

High Efficiency Sediment Basins for Quarries – A win for the environment and the operator's bottom line

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ABSTRACT:

Stormwater runoff during quarry operations typically needs to be directed to a sediment basin under licence conditions. Existing design standards in Queensland specify basins to be sized to cater for the 1 in 5 year ARI, 24 hour storm event generating a basin size of approximately 25% of total catchment size. These basins are difficult to place on space-constrained sites whilst also being very expensive to build, maintain and operate, with manual dewatering timeframes playing a significant role in treatment performance. This presentation will put forward an innovative new basin design incorporating an automated coagulant dosing system that can dramatically reduce the required basin footprint to one quarter the size of a traditional basin whilst offering better environmental outcomes and reduced operational costs.

Studies into new basin designs carried out by O2 have built on previous work by Auckland Regional Council, Sunshine Coast Regional Council and others. The new designs utilise a continuous flow system which automatically doses coagulant to inflow as it enters the system. The water slowly travels through the basin allowing colloidal particles to settle out prior to discharging via floating offtakes at the downstream end of the basin that skim clean water from the surface. O2's work has shown that substituting current 'batch treatment' basin designs with the 'High Efficiency Sediment' (HES) basin concept can result in the much more effective removal of suspended sediment than was previously the case. This makes smaller basin sizes possible whilst maintaining or increasing sediment removal efficiency. It is therefore O2's recommendation that HES basin designs be recognised as a cost effective and environmentally sound alternative to traditional sediment basins and are implemented in locations accordingly.

