



RECLAIMED WATER
AWARENESS

WHITE PAPER



Irrigating with Reclaimed Water: What You Need to Know

RAIN  BIRD®

History

Over the years, many progressive communities have found uses for reclaimed, or recycled, water to both conserve fresh water supplies and enhance economic growth and development. While some drought-prone and arid regions have used reclaimed water since the 1920s, more cities and regions worldwide are now building water reclamation into their planning processes.

[Florida's water reuse program](#) reclaimed approximately 738 million gallons per day in 2015 alone — 37 gallons per day per person. In a single year, Floridians saved more than 144 billion gallons of fresh water while adding more than 86 billion gallons back to available groundwater supplies. [Austin, Texas](#) currently has over 50 miles of reclaimed water pipes under its streets. The city's code requires new commercial developments or redevelopments within 250 feet of a reclaimed water main to use reclaimed water for irrigation, cooling and other non-potable applications. [California](#) has plans to increase its use of reclaimed water by at least two million acre-feet per year by 2030. If the state can someday reclaim and sell the estimated 4.5 million acre-feet of wastewater it produces annually, it could generate up to \$2.5 billion in much-needed revenue.

Clearly, the movement toward increased reclaimed water use is well under way. Reclaimed water offers both benefits and challenges, and it has become an integral part of Rain Bird's efforts to help its customers meet their irrigation needs. Rain Bird continues to develop and enhance irrigation system components for use with reclaimed water, making it easier to irrigate with water that was formerly discarded. Read on to learn more about reclaimed water, benefits and challenges and how to implement it at your site.



What is Reclaimed Water?

There are many types of water, each of which falls under the category of “potable” (drinkable) or “non-potable” (not suitable for consumption). In the U.S., tap water and well water are typically the only types of water that are considered potable. However, well water is not regulated by the EPA, so some well water might not be potable. Non-potable water types include reclaimed water, brackish water, sea water, river water and runoff.

TYPES OF WATER		
	Typically Potable	Typically Non-Potable
Potable, Drinking or Tap Water	Yes	No
Reclaimed or Recycled Water	No	Yes
Reverse Osmosis Water	No	Yes
Filtered Water	No	Yes
Brackish Water (mix of fresh and sea)	No	Yes
Sea Water	No	Yes
Well Water	Yes*	No
River Water	No	Yes
Runoff Water	No	Yes

NOTE: These are typical applications in the U.S.. Any water type can be treated and disinfected to meet drinking water standards — which occurs in many parts of the world.

**The EPA does not regulate private wells. Some well water might not be potable.*

Reclaimed water is basically “cleaned” wastewater. It’s the final product of a multi-stage, advanced water treatment process. This processed water is typically subject to strict standards and is rigorously monitored by local, state and federal agencies to ensure it continuously meets those standards.

While processes may vary depending on location, sewage is typically first treated to separate water from any large particles. Then, it’s transferred to sedimentation tanks where chemicals cause sludge to settle to the bottom and scum to float to the surface. In a secondary treatment, bacteria that has been added to the wastewater begin to ingest any organic solids. This produces a secondary sludge which, again, settles to the bottom of the tanks. From there, tertiary treatment filters remove whatever solids may remain, chlorine disinfects the water and salt is removed.

Certainly, water can be purified to a very high degree. However, higher levels of purification can be quite costly to achieve. In short, the more purified the water, the more expensive it is. Consequently, the challenge for reclaimed water suppliers and their customers has been to match the level of water reclamation to the water requirements of a given application. While most reclaimed water today is not considered potable, it has a number of other uses including industrial cooling, street sweeping, dust mitigation, manufacturing and, of course, landscape irrigation.

Irrigating with Reclaimed Water

Landscape irrigation has become the most common use for reclaimed water, and for good reason. According to the [EPA's WaterSense Program](#), the average American family uses 320 gallons of water per day, about 30 percent of which is devoted to outdoor uses. More than half of that outdoor water is used for watering lawns and gardens. Nationwide, landscape irrigation is estimated to account for nearly one-third of all residential water use, totaling nearly 9 billion gallons per day. It's clear that replacing those billions of gallons of fresh water with reclaimed water could have a significant impact on fresh water supplies here in the U.S. alone.

Reclaimed water's nitrogen and phosphorus content can make it ideal for irrigation use, as those components are found in most fertilizers. However, irrigating with reclaimed water also comes with its own unique set of challenges.

As water is reclaimed, its salinity level increases. Higher salt content can harm not only the soil and the fauna, but also the irrigation equipment used to deliver this water. It may be necessary to "overwater" plants by about 10% depending on soil and plant type to mitigate any possible negative effects. However, some plants, including turf grasses, deciduous trees and most annual plants, tend to tolerate salt better than others. Selecting the right plants and managing irrigation wisely will minimize the impact of higher salt levels.

