

# **Aquifer Re-Classification and Monthly Groundwater Study by Provincial Ministry collaborating with SSIWPA and Golder Associates**

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Did you know that many Salt Spring Islanders rely on groundwater as their main source of fresh water? When creeks and streams are low or dry in the summer, groundwater deep underground still flows in the spaces between soil grains and the breaks (fractures) in the rock. Groundwater is replenished by rain and snow and is usually of excellent quality. However, as a resource it can be vulnerable to impacts from activities on the land and subject to unsustainable use. Salt Spring Island in the Salish Sea is surrounded by saltwater and fresh groundwater can be compromised by saltwater intrusion, generally caused by over-pumping close to the shoreline.

The BC Ministries of Environment and Forests, Lands and Natural Resource Operations are excited to be partnering with SSIWPA to carry out a new study focussing to improve our understanding of the groundwater resources on the island. The study will be carried out by Golder Associates Ltd and is being funded by the Ministry of Environment's Water Science Program which has been created to improve the characterization of groundwater resources to help implement the new *Water Sustainability Act*.

A start-up meeting for the study titled *Aquifer Mapping and Monthly Water Budgets for the Aquifers on Salt Spring Island* was held on Salt Spring Island in early December 2016. The study has been broken into two phases to be completed over two years. The first phase to be completed by March 31<sup>st</sup> 2017 includes:

- Literature Review and Data Acquisition – Identifying, assembling, and reviewing hydrogeologic studies and hydrogeologic data sources. Data shall include, but is not limited to, hydrologic and hydrometric data, groundwater level data, water use and water license data, and aquifer properties. Collaboration with SSIWPA and the Salt Spring Island community water improvement districts will assist at this stage.

- Aquifer Mapping - Preparing hydrogeologic cross-sections to delineate the hydrostratigraphy of the island. The existing aquifer boundaries will be reviewed and updated if necessary
- Conceptual geological model – a conceptual model of the aquifers of the study area based on hydrogeologic interpretation will be developed. Comments on the inferred interconnectivity between aquifers as well as connectivity with surface water bodies.
- Conceptual Groundwater Model - Develop a conceptual model of groundwater movement, including characterization of regional groundwater movement, groundwater recharge, groundwater interaction with surface waters, hydraulic communication between aquifers, and groundwater use.

The phase I study will benefit from the geological mapping of the rock formations on Salt Spring Island completed by long-time Salt Spring Island resident Dr. Hugh Greenwood available to the public from the BC Geological Survey at

[http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/OpenFiles/2009/Documents/2009-11/OF2009-11\\_notes.pdf](http://www.empr.gov.bc.ca/Mining/Geoscience/PublicationsCatalogue/OpenFiles/2009/Documents/2009-11/OF2009-11_notes.pdf).

The second phase of the study (Water Budget Analysis and Reporting) will be started in April 2017 and be completed by March 31<sup>st</sup> 2018. This phase of the study will include:

- Water Budget Construction - Using data assembled in the Phase 1 studies a monthly water budget for the study area will be developed. The water budget will include coupled groundwater and surface water components, and will address a minimum of three (3) years of hydrologic information representing dry, wet, and average precipitation conditions coupled with current surface and groundwater use.
- Water Budget Analysis and Evaluation - The nature of groundwater connectivity to surface waters, will be assessed and described and the rationale supporting the characterization of connectivity between surface and groundwater documented. Estimates of groundwater flows to and from surface waters will be provided. The potential impacts from groundwater pumping on surface flows and salt water intrusion will be assessed.
- Available Groundwater – Estimates of available groundwater for future water allocation decisions will be proposed --based on consideration of existing surface and groundwater use, maintaining current groundwater levels, limiting salt water intrusion, meeting requirements for groundwater dependent baseflows in connected surface waters, and the recommended safety factor.

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