

---

**Report**

**City of Augusta, Georgia Corrosion Control  
The Implementation of the SeaQuest Technology**

**For**

**Water Quality and Distribution**

**Debra Beazley, Water Superintendent  
Allen Flanagan, Plant Manager, Hicks Water Plant  
Brantley Kuglar, Water Superintendent (Retired)**

**Augusta Utilities  
Hicks, Highland and Ground Water Treatment Facilities  
Augusta, Georgia**

**2000 - 2018**

### **Background Pre 2000**

Prior to 2000, Augusta Utilities had 3 ground Water Plants (for a total average of about 15 MGD) and 1 Surface Water Plant (the Highland Plant at a total average of about 40 MGD).

Currently, The City of Augusta is now supplied by 3 Ground Water Plants (for a total average of 15 MGD) and 2 Surface Water Plants (for a total average of 75 MGD).

Every 1 to 3 years, the City of Augusta formally bids out all water treatment chemical supplies which include a Phosphate product for color and corrosion control, as well as for lead and copper. For about 15 years prior to 2000, the city was supplied by a variety of different phosphate manufacturers who have supplied Augusta with their different phosphate products. The winner of the bid was always awarded the yearly contract based upon which manufacturer could provide the least expensive product which was always determined by the product's cost per pound or cost per gallon. There was never a consideration to award a bid based upon the yearly cost to use the product, and some years Augusta would use more or less product than the previous year. No one product was able to provide consistent results to motivate the City of Augusta to stay with only one phosphate brand. The City concluded that all Phosphates were basically the same and each phosphate brand provided only a limited amount of benefits. As a result, the city's water treatment plants experienced a fluctuation with their chlorine usage at each facility, as well as a fluctuation with the amount of pH adjustment product (Lime or Caustic) used with the additional problems of dealing with coupon corrosion rates that were not consistent and having a number of dirty water calls throughout distribution.

### **Testing the SeaQuest Phosphate**

For many years during the Summer season, Augusta Utilities would use a specific 1.2 MDG ground water source to provide water to one specific small distribution area. Over the years, whichever phosphate product they would use, it did not work with the water's pH range of 6.0 – 6.3. This pH range was too low for any phosphate to work efficiently so Sodium Hydroxide (Caustic) was added to increase the pH. This did not help and the various phosphate brands used and the Caustic were precipitating out into the pipes. In 2000, an engineering firm was consulted and they recommended SeaQuest as the only stable phosphate solution to effectively work without the need of the pH adjustment (although the Georgia State EPD required a 6.5 minimum pH). While the superintendent at the time was skeptical, he decided to try the SeaQuest to see if it work in this extreme situation. When the superintendent saw that everything went well and he realized that SeaQuest could handle the ground water effectively, he allowed Aqua Smart, Inc., the manufacturer of SeaQuest to bid for the city of Augusta's water department's upcoming bid. However, there were 2 conditions. Number one, Aqua Smart could bid its SeaQuest phosphate only for the ground water plants to test out the product and see how effectively SeaQuest works, and number two, SeaQuest had to be less expensive and win the price bid!

Page 2.

## Augusta Utilities, Augusta, GA

In 2003, when Aqua Smart bid the SeaQuest phosphate, it requested that Augusta Utilities add one more line on the bid spec which it had never done before, and that was for the vendors to list the cost to use their product per year. That way, the city could see what it would actually spend on the product cost per year as opposed to the seductive and inaccurate overall cost of price per pound. **SeaQuest was more expensive per pound by about 30%, yet Augusta Utilities would only need approximately one-quarter of the amount** of SeaQuest than what they were using of any other phosphate products in the past. The yearly average of dry phosphate usage at the ground water plants **was about 75,000 pounds**, and the use of SeaQuest, based upon the water quality of Augusta's ground water plants came to **only less than 18,300 pounds per year**, and the dosage rate was guaranteed! **As a result, with the dramatic reduction of the usage of product, there was a dramatic cost savings of under \$14,000 per year** from the next cheapest phosphate product bid, and consequently, the bid was awarded to Aqua Smart for the use of SeaQuest as the less expensive product **based upon the yearly usage and not on the cost per pound**. And never before had Augusta Utilities ever asked for a guarantee with a dosage rate. Aqua Smart insisted upon it.

One year later when the bid was up for renewal, Brantley Kuglar, the Superintendent of Water of Augusta Utilities at the time received a call from Debra Beazley (the current Superintendent of Water) and Allen Flanagan (the current Plant Manager of the Hicks Water Plant). They told Brantley Kuglar that they did not care who would win the upcoming bid for the new year, they wanted to stay with SeaQuest. The reason they told Mr. Kuglar that they did not want to use any other phosphate product was that for the first time using a phosphate product, they had a stable and consistent pH adjustment feed at the Plants in order to maintain the pH they desired and that less pH adjustment usage was giving them what they needed. In addition to using less Lime, the ground water plants were also using less Chlorine and maintaining better residuals throughout the system especially at the end points some 15 miles away.

With that result, Aqua Smart, Inc. was allowed to bid SeaQuest for both the ground water plants and the surface water treatment plants. The surface water plants **were using approximately 55,700 gallons** of other phosphate products per year and **SeaQuest was 3 times more expensive per gallon**. However, **the guaranteed dosage rate of SeaQuest was for approximately 9,855 gallons** and **the yearly cost savings to the nearest cheaper price was just over \$54,500!** That cost to use SeaQuest per year with the additional benefits which other products could not provide, saved Augusta an additional amount of money with the reduction of lime and chlorine usage. And with a guaranteed dosage rate, Augusta Utilities knew that they would stay within budget.

### The Results of Using SeaQuest

**Since the introduction of SeaQuest, Augusta Utilities has used less pH adjustment at their treatment plants, has used less chlorine at their plants to maintain residuals throughout their system, had a reduction in pipe corrosion coupon rates, reduced dirty water calls and has used much less phosphate chemicals than ever before since switching to SeaQuest. They also passed all lead and copper tests when prior to SeaQuest, that was not always the case.**

**Page 3.**

**Augusta Utilities, Augusta, GA**

Today, Augusta has changed its bidding specifications from the best price per pound (for their ground water systems) or best price per gallon (for their surface water systems) to a specification bid based upon extensive documentation including professional papers, and the consistent performance of the SeaQuest product which no other phosphate can accomplish.

The specifications call for the ability of the phosphate to remain stable and work in a higher temperature range of boiling without the polyphosphate reverting to an orthophosphate, working exactly the same without any pH adjustment in a range from 5.5 and remaining stable through 12, removing corrosion in pipes for cleanout, removing biofilms, reducing lead and copper numbers and stopping dirty water calls and the proven reduction of chlorine usage at the water plant facilities while maintaining chlorine residuals throughout distribution.