REGIONAL DISTRICT OF NANAIMO

P O L I C Y

SUBJECT:	***Hydrogeological (groundwater) assessment requirements for rezoning un-serviced lands and for development permits*** (Current Planning)	POLICY NO: CROSS REF.:	B 1.21
EFFECTIVE DATE:	February 22, 2011	APPROVED BY:	Board
REVISION DATE:	**April 23, 2019**	PAGE:	1 of 8

PURPOSE

To identify and standardize the technical information required for rezoning applications to confirm that the potable water needs of a proposed parcel, parcels or use can be met, assess potential impacts on groundwater resources, existing groundwater users, and hydraulically-connected streams., and provide consistency in the review of development proposals.

To identify and standardize the technical information required through development permit area guidelines for hydrogeological assessments and provide consistency in the review of development approvals.

To uphold the policies and objectives in the Official Community Plans (OCP) with regards to water supply in rural areas, and to identify and minimize potential impacts of the proposed development on existing groundwater or surface water users and sensitive ecosystems.

POLICY

This policy outlines the approaches that will be taken when considering rezoning lands that are un-serviced (by community water), and when considering issuance of a development permit where a hydrogeological assessment is required, and outlines details the requirements for the following application types:

A. Rezoning to facilitate subdivision.
B. Rezoning to permit multi-family, commercial, institutional or industrial use.
C. Development permit application where a hydrogeological assessment is required through the development permit area guidelines.

For both types of rezoning and for development permit applications, a preliminary hydrogeological assessment is required. In cases where a desktop review of available data and site visit provide a sufficient

level of confidence that the required water needs can be met without adverse impact, in the opinion of the qualified professional registered with Engineers and Geoscientists of BC (EGBC) with competency in hydrogeology, then a pumping test is not required. If the qualified professional deems it necessary to perform a pumping test to confirm water supply, a well must be drilled (if not already present) on the parcel and tested through the completion of a pumping test to proceed with the assessment.

This assessment is not intended to provide a guarantee that future property owners will have an adequate supply of potable water, but rather to provide a qualified opinion of the likelihood of obtaining an adequate supply of potable water without compromising water resource sustainability, existing water users and hydraulically-connected streams.

A. Rezoning to facilitate subdivision

Where a parcel is the subject of a rezoning application to reduce the minimum lot size in order to facilitate a subdivision, a **preliminary hydrogeological assessment** completed by a qualified professional (P. Eng or P. Geo. registered with Engineers and Geoscientists of BC (EGBC) with competency in hydrogeology) must be submitted as part of the rezoning application and must be received and reviewed by staff prior to proceeding to the Board for introduction of the associated amendment bylaw.

See flow chart for *rezoning to facilitate subdivision* below in **Figure 1**.

NOTE: *If the application involves the rezoning of lands to permit subdivision of lands that are currently occupied by dwellings, each with their own well, and the rezoning will not result in additional dwelling unit or a change in water use, a preliminary hydrogeological assessment is not required provided the applicant proceeds with the well testing and associated final well report (outlined below) to the satisfaction of the Regional District.*

Preliminary Hydrogeological Assessment Report Requirements

The preliminary hydrogeological assessment must confirm that in the opinion of the qualified professional:

i. a minimum year-round potable water supply of
    a. 3.5 m^3 (3,500 litres) per day can be provided for each new residential parcel being proposed
    b. Or, for non-residential uses, sufficient supply to support the proposed use can be provided on each new parcel being proposed
ii. the proposed well(s) are not anticipated to have adverse impacts on groundwater resources, existing groundwater users, and hydraulically-connected streams.

Requirements for the preliminary hydrogeological assessment are outlined in full within a detailed checklist (**Appendix I: RDN Checklist for Hydrogeological Assessment Reports**). The report should address all the items listed in the checklist.

Prior to bylaw adoption, a covenant must be registered on title which will require that the new wells be constructed, tested, and a **final well report (Appendix II: Final Well Report Requirements)** submitted to the RDN prior to final approval of subdivision.

