



Irvine Ranch Water District.
Innovative approach.
Reliable resource.



2018 RECYCLED WATER QUALITY REPORT



IRWD 2018 Recycled Water Quality Report.

Irvine Ranch Water District is a national leader in recycled water — with a history of achievements dating to 1963, when our Board of Directors implemented a vision to integrate water recycling into the design of our community. IRWD's recycled water consistently meets the State Water Resources Control Board's stringent water quality criteria for water reuse. **This Recycled Water Quality Report covers calendar year 2017 testing and reporting.**

What is recycled water?

Recycled water is the end product of sewage treatment that mirrors and accelerates the natural water cycle. Just as the earth takes moisture from the oceans and other sources and cycles it back to the headwaters, IRWD's recycled water process removes contaminants and returns a clean resource. The treatment process takes about 16-18 hours from the time the sewage enters the treatment plant until the finished product is disinfected and ready for distribution throughout the service area.

Where does IRWD get recycled water?

Sewage from the local community is collected and treated to tertiary standards at the Michelson Water Recycling Plant (MWRP) in Irvine and the Los Alisos Water Recycling Plant (LAWRP) in Lake Forest.



How is IRWD recycled water used?

IRWD produces and distributes tertiary treated recycled water, also known as Title 22 water. Title 22 water is used throughout the IRWD service area for landscape and agricultural irrigation. It is also used for toilet-flushing, cooling towers in commercial buildings, dust control on construction sites and industrial processes such as concrete production and composting. Every gallon of recycled water used for these purposes saves a gallon of drinking water.

Benefits of using recycled water

- Helps maintain long-term sustainability
- Increases water supply reliability
- Is a drought-proof source of water
- Reduces dependence on costly imported water

How is recycled water distributed?

Recycled water is delivered through a distribution system that is completely separate from the drinking water infrastructure. This isolated system uses purple pipe to keep these valuable sources of water distinguishable and make the recycled water system easily identifiable. IRWD pioneered the use of purple piping, which is now the international symbol for recycled water.

Is residential use of recycled water allowed?

Recycled water is not available for use on individual properties unless they are estate-sized lots and the water is used exclusively for outside irrigation. If you think your property may be eligible, please contact the IRWD recycled water manager at **949-453-5592**.



IRWD uses purple pipe throughout its recycled water system to identify the presence of recycled water. This helps ensure recycled water is always kept separate from drinking water.



Is recycled water regulated?

Yes. A large body of laws, regulations and statewide policies govern how recycled water is defined, what it can be used for, and under what conditions it can be used in California. Title 22 of the California Code of Regulations describes the treatment requirements for recycled water as well as the approved uses based on the level of treatment.

Also included in Title 22 are the use area requirements, which describe restrictions on the use of recycled water and the requirement to notify the public through signage that a site is using recycled water.

Title 17 of the California Code of Regulations describes the backflow devices required at a site when recycled water is being used, to maintain a clear separation between recycled water and drinking water. IRWD also extensively monitors, tests and reports on the recycled water we produce and distribute.

How is recycled water tested?

The IRWD Water Quality Department samples the recycled water system every week. While state regulations require IRWD to monitor the quality of recycled water as it leaves the recycling treatment plant, sampling within the distribution system is not required by any regulatory agency. IRWD provides that additional testing voluntarily, for the benefit of our customers and to maintain internal standards.

Twelve distribution sites, three supplemental irrigation wells and four recycled-water storage reservoirs are tested on a monthly or more frequent basis. The table at right is a summary of IRWD recycled water quality testing results.



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Irvine Ranch Water District Title 22 tertiary treated recycled water meets all permitted limits.

