Dublin San Ramon Services District
Water, wastewater, recycled water

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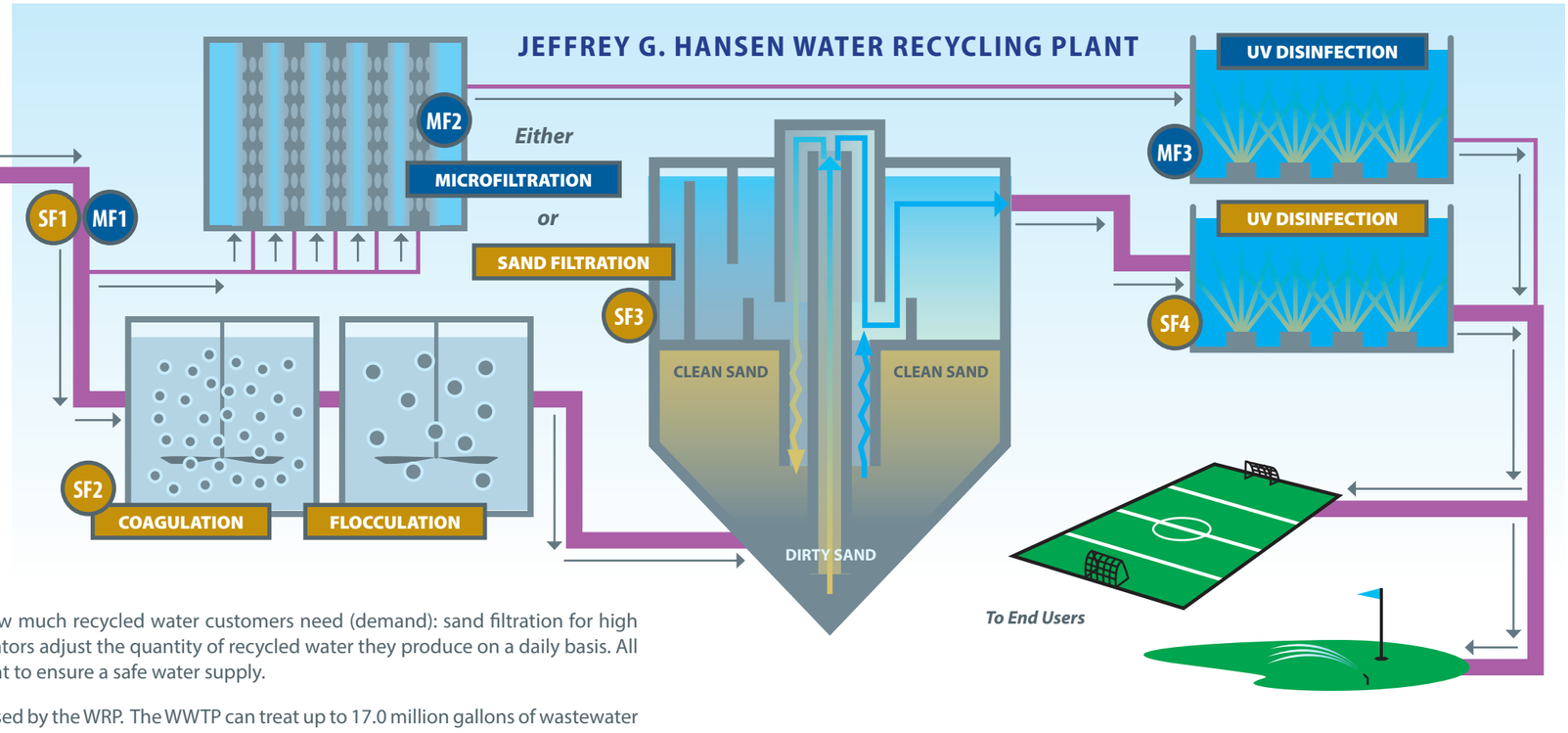


Understanding the Recycled Water Advanced Treatment Process

The Jeffrey G. Hansen Water Recycling Plant (WRP) is a joint effort by the Dublin San Ramon Services District (DSRSD), the East Bay Municipal Utility District (EBMUD), and the City of Pleasanton to supply recycled water to irrigate schoolyards, parks, roadway medians, commercial and multi-family complexes, and golf courses in Dublin, San Ramon, Blackhawk, Danville, and Pleasanton.

