



**Clean Water  
Booklet**

**Hilton Head PSD  
24-Hour Service Hotline  
(843)681-5525**

July 2013

## About this Booklet

This Clean Water Booklet contains information about the tap water provided by Hilton Head Public Service District (PSD). Information in this booklet is current as of its date of publication.

## Contact Us

For general questions about your water service, please contact Hilton Head PSD at [info@hhpsd.com](mailto:info@hhpsd.com) or call **(843) 681-5525** during normal business hours from 8 a.m. to 5 p.m. Monday through Friday.

Our 24-Hour Hotline for emergency service can be reached at **(843) 681-5525**.

## Where Does the Drinking Water Come From?

The PSD has multiple sources of drinking water, which allows us to select from the most economical options for our customers and also provides us with resiliency in the face of a natural disaster such as a hurricane. Let's look at the sources and treatment techniques for the PSD's drinking water.

### **Reverse Osmosis (RO) Drinking Water Treatment Facility – the "RO Plant"**

The PSD's Reverse Osmosis (RO) Drinking Water Treatment Facility provides more than 40 percent of our water supply. Reverse osmosis is a pressure-driven membrane separation process that removes ions, salts, and other dissolved solids and nonvolatile organic compounds. The separation capability of the process is controlled by the diffusion rate of dissolved solids through a barrier and by sieving. The membranes are comprised of synthetic polymers similar to Nylon. The polymers are permeable to water but reject particulate matter such as salts and other minerals. The process produces fresh drinking water and yields a concentrate of the rejected solids.



***The PSD's RO Plant is located on Jenkins Island. The reverse osmosis process produces high-quality drinking water and is the same process used to produce many brand-name bottled waters.***

The PSD's RO Plant, located across U.S. 278 from Windmill Harbour, began operations in April 2009. It provides customers with 3 million gallons of fresh drinking water a day, about half of the average daily demand for water. In 2013, the PSD began preparations to expand the plant's production to 4 million gallons a day. The RO Plant's construction was necessary to replace water supply lost to saltwater intrusion.



*The interior of the PSD's RO Plant.*

The plant uses state-of-the-art filtration to produce a very high-quality drinking water. In fact, it's the same process used to produce many brand-name bottled waters and other beverages. The RO Plant is expandable to provide 6 million gallons of drinking water a day. The PSD has the capability to expand the plant in 1-MGD (million gallons per day) increments, thereby allowing the plant's capacity to increase as it is needed to replace drinking water supply lost as a result of saltwater intrusion.

The RO Plant is fed by three raw water wells drilled into the 600-foot-deep Middle Floridan Aquifer. The wells are pumped at a rate of approximately 1,500 gallons per minute (gpm) and the plant operates 24/7. The groundwater in this aquifer is brackish and requires filtration in the RO Plant. For every 3 MGD of drinking water produced by the plant, less than 1 MGD of concentrate is diffused into the saltwater background of Skull Creek via a pipeline at the end of Jenkins Island Road. Scientific research and monitoring has shown that the Middle Floridan Aquifer is a very abundant and long-term source of water for the island's future.

### **Treated Savannah River Surface Water**

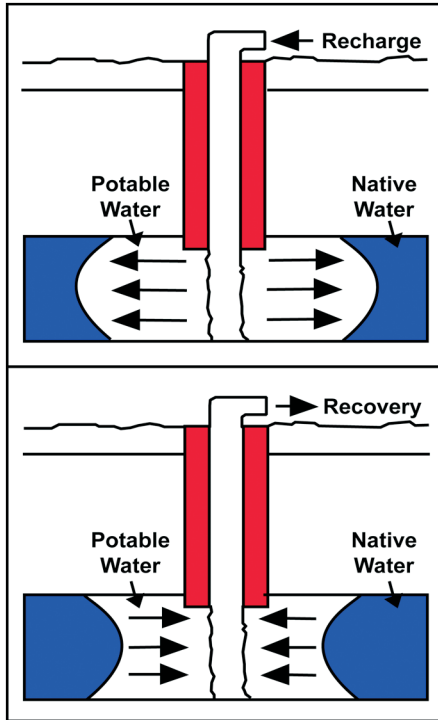
The treated Savannah River surface water we purchase from the Beaufort-Jasper Water & Sewer Authority (BJWSA) is drawn from the Savannah River. It is processed and purified at BJWSA's state-of-the-art surface water treatment plants in Chelsea and Purrysburg on the mainland. The purified water then enters the PSD's water storage tanks and distribution lines via a large pipeline located beneath the Intracoastal Waterway. Treated Savannah River water provides about 30 percent of our water supply.

