



STAFF REPORT

File No.: Long Range Planning: 09-6500-20-2021

DATE OF MEETING: March 7, 2022
TO: Galiano Island Local Trust Committee
FROM: Narissa Chadwick
Southern Team
COPY: Robert Kojima, Regional Planning Manager
Brad Smith, Island Planner
William Shulba, Senior Freshwater Specialist
SUBJECT: Groundwater Sustainability Project: Options for Implementation

RECOMMENDATION

- 1. That the Galiano Island Local Trust Committee request staff to prepare a draft bylaw to amend the “Galiano Island Official Community Plan Bylaw No. 108, 1995” to include Critical Aquifer Recharge Development Permit Area guidelines, map updates and minor updates to relevant sections as identified in the March 7, 2022 staff report.**
- 2. That the Galiano Island Local Trust Committee request staff to prepare a draft bylaw to amend the Land Use Bylaw to include updates to definitions, addition of cistern requirements for all new builds and updates to subdivision regulations related to potable water.**
- 3. That the Galiano Island Local Trust Committee request staff to identify options for changes to zoning regulations informed by GW Solutions (2021) groundwater availability assessment data.**

REPORT SUMMARY

This report presents options for Official Community Plan (OCP) amendments and Land Use Bylaw (LUB) amendments related to the implementation of the groundwater sustainability project. OCP amendment options presented include: proposed guidelines for a Critical Aquifer Recharge Development Permit Area, minor updates to relevant sections, and mapping updates. LUB amendment options include: updates to definitions, addition of cistern requirements for all new builds outside water service areas, and updates to subdivision regulations related to proof of potable water. The report also identifies options for the two most critically vulnerable groundwater regions – GAL 19 (South Galiano) and GAL 20 (Cain Peninsula).

BACKGROUND

At the February 1, 2021 meeting the LTC endorsed a project charter for the implementation phase (Phase 3) of the Groundwater Sustainability Science Program. At the April 12, 2021 meeting the LTC, after considering a number of options, agreed to continue with this phase.

Reports and mapping related to the research phases of the project can be found here: <https://islandstrust.bc.ca/island-planning/galiano/projects/> . This information was shared with the Galiano community in a webinar held on September 7, 2021. The slides from the presentation can be found here: <https://islandstrust.bc.ca/document/ground-water-sustainability-presentation/> .

Options for OCP and LUB amendments identified in this report are informed by the outcomes from the aquifer conceptualization, groundwater recharge potential mapping and groundwater availability assessments which were outcomes of the research phases of the Groundwater Sustainability Science Program. Aquifer vulnerability to saltwater intrusion and intrinsic aquifer vulnerability to surface contamination were also considered.

ANALYSIS

Proposed OCP Amendments

1. Creation of Critical Aquifer Recharge Development Permit Area

A groundwater protection DPA will help to minimize negative impact on the quality and quantity of subsurface water supplies in areas identified to be critical to groundwater recharge. The proposed Critical Aquifer Recharge Development Permit Area policy and guidelines (see Appendix 1) considers the existing Galiano Elevated Groundwater Catchment Development Permit Area, which was developed in 2014 and involved a hydrogeology consultant. The Critical Aquifer Recharge Development Permit Area policy and guidelines is informed by the Groundwater Sustainability Science Program and the Islands Trust Freshwater Sustainability Strategy.

Planning staff are working with the Senior Freshwater Specialist to identify appropriate Critical Aquifer Recharge DPA boundaries. These boundaries will be informed by the groundwater recharge potential mapping completed by GW Solutions in October 2021. This mapping is based on a methodology developed specifically to understand the conditions contributing to groundwater quantity and quality on the Islands. It identifies the potential of different areas to collect groundwater into aquifers. The groundwater recharge potential map for Galiano is contained in Appendix 2. The most critical recharge potential areas will define the proposed DPA boundaries.