B. Rezoning to permit multi-family, commercial, institutional or industrial use

Where a lot is the subject of a rezoning application to permit multiple residential units, commercial, institutional or industrial use, a **preliminary hydrogeological assessment** completed by a qualified professional (P. Eng or P. Geo registered with Engineers and Geoscientists of BC (EGBC) with competency in hydrogeology) must be submitted as part of the rezoning application. The preliminary assessment report must be received and reviewed by staff prior to proceeding to the Board for introduction of the associated amendment bylaw.

See flow chart for *rezoning to allow a change in use* below in **Figure 2**.

Preliminary Hydrogeological Assessment Requirements

The preliminary assessment report must contain estimated flow requirements for the proposed use and confirm that in the opinion of the qualified professional:

i. a minimum year-round potable water supply to support the proposed use can be provided on the parcel, and that,
ii. the proposed well(s) are not anticipated to have adverse impacts on groundwater resources, existing groundwater users, and hydraulically-connected streams.

Requirements for the preliminary hydrogeological assessment are outlined in full within a detailed checklist (**Appendix I: RDN Checklist for Hydrogeological Assessment Reports**). The report should address all the items listed in the checklist.

Prior to bylaw adoption the applicant must receive and demonstrate to the RDN:

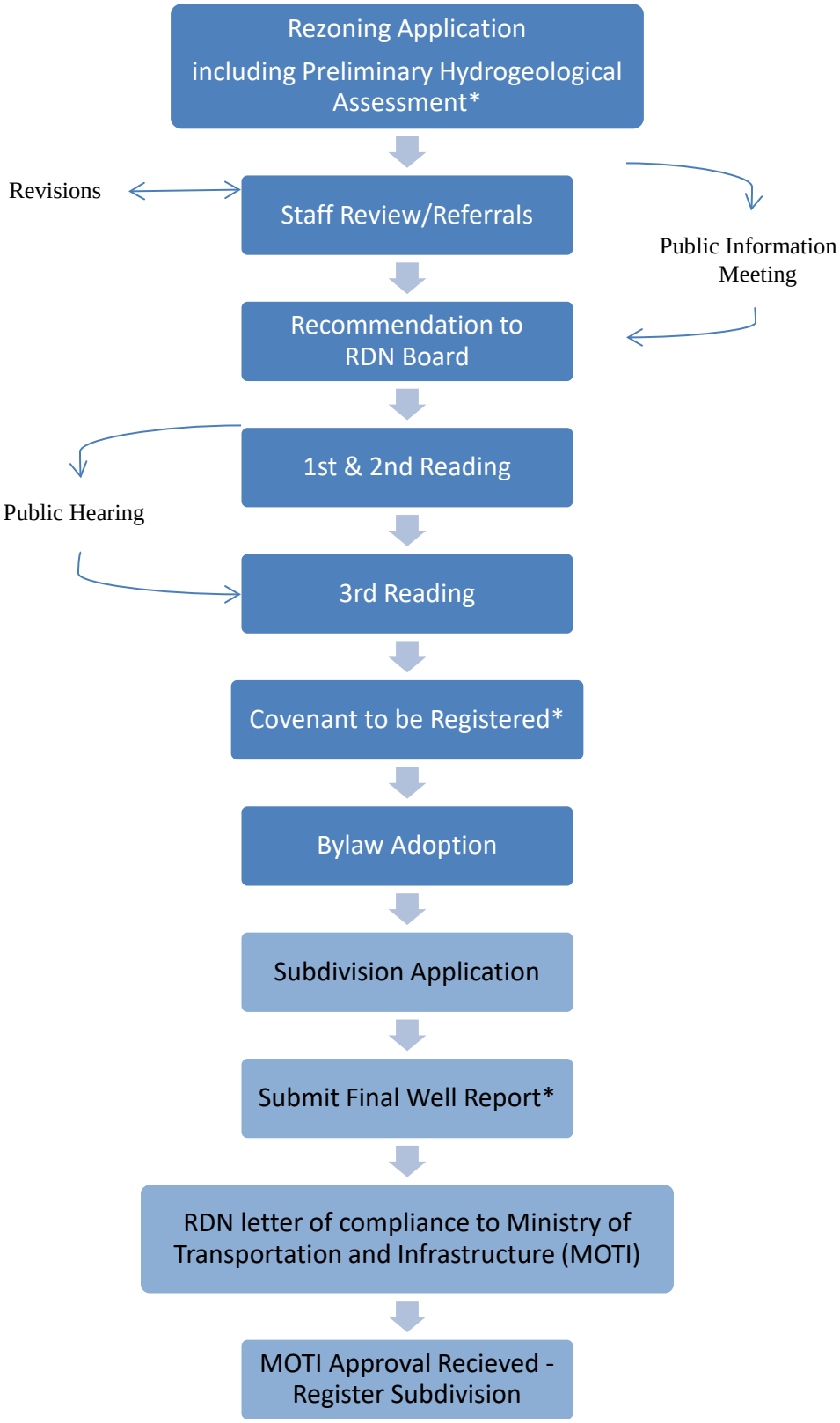
- An approved groundwater license from the Province. This is a requirement of all non-domestic groundwater uses.
- Source approval from the Vancouver Island Health Authority (Island Health), if required. This is required for all drinking water systems other than a single-family home.