### **Aquifer Storage & Recovery (ASR) Well**

The PSD constructed the island's first-ever Aquifer Storage & Recovery (ASR) well inside Hilton Head Plantation in 2011. The well both stores and withdraws drinking water.

During the winter months of low water demand, the PSD takes advantage of a reduced wholesale water rate from BJWSA and stores treated Savannah River surface water in the Middle Floridan Aquifer using the ASR well. Then, in the summer months when drinking water demand and the wholesale water rate increase, the ASR well is used to withdraw and re-treat 2 MGD of drinking water.

The ASR process involved the PSD injecting 240 million gallons of treated surface water into the 600-foot-deep Middle Floridan Aquifer to build



*The ASR process involves injecting treated water into the underground aquifer and then withdrawing and retreating it for distribution.*



**The PSD built the island's first-ever Aquifer Storage & Recovery (ASR) well in 2011. It is located inside Hilton Head Plantation.**

a bubble of fresh water in the brackish aquifer. The fresh water displaces the brackish water and a buffer zone is created at the edges of the fresh water bubble. When the ASR well is used to withdraw water, the water is drawn from the center of the fresh water bubble.

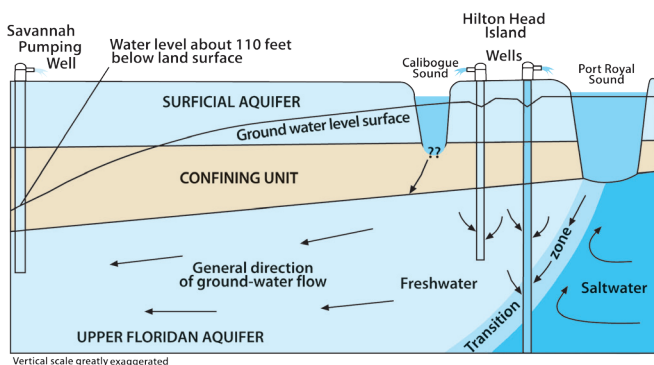
## The Upper Floridan Aquifer

The Upper Floridan (Floor-ih-dun) Aquifer is a limestone, freshwater aquifer located 50 to 150 feet underground. It is one of the largest aquifers in the world, and stretches from the Beaufort area southward through the Florida Everglades. Groundwater from this aquifer requires little treatment. The PSD utilizes automatic feeders that supply precise amounts of chloramines at our wells to treat the groundwater. The PSD treats Upper Floridan Aquifer water with chloramines directly at our well sites.

Unfortunately, this aquifer has been impacted by saltwater intrusion.

## Saltwater Intrusion & Hilton Head's Response

The water supply coming from our Upper Floridan wells continues to be threatened by saltwater intrusion. Extensive scientific research conducted by the states of South Carolina and Georgia, the U.S. Geological Survey and the PSD have shown that the intrusion is advancing at a rate of about 400 feet per year across Hilton Head and all Upper Floridan wells on the island will eventually be lost to the intrusion. The PSD has lost six of its 12 Upper Floridan wells since 2000 and anticipates losing five of the remaining six wells by 2024.



Vertical scale greatly exaggerated

Studies and monitoring have shown that the over-pumping of this aquifer in the Savannah, Ga., region has reversed the flow of the groundwater bringing saltwater from Port Royal Sound into the Upper Floridan Aquifer at Hilton Head Island. Some naturally-occurring plumes of saltwater also have impacted the Upper Floridan.

