



09 November 2020

Mayne Island Housing Society  
274 Mariners Way  
Mayne Island, BC, V0N 2J2

Attn: Ms. Deborah Goldman

**Re: Site Assessment for the Purpose of a Community Onsite Wastewater System for Subdivision Development and Rezoning – 375 Village Bay Road, Mayne 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 10 unit affordable housing project on Lot 1 of the propose subdivision.

### Summary

It is the determination of this report that an 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 three site visits and information from the Hydrogeologist Report and Ecological Assessment. Soils test pits were excavated, and base hydraulic testing was completed.

### Introduction

The site assessment was undertaken to establish the viability of establishing an onsite wastewater system to support a 10-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 visits were made on 18 August 2020, 7 October 2020 and 4 November 2020. The first visit was contained to the proposed property. During the second visit the area along the road east of the proposed property was

investigated. During the third visit, hydraulic and dye testing was done to ensure water entered into the soils would not break out on the lower wet areas.

### Site Description

The proposed subdivided property is located at 375 Village Bay Road, Mayne Island. It is the westerly 1.2145 ha (3 acre) portion of the land "Lot B, Section 7, MICD Plan 27091".

The land is at its highest elevation at Village Bay Road. North from the road the land slopes quite steep for between 20 and 40 meters at which point the slope is reduced but continues to the north end of the property. Much of the property is wet, some areas with standing water. The dry area suitable for an onsite infiltration field is along the high area close to and parallel with Village Bay Road. No other area on the property is suitable.

### Site Inspection

During the first visit, three test pits were dug along the south bank, one in the log sorting area and more north in an area that looked like it may be suitable. It was determined that the only suitable area was high along the bank parallel to the road. Subsequent review of the size of system required and the available area lead to a second visit to investigate the area further east off the proposed property paralleling the road. Three more test pits were dug for a total of six in the area selected.

The six test pits ranged in depth between 45 and 150 cm, were located between 10 and 40 meters from the road where the excavator was able to reach and from east to west covered 90 meters of length. The test pits confirmed typical soils found on the island, fractured rock and some bed rock.

Test pit 1 (most easterly) was high on the bank but in a small depression area with silty clay as the lowest exposed horizon. There was minimal ground water noted at the clay horizon, but during the second visit surface water was observed having run into the pit confirming the clay as a restrictive layer. Test pits 3 and 4 were high on the bank. These two test pits would be most representative of the proposed area for the dispersal field as the other pits (4, 5 and 6) were much lower down the bank. The soils in test pits 3 and 4 were shallow and fractured rock was very prevalent. On initial excavation there was no ground water and during the final visit, no water had collected. Test pits 4, 5 and 6 were near the bottom of the bank. They were on the edge of the wet area and had clay restrictive layers. On subsequent trips, they held water to the top of the clay layer.

The soils at all test pits were heavily permeated with roots and fractured rock making perc testing unreliable. Soil samples were taken to be sent to a lab for analysis, the results of which are not available for this report. Hand texturing of the soils indicate a combination of silt loam and some sandy loam.

During the third visit, large quantities of water with dye was introduced to each test pit. The test was to determine if any of the water introduced would break out on the surface near the bottom of the bank in the wet areas. The area was observed for the next two days by Bill Warning. He reported no dye observed until the second day and only at test pits 4 and 5, which was expected as these pits are located at the bottom of the bank very close to standing water. These pits were not representative of the proposed infiltrative area of concern.

Neighbouring wells are in excess of 150 meters to the north. There are 3 existing wells on the property of which only 1 is on the proposed subdivided property. The closest is a dug spring 40 meters north and east of the east end of the proposed dispersal field. The other is at the existing residence over 150 meters to the north east. The new well was drilled on the proposed property approximately 100 meters to the north.

### Design Criteria

The proposed development includes four 1-bedroom units, five 2-bedroom units and one 3-bedroom unit. It is expected to house an average of 26 people, leading to a daily design flow of 6,900 L/d of residential sewerage. This flow is in line with the flow requirement for the well to provide for a community of this description.

Originally the intention was to have the entire system within the boundaries of the proposed lot. Due to the infiltration area required, the field area available now extends onto the original property to the east parallel to the road. At the time of subdivision, an easement on the remaining lot should be applied to the title for use of this area.

### Site Constraints Specific to Onsite Wastewater Systems

Proper system design requires that the dispersal field provide for the final treatment of effluent prior to its reentering the ground water at large. This is accomplished by ensuring the effluent 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 and vertical separation is used to ensure this is accomplished.

The primary site constraint of concern is the liner loading rate which dictates the length of field required. The native soils are typically a silt loam, loam, sandy loam or of minimal existence. In the areas of silt loam which would require more length than is available, the soils are removed and replaced with constructed soils. This increase the effective liner loading rate in that location, thus shortening the required field length to within the length available.

### Proposed System Design

Components such as septic tanks, collection piping and treatment systems are not fully resolved at this time. The system overall sizing is based on the 10 residences as defined. The dispersal field size and location are proposed as is distribution and controls.

As noted above, the Daily Design Flow for the ten residences is 6,900 L/day. This volume is used to size all components of the system, most importantly the dispersal field.

The proposed dispersal field is of a mound construction with an infiltrative area 2 meters wide X 80 meters long. There will be sloped fill on the upgradient side and a longer sloped fill on the down gradient side with a mantel extending a minimum of 7.5 meters. The estimated total area will be approximately 12 meters X 90 meters.

