



CASE STUDY: WATER TREATMENT

Winning the War on Iron at the
City of Payette Municipal Pool

PROJECT DETAILS ::

City of Payette Municipal Pool

Project Location	Payette, Idaho
Project Type	Municipal Pool Water Treatment
Project Time Frame	Installed in late 2019
End User/Customer	City of Payette, Idaho
Engineering Firm/Consultant	Filtration Technology
Product Name	Yardney IMA-65 Filter
Model Number	MM-2460-3A
Targeted Contaminants	Suspended Iron Particulates
Flow Rate	50 GPM
Pressure	100 PSI
ASME Code or Non-Code	Non-Code
Quantity of Systems	1
Vessels Per System	3
Size	24" diameter, 60" side shell
Filtration Media Type	IMA-65

CHALLENGES

The City of Payette, located in southwestern Idaho near the Oregon border, operates a municipal indoor swimming pool that is open year-round. The facility provides the Payette community with a venue for various aquatic activities, including recreational swimming, fitness classes, and swim lessons for all ages.

The pool faced ongoing challenges with discolored water and staining on the pool floor, impacting the user experience. The staining was caused by iron present in the pool's makeup water, sourced from the city's water supply. To address the issue, the city engaged Boise-based Filtration Technology to develop a solution.

"It's common for older cities like Payette to have iron crustation in their raw water supply piping," said Filtration Technology President Gregg Fisher.

"Payette has multiple wells with varying iron concentrations, but generally, the average is about one part per million (ppm). The city does treat for iron and manganese, but instead of removing these elements, they are sequestered by injecting a blended phosphate treatment additive."

Payette's municipal pool has a chlorinator recirculation system, which draws water directly from the pool to a chlorinator and then back to maintain a specific chlorine level. *"With any municipal pool, the chlorine residual is going to be high,"* said Caloub Huttash, general manager at Filtration Technology. *"At Payette, it's at least 10 ppm. At that concentration, it was putting pressure on the phosphate's sequestering efficiency."*

To address the iron in the makeup water, Filtration Technology specified a Yardney IMA-65 iron, manganese and arsenic removal filter. The IMA-65 features a specialized media and a unique microporous structure designed to efficiently remove iron and manganese without the need for potassium permanganate, reducing dissolved iron levels to as low as 0.005 ppm.

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ABOUT YARNEY WATER FILTRATION SYSTEMS

Founded in 1965, Yardney Water Filtration Systems is a recognized leader in water filtration solutions for agriculture, golf, turf, landscape, industrial, commercial, and municipal markets worldwide. Featuring built-to-last fabrication and Made in USA quality, Yardney filters deliver reliable, long-term performance and extended product lifecycles. Yardney's offerings include filtration systems in either ASME code or non-code construction utilizing technologies such as manual and automatic screen filters, centrifugal sand separators, sand media, multimedia, granular activated carbon (GAC), and specialized media to address contaminants such as iron, manganese, arsenic, and PFAS. The company supports a sales network spanning the United States, Mexico, and Europe, bolstered by strategic dealer alliances that ensure a robust global presence.



Initially, Filtration Technology set up a pilot unit to prove the filter at a low-flow scale. *"The filter performed exceptionally well,"* Fisher said. *"It reduced iron levels to less than 0.01 ppm, clearly demonstrating its effectiveness."* Based on these results, the city approved the installation of a full-scale filtration system consisting of three 24-inch filter vessels with a flow rate of 50 gallons per minute.

SOLUTIONS

A Persistent Adversary

The Yardney IMA-65 was installed in late 2019, and for more than three years, the pool remained free of staining or discolored water. However, around August of 2023, those issues resurfaced, prompting the city to bring Filtration Technology back to investigate.

"When the filtration system was first put online, we specified that a chlorine residual of 0.5 ppm be maintained at all times downstream of the filter," Fisher explained. *"Upon our return, we found that the downstream chlorine residual had dropped to 0.1 ppm, which is much too low. At that level, the media was not being kept in an oxidation state."*

Additionally, Filtration Technology discovered that the media level in the Yardney filter was low. *"Unbeknownst to them, the city likely exceeded the recommended backwash flow rate of the filter and blew out some of the IMA-65 media,"* Fisher said. Filtration Technology recommended two corrective measures: 1) enhancing the media bed depth, and 2) increasing the chlorine level in the raw city water directly upstream of the filter to maintain a 0.5 ppm chlorine residual immediately downstream.

After implementing these actions, effluent water tests from the filter revealed that iron levels were extremely low, less than 0.01 ppm. Still, staining in the swimming pool persisted. Further investigations revealed the culprit: old iron piping and fittings.

"Both the recirculation line and the line downstream of the filter are from the 1950s and 60s and are caked with iron," according to Fisher. *"When there was a hydraulic change, iron was being scoured or sluffed off the inside of the pipes. With a chlorine residual as high as that of a municipal swimming pool, it doesn't take much dislodged iron to cause discolored water or staining."*

Understanding the full extent of the problem, the city installed new pipes and fittings, and the problem was completely resolved. *"The bottom line is that the filter has always been very effective as long as it was maintained properly,"* Fisher said.

Importantly, the city is very pleased with the aesthetic quality of the outcome. *"The water in the pool is like the Caribbean,"* said Jake Hust, water supervisor with the City of Payette. *"The clarity is incredible—it's sparkling clear."*

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