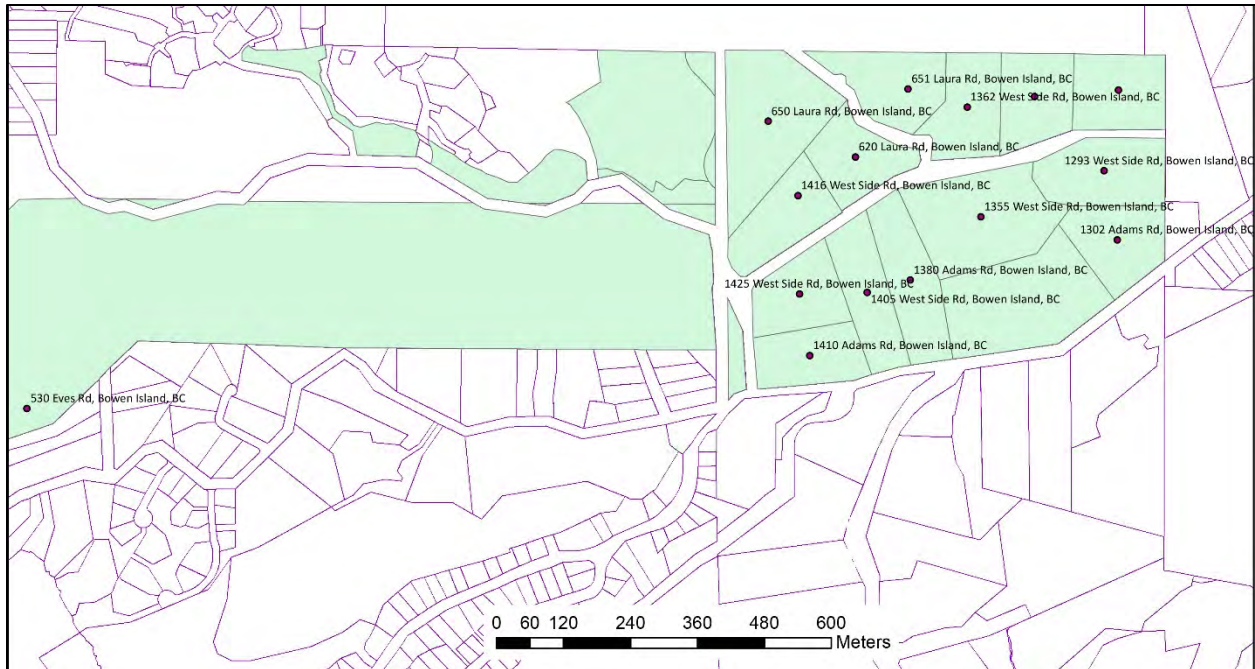
ECOLOGICAL/ENVIRONMENTAL/CLIMATE CONSIDERATIONS

This property includes a portion of Murray Creek along the eastern border of the site, and it's associated riparian area. Staff propose that, through implementation of the Conservation Development Policy, portions of the riparian area be protected through a restrictive covenant.

COMMUNICATION TO THE PUBLIC

In advance of this meeting, staff gave notice of Council's consideration of First Reading. Notice was placed in the Island Page, on an onsite notice sign, updated on the Municipal website, and mailed to property owners within 300 metres of 620 Laura Road, shown on the map below.

Figure 1 – Properties receiving mailout notices



At time of writing Staff have received [one letter on the application, which is included in the July 13th Council agenda.](#)

CONCLUSION

Staff present here a bylaw for consideration of First Reading to enable application RZ2026-0014 and recommend the bylaw be read a first time and referred to the Islands Trust.

ALTERNATIVES

Council has the following options available as alternatives to the staff recommendation:

1. The applicant has written to Council recommending an alternative *cidery* definition. Council may wish to make a motion amending Bylaw No. 726, prior to granting First Reading. Council would make the following motion:

That Council direct staff to amend the cidery definition in Bylaw No. 726, 2026 to read:

“CIDERY” means the use of buildings and structures for the production of cider, at a cidery facility licensed by the Liquor and Cannabis Regulation Branch, where at least 25% of the cider production comes from fruit grown on the same lot, or from another lot which is part of the same business. Any imported fruit used in the cidery shall be grown in British Columbia. A cidery must maintain 2 acres of fruit orchards on the same lot. A cidery may include cidery tours, cider tasting, cider sales, a picnic area, lounge endorsement, and the sale of cidery promotional products.

That Bylaw No. 726, cited as “Bowen Island Municipality Land Use Bylaw No. 57, 2002, Amendment Bylaw No. 726, 2026” be read a first time as amended;

That Council refer Bylaw No. 726, 2026, and the attached Islands Trust Policy Statement checklist to the Islands Trust; and

That Council direct staff to return with the results of that referral.

2. APC and members of the public have expressed a desire to still hold a Public Hearing for this bylaw. Council may give the recommended First Reading to the bylaw, but refer the bylaw to a First Reading following a potential Second Reading. To make this alternative, Council want move the recommendation with the additional motion:

That Council direct staff to refer Bylaw No. 726, 2026 to a Public Hearing

3. The Advisory Planning Commission noted that the eastern portion of 620 Laura Road is located within the Grafton lake watershed. As such, a part of the APC recommendation is for Council to consider deferring this application until completion of the Grafton Lake Management Plan. Could would make the following motion:

That Council direct staff to not pursue the proposal RZ-2026-0014 any further until the Grafton Lake Watershed Management Plan is complete

4. That Council direct staff to not pursue the proposal any further. Unless Council provided other guidance, staff would interpret a defeat of a motion for First Reading as Council denying the application; or
5. Other options as determined by Council.

ATTACHMENTS AND REFERENCES:

1. Bylaw No. 726, 2026
2. Islands Trust Policy Checklist
3. Hydrogeologist Report
4. Record of Sewerage System
5. Sewerage System Letter of Certification

Submitted by: Daniel Martin, Manager of Planning and Development

REVIEWED BY:

CAO	☒
Bylaw Services	☐
Communications	☒
Corporate Officer	☐
Finance	☐
Fire & Emergency	☒
Environment & Parks	☒

Planning ☒
Public Works ☐
Recreation & Community Services ☐

APPROVED BY:

Kristen Watson

Kristen Watson, Acting Chief Administrative Officer

**BOWEN ISLAND MUNICIPALITY
BYLAW NO. 726, 2026**

A Bylaw to amend Land Use Bylaw No. 57, 2002.

WHEREAS, “Bowen Island Land Use Bylaw No. 57, 2002” regulates the use of land, buildings, and structures within the Bowen Island Municipality

AND WHEREAS, Council wishes to amend “Bowen Island Land Use Bylaw No. 57, 2002” to amend existing regulations on the property legally described as:

LOT 1 BLOCK D DISTRICT LOT 492 PLAN 22501

THEREFORE

1.0 Citation

1.1 This bylaw may be cited for all purposes as “Bowen Island Municipality Land Use Bylaw No. 57, 2002, Amendment Bylaw No. 726, 2026”.

2.0 Amendments

2.1 “Bowen Island Municipality Land Use Bylaw No. 57, 2002,” is amended at Section 4.1.4 – Exceptions in Particular Locations by inserting section 4.1.4 (12) to read as follows:

4.1.4. (1) *Zone variation RR 2 (a)*

- (a) Despite Section 4.1.1. (1) *cidery* is a permitted principal use of Land, Buildings and Structures
- (b) *Lounge endorsement* is not a permitted use
- (c) Maximum *floor area of retail space* is 25 sq. m.
- (d) Maximum area of exterior patio space to be used as a picnic area is 80 sq. m.
- (e) The hours that a *cidery* may be open to the public area are as follows:
 - a. 11:00am to 7:00pm daily

2.2 “Bowen Island Municipality Land Use Bylaw No. 57, 2002,” is amended at Table 5-1 *MINIMUM NUMBER OF OFF-STREET PARKING SPACES* by inserting the following rows to read as follows:

LAND USE / ZONE	Number of <i>Off-Street Parking</i> spaces Required
	CIDERY
All Zones	1 per 30 m ² of <i>floor area</i>

LAND USE / ZONE Number of Off-Street Parking spaces Required

- 2.3 “Bowen Island Municipality Land Use Bylaw No. 57, 2002,” is amended at Section 1.1. DEFINITIONS by inserting the following definitions alphabetically:

“**CIDERY**” means the *use of buildings and structures* for the production of cider, at a cidery facility licensed by the Liquor and Cannabis Regulation Branch, where at least 25% of the cider production comes from fruit grown on the same *lot*, or from another *lot* which is part of the same business. Imported British Columbia fruit used in the *cidery* shall be limited to no more than 75% of cider production. A cidery may include *cidery* tours, cider tasting, cider sales, a picnic area, *lounge endorsement*, and the sale of *cidery* promotional products.

“**LOUNGE ENDORSEMENT**” means permission for the sale and service of liquor for on-site consumption for a licensed alcohol manufacturer. The lounge can be an indoor area, with or without a patio attached to the interior lounge, or may be a stand-alone patio located at the manufacturing site. A lounge may overlap in whole, or in part, a sampling area and/or on-site store.

- 2.4 Schedule “B” to “Bowen Island Municipality Land Use Bylaw No. 57, 2002” is amended by changing the description of the lands labelled “A” on Schedule “A” to this Bylaw from Rural Residential 2 (RR2) to Rural Residential 2 (a).

READ A FIRST TIME this ____ day of _____, _____;

READ A SECOND TIME this ____ day of _____, _____;

READ A THIRD TIME this ____ day of _____, _____;

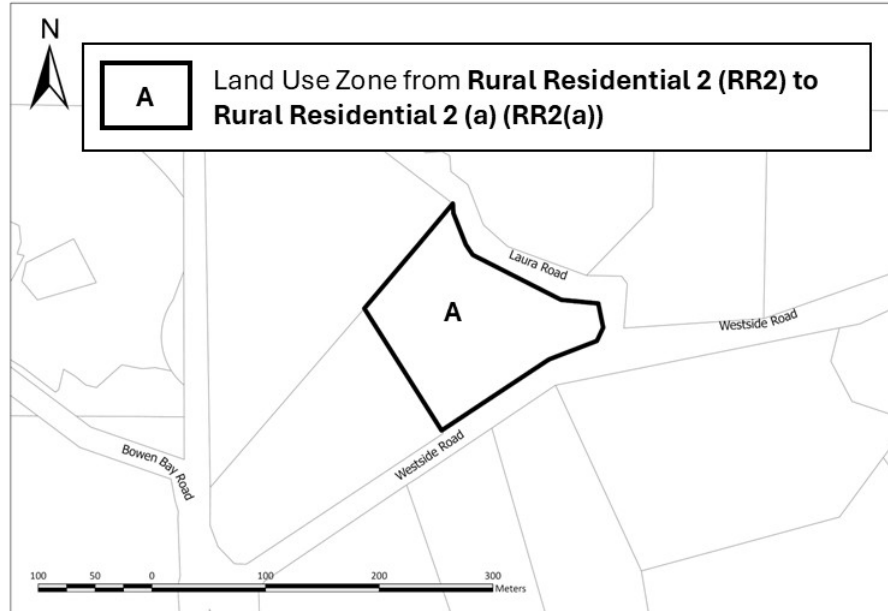
FINALLY ADOPTED this ____ day of _____, _____;

Andrew Leonard
Mayor

Sophie Idsigna
Corporate Officer

Bowen Island Municipality Land Use Bylaw No. 57, 2002

Amendment Bylaw No. 726, 2026 – Schedule A





Islands Trust

POLICY STATEMENT DIRECTIVES ONLY CHECK LIST

Bylaw No. 723, 2026 – File: 2026-0016 1658 1639 Mount Gardner Rd

PURPOSE

To provide staff with the Directives Only Checklist to highlight issues addressed in staff reports and as a means to ensure Local Trust Committee address certain matters in their official community plans and regulatory bylaws and Island Municipalities address certain matters in their official community plans and to reference any relevant sections of the Policy Statement.

POLICY STATEMENT

The Policy Statement is comprised of several parts. Parts I and II outline the purpose, the Islands Trust object, and Council's guiding principles. Parts III, IV and V contain the goals and policies relevant to ecosystem preservation and protection, stewardship of resources and sustainable communities.

There are three different kinds of policies within the Policy Statement as follows:

- Commitments of Trust Council which are statements about Council's position or philosophy on various matters;
- Recommendations of Council to other government agencies, non-government organizations, property owners, residents and visitors; and
- Directive Policies which direct Local Trust Committees and Island Municipalities to address certain matters.

DIRECTIVES ONLY CHECK LIST

The Policy Statement Directives Only Checklist is based on the directive policies from the Policy Statement (Consolidated April 2003) which require Local Trust Committees to address certain matters in their official community plans and regulatory bylaws and Island Municipalities to address certain a matters in their official community plans in a way that implements the policy of Trust Council.

Staff will use the Policy Statement Checklist (Directives Only) to review Local Trust Committee and Island Municipality bylaw amendment applications and proposals to ensure consistency with the Policy Statement. Staff will add the appropriate symbol to the table as follows:

- ✓ if the bylaw is **consistent** with the policy from the Policy Statement, or
- ✗ if the bylaw is **inconsistent (contrary or at variance)** with a policy from the Policy Statement, or
- N/A if the policy is not applicable.

Part III Policies for Ecosystem Preservation and Protection

CONSISTENT	NO.	DIRECTIVE POLICY
	3.1	Ecosystems
N/A	3.1.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification and protection of the environmentally sensitive areas and significant natural sites, features and landforms in their planning area.
✓	3.1.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the planning, establishment, and maintenance of a network of protected areas that preserve the representative ecosystems of their planning area and maintain their ecological integrity.
N/A	3.1.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the regulation of land use and development to restrict emissions to land, air and water to levels not harmful to humans or other species.
	3.2	Forest Ecosystems
N/A	3.2.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of unfragmented forest ecosystems within their local planning areas from potentially adverse impacts of growth, development, and land-use.
	3.3	Freshwater and Wetland Ecosystems and Riparian Zones
N/A	3.3.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address means to prevent further loss or degradation of freshwater bodies or watercourses, wetlands and riparian zones and to protect aquatic wildlife.
	3.4	Coastal and Marine Ecosystems
N/A	3.4.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of sensitive coastal areas.
N/A	3.4.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the planning for and regulation of development in coastal regions to protect natural coastal processes.

PART IV: Policies for the Stewardship of Resources

CONSISTENT	NO.	DIRECTIVE POLICY
	4.1	Agricultural Land
N/A	4.1.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification and preservation of agricultural land for current and future use.
N/A	4.1.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the preservation, protection, and encouragement of farming, the sustainability of farming, and the relationship of farming to other land uses.
N/A	4.1.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the use of adjacent properties to minimize any adverse affects on agricultural land.

CONSISTENT	NO.	DIRECTIVE POLICY
N/A	4.1.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the design of road systems and servicing corridors to avoid agricultural lands unless the need for roads outweighs agricultural considerations, in which case appropriate mitigation measures shall be required to derive a net benefit to agriculture
N/A	4.1.8	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address land uses and activities that support the economic viability of farms without compromising the agriculture capability of agricultural land.
N/A	4.1.9	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the use of Crown lands for agricultural leases.
	4.2	Forests
N/A	4.2.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the need to protect the ecological integrity on a scale of forest stands and landscapes.
N/A	4.2.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the retention of large land holdings and parcel sizes for sustainable forestry use, and the location and construction of roads, and utility and communication corridors to minimize the fragmentation of forests.
N/A	4.2.8	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the designation of forest ecosystem reserves where no extraction will take place to ensure the preservation of native biological diversity.
	4.3	Wildlife and Vegetation
	4.4	Freshwater Resources
N/A	4.4.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address measures that ensure neither the density nor intensity of land use is increased in areas which are known to have a problem with the quality or quantity of the supply of freshwater, water quality is maintained, and existing, anticipated and seasonal demands for water are considered and allowed for.
N/A	4.4.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address measures that ensure water use is not to the detriment of in-stream uses
	4.5	Coastal Areas and Marine Shorelands
N/A	4.5.8	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the needs and locations for marine dependent land uses.
N/A	4.5.9	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the compatibility of the location, size and nature of marinas with the ecosystems and character of their local planning areas.
N/A	4.5.10	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the location of buildings and structures so as to protect public access to, from and along the marine shoreline and minimize impacts on sensitive coastal environments.
N/A	4.5.11	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address opportunities for the sharing of facilities such as docks, wharves, floats, jetties, boat houses, board walks and causeways.
	4.6	Soils and Other Resources
N/A	4.6.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the

		protection of productive soils.
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PART V: Policies for Sustainable Communities

CONSISTENT	NO.	DIRECTIVE POLICY
	5.1	Aesthetic Qualities
N/A	5.1.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of views, scenic areas and distinctive features contributing to the overall visual quality and scenic value of the Trust Area.
	5.2	Growth and Development
N/A	5.2.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address policies related to the aesthetic, environmental and social impacts of development.
N/A	5.2.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address any potential growth rate and strategies for growth management that ensure that land use is compatible with preservation and protection of the environment, natural amenities, resources and community character.
N/A	5.2.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address means for achieving efficient use of the land base without exceeding any density limits defined in their official community plans.
N/A	5.2.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification of areas hazardous to development, including areas subject to flooding, erosion or slope instability, and strategies to direct development away from such hazards.
	5.3	Transportation and Utilities
N/A	5.3.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the development of a classification system of rural roadways, including scenic or heritage road designations, in recognition of the object of the Islands Trust.
N/A	5.3.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the impacts of road location, design, construction and systems.
N/A	5.3.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the designation of areas for the landing of emergency helicopters.
N/A	5.3.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the development of land use patterns that encourage establishment of bicycle paths and other local and inter-community transportation systems that reduce dependency on private automobile use.
	5.4	Disposal of Waste
N/A	5.4.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification of acceptable locations for the disposal of solid waste.

CONSISTENT	NO.	DIRECTIVE POLICY
	5.5	Recreation

N/A	5.5.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the prohibition of destination gaming facilities such as casinos and commercial bingo halls.
N/A	5.5.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the location and type of recreational facilities so as not to degrade environmentally sensitive areas, and the designation of locations for marinas, boat launches, docks and anchorages so as not to degrade sensitive marine or coastal areas.
N/A	5.5.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification of sites providing safe public access to beaches, the identification and designation of areas of recreational significance, and the designation of locations for community and public boat launches, docks and anchorages.
N/A	5.5.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification and designation of areas for low impact recreational activities and discourage facilities and opportunities for high impact recreational activities.
✓	5.5.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the planning for bicycle, pedestrian and equestrian trail systems.
	5.6	Cultural and Natural Heritage
N/A	5.6.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification, protection, preservation and enhancement of local heritage.
N/A	5.6.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the preservation and protection of the heritage value and character of historic coastal settlement patterns and remains.
	5.7	Economic Opportunities
N/A	5.7.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address economic opportunities that are compatible with conservation of resources and protection of community character.
	5.8	Health and Well-being
N/A	5.8.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address their community's current and projected housing requirements and the long-term needs for educational, institutional, community and health-related facilities and services, as well as the cultural and recreational facilities and services.

POLICY STATEMENT COMPLIANCE	
✓	COMPLIANCE WITH TRUST POLICY
N/A	
	NOT IN COMPLIANCE WITH TRUST POLICY for the following reasons:



GARP Hazard Assessment

April 30, 2021 | Revision 0

Riley's Cidery

Submitted to: Riley's Cider
Prepared by McElhanney

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Bowen Island, BC**

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Your Challenge. Our Passion.

Executive Summary

McElhanney has completed a screening level hazard assessment to ascertain whether the quality of water intended for use at the Cidery is influenced by surface water and is 'Groundwater at Risk of Pathogens' (GARP). We understand that, as a food processor, Riley's Cider intends to submit the report to Coastal Health in support of a permit to operate.

Water quality testing results from a sample collected at the point of use in February 2021 contained coliform and *E. coli* bacteria. A compromised storage tank was thought to be the source of the bacteria and was replaced in April 2021. Results from a sample of well water collected upstream of the old storage tank showed that there were no coliforms or *E. coli* bacteria present. Results from Riley's upcoming testing of water quality after the water system has been flushed will provide evidence whether the tank replacement has removed the source of bacteria that caused the coliforms in the February 2021 water sample. Periodic inspections of the cistern and overall water system are recommended going forward.

The Guidance Document for Determining GARP has 13 hazards listed under four categories. If none of the hazards are present, the groundwater source is considered at 'low risk' of containing pathogens (i.e. not GARP). If one or more hazards is present, the well may have a potential GARP risk and further assessment may be needed.

Results from the Level 1, Stage 1 GARP assessment are presented in the table following this summary.

Two GARP hazards were considered present, one each under categories 'B. Well Location' and 'D. Aquifer Type and Setting'. Both are attributable to the shallow intake of the well:

- B3: Well has an intake depth between the high-water mark and surface water bottom (or well intake is less than 15m bgs if surface water bottom is unknown) and is located within or less than 150m from the natural boundary of any surface water.
- D1: Well has an intake depth less than 15m below ground surface.

The well is completed in a fractured bedrock aquifer that regionally is partially confined to confined, depending on location. The well log lithology shows that, at the Site, material overlying the bedrock is primarily coarse-grained, which has a limited capacity to restrict infiltration of surface water. When pumped, there is the potential for the well to draw in shallow groundwater that has been affected by surface water. If the surface water contains pathogens, they may be conveyed to the well. Soil particles have natural filtration capability and can constrain the mobility of pathogens in the subsurface, but shallow groundwater (< 15m bgs) can still be at risk of pathogens from surface.

Surface waters can carry pathogens from onsite-sewerage systems, and livestock, animal, and waterfowl wastes. Adequate sewerage system setbacks from the well and the rural natural aspect of the

surrounding community mean that local surface waters are likely to have a low pathogen content. Therefore, the risk of pathogens affecting the quality of well water is considered low, but not absent.

The water quality result from April 2021 showed that there were no coliforms or *E. coli* bacteria present in the sample from the water well at that time. However, due to potential risk of hydraulic connection with surface water, the well water should be tested periodically for pathogens unless it is treated prior to use. Requirements for water testing frequency or treatment would be at the discretion of a DWO from Coastal Health.



Results from GARP Hazard Screening

GARP HAZARDS Water Well and Water Supply System	SCREENING		COMMENTS
	HAZARD NOT PRESENT	HAZARD MAY BE PRESENT	
A. Water Quality Results			
A1: Exhibits <u>recurring</u> presence of total coliform bacteria, fecal coliform bacteria, or <i>Escherichia coli</i> (<i>E. coli</i>).	✓		Initial water sample (February 2021) collected at point of use. In-ground water storage tank compromised and considered likely cause of bacteria. Total coliform and <i>E. coli</i> bacteria not present in water sample collected upstream from water storage tank, closer to well (April 2021). Water storage tank replaced with new cistern (April 2021). Client will flush water system prior to use and collect a water sample for laboratory analysis of total coliforms and <i>E. coli</i> to verify system maintenance was successful at eliminating source of bacteria.
A2: Has reported intermittent turbidity or has a history of consistent turbidity greater than 1 NTU.	No Data	No Data	No turbidity data. Turbidity is often used as an indicator of potential pathogens, and a trigger for additional investigation.
B. Well Location			
B1: Situated inside setback distances from possible sources of contamination as per section 8 of the BC Health Hazards Regulation: (a) 30 m from any probable source of contamination (b) 6 m from a private dwelling (c) unless contamination of the well would be impossible because of the physical conformation, 120 m from any cemetery or dumping ground	✓		Closest septic fields are roughly 80 m away (see figure) and downhill from the well. Sewerage System Regulation states that onsite sewerage must not be less than 30 m from a domestic water well. Well is more than 6m from a private dwelling, and any structures at Site. No cemeteries, landfills, dumps, etc. within 120 m.
B2: Has an intake depth <15 m below ground surface that is located within a natural boundary of surface water or a flood prone area.	✓		While well intake is less than 15 m bgs (see Table A), well is not within a flood prone area. Despite proximity to the well, the drainage ditch paralleling Laura Road (Murray Creek) is downhill from the well. If water overflowed banks it would still flow away from the well.
B3: Has * an intake depth between the high-water mark and surface water bottom (or < 15 m below the normal water level, if unknown); and * located within, or less than 150 m from the natural boundary of any surface water.		✓	Well is within 150 m of roadside drainage ditches and two runoff retention ponds. Well intake at about 183 m above sea level is within the high water mark and surface water bottom of the lower ditch and both ponds. This hazard considers whether surface waters are within the capture zone of the well. (See Appendix E)
B4: Located within 300 m of a source of probable enteric viral contamination without a barrier to viral transport.	✓		There are no intensive livestock operations, sewage outfalls, or sewage lagoons within 300 m. Uphill from the well land use is Rural 1 or Rural Reserve, which prevent industrial land uses. Septic fields are within 300 m, but locations exceed the minimum distance (30 m) from a well based on the Sewerage System Regulation.
C. Well Construction			
C1: Does not meet GWPR (Part 3 Div. 3) for surface sealing.	✓		Well has surface casing to 6.4 m below ground surface. There is no information in the well log regarding seal within annular space between borehole and casing; however no gap was noted between the casing and the ground to suggest a poor seal. Unknown if sealant (e.g. bentonite) used; however, casing may have been driven (no seal required).
C2: Does not meet GWPR (Part 4) and WSA (section 54) for well caps and covers	✓		Well cap is commercially fabricated, prevents inflow of runoff, and prevents entry by humans or animals. (see photo)
C3: Does not meet GWPR (section 63) and DWPA (Section 16) for floodproofing.	✓		Well casing is raised approximately 0.3 m above ground. Cap prevents entry of surface runoff. Not within a flood prone area (no risk of debris, ice, or erosion).
C4: Does not meet GWPR (Part 3 and Part 7) for wellhead protection.	✓		Casing is > 5 m bgs, is steel, extends 1 m into competent rock, stick up appears at least 0.3 m, and there is deflection of uphill runoff from well casing.
D. Aquifer Type and Setting			
D1: Has an intake depth <15 m below ground surface.		✓	Surface casing extends to 6.4 m bgs. Shallowest water-bearing fracture is 12.2 m bgs. Additional fracture with similar flow at/below 22.6 m bgs. There does not appear to be a confining unit over the bedrock to protect it. Soils overlying bedrock are described as sand and gravel or soil and rocks/gravel.
D2: Is situated in a highly vulnerable, unconfined, unconsolidated or fractured bedrock aquifer.	✓		Fractured bedrock aquifer (no. 749) has moderate vulnerability
D3: A water supply system well that is completed in a karst bedrock aquifer, regardless of depth. Even deep wells in karst aquifers are considered vulnerable to contamination.	✓		No karst in region



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Appendices

- A Certification of Analysis: February 2021 Water Sample
- B Well Log
- C Certificate of Analysis: April 20, 2021, Water Sample
- D Aquifer #749 Information
- E Analysis of Well Intake vs. Surface Water Elevations
- F Statement of Limitations



1. Introduction

Riley's Cidery is preparing to start operations as a craft apple cidery. They are located at 620 Laura Road ('Site') on Bowen Island, northwest of Vancouver, British Columbia (**Figure 1**).

