APPENDIX 12.01

Sludge Estimation at Relocated Sha Tin STW in Caverns

Primary Sludge

- Estimation based on design flow (340,000 m^3/d) and TSS concentration (raw sewage TSS = 300 mg/L)
- TSS removal rate of 60% in primary sedimentation tank is adopted; hence primary sludge production = 340,000 m^3/d × 300 mg/L × 60% / 1,000 = 61,200 kg/d (dry solids)

Secondary Sludge

- Estimation based on design flow, primary effluent loading, and biological treatment process.
- Biowin model is adopted to estimate secondary sludge production, which took into account of influent flow rate, BOD loading (~51,000kg/d), inert TSS (~ 40 mg/L) and biofilm detachment (~ 3.3 g/m^3/hr) in sludge calculation.
- The simulated effluent TSS is approx. 130 mg/L; the design TSS effluent target is 15 mg/L (average); TSS removal rate of 90% is adopted in solid/liquid separation; hence secondary sludge production = 340,000 m^3/d ×130 mg/L × 90% / 1,000 = 39,800 kg/d.

Total Sludge Production

- Total primary and secondary sludge = 61,200 + 39,000 = 101,000 kg/d
- With an estimated dry solid content of 30%, the weight of dewatered sludge is approximately 340 tonnes per day at the ultimate design flow of 340,000 m^3/d.