CASE STUDY

ENVIRONMENT AGENCY | UK

metasphere
make data count

RESERVOIR LEVEL MONITORING |

TODDBROOK RESERVOIR - WHALEY BRIDGE

BACKGROUND

The **Environment Agency (EA)** needed more reliable and effective level monitoring of the **Toddbrook Reservoir**, enabling the *Canal & River Trust* to help manage the pumping regime of the reservoir to prevent it from over-filling with water.

Toddbrook Reservoir is situated above the town of Whaley Bridge in the Derbyshire High Peak area of England. It is owned by the *Canal & River Trust* and is fed by Todd Brook, a stream with a catchment area of around 1,700 hectares (4,200 acres) including moorland on Shining Tor and farmland around Kettleshulme village.

Following several days of heavy rain in August 2019, a major incident was declared by the **EA** - a warning was issued that the dam was in danger of collapse after concrete slabs became partially dislodged by high volumes of water due to the rain. As a result, 1,500 residents had to be evacuated from parts of Whaley Bridge, Furness Vale and New Mills.

STAKEHOLDER

The **EA** was established in 1995 as a non-departmental public body and is sponsored by the UK government's **Department for Environment, Food & Rural Affairs (DEFRA)**. The **EA** is responsible for the protection and enhancement of the environment in England (and until 2013 also Wales).

The *Canal & River Trust* is responsible for 2,000 miles of canals and rivers, together with reservoirs and some heritage buildings and structures, in England and Wales.

BUSINESS NEEDS

The **EA** needed a reliable and proactive monitoring solution to manage the threat from flooding and potential collapse should the reservoir over-fill again. They used **Metasphere's Point Orange** to monitor the level of the reservoir, enabling the *Canal & River Trust* to help manage the pumping regime of the reservoir and prevent it over-filling with water. High-volume pumps were deployed to take water from the reservoir to prevent it from overflowing, and reduce pressure on the dam.

THE METASPHERE SOLUTION

The **Metasphere** 'Reservoir Level Monitoring' solution monitors various level points in a reservoir. For this project, a **Point Orange** datalogger / RTU (remote telemetry unit) coupled with a low-power pressure transducer with a 4-20mA output was installed at set-points, enabling the collection of level trend data to monitor the level of the reservoir. Two locations were selected: one upstream at the reservoir inlet, and the other in the bypass channel at the side of the reservoir.

The **Point Orange** dataloggers are configured to wake every 15 minutes to monitor the reservoir level using the pressure transducer; these values are sampled and stored with timestamps in the RTU, with the 4-20mA values scaled to indicate the level of water in the reservoir at the measurement point.

The data collected is communicated by **Point Orange** to the **EA**'s existing SCADA system for near-real-time data, and alarm visualisation and management: at the outset it uploaded timestamped data every 15 minutes, then twice a day after alarms were added to the RTU configuration. **Point Orange** compares the measured reservoir level to configured level setpoints, and determines whether it is in a 'High' (or overflow) state – if necessary it reports to the **EA** SCADA system which raises an alarm for operators to action. In this case, the dial-in regime dynamically adjusts to upload data every 15 minutes; once cleared, **Point Orange** dynamically reverts to communicating with SCADA twice a day.

Point Orange is a self-contained datalogger/RTU, with internal battery pack, IP68 unit enclosure, either a 4G (NB-IoT/ Cat-M1) or tri-band 3G modem, and quad band GSM/GPRS fallback, auto switching internal and external antenna options, software configurable AI, CI, DI, Modbus and SDI-12 communication options, integrated submersion sensor, local diagnostic points and intelligent alarm reporting. It communicates with Metasphere's Master Control System, DNP3/WITS DNP3 Masters or FTPS servers.

BENEFITS

The data and events generated by the Metasphere solution enabled the EA to provide early flood warnings to the public and the data needed for the *Canal & River Trust* to manage the level of the reservoir.

The EA was able to install units quickly in remote locations to provide the data needed. The ability to change the transmission rate, based on the alarm threshold, and to remotely modify the dataloggers' configuration were added benefits. Point Orange coupled with the low-power pressure transducer offered a lightweight, small-footprint solution making use of M2M comms.

Proactive management of the pressure and flood monitoring points of the reservoir level proved highly beneficial to the EA.

FIND OUT MORE!

If you would like to monitor flood levels, get in touch to find out how **Point Colour** RTUs can transform your network.

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