

A. R. Davis WTP Chooses Integrity Municipal Systems' A-758 Plus™ Lime Slaker Systems to Replace Existing Wallace and Tiernan® Systems

The Albert R. Davis Water Treatment Plant (WTP) in Austin, Texas, is one of three water treatment plants supplying drinking water to the greater Austin metropolitan area. The plant was built in 1954 and has had multiple upgrades over the years, increasing its capacity to 118 million gallons per day (MGD).

The WTP softens water by adding hydrated lime to the process water. This raises the pH of the finished water, which in turn minimizes corrosion throughout the water distribution system. Due to the relatively large quantities of hydrated lime required

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Matous Construction, Ltd.

Tiernan® paste-type lime slakers installed in the early 1990s. To simplify installation and minimize costs, they selected the A-758 Plus™ Lime Slaker manufactured by Integrity Municipal Systems, LLC (IMS). The six IMS paste-type lime slaker systems fit into the exact space occupied by the previous slakers, requiring minimal re-piping and modifications to the existing infrastructure.

The A-758 Plus™ paste-type lime slaker utilizes a 2:1 water-

to-lime slaking ratio to achieve the complete slaking reaction ($\text{CaO} + \text{H}_2\text{O} = \text{Ca(OH)}_2 + \text{heat}$), producing a very reactive lime slurry solution. Alternatives, such as slurry-type slakers, often require heated water and are typically less efficient. The plant officials chose the new A-758 Plus™ Lime Slaker in part because its advanced electronics seamlessly integrated into the plant’s SCADA system. The A-758 Plus™ Lime Slaker features a modulating slaking water valve and elaborate plant-specific Modicon PLC controls with a large 15-inch touch screen for local user interface. The PLC controls provide many additional features over the previous relay-logic based controls, primarily:

for water softening, the plant combines quicklime (CaO) with water in a process known as slaking, to produce hydrated lime (Ca(OH)_2). Producing hydrated lime via onsite slaking is significantly cheaper than purchasing pre-made, hydrated lime, resulting in reduced chemical costs for the WTP.

Extreme system wear and tear, resulting from an abrasive quicklime supply, prompted plant officials to replace the plant’s six existing, 4,000 lb/hr Wallace &

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1. System monitoring and remote system start/stop from the control room;
2. Increased control during start-up, reducing the time from system start to production of active lime paste;
3. PID control of paste thickness;
4. Lime paste temperature indication and trending;
5. Increased alarm detail, providing more specific alarms and simplified troubleshooting; and
6. Detailed alarm history.

The project posed unique challenges due to the large amounts of heavy grit and flint in the A.R. Davis WTP quicklime supply. The abrasive nature of the quicklime led plant officials to require additional system features and materials to help minimize wearing effects. In response, IMS modified its standard A-758 Plus™ system design, constructed from 316 stainless steel to minimize corrosion, to meet the specific operating needs of the facility. Modifications included adjustment of the system shutdown time to enable more effective cleaning of abrasive grit during shutdown, larger cleanout ports to aid in manual cleaning, control enclosures constructed from aluminum to resist corrosion, and modifications to the standard grit remover

design to allow a wheelbarrow to fit beneath the low-profile system for easy grit removal.

Installation of the new systems was simple and fast. The mounting base and footprint for each new slaker was the same as that of the previous system, facilitating replacement of one unit each day. After just six days of installation, start-up was performed by IMS personnel on a single- or dual-unit basis as required to maintain plant operations. During startup, IMS provided onsite modifications to the system controls to overcome challenges with the plant control system and wiring and to provide the desired system control features and settings. One such a modification adapted the feed-rate control to run based on the last value received in the event the plant control Ethernet signal is lost, a common occurrence at the facility. The modifications made by IMS saved the utility and

the contractor the time and money required to hardwire a backup signal. Other changes implemented at the request of the plant operators included changes to security settings and the addition of alarms.

Due to the excellent customer service provided by IMS, and a close working relationship among the contractor, plant personnel, and IMS, the units were successfully installed and commissioned in a timely manner without interruption to plant operations and to the complete satisfaction of the plant operators. Blake Pitts, Vice President of Matous Construction, Ltd., the contractor for the project, stated: "The IMS slakers greatly exceeded my expectations. The quality of the equipment, coupled with IMS's knowledgeable and professional staff, resulted in a first class project. IMS demonstrated why it is an elite organization on this project."



The existing systems consisted of painted carbon steel units which had been severely corroded. The units were in poor condition and required intensive operator intervention.



After the new paste-type lime slaker systems were installed, operators can start and stop each system without leaving the control room. Operators and other plant personnel can monitor many aspects of each slaker system from their desk computer. A detailed alarm is reported to the system controls and is displayed on the local screen, complete with history.