Reedy Creek Improvement District 2018 Reclaimed Water Quality Report

Reedy Creek Improvement District (RCID or District) has been reclaiming and reusing water for over two decades. Reuse of treated wastewater for non-potable (non-drinking) purposes has been a water conservation initiative at RCID that has reduced the consumption of potable water and furthered the conservation of our natural resources. Today, reclaimed water meets close to 30% of the overall water resource needs of the District through a wide variety of uses, including:

- Landscape irrigation (about 1535 acres)
- Vehicle and bus washing (about 390 buses and 1300 vehicles)
- Street and sidewalk cleaning
- Cooling tower makeup
- Fire suppression and fire prevention
- Dust control and construction
- Process water (at wastewater treatment plant)
- Toilet flushing (at selected locations)

Of the approximately 1,942 acres of irrigated area within the District, about 79% is irrigated with reclaimed water. In the future, the District and its customers will continue to pursue conversion of the balance to reclaimed water, whenever feasible. More conversions are planned for 2019. All new development and most re-development within RCID is required to connect to and use reclaimed water for irrigation and other non-potable needs. Doing so helps to ensure sustainability of the drinking water supply, the Upper Floridan Aquifer, by reducing demands on this finite source of high quality water.

Reclaimed water is a product of the wastewater treatment process. At RCID, wastewater is treated to an advanced level via biological means, filtered and disinfected. It typically meets all of the primary and secondary drinking water standards as set by the U.S. Environmental Protection Agency, and is visually indistinguishable from tap water. A comparison of the latest analysis of the reclaimed water to the drinking water standards is provided in the accompanying table. While the reclaimed water typically meets the drinking water standards, it is not and should not be used for consumption, cooking, bathing or body contact, in pools or spas, or to wash edible crops. These restrictions in use are due to the slightly higher risk of disease transmission or ingestion of contaminant(s) with reclaimed water than with potable water.

Nutrients in reclaimed water will vary widely with the source and level of treatment provided. Nutrients (principally nitrogen and phosphorus) are essential to all life forms, but excessive nutrients can lead to imbalances in aquatic flora and fauna, spawning algae blooms and nuisance species if levels exceed certain thresholds for extended periods. At RCID, most of the nutrients in the reclaimed water are removed in the treatment process (typically more than 95%) and those forms that remain are not normally readily available to plants and aquatic organisms. RCID's product water averaged 1.05 mg/l (or 1.05 part per million) of total nitrogen and 0.31 mg/l of total phosphorus in 2018. These values represent excellent removal and are near the limits of achievable technology. Users of reclaimed water should be aware of the presence of these constituents and account for their value when determining fertilization rates and when operating irrigation systems in close proximity to surface waters.

Reclaimed water is delivered to RCID customers through a distribution system of underground pipes, very similar in size and extent to that of the potable water distribution system. The pressure of the water in both systems is nearly identical. The pipes of the reuse distribution system are color coded purple, by pigmentation, paint, or striping and tape. Purple pipes, hydrants, valves, valve boxes and fittings identify the reclaimed water system throughout RCID. The purple designation is a State of Florida requirement and is an important measure to guard against cross connections with other piping systems, and other unintended uses.

Another aspect of the RCID reuse system is the use of rapid infiltration basins, or RIBs, for groundwater recharge. During wet weather periods or when demands on the reuse distribution system are low, the RIBs are utilized for disposition of the product water which serve to recharge the local aquifers.

The RIBs consist of 85 one-acre basins, situated on a ridge of sandy soils with high percolation characteristics. Water applied to the RIBs percolates through the sandy soils (between 30 and 70 feet thick) and replenishes the surficial and Upper Floridian aquifers. This practice helps to ensure sustainability of the water supplies by returning a portion of the product water to its source. During the course of 2018, about 58% of the product water was applied to the RIBs and 42% to the reuse distribution system.

The RCID RIBs are located in the northwest corner of the District and the site is bisected by the Western Beltway (Florida State Road 429). The RCID RIBs are visible to passing motorists from both sides of the Beltway be-tween Seidel Road and Western Way.

Service rates for reclaimed water are typically about 80% of those for potable water, and include a similar volumetric charge and a readiness-to-serve charge. The rate is intended to provide an economic incentive for customers to use reclaimed water in lieu of potable water, as well as to conserve the resource and to discourage wasteful practices. Some of the benefits of using reclaimed water are:

- Conservation of the drinking water supply
- Drought resistant and not subject to water use restrictions
- Promotes sustainability and conservation of natural resources
- Delays the development of expensive alternative water supplies
- Reduces potential adverse impacts to wetlands and surface waters

RCID appreciates this opportunity to educate its customers about reclaimed water and its role in water conservation. For additional information, please contact Randy Sims at 407-824-4842 or Randall.P.Sims@disney.com