Figure 1. Site location. (Base map source: BC Water Resources Atlas)



Riley's Cidery plans to use groundwater from an existing well on the property as wash water in its commercial operations. Well water will not be used to make the cider itself and collected surface water is used for irrigation of the orchard.

Riley's Cidery is applying to Coastal Health for a permit to use the water in a commercial food processing setting. Water quality testing results from a sample collected at the point of use in February 2021 contained coliform and *E. coli* bacteria (**Appendix A**). Coastal Health advised Riley's Cidery that they required a 'Groundwater at Risk of Pathogens' (GARP) assessment, which is required in situations where well water is under the influence of potentially contaminated surface. Surface waters have the potential to carry microbes, such as bacteria and viruses, which can pose risks to human health if the water is used as drinking water or in food preparation.

Riley's Cidery has contracted McElhanney Ltd (McElhanney) to conduct a screening level hazard assessment to ascertain whether the quality of its well water and water distribution system is influenced

by surface water. This report provides the findings from a screening level (i.e., Level 1 Stage 1) GARP assessment conducted for the Site.

1.1. REGULATORY BACKGROUND ON 'GARP'

The BC Ministry of Health has created a GARP determination process that is used to assist with assessments of whether well water may pose a human health risk from surface water pathogens¹. While consulting professionals can provide technical guidance regarding assessment of GARP, it is the discretion of a Drinking Water Officer (DWO) to make the decision whether a well is at risk of pathogens and if mitigation measures such as water treatment or on-going monitoring are required to control the risk.

There are up to four stages to GARP determination. Stage 1 involves hazard screening and assessment. Stages 2 through 4 of the GARP determination process are only required if a DWO has determined there is a GARP risk to a well based on the results from Stage 1. Stages 2 through 4 involve an iterative process of assessment and risk mitigation measures and, where necessary, long-term monitoring. If it is possible to remove the risks of GARP, the DWO can change the GARP determination once the required actions have been taken.

Stage 1 of the GARP determination process can be undertaken by qualified professionals. It starts with a desktop review and field inspection (Level 1), and may progress to increasing levels of hydrogeological investigation, as needed to gain clarity regarding the potential risks to groundwater.

1.2. APPROACH AND SCOPE

In conducting the hazard screening and assessment, McElhanney has followed:

- the BC Ministry of Health's *Guidance Document for Determining Groundwater at Risk of Containing Pathogens (GARP)*, v.3 (Sept. 2017); and,
- Engineers and Geoscientists British Columbia's Professional Practice Guidelines for *Assessment of Groundwater at Risk of Pathogens*, v.1.0 (July 2019).

The scope of work included communications with Riley's Cidery and on-line searches to collect information (documents, records, data, etc.) relevant to the water well, a desktop review of the information collected, and a site visit to visually inspect the well completion and its location in context with the watercourse and landscape.

2. Data Collected

McElhanney searched the online BC Water Resources Atlas and obtained the following information:

- Well record;
- Aquifer 749 Mapping Report and Factsheet;
- Topography, approximate watercourse locations, satellite imagery, and neighbouring land uses.

¹ BC Ministry of Health, 2017. *Guidance Document for Determining Groundwater at Risk of Pathogens (GARP)*, v3. <https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/how-drinking-water-is-protected-in-bc/garp-assessment-oct-2017.pdf>



Information in the provincial well record was incomplete. Riley's Cidery provided additional data on well completion and lithology.

There was no detailed topographic survey (e.g. LiDAR) available. McElhanney relied upon visual inspection during the site visits and publicly available topography information from Google Earth, BowMap2, and the BC Water Resources Atlas3.

A site visit was conducted by McElhanney personnel on April 8, 2021, to visually inspect the well and its context in the overall water system and within the surrounding landscape.

During initial project discussions, McElhanney learned that the initial water sample had been collected downstream from a compromised water storage tank (*Figure 2*). McElhanney recommended collection of a water sample closer to the well to test the quality of water closer to the source.

Figure 2. Water storage tank before (A, B) and after (C) replacement.

Image B shows the inside of the compromised cistern and growth of microbes on the sides of the tank.



Riley's Cidery collected a water sample on April 12, 2021, via a pipe that leads from the well to the water holding tank (i.e. upstream of the compromised water tank). Water was allowed to run from the pipe for a

² <https://www.bowenlandmunicipality.ca/bowmap>

³ <https://maps.gov.bc.ca/ess/hm/wrbc/>

few minutes before the sample was collected into a laboratory-supplied container. The water sample was stored and transported in a chilled cooler under standard chain of custody until its arrival for analysis of *E. coli* and total coliform bacteria at ALS Laboratories in Burnaby, BC.

3. Well Information and Site Conditions

3.1. WELL AND WATER SYSTEM OVERVIEW

The well providing water to the cidery has a 0.15m (6") diameter surface casing installed to 6.4m. Surface casing extends 2m below the top of fractured bedrock. The well is completed as an open borehole (no well screen) to a total depth of 30.5m (100 feet).

A water-bearing fracture was noted on the well log at 12.2m with potential yield of 0.1 L/s. A second fracture was inferred to occur at 22.6m. An increase in water yield to 0.2 L/s was noted on the log for that depth.

The well is located on a slope within an ornamental garden near the north end of the Site (*Figure 3*). Uphill from the well, soil has been mounded around the surface casing to direct surface runoff away from the base of the well (*Figure 3*). The surface casing extends above ground surface roughly 0.3m and is capped with a standard, manufactured well cap. The well may have a pitless adapter and buried distribution piping as no pipe was visible at surface.

Figure 3. Water well surface completion.

Image A shows well within garden area surrounded by fencing and general slope in vicinity. Image B shows soil mounded uphill from well casing to direct runoff around the well.



A summary of well information is provided in *Table A*. A copy of the well log is attached as *Appendix B*.



Water from the well is pumped into a cistern, or water tank, for temporary storage. From the cistern, the water is pumped to the point of use. Results from the water sample Riley's Cidery collected on April 12 upstream from the compromised water storage tank showed no coliform or *E. coli* bacteria (**Appendix C**).

3.2. LOCAL AQUIFER(S)

3.3. TOPOGRAPHY AND DRAINAGE

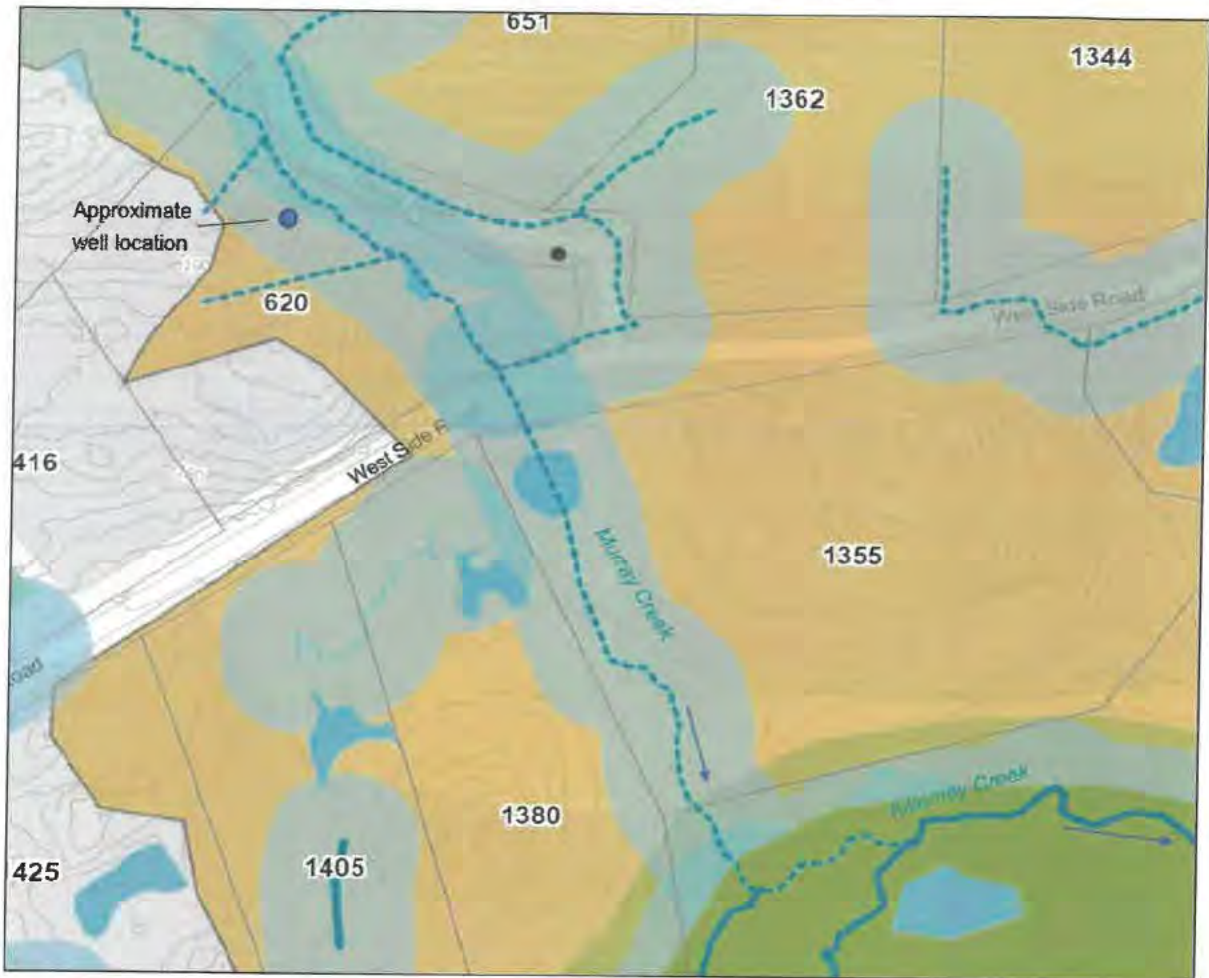
The Site is situated on a southwest facing slope near the foot of Mount Gardner (**Figure 5**). Laura Road slopes down toward its junction with West Side Road to the south. To the northeast and north, topography steepens toward the summit of Mount Gardner.

Figure 5. Topography (grey contour lines) and municipal land parcels (orange divisions).
(Image source: BC Water Resources)



Near the upper terminus of Laura Road is Frank Spring, where groundwater daylights at surface. Flow from the spring has been captured in a ditch, locally called Murray Creek, which is a narrow, shallow watercourse that runs parallel to Laura Road and passes through the Site adjacent to the roadway (**Figure 6**). Murray Creek flows into Killarney Creek, which drains to Grafton Lake near the centre of Bowen Island.

Figure 6. Local drainageways (dashed lines) and watercourses (solid lines). Blue shading shows riparian setbacks that define municipal development permit areas.



There is a surface water drainage divide at the northwest side of the Site (**Figure 7**). The majority of the Site drains south and southeast as part of the watershed for Killarney Creek. The northwest sliver of Site drains westward toward Tunstall Bay at the west side of Bowen Island.

There are two shallow surface water storage ponds (dugouts) at the Site that collect stormwater runoff (**Figure 8**). Water stored in the ponds is licensed for use at the Site for irrigation. Based on Site observations, both ponds appeared to have a maximum depth of no more than 2m.



Figure 7. A drainage divide runs through the Site at the NW side (purple line). Most of the site drains to the south toward Killamey Creek (see Fig.6). The northwest portion of the Site drains to the southwest, ultimately to Turnstall Bay.



Figure 8. Local surface waters.

Left: location of runoff collection ponds and connection to surface drainage. Blue shading indicates riparian setbacks defining municipal development permit areas. Right: Photograph of one of the ponds (April 8, 2021). Property boundary highlighted in bright Image source (left). <https://bowmap.bowenismunicipality.ca/>



3.4. SURROUNDING LAND USES

The Site is zoned Rural 1 (R1). Adjacent properties north of West Side Road are also zoned Rural (R1). Neighbouring properties south of West Side Road are zoned Rural Residential (RS) (*Figure 9*). Behind the properties on the north side of Laura Road land is zoned as Rural Reserve (R-RV) which is currently forested. The Rural Reserve lands cover the majority of Mount Gardner. Rural 1 and Rural Reserve lands are intended to maintain rural resources, protect ecosystems, watersheds, and rural atmosphere. While agriculture is permitted on rural-zoned lands, none of the adjacent properties was considered to have a land use that would generate a pathogen risk (for example intensive livestock production). Rural residential lots are at least 1 ha in size, and development is intended to preserve rural atmosphere, maintain low density housing. Most properties have water wells and onsite sewerage management, and the minimum lots size helps to protect local groundwater resources. This land use was not expected to be a pathogen risk to groundwater. Based on discussions with Riley's Cidery regarding neighbouring land uses, review of satellite imagery, and observations of neighbouring lands from the roadways, there did not appear to be land uses posing a risk of pathogens.

The septic fields at Site and on neighbouring properties are all at least 30m from the well (*Figure 10*), which is the minimum required separation based on the Sewerage System Regulation under BC's Public Health Act.

Figure 9. Land use (zoning) within 300m of the Site. Adjacent land use zones are Rural 1 (R1; 2 ha), Rural Residential (RS; 1 ha), Municipal Park (P); and Rural Reserve (RV).

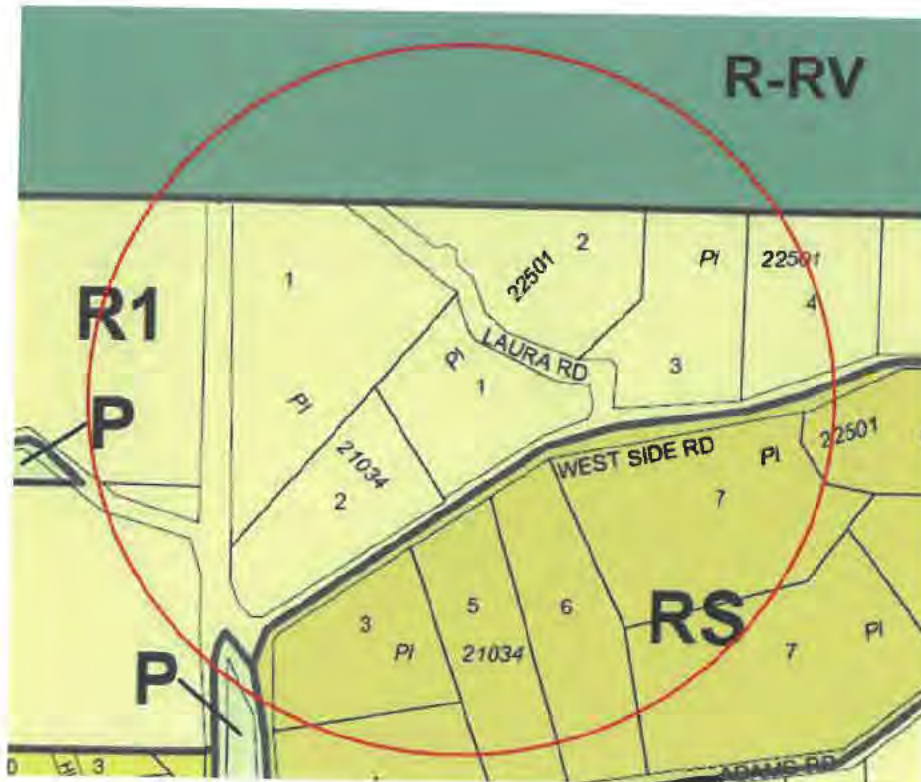


Figure 10. Location of well in relation to on site and neighbouring septic fields (onsite sewerage systems). Red circle shows approximate 30m radius from well. Sewerage System Regulation mandates 30m setbacks of onsite sewerage systems from water wells. Image source: Riley's Cidery.



4. GARP Hazard Screening Results and Discussion

The Guidance Document for Determining GARP has thirteen hazards listed under four categories. If none of the hazards are present, the groundwater source is considered at 'low risk' of containing pathogens (i.e., not GARP). If one or more hazards is present, the well may have a potential GARP risk and further assessment may be needed.

Results from McElhanney's Level 1, Stage 1 GARP assessment are summarized in **Table B** with supporting analysis in **Appendix E**. Two GARP hazards were considered present, one each under categories 'B. Well Location' and 'D. Aquifer Type and Setting'. Both are attributable to the shallow intake of the well:

- B3: Well has an intake depth between the high-water mark and surface water bottom (or well intake is less than 15m bgs if surface water bottom is unknown), and is located within or less than 150m from the natural boundary of any surface water.
- D1: Well has an intake depth less than 15m below ground surface.



Table B. Results from GARP Hazard Screening

GARP HAZARDS Water Well and Water Supply System	SCREENING		COMMENTS
	HAZARD NOT PRESENT	HAZARD MAY BE PRESENT	
A. Water Quality Results			
A1: Exhibits <u>recurring</u> presence of total coliform bacteria, fecal coliform bacteria, or <i>Escherichia coli</i> (<i>E. coli</i>).	✓		Initial water sample (February 2021) collected at point of use. In-ground water storage tank compromised and considered likely cause of bacteria. Total coliform and <i>E. coli</i> bacteria not present in water sample collected upstream from water storage tank, closer to well (April 2021). Water storage tank replaced with new cistern (April 2021). Client will flush water system prior to use and collect a water sample for laboratory analysis of total coliforms and <i>E. coli</i> to verify system maintenance was successful at eliminating source of bacteria.
A2: Has reported intermittent turbidity or has a history of consistent turbidity greater than 1 NTU.	No Data	No Data	No turbidity data. Turbidity is often used as an indicator of potential pathogens, and a trigger for additional investigation.
B. Well Location			
B1: Situated inside setback distances from possible sources of contamination as per section 8 of the BC Health Hazards Regulation: (a) 30 m from any probable source of contamination (b) 6 m from a private dwelling (c) unless contamination of the well would be impossible because of the physical conformation, 120 m from any cemetery or dumping ground	✓		Closest septic fields are roughly 80 m away (see figure) and downhill from the well. Sewerage System Regulation states that onsite sewerage must not be less than 30 m from a domestic water well. Well is more than 6m from a private dwelling, and any structures at Site. No cemeteries, landfills, dumps, etc. within 120 m.
B2: Has an intake depth <15 m below ground surface that is located within a natural boundary of surface water or a flood prone area.	✓		While well intake is less than 15 m bgs (see Table A), well is not within a flood prone area. Despite proximity to the well, the drainage ditch paralleling Laura Road (Murray Creek) is downhill from the well. If water overflowed banks it would still flow away from the well.
B3: Has: * an intake depth between the high-water mark and surface water bottom (or < 15 m below the normal water level, if unknown), and * located within, or less than 150 m from the natural boundary of any surface water.		✓	Well is within 150 m of roadside drainage ditches and two runoff retention ponds. Well intake at about 183 m above sea level is within the high water mark and surface water bottom of the lower ditch and both ponds. This hazard considers whether surface waters are within the capture zone of the well. (See Appendix E)
B4: Located within 300 m of a source of probable enteric viral contamination without a barrier to viral transport.	✓		There are no intensive livestock operations, sewage outfalls, or sewage lagoons within 300 m. Uphill from the well land use is Rural 1 or Rural Reserve, which prevent industrial land uses. Septic fields are within 300 m, but locations exceed the minimum distance (30 m) from a well based on the Sewerage System Regulation.
C. Well Construction			
C1: Does not meet GWPR (Part 3 Div. 3) for surface sealing.	✓		Well has surface casing to 6.4 m below ground surface. There is no information in the well log regarding seal within annular space between borehole and casing, however no gap was noted between the casing and the ground to suggest a poor seal. Unknown if sealant (e.g. bentonite) used; however, casing may have been driven (no seal required).
C2: Does not meet GWPR (Part 4) and WSA (section 54) for well caps and covers	✓		Well cap is commercially fabricated, prevents inflow of runoff, and prevents entry by humans or animals. (see photo)
C3: Does not meet GWPR (section 63) and OWPA (Section 16) for floodproofing.	✓		Well casing is raised approximately 0.3 m above ground. Cap prevents entry of surface runoff. Not within a flood prone area (no risk of debris, ice, or erosion).
C4: Does not meet GWPR (Part 3 and Part 7) for wellhead protection.	✓		Casing is > 5 m bgs, is steel, extends 1 m into competent rock, stick up appears at least 0.3 m, and there is deflection of uphill runoff from well casing.
D. Aquifer Type and Setting			
D1: Has an intake depth <15 m below ground surface.		✓	Surface casing extends to 6.4 m bgs. Shallowest water-bearing fracture is 12.2 m bgs. Additional fracture with similar flow at/below 22.6 m bgs. There does not appear to be a confining unit over the bedrock to protect it. Soils overlying bedrock are described as sand and gravel or soil and rocks/gravel.
D2: Is situated in a highly vulnerable, unconfined, unconsolidated or fractured bedrock aquifer.	✓		Fractured bedrock aquifer (no. 749) has moderate vulnerability
D3: A water supply system well that is completed in a karst bedrock aquifer, regardless of depth. Even deep wells in karst aquifers are considered vulnerable to contamination.	✓		No karst in region



The well is completed in a fractured bedrock aquifer that regionally is partially confined to confined, depending on location. The well log lithology shows that at the Site, material overlying the bedrock is primarily coarse-grained, which has a limited capacity to restrict infiltration of surface water. When pumped, there is the potential for the well to draw in shallow groundwater that has been affected by surface water. If the surface water contains pathogens, they may be conveyed to the well. Soil particles have natural filtration capability and can constrain the mobility of pathogens in the subsurface, but shallow groundwater (< 15m bgs) can still be at risk of pathogens from surface.

Surface waters can carry pathogens from onsite-sewerage systems, and livestock, animal, and waterfowl wastes. Adequate sewerage system setbacks from the well and the rural, natural aspect of the surrounding community mean that local surface waters are likely to have a low pathogen content. Therefore, the risk of pathogens affecting the quality of well water is considered low, but not absent.

5. Conclusions and Recommendations

The bacteria present in the water sample collected in February 2021 was likely due to a compromised water storage tank. Results from Riley's upcoming testing of water quality after the water system has been flushed will provide evidence whether the tank replacement has removed the source of bacteria that caused the coliforms in the February 2021 water sample. Periodic inspections of the cistern and water conveyance system are recommended going forward.

Based on the assessment of potential GARP hazards, the risk of pathogens from surface waters affecting the quality of well water is low, but not absent. The water quality result from April 2021 showed that there were no coliforms or *E. coli* bacteria present in the sample from the water well at that point in time. However, due to the potential risk of hydraulic connection with surface water, the well water should be tested periodically for pathogens unless it is treated prior to use. Requirements for water testing frequency or treatment would be at the discretion of a DWO from Coastal Health.



6. Closing

The information presented in this report is subject to limitations (*Appendix F*). If you have any questions or concerns regarding the information presented in this document, please contact the undersigned.

Sincerely,
McELHANNEY LTD.

Prepared by:

Reviewed by:



Jane Yetter, MSc, PEng
Senior Environmental Engineer
jyetter@mcclhanney.com
778-746-7406

A handwritten signature in cursive script, likely belonging to Gary Lin.

