

Your Name and/or Company

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Maintenance Plan for Sewerage System at 2222 Raven Road, Nanaimo, BC

January 31, 2015

Info for the Owner:

Maintenance of sewerage systems is a regulatory requirement. Owners are required to ensure sewerage systems are maintained as per the Maintenance Plan filed at the local Health Authority. This maintenance plan becomes a prescription – detailing the allowable flow volumes and the specific maintenance procedures that are required for compliance with the Sewerage System Regulation.

The Sewerage System Regulation also stipulates that maintenance must only be performed by Authorized Persons. Check the Applied Science Technologist's and Technicians of BC (ASTTBC) website for a current listing of Authorized Persons (<http://owrp.asttbc.org>). My recommendation for an Authorized maintenance provider is Acme Services (250 248 1234).

I recommend an initial maintenance service within six months of system start up. Afterwards, the **minimum required frequency of maintenance for this type 1 system is every 24 months.**

Please see the drawings and owner's manual attached. Feel free to contact me if you require copies of any of these documents or if you have any questions or concerns.

Info for the Maintenance Provider:

System Overview:

- Daily design flow (DDF) for this system is 1890 L/day. Required treatment is type 1.
- See the attached as built drawing for accurate dimensions indicating the location of all serviceable components.
- The original 750 gallon concrete septic is reused, with new risers and access lids. A new 600 g, 2 compartment concrete tank is added to increase retention capacity. An effluent filter is included.
- The pump chamber is a new 450 g concrete tank, with a Myers ME 75 effluent pump ... controlled by weighted floats and a Rhombus control panel, set to demand dosing. The pump chamber includes a check valve, union and force main shut off valve.
- The dispersal system is a sand mound with 2.7 m x 18 m rock filled dispersal bed with three - 32 mm diameter (1 ¼") laterals, centre feed manifold with cleanout, lateral isolation valves (6) and lateral cleanouts (6). Orifice shields are used over 3/16 inch holes. Infiltrative surface observation ports (2) are included. All valves, cleanouts and the observation ports are in 6 inch lawn boxes.
- Flow monitoring by the Rhombus panel is by cycle count and elapsed run time. Flow should be less than or equal to average flow allowance = ½ of DDF = 945 L per day, determined by multiplying the cycle count X dose volume of 230 L per dose.
- Required total dynamic head (for pump replacement) is 45 feet with required minimum pump flow of 55 us gpm.

Commissioning Details:

- The dosing control panel record at commissioning (January 19, 2015) is as follows:
 - elapsed run time of 0 hours, 5 minutes (Et 00:05)
 - cycle count of 15 (CC 15)
 - alarm count of 5 (Al-ctr 5)
 - float error count of 3 (Fe-ctr 3)
 - pump run time per dose approximately 45 seconds

The MP needs to deduct these cycle counts, alarm events etc. from the data recorded by the control panel at subsequent maintenance visits, to determine the flow monitoring volume and number of alarm events in the intervening period. The MP should record the panel data at each maintenance service to track the usage volume and alarm events over time.

- Dispersal field squirt height at commissioning was approximately 56 cm (22 inches) above the finished cover soil.

The MP should assess any discrepancies from these squirt heights at subsequent maintenance visits. Differing squirt heights could indicate either clogged orifices resulting in higher squirt height, or leaks resulting in lower squirt heights, or other problems affecting residual head.

- Float settings measured as height of liquid from the base of the pump are as follows:
 - off float setting at 45 cm (18") in the partially down switching position
 - on float setting at 59 cm (23") in the partially up switching position
 - alarm on float setting at 76 cm (30") in the partially up switching position

The MP should ensure these float settings remain in place at every maintenance service.

Maintenance and Monitoring Requirements:

The Maintenance Provider must complete a report for the owner of the house confirming all maintenance tasks were completed and including control panel data records. Any problems should either be fixed immediately or reported to the owner with recommendations and cost estimates for repairs. The Maintenance Provider must perform the maintenance tasks and performance checks as listed on the following pages.