CONSTITUENT	UNITS	2017 ANNUAL AVERAGE ^{1,2}		PERMIT LIMIT or WQBEL ³
		Michelson Water Recycling Plant	Los Alisos Water Recycling Plant	
pH (maximum)	S.U.	7.5	8.7	9.0
pH (minimum)	S.U.	6.5	6.0	6.0
Total coliforms	MPN/100 ml	<1.8	<1.8	2.2
Ammonia as nitrogen	mg/L	0.10	32	0.75 MWRP; NR LAWRP
Chloride	mg/L	149	149	NR
Ortho-phosphate as P	mg/L	2.9	NR	NR
Specific conductance	umhos/cm	1,234	1,538	NR
Sulfate	mg/L	100	187	NR
Total dissolved solids	mg/L	636	804	720 MWRP; 910 LAWRP
Total hardness as CaCO₃	mg/L	152	252	NR
Total Kjeldahl nitrogen	mg/L	0.75	NR	NR
Total organic carbon	mg/L	5.8	9.0	NR
Total phosphorus	mg/L	3.6	NR	NR
Total suspended solids	mg/L	ND	0.6	20
Turbidity (filter effluent)	NTU	0.95	1.5	2.0
Turbidity (MBR effluent)	NTU	0.07	NR	0.2
Antimony	ug/L	<0.50	<0.50	4,300
Arsenic	ug/L	<2.0	<2.0	150
Beryllium	ug/L	ND	ND	NR
Cadmium	ug/L	<0.25	ND	3.6
Chromium	ug/L	<0.50	ND	310
Copper	ug/L	7.5	1.93	14
Iron	ug/L	25.5	17.4	NR
Lead	ug/L	<0.50	ND	6.2
Mercury	ug/L	ND	ND	0.052
Nickel	ug/L	2.9	3.96	80
Selenium	ug/L	<2.0	<2.0	5.0
Silver	ug/L	ND	ND	9.8
Thallium	ug/L	<1.0	<1.0	6.2
Zinc	ug/L	53.7	3.93	180
1,2-dichlorobenzene	ug/L	ND	ND	1,200
1,4-dichlorobenzene	ug/L	ND	ND	NR
Bis(2-ethylhexyl) phthalate	ug/L	ND	<5.0	5.9
Endrin	ug/L	ND	ND	0.036
Heptachlor	ug/L	ND	ND	0.00022
Heptachlor epoxide	ug/L	ND	ND	0.00012
Pentachlorophenol	ug/L	ND	ND	4.1
Total PCBs	ug/L	ND	ND	NR

¹ ND = Not detected

² NR = Not required; the Regional Water Quality Control Board does not require analysis of this constituent at this facility.

³ National Pollution Discharge Elimination System (NPDES) limit or Water Quality Based Effluent Limit (WQBEL). Except where noted, limits apply to both Michelson Water Recycling Plant (MWRP) and Los Alisos Water Recycling Plant (LAWRP).

IRWD recycled water facilities



Offices

- IRWD Sand Canyon Administrative Offices
- IRWD Operations Center

Plants and storage

- Michelson Water Recycling Plant
- Los Alisos Water Recycling Plant
- Sixteen recycled water reservoirs, including Rattlesnake, Sand Canyon, San Joaquin, and Syphon, with a combined storage capacity of 1,640 million gallons.



Michelson Water Recycling Plant aerial view shows chlorine contact disinfection tanks in foreground.

How is recycled water treated?

Recycled water is highly regulated by the state of California and approved uses differ depending on the level of treatment applied. At IRWD, sewage undergoes primary, secondary and tertiary treatment at our two water recycling treatment plants.

- **Primary treatment:** This is the stage where large solids are removed.
- **Secondary treatment:** At this stage, bacteria are used to remove approximately 90% to 95% of the remaining solids.
- **Tertiary treatment:** IRWD uses two types of tertiary treatment. In traditional tertiary treatment, filtration removes any remaining solids. The water is treated with a disinfectant, such as chlorine, to destroy bacteria, viruses and other pathogens. A more refined

tertiary treatment process uses a combination of membrane bioreactor filtration and ultraviolet light disinfection. This new technology produces a more purified water and reduces the need for traditional disinfection chemicals like chlorine.

- **Advanced tertiary treatment:** This process uses filtration or reverse osmosis to duplicate and accelerate nature's own purifying system. This advanced treatment produces recycled water so pure that it can be used for groundwater recharge, where it ultimately works its way back into the drinking water cycle. Locally, the Orange County Water District is producing and using advanced treated recycled water from its Groundwater Replenishment System to supplement water supplies in the Orange County Groundwater Basin.



Storage capacity is vital to a recycled-water system. Sand Canyon Reservoir—adjacent to the Strawberry Hills golf course in Irvine—has a surface area of 42 acres, an average depth of 18 feet and a volume of 250 million gallons. The picturesque reservoir is used for both seasonal and operational storage.