Gary Lin, PhD, PEng, CSAP
Senior Environmental Engineer
glin@mcclhanney.com
778-357-1294



APPENDIX A

Certification of Analysis: February 2021 Water Sample



ALS Environmental

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: VA21A2278	Page	: 1 of 3
Client	: Cash Clients Canada	Laboratory	: Vancouver - Environmental
Contact	: Riley's Cider Christine Hardie	Account Manager	: Email: ALSEV.CC@alsglobal.com
Address	: 8081 Lougheed Highway	Address	: 8081 Lougheed Highway
Telephone	: [REDACTED]	Telephone	: 604-253-4188
Project	: [REDACTED]	Date Samples Received	: 08-Feb-2021 06:20
PO	: [REDACTED]	Date Analysis Commenced	: 08-Feb-2021
C-O-C number	: 17-861141	Issue Date	: 16-Feb-2021 16:29
Sampler	: [REDACTED]		
Site	: [REDACTED]		
Quote number	: [REDACTED]		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Microbiology, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
% T/cm	% transmittance per centimetre
AU/cm	absorbance unit per cm
mg/L	milligrams per litre
MPN/100mL	most probable number per 100 mL
>: greater than.	
<: less than.	

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.



Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Client sample ID
Sampling date/time

Riley's Cider
08-Feb-2021
00:00

Analyte	Method	LOR	Unit	CDWG MAC	Category	Result	Limit
Aggregate Organics							
tannin + lignin (as tannic acid)	E563	0.10	mg/L	<0.10			
Bacteriological Tests							
coliforms, Escherichia coli [E. coli]	E010	1	MPN/100mL	<1			
coliforms, total	E010	1	MPN/100mL	9			
Physical Tests							
absorbance, UV (@ 254nm)	E404	0.0050	AU/cm	0.0120			
transmittance, UV (@ 254nm)	E404	1.0	% T/cm	97.3			

Please refer to the General Comments section for an explanation of any qualifiers detected.

Summary of Guideline Breaches by Sample

Client Sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
			No description available for this compound in this guideline				

Keys:

CDWG

MAC

Canada Guidelines for Canadian Drinking Water Quality (JAN, 2021)
Maximum Acceptable Concentrations

APPENDIX B

Well Log

RECEIVED AUG 08 1989
Water Management Branch

WATER WELL RECORD

Date 8 9 7 3 1
 yn mo mi

Location Accuracy

WELL No. ELEV

U
T
M

Date 19 ____ Well Type ____

Well
Type

Name & Address Mohcreek Logging Ltd., P.O. Box 2436, Parksville, B.C. V0R 2S0

Description & Address

Descriptive Location Lot #1 Bowen Island

TYPE	1 ☒ New Well	2 ☐ Reconditioned
OF WORK	3 ☐ Deepened	4 ☐ Abandoned

WORK METHOD

1 ☐ Cable tool	2 ☐ Bored	3 ☐ Jetted	
4 ☐ Rotary	a ☐ mud	b ☐ air	c ☐ reverse
☐ Other			

WATER 1 ☐ Domestic 2 ☐ Municipal 3 ☐ Irrigation
WELL USE 4 ☐ Comm. & Ind. ☐ Other

DRILLING ADDITIVES

MEASUREMENTS from 1 ☐ ground level 2 ☐ top of casing
casing height above ground level _____

9. CASING: 1 ☐ Steel 2 ☐ Galvanized 3 ☐ Wood
Materials 4 ☐ Plastic 5 ☐ Concrete
☐ Other

Hole Diameter					units
Diameter					ins
from					ins
to					ft
Thickness					ft
Weight					ins
					lb/ft

Pillars unit _____ fl 1 ☐ above 2 ☐ below ground level
 1 ☐ Welded 2 ☐ Cemented 3 ☐ Threaded | 1 ☐ New 2 ☐ Used
 Perforations: _____

Shoe (s): _____
Open hole, from _____ to _____ ft Diameter _____ ins
Grout: _____

10. SCREEN: 1 ☐ Nominal (Telescope) 2 ☐ Pipe Size
Type 1 ☐ Continuous Slot 2 ☐ Perforated 3 ☐ Louvre
☐ Other _____
Material 1 ☐ Stainless Steel 2 ☐ Plastic ☐ Other _____
Set from _____ to _____ ft below ground level

RISER, SCREEN & BLANKS							units
Length							ft
Diam. I D							ins
Slot Size							ins
from							ft
to							ft

Fittings, top _____ bottom _____
Gravel Pack _____

11. DEVELOPED BY: 1 ☐ Surging 2 ☐ Jetting 3 ☐ Air
4 ☐ Boiling 5 ☐ Pumping ☐ Other

12. TEST 1 ☐ Pump 2 ☐ Ball 3 ☐ Air
 Rate _____ USgpm Temp _____ °C
 Water Level _____ ft after test of _____ hrs

☐ DRAWDOWN in ft				☐ RECOVERY in ft			
mins	WL	mins	WL	mins	WL	mins	WL

13. RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE

14. WATER TYPE: 1 ☐ fresh 2 ☐ salty 3 ☐ clear 4 ☐ cloudy
colour _____ smell _____; gas 1 ☐ yes 2 ☐ no

15. WATER ANALYSIS:

2 Iron	_____	mg/L
4 pH	_____	
1 Hardness	_____	mg/L
3 Chloride	_____	mg/L

Field Date _____
Lab Date _____ YR _____

CONSULTANT

Address

WELL LOCATION SKETCH

SITE ID No.

16. FINAL WELL COMPLETION DATA



Groundwater Wells and Aquifers

Well Summary

Well Tag Number: 94045
 Well Identification Plate Number:
 Owner Name: 360318 BC LIMITED
 Intended Water Use: Unknown Well Use

Well Status: New
 Well Class: Water Supply
 Well Subclass: Not Applicable
 Aquifer Number:

Observation Well Number:
 Observation Well Status:
 Environmental Monitoring System (EMS) ID:
 Alternative specs submitted: No

Licensing Information

Licensed Status: Unlicensed

Licence Number:

Location Information

Street Address:
 Town/City: BOWEN ISLAND

Legal Description:

Lot	1
Plan	7107
District Lot	492
Block	
Section	
Township	
Range	
Land District	36
Property Identification Description (PID)	

Description of Well Location: SUSET PARK ESTATES



Geographic Coordinates - North American Datum of 1983 (NAD 83)

Latitude: 49.36217	Longitude: -123.40078
UTM Easting: 470899	UTM Northing: 5467795
Zone: 10	Coordinate Acquisition Code: (10 m accuracy) Handheld GPS with accuracy of +/- 10 metres

Well Activity

Activity	↕ Work Start Date	↕ Work End Date	↕ Drilling Company	↕ Date Entered	↕
Legacy record	1989-07-31	1989-07-31	Tri-K Drilling	October 29th 2008 at 8:02 AM	

Well Work Dates

Start Date of Construction	End Date of Construction	Start Date of Alteration	End Date of Alteration	Start Date of Decommission	End Date of Decommission
1989-07-31	1989-07-31				

Well Completion Data

Total Depth Drilled:
 Finished Well Depth:
 Final Casing Stick Up:
 Depth to Bedrock:
 Ground elevation:

Static Water Level:
 Estimated Well Yield:
 Artesian Flow:
 Artesian Pressure:
 Method of determining elevation: Unknown

Well Cap:
 Well Disinfected Status: Not Disinfected
 Drilling Method:
 Orientation of Well: VERTICAL

Lithology

From (ft bgl)	To (ft bgl)	Raw Data	Description	Moisture	Colour	Hardness	Observations	Water Bearing Flow Estimate (USGPM)
There are no records to show								

Casing Details

From (ft bgl)	To (ft bgl)	Casing Type	Casing Material	Diameter (in)	Wall Thickness (in)	Drive Shoe
There are no records to show						

Surface Seal and Backfill Details

Surface Seal Material:
 Surface Seal Installation Method:
 Surface Seal Thickness:
 Surface Seal Depth:

Backfill Material Above Surface Seal:
 Backfill Depth:

Liner Details

Liner Material:
 Liner Diameter:
 Liner from:

Liner Thickness:
 Liner to:

Liner perforations

From (ft bgl)

To (ft bgl)

There are no records to show

Screen Details

Intake Method:
 Type:
 Material:
 Opening:
 Bottom:

Installed Screens

From (ft bgl)	To (ft bgl)	Diameter (in)	Assembly Type	Slot Size
There are no records to show				

Well Development

Developed by:

Development Total Duration:

Well Yield

Estimation Method:
 Static Water Level Before Test:
 Hydraulic Fracturing Performed: No

Estimation Rate:
 Drawdown:
 Increase in Yield Due to Hydraulic Fracturing:

Estimation Duration:

Well Decommission Information

Reason for Decommission:
 Sealant Material:
 Decommission Details:

Method of Decommission:
 Backfill Material:

Comments

No comments submitted

Alternative Specs Submitted: No

Documents

- [WTN 94045_Map.pdf](#)

Disclaimer

The information provided should not be used as a basis for making financial or any other commitments. The Government of British Columbia accepts no liability for the accuracy, availability, suitability, reliability, usability, completeness or timeliness of the data or graphical depictions rendered from the data.

SEP 28 1989

WATER WELL LOCATION DESCRIPTION FORM

NAME OF WELL OWNER : 360318 B.C. LTD.
 ADDRESS : Box 1126 GANGES Phone No. 732-7635
V05 1E0
 DRILLING CONTRACTOR: TRIK DRILLING LTD. VICTORIA
 DATE WELL DRILLING COMMENCED: JULY 31/89.

LEGAL DESCRIPTION OF PROPERTY WHERE THE WELL IS LOCATED
 (fill in applicable items)

LAND DISTRICT: 37 36

DISTRICT LOT (DL): 492

TOWNSHIP (TP): _____

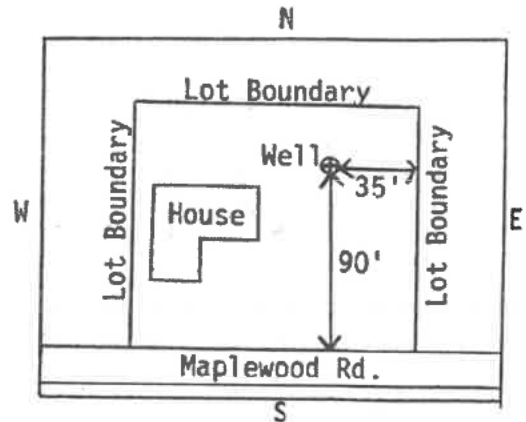
RANGE (R): _____

SECTION (SEC): _____

PLAN NO. : 7107

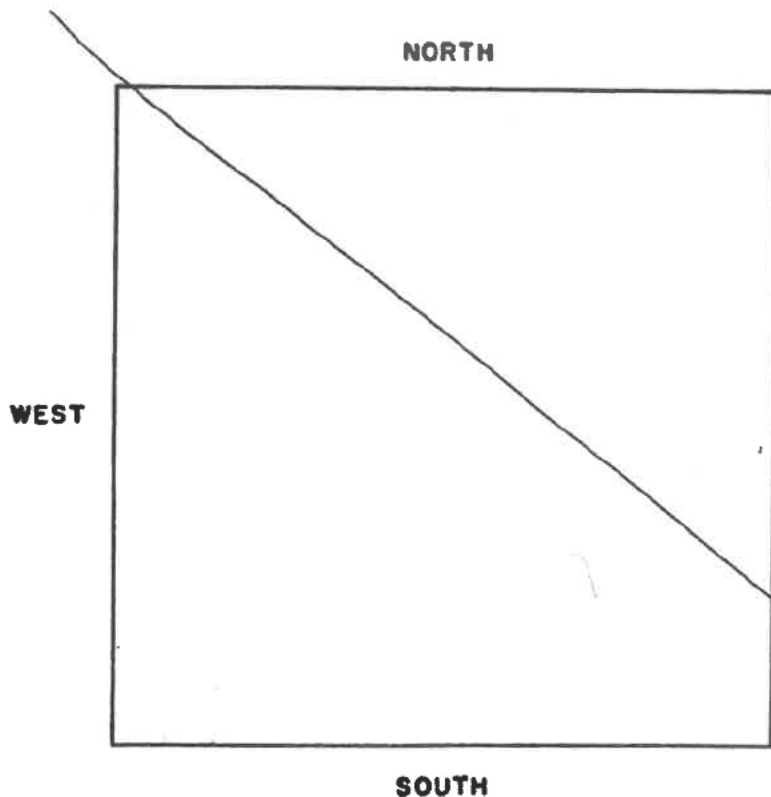
LOT NO. : D 1

WELL LOCATION SKETCH EXAMPLE



Lots 1-7 Bowen Island.
Sunset Park Estates.

WELL LOCATION SKETCH MAP



*see
enclosures.
(approximate
well
locations)*

APPENDIX C

Certificate of Analysis: April 20, 2021, Water Sample



ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: VA21A6689	Page	: 1 of 2
Client	: Cash Clients Canada	Laboratory	: Vancouver - Environmental
Contact	: Riley's Cider Christine Hardie	Account Manager	: Email: ALSEV.CC@alsglobal.com
Address	: 8081 Loughheed Highway Burnaby BC Canada V5A 1W9	Address	: 8081 Loughheed Highway Burnaby BC Canada V5A 1W9
Telephone	[REDACTED]	Telephone	: 604-253-4188
Project	—	Date Samples Received	: 12-Apr-2021 06:15
PO	—	Date Analysis Commenced	: 12-Apr-2021
C-O-C number	—	Issue Date	: 19-Apr-2021 14:15
Sampler	—		
Site	—		
Quote number	Vancouver Cash Clients		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position
Lindsay Gung	Supervisor - Water Chemistry
	Laboratory Department
	Microbiology, Burnaby, British Columbia

RIGHT SOLUTIONS | RIGHT PARTNER



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference. Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	Description
MPN/100mL	most probable number per 100 mL

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED ON SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Water

(Matrix: Water)

Analyte	Client sample ID				Riley's Cidery	
	CAS Number	Method	LOR	Unit	12-Apr-2021	VA21A6689-001
Bacteriological Tests	—	E010	1	MPN/100mL	Result	<1
		E010	1	MPN/100mL		
coliforms, total	—	E010	1	MPN/100mL	Result	<1
coliforms, Escherichia coli [E. coli]	—	E010	1	MPN/100mL		

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA21A6689	Page	1 of 5
Contact	: Cash Clients Canada	Laboratory	: Vancouver - Environmental
Contact	: Riley's Cider Christine Hardie	Account Manager	: Email: ALSEV.CC@alsglobal.com
Address	: 8081 Lougheed Highway	Address	: 8081 Lougheed Highway
Telephone	: Burnaby BC Canada V5A 1W9	Telephone	: 604-253-4188
Project	: [REDACTED]	Date Samples Received	: 12-Apr-2021 06:15
PO	: [REDACTED]	Issue Date	: 19-Apr-2021 14:15
C-O-C number	: [REDACTED]		
Sampler	: [REDACTED]		
Site	: [REDACTED]		
Quote number	: Vancouver Cash Clients		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: Water

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation			Analysis				
			Preparation Date	Holding Times Rec	Actual	Eval	Analysis Date	Holding Times Rec	Actual	Eval
Bacteriological Tests : Total Coliforms and E. coli (Enzyme Substrate)										
Sterile HDPE (Sodium thiosulphate) Riley's Cidery	E010	12-Apr-2021	—	—	—		12-Apr-2021	30 hrs	12 hrs	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.						
Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)	
			QC	Regular	Actual	Expected
Analytical Methods						
Laboratory Duplicates (DUP)						
Total Coliforms and E. coli (Enzyme Substrate)	E010	177484	1	1	100.0	10.0
Method Blanks (MB)						
Total Coliforms and E. coli (Enzyme Substrate)	E010	177484	1	1	100.0	5.0



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Coliforms and E. coli (Enzyme Substrate)	E010 Vancouver - Environmental	Water	APHA 9223 (mod)	The enzyme substrate test simultaneously detects Total Coliforms and E. coli in a 100 mL sample after incubation at 35.0 ±0.5°C for either 18 or 24 hours (dependent on reagent used).



ALS Environmental

QUALITY CONTROL REPORT

Work Order

: VA21A6689

Page

: 1 of 3

Client

: Cash Clients Canada

Contact

: Riley's Cider Christine Hardie

Address

: 8081 Loughheed Highway

Telephone

: Burnaby BC Canada V5A 1W9

Project

: [REDACTED]

PO

: [REDACTED]

C-O-C number

: [REDACTED]

Sampler

: [REDACTED]

Site

: [REDACTED]

Quote number

: Vancouver Cash Clients

No. of samples received

: 1

No. of samples analysed

: 1

Laboratory

: Vancouver - Environmental

Account Manager

: Email: ALSEV.CC@alsglobal.com

Address

: 8081 Loughheed Highway

: Burnaby, British Columbia Canada V5A 1W9

Telephone

: 604-253-4188

Date Samples Received

: 12-Apr-2021 06:15

Date Analysis Commenced

: 12-Apr-2021

Issue Date

: 19-Apr-2021 14:15

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories

Position

Lindsay Gung

Supervisor - Water Chemistry

Laboratory Department

Microbiology, Burnaby, British Columbia



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QC) for applicable method references and methodology summaries.

Key :

- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
- DQO = Data Quality Objective.
- LOR = Limit of Reporting (detection limit).
- RPD = Relative Percentage Difference
- # = Indicates a QC result that did not meet the ALS DQO.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Water

Laboratory sample ID		Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Bacteriological Tests (QC Lot: 177484)												
VA21A6689-001		Riley's Cider	coliforms, Escherichia coli [E. coli]	---	E010	1	MPN/100mL	<1	<1	0	Diff <2x LOR	---
			coliforms, total	---	E010	1	MPN/100mL	<1	<1	0	Diff <2x LOR	---

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte		CAS Number/Method		LOR	Unit	Result	Qualifier
Bacteriological Tests (QC Lot: 177484)							
coliforms, Escherichia coli [E. coli]		—	E010	1	MPN/100mL	<1	—
	coliforms, total		—	E010	1	MPN/100mL	<1





Page of

SAMPLES RECEIVED WITHOUT CHAIN OF CUSTODY (CofC)

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY	YELLOW - CLIENT COPY	GENF 18.01 Front
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no ice.

APPENDIX D

Aquifer #749 Information



Groundwater Wells and Aquifers

[Aquifer Search](#) / [Aquifer Summary](#)

Aquifer 749 Summary

Aquifer number	749	Year of mapping	2006
Aquifer name		Litho stratigraphic unit	Lower Jurassic to Middle Jurassic Bowen Island Group
Descriptive location	Bowen Island - SW	Vulnerability	Moderate
Material type	Bedrock	Subtype	Fractured crystalline bedrock
Quality concerns	Isolated	Productivity	Moderate
Size (km ²)	4.1	Calculated well density	High



Well Information

Number of wells correlated to the aquifer	12
Number of uncorrelated wells within mapped aquifer extent	68
Artesian wells	0 artesian wells in aquifer

Well info last updated 2/2/2021

Documentation

[Factsheets](#)

- AQ_00749_Aquifer_Factsheet.pdf

Other Documents

- AQ_00749_Aquifer_Mapping_Report.pdf

Licensing Information

The licensing summaries should be considered estimates. Due to complexities in the structure of the licensing data, reported values should be confirmed through the e-licensing portal (https://1200.gov.bc.ca/pub/ams/Default.aspx?PossePresentation=AMSPublic&PosseObjectDef=0_ATIS_DocumentSearch&PosseMenuName=WS_Main).

Number of groundwater licences	0
Water withdrawal volume (annual)	No information available.

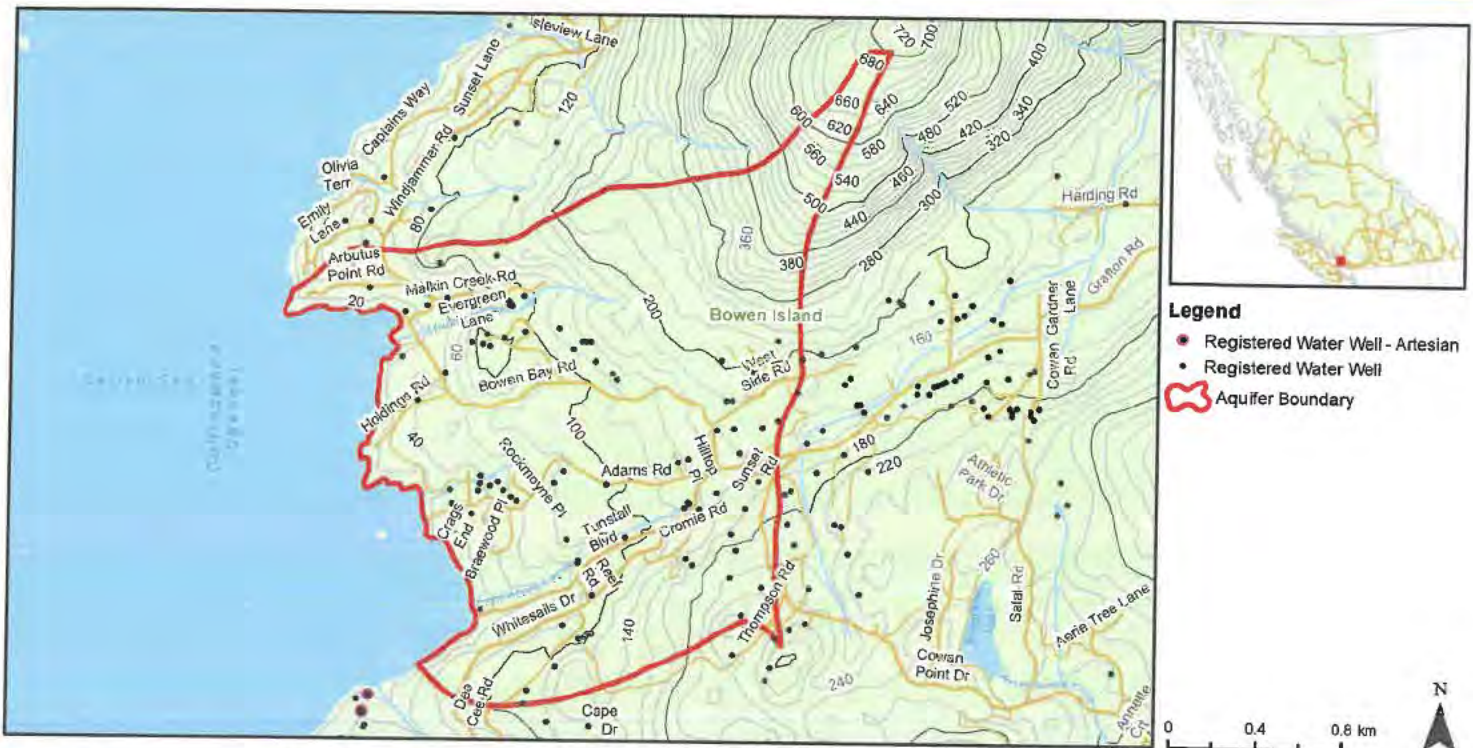
Licensing information is obtained from the [Water Rights Licence - Public data layer \(https://catalogue.data.gov.bc.ca/dataset/water-rights-licences-public\)](https://catalogue.data.gov.bc.ca/dataset/water-rights-licences-public).

Unique licenses are counted once for each aquifer that they are associated with.

The total licensed volume is counted once for each licence (the total volume may be shared between wells if there are multiple wells in a licence). In cases where specific volumes are licensed for multiple purposes, individual volumes are summed.

Knowledge Indicators

Advanced mapping	No information available.
Artesian advisory	No information available.
Observation wells	No information available.
Numerical model	No information available.
Pumping stress index	• Stress Index Report (https://services6.arcgis.com/ubm4tcTYICK8pist/arcgis/rest/services/Aquifer_180613_NA/FeatureServer/0/235/attachments/235)
Water budget	No information available.
Water quality information	4 wells with an EMS ID
Hydraulically connected (screening level)	Less likely
Groundwater Surface Water interactions	No information available.
Other information	No information available.



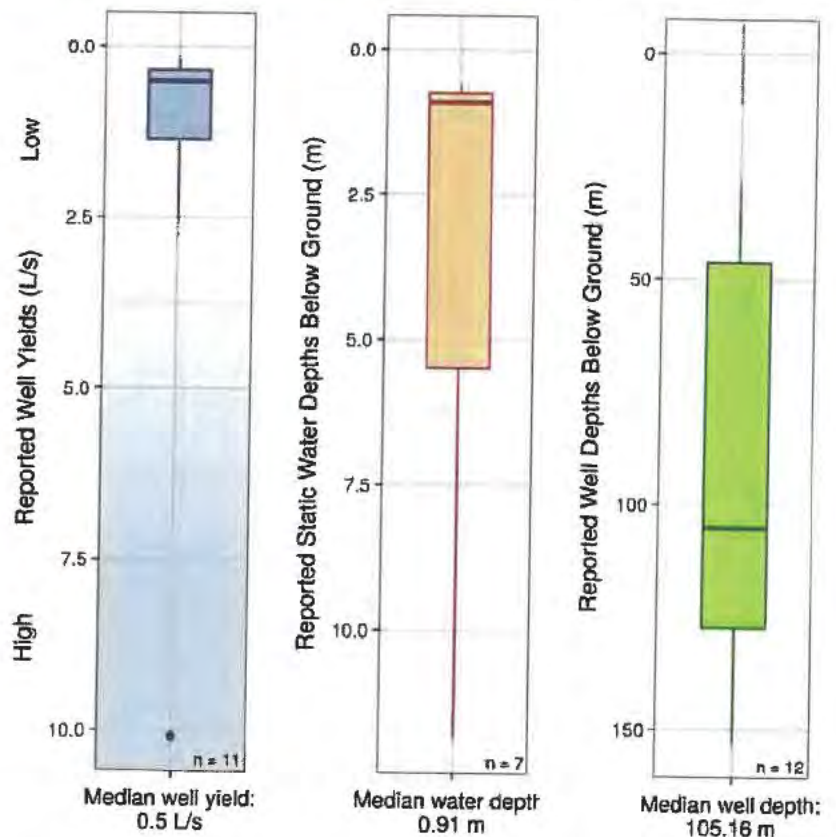
Aquifer Description (Mapping Report - 2006):

Fractured crystalline (igneous intrusive or meta-morphic, meta-sedimentary, meta-volcanic, volcanic) rock aquifer (subtype = 6b).