These documents fulfill much of what is required for a final well report (Appendix II). The applicant may be asked to provide supplementary information to the groundwater license and source approval as per **Appendix II: Final Well Report Requirements**, if necessary.

C. Development permit application where a hydrogeological assessment is required through the development permit area guidelines

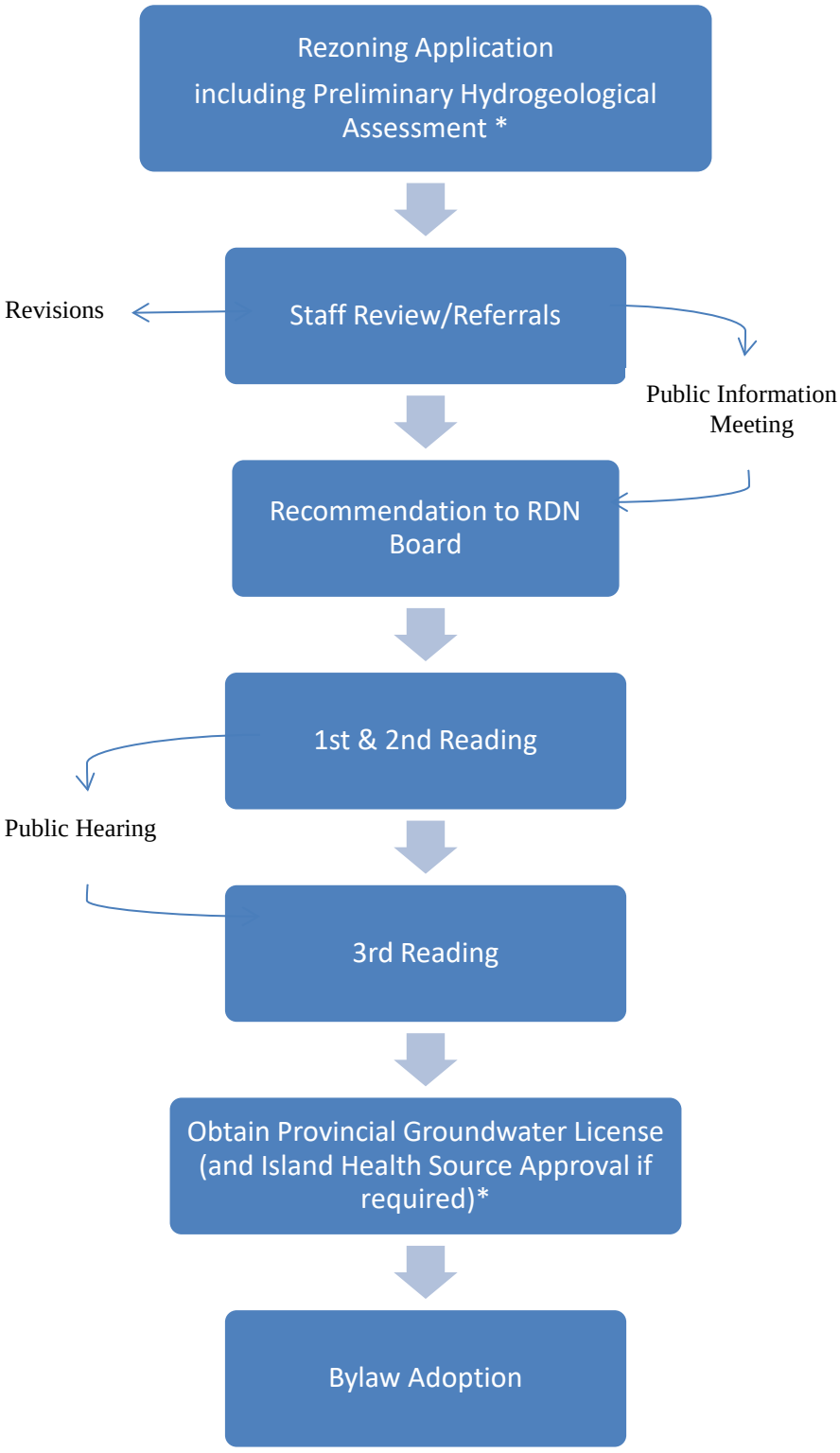
Where a hydrogeological assessment is required for a development permit application, the assessment must address the items listed in **Appendix I: RDN Checklist for Hydrogeological Assessment Reports** in addition to the relevant development permit guidelines.

