

University of Pacific Pool Case Study

Saving an additional \$20K+ a
month with Magnation

50% reduction in chemical use



OVERVIEW

The Chris Kjeldsen Pool, home to the champion water polo team the Pacific Tigers, had a black mold problem that only Magnation was able to solve quickly — saving the University over \$20K a month

Eliminating black mold without disruption or harsh chemicals

Swimming pool maintenance is an extremely expensive endeavor — and that's if nothing goes wrong. Introduce black mold, and you have a real problem. For Emron Qarqat, Senior Superintendent of Operations at University of the Pacific in Stockton, California, realizing that the Olympic-sized Chris Kjeldsen Pool had a black mold problem was a low moment. This pool, after all, was host to the University of Pacific NCAA D1 water polo championship team and was required to meet NCAA standards. Aside from these regulations, black mold is not good for swimmers or for the perception of the pool's cleanliness.

There were only two ways Qarqat knew of to solve black mold. One was to drain the 1M-gallon pool and physically scrape off the mold with a corrosive cleaner. The other was to treat the water with a harsh algicide chemical. Either way, the pool would have to be shut down for the duration of time it took to fix the problem. Both solutions were very expensive and would be crippling to the water polo team's practice time.

Fortunately, a third solution presented itself. Magnation Water Technologies.

The Chris Kjeldsen Pool is one of five pools at the two University of Pacific campuses, but it's home to the Pacific Tigers, a water polo team that's become one of the nation's elite programs under award-winning Head Coach James Graham. The Pacific Tigers swim team also trains here, and the pool hosts swim lessons and open swim times for the University's students and staff. Upwards of 600 people use the pools in summer months.

Any commercial pool requires constant maintenance to balance the water chemistry, manage equipment energy consumption, prevent pathogens, ensure water clarity, and minimize mineral-scale buildup. Proper maintenance for pools typically means regular chlorination, filtration, and pH control, plus constant monitoring of the water quality to ensure a safe and healthy swimming environment for pool users, and it can end up being extremely costly.

Since the pool has to follow NCAA standards in order to remain compliant for water polo competitions, the stakes are high. When Qarqat realized that black mold was covering 90% of the pool, he says, "I'll never forget, I went over there and used a long brush with stainless steel bristles, and I scrubbed it for probably five or six minutes, and I could not get the mold to go away."

Black mold like this is typically caused by quickly growing organic matter. When phosphates and other substances build up in the water, molds develop. Standard pool chemicals can keep phosphates under control only to a certain point. But once they pass that threshold, water quality can degrade quickly. Qarqat had a massive job cut out for him.

Magnation tackled water quality without disruption to pool usage

When Qarqat first heard about Magnation at a trade show, he was skeptical, but after being shown evidence from existing customers, he was persuaded to try the innovative treatment. In the summer of 2023, he embarked upon an initial three-month trial run in the Chris Kjeldsen Pool, installing Magnation's Turbulator on the pool's recirculating pump and Magnation's Rainbolt on make-up water. Qarqat was astonished when the mold was dramatically cleared at the end of the first month, and completely gone by the end of the trial. The best part? He didn't have to shut down the pool during that time.

Qarqat says, "Once we began the Magnation treatment, the water quality vastly improved. It is remarkably clear right now! This trial was so successful that we are now looking to use Magnation in other locations on our campus. We plan to install Magnation in our other pools, and we are considering using it in our water supply systems for buildings on campus, to provide enhanced water quality at our hydration stations."



SOLUTION

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Saving an additional \$20K+ a month with Magnation

While eliminating the black mold was Qarqat's number-one concern, he has since found that using Magnation in the pool improves the water in general and saves money on standard maintenance as well. Although Magnation's filtration system does not capture any total dissolved solids (TDS), it does provide benefits such as improving solubility, pulverize, separate, and suspend the TDS, which also helps keep membrane systems to stay cleaner for much longer time. "The filtration system simply works better, and people who use the pool notice," Qarqat says, "We've actually had people say, 'What did you do to the pool? The water is so clear!'"

It's true that swimmers now can see through the water more easily because there are fewer bubbles. This physical change in the water makes a difference in public perception, but more importantly, it makes the water performance better, the pool cleaner, and maintenance less stressful and expensive. The difference is not just subjective; it can be measured. Before Magnation, water pressure was at 12 PSI, and after Magnation, it's typically at 8 PSI. Because Magnation lowers the pressure of the water (in a closed loop system such as a pool), the pumps don't have to work as hard, which saves energy — roughly \$700 to \$800 worth of energy costs a month, in fact.

And where the University had been spending around \$40,000 a month on chemical input costs alone, now, those costs are closer to \$15,000 a month. Qarqat says, "We saw a tangible ROI from implementing Magnation technology in less than three months, just in reduction of chemical use alone."

"We got lucky with Magnation," says Qarqat. "We're saving at least \$20,000 a month. That's conservative. It's probably a lot more."

The ROI on Lowered Pressure

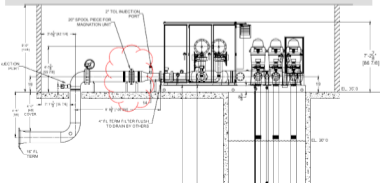
In swimming pool systems, the pump is responsible for circulating water through the pool's filtration system, ensuring proper water sanitation and effective circulation. A reduction of 4 pounds of pressure on an Olympic-size swimming pool pump typically refers to a decrease in the water pressure within the pump system, suggesting that the resistance or flow restriction within the system has lessened due to a decrease in clogged or dirty filters, improved water flow through the plumbing, and a reduction in friction at the recirculating pump.