The amount of treatment chemicals present in reclaimed water can spike significantly earlier in the day when water systems are typically "shocked" to disinfect the reclaimed water line. Chemicals such as chlorine used to disinfect reclaimed water can break down irrigation system components more quickly, as can the microbes and other solids that typically remain after treatment. It's also important for properties irrigating with reclaimed water to avoid overspray, particularly in high-traffic areas.

Still, the potential benefits of reclaimed water use far outweigh the challenges. In addition to conserving potable water, water reuse can save money, as reclaimed water rates are typically lower than drinking water rates. Perhaps most importantly, reclaimed water use helps ensure that communities have enough water to meet their current and future needs.



California's LEGOLAND® family theme park irrigates 90 percent of its landscape with reclaimed water. Its irrigation system consists of various Rain Bird components, including RD1800™ Series sprays and PESB-R valves, both designed to withstand chlorine and other harsh chemicals.

Getting Started with Reclaimed Water

If you're interested in using reclaimed water for irrigation, you must first determine whether it's feasible for your property. The first step is ensuring that you have access to a reclaimed water supply. Even the most progressive water utilities and districts currently recycling wastewater are not able to provide it to all areas and addresses within their jurisdiction. In some cities, like Tucson, Arizona, your property must be within $\frac{1}{8}$ mile of an existing reclaimed water main. Contact your local water authority to find out if using reclaimed water is an option for you.

Using reclaimed water should also make economic sense for your site. There is an initial cost involved with connecting to and using a reclaimed water system. And, if you have an irrigation system currently installed, you may need to change out your existing components for those made specifically for use with reclaimed water. Fortunately, because reclaimed water often costs less than potable water, it may be possible to recoup the cost of any related expenses over time. If you have access to reclaimed water and you're able to offset associated costs, it's time to determine what steps must take place before you can connect to your local reclaimed water supply. The following list is typical of the process required by many water agencies. Contact your water authority to learn exactly what's required in your area.

- **Apply for permits.** Whether your property falls under the category of new construction or you're an existing commercial customer, you'll most likely need to submit approved construction plans and/or valid permits before you'll be allowed to connect to the reclaimed water system. Your local water agency will have the information you need.
- **Make any necessary site modifications or improvements.** Be sure to consult with your construction inspector to address any construction issues related to preventing cross-connections between your potable and reclaimed water supplies. Make any improvements or modifications to your plan as needed. Typically, all irrigation systems that use reclaimed water must be kept completely separate from other water systems on site.
- **Schedule backflow and plumbing inspections.** From there, depending on your local ordinances, it's time to schedule backflow and plumbing inspections. If everything passes inspection, it's time to apply for reclaimed water service and pay any associated connection fees. Often, you'll be asked where you plan on using reclaimed water and how much of it you anticipate consuming.
- **Connect your reclaimed water meter.** Once your application is approved, your local water agency delivers and installs a special reclaimed water meter. After that, service can officially begin.
- **Erect signage and determine reporting requirements.** Some water agencies may require you to report your reclaimed water usage on an ongoing basis. There will also be regulations about posting signage on your property alerting visitors to the fact that reclaimed water is in use. Standards also mandate that all pipes and irrigation equipment conveying reclaimed water must be purple or have purple markings—the universal sign of reclaimed water use—to prevent cross connection with potable water supplies.



Usage Tips

While using reclaimed water for irrigation is certainly a concept whose day has come, implementing such a system comes with some definite “dos and don’ts.” When planning such a system, be sure to take these tips into consideration.

DO:

- Post signs on the property indicating that reclaimed water is in use and is not appropriate for human or animal consumption.
- Use purple indicators on irrigation equipment that uses reclaimed water.
- Water at night or whenever the potential for human contact is low.
- Prevent water from pooling or running off into adjacent properties.
- Avoid overspray onto outdoor picnic or dining areas where food may be prepared or eaten.
- Wash your hands with soap and drinking water if you come into physical contact with reclaimed water.
- Ensure all landscape and irrigation maintenance professionals know that reclaimed water is being used on the property.

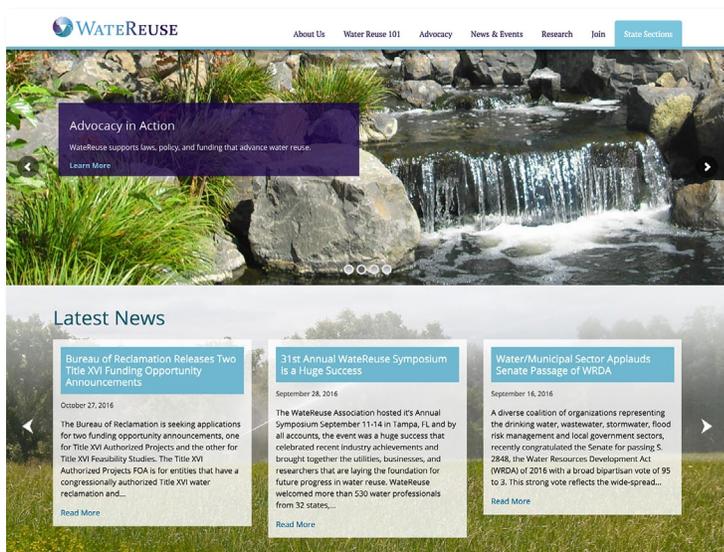
DON'T:

