

Wastewater inlet works structural condition assessments – lessons learned

J Wilson¹

¹Whitsunday Regional Council, Proserpine, QLD

Whitsunday Regional Council and Mackay Regional Council, neighbouring councils located in Central and North Queensland, joined together on a collaborative joint project in 2018-19 to transition from external contractor delivering operations and maintenance to inhouse sourcing of wastewater treatment plants. To successfully transition the infrastructure, operations and staff under each council's jurisdiction, a program of works was undertaken including preliminary condition assessments of each wastewater treatment plant. These plants include: Mackay North Water Recycling Facility (MNWRF), Mackay South Water Recycling Facility (MSWRF), Cannonvale Sewage Treatment Plant (CSTP) and Proserpine Sewage Treatment Plant (PSTP), servicing the populations of Mackay, Proserpine, Cannonvale and Airlie Beach, respectively.

Based on visual inspections and anecdotal evidence from operations and maintenance staff, a preliminary structural condition assessment with limited concrete testing was commissioned for the inlet works of all plants and the bioselectors at CSTP and PSTP. This required comprehensive operations and maintenance planning to allow for bypassing sections of the plant without disrupting treatment performance, managing environmental compliance and that activities were completed in a safe and timely manner.

Results from the structural condition assessment confirmed a number of defects, including: liner delamination (possibly due to poor installation of the protective coating system resulting in loss of adhesion from the concrete substrate), significant localised concrete deterioration / friability typically around edges, rebates at penstock locations and on top of the concrete walls, to severe widespread concrete deterioration for the inlet works including concrete section loss (from 50 mm to 75 mm) mainly due to hydrogen sulphide attack.

From the findings of the structural condition assessments, both organisations undertook odour condition assessments to better understand the root causes of the structural issues. Defects identified with the odour systems were linked to degradation, improper design, important installation and improper maintenance, several of which posed a risk to workplace health and safety for which mitigation plans were put in place to address.