Figure 1 – Flow Chart for A. Rezoning to Allow Subdivision



* Denotes key requirement of Board Policy B1.21

Figure 2- Flow Chart for B. Rezoning to Allow a Change in Use



* Denotes key requirement of Board Policy B1.21

Appendix I: RDN Checklist for Hydrogeological Assessment Reports

This checklist outlines the elements to be addressed in the preliminary professional hydrogeological assessment reports required for rezoning applications OR for professional hydrogeological assessment reports for development permit applications:

Component	**Details / Sources**
Site Description	☐ Description of the project, site and study area including a description of proposed land use and water use for the site. ☐ Location map including: o topography o aquifer boundaries where mapped o locations of current and proposed wells (production and monitoring) on the site and adjacent properties o location of existing licensed water users (groundwater and surface water) within at least 300 m radius of the property. o locations of watercourses and sensitive environmental features o surrounding land uses
Local Hydrogeology	☐ Description of local geology – bedrock and/or surficial (GSC /NRCAN). ☐ Summary of data on neighbouring wells diverting groundwater (GWELLS or iMapBC). ☐ Description of the aquifer including storativity, transmissivity, hydraulic conductivity (Provincial aquifer classification database, well records, ECOCAT, RDN Water Budget Study, other local reports). ☐ Description of local groundwater regime and its seasonal variations (e.g. measured water level fluctuations from existing observation wells or other monitored wells nearby, if applicable.) ☐ Hydrogeological maps and cross sections illustrating groundwater flow and surface water interaction, if available.
Hydrologic Setting	☐ Description of the local area's climate and a summary of relevant available climate data. ☐ Description of nearby lakes, streams, springs, wetlands in the area. ☐ Description of surface water flux (i.e. streamflow data, lake level data) in correlation to precipitation data and groundwater level fluctuations.
Hydraulic Connectivity	☐ Description of known or potential hydraulic connections to surface water bodies and under what conditions might pumping be likely to impact the quantity of water in those surface water bodies.
Assessment of Adequacy of Supply **[*Only applies to Rezoning]***	☐ For multi-family, commercial, institutional or industrial: provide demand estimates (flow requirements) for the proposed use. ☐ Confirmation that a minimum year-round potable water supply of 3.5 m^3 (3,500 litres) per day can be provided for each new parcel (A) or the proposed use (B). ☐ Use publicly available data and/or referenced literature values to support estimates.
Discretionary:	☐ *If deemed necessary by Professional, considering aquifer stress level and characteristics, provide pumping test results and interpretation. Must follow BC Pumping Test Guidelines and BC Water Sustainability Act and Regulations for time of year, duration, methodology etc.*
Assessment of Quality of Supply	☐ Describe known water quality concerns in the regional and local area. ☐ Include well water test results if applicable; confirm the water quality meets the Canadian Drinking Water Guidelines. ☐ Recommendations for water treatment if applicable.
Assessment of Potential Impacts	☐ Confirm that the proposed well(s) and associated pumping will not adversely impact groundwater resources, existing groundwater users and hydraulically connected streams. ☐ Use aquifer parameters obtained from pumping tests conducted on site or in the immediate area or from other referenced information, if available. ☐ Address the risk of sea water intrusion, if applicable.
Conclusions and Recommendations	☐ Provide recommendations; monitoring and/or management approaches to mitigate aquifer impacts. ☐ Consider innovative options– i.e. rainwater harvesting, stormwater infiltration, efficient landscaping etc.