- Allow humans or house pets to consume reclaimed water unless it’s been disinfected and specified by your local utility.
- Connect reclaimed water to the drinking water system.
- Bathe in reclaimed water.
- Use reclaimed water in swimming pools or spas.
- Use in aquariums.
- Use for heating and cooling equipment.
- Connect to fountains.
- Wash vehicles, playground equipment, driveways, sidewalks or other structures.



Interested in learning more tips and gathering more information about reclaimed water?

[WateReuse](#), an organization focusing solely on advancing laws, policy and funding to increase water reuse, offers a number of interesting case studies and news related to reclaimed water advocacy. Rain Bird's [Reclaimed Water System Solutions](#) web page provides site reports and product information that can help you develop a custom irrigation solution to meet your unique needs.



The Rain Bird Commitment

Regardless of the challenges that reclaimed water presents, its use is here to stay — both in the United States and throughout the world. Recycling water makes sense for a cleaner and greener environment. Rain Bird will remain steadfastly committed to developing irrigation system components that better withstand the effects of reclaimed water for more intelligent water management across the globe.

The Rain Bird Advantage

Rain Bird has a great deal of experience in working with our customers seeking to use reclaimed water for irrigation. Since each customer has unique needs, Rain Bird works closely with its customers to help them better understand the challenges and benefits of reclaimed water use for their particular applications. As the demand for water increases and the availability of local and imported supplies is stretched to its limits, water reuse becomes an essential and cost-effective means of developing “new water.” Promoting the use of reclaimed water is just one more example of how Rain Bird Corporation supports The Intelligent Use of Water™.

Appendix

Rain Bird's Reclaimed Water Solutions

Rain Bird is the only irrigation systems manufacturer to offer an end-to-end reclaimed water irrigation solution. This is particularly important for public agencies, corporate accounts, landscape architects, irrigation system designers and irrigation consultants, as it's much easier to specify a system from a single manufacturer. Our components are built to perform better and last longer in the harsher, tougher conditions brought about by reclaimed water use.

Pump Stations — Rain Bird is the only irrigation manufacturer to offer pump stations, providing a totally integrated approach to reclaimed water irrigation with one trusted partner. By ensuring correct water pressure and delivering the right flow of water, our pump stations allow reclaimed water users to maximize system efficiency.

- [LC Series Light Commercial Pump Station](#)
- [CLP Pump Series](#)



Central Control — With features like ET-based scheduling, flow management and Cycle+Soak™, Rain Bird central control products help eliminate overwatering and runoff, reducing reclaimed water waste. When local water authorities require water use reporting, these systems allow users to report by water type to save you time and effort.

- [IQ™ Platform](#)
- [ESP-LXMEF](#)
- [ESP-LXD](#)



Valves — Constructed from heavy-duty, glass-filled nylon and designed with chlorine- and chemical-resistant diaphragms and components, these Rain Bird valves will perform effectively year after year. Valve boxes with purple lids ensure everyone is aware of reclaimed water use.

- [PESB-R Series Valves](#)
- [EFB-CP Series Valve](#)
- [QC Valves](#)
- [Purple Valve Box Lids](#)



Emitters — These emitters are designed to handle the challenging conditions associated with reclaimed water use. Some feature internal components that flush or filter debris from your system, while others, like the RD1800™, can easily withstand high levels of chlorine and other chemicals that would reduce a regular spray's lifespan. All of these products feature visible purple indicators so everyone knows reclaimed water is being used at the site.

- [RD1800 Series Sprays](#)
- [5000 Series NP Rotors](#)
- [Falcon® 6504 Series Rotors](#)
- [8005 Series Rotors](#)
- [2045A MaxiPaw® NP](#)
- [Drip Control Zone Kits](#)
- [XFD Purple Dripline](#)





RECLAIMED WATER AWARENESS

Dramatically increasing our use of reclaimed water is one of the most impactful ways we can save tomorrow's water. That's why Rain Bird is leading the effort to increase its use with Reclaimed Water Awareness. By educating public agencies, specifiers, contractors and homeowners about the possibilities of reclaimed water, we're working to prove the water-saving possibilities of this underutilized resource.

Visit rainbird.com/reclaimed to learn more about the innovations that offer endless potential for reclaimed water use.



Pump Stations



Central Control



Valves



Emitters



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