Hilton Head Island's withdrawals from the Upper Floridan Aquifer have been capped by the State of South Carolina since 1997. In that same year, Hilton Head and Broad Creek PSDs spent \$16 million to construct a 24-inch water supply transmission line and related distribution equipment to bring treated Savannah River surface water to the island. The PSD's RO Plant and ASR well were needed to replace drinking water supply lost as a result of saltwater

intrusion into the Upper Floridan. The island's three PSDs estimate that they have collectively spent \$129 million combatting saltwater intrusion since 1998 – including the development of alternative water supplies and purchasing more treated Savannah River surface water. The three utilities estimate that another \$80 million may be spent in the next 20 years to continue replacing lost supply.

### **Saltwater Intrusion Timeline:**

- 1995 – South Carolina Department of Health and Environmental Control (DHEC) declares capacity use zone.
- 1999 – Pipeline from mainland provides treated surface water.
- 2000 – PSD begins losing wells to saltwater intrusion.
- 2004-2006 – PSD undertakes series of feasibility studies to determine alternative supply options.
- 2009 – PSD opens its Reverse Osmosis (RO) Plant.
- 2011 – PSD builds island's first-ever Aquifer Storage & Recovery (ASR) well.
- 2013 – PSD plans to add an additional 1 million gallons per day capacity to RO Plant.

## **Water Quality Testing**

The PSD routinely collects water samples for analysis from its wells, treated surface water supplies, storage tanks and numerous strategically located sampling sites throughout the distribution system. In fact, more than 500 samples of PSD drinking water are analyzed during the year to verify the safety of the drinking water we provide to you. We analyze the quality of our water in our Water Quality Laboratory. The PSD posts its annual Water Quality Report to its **hhpsd.com** website each year.

The PSD also utilizes independent contractors to periodically review and assess our water quality and treatment methods, to make sure we are using the most effective and efficient treatment techniques available to us.

Visit the U.S. Environmental Protection Agency's "Water" homepage at **<http://water.epa.gov>** for a wide array of information about national water quality regulations.

## **How is the Water Treated?**

Hilton Head PSD uses liquid chlorine, or sodium hypochlorite, to treat drinking water. Chlorine is a chemical disinfectant that kills living organisms in the water. It is the most common form of water treatment in the United States and Canada. An added benefit of liquid chlorine is that it is

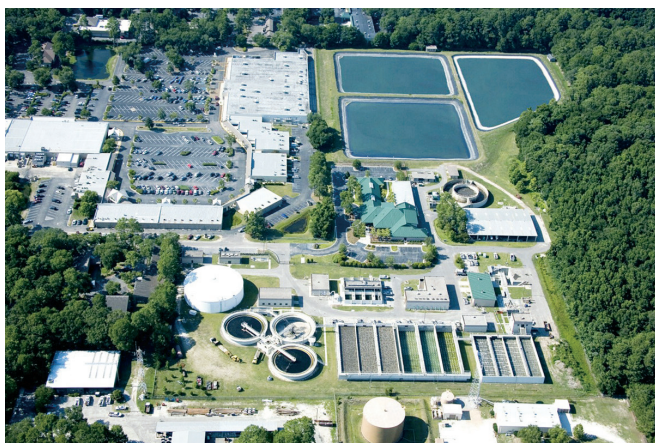
safer for PSD employees and the general public than storing and using chlorine gas to treat water.

The PSD also uses chloramines, a combination of chlorine and ammonia, to treat water at our Upper Floridan Aquifer groundwater wells. This safe and effective method of treatment is used by water utilities around the globe.

The Beaufort-Jasper Water & Sewer Authority (BJWSA) uses advanced filtration and treatment with liquid chlorine to treat the Savannah River surface water that the PSD purchases wholesale from the mainland utility. In the winter months, this water is stored in the PSD's Aquifer Storage & Recovery (ASR) well and then re-treated by the PSD when it is withdrawn for distribution in the summer months.

