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March 18, 2023 H_2O File: 23-3

Triple Rock Land Cooperative
Denman Road
Denman Island, BC V0R 1T0

Re: Feasibility of Additional Wastewater Systems
Triple Rock Land Cooperative Property

Introduction

H_2O Environmental (H_2O) was asked to assess whether there is adequate space and soils for additional wastewater systems at the Triple Rock Land Cooperative (COHO) property (site). H_2O understands that COHO is planning for additional households that may result in up to five more wastewater systems being installed at the site.

H_2O has designed all the wastewater systems that exist at the site and is familiar with the soil characteristics as they pertain to wastewater dispersal and treatment.

In the bylaws for COHO, all residential toilets must be composting toilets. With this bylaw in place, H_2O can reduce the overall rated outflow from dwellings by 30%, which is the industry accepted value of the contribution to Daily Design Flow of a standard flush toilet.

Wastewater System Design

The general design of the greywater systems consists of a 2 chamber septic/pump tank with an in-ground dispersal field. The first chamber of the tank is used for settlement and the second is used for additional settlement and pumping to the pressurized dispersal field nearby. Tanks are sized in accordance with the BC Manual of Composting Toilet and Greywater Practice. The dispersal fields are designed consistent with the current Sewerage System Standard Practice Manual, Version 3.

The dispersal fields will range in size, depending on the soil characteristics and the daily flow from the dwelling. Generally speaking, the fields will consist of two or three PVC laterals with drilled orifices of specific diameter, placed on top of aggregate that is approximately 15 to 20 centimetres (cm) deep. These PVC lines are used to uniformly spread the effluent over the entire field area at every dose.

The systems are set to be socially controlled. That is, when a specific level of effluent is reached in the tank, a pump cycle occurs which transfers effluent from the tank to the dispersal field. The specific level in the tank is calculated for an 8 dose/day frequency, based on the Daily Design Flow. A generalized view of a wastewater system dispersal field is attached to this letter as Figure 1.

In previous work, the soils at the site were found to be loam to sandy loam with depths to bedrock varying from 80 cm to 100 cm below grade. The topographical grades vary throughout the site. These types of soil are very conducive to proper treatment and final polishing of the effluent. The moderate permeability rates, the speed with which the effluent moves through the soil, ensure that the effluent will have time to be adequately treated before moving horizontally down gradient.

Discussion

The COHO bylaw that limits use to composting toilets reduces the overall use of water in the dwelling. This, in turn, reduces the size of the tanks and dispersal fields necessary to safely treat and disperse the greywater.

Additionally, using the in-ground wastewater system model, which returns the treated water to the ground, where it is polished by the soil and returned to the local aquifer, the overall impact of water use is greatly reduced.

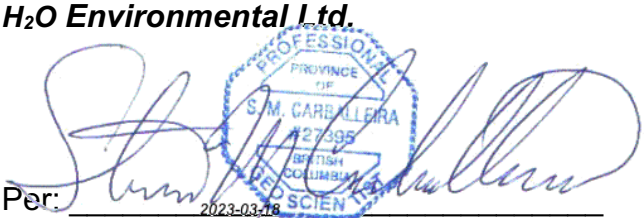
Soils vary in all locations. Generally speaking, during a review of the designs for other dwellings on the site, the soils were fairly consistent, with depth to bedrock varying the most. While this is no guarantee of similar soils in the new areas, H_2O is confident that greywater wastewater systems can be installed in the new areas of residence.

Conclusions

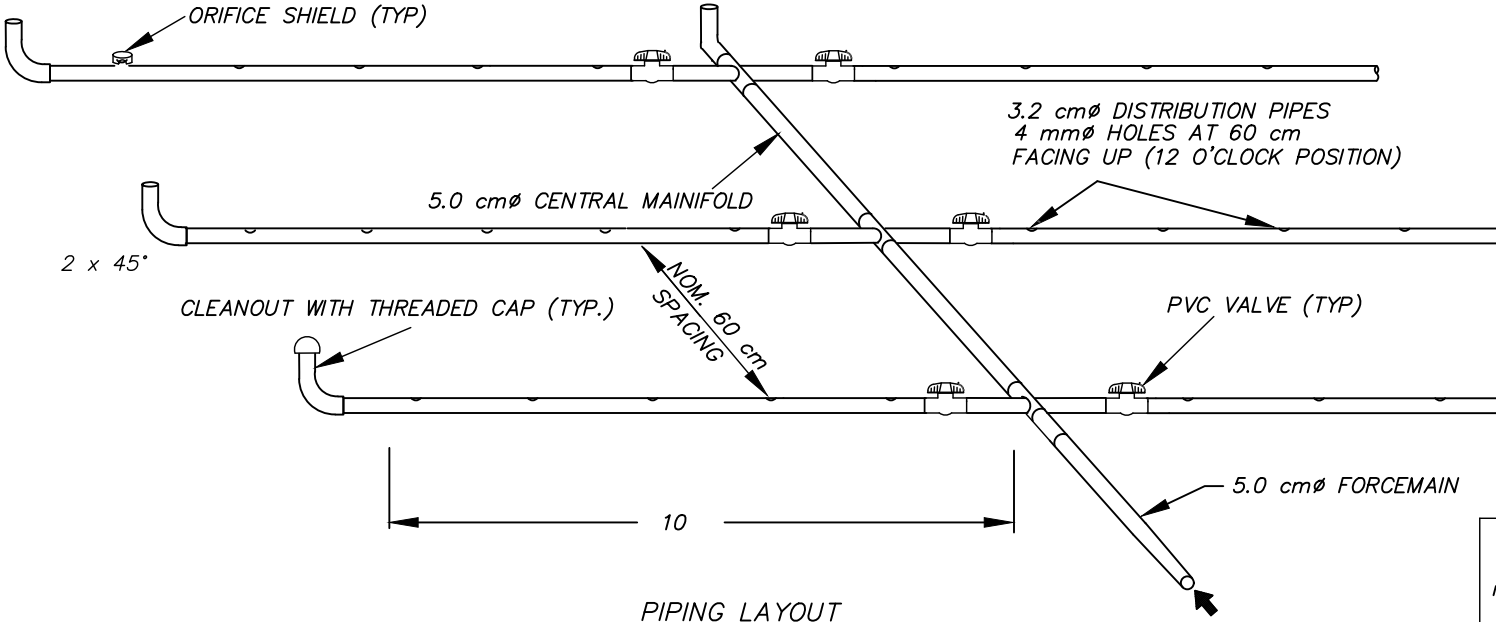
H_2O believes that the additional dwellings being proposed for the overall site can be serviced by greywater systems that will safely treat and disperse the effluent back into the environment.

