



**GEORGE
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CASE STUDY GLENKILN SIPHON

PROJECT OVERVIEW

Glenkiln Reservoir is located northwest of Dumfries. The project focused on enabling critical upgrade works, including the installation of a new concrete cut off downstream of the overflow weir and a new hydraulically operated scour valve at the base of the valve tower.

To safely deliver these works, the reservoir water level had to be drawn down and maintained within a narrow operating range between 1.25 m and 0.175 m below Top Water Level (TWL).

EXECUTIVE SUMMARY

The Glenkiln Reservoir project required a safe, precise, and reliable temporary draw-down solution to support essential construction works.

A dual siphon system was designed and installed to manage flows of up to 1,500 litres per second while maintaining full regulatory compliance.

The autonomous, low carbon solution eliminated the need for fuel intensive pumping, enabled remote monitoring in a challenging location, and successfully supported delivery of the works in a safe, efficient, and environmentally responsible manner.

OUR SUSTAINABILITY ROUTE



Nature Based Solutions



Recycled Aggregates



Low Carbon Steel



Low Carbon Concrete



Battery Units



HVO Fuel



Welfare Eco Cabins



Green Energy

PROJECT BACKGROUND

The existing 18 inch scour valve was unsuitable for prolonged drawdown operations due to the risk of silt mobilisation and potential pollution release. A temporary alternative was therefore required that could replicate normal reservoir operations without breaching compliance requirements under the Reservoirs Act or impacting public health standards. The works were subject to oversight from both SEPA and the Drinking Water Quality Regulator (DWQR).



The reservoir's remote location, limited dam crest space, and the need to accommodate extreme variable flows of up to 1,500 litres per second presented additional challenges. The system also needed to be highly reliable and capable of unattended operation overnight and at weekends, without constant on-site supervision.

George Leslie, working collaboratively with Selwood, designed a dual siphon solution comprising two 600 mm siphons. Variable valve controls allowed precise regulation of drawdown rates, while Selwood's autonomous priming technology minimised system footprint and human intervention. To overcome poor connectivity at the site, a Starlink system was integrated to enable constant remote monitoring and control.

The system successfully achieved and sustained the required drawdown flows, with performance verified through inline flow metering and was provided as evidence to SEPA and the DWQR.

SUSTAINABLE BENEFITS

The dual siphon system delivered significant environmental advantages over a traditional pumped solution. By eliminating the need for large, fuel hungry diesel pumps, the system reduced fuel consumption,



mechanical complexity, and environmental risk.

Estimated efficiency savings showed reductions of up to 168 litres per hour during high volume operations and up to 64 litres per hour during low flow conditions when compared with pumped alternatives.

The reduced number of moving parts also improved reliability, lowering the likelihood of mechanical failure and avoiding pollution risk associated with fuel storage and refuelling activities at a remote site.



CONCLUSION

The Glenkiln Reservoir project demonstrates how innovation and collaboration can deliver a safe, compliant, and low carbon solution to complex water management challenges. The dual siphon system provided precise control of reservoir levels, ensured regulatory compliance, and significantly reduced environmental impact compared to traditional pumping methods.

The approach enabled critical infrastructure upgrades to be delivered efficiently and provides a strong reference model for future reservoir drawdown operations in challenging locations.