'Out with the old, in with the new' – Upcycling a terminally ill GPT

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Abstract Overview:
In recent decades a large number of Gross Pollutant Traps (GPTs) have been constructed in the Sydney metropolitan area, primarily by local government. Experience shows that some GPTs have not had the benefit of adequate master planning and/or rigor in the design, locating and construction process. This has led to poor outcomes on the ground and increased risk for the asset owner, i.e. local government.

Much has been learnt through the design, construction and auditing of the ever growing number of GPTs. The existing CleansAll in Little Young Street, Cremorne constructed by North Sydney Council in 2003 had a long and sordid history with numerous problems. Optimal Stormwater recommended that it be decommissioned in an audit of Council's GPTs in 2015.

The CleansAll had underperformed since installation. It was simply the wrong GPT for the site. The sump was too small and it was prone to bypassing, sending pollution downstream. It was subject to frequent surcharging and no amount of persuasion could keep the lids in place. The project was so fraught with difficulties and delays that it even bankrupted the contractor!

In the end, the CleansAll proved to be poorly constructed and there was visual evidence of it literally falling apart. The precast components of the GPT had actually separated due to ground subsidence. The CleansAll was also particularly difficult to clean. Ultimately, Council was paying a lot to maintain an underperforming stormwater asset that had minimal benefit to the environment and a constant source of complaints from the community.

Objectives:
North Sydney Council made several attempts to rectify the CleansAll, but none were overly successful. After exhausting all the options, Optimal Stormwater was engaged in 2016 to design a solution for the site that would improve the quality of stormwater coming off the 47ha urban catchment. Several alternatives where compared and it was recommended that the existing CleansAll be upcycled to a CDS Unit, which was determined to be the most suitable propriety GPT for this site owing to its hydraulic efficiency, storage capacity and ease of cleaning.

Method:
The site had numerous constraints and Optimal Stormwater identified all sources of risk to formulate the most practical, safest and economical construction methodology. Ground conditions presented the greatest challenge. There was a real risk of subsidence from poorly compacted soil and a novel approach to shoring was required. The subsurface was known to be inconsistent and composed of fill, being sand, clay and construction waste. Optimal

Stormwater needed to mitigate these risks during construction for the safety of workers and to ameliorate the complications for North Sydney Council.

Results:
The diversion chamber and sump of the CleansAll were reengineered to serve as the inlet/outlet structure for the CDS Unit. As a way to dispose of the CleansAll, it was filled with excavated spoil. The stainless steel baskets of the CleansAll were sent to a metal recycler. The newly installed CDS Unit significantly improves both the capture and retention of gross pollutants from the catchment, greatly enhancing the quality of stormwater discharging to Sydney Harbour. It also eliminates surcharging at the site and subsequent impact on the reserve and public safety.

Conclusion:
To our knowledge the decommissioning and transformation of a poorly performing CleansAll to a CDS Unit has never been designed or carried-out anywhere in Australia. This project is on the cutting edge of GPT design and construction. It clearly demonstrates that an asset owner is not necessarily 'stuck' with a poorly performing GPT, but that a cost effective option(s) to upgrade it at much less cost than constructing a wholly new GPT may well exist.