Aquifer Details

Region	South Coast
Water District	Vancouver
Aquifer Area	4.1 km ²
No. Wells Correlated to Aquifer	12
Vulnerability to Contamination	Moderate
Productivity	Moderate
Aquifer Classification	IB
Hydraulic Connectivity ¹	Not Likely
Aquifer Stress Index	Method not applicable - confined aquifer
No. Water Licences Issued to Wells	Unknown
Observation Wells (Active, Inactive)	None

¹ Based on broad regional assessment



Disclaimer: Use of information from Aquifer factsheets (accessed by BC government website) is subject to limitation of liability provisions (further described on that website). That information is provided by the BC government as a public service on an "as is" basis, without warranty of any kind, whether express or implied, and its use is at your own risk. Under no circumstances will the BC government, or its staff, agents and contractors, be responsible or liable to any person or business entity, for any direct, indirect, special, incidental, consequential or any other loss or damages to any person or business entity based on this factsheet or any use of information from it.

Detailed methods for all figures are described in the companion document (Aquifer Factsheet - Companion Document.pdf).
Factsheet generated on 2020-08-06 for Aquifer #749. For the meeting of 27 July 2026. <https://apps.nrs.gov.bc.ca/gwells/aquifers>.

AQUIFER CLASSIFICATION WORK SHEET

DATE: January 1, 2006

AQUIFER MAPPER: A.P. Kohut

AQUIFER LOCATION: Tunstall – Bowen Bay, Southwest side of Bowen Island.

AQUIFER NUMBER: 749

NTS MAP SHEETS: 92G/6

BCGS TRIM Maps (1:20,000): 092G.033

CLASSIFICATION: IB

RANKING: 12

Aquifer Size:

Area of aquifer is approximately 4.1 km².

Aquifer Boundaries:

The aquifer boundary has been delineated using water well record information (area of development), topography, surface drainage features and major geologic structural (fault/lineament) features. The aquifer forms part of the larger fractured crystalline bedrock aquifer system that underlies Bowen Island.

Geologic Formation (overlying):

Pleistocene and Holocene deposits including clay, till, boulders, silt, sand and gravel, see Ministry of Environment (1978).

Geologic Formation (aquifer):

Fractured crystalline bedrock including Lower Jurassic to Middle Jurassic *Bowen Island Group* around Tunstall Bay comprised of argillite, greywacke and conglomerate turbidites, and Late Jurassic quartz diorite around Bowen Bay. See Roddick and Woodsworth (1979) and British Columbia Geological Survey (2005).

Confined/Partially Confined/Unconfined: Confined and partially confined.

Vulnerability:

Moderate. The geometric mean (geomean) depth to static water level is 0.4 metres (1.3 feet). The geometric mean thickness of the confining layer is 6.81 metres (22.3 feet). The range of thickness of the confining layer is from 0.61 to 34.75 metres (2.0 to 114.0 feet).

Productivity:

Highly variable from low to high and **moderate overall** for fractured bedrock. Well yields reported in the well records range up to 2.52+ L/s (40+ USgpm). The geometric mean of 12 reported well yields is 0.43 L/s (6.8 USgpm) and the median well yield is 0.41 L/s (6.5 USgpm).

Depth to Water Table:

The geometric mean static water level is 0.4 metres (1.3 feet) and the median static water level is 0.7 metres (2.3 feet) based on 8 well records. Flowing conditions are reported in three wells near the coast.

Direction of Groundwater Flow:

Groundwater likely moves from eastern upland areas towards the west discharging into Tunstall Bay and Bowen Bay.

Recharge:

Precipitation and infiltration from eastern upland surface sources.

Domestic Well Density:

Moderate. Approximately 4 wells/km². Wells are concentrated along the coastal part of the aquifer area.

Type of Water Use:

Domestic for individual properties and community water supplies.

Reliance on Source:

Important source for individual properties and community supplies including Bowen Bay Water System and Tunstall Bay Water System.

Conflicts Between Users:

Unknown.

Quantity Concerns (type, source, level of concern):

Downward trend reported in water levels in some wells, (Bowen Island Municipality, 2005a). This may need further investigation.

Quality Concerns (type, source, level of concern):

Elevated TDS, Iron and Chlorides in some wells along southern boundary of aquifer. Two flowing wells reported with high pH (9.4). Source water quality protection is of interest for community water systems (Bowen Island Municipality, 2005a and 2005b).

Comments:

The geometric mean depth of water wells in this aquifer is 82.98 metres (272.3 feet). The median depth of wells is 105.15 metres (345.0 feet) and the range of well depths is from 28.95 to 153.0 metres (95.0 to 502.0 feet).

The statistics quoted for this aquifer are based on 8 to 14 water well records.

References:

Berardinucci, J. and K. Ronneseth. 2002. *Guide to Using the BC Aquifer Classification Maps for the Protection and Management of Groundwater*. Water, Air and Climate Change Branch. BC Ministry of Water, Land and Air Protection. Victoria, B.C. 54 pp.

British Columbia Geological Survey. 2005. *Geology Map* at Map Place.ca

<http://webmap.em.bc.ca/mapplace/minpot/bcgs.cfm>

- Bowen Island Municipality. 2005a. Tunstall Bay Water System, Drinking Water Quality, Annual Report - Final, Calendar Year 2004.
- Bowen Island Municipality. 2005b. Bowen Bay Water System, Drinking Water Quality, Annual Report - Final, Calendar Year 2004.
- Brown, W.L., and R.B. Erdman. 1970. Groundwater Development, Tunstall Bay, Bowen Island for Deecee Projects Ltd. Robinson, Roberts and Brown Ltd., North Vancouver, British Columbia. NTS File 092G/06-57 Ministry of Environment, Victoria, British Columbia.
- Buble, G. 1989. part of a report on Bowen Bay Improvement District's water sources. Municipal Engineering Services, Ministry of Municipal Affairs, Province of British Columbia, Victoria, British Columbia.
- Erdman, R.B., and H.W. Reed. 1976. Completion Report on a Deep Production Well for Mary B. Adams, Bowen Island, British Columbia. Piteau Gadsby Macleod Ltd., Vancouver, British Columbia. NTS File 092G/06-50 Ministry of Environment, Victoria, British Columbia.
- Journey, J.M. and Dunster, J., 2002. *The Bowen Island GeoLibrary; Spinning the web of Community Knowledge (v1.0)*. A project of the Bowen Island Forest and Water Management Society. Available on CD and online at: www.bowenisland.info
- Ministry of Environment. 1978. *Bowen Island: a resource analysis for land use planning, Volumes 1 and 2*. The Islands Trust, Ministry of Municipal Affairs and Housing, Victoria, British Columbia. NTS File 092G/06-13, Ministry of Environment, Victoria, British Columbia.
- Reed, H.W. 1979. Production Well Aquifer Test for Mary B. Adams, Bowen Island, British Columbia. Brown, Erdman & Associates Ltd., Vancouver, British Columbia. NTS File 092G/06-50 Ministry of Environment, Victoria, British Columbia.
- Roddick, J.A., and G.J. Woodsworth. 1979. Geology of Vancouver West Half and Mainland Part of Alberni, Geological Survey of Canada O.F. 611

AQUIFER CLASSIFICATION AND RANKING

AQUIFER LOCATION: Tunstall – Bowen Bay, Southwest side of Bowen Island.

AQUIFER NUMBER: 749

CLASSIFICATION:	IB	RANKING VALUE:	12
------------------------	-----------	-----------------------	-----------

Classification Component:

Level of development: **Heavy - High** level of demand in relationship to **moderate** level of aquifer productivity and water availability. Additional development of the aquifer should be carefully assessed.

Level of Vulnerability: **Moderate: Moderate** level of vulnerability to surface contamination.

Ranking Component:

	Ranking Value
Productivity:	2
Vulnerability:	2
Size:	1
Demand*:	3
Type of Use:	2
Quality Concerns:	1
Quantity Concerns:	1
Total:	12

- Demand has been assessed subjectively. Demand is based on domestic well density, number and type of wells, and general knowledge of well use and land use in the area. Demand assumes that the reported well capacity is the amount of water used, which can be misleading. The reported well capacity can be higher than actual use.

Number of water wells available for aquifer delineation = 14
Statistical Summary of Well Record Data for Aquifer # 749

	<i>Well Depth</i>		<i>Depth to Water</i>		<i>Depth to Bedrock</i>		<i>Reported Well Yield *</i>		<i>Estimated Thickness of Confining Materials **</i>	
<i>Number of Wells</i>	14	14	8	8	14	14	12	12	14	14
	m	ft	m	ft	m	ft	L/s	gpm	m	ft
<i>Maximum</i>	153.00	502.0	11.89	39.0	34.75	114.0	2.52	40.0	34.75	114.0
<i>Minimum</i>	28.95	95.0	0.03	0.1	0.61	2.0	0.01	0.2	0.61	2.0
<i>Average</i>	95.40	313.0	2.3	7.5	10.73	35.2	0.69	11.0	10.73	35.2
<i>Median</i>	105.15	345.0	0.7	2.3	6.40	21.0	0.41	6.5	6.40	21.0
<i>Geometric Mean</i>	82.98	272.3	0.4	1.3	6.81	22.3	0.43	6.8	6.81	22.3

* - USgpm

** Does not include surficial wells where bedrock was not encountered.

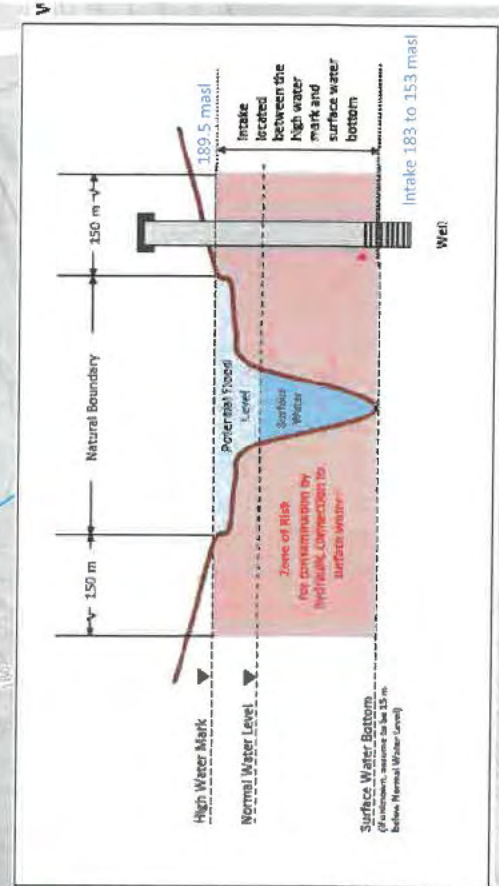
APPENDIX E

Analysis of Well Intake vs. Surface Water Elevations

Analysis of Potential GARP Hazard B3:

Bottom of surface casing at ~
183 m asl
(Interval from 183 to 153 masl)

Pond level ~ 183 m
(has to be lower than
184 contour to not overflow)



Appendix E – Analysis of Well Intake vs. Surface Water Elevations

APPENDIX F

Statement of Limitations

Statement of Limitations

Use of this Report. This report was prepared by McElhanney Ltd. ("McElhanney") for the particular site, design objective, development and purpose (the "**Project**") described in this report and for the exclusive use of the client identified in this report (the "**Client**"). The data, interpretations and recommendations pertain to the Project and are not applicable to any other project or site location and this report may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client, without the prior written consent of McElhanney. The Client may provide copies of this report to its affiliates, contractors, subcontractors and regulatory authorities for use in relation to and in connection with the Project provided that any reliance, unauthorized use, and/or decisions made based on the information contained within this report are at the sole risk of such parties. McElhanney will not be responsible for the use of this report on projects other than the Project, where this report or the contents hereof have been modified without McElhanney's consent, to the extent that the content is in the nature of an opinion, and if the report is preliminary or draft. This is a technical report and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies.

Standard of Care and Disclaimer of Warranties. This report was prepared with the degree of care, skill, and diligence as would reasonably be expected from a qualified member of the same profession, providing a similar report for similar projects, and under similar circumstances, and in accordance with generally accepted engineering and scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this report.

Information from Client and Third Parties. McElhanney has relied in good faith on information provided by the Client and third parties noted in this report and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

Effect of Changes. All evaluations and conclusions stated in this report are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the assessment and report preparation. Some conditions are subject to change over time and the Client recognizes that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site may substantially alter such evaluations and conclusions. Construction activities can significantly alter soil, rock and other geologic conditions on the site. McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein upon any of the following events: a) any changes (or possible changes) as to the site, purpose, or development plans upon which this report was based, b) any changes to applicable laws subsequent to the issuance of the report, c) new information is discovered in the future during site excavations, construction, building demolition or other activities, or d) additional subsurface assessments or testing conducted by others.

Independent Judgments. McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land or with respect to public offerings for the sale of securities.



Contact

Michael Florendo, MS, PEng, Project Manager
604-838-0953

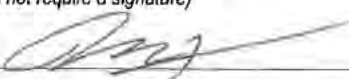
mflorendo@mcelhanney.com



McElhanney



RECORD OF SEWERAGE SYSTEM

		Filing # (OFFICE USE ONLY)	
1. Property Information	☒ New Construction ☐ Alteration ☐ Repair ☐ Amendment – Original Filing #		
	Tax Assessment Roll # 00028.100		PID # 015-026-701
	Legal Description (Plan, Lot, District Lot, Block Numbers) Lot 1, Block D, Plan VAP22501, District Lot 492.		
	Street (Civic) Address or General Location 620 Laura Road		City Bowen Island
2. Owner Information	Name of Legal Owner Rob Purdy		Mailing Address 620 Laura Road
	Phone [REDACTED]	City Bowen Island	Prov BC Postal Code V0N 1G2
3. Authorized Person Information	Name of Authorized Person Michael Florendo, P.Eng.		Mailing Address Suite 200, 858 Beatty Street
	Phone 1-604-838-0953	City Vancouver	Prov BC Postal Code V6B 1C1
	Registration # EGBC P.Eng. 30052		Email mflorendo@mcelhanney.com
4. Structure Information	Sewerage System Will Serve:		
	☐ Single Family Dwelling ☒ Other Structure (specify) <u>Cider</u> ☐ Other Dwelling (specify)		
	The sewerage system is designed for an estimated minimum daily domestic sewage flow of (check one)		
	☒ Less than or equal to 9,100 litres ☐ More than 9,100 litres but less than 22,700 litres		
5. Site Information	Depth of native soil to seasonal high water table or restrictive layer (cm) 100		Information respecting the type, depth and porosity of the soil is attached ☒ Yes ☐ No
	GPS Location of System (decimal degrees) Latitude 49.362248° Longitude -123.401498°		
	Horizontal Accuracy (m) 89.7		☐ Recreational GPS ☒ Differential GPS
6. Drinking Water Protection	Will the sewerage system be located less than 30 m from a well? ☐ Yes ☒ No		
	If yes, attach a professional's report and specify the intended distance (m) Distance of proposed sewerage system to the closest body of surface water 50 (m)		
7. System Information	Sewerage treatment method ☐ Type 1 ☐ Type 2 ☐ Type 3		
8. Legal or Regulatory Considerations	☒ Construction of the proposed sewerage system will not conflict with legal instruments registered on the property.		Is this filing submitted as the result of an order from the Health Authority? ☐ Yes (attach a copy of the order) ☒ No
9. Plot Plan and Specifications	Plot Plan (to scale) and specifications are attached ☒ Yes ☐ No		
	☒ The plans and specifications are consistent with Standard Practice Source of Standard Practice: ☐ Ministry of Health Standard Practice Manual ☒ Other		
10. Authorized Person's Signature	Signature (email submission does not require a signature) 		OFFICE USE ONLY Filing Accepted Date Receipt Number
	Date (dd / mm / yyyy) 25 June 2021		

SEWERAGE SYSTEM LETTER OF CERTIFICATION

Filing #	Folio or PID # 015-026-701	Date (dd/mm/yyyy) 25/06/2021
Civic Address 620 Laura Road, Bowen Island, B.C. V0N 1G2		
Legal Description Lot 1, Block D, Plan VAP22501, District Lot 492, Group 1, New Westminster Land District		
The construction of the proposed sewerage system on the above property was completed on:		Date (dd/mm/yyyy) 23/06/2021

This system was installed:

☒ By or under the supervision* of a professional	Name Michael Florendo, P.Eng.	Registration # EGBC 30052
☐ By a Registered Onsite Wastewater Practitioner Installer	Name	Registration #
☐ By the property owner under the supervision* of	Name	Registration #

I am an "Authorized Person" as defined in the Sewerage System Regulation "BC Reg. 326/2004."

The signature and seal of the undersigned on this document certifies that:

- The Owner has been provided with:
 - ☒ A copy of the sewerage system plans and specifications as filed with the Health Authority;
 - ☒ A maintenance plan for the sewerage system that is consistent with standard practice;
 - ☒ A copy of this Letter of Certification as filed with the Health Authority;
- The sewerage system has been constructed in accordance with standard practice as indicated in the Sewerage System Filing Form filed on **25/06/2021** (dd/mm/yyyy);
- The sewerage system has been constructed substantially in accordance with the plans and specifications filed with the Health Authority;
- The estimated daily domestic sewage flow through the sewerage system will be less than 22,700 liters;
- If operated and maintained as set out in the maintenance plan, the sewerage system will not cause or contribute to a health hazard.

* Where the authorized person is a professional, "supervision" means conducting field reviews of the construction of the above system that the professional in his or her professional discretion considers necessary to ascertain whether the construction substantially complies with the plans and specifications filed with the Health Authority.

Appended to this document is a plan of the sewerage system as it was built and a copy of the maintenance plan.

Name (please print) Michael Florendo, P.Eng.	Health Authority Use Only
Signature	
Authorized Person's Seal 	



To: Mayor Leonard and Council

From: Daniel Martin

Date: July 15, 2026

Meeting Date: July 27, 2026

Revised July 24, 2026 to include recommendation made by the Advisory Planning Commission at its July 23, 2026 meeting.

Subject: **620 Laura Road**
LOT 1 BLOCK D DISTRICT LOT 492 PLAN 2250
File: RZ-2026-0014

RECOMMENDATION

That Bylaw No. 726, cited as "Bowen Island Municipality Land Use Bylaw No. 57, 2002, Amendment Bylaw No. 726, 2026" be read a first time;

That Council refer Bylaw No. 726, 2026, and the attached Islands Trust Policy Statement checklist to the Islands Trust; and

That Council direct staff to return with the results of that referral.

PURPOSE

To present to Council a bylaw to amend the Land Use Bylaw at 620 Laura Road permitting *cidery use* for consideration of First Reading.

BACKGROUND

Bowen Island Municipality staff most recently presented application RZ-2026-0014, at 620 Laura Road, at [the May 25, 2026 Regular Council Meeting](#). That application sought to permit *cidery* as a zone variation at 620 Laura Road. At that meeting Council adopted the following motion:

That Council refer the revised RZ-2026-0014 (620 Laura Road) to the Advisory Planning Commission and the Parks, Environment, Climate Action Advisory Committee for a recommendation; and

That Council directs staff to prepare bylaws to amend the Land Use Bylaw to allow the development proposal in OCP/RZ-2026-0014.

Underlying details of the subject property and existing TUP can be found in the previous [staff report](#) on this application.

RESULTS OF REFERRALS

Parks, Environment, and Climate Action Advisory Committee (PECAAC)

The PECAAC met to discuss this referral at their July 7th meeting, and adopted the following recommendation:

That the Parks, Environment and Climate Action Advisory Committee recommend the following regarding RZ-2026-0014 (620 Laura Road) before formal consideration by the committee:

- *That the proponent must meet BIM's Conservation Development Policy by*
 - *Protecting 50% or greater of the property for conservation purposes*
 - *Using conservation covenants*
 - *Including the heritage orchard, its associated biodiversity, and Murray Creek and its associated riparian area in covenanted areas*
 - *Indicating where covenanted areas on a map to be provided to Council and committees*
- *That an assessment from a professional hydrogeologist be completed to investigate potential impacts on the ground watershed, including cumulative impacts and consideration of climate change.*
- *That the proponent engages a Registered Onsite Wastewater Practitioner or a suitably qualified professional to provide a Letter of Assurance that confirms that the intended use of the property will not have a negative impact on the onsite wastewater system.*
- *That clarification be provided on the quantity and composition of any solid and liquid waste that may be disposed of on the property, now or in the future, and any known impacts of such disposal.*
- *That Council consider a restriction or a limit on cidery output if deleterious effects are anticipated with a significant increase in cidery production.*

CARRIED UNANIMOUSLY

Advisory Planning Commission (APC)

The APC met to discuss this application at their July 23, 2026 meeting. At the meeting the APC adopted the following recommendation:

That the Advisory Planning Commission recommend the following regarding RZ-2026-0014 at 620 Laura Road:

- *That an environmental waste management assessment be required to evaluate production wastewater, cleaning effluent, and organic byproducts from cidery operations, ensuring waste impacts are fully assessed beyond the septic review.*
- *That consideration of the rezoning be deferred pending completion of the Grafton Lake Watershed Management Plan to ensure watershed impacts are fully assessed.*
- *That Council should give consideration to whether there is a method, either through a covenant or the application of the Conservation Development Policy, to preserve the diversity of the existing heritage orchard.*
- *That Council should still consider having a public hearing for this application.*

CARRIED. COMMISSIONER DOHMEIER IN OPPOSITION

OFFICIAL COMMUNITY PLAN

620 Laura Road is designated as “R1 – Rural 1.” This designation identifies: Properties designated as Rural 1 include large lots that provide rural resource values, such as agriculture and forestry, and properties that have been maintained for purposes of a rural lifestyle.

A number of objectives speak to support for agricultural activity.

Objective 80

To encourage commercial and domestic agriculture in suitable locations, and to encourage local food production.

Objective 82.

To preserve lands that are used or are suitable for agricultural activity

Objective 83

To encourage commercial and domestic agriculture in suitable locations, and to encourage local food production.

Objective 86 To promote sustainable active farming on lands with agricultural potential and to protect the resources necessary for such agricultural activity for:

- purposes of domestic food production;*
- preservation of open space and a rural atmosphere; and*
- to contribute to a sense of community on Bowen.*

Objective 88

To provide for the supporting infrastructure necessary to maintain and strengthen the agricultural economy.

Objective 89

To encourage land uses that are compatible with farming to be established in conjunction with agricultural activity.

As outlined above, this application, for cidery use is consistent with Bowen’s 2011 Official Community Plan. In particular, the application provides a clear case study of how to meet Objectives 88 and 89.

STAFF DISCUSSION

Water

Riley’s Cidery has provided a Hydrogeologist Report, completed in 2021 as part of the application for a permit from Vancouver Coastal Health. That report considered whether the quality of water intended for use at the Cidery is influenced by surface water and is ‘Groundwater at Risk of Pathogens’ (GARP). The report provides details on the water supply for the property, coming from a surface water license (for irrigation of the orchard) and an existing well (for wash water in its commercial operations). Water is not used in the production of cider itself.

The report concludes that the risk of pathogens is low, but not absent. The report recommends periodic testing for pathogens at the discretion of VCH. The report also recommends periodic inspections of the cistern and water conveyance system.

Septic

At the May 25th meeting, staff provided Council with a recommendation from Vancouver Coastal Health on this application, which said:

In reviewing this application, Vancouver Coastal Health recommends that the Bowen Island Municipality require that the proponent engages a Registered Onsite Wastewater Practitioner or a Professional to provide a Letter of Assurance that confirms that the intended use of the property will not have a negative impact on the onsite wastewater system and that the system can handle the proposed new use.

After the application was amended, staff re-referred the reduced application (for cidery use only) to Vancouver Coastal Health, who replied:

A ROWP letter of assurance was recommended for the guest house to confirm the potential additional flow into the septic system would not cause a negative impact. If there is no change in actual usage, no I don't think a letter of assurance from a ROWP is required.

The applicant has provided (and staff have attached to this report) records of the sewage filing associated with the Cidery opening in 2021.

