Into the Belly of the Beast: Maintaining Water Quality in Elevated Water Storage Tanks

By the Water Quality & Health Council

We hear much about the vast, leaky water distribution system below our feet, but not much about some of the more highly visible, towering components of this system. These are the elevated water storage tanks that dot our landscape, looking like odd, other-worldly creatures.

Elevated water storage tanks are a source of pressurized drinking water for communities. Situated hundreds of feet above sea level, these storage tanks help maintain a steady pressure and flow of safe drinking water to consumers, augmenting the H₂O supply during times of high use, fire, or power failures. As part of a potable water delivery system, they require maintenance. And maintenance requires entering the “belly of the beast.”

Inspecting the Belly of the Beast

According to an article in Municipal Sewer & Water Magazine, routine inspection and cleaning are key to preventing corrosion and sediment build-up in water storage tanks. Remote sensing equipment helps ease the inspection process. Visual inspections may be carried out without draining the water storage tank by using a remote-controlled underwater video camera. The camera is first sanitized with a 200 parts per million chlorine solution to prevent contamination, and then placed in the tank. The camera may be tethered to a cable, for example, that controls the location, orientation and operation of the camera to record images of the ceiling, walls and floor of the tank.

Remotely operated vehicle (ROV) cameras, also prepped by sanitizing, are another option for inspecting water tank interiors. An ROV camera is attached to what is essentially a small, unmanned submarine that can be moved around the tank interior with the aid of propellers. As a third option, a professional diver operating an underwater camera may be employed (but for safety reasons, divers usually enter only in cylindrical, flat-bottomed tanks). In that case, the diver dons a dry suit and gear intended only for potable water environments. There is no direct contact between the diver’s body and the water supply, and the diver’s equipment is sanitized with a chlorine solution before he or she enters the tank. The American Water Works Association (AWWA) has developed standards for potable water diving.
**Sediment Removal**

Sediment build-up, from inches to feet, can accumulate at the bottom of water tanks, especially flat-bottomed cylindrical tanks. It is important to remove sediment because it can form a barrier to the chlorinated water above and provide an area in which bacteria and other pathogens may thrive. According to the *Municipal Sewer & Water Magazine* article, diver teams can use a vacuum system to remove sediment, which must then be properly disposed.

Note to Brick Factor: please embed the video [Potable Water Tank Cleaning](#) here.

**Proactive Measures**

Regular inspection and maintenance of water storage tanks can help prevent water quality issues. The AWWA suggests, for example, that metal storage tanks be drained, cleaned, inspected and disinfected every three years. If sediment is a problem, the tank should be washed out annually. According to a 2013 AWWA *OpFlow* article, “Monitoring disinfection levels of water entering and exiting a pressure zone or storage facility is one of the simplest, most-effective ways to determine if cleaning is needed.”

A decline in chlorine level could indicate a source of contamination that is increasing the “chlorine demand.”

The *OpFlow* article notes that tank cleaning methods include power washing and chemical cleaning, with best results from chemical cleaning. Power washing may leave behind biofilm and scale, according to the authors, which may promote biofilm re-growth and ultimately, deteriorating water quality. The article recommends spray on and rinse off chemical formulations designed to remove both biofilm and scale as most effective.

Elevated water storage tanks are prominent reminders of the water distribution systems that deliver our lifeline—clean water—every day. Keeping those tanks clean is a challenging, but important responsibility of municipalities.

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