

# DELIVERING UNDER PRESSURE

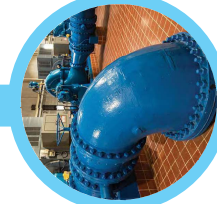
## Pump It Up

So how do utilities get our drinking water? It depends on the source, but each process involves pumping.

**Groundwater** is pumped from the Floridan Aquifer through wells drilled hundreds of feet into the ground. Tampa Bay Water's 13 wellfields include nearly 200 wells.

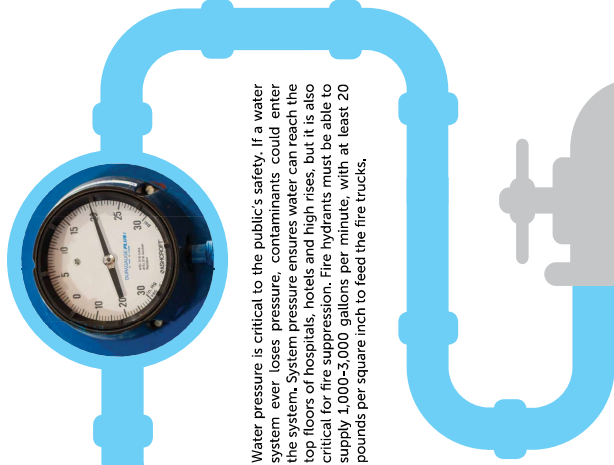
**River water** is withdrawn by pumps and is either pumped to the surface water treatment plant or into the regional reservoir for storage. Because the reservoir is elevated, gravity lets the water flow back to our facilities for treatment, as in the aqueducts of ancient Rome. When gravity isn't enough, big pumps push the water to the treatment plant.

**Desalinated seawater** from the Tampa Bay Seawater Desalination Plant starts as seawater used by the Big Bend Power Plant in Apollo Beach to cool the equipment that creates electricity. The desalination plant uses pumps to move up to 44 million gallons per day of that water for desalination.



## Under Pressure

Tampa Bay Water has more than 200 miles of pipeline. Your local water utility also has hundreds and, in some cases, thousands more miles of pipes that move the water to businesses and to homes. On average, our drinking water travels 20-50 miles, from the source to Tampa Bay Water's treatment plant to your utility's water treatment plant and, finally, to your home.



Water pressure is critical to the public's safety. If a water system ever loses pressure, contaminants could enter the system. System pressure ensures water can reach the top floors of hospitals, hotels and high rises, but it is also critical for fire suppression. Fire hydrants must be able to supply 1,000-3,000 gallons per minute, with at least 20 pounds per square inch to feed the fire trucks.

The water makes that trip quickly thanks to hydraulic engineering – the science of collecting, storing and transporting water.

## Booster Pumps Put the Pressure On!

Tampa Bay Water's system has dozens of booster pumps throughout its 2,000 square miles, ranging in size from 100 horsepower to 3,000 horsepower; that's the difference between a motorcycle and a professional drag racer!

## WATER PRESSURE BY THE NUMBERS

Water pressure is commonly measured in pounds per square inch (psi).



AVERAGE GARDEN HOSE  
**50** psi



WATER PRESSURE IN TAMPA BAY WATER'S PIPELINES  
**50-150** psi



TYPICAL FIRE HOSE  
**200-275** psi



COIN-OPERATED CAR WASH SPRAY NOZZLE  
**700** psi



DESALINATION REVERSE OSMOSIS PRESSURE  
**1,000** psi



PRESSURE WASHER  
**1,000-4,000** psi



## HYDRAULICS CAN BE COMPLEX

Hydraulics may sound simple but can be complex. Hydraulic engineers must keep adequate water pressure everywhere in the system at all times – even though people use different amounts of water at different times during the day.

Why would that be hard? Because pipelines aren't straight and aren't the same size or age. Pipeline sizes vary, with some connecting to larger pipes and others connecting to smaller ones. Also, there are turns to consider as well as the amount of water in the pipeline.