2. Minor updates to relevant sections:

Staff have reviewed the OCP in detail and identified the following minor updates:

- Changing references to “groundwater” to “freshwater” where appropriate.
- Emphasizing support for the sustainability of freshwater resources.
- Identifying support for the protection of groundwater resources in land use designation objectives
- Consideration of groundwater vulnerability with respect to policies supporting additional density.
- Update to water supply objectives.
- Updates to water supply policies in line with recent data.
- Updates to water supply advocacy policies in line with Freshwater Sustainability Strategy.

- Add climate adaptation policies related to freshwater sustainability.
- Updating subdivision policies for water use in line with proposed changes to LUB.
- Acknowledging the indigenous traditional knowledge where appropriate.
- Updates to definitions where needed.

If the LTC supports these suggested minor updates, staff will proceed with drafting bylaw amendments.

3. Map Updates:

- Changes to DPA Compilation Map to remove area delegated for Elevated Groundwater Catchment DPA and to include area delegated for Critical Aquifer Recharge DPA.
- Update to Schedule D to previous watershed regions with groundwater regions (See Appendix 5).
- Update to Schedule G DPA 4 Elevated Groundwater Catchment to reflect boundaries for the new DPA 4 Critical Aquifer Recharge DPA (TBD)

Proposed LUB Amendments

1. Updated Definitions – see Appendix 3

Proposed definitions correspond with the update to the subdivision regulations and are consistent with what is being proposed for Salt Spring Island and North Pender Island.

2. Addition of Cistern Requirements –See Appendix 3

Cistern requirements correspond with what is being proposed for North Pender Island. They apply to the addition of secondary suites and all new residential buildings outside of water service areas. Staff have proposed this approach in light of increasing water challenges being experienced in the summer, the increase in fulltime residents and uncertainties related to climate change. Cisterns could be used for the collection and storage of rainwater or groundwater. The water would not be required to be potable. The use of this supply for gardens, toilets and other non potable water uses would help off set the use of potable water. Owners could use cisterns for potable water where treatment systems are installed. The minimum cistern capacity (single cistern of collection of smaller cisterns) would be 18,000 litres. This number is based on the potential for a household, in an emergency, to manage for one week. It also considers the size of cisterns that are commercially available. Staff will be encouraging consistency of cistern size requirements across the Trust Area.

3. Update to Subdivision Regulations related to Potable Water – Appendix 4

The proposed update to the proof of water subdivision regulations is based on a concurrent project for Salt Spring Island Local Trust Area under development by Island Planners in consultation with the Islands Trust’s Senior Freshwater Specialist, the Salt Spring Island Watershed Protection Alliance Technical Working Group, and provincial staff. Updates to proof of water bylaws incorporate existing subdivision regulations as well as align with new regulations in the *Water Sustainability Act Drinking Water Protection Act*, and other regulatory guidance documents. Volumes relating to proof of water for non-domestic agricultural, commercial, commercial

guest accommodation, and industrial uses might not be included as this is adjudicated by provincial water authorizations staff. Staff will be looking into this further. Domestic water volumes have been updated to align with deemed rights under the *Water Sustainability Act*.

4. Changes to zoning regulations in critical areas

Proposed changes to zoning regulations in stressed groundwater areas will be primarily informed by the [Islands Trust Area Groundwater Availability Assessment](#) completed by GW Solutions in October 2021. Saltwater Intrusion potential and the potential impact of density on increases in sewage (identified through DRASTIC modeling) are also considered.

The GW Solutions (2021c) groundwater availability model estimates monthly potential evapotranspiration, soil moisture storage, actual evapotranspiration, soil moisture deficit, and soil moisture surplus (i.e., runoff and groundwater recharge). Using proxy data from a variety of sources, the model also estimate surface and groundwater use across the study Islands. Using the results from the water balance model, the study estimates the percentage of groundwater use relative to aquifer recharge, per groundwater region. The results reveal the regional disparities in groundwater use across the study Islands. Use in some areas on Mayne Island, North Pender Island and Galiano Island reaches over 10% of groundwater recharge. This likely creates stress on environmental needs and may result in water conflicts.