## Recycled Water & the Wastewater Treatment Process

It's important to remember that 100 percent of the residential and commercial wastewater treated by the PSD is used as beneficial recycled water for golf-course irrigation and wetlands nourishment. While this water is not used as drinking water supply, it does help save our drinking water supply. The PSD annually recycles more than 1 billion gallons of wastewater into beneficial recycled water. It then plays a vital role in the island's economy and ecology by



*The PSD's Recycled Water Plant is located at 21 Oak Park Drive off Mathews Drive.*

providing irrigation water for 11 golf courses – thereby conserving precious drinking water. Recycled water also is used to nourish wetlands in Palmetto Hall and Hilton Head Plantation. Renowned wetlands biologist Todd Ballantine monitors the wetlands for the PSD and reports that these unique habitats for plants and wildlife would cease to exist without the benefit of recycled water.

The recycled water process mimics, at an accelerated rate, the naturally occurring process of water purification. In the initial phase of treatment, screens and grit chambers remove large solids as well as sand and gravel, protect-



ing the remaining treatment infrastructure from excessive wear and damage. The wastewater then flows to the aeration basin where microbes biologically break down or consume the organic matter. After aeration, the water



*The PSD's recycled water nourishes the Whooping Crane Pond Conservancy in Hilton Head Plantation and three other wetlands.*

flows to the sedimentation tank, or clarifier, where the water is separated from microorganisms and solids that settle by gravity. The water then receives a chlorine injection to destroy any remaining bacteria or microorganisms. Finally, the water undergoes tertiary, or advanced, treatment that removes extremely fine solids and particles. The bio-solids produced by

the process are dewatered and disposed of in a sanitary landfill.

The recycled water is then stored at the PSD's Recycled Water Plant on Oak Park drive, pumped to designated lagoons and tanks at golf courses, or sent to the wetlands.

## **Water Hardness**

Hardness is a measure of the amount of naturally occurring minerals found in water, namely calcium and magnesium. While calcium and magnesium are essential minerals for human health, hardness may cause spotting on dishes and shower walls, affect the lathering of soap or cause deposits on water related fixtures. The PSD has implemented measures to reduce hardness levels, which in the past have been significantly higher than current figures. Depending on the exact blend of water coming from different sources at any given moment, water hardness levels may vary.

The hardness of water is reported in grains per gallon, milligrams per liter (mg/L) or parts per million (ppm). One grain of hardness equals 17.1 mg/L or ppm of hardness. Below is the United State Environmental Protection Agency (U.S. EPA) hardness scale:

## U.S. EPA Hardness Scale

Classification	mg/L or ppm	grains/gal
Soft	0 – 17.1	0 – 1
Slightly Hard	17.1 – 60	1 – 3.5
Moderately Hard	60 – 120	3.5 – 7.0
Hard	120 – 180	7.0 – 10.5
Very Hard	180 & over	10.5 & over

To determine the water hardness level in your particular area, refer to the “Water Hardness” page at [www.hhpsd.com](http://www.hhpsd.com). We regularly update the hardness level at designated sampling points throughout our service area. Compare a sampling point near your home or business to the hardness scale to determine the approximate hardness of your tap water.

## How Much Water Should You Drink?

The Mayo Clinic recommends the following:

- Drink a glass of water with each meal and between each meal.
- Hydrate before, during and after exercise.
- Substitute sparkling water for alcoholic drinks at social gatherings.
- Consult with your doctor about the water needs of infants.

Reference: Symons, J. (2010) Plain Talk About Drinking Water. Denver, CO: American Water Works Association.