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

At this stage, treatment level is expected to be Type 2, but Type 3 treatment may have some advantages once the final site plan is complete.

## Conclusions and Recommendations

It is the conclusion of this report that a system of this size can be installed on the property if extended to the east beyond the proposed property line.

The following recommendations are offered:

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

Once the main driveway is roughed in, further test pits should be conducted at the west end of the proposed field area.

## Limitations

This report is prepared for the exclusive use of the Mayne Island Housing Society 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 subdivision and 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.

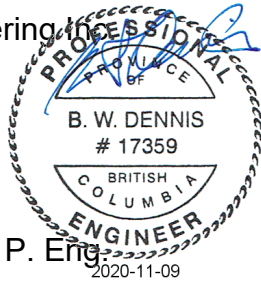
If new information is discovered during future work, including excavations, soil boring, or other investigations, BWD Engineering should be requested to re-evaluate the conclusions of this report and to provide amendments, as required, prior to any reliance upon the information presented herein.

Closure

We trust the information provided is sufficient for your consideration. Should you have any questions or comments, please contact the undersigned.

Sincerely

BWD Engineering

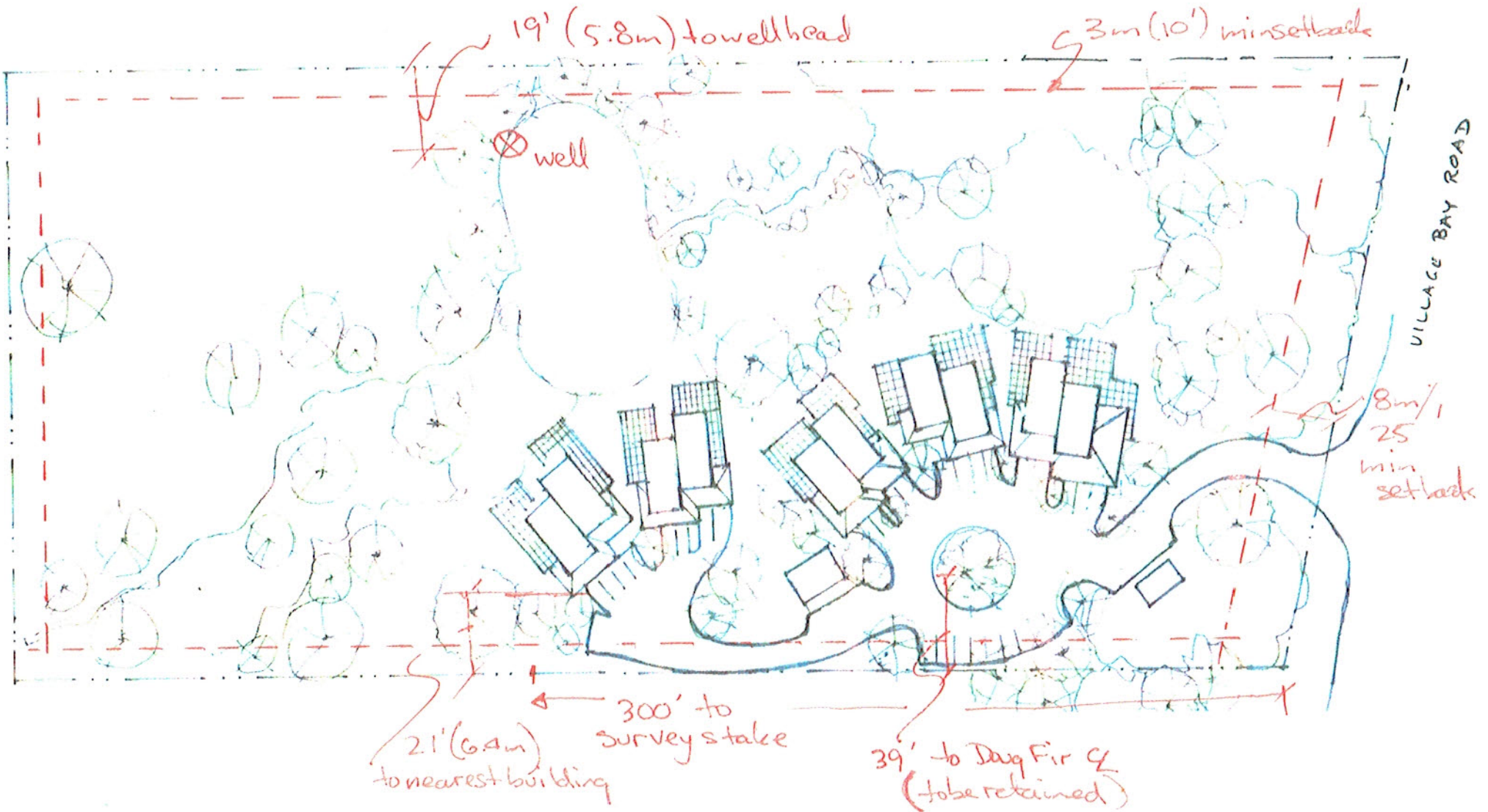
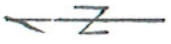


Brent Dennis, P. Eng

Attachments:

1. Way Mayenburg Land Survey (Proposed septic field & well are added)
2. Site Plan (Driveway will be relocated to accommodate septic field)





SITE PLAN  
9-11-20