Conservation Covenant

As discussed with PECAAC and in earlier Council reports, staff have recommended a protective covenant be placed on Riparian areas of Murray Creek and on agricultural land, particularly the heritage apple orchard. The Murray Creek covenant would protect the riparian area from development, while the agricultural covenant would protect that land as either environmental protection or for agricultural uses. Approximate areas of the covenant are shown below:

The applicant has questioned the applicability of the Conservation Development Policy, given its stated objective “to ensure all rezoning applications which increase density outside of the Snug Cove Village incorporate Conservation Development principles and achieve a goal of “Nature Needs Half.” Staff believe that the use of the Conservation Development Policy is appropriate in this case, for an application that is seeking additional uses on its property. Council may wish to indicate to staff whether they would expect covenants in place to protect riparian areas and/or agricultural areas as part of this rezoning application.

Cidery Definition

Bylaw No. 726, 2026 has been drafted to contain the same *cidery* definition as found in the TUP issued for the property. This definition reads:

“CIDERY” means the *use of buildings and structures* for the production of cider, at a cidery facility licensed by the Liquor and Cannabis Regulation Branch, where at least 25% of the cider production comes from fruit grown on the same *lot*, or from

another *lot* which is part of the same business. Imported British Columbia fruit used in the *cidery* shall be limited to no more than 75% of cider production. A cidery may include *cidery* tours, cider tasting, cider sales, a picnic area, *lounge endorsement*, and the sale of *cidery* promotional products.

The applicant, in a letter dated July 21, 2026, proposes an alternate definition that would match the [Liquor Distribution Brach \(LDB\) land-based winery requirements](#), which are:

- 100% of the product must be made from fruit grown or produced in British Columbia;
- at least 25% of the fruit used in production must come from acreage owned or leased by the licensee; and
- at least two acres of fruit orchard must be maintained at the licensed establishment.

The key differences seem to be:

1. There would no longer be a volume threshold of fruit coming from 620 Laura Road; and
2. There would be a requirement to maintain 2 acres of orchard to continue cidery production.

The applicant notes that this definition, aligning with the LDB criteria, removes a hurdle for Riley's Cidery to meet different standards to continue to operate. This alternate definition may also remove one misaligned incentive in the current definition. Namely that the heritage orchard on the property was planted and maintained for a wide variety of apples, rather than to maximize apple production. Under the current defection, to increase production the cidery would be incentivized to modernize the heritage orchard to prioritize increased apple production rather than maintaining the diversity of apple species. However, this definition would also mean that cidery production would no longer be tied as closely to the actual production on the site.

ISLANDS TRUST POLICY CHECKLIST

Staff have prepared the Islands Trust Policy Checklist to form part of the bylaw referral to the Islands Trust. The checklist is provided in Attachment 2.

FINANCIAL/ RESOURCE/MAINTENANCE CONSIDERATIONS

This report is not anticipated to have a financial impact.

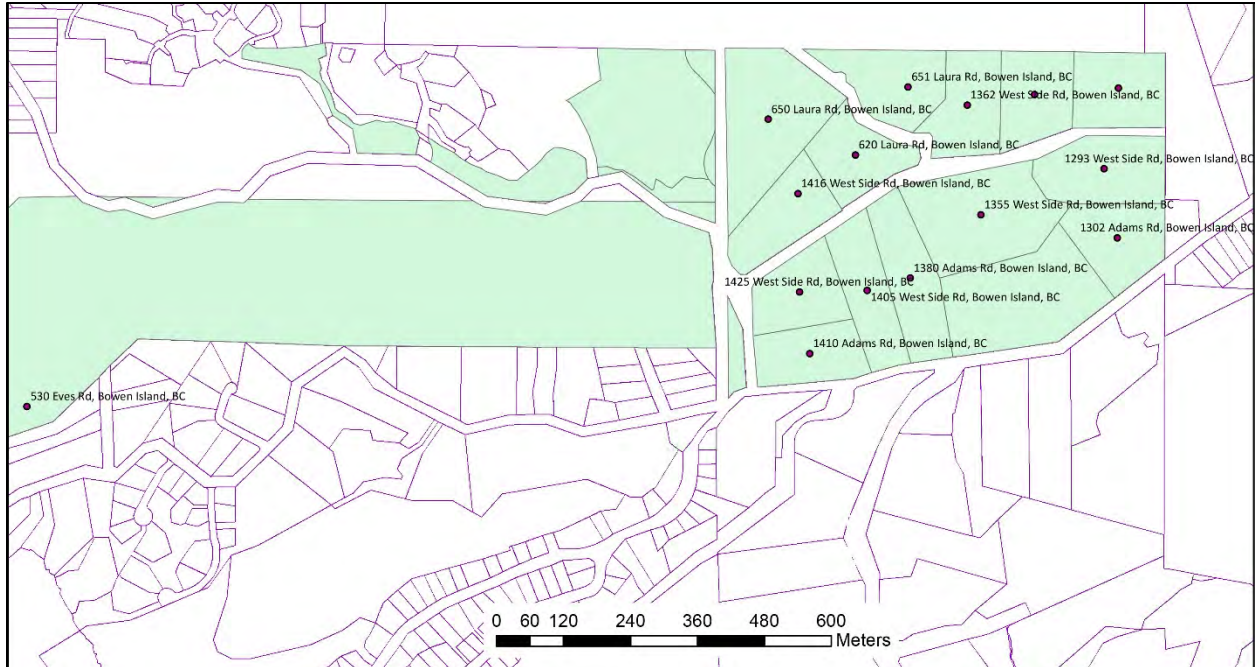
ECOLOGICAL/ENVIRONMENTAL/CLIMATE CONSIDERATIONS

This property includes a portion of Murray Creek along the eastern border of the site, and it's associated riparian area. Staff propose that, through implementation of the Conservation Development Policy, portions of the riparian area be protected through a restrictive covenant.

COMMUNICATION TO THE PUBLIC

In advance of this meeting, staff gave notice of Council's consideration of First Reading. Notice was placed in the Island Page, on an onsite notice sign, updated on the Municipal website, and mailed to property owners within 300 metres of 620 Laura Road, shown on the map below.

Figure 1 – Properties receiving mailout notices



At time of writing Staff have received [one letter on the application, which is included in the July 13th Council agenda.](#)

CONCLUSION

Staff present here a bylaw for consideration of First Reading to enable application RZ2026-0014 and recommend the bylaw be read a first time and referred to the Islands Trust.

ALTERNATIVES

Council has the following options available as alternatives to the staff recommendation:

1. The applicant has written to Council recommending an alternative *cidery* definition. Council may wish to make a motion amending Bylaw No. 726, prior to granting First Reading. Council would make the following motion:

That Council direct staff to amend the cidery definition in Bylaw No. 726, 2026 to read:

“CIDERY” means the use of buildings and structures for the production of cider, at a cidery facility licensed by the Liquor and Cannabis Regulation Branch, where at least 25% of the cider production comes from fruit grown on the same lot, or from another lot which is part of the same business. Any imported fruit used in the cidery shall be grown in British Columbia. A cidery must maintain 2 acres of fruit orchards on the same lot. A cidery may include cidery tours, cider tasting, cider sales, a picnic area, lounge endorsement, and the sale of cidery promotional products.

That Bylaw No. 726, cited as “Bowen Island Municipality Land Use Bylaw No. 57, 2002, Amendment Bylaw No. 726, 2026” be read a first time as amended;

That Council refer Bylaw No. 726, 2026, and the attached Islands Trust Policy Statement checklist to the Islands Trust; and

That Council direct staff to return with the results of that referral.

2. APC and members of the public have expressed a desire to still hold a Public Hearing for this bylaw. Council may give the recommended First Reading to the bylaw, but refer the bylaw to a First Reading following a potential Second Reading. To make this alternative, Council want move the recommendation with the additional motion:

That Council direct staff to refer Bylaw No. 726, 2026 to a Public Hearing

3. The Advisory Planning Commission noted that the eastern portion of 620 Laura Road is located within the Grafton lake watershed. As such, a part of the APC recommendation is for Council to consider deferring this application until completion of the Grafton Lake Management Plan. Could would make the following motion:

That Council direct staff to not pursue the proposal RZ-2026-0014 any further until the Grafton Lake Watershed Management Plan is complete

4. That Council direct staff to not pursue the proposal any further. Unless Council provided other guidance, staff would interpret a defeat of a motion for First Reading as Council denying the application; or
5. Other options as determined by Council.

ATTACHMENTS AND REFERENCES:

1. Bylaw No. 726, 2026
2. Islands Trust Policy Checklist
3. Hydrogeologist Report
4. Record of Sewerage System
5. Sewerage System Letter of Certification

Submitted by: Daniel Martin, Manager of Planning and Development

REVIEWED BY:

CAO	☒
Bylaw Services	☐
Communications	☒
Corporate Officer	☐
Finance	☐
Fire & Emergency	☒
Environment & Parks	☒

Planning ☒
Public Works ☐
Recreation & Community Services ☐

APPROVED BY:

Kristen Watson

Kristen Watson, Acting Chief Administrative Officer

**BOWEN ISLAND MUNICIPALITY
BYLAW NO. 726, 2026**

A Bylaw to amend Land Use Bylaw No. 57, 2002.

WHEREAS, “Bowen Island Land Use Bylaw No. 57, 2002” regulates the use of land, buildings, and structures within the Bowen Island Municipality

AND WHEREAS, Council wishes to amend “Bowen Island Land Use Bylaw No. 57, 2002” to amend existing regulations on the property legally described as:

LOT 1 BLOCK D DISTRICT LOT 492 PLAN 22501

THEREFORE

1.0 Citation

1.1 This bylaw may be cited for all purposes as “Bowen Island Municipality Land Use Bylaw No. 57, 2002, Amendment Bylaw No. 726, 2026”.

2.0 Amendments

2.1 “Bowen Island Municipality Land Use Bylaw No. 57, 2002,” is amended at Section 4.1.4 – Exceptions in Particular Locations by inserting section 4.1.4 (12) to read as follows:

4.1.4. (1) *Zone variation RR 2 (a)*

- (a) Despite Section 4.1.1. (1) *cidery* is a permitted principal use of Land, Buildings and Structures
- (b) *Lounge endorsement* is not a permitted use
- (c) Maximum *floor area of retail space* is 25 sq. m.
- (d) Maximum area of exterior patio space to be used as a picnic area is 80 sq. m.
- (e) The hours that a *cidery* may be open to the public area are as follows:
 - a. 11:00am to 7:00pm daily

2.2 “Bowen Island Municipality Land Use Bylaw No. 57, 2002,” is amended at Table 5-1 *MINIMUM NUMBER OF OFF-STREET PARKING SPACES* by inserting the following rows to read as follows:

LAND USE / ZONE	Number of <i>Off-Street Parking</i> spaces Required
	CIDERY
All Zones	1 per 30 m ² of <i>floor area</i>

LAND USE / ZONE Number of Off-Street Parking spaces Required

- 2.3 “Bowen Island Municipality Land Use Bylaw No. 57, 2002,” is amended at Section 1.1. DEFINITIONS by inserting the following definitions alphabetically:

“CIDERY” means the *use of buildings and structures* for the production of cider, at a cidery facility licensed by the Liquor and Cannabis Regulation Branch, where at least 25% of the cider production comes from fruit grown on the same *lot*, or from another *lot* which is part of the same business. Imported British Columbia fruit used in the *cidery* shall be limited to no more than 75% of cider production. A cidery may include *cidery* tours, cider tasting, cider sales, a picnic area, *lounge endorsement*, and the sale of *cidery* promotional products.

“LOUNGE ENDORSEMENT” means permission for the sale and service of liquor for on-site consumption for a licensed alcohol manufacturer. The lounge can be an indoor area, with or without a patio attached to the interior lounge, or may be a stand-alone patio located at the manufacturing site. A lounge may overlap in whole, or in part, a sampling area and/or on-site store.

- 2.4 Schedule “B” to “Bowen Island Municipality Land Use Bylaw No. 57, 2002” is amended by changing the description of the lands labelled “A” on Schedule “A” to this Bylaw from Rural Residential 2 (RR2) to Rural Residential 2 (a).

READ A FIRST TIME this ____ day of _____, _____;

READ A SECOND TIME this ____ day of _____, _____;

READ A THIRD TIME this ____ day of _____, _____;

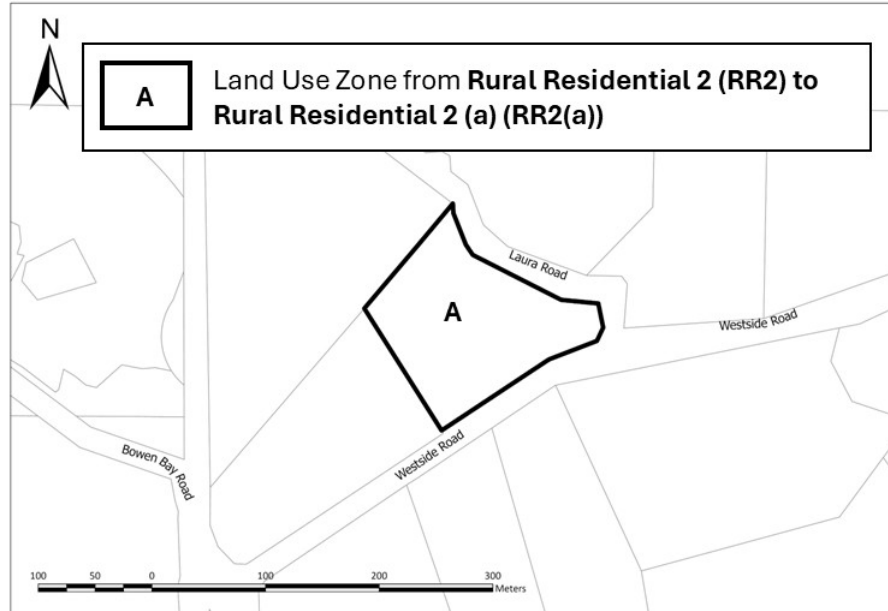
FINALLY ADOPTED this ____ day of _____, _____;

Andrew Leonard
Mayor

Sophie Idsigna
Corporate Officer

Bowen Island Municipality Land Use Bylaw No. 57, 2002

Amendment Bylaw No. 726, 2026 – Schedule A





Islands Trust

POLICY STATEMENT DIRECTIVES ONLY CHECK LIST

Bylaw No. 726, 2026 – File: 2026-0014 620 Laura Road

PURPOSE

To provide staff with the Directives Only Checklist to highlight issues addressed in staff reports and as a means to ensure Local Trust Committee address certain matters in their official community plans and regulatory bylaws and Island Municipalities address certain matters in their official community plans and to reference any relevant sections of the Policy Statement.

POLICY STATEMENT

The Policy Statement is comprised of several parts. Parts I and II outline the purpose, the Islands Trust object, and Council's guiding principles. Parts III, IV and V contain the goals and policies relevant to ecosystem preservation and protection, stewardship of resources and sustainable communities.

There are three different kinds of policies within the Policy Statement as follows:

- Commitments of Trust Council which are statements about Council's position or philosophy on various matters;
- Recommendations of Council to other government agencies, non-government organizations, property owners, residents and visitors; and
- Directive Policies which direct Local Trust Committees and Island Municipalities to address certain matters.

DIRECTIVES ONLY CHECK LIST

The Policy Statement Directives Only Checklist is based on the directive policies from the Policy Statement (Consolidated April 2003) which require Local Trust Committees to address certain matters in their official community plans and regulatory bylaws and Island Municipalities to address certain a matters in their official community plans in a way that implements the policy of Trust Council.

Staff will use the Policy Statement Checklist (Directives Only) to review Local Trust Committee and Island Municipality bylaw amendment applications and proposals to ensure consistency with the Policy Statement. Staff will add the appropriate symbol to the table as follows:

- ✓ if the bylaw is **consistent** with the policy from the Policy Statement, or
- ✗ if the bylaw is **inconsistent (contrary or at variance)** with a policy from the Policy Statement, or
- N/A if the policy is not applicable.

Part III Policies for Ecosystem Preservation and Protection

CONSISTENT	NO.	DIRECTIVE POLICY
	3.1	Ecosystems
✓	3.1.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification and protection of the environmentally sensitive areas and significant natural sites, features and landforms in their planning area.
Staff Comment		The rezoning application includes a protective covenant around Murray Creek riparian area.
✓	3.1.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the planning, establishment, and maintenance of a network of protected areas that preserve the representative ecosystems of their planning area and maintain their ecological integrity.
Staff Comment		The rezoning application includes a protective covenant around Murray Creek riparian area.
N/A	3.1.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the regulation of land use and development to restrict emissions to land, air and water to levels not harmful to humans or other species.
	3.2	Forest Ecosystems
✓	3.2.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of unfragmented forest ecosystems within their local planning areas from potentially adverse impacts of growth, development, and land-use.
Staff Comment		The rezoning application includes a protective covenant around Murray Creek riparian area.
	3.3	Freshwater and Wetland Ecosystems and Riparian Zones
✓	3.3.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address means to prevent further loss or degradation of freshwater bodies or watercourses, wetlands and riparian zones and to protect aquatic wildlife.
Staff Comment		The rezoning application includes a protective covenant around Murray Creek riparian area.
	3.4	Coastal and Marine Ecosystems
N/A	3.4.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of sensitive coastal areas.
N/A	3.4.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the planning for and regulation of development in coastal regions to protect natural coastal processes.

PART IV: Policies for the Stewardship of Resources

CONSISTENT	NO.	DIRECTIVE POLICY
	4.1	Agricultural Land
✓	4.1.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification and preservation of agricultural land for current and future use.
Staff Comment		Rezoning application includes provision for cidery use to provide a viable economic model to support ongoing use of agriculture land as productive apple orchards.
✓	4.1.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the preservation, protection, and encouragement of farming, the sustainability of farming, and the relationship of farming to other land uses.
Staff Comment		Rezoning application includes provision for cidery use to provide a viable economic model to support ongoing use of agriculture land as productive apple orchards.
N/A	4.1.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the use of adjacent properties to minimize any adverse affects on agricultural land.
CONSISTENT	NO.	DIRECTIVE POLICY
N/A	4.1.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the design of road systems and servicing corridors to avoid agricultural lands unless the need for roads outweighs agricultural considerations, in which case appropriate mitigation measures shall be required to derive a net benefit to agriculture
✓	4.1.8	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address land uses and activities that support the economic viability of farms without compromising the agriculture capability of agricultural land.
Staff Comment		Rezoning application includes a protective covenant for agriculture land that it be used for that purpose. The cidery operation provides economic viability for the ongoing orchard operation.
N/A	4.1.9	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the use of Crown lands for agricultural leases.
	4.2	Forests
N/A	4.2.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the need to protect the ecological integrity on a scale of forest stands and landscapes.
N/A	4.2.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the retention of large land holdings and parcel sizes for sustainable forestry use, and the location and construction of roads, and utility and communication corridors to minimize the fragmentation of forests.
N/A	4.2.8	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the designation of forest ecosystem reserves where no extraction will take place to ensure the preservation of native biological diversity.
	4.3	Wildlife and Vegetation
	4.4	Freshwater Resources
✓	4.4.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address

		measures that ensure neither the density nor intensity of land use is increased in areas which are known to have a problem with the quality or quantity of the supply of freshwater, water quality is maintained, and existing, anticipated and seasonal demands for water are considered and allowed for.
Staff Comment		Hydrogeologist report provided as part of the report outlines water sustainability. Water is provided from a groundwater source for cidery operations and a creek licence for irrigation.
✓	4.4.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address measures that ensure water use is not to the detriment of in-stream uses
Staff Comment		Hydrogeologist report provided as part of the report outlines water sustainability. Water is provided from a groundwater source for cidery operations and a creek licence for irrigation.
	4.5	Coastal Areas and Marine Shorelands
N/A	4.5.8	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the needs and locations for marine dependent land uses.
N/A	4.5.9	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the compatibility of the location, size and nature of marinas with the ecosystems and character of their local planning areas.
N/A	4.5.10	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the location of buildings and structures so as to protect public access to, from and along the marine shoreline and minimize impacts on sensitive coastal environments.
N/A	4.5.11	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address opportunities for the sharing of facilities such as docks, wharves, floats, jetties, boat houses, board walks and causeways.
	4.6	Soils and Other Resources
N/A	4.6.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of productive soils.

PART V: Policies for Sustainable Communities

CONSISTENT	NO.	DIRECTIVE POLICY
	5.1	Aesthetic Qualities
N/A	5.1.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the protection of views, scenic areas and distinctive features contributing to the overall visual quality and scenic value of the Trust Area.
	5.2	Growth and Development
N/A	5.2.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address policies related to the aesthetic, environmental and social impacts of development.
N/A	5.2.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address any potential growth rate and strategies for growth management that ensure that land use is compatible with preservation and protection of the environment, natural amenities, resources and community character.
N/A	5.2.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address means for achieving efficient use of the land base without exceeding any density limits defined in their official community

		plans.
N/A	5.2.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification of areas hazardous to development, including areas subject to flooding, erosion or slope instability, and strategies to direct development away from such hazards.
	5.3	Transportation and Utilities
N/A	5.3.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the development of a classification system of rural roadways, including scenic or heritage road designations, in recognition of the object of the Islands Trust.
N/A	5.3.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the impacts of road location, design, construction and systems.
N/A	5.3.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the designation of areas for the landing of emergency helicopters.
N/A	5.3.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the development of land use patterns that encourage establishment of bicycle paths and other local and inter-community transportation systems that reduce dependency on private automobile use.
	5.4	Disposal of Waste
N/A	5.4.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification of acceptable locations for the disposal of solid waste.

CONSISTENT	NO.	DIRECTIVE POLICY
	5.5	Recreation
N/A	5.5.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the prohibition of destination gaming facilities such as casinos and commercial bingo halls.
N/A	5.5.4	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the location and type of recreational facilities so as not to degrade environmentally sensitive areas, and the designation of locations for marinas, boat launches, docks and anchorages so as not to degrade sensitive marine or coastal areas.
N/A	5.5.5	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification of sites providing safe public access to beaches, the identification and designation of areas of recreational significance, and the designation of locations for community and public boat launches, docks and anchorages.
N/A	5.5.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification and designation of areas for low impact recreational activities and discourage facilities and opportunities for high impact recreational activities.
N/A	5.5.7	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the planning for bicycle, pedestrian and equestrian trail systems.
	5.6	Cultural and Natural Heritage
N/A	5.6.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the identification, protection, preservation and enhancement of local heritage.

N/A	5.6.3	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address the preservation and protection of the heritage value and character of historic coastal settlement patterns and remains.
	5.7	Economic Opportunities
✓	5.7.2	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address economic opportunities that are compatible with conservation of resources and protection of community character.
Staff Comment		Cidery operations provide an economic opportunity on Bowen Island to support agricultural on Bowen Island.
	5.8	Health and Well-being
N/A	5.8.6	Local Trust Committees and Island Municipalities shall, in their official community plans and regulatory bylaws, address their community's current and projected housing requirements and the long-term needs for educational, institutional, community and health-related facilities and services, as well as the cultural and recreational facilities and services.

POLICY STATEMENT COMPLIANCE	
✓	COMPLIANCE WITH TRUST POLICY
N/A	
	NOT IN COMPLIANCE WITH TRUST POLICY for the following reasons:



GARP Hazard Assessment

April 30, 2021 | Revision 0

Riley's Cidery

**620 Laura Road
Bowen Island, BC**

Submitted to: Riley's Cider
Prepared by McElhanney

Contact

Michael Florendo, MS, PEng
Project Manager
604-838-0953
mflorendo@mcelhanney.com

Address

200 – 858 Beatty Street,
Vancouver BC Canada,
V6B 1C1

Our file: 2121-00776-00



Your Challenge. Our Passion.

Executive Summary

McElhanney has completed a screening level hazard assessment to ascertain whether the quality of water intended for use at the Cidery is influenced by surface water and is 'Groundwater at Risk of Pathogens' (GARP). We understand that, as a food processor, Riley's Cider intends to submit the report to Coastal Health in support of a permit to operate.

Water quality testing results from a sample collected at the point of use in February 2021 contained coliform and *E. coli* bacteria. A compromised storage tank was thought to be the source of the bacteria and was replaced in April 2021. Results from a sample of well water collected upstream of the old storage tank showed that there were no coliforms or *E. coli* bacteria present. Results from Riley's upcoming testing of water quality after the water system has been flushed will provide evidence whether the tank replacement has removed the source of bacteria that caused the coliforms in the February 2021 water sample. Periodic inspections of the cistern and overall water system are recommended going forward.

The Guidance Document for Determining GARP has 13 hazards listed under four categories. If none of the hazards are present, the groundwater source is considered at 'low risk' of containing pathogens (i.e. not GARP). If one or more hazards is present, the well may have a potential GARP risk and further assessment may be needed.

Results from the Level 1, Stage 1 GARP assessment are presented in the table following this summary.

Two GARP hazards were considered present, one each under categories 'B. Well Location' and 'D. Aquifer Type and Setting'. Both are attributable to the shallow intake of the well:

- B3: Well has an intake depth between the high-water mark and surface water bottom (or well intake is less than 15m bgs if surface water bottom is unknown) and is located within or less than 150m from the natural boundary of any surface water.
- D1: Well has an intake depth less than 15m below ground surface.

