

Onsite Wastewater System Site Assessment

New Commons Development

February 2021

Project No. 21108

Prepared by: BWD Engineering Inc. 20 February 2021

Project Number: 21108

To: New Commons Development

C/O Peter Treuheit – Mobius Architecture email: peter@mobiusarchitecture.ca

Re: Site Assessment to support a Community Onsite Wastewater System for the Purpose of Rezoning – 409 Porlier Pass Road, Galiano Island, BC

As requested, BWD Engineering Inc. has conducted a general site assessment of the above noted property with respect to the installation of a community onsite wastewater system for a 20-unit affordable housing project on the above noted property.

It is the determination of this report that a Type 1 onsite sewerage system suitable for the proposed development can be constructed to meet the current BC Provincial Sewerage System Regulation 326/2004.

The site assessment was based on a site visit of 24 November 2020 and information from the Hydrogeologist Report and Ecological Assessment Report. Soils test pits were excavated on the upper bench. Hydraulic testing and test pits on the lower bench were not completed during this visit due to a windstorm and the site being in the area of many hazard trees. During a walk through, it is believed that the soils on the lower bench as very similar to those of the upper bench. That said, excavation of further test pits and hydraulic testing will be required prior to the detail design phase of the project.

Photos of the soils test pits and a site plan sketch locating the proposed septic dispersal fields are included in the appendix at the end of the report.

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Introduction

The site assessment was undertaken to determine the viability of establishing an onsite wastewater system to support a 20-unit affordable housing project while meeting the BC Provincial Sewerage System Regulation 326/2004. The BC Standard Practice Manual (SPM-V3) is used as the standard of practice. Both hydrogeological and ecological reports were also reviewed for the assessment.

The site inspection visit was made on 24 November 2020. During the visit, 5 test pits were dug down to a bedrock restrictive layer in the upper proposed dispersal field site. Hydraulic testing was not completed during this visit due to a windstorm and the site being in the area of many hazard trees. During a walk through, it is believed that the soils on the lower bench as very similar to those of the upper bench. That said, excavation of further test pits and hydraulic testing will be required prior to the detail design phase of the project.

Site Description

The property is located at civic address 409 Porlier Pass Road, Galiano Island. It stretches from Porlier Pass Road, south to Georgeson Road. Access for the purpose of this study was from an existing drive off Georgeson Road. This is the future planned development access point.

Legal Description:	Lot 1, DL 3, GICD Plan 29196
PID:	001-416-987
BC Tax Folio:	01-764-02163.030

At either road entrance the elevation is about 42 meters ASL. The highest elevation, 76 meters ASL, is at the mid-way point between the two roads. North from the high point the land is quite steep. There is a secondary top-of-bank about 35 meters north and then the land levels out to the ecological sensitive area and the Putter Creek riparian area. South along the driveway is a more consistent gentle slope to Georgeson Road making it easily walkable. Directly south from the high point, the land also slopes quite steep and levels out as it approaches Georgeson Road in the two covenanted areas. An old skid trail exists through this area.

With respect to the placement of a large onsite wastewater dispersal field, the property is quite large, and the restrictive attributes would be considered moderate.

Site Inspection

One site visit was conducted on 24 November 2020. During the visit, 5 test pits were dug down to a rock restrictive layer in the upper bench proposed dispersal field site. Further test pits on the lower bench and hydraulic testing were not completed during this visit due to a windstorm and the site being in the area of many hazard trees.

The area at the south end of the property between the covenant areas, Georgeson Road and building #4 was considered for the dispersal field. The area available does not have the length required and soils may be damaged by traffic on the old skid trial. The area is considered the best location for sewerage collection and if required, treatment tank system as all wastewater produced can reach this area by gravity and it is easy access for pumper trucks and maintenance providers.

On the upper bench, the proposed dispersal field area is from just outside the 30 -meter setback from the well, running north and curving west following the contour lines. The 5 test pits are numbered 1 - 5, south to north.

The soils in all test pits were typical. Fractured rock makes up in excess of 50% of the soil volume with the remaining being primarily loam with well-defined blocky structure. The test pits ranged from 20 cm to 40 cm in depth to the restrictive layer. Percolation rates should be in the 15 - 30 minutes per inch range. The SPM linier loading rate (LLR) table II-27 does not directly apply. Hydraulic testing for linier loading will need to be done for final field design to ensure security of the vadose zone. The soils on the lower bench are expected to be similar. As this area would be more difficult to access, choosing a Type 2 or Type 3 system may contain the field to the upper bench.

The existing well is 30-meters south and up gradient of the proposed upper dispersal field area and is cross and significantly further up-gradient of the proposed lower field area. The expected flow direction of the effluent from the proposed dispersal field areas is primarily north, away from the well. Under the Sewerage System Regulation, the well is not considered a high pumping rate community well, so the 30-meter setback is adequate.

The closest neighboring well is a further 50+ meters away in the south-east direction. All other neighboring wells are significantly further away in all directions. There are no known wells north, down gradient, of the proposed dispersal fields and south of Porlier Pass Road and Putter Creek.