As identified in the maps in Appendix 5, the groundwater availability assessment data reveals that there are two groundwater regions that are likely to be critical vulnerable – South Galiano (GAL19) and the Cain Peninsula (GAL20). Staff recommend that the LTC focus on these areas for potential zoning regulation changes. Staff note that Gossip Island was not included in the GW Solutions work but is well know to be experiencing groundwater challenges similar to those of the Cain Peninsula.

Groundwater regions that are likely vulnerable to stressed groundwater availability and also have increased risk of saltwater intrusion determined using Simon Fraser University (Allen and Klassen, 2016; see Map 3 in Appendix 2). In coastal areas, freshwater aquifers are in direct contact with the ocean and under normal conditions, fresh groundwater flows towards the ocean. In areas with risk of saltwater intrusion, seawater moves into a freshwater aquifer (Allen and Klassen, 2016). Wells proximal to the coast are at higher risk for saltwater intrusion and when it occurs one or more wells can be impacted making water unpotable and unlawful to operate under the Groundwater Protection Regulation.

The maps in Appendix 6 also reveal increased likelihood of vulnerability to contamination and septic impacts to aquifers. This is determined using intrinsic fractured media aquifer vulnerability mapping (Denny and Allen, 2007). The methodology is known as “DRASTIC”. D = Depth to water; R = Net Recharge; A = Aquifer Media; T = Topography; I = Impact of Vadose Zone (vadose zone is the area above the water table); C = Conductivity of the Aquifer (this refers to how fast the water moves). For more information on DRASTIC mapping for the Gulf Islands see :

https://a100.gov.bc.ca/pub/acat/documents/r42387/DRASTIC_March2014_1396286363816_6285348741.pdf

Focusing on mitigating potential groundwater sustainability risks, options related to zoning include: reducing or transferring current density; limiting existing uses; placing restrictions on size and siting; identify requirements for potable water as a condition of certain uses and/or increases in density; and place limits on impermeable surfaces. The map in Appendix 7, identifies vacant lots and lots with subdivision potential providing insight to areas where potential changes in zoning could have the most impact. Staff will be reviewing options for these specific critical areas that will be presented to the LTC at a subsequent regular meeting.

Staff note that options can also include working with the Province to have aquifer notes written up for select groundwater regions. Provincial aquifer notes record information regarding vulnerable aquifers. These notes can be used to inform the provision of water licences. This action would be supporting the Islands Trust’s Freshwater Sustainability Strategy focus on collaborating with other agencies.

Alternatives

1. Request further information

The LTC may request further information prior to making a decision. This may delay aspects of the project. Recommended wording for the resolution is as follows:

That the Galiano Island Local Trust Committee request additional information related to.....

2. Request that staff examine other options and/or aspects not identified in the staff report

The LTC may request that staff consider other types of options and/or aspects that are not covered in the staff report.

That the Galiano Island Local Trust Committee request that staff consider.....

NEXT STEPS

- Staff will present the LTC with options for DPA boundaries
- Staff will develop options for zoning regulation changes in critical areas
- Staff will draft OCP amendments
- Staff will draft LUB amendments

Submitted By:	Narissa Chadwick, RPP	February 24, 2022
Concurrence:	Robert Kojima, Regional Planning Manager	February 28, 2022
Concurrence:	William Shulba, Senior Freshwater Specialist	February 28, 2022

APPENDIX

1. Draft Development Permit Area Guidelines
2. GW Solutions Groundwater Recharge Potential Mapping
3. Land Use Bylaw Definitions and Cistern Requirements
4. Subdivision Standards for Potable Water
5. Groundwater Availability Assessment Map
6. Groundwater Vulnerability Analysis Maps
7. Groundwater Availability, Vacant Lots and Subdivision Potential: Focus Area