The well is completed in a fractured bedrock aquifer that regionally is partially confined to confined, depending on location. The well log lithology shows that, at the Site, material overlying the bedrock is primarily coarse-grained, which has a limited capacity to restrict infiltration of surface water. When pumped, there is the potential for the well to draw in shallow groundwater that has been affected by surface water. If the surface water contains pathogens, they may be conveyed to the well. Soil particles have natural filtration capability and can constrain the mobility of pathogens in the subsurface, but shallow groundwater (< 15m bgs) can still be at risk of pathogens from surface.

Surface waters can carry pathogens from onsite-sewerage systems, and livestock, animal, and waterfowl wastes. Adequate sewerage system setbacks from the well and the rural natural aspect of the

surrounding community mean that local surface waters are likely to have a low pathogen content. Therefore, the risk of pathogens affecting the quality of well water is considered low, but not absent.

The water quality result from April 2021 showed that there were no coliforms or *E. coli* bacteria present in the sample from the water well at that time. However, due to potential risk of hydraulic connection with surface water, the well water should be tested periodically for pathogens unless it is treated prior to use. Requirements for water testing frequency or treatment would be at the discretion of a DWO from Coastal Health.



Results from GARP Hazard Screening

GARP HAZARDS Water Well and Water Supply System	SCREENING		COMMENTS
	HAZARD NOT PRESENT	HAZARD MAY BE PRESENT	
A. Water Quality Results			
A1: Exhibits <u>recurring</u> presence of total coliform bacteria, fecal coliform bacteria, or <i>Escherichia coli</i> (<i>E. coli</i>).	✓		Initial water sample (February 2021) collected at point of use. In-ground water storage tank compromised and considered likely cause of bacteria. Total coliform and <i>E. coli</i> bacteria not present in water sample collected upstream from water storage tank, closer to well (April 2021). Water storage tank replaced with new cistern (April 2021). Client will flush water system prior to use and collect a water sample for laboratory analysis of total coliforms and <i>E. coli</i> to verify system maintenance was successful at eliminating source of bacteria.
A2: Has reported intermittent turbidity or has a history of consistent turbidity greater than 1 NTU.	No Data	No Data	No turbidity data. Turbidity is often used as an indicator of potential pathogens, and a trigger for additional investigation.
B. Well Location			
B1: Situated inside setback distances from possible sources of contamination as per section 8 of the BC Health Hazards Regulation: (a) 30 m from any probable source of contamination (b) 6 m from a private dwelling (c) unless contamination of the well would be impossible because of the physical conformation, 120 m from any cemetery or dumping ground	✓		Closest septic fields are roughly 80 m away (see figure) and downhill from the well. Sewerage System Regulation states that onsite sewerage must not be less than 30 m from a domestic water well. Well is more than 6m from a private dwelling, and any structures at Site. No cemeteries, landfills, dumps, etc. within 120 m.
B2: Has an Intake depth <15 m below ground surface that is located within a natural boundary of surface water or a flood prone area.	✓		While well intake is less than 15 m bgs (see Table A), well is not within a flood prone area. Despite proximity to the well, the drainage ditch paralleling Laura Road ('Murray Creek') is downhill from the well. If water overflowed banks it would still flow away from the well.
B3: Has * an intake depth between the high-water mark and surface water bottom (or < 15 m below the normal water level, if unknown); and * located within, or less than 150 m from the natural boundary of any surface water.		✓	Well is within 150 m of roadside drainage ditches and two runoff retention ponds. Well intake at about 163 m above sea level is within the high water mark and surface water bottom of the lower ditch and both ponds. This hazard considers whether surface waters are within the capture zone of the well. (See Appendix E)
B4: Located within 300 m of a source of probable enteric viral contamination without a barrier to viral transport.	✓		There are no intensive livestock operations, sewage outfalls, or sewage lagoons within 300 m. Uphill from the well land use is Rural 1 or Rural Reserve, which prevent industrial land uses. Septic fields are within 300 m, but locations exceed the minimum distance (30 m) from a well based on the Sewerage System Regulation.
C. Well Construction			
C1: Does not meet GWPR (Part 3 Div. 3) for surface sealing.	✓		Well has surface casing to 6.4 m below ground surface. There is no information in the well log regarding seal within annular space between borehole and casing; however no gap was noted between the casing and the ground to suggest a poor seal. Unknown if sealant (e.g. bentonite) used; however, casing may have been driven (no seal required).
C2: Does not meet GWPR (Part 4) and WSA (section 54) for well caps and covers	✓		Well cap is commercially fabricated, prevents inflow of runoff, and prevents entry by humans or animals. (see photo)
C3: Does not meet GWPR (section 63) and DWPA (Section 16) for floodproofing.	✓		Well casing is raised approximately 0.3 m above ground. Cap prevents entry of surface runoff. Not within a flood prone area (no risk of debris, ice, or erosion).
C4: Does not meet GWPR (Part 3 and Part 7) for wellhead protection.	✓		Casing is > 5 m bgs, is steel, extends 1 m into competent rock, stick up appears at least 0.3 m, and there is deflection of uphill runoff from well casing.
D. Aquifer Type and Setting			
D1: Has an intake depth <15 m below ground surface.		✓	Surface casing extends to 6.4 m bgs. Shallowest water-bearing fracture is 12.2 m bgs. Additional fracture with similar flow at/below 22.6 m bgs. There does not appear to be a confining unit over the bedrock to protect it. Soils overlying bedrock are described as sand and gravel or soil and rocks/gravel.
D2: Is situated in a highly vulnerable, unconfined, unconsolidated or fractured bedrock aquifer.	✓		Fractured bedrock aquifer (no. 749) has moderate vulnerability
D3: A water supply system well that is completed in a karst bedrock aquifer, regardless of depth. Even deep wells in karst aquifers are considered vulnerable to contamination.	✓		No karst in region



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Appendices

- A Certification of Analysis: February 2021 Water Sample
- B Well Log
- C Certificate of Analysis: April 20, 2021, Water Sample
- D Aquifer #749 Information
- E Analysis of Well Intake vs. Surface Water Elevations
- F Statement of Limitations



1. Introduction

Riley's Cidery is preparing to start operations as a craft apple cidery. They are located at 620 Laura Road ('Site') on Bowen Island, northwest of Vancouver, British Columbia (**Figure 1**).

Figure 1. Site location. (Base map source: BC Water Resources Atlas)



Riley's Cidery plans to use groundwater from an existing well on the property as wash water in its commercial operations. Well water will not be used to make the cider itself and collected surface water is used for irrigation of the orchard.

Riley's Cidery is applying to Coastal Health for a permit to use the water in a commercial food processing setting. Water quality testing results from a sample collected at the point of use in February 2021 contained coliform and *E. coli* bacteria (**Appendix A**). Coastal Health advised Riley's Cidery that they required a 'Groundwater at Risk of Pathogens' (GARP) assessment, which is required in situations where well water is under the influence of potentially contaminated surface. Surface waters have the potential to carry microbes, such as bacteria and viruses, which can pose risks to human health if the water is used as drinking water or in food preparation.

Riley's Cidery has contracted McElhanney Ltd (McElhanney) to conduct a screening level hazard assessment to ascertain whether the quality of its well water and water distribution system is influenced

by surface water. This report provides the findings from a screening level (i.e., Level 1 Stage 1) GARP assessment conducted for the Site.

1.1. REGULATORY BACKGROUND ON 'GARP'

The BC Ministry of Health has created a GARP determination process that is used to assist with assessments of whether well water may pose a human health risk from surface water pathogens¹. While consulting professionals can provide technical guidance regarding assessment of GARP, it is the discretion of a Drinking Water Officer (DWO) to make the decision whether a well is at risk of pathogens and if mitigation measures such as water treatment or on-going monitoring are required to control the risk.

There are up to four stages to GARP determination. Stage 1 involves hazard screening and assessment. Stages 2 through 4 of the GARP determination process are only required if a DWO has determined there is a GARP risk to a well based on the results from Stage 1. Stages 2 through 4 involve an iterative process of assessment and risk mitigation measures and, where necessary, long-term monitoring. If it is possible to remove the risks of GARP, the DWO can change the GARP determination once the required actions have been taken.

Stage 1 of the GARP determination process can be undertaken by qualified professionals. It starts with a desktop review and field inspection (Level 1), and may progress to increasing levels of hydrogeological investigation, as needed to gain clarity regarding the potential risks to groundwater.

1.2. APPROACH AND SCOPE

In conducting the hazard screening and assessment, McElhanney has followed:

- the BC Ministry of Health's *Guidance Document for Determining Groundwater at Risk of Containing Pathogens (GARP)*, v.3 (Sept. 2017); and,
- Engineers and Geoscientists British Columbia's Professional Practice Guidelines for *Assessment of Groundwater at Risk of Pathogens*, v.1.0 (July 2019).

The scope of work included communications with Riley's Cidery and on-line searches to collect information (documents, records, data, etc.) relevant to the water well, a desktop review of the information collected, and a site visit to visually inspect the well completion and its location in context with the watercourse and landscape.

2. Data Collected

McElhanney searched the online BC Water Resources Atlas and obtained the following information:

- Well record;
- Aquifer 749 Mapping Report and Factsheet;
- Topography, approximate watercourse locations, satellite imagery, and neighbouring land uses.

¹ BC Ministry of Health, 2017. *Guidance Document for Determining Groundwater at Risk of Pathogens (GARP)*, v3. <https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/how-drinking-water-is-protected-in-bc/garp-assessment-oct-2017.pdf>



Information in the provincial well record was incomplete. Riley's Cidery provided additional data on well completion and lithology.

There was no detailed topographic survey (e.g. LiDAR) available. McElhanney relied upon visual inspection during the site visits and publicly available topography information from Google Earth, BowMap2, and the BC Water Resources Atlas3.

A site visit was conducted by McElhanney personnel on April 8, 2021, to visually inspect the well and its context in the overall water system and within the surrounding landscape.

During initial project discussions, McElhanney learned that the initial water sample had been collected downstream from a compromised water storage tank (*Figure 2*). McElhanney recommended collection of a water sample closer to the well to test the quality of water closer to the source.

Figure 2. Water storage tank before (A, B) and after (C) replacement.

Image B shows the inside of the compromised cistern and growth of microbes on the sides of the tank.



Riley's Cidery collected a water sample on April 12, 2021, via a pipe that leads from the well to the water holding tank (i.e. upstream of the compromised water tank). Water was allowed to run from the pipe for a

² <https://www.bowenlandmunicipality.ca/bowmap>

³ <https://maps.gov.bc.ca/ess/hm/wrbc/>

few minutes before the sample was collected into a laboratory-supplied container. The water sample was stored and transported in a chilled cooler under standard chain of custody until its arrival for analysis of *E. coli* and total coliform bacteria at ALS Laboratories in Burnaby, BC.

3. Well Information and Site Conditions

3.1. WELL AND WATER SYSTEM OVERVIEW

The well providing water to the cidery has a 0.15m (6") diameter surface casing installed to 6.4m. Surface casing extends 2m below the top of fractured bedrock. The well is completed as an open borehole (no well screen) to a total depth of 30.5m (100 feet).

A water-bearing fracture was noted on the well log at 12.2m with potential yield of 0.1 L/s. A second fracture was inferred to occur at 22.6m. An increase in water yield to 0.2 L/s was noted on the log for that depth.

The well is located on a slope within an ornamental garden near the north end of the Site (*Figure 3*). Uphill from the well, soil has been mounded around the surface casing to direct surface runoff away from the base of the well (*Figure 3*). The surface casing extends above ground surface roughly 0.3m and is capped with a standard, manufactured well cap. The well may have a pitless adapter and buried distribution piping as no pipe was visible at surface.

Figure 3. Water well surface completion.

Image A shows well within garden area surrounded by fencing and general slope in vicinity. Image B shows soil mounded uphill from well casing to direct runoff around the well.



A summary of well information is provided in *Table A*. A copy of the well log is attached as *Appendix B*.



Water from the well is pumped into a cistern, or water tank, for temporary storage. From the cistern, the water is pumped to the point of use. Results from the water sample Riley's Cidery collected on April 12 upstream from the compromised water storage tank showed no coliform or *E. coli* bacteria (**Appendix C**).

3.2. LOCAL AQUIFER(S)

Map of Bowen Island showing the location of the study site. The map includes labels for 'Bowen Island', 'Bowen Bay Rd', 'Whaleback Dr', 'Adams Rd', and 'Site' marked with a star. A scale bar at the bottom indicates 0 to 0.6 km. A north arrow is also present.

3.3. TOPOGRAPHY AND DRAINAGE

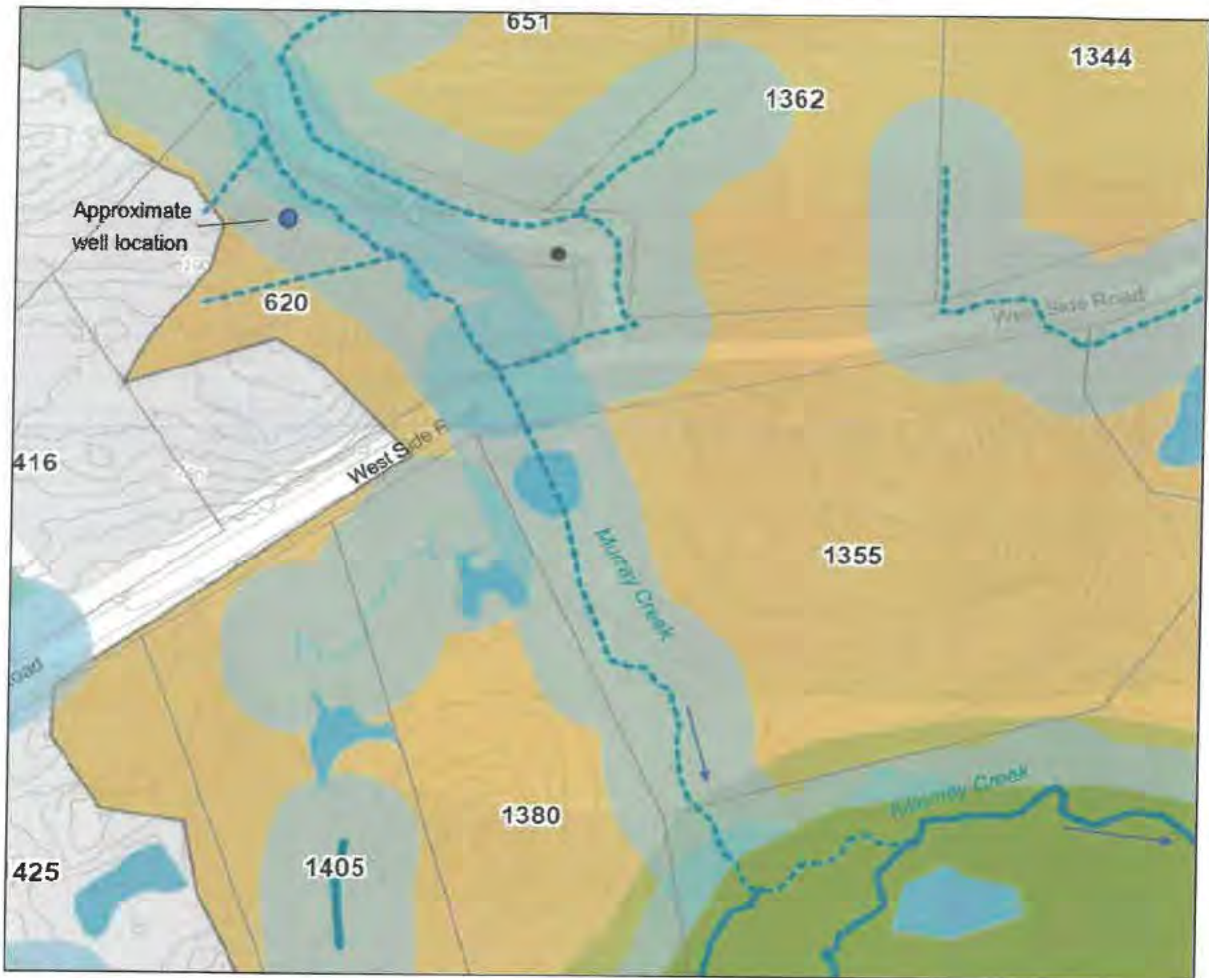
The Site is situated on a southwest facing slope near the foot of Mount Gardner (**Figure 5**). Laura Road slopes down toward its junction with West Side Road to the south. To the northeast and north, topography steepens toward the summit of Mount Gardner.

Figure 5. Topography (grey contour lines) and municipal land parcels (orange divisions).
(Image source: BC Water Resources)



Near the upper terminus of Laura Road is Frank Spring, where groundwater daylights at surface. Flow from the spring has been captured in a ditch, locally called Murray Creek, which is a narrow, shallow watercourse that runs parallel to Laura Road and passes through the Site adjacent to the roadway (**Figure 6**). Murray Creek flows into Killarney Creek, which drains to Grafton Lake near the centre of Bowen Island.

Figure 6. Local drainageways (dashed lines) and watercourses (solid lines). Blue shading shows riparian setbacks that define municipal development permit areas.



There is a surface water drainage divide at the northwest side of the Site (**Figure 7**). The majority of the Site drains south and southeast as part of the watershed for Killarney Creek. The northwest sliver of Site drains westward toward Tunstall Bay at the west side of Bowen Island.

There are two shallow surface water storage ponds (dugouts) at the Site that collect stormwater runoff (**Figure 8**). Water stored in the ponds is licensed for use at the Site for irrigation. Based on Site observations, both ponds appeared to have a maximum depth of no more than 2m.



Figure 7. A drainage divide runs through the Site at the NW side (purple line). Most of the site drains to the south toward Killamey Creek (see Fig.6). The northwest portion of the Site drains to the southwest, ultimately to Turnstall Bay.



Figure 8. Local surface waters.

Left: location of runoff collection ponds and connection to surface drainage. Blue shading indicates riparian setbacks defining municipal development permit areas. Right: Photograph of one of the ponds (April 8, 2021). Property boundary highlighted in bright Image source (left). <https://bowmap.bowenlandmunicipality.ca/>



3.4. SURROUNDING LAND USES

The Site is zoned Rural 1 (R1). Adjacent properties north of West Side Road are also zoned Rural (R1). Neighbouring properties south of West Side Road are zoned Rural Residential (RS) (*Figure 9*). Behind the properties on the north side of Laura Road land is zoned as Rural Reserve (R-RV) which is currently forested. The Rural Reserve lands cover the majority of Mount Gardner. Rural 1 and Rural Reserve lands are intended to maintain rural resources, protect ecosystems, watersheds, and rural atmosphere. While agriculture is permitted on rural-zoned lands, none of the adjacent properties was considered to have a land use that would generate a pathogen risk (for example intensive livestock production). Rural residential lots are at least 1 ha in size, and development is intended to preserve rural atmosphere, maintain low density housing. Most properties have water wells and onsite sewerage management, and the minimum lots size helps to protect local groundwater resources. This land use was not expected to be a pathogen risk to groundwater. Based on discussions with Riley's Cidery regarding neighbouring land uses, review of satellite imagery, and observations of neighbouring lands from the roadways, there did not appear to be land uses posing a risk of pathogens.

The septic fields at Site and on neighbouring properties are all at least 30m from the well (*Figure 10*), which is the minimum required separation based on the Sewerage System Regulation under BC's Public Health Act.

Figure 9. Land use (zoning) within 300m of the Site. Adjacent land use zones are Rural 1 (R1; 2 ha), Rural Residential (RS; 1 ha), Municipal Park (P); and Rural Reserve (RV).

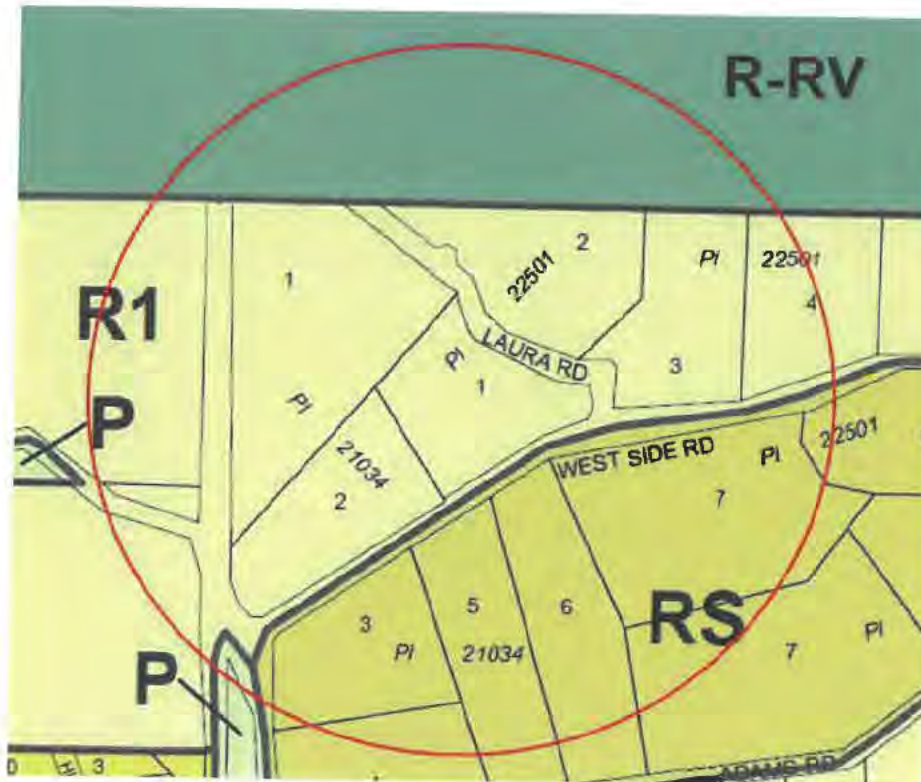


Figure 10. Location of well in relation to on site and neighbouring septic fields (onsite sewerage systems). Red circle shows approximate 30m radius from well. Sewerage System Regulation mandates 30m setbacks of onsite sewerage systems from water wells. Image source: Riley's Cidery.



4. GARP Hazard Screening Results and Discussion

The Guidance Document for Determining GARP has thirteen hazards listed under four categories. If none of the hazards are present, the groundwater source is considered at 'low risk' of containing pathogens (i.e., not GARP). If one or more hazards is present, the well may have a potential GARP risk and further assessment may be needed.

Results from McElhanney's Level 1, Stage 1 GARP assessment are summarized in **Table B** with supporting analysis in **Appendix E**. Two GARP hazards were considered present, one each under categories 'B. Well Location' and 'D. Aquifer Type and Setting'. Both are attributable to the shallow intake of the well:

- B3: Well has an intake depth between the high-water mark and surface water bottom (or well intake is less than 15m bgs if surface water bottom is unknown), and is located within or less than 150m from the natural boundary of any surface water.
- D1: Well has an intake depth less than 15m below ground surface.