To estimate the energy savings in kilowatts (kW) resulting from a 4 PSI reduction in pressure on an 8" recirculating pump with a flow rate of 1650 gallons per minute (gpm), 24/7:

Energy Savings (kW) = Pressure Difference (psi) * Flow Rate (gpm) * Pump Efficiency / 1714

4 pounds of PSI reduction with estimated 1650 GPM after the Magnation installation, Energy Savings (kW) is 3,539 kW per minute x 60 x 24 x 365 = 1,860,098.4 Kw @ 16 cents first tier pricing at PGE Which leads to less backwash, less evaporation, more water conservation, and a reduction in maintenance and changing of filters

As well as a reduction of TDS levels with increase of pool activity due to solubility of water



Future Benefits of Using Magnation

Looking ahead, Qarqat is optimistic about how Magnation's products will further benefit not just the Chris Kjeldsen Pool but other pools and water systems on the two university campuses.

Lessening backwashing frequency

The filter system for any standard pool includes a step called "backwashing" where dirty water is captured and particles are pushed out of the system. While in a smaller pool this might be done monthly, in the case of the large Chris Kjeldsen Pool, this process is done about once a week. With Magnation keeping the water cleaner to begin with, the hope is that backwashing can be implemented less frequently, saving time and energy.

More efficient water heating

As a surprising side benefit, Magnation has helped accelerate the water-heating process in the pool. For Qarqat, this sparked the realization that Magnation could help with the optimization of heat pumps throughout the campus, including prolonging the life of a boiler that has been going into "fail mode" frequently because of calcification from water being passed through it. "That's good news," he says, "because of budgetary constraints. Instead of having to purchase a new boiler, Magnation could help us maintain this boiler for perhaps another 10 years."

Other potential use cases

Qarqat also envisions using Magnation to optimize the roughly 25 water cooling towers on campus that support various buildings, ideally replacing chemicals in the water that are currently used to prevent corrosion and keep water from freezing. Like the boiler, these water towers are prone to calcification, particularly in the fine copper tubing. The maintenance team periodically has to open up the water cooler chillers and run strong bristles through them to get the calcium buildup out.

Qarqat's team is currently conducting inventory and analysis to determine the location, size, and frequency of pipes in order to build a new budget. "If Magnation can help us solve a lot of the issues we've had with cooling towers," he confirms, "it would make a big difference and lower our chemical consumption."

The Top 3 Benefits University of Pacific gets from Magnation:

Maintenance savings: "Pool maintenance is not nearly as labor intensive."

Cost savings: "We're seeing great savings on chemicals and power."

Perception: "The perception we get from our pool manager and people who use the swimming pool is great, and we're showing that we're willing to bring innovations to the university."



CONCLUSION

Partnering with Magnation for the long term

Magnation has partnered with University of the Pacific to solve this water problem as well as future use cases for the system. Qarqat says, "They have been super supportive, coming down here to visit and helping me with questions any time I call. They give me a lot of relevant research, and they're super responsive."

It's a partnership that Qarqat knows will show the worth of his own team to the university. "We're showing that we can save money on maintenance costs, but also be more sustainable — a number-one issue to the greater university. University leadership really likes the sort of innovation we're bringing."

As for the Pacific Tigers, clearer and faster water, and the confidence that the pool won't need to close due to water issues, definitely ensures happier, healthier swimmers.

The value of Magnation for your commercial swimming pool

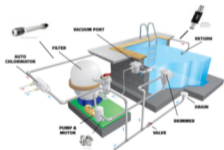
Magnation water treatment systems play a significant role in more efficient maintenance, reducing bacteria in swimming pools by improving water quality, enhancing disinfection, lowering chemical usage, and promoting a cleaner, healthier and more enjoyable swimming experience and environment for pool owners and users.

Benefits of Magnation technology in swimming pools include:

- Enhanced water quality and clarity:** Reduced scaling, less mineral buildup, and cleaner, clearer, more enjoyable pool water while minimizing the need for harsh chemicals.
- Improved equipment efficiency:** Savings that come from more more efficient pool equipment and the ability to extend the equipment lifespan, optimize performance, and cut maintenance costs.
- 24/7 consistent water quality and chemical balance:** Restructuring water molecules improves their interaction with chemicals to boost effectiveness and efficiency, and decreases the need for chemicals, resulting in stable water chemistry, lower costs, and a more eco-friendly pool maintenance approach.
- Enhanced disinfection:** By optimizing water quality and promoting better distribution of sanitizing agents, Magnation systems help ensure that bacteria are effectively controlled in the pool water.
- Reduced pathogens:** By restructuring and polarizing water molecules, Magnation systems enhance water's ability to interact with chemicals, making them more efficient at killing and controlling pathogens and bacteria, creating a more sanitary swimming environment.
- 50% reduction in chemical use:** Decreased need for conventional, expensive pool chemicals like chlorine and algaecides — an environmentally friendly approach that minimizes chemical runoff, fosters a healthier swimming environment, and streamlines the maintenance of pool chemistry.
- Prevention of biofilm formation:** Biofilm (slimy bacteria) is prevented when the scale buildup is reduced, promoting cleaner pool surfaces.
- Healthier and more comfortable swimming experience:** Through improved water quality and decreased dependence on harsh chemicals, Magnation-treated pool water offers a healthier and more comfortable swimming experience.
- Sustainable and eco-friendly solution:** Magnation systems promote water conservation by improving water quality and reducing the need for excessive chemical treatments — a more environmentally sustainable choice.



Physical Water Treatment



Magnation conditions, corrects and treats water with:

Zero	Chemicals and Inputs	Zero	Waste and Maintenance
Zero	Large Capital Investments	Zero	Processing and Energy Use