APPENDIX II: Final Well Report Requirements

The intent of the final well report for **A. Rezoning to facilitate subdivision** is to confirm, once the well(s) is/are installed, that there is a well for each proposed parcel that can provide adequate water and meets current Groundwater Protection regulations. The report must be completed, dated, signed and sealed by a qualified professional and include/confirm the following:

- the date when the well was drilled along with a copy of the driller's log (if available);
- the well identification number as indicated on the plate secured to the well;
- photographs of the well identity tag, 'stick up', and general location of the well;
- that a pumping test has been completed by a registered well driller, registered pump installer or person working under the direct supervision of the well driller, pump installer or professional with competency in hydrogeology, in accordance with the protocols outlined in the BC Guide to Conducting Well Pumping Tests.
- the pumping test is required to have been run for the greater of 12 hours or until the water level stabilizes at the pumping rate of at least 2.5 litres/minute with a well recovery period monitored for the greater of 6 hours or until the water level recovers to a minimum of 90% of its pre-pumping water level. This pumping test must be conducted only during the months of July through October (lowest water table). [Note: if a pumping test was completed on a new well that will service the re-zoned parcel as part of the Preliminary Hydrogeological Assessment it is considered valid for the final well report within 3 years.]
- test results (i.e. chemical analyses from a certified laboratory) of the well water quality as analyzed against the Guidelines for Canadian Drinking Water Quality. The analysis should have been completed within 6 months of the date of the report. The report must also identify where parameters do not meet the Guidelines for Canadian Drinking Water Quality and the qualified professional shall provide recommendations for appropriate mitigation / treatment to achieve a potable quality;
- confirmation that the well meets the current minimum well standards as outlined in the Groundwater Protection Regulation under the *BC Water Sustainability Act,* in particular:
    - is at minimum 30m from potential sources of contamination, including but not limited to: agricultural buildings, septic fields, animal pens/runs, refuse and compost piles, areas of fertilizer/herbicide use or storage, above or below ground storage tanks, and parking areas;
    - is outside of a floodplain, or if within a floodplain measures taken/required to protect the well;
    - is accessible for maintenance;
    - has a secure and watertight cap;
    - the well head is at minimum 300mm above the adjacent finished grade, above the 200 year flood level and the ground around the well head is sloped away from the well casing.
    - a surface seal is installed to prevent surface contaminants from entering the well from outside the casing.

Appendix III: Information Sources for Hydrogeological Assessments – current to February 2019

Provincial Resources

Links Page – Groundwater Science and Data

- GWELLS - Groundwater Wells Search
- BC Water Resources Atlas
- ECO CAT - Ecological Reports Catalogue
- Guide To Using BC Aquifer Classification Maps
- Guide To Conducting Well Pumping Tests
- Determining Likelihood Of Hydraulic Connection
- Modelling Tools For Estimating Effects Of Groundwater Pumping On Surface Waters
- BC Observation Well Network Interactive Map
- Environmental Reporting - Trends in Groundwater Levels in BC

Real-time Water Data Reporting

Regional Resources

RDN Phase 1 Water Budget Study

RDN GIS … Select: Water Map

DWWP Reports Inventory …includes State of our Aquifers Reports

RDN Well Protection Upgrade Rebate