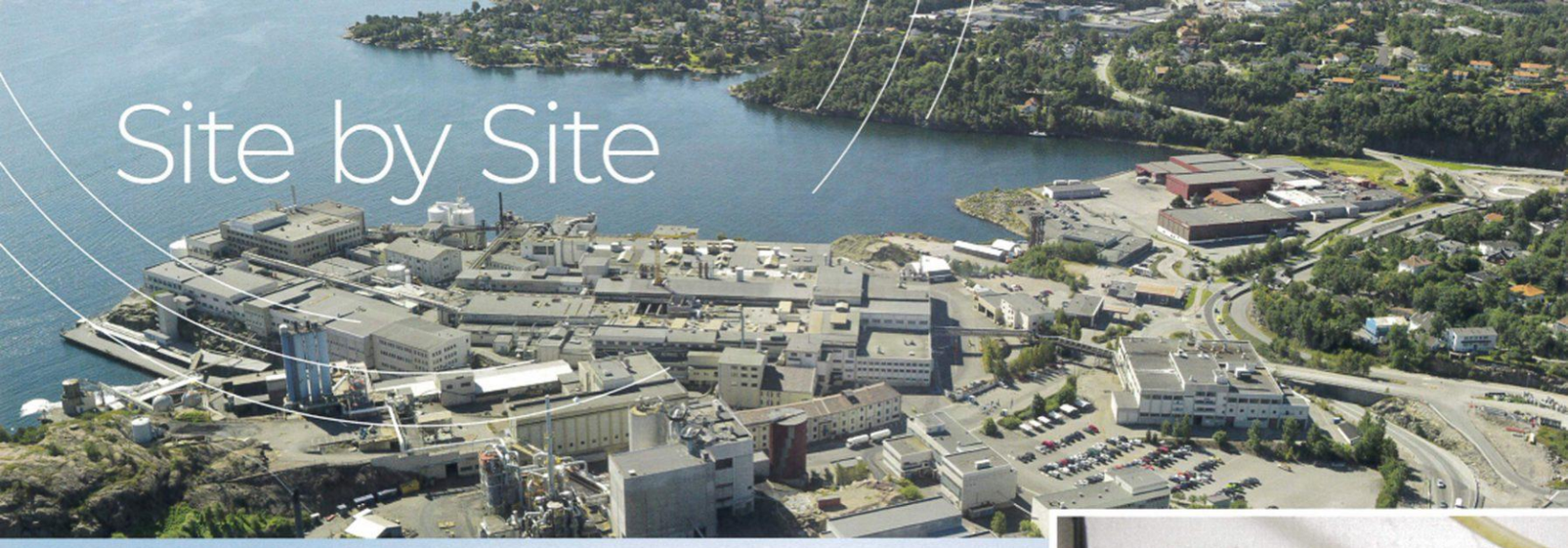
Site by Site



Nikkelverk – Norway

Pipe Dreams

The Byfjorden, a scenic 10.5-kilometre long fjord that leads from the North Sea to the city of Stavangar in Norway, as well as the Kristiansandsfjorden, a fjord just outside of the city of Kristiansand, home of Nikkelverk, provide the necessary cold seawater Nikkelverk requires for its numerous heat exchangers and various cooling towers across the site. Water, of course, is brimming with life and as Nikkelverk pumps seawater, various life forms invariably follow – algae, snails, sea anemones and large colonies of mussels – all of which pose a challenge for the team.



Two pipes measuring 1.2 metres (m) in diameter suck water from Byfjorden at a rate of 3,400 m^3 per hour. From the pumping station run three pipelines: one destined for the sulfuric acid plant and the limestone tower, one for the secondary leaching plant, and the last for the chlorine plant, hydrogen plant, electrolyte purification plant and the cobalt refinery.



Terje Andersson, Manager, Water, Steam and Air Supply, states, "The bustling life that grows and adheres to the inside of the pipes and valves challenges the operation due to the time and costly maintenance required to keep the pipes free of organisms."

Until recently, the team used biocides to treat the pipes. Not only was the use of biocides expensive costing nearly 800,000 NOK per year (approximately US$100,000), the mussels were demonstrating their adaptability. Accustomed to the maintenance schedule, the mussels learned to close during the release of the biocide to avoid its impact, which led the team to adjust to an irregular schedule.

The solution

To avoid the ongoing cost and battle of wills with the mussel population, Terje carried out research and submitted a proposal to the Property team outlining a new method of managing the life forms flowering in the pipe system.

His research brought him to a company named Algaefree, which offers a product that emits sound waves in the water to create an environment that algae (and the biofilm and bacteria they feed off) avoid in nature – water turbulence. Already established in other settings such as fish farming, marinas and recreational pools, Algaefree's Ultra Q 4-Ways prevents bacterial growth and biofilm from forming on targeted areas.





Terje Andersson, Manager, Water, Steam and Air Supply at Nikkelverk, is all smiles standing by Algaefree's product, which is expected to address the challenges posed by the sea life that thrives in the pipes used to pump seawater into the operation.

As bacteria and biofilm are prevented from growing in the pipes, other life forms that depend on these food sources for survival disappear too.

Nikkelverk has installed Algaefree's Ultra Q 4-Ways relatively recently, so the team is anxious for the potential benefits to take shape.

"We're eager to reduce operational downtime, minimize maintenance costs and uphold the environment by avoiding the use of biocides," says Terje. "We'll be monitoring progress to quantify the extent of the positive impact this change will bring."

Colonies of mussels clogging up the pipes used to pump cold seawater for the numerous heat exchangers and cooling towers across the site.

