

An aerobic digestion can greatly reduce the amount of organic matter that might otherwise be destined to be landfilled or burnt in an incinerator. At the Ringsend Treatment Works in Dublin, it is doing just that – converting around 50% of volatile solids of the sludge into biogas.

Celtic Anghian Water operates the largest wastewater treatment plant in Ireland at Ringsend, Dublin, as well as large wastewater treatment plants in Waterford and Sligo. The Ringsend Treatment Works caters for a population equivalent of 1.7M people. Wastewater from north Dublin is pumped from Sutton pumping station to Ringsend for treatment via the submarine pipeline under Dublin Bay.

The entire treatment process at Ringsend is entirely natural. Oxygen from the air treats the wastewater and heat is used to treat the sludge. The outputs from the treatment works are water, fertiliser and energy. Sludge is a by-product of the treatment of wastewater. At Ringsend it is treated using hydrolysis and digestion before being thermally dried at air temperatures of 450°C, killing pathogens and producing a pasteurised, organic-based fertiliser.

The sludges are treated anaerobically by digestion in three tanks 18m diameter x 16m sludge depth with a total volume of 12,750m³. The process of anaerobic digestion involves the breakdown of organic waste by bacteria in an oxy-



The Geotech Biogas Check portable gas analyser in use at Ringsend Treatment Works

gen-free environment. The process at Ringsend converts about 50% of the volatile solids of the sludge into biogas.

A by-product of the digestion process is methane gas, which can be used as a fuel. The three digesters produce 35,000m³/day of gas. It is fed into a combined heat and power unit that supplies over half of the heat and electricity required at the Ringsend works.

Ciarán McCausland, the process engineer on the site, monitors the gases being produced from the digester on a daily basis. He uses the Geotech Biogas Check portable gas analyser to monitor methane, carbon dioxide, oxygen, hydrogen sulphide and hydrogen. These gases can give an early indication of any changes in the process and help optimise gas production and digester stability.

To check hydrogen sulphide and hydrogen, McCausland uses the optional addition of gas-specific electrochemical cell pods – one for each gas. When checking for hydrogen with the hydrogen pod, the reading is stabilised with an in-line hydrogen sulphide filter on the inlet side of the Biogas Check gas analyser. This removes all the hydrogen sulphide and helps gain more accurate hydrogen level readings.

The Biogas Check is also used on the Waterford and Sligo wastewater treatment plants. McCausland works closely with CSL – Geotechnical Instruments' Irish distributor – which supplied and services the Geotech Biogas Check analyser.

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