Reedy Creek Improvement District
2018 Reclaimed Water Quality Analysis
Results

Parameter Name	Units*	Conc.	Results	Drinking Water Standards
Inorganics				
Antimony	mg/l	<0.001	BDL	0.006
Arsenic	mg/l	<0.0015	BDL	0.01
Barium	mg/l	0.0015	0.0015	2
Beryllium	mg/l	< 0.00012	BDL	0.004
Cadmium	mg/l	<0.00009	BDL	0.005
Chromium	mg/l	<0.001	BDL	0.01
Cyanide	mg/l	<0.0066	BDL	0.2
Flouride	mg/l	<0.0001	0.04	4
Lead	mg/l	<0.0004	BDL	0.015
Mercury	mg/l	<0.00005	BDL	0.002
Molybdenum	mg/l	0.01	0.01	NA
Nickel	mg/l	0.001	0.001	0.1
Nitrate as N	mg/l	0.479	1.83	10
Nitrite as N	mg/l	< 0.005	BDL	1
Nitrate plus Nitrite	mg/l	0.479	1.83	10
Selenium	mg/l	0.0005	0.0005	0.05
Silver	mg/l	< 0.00005	BDL	0.05
Sodium	mg/l	91.4	89.9	160
Thallium	mg/l	< 0.0003	BDL	0.002
Volatile Organics				
Para (1,4)-dichlorobenzene	ug/l	<0.13	BDL	75
Vinyl chloride	ug/l	<0.16	BDL	1
1,1 -dichloroethylene	ug/l	<0.15	BDL	7
1,1 -dichloroethane	ug/l	<0.39	BDL	NA
1,2-dichloroethane	ug/l	<0.086	BDL	3
1,1,1-trichloroethane	ug/l	<0.15	BDL	200
1,1,2 - trichloroethane	ug/l	<0.16	BDL	5
1,2 -dichloropropane	ug/l	<0.086	BDL	5
1,2,4-trichlorobenzene	ug/l	<0.12	BDL	70
Cis-1,2-dichloroethene	ug/l	<0.090	BDL	70
Dichloromethane (methylene chloride)	ug/l	<0.20	BDL	5
Ethylbenzene	ug/l	< 0.099	BDL	700
Monochlorobenzene	ug/l	<0.14	BDL	100
1,2-dichlorobenzene	ug/l	< 0.16	BDL	600
Styrene	ug/l	<0.089	BDL	100
Tetrachloroethylene	ug/l	<0.18	BDL	3
Toluene	ug/l	<0.086	BDL	1000
1,2-trans-dichloroethylene	ug/l	<0.090	BDL	100
Trichloroethylene	ug/l	<0.13	BDL	3
Xylenes	ug/l	<0.086	BDL	10,000
Carbon tetrachloride	ug/l	<0.11	BDL	3
Benzene	ug/l	<0.082	BDL	1
Trihalomethanes				
Bromoform	ug/l	<0.39	BDL	NA
Bromodichloromethane	ug/l	13	13	NA
Chloroform	ug/l	37	37	NA
Dibromonochloromethane	ug/l	2.5	2.5	NA
Total Trihalomethanes (TTHM)	ug/l	70	54.0	80

Parameter Name	Units*	Conc.	Results	Drinking Water Standards
Organics				
2,3,7,8- tetrachlorodibenzo-p-dioxin	ug/l	<0.0000045	BDL	0.00003
2,4- dichlororphenoxyacetic acid	ug/l	<0.037	BDL	100
2,4,5-TP (Silvex)	ug/l	<0.060	BDL	50
Alachlor	ug/l	< 0.032	BDL	2
Atrazine	ug/l	< 0.021	BDL	3
Benzo(a)pyrene	ug/l	<0.028	BDL	2
Carbofuran	ug/l	<0.25	BDL	40
Chlordane (tech mix. and meta	ug/l	<0.16	BDL	2
Dalapon	ug/l	1	5.9	200
Bis(2-ethylhexyl)adipate	ug/l	<0.59	BDL	400
Bis (2-ethylhexyl) phthalate	ug/l	32	6.600	6
Dibromochloropropane (DBCP)	ug/l	<0.0048	BDL	0.2
Dinoseb	ug/l	<0.15	BDL	7
Diquat	ug/l	<0.40	BDL	20
Endothall	ug/l	<6.3	BDL	100
Endrin	ug/l	<0.0021	BDL	0.02
Ethylene Dibromide (1,2-dibromoethane)	ug/l	<0.0021	BDL	0.02
Glyphosate	ug/l	<5.0	BDL	700
Heptachlor	ug/l	<0.0060	BDL	0.4
Heptachlor Epoxide	ug/l	<0.0016	BDL	0.2
Hexachlorobenzene	ug/l	<0.040	BDL	1
Hexachlorocyclopentadiene	ug/l	<0.041	BDL	50
Lindane	ug/l	<0.0023	BDL	2
Methoxychlor	ug/l	<0.0074	BDL	40
Oxamyl (vydate)	ug/l	<0.37	BDL	200
Pentachlorophenol	ug/l	<0.038	BDL	1
Picloram	ug/l	<0.077	BLD	500
Polychlorinated Biphenyls (PCBs)	ug/l	<0.044	BDL	0.5
Simazine	ug/l	<0.034	BDL	4
Toxaphene	ug/l	<0.055	BDL	3
Radiologicals				
Gross Alpha	pCi/L	<1.6	BDL	15
Radium 226 and 228	pCi/L	<0.9	BDL	5
Secondary Chemistry				
Aluminum, Total Recoverable	mg/l	<0.01	BDL	0.2
Chloride	mg/l	117	126	250
Copper	mg/l	0.0022	0.002	1
Iron	mg/l	0.14	0.17	0.3
Manganese	mg/l	0.001	0.0040	0.05
Sulfate	mg/l	54.3	46.6	250
Zinc	mg/l	0.026	0.030	5.0
pH (units)	mg/l	7.3	7.1	6.5-8.5
Total Dissolved Solids	mg/l	432	438	500
Foaming Agents	mg/l	<0.099	BDL	0.5

*Units:
mg/l are milligrams per liter or parts per million
ug/l are micrograms per liter of parts per billion
pCi/l are picoCuries per liter
**BDL means below the detection limit of the analysis technique employed