Table B. Results from GARP Hazard Screening

GARP HAZARDS Water Well and Water Supply System	SCREENING		COMMENTS
	HAZARD NOT PRESENT	HAZARD MAY BE PRESENT	
A. Water Quality Results			
A1: Exhibits <u>recurring</u> presence of total coliform bacteria, fecal coliform bacteria, or <i>Escherichia coli</i> (<i>E. coli</i>).	✓		Initial water sample (February 2021) collected at point of use. In-ground water storage tank compromised and considered likely cause of bacteria. Total coliform and <i>E. coli</i> bacteria not present in water sample collected upstream from water storage tank, closer to well (April 2021). Water storage tank replaced with new cistern (April 2021). Client will flush water system prior to use and collect a water sample for laboratory analysis of total coliforms and <i>E. coli</i> to verify system maintenance was successful at eliminating source of bacteria.
A2: Has reported intermittent turbidity or has a history of consistent turbidity greater than 1 NTU.	No Data	No Data	No turbidity data. Turbidity is often used as an indicator of potential pathogens, and a trigger for additional investigation.
B. Well Location			
B1: Situated inside setback distances from possible sources of contamination as per section 8 of the BC Health Hazards Regulation: (a) 30 m from any probable source of contamination (b) 6 m from a private dwelling (c) unless contamination of the well would be impossible because of the physical conformation, 120 m from any cemetery or dumping ground	✓		Closest septic fields are roughly 80 m away (see figure) and downhill from the well. Sewerage System Regulation states that onsite sewerage must not be less than 30 m from a domestic water well. Well is more than 6m from a private dwelling, and any structures at Site. No cemeteries, landfills, dumps, etc. within 120 m.
B2: Has an intake depth <15 m below ground surface that is located within a natural boundary of surface water or a flood prone area.	✓		While well intake is less than 15 m bgs (see Table A), well is not within a flood prone area. Despite proximity to the well, the drainage ditch paralleling Laura Road (Murray Creek) is downhill from the well. If water overflowed banks it would still flow away from the well.
B3: Has: * an intake depth between the high-water mark and surface water bottom (or < 15 m below the normal water level, if unknown), and * located within, or less than 150 m from the natural boundary of any surface water.		✓	Well is within 150 m of roadside drainage ditches and two runoff retention ponds. Well intake at about 183 m above sea level is within the high water mark and surface water bottom of the lower ditch and both ponds. This hazard considers whether surface waters are within the capture zone of the well. (See Appendix E)
B4: Located within 300 m of a source of probable enteric viral contamination without a barrier to viral transport.	✓		There are no intensive livestock operations, sewage outfalls, or sewage lagoons within 300 m. Uphill from the well land use is Rural 1 or Rural Reserve, which prevent industrial land uses. Septic fields are within 300 m, but locations exceed the minimum distance (30 m) from a well based on the Sewerage System Regulation.
C. Well Construction			
C1: Does not meet GWPR (Part 3 Div. 3) for surface sealing.	✓		Well has surface casing to 6.4 m below ground surface. There is no information in the well log regarding seal within annular space between borehole and casing, however no gap was noted between the casing and the ground to suggest a poor seal. Unknown if sealant (e.g. bentonite) used; however, casing may have been driven (no seal required).
C2: Does not meet GWPR (Part 4) and WSA (section 54) for well caps and covers	✓		Well cap is commercially fabricated, prevents inflow of runoff, and prevents entry by humans or animals. (see photo)
C3: Does not meet GWPR (section 63) and OWPA (Section 16) for floodproofing.	✓		Well casing is raised approximately 0.3 m above ground. Cap prevents entry of surface runoff. Not within a flood prone area (no risk of debris, ice, or erosion).
C4: Does not meet GWPR (Part 3 and Part 7) for wellhead protection.	✓		Casing is > 5 m bgs, is steel, extends 1 m into competent rock, stick up appears at least 0.3 m, and there is deflection of uphill runoff from well casing.
D. Aquifer Type and Setting			
D1: Has an intake depth <15 m below ground surface.		✓	Surface casing extends to 6.4 m bgs. Shallowest water-bearing fracture is 12.2 m bgs. Additional fracture with similar flow at/below 22.6 m bgs. There does not appear to be a confining unit over the bedrock to protect it. Soils overlying bedrock are described as sand and gravel or soil and rocks/gravel.
D2: Is situated in a highly vulnerable, unconfined, unconsolidated or fractured bedrock aquifer.	✓		Fractured bedrock aquifer (no. 749) has moderate vulnerability
D3: A water supply system well that is completed in a karst bedrock aquifer, regardless of depth. Even deep wells in karst aquifers are considered vulnerable to contamination.	✓		No karst in region



The well is completed in a fractured bedrock aquifer that regionally is partially confined to confined, depending on location. The well log lithology shows that at the Site, material overlying the bedrock is primarily coarse-grained, which has a limited capacity to restrict infiltration of surface water. When pumped, there is the potential for the well to draw in shallow groundwater that has been affected by surface water. If the surface water contains pathogens, they may be conveyed to the well. Soil particles have natural filtration capability and can constrain the mobility of pathogens in the subsurface, but shallow groundwater (< 15m bgs) can still be at risk of pathogens from surface.

Surface waters can carry pathogens from onsite-sewerage systems, and livestock, animal, and waterfowl wastes. Adequate sewerage system setbacks from the well and the rural, natural aspect of the surrounding community mean that local surface waters are likely to have a low pathogen content. Therefore, the risk of pathogens affecting the quality of well water is considered low, but not absent.

5. Conclusions and Recommendations

The bacteria present in the water sample collected in February 2021 was likely due to a compromised water storage tank. Results from Riley's upcoming testing of water quality after the water system has been flushed will provide evidence whether the tank replacement has removed the source of bacteria that caused the coliforms in the February 2021 water sample. Periodic inspections of the cistern and water conveyance system are recommended going forward.

Based on the assessment of potential GARP hazards, the risk of pathogens from surface waters affecting the quality of well water is low, but not absent. The water quality result from April 2021 showed that there were no coliforms or *E. coli* bacteria present in the sample from the water well at that point in time. However, due to the potential risk of hydraulic connection with surface water, the well water should be tested periodically for pathogens unless it is treated prior to use. Requirements for water testing frequency or treatment would be at the discretion of a DWO from Coastal Health.



6. Closing

The information presented in this report is subject to limitations (*Appendix F*). If you have any questions or concerns regarding the information presented in this document, please contact the undersigned.

Sincerely,
McELHANNEY LTD.

Prepared by:

Reviewed by:



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A handwritten signature in cursive script, appearing to read "Gary Lin".

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mlin@mcclhanney.com
778-357-1294



APPENDIX A

Certification of Analysis: February 2021 Water Sample



ALS Environmental

CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order	: VA21A2278	Page	: 1 of 3
Client	: Cash Clients Canada	Laboratory	: Vancouver - Environmental
Contact	: Riley's Cider Christine Hardie	Account Manager	: Email: ALSEV.CC@alsglobal.com
Address	: 8081 Lougheed Highway	Address	: 8081 Lougheed Highway
Telephone	: [REDACTED]	Telephone	: 604-253-4188
Project	: [REDACTED]	Date Samples Received	: 08-Feb-2021 06:20
PO	: [REDACTED]	Date Analysis Commenced	: 08-Feb-2021
C-O-C number	: 17-861141	Issue Date	: 16-Feb-2021 16:29
Sampler	: [REDACTED]		
Site	: [REDACTED]		
Quote number	: [REDACTED]		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Jon Fisher	Department Manager - Inorganics	Inorganics, Waterloo, Ontario
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Microbiology, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

Unit	Description
% T/cm	% transmittance per centimetre
AU/cm	absorbance unit per cm
mg/L	milligrams per litre
MPN/100mL	most probable number per 100 mL
>: greater than.	
<: less than.	

Red shading is applied where the result is equal to or greater than the Guideline Upper Limit or the result is lower than the Guideline Lower Limit.



Analytical Results

Sub-Matrix: **Water**
 (Matrix: **Water**)

Client sample ID
 Sampling date/time

Riley's Cider
 08-Feb-2021
 00:00

Analyte	Method	LOR	Unit	CDWG MAC	Result	Limit
Aggregate Organics						
tannin + lignin (as tannic acid)	E563	0.10	mg/L	-		
Bacteriological Tests						
coliforms, Escherichia coli [E. coli]	E010	1	MPN/100mL	1		
coliforms, total	E010	1	MPN/100mL	1		
Physical Tests						
absorbance, UV (@ 254nm)	E404	0.0050	AU/cm	0.0120		
transmittance, UV (@ 254nm)	E404	1.0	% T/cm	97.3		

Please refer to the General Comments section for an explanation of any qualifiers detected.

Summary of Guideline Breaches by Sample

Client Sample ID	Matrix	Analyte	Analyte Summary	Guideline	Category	Result	Limit
			No description available for this compound in this guideline				

Keys:

CDWG

MAC

Canada Guidelines for Canadian Drinking Water Quality (JAN, 2021)
 Maximum Acceptable Concentrations

APPENDIX B

Well Log

RECEIVED AUG 08 1989
Water Management Branch

WATER WELL RECORD

Date 8 9 7 3 1

Location Accuracy

WELL No. [illegible]

U
T
M

Date 19__ Well Type

Well
Type

Name & Address Mohcreek Logging Ltd., P.O. Box 2436, Parksville, B.C. V0R 2S0

Description & Address

Descriptive Location Lot #1 Bowen Island

TYPE	1 ☒ New Well	2 ☐ Reconditioned
OF WORK	3 ☐ Deepened	4 ☐ Abandoned

WORK METHOD

1 ☐ Cable tool	2 ☐ Bored	3 ☐ Jetted	
4 ☐ Rotary	a ☐ mud	b ☐ air	c ☐ reverse
☐ Other			

WATER 1 ☐ Domestic 2 ☐ Municipal 3 ☐ Irrigation
WELL USE 4 ☐ Comm. & Ind. ☐ Other

DRILLING ADDITIVES

MEASUREMENTS from 1 ☐ ground level 2 ☐ top of casing
casing height above ground level

9. CASING: 1 ☐ Steel 2 ☐ Galvanized 3 ☐ Wood
Materials 4 ☐ Plastic 5 ☐ Concrete
☐ Other

Hole Diameter						units
Diameter						ins
from						ins
to						ft
Thickness						ft
Weight						ins
						lb/ft

Pillars unit _____ fl 1 ☐ above 2 ☐ below ground level
 1 ☐ Welded 2 ☐ Cemented 3 ☐ Threaded | 1 ☐ New 2 ☐ Used
 Perforations: _____

Shoe (s): _____
Open hole, from _____ to _____ ft Diameter _____ ins
Grout: _____

10. SCREEN: 1 ☐ Nominal (Telescope) 2 ☐ Pipe Size
Type 1 ☐ Continuous Slot 2 ☐ Perforated 3 ☐ Louvre
☐ Other _____
Material 1 ☐ Stainless Steel 2 ☐ Plastic ☐ Other _____
Set from _____ to _____ ft below ground level

RISER, SCREEN & BLANKS							units
Length							ft
Diam. I D							ins
Slot Size							ins
from							ft
to							ft

Fittings, top _____ bottom _____
Gravel Pack _____

11. DEVELOPED BY: 1 ☐ Surging 2 ☐ Jetting 3 ☐ Air
4 ☐ Boiling 5 ☐ Pumping ☐ Other _____

12. TEST 1 ☐ Pump 2 ☐ Ball 3 ☐ Air
 Rate _____ USgpm Temp _____ °C
 Water Level _____ ft after test of _____ hrs
 Date _____
 SWL before test _____ ft

[illegible]

13. RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE

14. WATER TYPE: 1 ☐ fresh 2 ☐ salty 3 ☐ clear 4 ☐ cloudy
colour _____ smell _____; gas 1 ☐ yes 2 ☐ no

15. WATER ANALYSIS:

2 Iron	_____	mg/L
4 pH	_____	
1 Hardness	_____	mg/L
3 Chloride	_____	mg/L

Field Date _____
Lab Date _____ YR _____ SM _____ B43

CONSULTANT

Address

WELL LOCATION SKETCH

SITE ID No.

16. FINAL WELL COMPLETION DATA

BRITISH
COLUMBIA

Groundwater Wells and Aquifers

Well Summary

Well Tag Number: 94045
 Well Identification Plate Number:
 Owner Name: 360318 BC LIMITED
 Intended Water Use: Unknown Well Use

Well Status: New
 Well Class: Water Supply
 Well Subclass: Not Applicable
 Aquifer Number:

Observation Well Number:
 Observation Well Status:
 Environmental Monitoring System (EMS) ID:
 Alternative specs submitted: No

Licensing Information

Licensed Status: Unlicensed

Licence Number:

Location Information

Street Address:
 Town/City: BOWEN ISLAND

Legal Description:

Lot	1
Plan	7107
District Lot	492
Block	
Section	
Township	
Range	
Land District	36
Property Identification Description (PID)	

Description of Well Location: SUSET PARK ESTATES



Geographic Coordinates - North American Datum of 1983 (NAD 83)

Latitude: 49.36217	Longitude: -123.40078
UTM Easting: 470899	UTM Northing: 5467795
Zone: 10	Coordinate Acquisition Code: (10 m accuracy) Handheld GPS with accuracy of +/- 10 metres

Well Activity

Activity	↕ Work Start Date	↕ Work End Date	↕ Drilling Company	↕ Date Entered	↕
Legacy record	1989-07-31	1989-07-31	Tri-K Drilling	October 29th 2008 at 8:02 AM	

Well Work Dates

Start Date of Construction	End Date of Construction	Start Date of Alteration	End Date of Alteration	Start Date of Decommission	End Date of Decommission
1989-07-31	1989-07-31				

Well Completion Data

Total Depth Drilled:
 Finished Well Depth:
 Final Casing Stick Up:
 Depth to Bedrock:
 Ground elevation:

Static Water Level:
 Estimated Well Yield:
 Artesian Flow:
 Artesian Pressure:
 Method of determining elevation: Unknown

Well Cap:
 Well Disinfected Status: Not Disinfected
 Drilling Method:
 Orientation of Well: VERTICAL

Lithology

From (ft bgl)	To (ft bgl)	Raw Data	Description	Moisture	Colour	Hardness	Observations	Water Bearing Flow Estimate (USGPM)
There are no records to show								

Casing Details

From (ft bgl)	To (ft bgl)	Casing Type	Casing Material	Diameter (in)	Wall Thickness (in)	Drive Shoe
There are no records to show						

Surface Seal and Backfill Details

Surface Seal Material:
 Surface Seal Installation Method:
 Surface Seal Thickness:
 Surface Seal Depth:

Backfill Material Above Surface Seal:
 Backfill Depth:

Liner Details

Liner Material:
 Liner Diameter:
 Liner from:

Liner Thickness:
 Liner to:

Liner perforations

From (ft bgl)

To (ft bgl)

There are no records to show

Screen Details

Intake Method:
 Type:
 Material:
 Opening:
 Bottom:

Installed Screens

From (ft bgl)	To (ft bgl)	Diameter (in)	Assembly Type	Slot Size
There are no records to show				

Well Development

Developed by:

Development Total Duration:

Well Yield

Estimation Method:
 Static Water Level Before Test:
 Hydraulic Fracturing Performed: No

Estimation Rate:
 Drawdown:
 Increase in Yield Due to Hydraulic Fracturing:

Estimation Duration:

Well Decommission Information

Reason for Decommission:
 Sealant Material:
 Decommission Details:

Method of Decommission:
 Backfill Material:

Comments

No comments submitted

Alternative Specs Submitted: No

Documents

- [WTN 94045_Map.pdf](#)

Disclaimer

The information provided should not be used as a basis for making financial or any other commitments. The Government of British Columbia accepts no liability for the accuracy, availability, suitability, reliability, usability, completeness or timeliness of the data or graphical depictions rendered from the data.

SEP 28 1989

WATER WELL LOCATION DESCRIPTION FORM

NAME OF WELL OWNER : 360318 B.C. LTD.
 ADDRESS : Box 1126 GANGES Phone No. 732-7635
V05 1E0
 DRILLING CONTRACTOR: TRIK DRILLING LTD. VICTORIA
 DATE WELL DRILLING COMMENCED: JULY 31/89.

LEGAL DESCRIPTION OF PROPERTY WHERE THE WELL IS LOCATED
 (fill in applicable items)

LAND DISTRICT: 37 36

DISTRICT LOT (DL): 492

TOWNSHIP (TP): _____

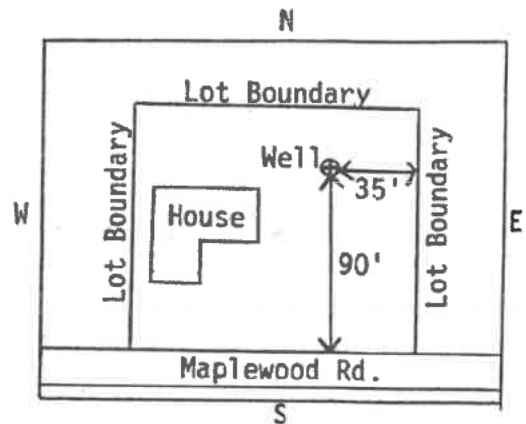
RANGE (R): _____

SECTION (SEC): _____

PLAN NO. : 7107

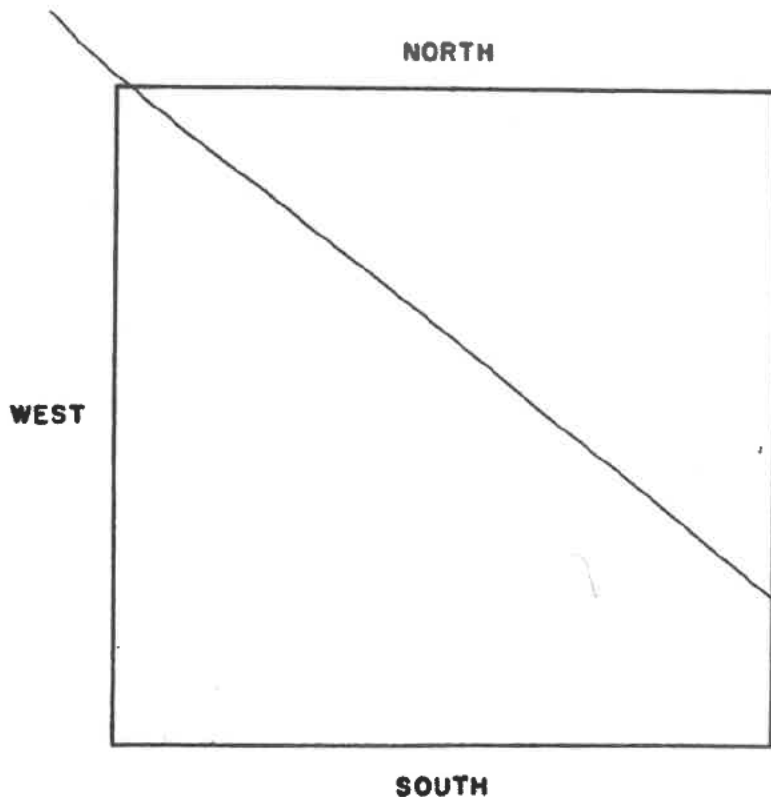
LOT NO. : D 1

WELL LOCATION SKETCH EXAMPLE



Lots 1-7 Bowen Island.
Sunset Park Estates.

WELL LOCATION SKETCH MAP



*see
enclosures.
(approximate
well
locations)*

APPENDIX C

Certificate of Analysis: April 20, 2021, Water Sample



ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: VA21A6689	Page	: 1 of 2
Client	: Cash Clients Canada	Laboratory	: Vancouver - Environmental
Contact	: Riley's Cider Christine Hardie	Account Manager	: Email: ALSEV.CC@alsglobal.com
Address	: 8081 Loughheed Highway Burnaby BC Canada V5A 1W9	Address	: 8081 Loughheed Highway Burnaby BC Canada V5A 1W9
Telephone	[REDACTED]	Telephone	: 604-253-4188
Project	---	Date Samples Received	: 12-Apr-2021 06:15
PO	---	Date Analysis Commenced	: 12-Apr-2021
C-O-C number	---	Issue Date	: 19-Apr-2021 14:15
Sampler	---		
Site	---		
Quote number	Vancouver Cash Clients		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position
Lindsay Gung	Supervisor - Water Chemistry
	Laboratory Department
	Microbiology, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference. Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

Unit	Description
MPN/100mL	most probable number per 100 mL

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Water

(Matrix: Water)

Analyte	Client sample ID				Riley's Cidery	
	CAS Number	Method	LOR	Unit	12-Apr-2021	VA21A6689-001
Bacteriological Tests						
coliforms, total coliforms, Escherichia coli [E. coli]	—	E010	1	MPN/100mL	<1	—
	—	E010	1	MPN/100mL	<1	—

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA21A6689	Page	1 of 5
Contact	: Cash Clients Canada	Laboratory	: Vancouver - Environmental
Contact	: Riley's Cider Christine Hardie	Account Manager	: Email: ALSEV.CC@alsglobal.com
Address	: 8081 Lougheed Highway	Address	: 8081 Lougheed Highway
Telephone	: Burnaby BC Canada V5A 1W9	Telephone	: 604-253-4188
Project	: [REDACTED]	Date Samples Received	: 12-Apr-2021 06:15
PO	: [REDACTED]	Issue Date	: 19-Apr-2021 14:15
C-O-C number	: [REDACTED]		
Sampler	: [REDACTED]		
Site	: [REDACTED]		
Quote number	: Vancouver Cash Clients		
No. of samples received	: 1		
No. of samples analysed	: 1		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: Water

Analyte Group		Method	Sampling Date	Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time												
				Extraction / Preparation			Analysis									
				Preparation Date	Holding Times Rec	Actual	Eval	Analysis Date	Holding Times Rec	Actual	Eval					
Container / Client Sample ID(s)																
Bacteriological Tests : Total Coliforms and E. coli (Enzyme Substrate)																
Sterile HDPE (Sodium thiosulphate)																
Riley's Cidery		E010	12-Apr-2021	—	—	—	—	—	—	—	—	—	—	—	—	—
																✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water**

Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Evaluation: ✖ = QC frequency outside specification; ✓ = QC frequency within specification.							
Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Total Coliforms and E. coli (Enzyme Substrate)	E010	177484	1	1	100.0	10.0	✓
Method Blanks (MB)							
Total Coliforms and E. coli (Enzyme Substrate)	E010	177484	1	1	100.0	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Total Coliforms and E. coli (Enzyme Substrate)	E010 Vancouver - Environmental	Water	APHA 9223 (mod)	The enzyme substrate test simultaneously detects Total Coliforms and E. coli in a 100 mL sample after incubation at 35.0 ±0.5°C for either 18 or 24 hours (dependent on reagent used).



ALS Environmental

QUALITY CONTROL REPORT

Work Order

: VA21A6689

Page

: 1 of 3

Client

: Cash Clients Canada

Contact

: Riley's Cider Christine Hardie

Address

: 8081 Loughheed Highway

Telephone

: Burnaby BC Canada V5A 1W9

Project

: [REDACTED]

PO

C-O-C number

Sampler

Site

Quote number

No. of samples received

No. of samples analysed

: 1

: 1

: Vancouver Cash Clients

Laboratory

Account Manager

Address

Telephone

Date Samples Received

Date Analysis Commenced

Issue Date

: 12-Apr-2021 06:15

: 12-Apr-2021

: 19-Apr-2021 14:15

: Vancouver - Environmental

: Email: ALSEV.CC@alsglobal.com

: 8081 Loughheed Highway

: Burnaby, British Columbia Canada V5A 1W9

: 604-253-4188

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories

Position

Lindsay Gung

Supervisor - Water Chemistry

Laboratory Department

Microbiology, Burnaby, British Columbia



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QC) for applicable method references and methodology summaries.

Key :

- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
- DQO = Data Quality Objective.
- LOR = Limit of Reporting (detection limit).
- RPD = Relative Percentage Difference
- # = Indicates a QC result that did not meet the ALS DQO.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Water

Laboratory sample ID		Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Bacteriological Tests (QC Lot: 177484)												
VA21A6689-001		Riley's Cider	coliforms, <i>Escherichia coli</i> [<i>E. coli</i>]	—	E010	1	MPN/100mL	<1	<1	0	Diff <2x LOR	—
			coliforms, total	—	E010	1	MPN/100mL	<1	<1	0	Diff <2x LOR	—

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Water

Analyte	CAS Number/Method	LOR	Unit	Result	Qualifier
Bacteriological Tests (QC Lot: 177484)					
coliforms, <i>Escherichia coli</i> [<i>E. coli</i>]	— E010	1	MPN/100mL	<1	—
	— E010	1	MPN/100mL	<1	—
coliforms, total					





Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

Page of

Report Format / Distribution		Standard: Other (specify):		Regular (Standard Turnaround Times - Business Days)	
Select: PDF Excel Digital Fax		Priority (2-4 Business Days) - 50% surcharge - Contact ALS to confirm TAT		Emergency (1-2 Business Days) - 100% Surcharge - Contact ALS to confirm TAT	
Email 1:		Email 2:		Same Day or Weekend Emergency - Contact ALS to confirm TAT	
Client / Project Information		Job #:		Analysers Request	
PO / AFE:		LSD:		(Indicate Filtered or Preserved, F/P)	
Quote #:		ALS Contact:		Number of Containers	
Sample Identification		Data (dd-mm-yy)		Time (hh:mm)	
Sample Type		Water			
Environmental Division		Vancouver			
Work Order Reference		VA21A6689			
Barcode					
Telephone : +1 604 253 4188					
Special Instructions / Regulations with water or land use (CCME Freshwater Analysis Sheet - 1 Natural / ETC) / Hazardous Waste					

SAMPLES RECEIVED WITHOUT CHAIN OF CUSTODY (CofC)

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RECEIPT (ADDENDUM)						SHIPMENT VERIFICATION (LAB USE ONLY)				
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
						2.4 °C	DB CFW	April 12,	6:15 am	
							WHITE - LABORATORY COPY		YELLOW - CLIENT COPY	
REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION										GENF 18.01 Front

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

GENF 18.01 Front

APPENDIX D

Aquifer #749 Information



Groundwater Wells and Aquifers

[Aquifer Search](#) / [Aquifer Summary](#)

Aquifer 749 Summary

Aquifer number	749	Year of mapping	2006
Aquifer name		Litho stratigraphic unit	Lower Jurassic to Middle Jurassic Bowen Island Group
Descriptive location	Bowen Island - SW	Vulnerability	Moderate
Material type	Bedrock	Subtype	Fractured crystalline bedrock
Quality concerns	Isolated	Productivity	Moderate
Size (km ²)	4.1	Calculated well density	High



Well Information

Number of wells correlated to the aquifer	12
Number of uncorrelated wells within mapped aquifer extent	68
Artesian wells	0 artesian wells in aquifer

Well info last updated 2/2/2021

Documentation

Factsheets

- AQ_00749_Aquifer_Factsheet.pdf

Other Documents

- AQ_00749_Aquifer_Mapping_Report.pdf

Licensing Information

The licensing summaries should be considered estimates. Due to complexities in the structure of the licensing data, reported values should be confirmed through the e-licensing portal (https://1200.gov.bc.ca/pub/ams/Default.aspx?PossePresentation=AMSPublic&PosseObjectDef=o_ATIS_DocumentSearch&PosseMenuName=WS_Main).

