

Axbridge

United Kingdom

Water
Treatment

THE CLIENT

Bristol Water Plc covers an area of supply of 2,400 square kilometres. The organisation has over 6,600 kilometres of mains and serves a population 1,119,000. The average daily supply is 282 million litres.

THE WORKS

The plant at Axbridge is licensed to abstract water from the River Axe and the new works can treat up to 30 million litres a day. The new works treats water abstracted from the River Axe to a standard such that it can be put into Cheddar Reservoir.

PROJECT OVERVIEW

The Axbridge treatment plant is designed to remove nutrients from the river water for reservoir recharge. As part of Bristol Water's AMP4 programme, this emergency plant required a permanent pre-treatment system with the process objective being to remove turbidity, colour and nutrients from the river source. Without such removal algal blooms could be expected which would double the phosphate load in Cheddar Reservoir.

CLIENT'S NEEDS

At Axbridge, a low footprint was critical in order that the new pre-treatment system could be sited at the original emergency sedimentation plant. Further Bristol Water required a rapid start up and shut down process due to their annual abstraction window – operational flexibility was vital.



THE ACTIFLO® PROCESS

Actiflo® is a very compact process that utilises microsand as a seed for floc formation. The microsand provides surface area that enhances flocculation and also acts as a ballast or weight. The resulting microsand ballasted floc display unique settling characteristics, which allow for clarifier designs with high overflow rates and short retention times. These designs result in system footprints that are between 5 times smaller than classic lamella clarifier or dissolved air flotation and up to 20 times smaller than conventional clarification systems of similar capacity, with an ability to start up from a "standby" mode of operation to a steady state operating mode within minutes.

Completion: April 2008

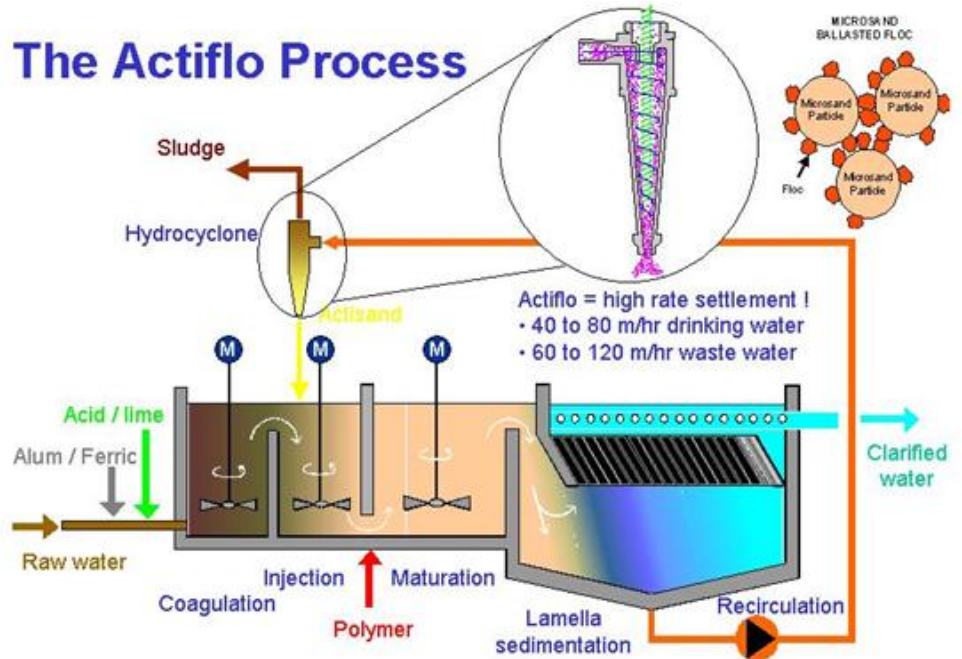
CONSTRUCTION

The project team comprised of Bristol Water and their framework partner Costain Plc and were responsible for the civils work and key pumping stations, VWS were the specialist Process Contractor responsible for the design and construction of the water and sludge unit processes.



Actiflo Plant during construction

The Actiflo Process



PROJECT IMPLEMENTATION

The VWS Actiflo system was identified by Bristol Water, as the most efficient means of removing the majority of phosphate and turbidity from the abstracted River Axe water due to its enhanced coagulation process.

The 30MLD pre-treatment plant comprises of 4 No fabricated package stainless steel AS4 Actiflo's, operating as duty units rated at 7.5MLD per. 96% sulphuric acid is dosed for pH correction, and PACl added as coagulant upstream of an inlet blending tank.

Performance Targets

Parameter	Design Basis	Current Operational Data
Flow	30MLD	22.5MLD
Raw Water:		
Turbidity	<72.2NTU	
Phosphate	<965 µg/l asPO4 (483 µg/l as 95%)	360 - 1090µg/l as PO4
Colour	<45.5 Hazen	18 – 62 Hazen
Treated Water:		
Turbidity	<2NTU	0.9 – 1.9 NTU
Phosphate	50 µg/l as PO4 (95%ile)	10 – 50 µg/l as PO4
Colour	<10.0 Hazen	5 – 10 Hazen
Thickened sludge	>4% ds (95%ile)	Min 4%
Sludge cake	>18% ds (95%ile)	Min 18%

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