

# Don't judge phosphates on costs alone

**T**he interesting thing about working with public water systems is that there is no shortage of ideas or recommendations how to accomplish a project. I find this to be generally more so with new council and board members than operators. Recently, I've bumped into a number of communities that have stopped using ortho or poly phosphate treatment. In several cases, the decision to discontinue the use of the additive was made by newly elected board and council members, none of who have a very heavy involvement in the actual operation of their water system. They then ask the question why the city or RWD is spending money to purchase phosphate additives.

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## Preventing corrosion, staining

Public water systems that are candidates to consider using poly-phosphates are those systems that have problems with corrosive water (low pH) or staining from higher concentrations of iron or manganese. In public water systems, the poly-phosphates are commonly referred to as sequestering chemicals. They are very effective for marginal concentrations of iron or manganese.

Corrosion control is a treatment process that began in many communities to help reduce the incidence of lead/copper monitoring failures. Corrosion control addresses the aggressive nature of the water

and will reduce the potential of lead/copper from leaching into the water. When poly-phosphates are added to the water supply, over time a microscopically thin

coating will develop in the interior of and prevent the water from making contact with the pipes. The pH level is sometimes also adjusted upward to make the water less acidic.

**The cost reduction of not adding the phosphate will be offset with an increase in chlorine usage.**

Iron and manganese occur naturally in many areas of Kansas' geologic formations. Both minerals dissolve into groundwater. In higher

concentrations, iron and manganese may cause problems with staining of laundry and water use fixtures and also can produce a problem with taste of

the water, having a metallic or vinyl type taste in the water. Phosphates have been approved by regulatory agencies as both a food and beverage additive. Phosphate-based food additives have been used and consumed for over 75 years in foods such as colas, pasteurized process cheeses, prepared cereals, meats such as ham,



*Paul Strathman, Manager/Operator of Nemaha RWD 3, checks the amount of phosphate pumped during the prior 24-hour period. The RWD presently produces an average of 600,000 gallons per day. With iron content of 0.6 and manganese at 0.13, Strathman says that patrons would not tolerate the staining that might be prevalent were the RWD to not use a good sequestering agent.*

*The phosphate selected by the RWD also provides corrosion control. The alternative would be to do pH adjustment by adding caustic soda with a lower cost phosphate, however, the total cost would exceed the better performing phosphate by 25%, needless to mention the capital costs and hazards of applying caustic soda.*

bacon and turkey, cakes and toothpaste. It is well documented that there are no harmful side effects.

In working with the system that has just stopped using phosphate and previously those that have just started, the first thing that I have noticed is that chlorination suddenly becomes an issue. What had worked before now doesn't. One system I've worked with stopped using the poly-phosphate because of what the board/council perceived as a high expense. For the next three weeks, chlorine adjustments had to be monitored several times a day and adjusted accordingly, with chlorine use up about twice what it was before. The cost reduction of not adding the phosphate will be offset with an increase in chlorine usage. That is the experience of one system. The increase in chlorine demand may be due to varying iron and manganese amounts. Sometimes when a water system initially begins adding poly-phosphate, there will be a substantial variation in chlorine demand. It seems that every system is different. Because of that I always recommend that the community or RWD work with and use the services of a certified manufacturer's lab to ensure proper dosage and procedures are followed.

My suggestion to water system officials who are considering discontinuing use of phosphates is to think twice. Make sure that you understand why these additives were chosen and make sure that they are being applied properly. This is a relatively easy topic to discuss and explain. I would be pleased to meet with any system that has questions concerning use of sequestering agents, the reasons for use, costs and expected benefits. Call us at 785.336-3760.

## Benefits of phosphates and reasons for use

### Corrosion control; less staining

- Increase life of iron, steel, copper and lead plumbing
- Inhibits lead and copper leaching helping to maintain compliance with drinking water standards
- Sequesters iron and manganese, minimizing rusty, black, staining and dirty water complaints
- Decrease iron turbidulation, for less depositing to extend life of mains
- Diminishes calcium scale deposits in hot water lines and heaters
- Reduces costs by reducing flushing needs
- Lessens the occurrence of microbial-influence corrosion (iron bacteria), providing longer system life
- Lowers chlorine demand and improves disinfection

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