Interreg North-West Europe Water Test Network

European Regional Development Fund

THE EUROPEAN TEST FACILITY NETWORK FOR WATER INNOVATION

Case Study Kolina Ltd

ABOUT KOLINA LIMITED

Kolina manufactures and supplies its proprietary Electrocoagulation (EC) treatment system for water and wastewater treatment. Its patented EC technology offers a sustainable alternative to chemical dosing for removal of phosphorus; it generates coagulant ferric ion species through an electrochemical reaction in the EC cells between passed current and sacrificial electrodes.

KOLINA'S ELECTROCOAGULATION TECHNOLOGY AND RESULTS WITHIN WTN TESTS

Kolina deployed its innovative Electrocoagulation treatment system for Phosphorus and Phosphate removal aimed at helping Utilities to meet the new discharge consent for Phosphorus as part of the new AMP7 cycle. Kolina's treatment unit is a plug and play system housed in a 20ft iso container and capable of treating up to 480m^3/day. The technology offers a greener alternative to currently existing treatment (chemical dosing).

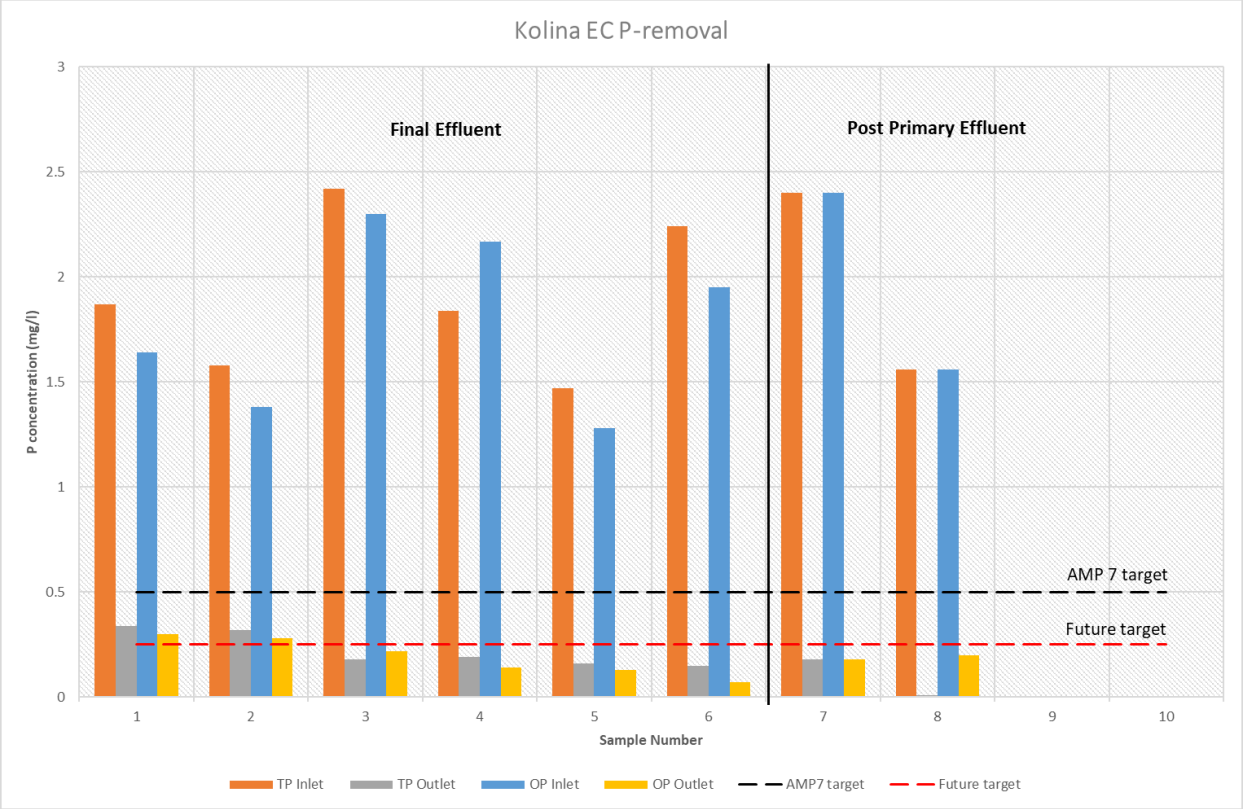
The trial is aimed at testing Kolina's EC on three different streams; final effluent, post primary and primary effluent and evaluate its perfromance primarily for Total P and Soluble P. Other parameters were also measured such as COD, pH, Conductivity, Suspended Solids, Zinc, Chromium, Alkalinity and Iron. All analyses were performed independently by Scottish Water accredited laboratory.