H_2O recommends that a certified maintenance provider be contracted who will regularly inspect and, if necessary, repair the greywater systems on the site. Regular maintenance is critical for safe, sustainable operation of wastewater systems.

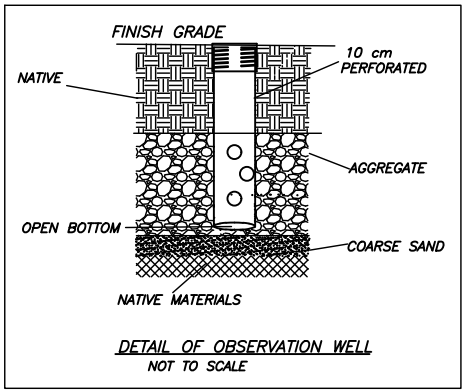
Sincerely,
H_2O Environmental Ltd.



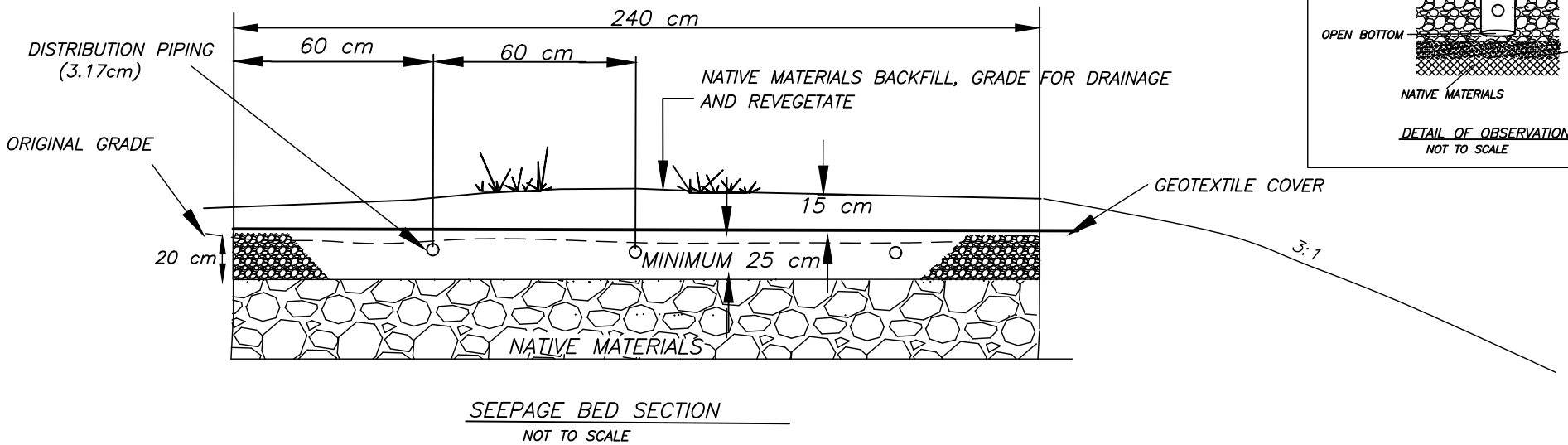
Per: _____ 2023-03-18
Steven M. Carballeira, P.Geo.
Permit to practice #1001460



PIPING LAYOUT
NOT TO SCALE



DETAIL OF OBSERVATION WELL
NOT TO SCALE



SEEPAGE BED SECTION
NOT TO SCALE

NOTES:
1. In case of discrepancies between drawings and specifications, specifications will govern.
2. All measurements in metres, except as noted.

TITLE: SHALLOW SEEPAGE BED PLAN	DATE:
	DESIGN BY: SMC
PROJECT: GREYWATER SYSTEM DESIGN	DRAWN BY: SMC
	SCALE: NTS
CLIENT:	PROJECT NO.:

H2O ENVIRONMENTAL LTD

FIGURE 1

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