Design Criteria

The proposed development includes two studio suits, ten 1-bedroom units, four 2-bedroom units and four 3-bedroom units. Based on the BC Sewage System Regulation, Standard Practice Manual Version 3, the complex is expected to house an average of 52 people, leading to a peak daily design flow of 13,650 L/d of residential sewage. This peak design flow incorporates a safety factor of 1.5, thus the actual average daily flow expectation is 9,100 L/d. The safety factor is required under the Sewage System Regulation to allow for periods with larger numbers of people. These flows are in line with the actual flow requirement for the well to provide for a community of this description per the Hy-Geo Report and the water management plan per the Gwaii Engineering Report.

Site Constraints Specific to Onsite Wastewater Systems

Proper system design requires that the dispersal fields provide for the final treatment of effluent prior to its reentering the ground water at large. This is accomplished by ensuring the effluent

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passes through suitable airable native and/or constructed soils prior to contacting a restrictive layer, ground water or surface break out point. The BC Standard Practice Manual reference to specific setbacks, loading rates, and vertical separation is used to ensure this is accomplished. To meet this objective on this property, constructed vertical separation will be required. This is a standard practice in the province of BC.

Proposed System Design

Components such as septic tanks, collection piping and treatment systems are not fully resolved at this time. The standard design for this type of community for collection, septic retention and effluent treatment would have a dedicated septic tank for each structure, effluent would then flow by gravity to an equalization/pump tank, with time-dose pumping to the field areas. The control system will include a data recorder to monitor system operation most specifically flow rates.

The system overall sizing is based on the 20 residences as defined above. The dispersal fields size and locations are proposed based on industry standards for volume of residential sewerage generated and site constraints considered.

As noted above, the peak Daily Design Flow for the 20 residences is 13,800 L/day. This volume is used to size all components of the system, most importantly the dispersal field.

The proposed dispersal field areas will be of a mound construction with an infiltrative area 2 meters wide X 60 meters long each. There will be sloped fill on the upgradient side and a longer sloped fill on the down gradient side with a down gradient mantel extending a minimum of 7.5 meters. The estimated total area will be approximately 12 meters X 65 meters for each field.

Due to the system being large and above grade it will require uniform distribution and time-dose pump control. These are standard requirements and used extensively throughout the province.

Conclusions and Recommendations

It is the determination of this report that a Type 1 onsite wastewater system suitable for the proposed development can be constructed to meet the current BC Provincial Sewerage System Regulation 326/2004.

The following recommendations are offered:

As the soils vary in depth across the proposed field area, during construction great care must be taken to ensure final treatment, infiltration and reduce possibilities of down slope break out are accommodated.

Once access to the lower proposed field area is available, further test pits can be conducted at this location to assess it, confirming the amount of constructed vertical separation required.

Limitations

This report is prepared for the exclusive use of the Client and provides an assessment based on the information contained herein. The assessment is intended to evaluate the proposed property for compliance with standards of practice as laid out in the BC Sewerage System Regulation under the Health Act. The interpretations and inferences, concerning the site contained in this report, are based on information provided and information gathered during the site visit as presented herein and are based solely on the condition of the property at the time of reference.

The findings and conclusions documented in this report have been prepared for specific application to the noted rezoning application and have been developed in a manner consistent with the level of care exercised by Wastewater Professionals currently practicing under similar conditions in the jurisdiction. BWD Engineering makes no other warranty, expressed or implied.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. BWD Engineering accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

If new information is discovered during future work, including excavations, soil boring, or other investigations, BWD Engineering 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.

Closure

We trust the professional opinions and advice in the report are sufficient for your current requirements. Please note there are restrictions and limitations that apply to the scope of our service and conclusions provided herein, as outlined above. Should you have any questions, or if we can be of further assistance in this matter, please contact the undersigned.

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References

- British Columbia Government. 2010. Public Health Act Sewerage System Regulation (SSR). Accessed online: <u>http://www.bclaws.ca/civix/document/id/loo97/loo97/22_326_2004</u>
- Hy-Geo Consulting Report Results of 2020 Pump Testing of Well WID 23204 at 409 Porlier Pass Road, Galiano Island, 9 December 2020

Terrawest Environmental Consulting - Phase 1 Environmental Site Assessment, 20 Nov. 2020

Gwaii Engineering Ltd. - Galiano Green Water Management Plan Report, 15 February 2021

Appendix A: Site Reconnaissance Photos

Photo I:	to I: Test Pit 01 – Looking North Along Proposed Field Area No. I	
Photo 2:	hoto 2: Test Pit 02 – Typical Depth to Bedrock and Soil Structure	
Photo 3:	noto 3: Test Pit 03 – Looking East, Down-Gradient	
Photo 4: Test Pit 04 – Looking South East		
Photo 5:	Test Pit 05 – Looking North West	



Photo 1: Test Pit 01 – Looking North Along Proposed Field Area No. 1



Photo 2: Test Pit 02 – Typical Depth to Bedrock and Soil Structure



Photo 3: Test Pit 03 – Looking East and Down-Gradient



Photo 4: Test Pit 04 Looking South East



Photo 5: Test Pit 05 – Looking North West

Appendix B: Site Plan



