Carbonxt
ADVANCED CARBON PRODUCTS

TECHNOLOGY BRIEF

Carbonxt Hydrestor® Technology - Low Phosphorus Applications

PLANT CHALLENGE

Simultaneously Achieve Total Nitrogen and Total Phosphorus Effluent Compliance with Low and Variable Flow Operations

A Florida water utility approached Carbonxt in an attempt to validate the technology for use as a phosphorus removal component in their upcoming system renovations. The size and location of this utility caused it to have low flows and diurnal variations which were difficult to balance nutrient effluents with.

The plant could only target one nutrient at a time to treat in their process, and had low phosphorus concentrations already, so they chose to target nitrogen removal in their process, and pilot test Hydrestor® as a phosphorus polishing step to achieve Total Phosphorus effluent compliance.

CARBONXT SOLUTION

Enhanced Activated Carbon Pellets

Activated carbon is not typically able to adsorb phosphorus from water. Through specialized manufacturing and additives, Carbonxt is able to deploy activated carbon pellets capable of removing phosphorus.

A series of adsorption vessels were installed on-site in order to test necessary contact times for efficient removal of phosphorus. The data generated was used to understand kinetics and capacity of the Hydrestor® media.

Hydrestor® is a specially blended activated carbon pellet available in 4mm pellets in order to minimize head loss through the media bed.

RESULT

The Hydrestor® media was successful in reducing phosphorus concentrations down to concentrations of 0.07 mg/L Total Phosphorus (TP), and 0.01 mg/L orthophosphate. On average, the percent removal neared 40% with reductions from an average of 0.4 mg/L TP down to an average of 0.2 mg/L ensuring plant compliance.

These results were achievable in an application that lent itself well to contact times of 80 minutes.

As of Q4 2021, the plant is in the process of designing and making final construction decisions.

Removal Efficiency at Various Phosphorus Concentrations of Pilot Test

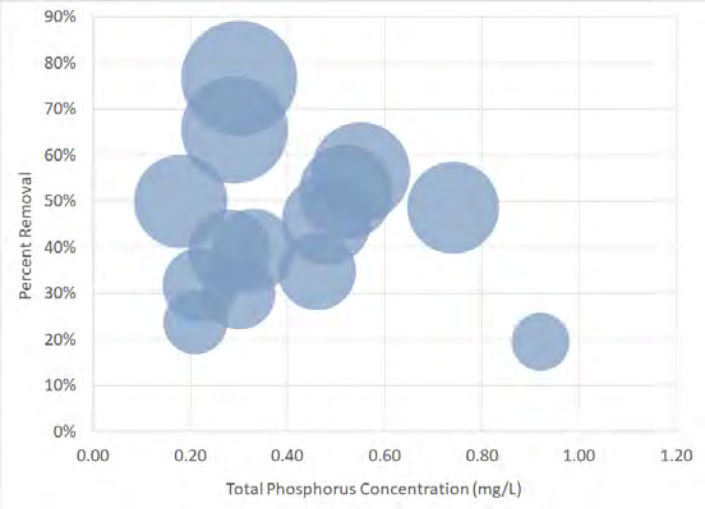

Figure 1 shows the effectiveness of Hydrestor® media to remove on average 39% Total Phosphorus at various low level concentrations.

At concentrations between 0.2 and 0.6 mg/L the average removal efficiency was 45% where effluent concentrations were dropped to as low as 0.07 mg/L.

CONTACT CARBONXT

Email Domenic Contrino, Engineer at D.Contrino@Carbonxt.com
Visit carbonxt.com for more information about us.