Chemicals Case Study

Inorganic chemical effluent reduction

Reducing Nitrate levels to new EA consent limits.

The site discharged its water to the local Sewage Treatment Works (STW), and contributed 95% of the nitrate load to the works. As the receiving river was designated as an eutropic sensitive area, the STW was required to meet the urban wastewater treatment regulations for nitrogen at its outfall. This was translated into a greatly reduced trade discharge agreement.

New consent limits proposed by the Environment Agency meant reducing the nitrate discharge to 0.5% of the previous value. As a result, the site had to consider how best to meet this requirement.

ABB Consulting were engaged to investigate how the nitrate levels could be reduced.

Benefits

- Nitrate levels reduced to meet new limits
- Strategic solutions based on knowledge of current and forthcoming technologies and legislation
- Assistance in discussions with the Environment Agency and utility companies through sound understanding of environmental legislation

Solution

ABB Consulting carried out the waste minimisation study using a methodology that encouraged 'out of the box' thinking, followed by rapid and structured evaluation of potential solutions.

During the study we carried out the following activities:

- We examined the regulatory framework to ensure that the restriction had been fairly and legally enforced
- We identified the most significant discharges by characterising their source and nature
- We investigated the upstream processes to generate waste minimisation opportunities
- We made a technical evaluation of potential solutions for nitrate removal
- We conducted a life-time cost evaluation of candidate solutions
- We recommended the most suitable techniques for compliance with current and impending legislation

We identified concentration of the effluent for off-site disposal as the most viable short-to-medium term technical solution. The economics of the scheme were affected by tankering costs, permeate quality and water recycle.

Our evaluation of capital and operating costs demonstrated that concentration using membranes and/or thermal evaporation provided solutions which were technically and economically viable.

We also identified an emerging technology with the potential for zero discharge, recommending it for development into a long-term, sustainable solution.

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Environmental services