

APPLICATION NOTE

WORRY-FREE CHEMICAL PHOSPHORUS REMOVAL

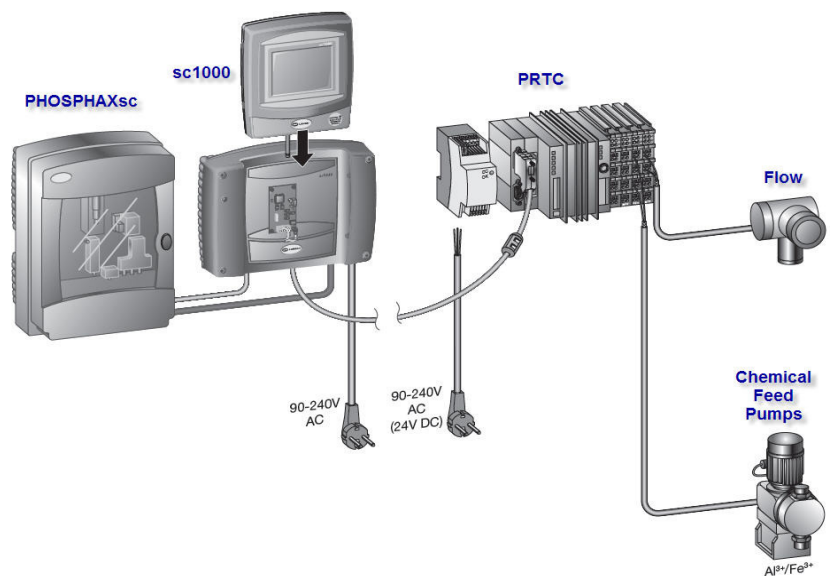
By Rob Minnema, Utility Foreman, City of Beaver Dam, Wisconsin
Bob Dabkowski, Wastewater Specialist, Hach Company

Beaver Dam saves 56% in Ferric Costs by switching to automated dosing control.

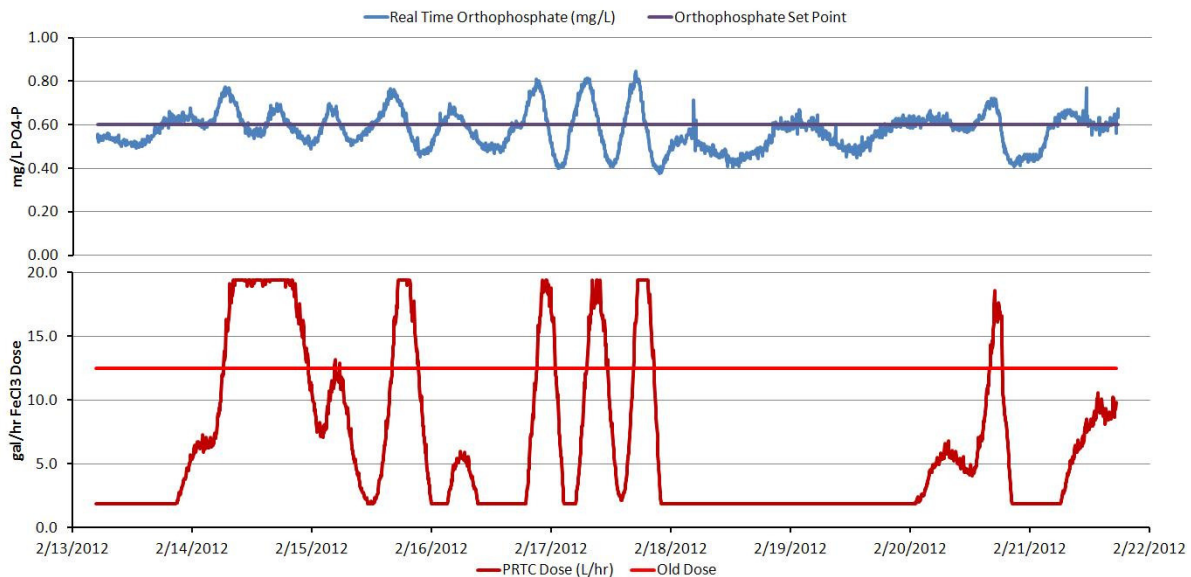
The operators at the Beaver Dam, Wisconsin wastewater treatment plant knew there had to be a better way. In order to meet the 1.0 mg/L total phosphorus limit, they had to feed enough ferric chloride to handle the incoming phosphorus spikes, without overfeeding, increasing production and wasting chemical. The operators were chasing the phosphorus levels—manually adjusting the ferric feed based on results from composite samples taken during the prior week.

They found a better way and optimized their ferric feed with the RTC101P Chemical Phosphorus Optimization Solution from Hach. The phosphorus control system automatically feeds the exact amount of precipitant needed to maintain a programmed orthophosphate setpoint. Measuring effluent flow and orthophosphate in real time, the controller uses preprogrammed algorithms to automatically adjust the ferric chloride dose ahead of the clarifiers as the phosphorus load changes. If a real time measurement signal is lost, the controller will switch to previously entered data until the signal is restored. Now, the operators rest easy, confident that the phosphorus level is consistently below their limits.

At Beaver Dam, the installation was simple. The orthophosphate analyzer measures plant effluent every five minutes, sends that measurement along with the measured effluent flow to the controller installed in a PLC cabinet. The phosphorus controller outputs the ferric dosing signal through the PLC to control the chemical feed pumps based upon the setpoint programmed into the phosphorus controller. The system was installed, configured, and operational in less than 48 hours.



The chart below shows a typical week at Beaver Dam. Even with substantial pretreatment, influent phosphorus spikes are common. When the phosphorus controller senses the load of phosphorus changing, it increases the ferric chloride dose to maintain the 0.60 mg/L orthophosphate setpoint.



Previously, the staff maintained an average ferric chloride dose of 12.5 gallons per hour. After the phosphorus controller installation, the average feed is 5.55 gallons per hour—saving 56% in ferric chloride costs alone. Although not yet quantified, the staff believe that an associated decrease in sludge production provides additional savings from reduced solids handling costs.

Ferric Chloride Savings (160 Day Period)			
Before		After	
Dose	12.5	PRTC Dose (average)	5.55
Gallons Consumed	48,000	Gallons Consumed	21,312
Gallons Saved			26,668
% Saved			56%

Lastly, and most importantly, staff no longer feel like they are “chasing” phosphorus. Their worry while waiting for phosphorus results has been replaced by confidence and peace of mind. If the permit limits decrease in the future, the Beaver Dam staff aren’t worried—they will simply change the setpoint in the Hach RTC101P and rest assured that the new limit will be met.

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