Prescribed Minimum Maintenance Tasks:

Tanks and Controls:

- REMINDER: Be aware of electrical hazards ... tripping and falling hazards from open lids ... protect bystanders, kids, dogs etc.
- Check flow volume recorded at the Rhombus control panel with cycle count multiplied by dose volume of 230 L, not to exceed average daily flow of 945 L/day.
- Check alignment, condition and proper operation of inlet and outlet baffles in the septic tank.
- Confirm no trickle flows when plumbing fixtures are off ... confirm no leaking toilets, no dripping faucets, no groundwater infiltration.
- Clean fats, oil, and grease from inlet baffle.
- Measure to confirm that the combined volume of sludge plus scum is one third or less of the total first compartment volume. Pump out only if this volume (1/3) is exceeded, or if other conditions

indicate a need for pump out, such as significant solids have carried over to the second compartment, the scum layer is significantly hard, or if there are excessive fats or other materials harmful to the treatment and dispersal processes.

- Look for signs of backups and exceeding recommended flows, excessive household use of materials harmful to bacteria, unusual solids build up, non-biodegradable materials, assess fats, oils and grease. Discuss any indicated usage issues with the owner.
- Inspect and clean the effluent filter.
- Examine the pump chamber and controls.
 - Inspect internal components of the dosing control panel and all electrical connections of control floats, power source for panel, power supply to the pump for corrosion/condition/safety. Also check the junction box adjacent to the pump chamber.
 - Confirm proper sealing of electrical conduit to pump chamber - must be adequate to completely prevent any passage of moisture or gases to the junction box. Confirm no moisture in the control panel or electrical junction box.
 - Clean the control floats and exposed portions of the pump and wires.
 - Check pump chamber float height settings for off, on and alarm events - must be at the original design heights (± 1 cm) as listed on page 2 of this maintenance plan. Note that the specified height of floats refers to either the partially up or partially down position corresponding to the proper switching position for the float ... DOWN for the off float (roughly equivalent to bottom of the attached weight) and UP for the on float and the alarm float (roughly equivalent to the top of the attached weight).
 - Test the high level alarm by raising the alarm float. Also test the external alarm test function on the panel by operating the spring loaded test switch located on the outer left side of the panel.
 - Test the manual pump over ride function inside the control panel by operating the HAND button.
 - Assess solids build up in the bottom of the pump chamber - there should be little or no measurable solids and no foreign objects that could interfere with proper pump operation. Clean out if necessary.
 - Run the pump to confirm proper operation. The specified float settings should result in a demand dose run time of approximately 45 seconds.
 - Confirm leak free condition of the union and all other piping within the chamber. Note that there is an anti siphon/air removal orifice which will 'squirt' during pump operation ... and confirm that this hole continues to be clear and effectively allows air to flow.
- Confirm continued protection of tanks, no traffic or structures, suitable drainage, etc.
- After service, remember to record the panel records of cycle counts, elapsed run time, float errors, alarm counts. Be sure that the AUTO function is set, confirm that the breaker inside the panel is ON, and secure both covers - the inner cover for the internal electronics and the outer panel door.
- After service, ensure all tank lids are properly secured.

Dispersal System:

- Inspect the dispersal area for any signs of leaks or breakout.
- Flush the system using the effluent pump - first through the 51 mm (2") manifold cleanout with all lateral valves closed, then each lateral individually with the distal cleanout caps removed and only one lateral valve open during each flushing cycle to increase the scouring velocity in the lateral. Discharge at least 2 times the lateral volume or until the discharge is clear.
- Then install temporary threaded caps with 3/16 inch orifices at lateral cleanouts and perform squirt test with all lateral valves open - check to ensure that squirt height is similar to height at commissioning. A lower squirt height may indicate leaks, pump wear or other problem causing increased head or reduced flow volume. A higher squirt height is an indicator of clogged orifices.
- Confirm continued protection of the dispersal field - with no structures, no heavy traffic, appropriate vegetation and landscaping, no erosion, no groundwater or surface water flows that could interfere with proper operation of the dispersal field.
- Inspect the infiltrative surface observation ports. There are two within the dispersal system (see the as-built drawing), installed with the bottom of the port approximately 5 cm (2 inches) below the infiltrative surface. This is intended to assess long term clogging of the receiving soil. Within a few minutes after a dose, there should be little or no ponding of effluent at the infiltrative surface. Contact the Planner if water persists in the observation ports.
- After service, don't forget to remove the drilled test caps; ensure all cleanout caps are in place and confirm that all valves for the dispersal laterals are open. Ensure all lawn box lids are in place.