The EC unit deployed at Bo'Ness Wastewater site worked as expected, and results obtained to date on treating the final effluent and the post primary effluent achieved Total P and Sol. P treated to <0.25mg/L, no effect on alkalinity post-treatment, no release of Zn and Cr in treated effluent, and COD polished to <15mg/L. These initial results show the suitability of Kolina's EC as a viable option to traditional and newly trialled technologies to removing phosphorus to below the current (0.5 mg/l) and future (0.25 mg/l) limit.

The utilities sector in the UK is moving towards chemical-free treatment and currently in England in the Asset Management Programme 7 (AMP7) there is a tight discharge limit for phosphorus which current treatment processes will find challenging to address. Kolina's Electrocoagulation technology is a viable chemical-free alternative for Phosphorus removal and there was need to validate the process on a utilities site, hence the deployment at Scottish Water Bo'Ness site.

Results obtained to date has shown that Kolina's Phosphorus Removal plant conclusively removes both total and orthophosphate to below the current (AMP7) and future limits, as shown below in Figure 3. Kolina has treated the 'final effluent stream and also the post primary effluent. The final effluent stream has gone through the full wastewater treatment plant at Bo'Ness, and thus contains residual contaminants that the traditional treatment plant has not managed to remove. Therefore, the residual fraction contains harder to remove and recalcitrant contaminants, which this and many traditional wastewater plants will struggle with. The post primary effluent has only undergone screening. From the data received thus far, the following conclusions can be made:

- Kolina's EC can remove Total Phosphorus and Ortho Phosphate from the final effluent and post primary samples to less than 0.25mg/L
- The treatment has no significant effect on alkalinity (depletion) post-treatment
- No release of Zinc and Chromium in the treated effluent
- COD polished to <15 mg/L
- Residual ferric in solution currently comfortably within the allowable discharge limit of 4 mg/L (recent data showed that residual ferric concentrations in the treated effluent range from 0.8-2.3 mg/L)



WHAT IS THE ADDED VALUE OF WTN AND WHY WOULD KOLINA RECOMMEND WTN TO OTHER SMES?

The Water Test Network provides an unique opportunity to deploy our plug and play chemical-free treatment system on a live site with the support of WTN, which not only provided the funding but also allowed us to access the network of professionals and the potential to market our technology/product to a wider audience in both the UK and the EU.

WTN is the perfect platform for us as our demonstration is effectively a third party validation without any bias. Data obtained would be from accredited labs. Further regular meetings with the stakeholders in the project ensures that all parties are updated of the progress and for Kolina it gives us the opportunity to interact with the wider utilities audience. WTN is also very proactive and everyone in the team is very supportive, engaging and open to innovative ideas right from the start of the application process to deployment on site. Hence the perfect blend to ensure success.

LINK TO KOLINA'S WEBSITE AND SOCIAL MEDIA ACCOUNTS

Website: https://www.kolina.co.uk/

Email address: info@kolina.co.uk

LinkedIn: https://www.linkedin.com/company/kolina-limited

PICTURES OF KOLINA'S ELECTROCOAGULATION UNIT AND TESTING

Wastewater treatment unit arriving on site in Bo'ness

Electrocoagulation cells within phosphate removal unit, and a Kolina engineer carrying out testing on the unit

A Kolina engineer showing a Scottish Water personnel around Kolina;s P-removal plant