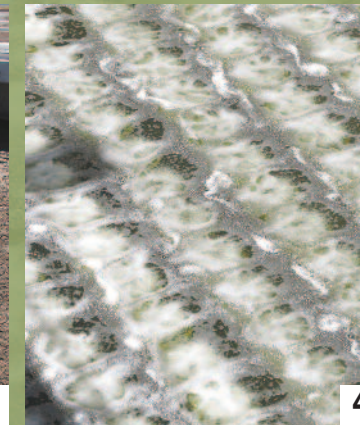
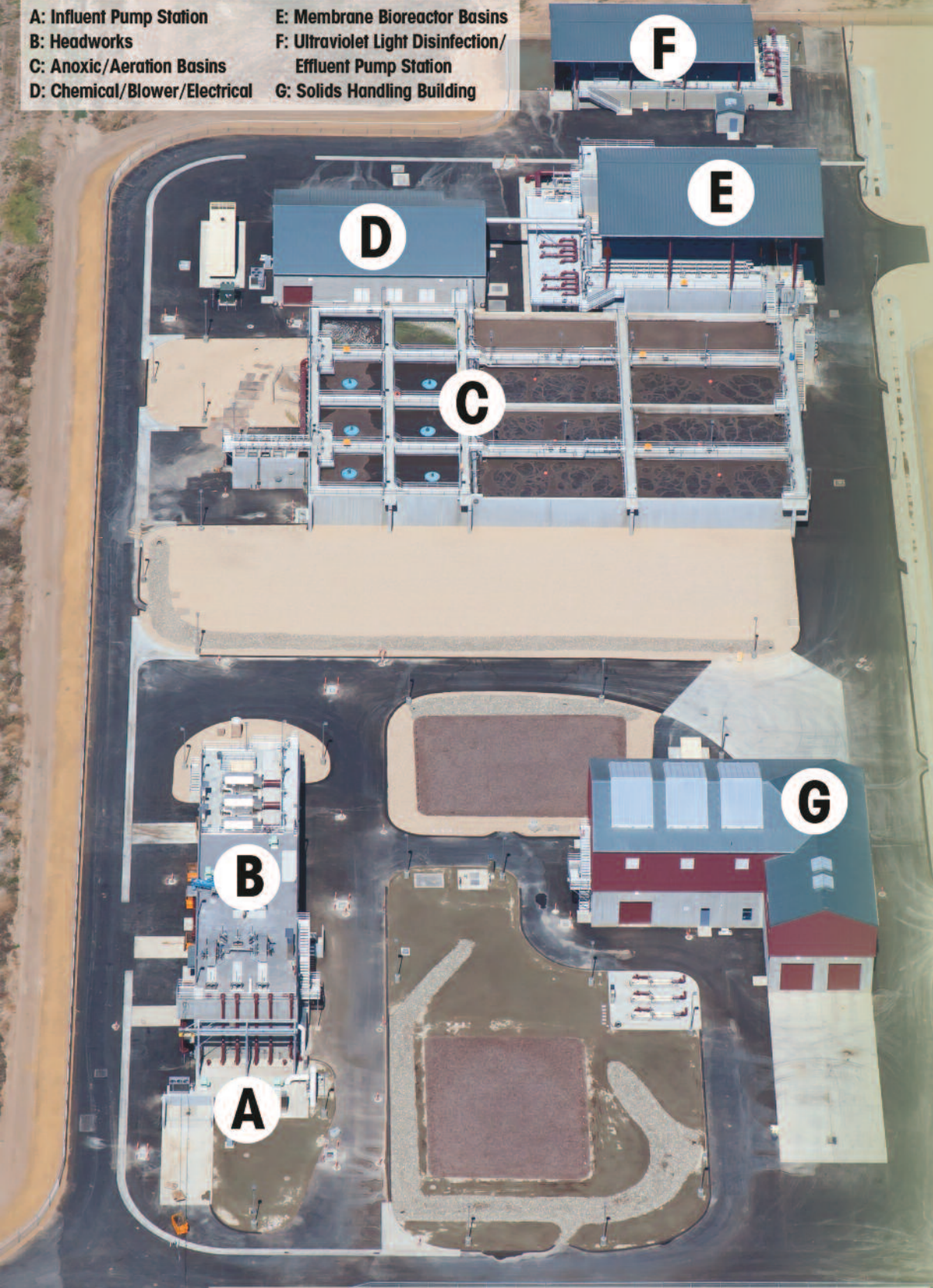