The WRP produces recycled water using two separate treatment processes depending on how much recycled water customers need (demand): sand filtration for high demand, microfiltration for low demand, and both systems when demand peaks. Facility operators adjust the quantity of recycled water they produce on a daily basis. All treatment includes continuous electronic monitoring and disinfection with ultraviolet (UV) light to ensure a safe water supply.

DSRSD's Wastewater Treatment Plant (WWTP) is the source of water (secondary effluent) processed by the WRP. The WWTP can treat up to 17.0 million gallons of wastewater per day (average dry weather flow) and the WRP can produce up to 10.3 million gallons of recycled water per day.

Sand Filtration Treatment Process

Sand filtration, because of its lower cost and higher output, is used during high-demand periods. The system can be operated at a flow of 2.0 to 7.9 million gallons per day (mgd).

Step 1 (SF1): Secondary effluent (wastewater that has completed primary and secondary treatment, removing up to 95% of suspended solids and meeting requirements for discharge to the Bay) enters the WRP.

Step 2 (SF2): Chemicals are added to concentrate particles remaining in the water. The chemicals (called coagulants) clump small particles into larger particles so they are easier to filter out of the water (a process called coagulation/flocculation).

Step 3 (SF3): The water then passes through an 80-inch-deep continuous backwash sand filter system, which removes the remaining solids. The sand is Colorado silica, which has a nicely rounded shape and does a good job filtering clumps of undesirable particles from the water. This process reduces the turbidity of the water to less than two nephelometric turbidity units (NTUs). Turbidity is a measure of water cloudiness and a lower number of NTUs means clearer water. Drinking water in California cannot exceed 1 NTU and recycled water for nonpotable uses cannot exceed 2 NTUs.

Step 4 (SF4): The filtered water slowly passes by UV lights, which kill or inactivate any bacteria and viruses that might remain in the water. Similar to the disinfecting power of sunlight, UV light destroys the DNA of pathogens.

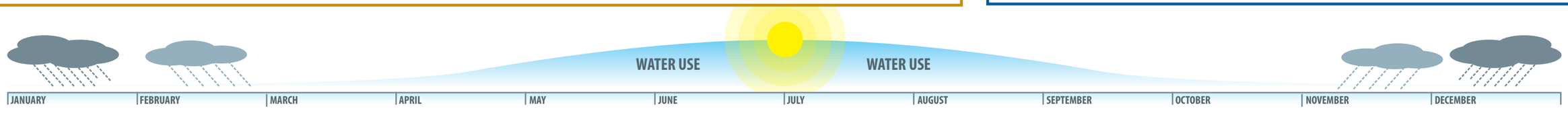
Microfiltration Treatment Process

Microfiltration, because of its higher cost and lower output, is used primarily as a back-up to sand filtration and during the off-season. The microfiltration system can be operated at a flow of 0 to 2.4 mgd.

Step 1 (MF1): Secondary effluent (wastewater that has completed primary and secondary treatment, removing up to 95% of suspended solids and meeting requirements for discharge to the Bay) enters the WRP.

Step 2 (MF2): The water passes through a microporous membrane filtration process, removing particulates and contaminants. Pores in the membrane are 0.1 micrometers in size, more than 100 times smaller than the width of a human hair. Microfiltration can remove pathogens from water, including Giardia, Cryptosporidium, and any large bacteria.

Step 3 (MF3): The filtered water slowly passes by UV lights, which kill or inactivate any bacteria and viruses that might remain in the water. Similar to the disinfecting power of sunlight, UV light destroys the DNA of pathogens.



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