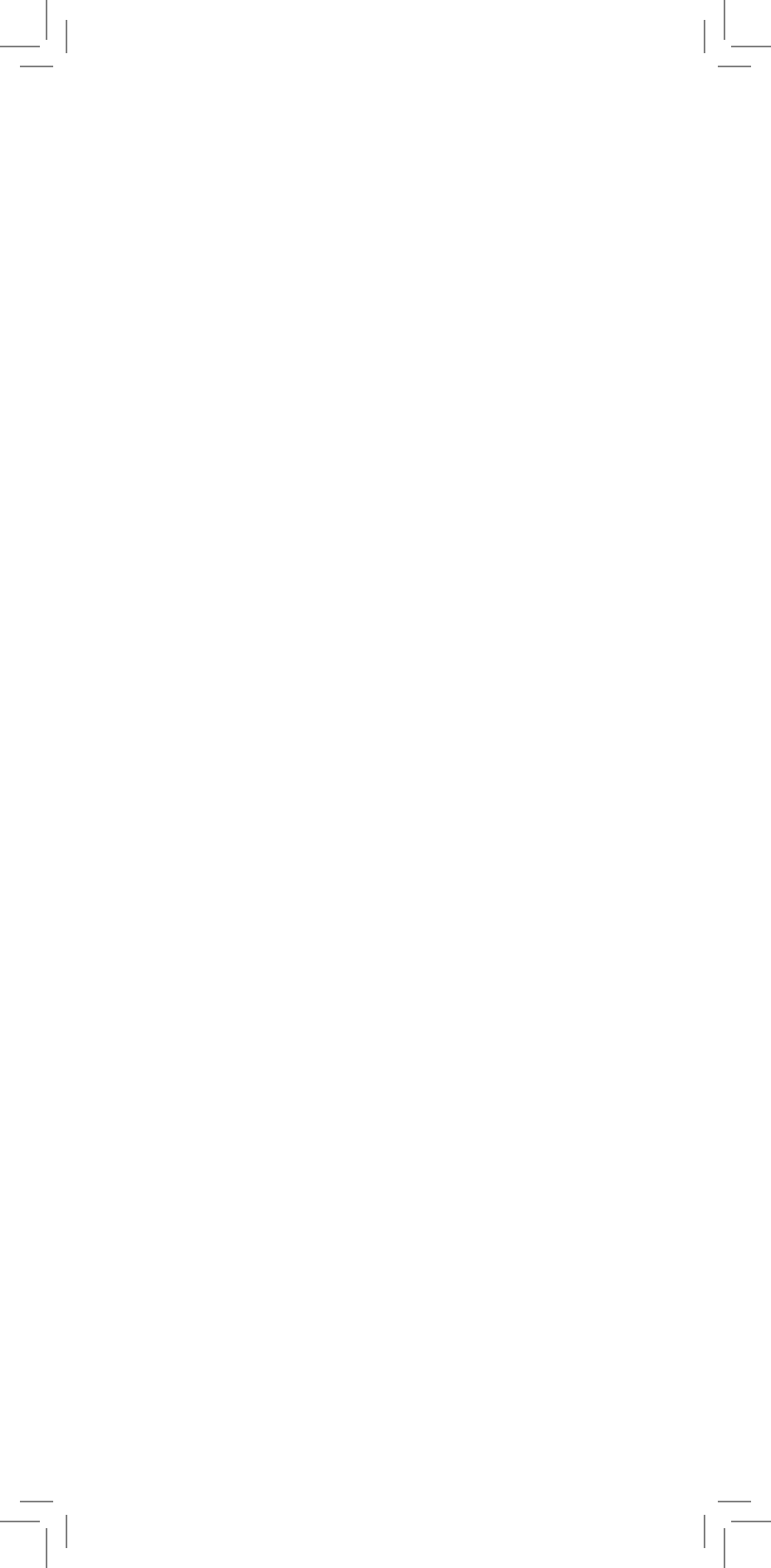
## Boil Water Advisories & Treating Water in an Emergency

If the PSD’s water distribution system is affected by a hurricane or other disaster, a boil-water advisory may be issued. Boiling is the most effective way of disinfecting water that has been contaminated by living organisms.

Bring the water to boil for at least three minutes and then allow it to cool before storing.

Boiled water should be used soon after it cools. Otherwise, refrigerate it or add a commercially available disinfectant tablet, which can be found at most camping supply stores.

Check the PSD’s Emergency Information Hotline at **(843) 681-0555** for information about boil water advisories in the event of a hurricane or other disaster.





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