

4.2 Capacity of Existing Wastewater System

This section provides a summary of the results of the wastewater system analysis with respect to the existing capacity of the Lantz Sewage Treatment Plant, the pumping stations and forcemain and the gravity collection system.

4.2.1 Sewage Treatment Plant

As discussed in Section 3.1, the volumes of the three wastewater treatment cells have been calculated to be: 7.9 Musgal for Cell 1, 11.3 Musgal for Cell 2 and 18.5 Musgal for Cell 3 for a total volume of 37.7 Musgal. Using these lagoon-cell volumes and the treatment efficiency calculation recommended in the Nova Scotia Standards and Guidelines Manual and a design BOD concentration of 200 mg/L (which is a typical design value), the treatment capacity of the lagoon was determined to be 1,140,000 USGPD (average daily flow). It should be noted that CBCL Ltd. indicated that, by contrast, the volume of the lagoons is 40.5 Musgal and the capacity of the lagoon is suitable for a total flow of 1,494,000 USGPD (population of 15,000 persons at an average unit flow rate of 100 usgpcd) based on a design BOD concentration of 180 mg/L. It can be concluded from this evaluation that the capacity of lagoons will depend on the future organic strength of the wastewater and is likely to be in the range of 1.1 to 1.5 Musgpd for a serviced population of 14,400 to 15,000 persons).

The above capacity calculations were based strictly on the hydraulic retention time (i.e., volume of the lagoon cells). The existing aeration system, including the blowers and the static tube aerators, were only designed to provide oxygen to treat the flow from a serviced population of 9,000 persons at a per capita flow of 100 USGPD for a total flow of 900,000 USGPD (based on a design BOD concentration of 180 mg/L). Therefore, once the loading to the lagoon reaches this value, the aeration system will be inadequate to supply sufficient oxygen for the biological reactions and additional aeration will be required. The upgrades to the aeration system have been incorporated into the future infrastructure requirements.