Number of groundwater licences	0
Water withdrawal volume (annual)	No information available.

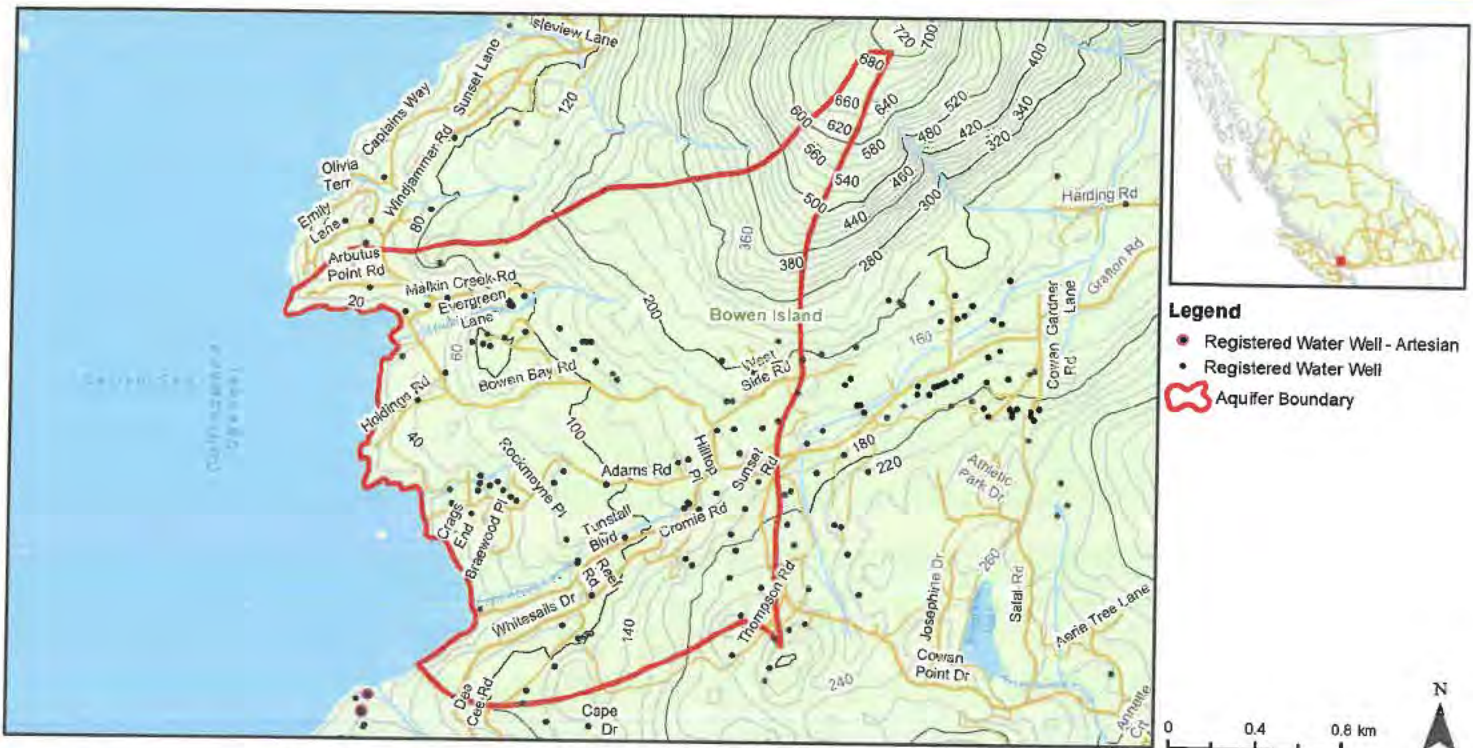
Licensing information is obtained from the [Water Rights Licence - Public data layer \(https://catalogue.data.gov.bc.ca/dataset/water-rights-licences-public\)](https://catalogue.data.gov.bc.ca/dataset/water-rights-licences-public).

Unique licenses are counted once for each aquifer that they are associated with.

The total licensed volume is counted once for each licence (the total volume may be shared between wells if there are multiple wells in a licence). In cases where specific volumes are licensed for multiple purposes, individual volumes are summed.

Knowledge Indicators

Advanced mapping	No information available.
Artesian advisory	No information available.
Observation wells	No information available.
Numerical model	No information available.
Pumping stress index	• Stress Index Report (https://services6.arcgis.com/ubm4tcTYICK8pist/arcgis/rest/services/Aquifer_180613_NA/FeatureServer/0/235/attachments/235)
Water budget	No information available.
Water quality information	4 wells with an EMS ID
Hydraulically connected (screening level)	Less likely
Groundwater Surface Water interactions	No information available.
Other information	No information available.



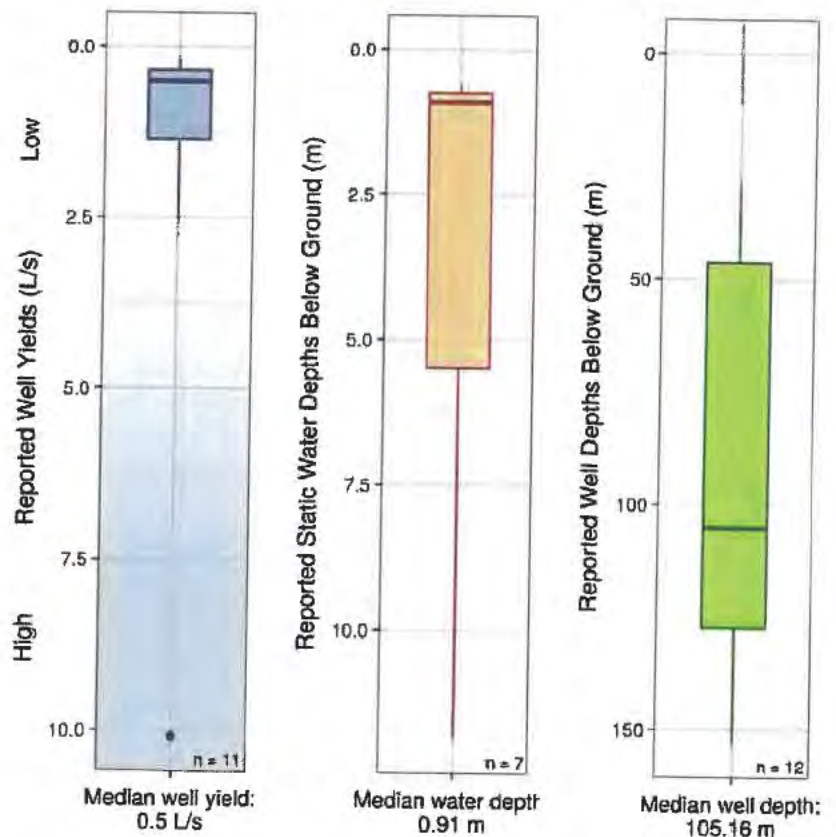
Aquifer Description (Mapping Report - 2006):

Fractured crystalline (igneous intrusive or meta-morphic, meta-sedimentary, meta-volcanic, volcanic) rock aquifer (subtype = 6b).

Aquifer Details

Region	South Coast
Water District	Vancouver
Aquifer Area	4.1 km ²
No. Wells Correlated to Aquifer	12
Vulnerability to Contamination	Moderate
Productivity	Moderate
Aquifer Classification	IB
Hydraulic Connectivity ¹	Not Likely
Aquifer Stress Index	Method not applicable - confined aquifer
No. Water Licences Issued to Wells	Unknown
Observation Wells (Active, Inactive)	None

¹ Based on broad regional assessment



Disclaimer: Use of information from Aquifer factsheets (accessed by BC government website) is subject to limitation of liability provisions (further described on that website). That information is provided by the BC government as a public service on an "as is" basis, without warranty of any kind, whether express or implied, and its use is at your own risk. Under no circumstances will the BC government, or its staff, agents and contractors, be responsible or liable to any person or business entity, for any direct, indirect, special, incidental, consequential or any other loss or damages to any person or business entity based on this factsheet or any use of information from it.

Detailed methods for all figures are described in the companion document (Aquifer Factsheet - Companion Document.pdf).
Factsheet generated on 2020-08-06. Aquifer published after the meeting.

AQUIFER CLASSIFICATION WORK SHEET

DATE: January 1, 2006

AQUIFER MAPPER: A.P. Kohut

AQUIFER LOCATION: Tunstall – Bowen Bay, Southwest side of Bowen Island.

AQUIFER NUMBER: 749

NTS MAP SHEETS: 92G/6

BCGS TRIM Maps (1:20,000): 092G.033

CLASSIFICATION: IB

RANKING: 12

Aquifer Size:

Area of aquifer is approximately 4.1 km².

Aquifer Boundaries:

The aquifer boundary has been delineated using water well record information (area of development), topography, surface drainage features and major geologic structural (fault/lineament) features. The aquifer forms part of the larger fractured crystalline bedrock aquifer system that underlies Bowen Island.

Geologic Formation (overlying):

Pleistocene and Holocene deposits including clay, till, boulders, silt, sand and gravel, see Ministry of Environment (1978).

Geologic Formation (aquifer):

Fractured crystalline bedrock including Lower Jurassic to Middle Jurassic *Bowen Island Group* around Tunstall Bay comprised of argillite, greywacke and conglomerate turbidites, and Late Jurassic quartz diorite around Bowen Bay. See Roddick and Woodsworth (1979) and British Columbia Geological Survey (2005).

Confined/Partially Confined/Unconfined: Confined and partially confined.

Vulnerability:

Moderate. The geometric mean (geomean) depth to static water level is 0.4 metres (1.3 feet). The geometric mean thickness of the confining layer is 6.81 metres (22.3 feet). The range of thickness of the confining layer is from 0.61 to 34.75 metres (2.0 to 114.0 feet).

Productivity:

Highly variable from low to high and **moderate overall** for fractured bedrock. Well yields reported in the well records range up to 2.52+ L/s (40+ USgpm). The geometric mean of 12 reported well yields is 0.43 L/s (6.8 USgpm) and the median well yield is 0.41 L/s (6.5 USgpm).

Depth to Water Table:

The geometric mean static water level is 0.4 metres (1.3 feet) and the median static water level is 0.7 metres (2.3 feet) based on 8 well records. Flowing conditions are reported in three wells near the coast.

Direction of Groundwater Flow:

Groundwater likely moves from eastern upland areas towards the west discharging into Tunstall Bay and Bowen Bay.

Recharge:

Precipitation and infiltration from eastern upland surface sources.

Domestic Well Density:

Moderate. Approximately 4 wells/km². Wells are concentrated along the coastal part of the aquifer area.

Type of Water Use:

Domestic for individual properties and community water supplies.

Reliance on Source:

Important source for individual properties and community supplies including Bowen Bay Water System and Tunstall Bay Water System.

Conflicts Between Users:

Unknown.

Quantity Concerns (type, source, level of concern):

Downward trend reported in water levels in some wells, (Bowen Island Municipality, 2005a). This may need further investigation.

Quality Concerns (type, source, level of concern):

Elevated TDS, Iron and Chlorides in some wells along southern boundary of aquifer. Two flowing wells reported with high pH (9.4). Source water quality protection is of interest for community water systems (Bowen Island Municipality, 2005a and 2005b).

Comments:

The geometric mean depth of water wells in this aquifer is 82.98 metres (272.3 feet). The median depth of wells is 105.15 metres (345.0 feet) and the range of well depths is from 28.95 to 153.0 metres (95.0 to 502.0 feet).

The statistics quoted for this aquifer are based on 8 to 14 water well records.

References:

Berardinucci, J. and K. Ronneseth. 2002. *Guide to Using the BC Aquifer Classification Maps for the Protection and Management of Groundwater*. Water, Air and Climate Change Branch. BC Ministry of Water, Land and Air Protection. Victoria, B.C. 54 pp.

British Columbia Geological Survey. 2005. *Geology Map* at Map Place.ca

<http://webmap.em.bc.ca/mapplace/minpot/bcgs.cfm>

- Bowen Island Municipality. 2005a. Tunstall Bay Water System, Drinking Water Quality, Annual Report - Final, Calendar Year 2004.
- Bowen Island Municipality. 2005b. Bowen Bay Water System, Drinking Water Quality, Annual Report - Final, Calendar Year 2004.
- Brown, W.L., and R.B. Erdman. 1970. Groundwater Development, Tunstall Bay, Bowen Island for Deecee Projects Ltd. Robinson, Roberts and Brown Ltd., North Vancouver, British Columbia. NTS File 092G/06-57 Ministry of Environment, Victoria, British Columbia.
- Buble, G. 1989. part of a report on Bowen Bay Improvement District's water sources. Municipal Engineering Services, Ministry of Municipal Affairs, Province of British Columbia, Victoria, British Columbia.
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- Journey, J.M. and Dunster, J., 2002. *The Bowen Island GeoLibrary; Spinning the web of Community Knowledge (v1.0)*. A project of the Bowen Island Forest and Water Management Society. Available on CD and online at: www.bowenisland.info
- Ministry of Environment. 1978. *Bowen Island: a resource analysis for land use planning, Volumes 1 and 2*, The Islands Trust, Ministry of Municipal Affairs and Housing, Victoria, British Columbia. NTS File 092G/06-13, Ministry of Environment, Victoria, British Columbia.
- Reed, H.W. 1979. Production Well Aquifer Test for Mary B. Adams, Bowen Island, British Columbia. Brown, Erdman & Associates Ltd., Vancouver, British Columbia. NTS File 092G/06-50 Ministry of Environment, Victoria, British Columbia.
- Roddick, J.A., and G.J. Woodsworth 1979. Geology of Vancouver West Half and Mainland Part of Alberni, Geological Survey of Canada O.F. 611

AQUIFER CLASSIFICATION AND RANKING

AQUIFER LOCATION: Tunstall – Bowen Bay, Southwest side of Bowen Island.

AQUIFER NUMBER: 749

CLASSIFICATION:	IB	RANKING VALUE:	12
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Classification Component:

Level of development: **Heavy - High** level of demand in relationship to **moderate** level of aquifer productivity and water availability. Additional development of the aquifer should be carefully assessed.

Level of Vulnerability: **Moderate: Moderate** level of vulnerability to surface contamination.

Ranking Component:

	Ranking Value
Productivity:	2
Vulnerability:	2
Size:	1
Demand*:	3
Type of Use:	2
Quality Concerns:	1
Quantity Concerns:	1
Total:	12

- Demand has been assessed subjectively. Demand is based on domestic well density, number and type of wells, and general knowledge of well use and land use in the area. Demand assumes that the reported well capacity is the amount of water used, which can be misleading. The reported well capacity can be higher than actual use.

Number of water wells available for aquifer delineation = 14
Statistical Summary of Well Record Data for Aquifer # 749

	<i>Well Depth</i>		<i>Depth to Water</i>		<i>Depth to Bedrock</i>		<i>Reported Well Yield *</i>		<i>Estimated Thickness of Confining Materials **</i>	
<i>Number of Wells</i>	14	14	8	8	14	14	12	12	14	14
	m	ft	m	ft	m	ft	L/s	gpm	m	ft
<i>Maximum</i>	153.00	502.0	11.89	39.0	34.75	114.0	2.52	40.0	34.75	114.0
<i>Minimum</i>	28.95	95.0	0.03	0.1	0.61	2.0	0.01	0.2	0.61	2.0
<i>Average</i>	95.40	313.0	2.3	7.5	10.73	35.2	0.69	11.0	10.73	35.2
<i>Median</i>	105.15	345.0	0.7	2.3	6.40	21.0	0.41	6.5	6.40	21.0
<i>Geometric Mean</i>	82.98	272.3	0.4	1.3	6.81	22.3	0.43	6.8	6.81	22.3

* - USgpm

** Does not include surficial wells where bedrock was not encountered.

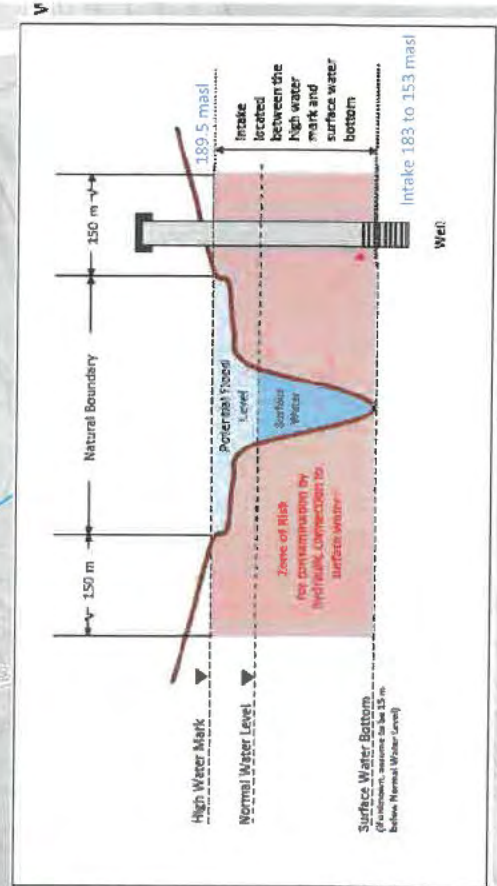
APPENDIX E

Analysis of Well Intake vs. Surface Water Elevations

Analysis of Potential GARP Hazard B3:

Bottom of surface casing at ~
183 m asl
(Interval from 183 to 153 masl)

Pond level ~ 183 m
(has to be lower than
184 contour to not overflow)



Appendix E – Analysis of Well Intake vs. Surface Water Elevations

APPENDIX F

Statement of Limitations

Statement of Limitations

Use of this Report. This report was prepared by McElhanney Ltd. ("**McElhanney**") for the particular site, design objective, development and purpose (the "**Project**") described in this report and for the exclusive use of the client identified in this report (the "**Client**"). The data, interpretations and recommendations pertain to the Project and are not applicable to any other project or site location and this report may not be reproduced, used or relied upon, in whole or in part, by a party other than the Client, without the prior written consent of McElhanney. The Client may provide copies of this report to its affiliates, contractors, subcontractors and regulatory authorities for use in relation to and in connection with the Project provided that any reliance, unauthorized use, and/or decisions made based on the information contained within this report are at the sole risk of such parties. McElhanney will not be responsible for the use of this report on projects other than the Project, where this report or the contents hereof have been modified without McElhanney's consent, to the extent that the content is in the nature of an opinion, and if the report is preliminary or draft. This is a technical report and is not a legal representation or interpretation of laws, rules, regulations, or policies of governmental agencies.

Standard of Care and Disclaimer of Warranties. This report was prepared with the degree of care, skill, and diligence as would reasonably be expected from a qualified member of the same profession, providing a similar report for similar projects, and under similar circumstances, and in accordance with generally accepted engineering and scientific judgments, principles and practices. McElhanney expressly disclaims any and all warranties in connection with this report.

Information from Client and Third Parties. McElhanney has relied in good faith on information provided by the Client and third parties noted in this report and has assumed such information to be accurate, complete, reliable, non-fringing, and fit for the intended purpose without independent verification. McElhanney accepts no responsibility for any deficiency, misstatements or inaccuracy contained in this report as a result of omissions or errors in information provided by third parties or for omissions, misstatements or fraudulent acts of persons interviewed.

Effect of Changes. All evaluations and conclusions stated in this report are based on facts, observations, site-specific details, legislation and regulations as they existed at the time of the assessment and report preparation. Some conditions are subject to change over time and the Client recognizes that the passage of time, natural occurrences, and direct or indirect human intervention at or near the site may substantially alter such evaluations and conclusions. Construction activities can significantly alter soil, rock and other geologic conditions on the site. McElhanney should be requested to re-evaluate the conclusions of this report and to provide amendments as required prior to any reliance upon the information presented herein upon any of the following events: a) any changes (or possible changes) as to the site, purpose, or development plans upon which this report was based, b) any changes to applicable laws subsequent to the issuance of the report, c) new information is discovered in the future during site excavations, construction, building demolition or other activities, or d) additional subsurface assessments or testing conducted by others.

Independent Judgments. McElhanney will not be responsible for the independent conclusions, interpretations, interpolations and/or decisions of the Client, or others, who may come into possession of this report, or any part thereof. This restriction of liability includes decisions made to purchase, finance or sell land or with respect to public offerings for the sale of securities.



Contact

Michael Florendo, MS, PEng, Project Manager
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McElhanney



RECORD OF SEWERAGE SYSTEM

		Filing # (OFFICE USE ONLY)	
1. Property Information	☒ New Construction ☐ Alteration ☐ Repair ☐ Amendment – Original Filing #		
	Tax Assessment Roll # 00028.100		PID # 015-026-701
	Legal Description (Plan, Lot, District Lot, Block Numbers) Lot 1, Block D, Plan VAP22501, District Lot 492.		
	Street (Civic) Address or General Location 620 Laura Road		City Bowen Island
2. Owner Information	Name of Legal Owner Rob Purdy		Mailing Address 620 Laura Road
	Phone [REDACTED]	City Bowen Island	Prov BC Postal Code V0N 1G2
3. Authorized Person Information	Name of Authorized Person Michael Florendo, P.Eng.		Mailing Address Suite 200, 858 Beatty Street
	Phone 1-604-838-0953	City Vancouver	Prov BC Postal Code V6B 1C1
	Registration # EGBC P.Eng. 30052		Email mflorendo@mcelhanney.com
	Sewerage System Will Serve: ☐ Single Family Dwelling ☒ Other Structure (specify) <u>Cidery</u> ☐ Other Dwelling (specify) _____ The sewerage system is designed for an estimated minimum daily domestic sewage flow of (check one) ☒ Less than or equal to 9,100 litres ☐ More than 9,100 litres but less than 22,700 litres		
4. Structure Information			
5. Site Information	Depth of native soil to seasonal high water table or restrictive layer (cm) 100		Information respecting the type, depth and porosity of the soil is attached ☒ Yes ☐ No
	GPS Location of System (decimal degrees) Latitude 49.362248° Longitude -123.401498°		
	Horizontal Accuracy (m) 89.7 ☐ Recreational GPS ☒ Differential GPS		
6. Drinking Water Protection	Will the sewerage system be located less than 30 m from a well? ☐ Yes ☒ No		
	If yes, attach a professional's report and specify the intended distance (m)		
	Distance of proposed sewerage system to the closest body of surface water 50 (m)		
7. System Information	Sewerage treatment method ☐ Type 1 ☐ Type 2 ☐ Type 3		
8. Legal or Regulatory Considerations	☒ Construction of the proposed sewerage system will not conflict with legal instruments registered on the property.		Is this filing submitted as the result of an order from the Health Authority? ☐ Yes (attach a copy of the order) ☒ No
9. Plot Plan and Specifications	Plot Plan (to scale) and specifications are attached ☒ Yes ☐ No		
	☒ The plans and specifications are consistent with Standard Practice Source of Standard Practice: ☐ Ministry of Health Standard Practice Manual ☒ Other		
10. Authorized Person's Signature	Signature (email submission does not require a signature)		OFFICE USE ONLY Filing Accepted Date Receipt Number
	Date (dd / mm / yyyy) 25 June 2021		

SEWERAGE SYSTEM LETTER OF CERTIFICATION

Filing #	Folio or PID # 015-026-701	Date (dd/mm/yyyy) 25/06/2021
Civic Address 620 Laura Road, Bowen Island, B.C. V0N 1G2		
Legal Description Lot 1, Block D, Plan VAP22501, District Lot 492, Group 1, New Westminster Land District		
The construction of the proposed sewerage system on the above property was completed on:		Date (dd/mm/yyyy) 23/06/2021

This system was installed:

☒ By or under the supervision* of a professional	Name Michael Florendo, P.Eng.	Registration # EGBC 30052
☐ By a Registered Onsite Wastewater Practitioner Installer	Name	Registration #
☐ By the property owner under the supervision* of	Name	Registration #

I am an "Authorized Person" as defined in the Sewerage System Regulation "BC Reg. 326/2004."

The signature and seal of the undersigned on this document certifies that:

- The Owner has been provided with:
 - ☒ A copy of the sewerage system plans and specifications as filed with the Health Authority;
 - ☒ A maintenance plan for the sewerage system that is consistent with standard practice;
 - ☒ A copy of this Letter of Certification as filed with the Health Authority;
- The sewerage system has been constructed in accordance with standard practice as indicated in the Sewerage System Filing Form filed on **25/06/2021** (dd/mm/yyyy);
- The sewerage system has been constructed substantially in accordance with the plans and specifications filed with the Health Authority;
- The estimated daily domestic sewage flow through the sewerage system will be less than 22,700 liters;
- If operated and maintained as set out in the maintenance plan, the sewerage system will not cause or contribute to a health hazard.

* Where the authorized person is a professional, "supervision" means conducting field reviews of the construction of the above system that the professional in his or her professional discretion considers necessary to ascertain whether the construction substantially complies with the plans and specifications filed with the Health Authority.

Appended to this document is a plan of the sewerage system as it was built and a copy of the maintenance plan.

Name (please print) Michael Florendo, P.Eng.	Health Authority Use Only
Signature	
Authorized Person's Seal 	