

## Rivelin Water Treatment Works Improvements Sheffield, South Yorkshire

Yorkshire Water and Mott MacDonald Bentley

**BIG Biodiversity Challenge Award category:** Client Award

### Project overview

Yorkshire Water were required to improve the treatment facilities at Rivelin WTW to ensure continued supply of high quality drinking water to the 104,000 people in it's supply area.

Rivelin WTW is located on the A57 snake pass road which leads West from Sheffield into the Peak District National Park. It is located in the Rivelin Valley, which is a large open valley with meadowland and pockets of deciduous woodland.

The views around the works are dominated by rural open space, with the stone built water treatment works being the main visible building in the area.

The capital work required an additional large footprint building to house a new treatment process.

The delivery team evaluated all sorts of options to try and reduce or remove the impact of a new building on the local ecology and aesthetic views of the valley.

### What were the biodiversity conditions on site prior to the enhancement?

The site chosen for the new process was adjacent to the existing WTW buildings in a grazing meadow to the West. Adjacent is a Nature reserve serviced by Sheffield Wildlife Trust.

Diverse flora and fauna were already established in the area, including Willow Tit, Badgers, various raptors, and deer.

### Were there any specific conditions that led to you carrying out this work?

The client's compliance date for the new process to be in operation is December 2017. This was always going to be a challenging deadline for a new build in the green belt, bordering the Peak District National Park. The delivery team needed to ensure that the project delivered the lowest possible impact on the surrounding area, both in terms of ecology and aesthetics.



*Rivelin Valley, with WTW center*

Extensive engagement with Rivelin Valley Conservation Group and Sheffield Wildlife Trust was undertaken to explain the need for the project and to develop a building that had the support from the local community.

### What were the biodiversity measures taken?

The council planners were keen to see a large conventional barn to house the new process plant.

The project team disagreed, as the valley is a largely open meadows, and the “baseline” structure would have been a huge. The barn would have had to be isolated, located away from the existing buildings due to a large gas main restricting adjacent construction.

Working closely with conservation groups, Wildlife trusts and national parks staff, a proposal to create a buried process building was developed and eventually endorsed by the council’s planning team.

The buried building will have a grass roof seeded using top soil from the original field and will minimise the impact of this essential new building on the biodiversity and vista of this beautiful landscape.

This solution will cost more than the “baseline” conventional barn , but the YWS board were impressed with the innovative thought that had gone into developing the buried option .

The solution was then used to test the new government sponsored Natural Capital Protocol, a mechanism for assessing the value of harder to measure elements of capital investment such as biodiversity, pollination etc.

A pilot Natural Capital Assessment (NCA) was run on the Rivelin project, and concluded:-

*“The largest benefits were realized through the use of a low-energy (and therefore low-carbon) water treatment process and installation of a green roof, which enhanced biodiversity. The ‘chosen’ option yielded further natural capital savings due to no land use change relative to the ‘baseline’ option”.*



*Above Ground vs Below Ground Solutions*

### What were the biodiversity measures taken?

After engaging with stakeholders during the planning phase, a collaborative plan to extend the habitats in the adjacent nature reserve was developed.

These include:-

- Log piles around the works boundary
- Reinstatement of dry stone walls for reptile habitat
- Stumps at left for Willow tit nests
- Reuse of excavated material for re-profiling the buried building.

## How would you best describe the project?

Mitigation

### Further information

The Rivelin Scheme has become recognised within Yorkshire Water as a flagship scheme for addressing preservation of a rich and complex biodiverse area during essential construction works for the following reasons:-

The introduction of Natural Capital Assessment into the decision making matrix for a large scheme was innovative, and has been warmly welcomed as a method to convert elements of environment, aesthetics and biodiversity, (often perceived as “additional benefits” compared to capex and opex ) into valued measures for decision makers. Following the Rivelin report, YWS are now considering how to include NCA their end to end process for capital schemes.

The engagement of Sheffield Wildlife Trust, Rivelin Valley Conservation Group, Peak District National Park officers and local residents in solution development, provided real substance to the argument to deliver the least damaging solution to biodiversity and environment, when countering council preferences for a barn. Simple biodiversity enhancements to the design have been included following engagement with stakeholders – e.g. building vents made to look like meadow bee-hives, seeding using original top soil and local meadow seedheads (harvested this summer).

The buried building option was the most expensive in terms of capital cost, but the effective case for long term environmental cost benefit was compelling.

The construction of the buried process is underway, with a 2018 completion target date on track.



*CAD of buried process in background, existing works at front.*

### What was your personal motivation for carrying out the enhancement?

Project Team Motivation - Provide:-

- A robust, low energy water treatment process.
- Enhance biodiversity by improving habitats.
- Using innovative design, safeguard the stunning views of Rivelin
- Leave a site where wildlife and people alike choose to visit and flourish.
- Change perception of the value of biodiversity in conventional capital investment.