# Getting acquainted with ISD's new Water Recycling Facility

- A: Influent Pump Station
- B: Headworks
- C: Anoxic/Aeration Basins
- D: Chemical/Blower/Electrical
- E: Membrane Bioreactor Basins
- F: Ultraviolet Light Disinfection/Effluent Pump Station
- G: Solids Handling Building



## HANDLING 4.3 MILLION GALLONS OF WATER A DAY IS TOUGH...

On its surface, Ironhouse Sanitary District's (ISD) state-of-the-art Water Recycling Facility looks like a simple collection of buildings and structures, but hidden behind these walls is a complex of piping and processes designed to turn the wastewater our communities generate into a product that is safe to return to the environment and safe to reuse for irrigation.

The process begins when raw

sewage enters the **Influent Pump Station (A)(1)** and conveys it to the **Headworks Building (B)** for two-stage screening, grit removal and metering. At the **drum screens (2)**, the second stage screening process, a rotating cylinder removes solids larger than 1 millimeter — about the size of the tip of a ballpoint pen — improving operation of downstream equipment and processes.

The wastewater is piped to the

**Anoxic/Aeration Basins (C)(3)(4)**, large holding tanks about 16 feet deep, where the wastewater is mixed and aerated to allow the biological process to remove soluble matter and nitrogen compounds in the wastewater. These things must be removed to protect the environment. The air for the aeration basins is supplied by very efficient 300 horsepower high speed **turbo blowers (D)(5)**.

Ultra-modern technology comes into play with the next stage of the process. A number of large pumps lift the partially treated wastewater from the aeration basins and into the **Membrane Bioreactor (MBR) Basins (E)(6)**. The MBR basins are suspended growth biological (living organisms) reactors integrated with an ultrafiltration membrane system. The membranes are comprised of

tubes with microscopic pores. **Vacuum pumps (7)** draw the treated water through the pores of the membranes, leaving the solids outside, creating a high quality effluent.

Effluent from the MBR basins is disinfected by passing it through channels equipped with **ultraviolet (UV) light lamps (F)(8)** that expose the microorganisms to lethal doses of UV radiation. After UV disinfection



the wastewater is now fully treated and meets the most stringent California Department of Public Health, Title 22, unrestricted reuse requirements.

Three methods for discharge of the **fully treated effluent (F)(9)** are currently available. The effluent can be stored on-site in a large 76 million gallon holding pond, land-applied on agricultural land that ISD owns on nearby Jersey Island, or conveyed to an outfall pipe in the

San Joaquin River.

The choice of discharge method may be influenced by several factors, including the time of year, volume of water and weather conditions. In all cases, the recycled water is now pure enough to irrigate crops and won't pose a danger to fish or wildlife.

In the future, treated effluent will be available to offset potable water use for irrigation of parks, vineyards, medians and for industrial use.

The Water Recycling Facility is also equipped with a **Solids Handling Building (G)(10)** where waste solids generated during the treatment process are dewatered and hauled offsite in trucks for disposal. The facilities include a solids holding tank, waste activated sludge pump station, solids feed pump station, dewatering belt filter presses and a dual truck bay for temporary storage.

As you might imagine, running

all this equipment takes quite a bit of energy, which is why the recycling facility includes a large amount of electrical systems on site. The plant is serviced by 21,000 volts of primary power. Backup generators are available to kick on in rare occasions when primary power from PG&E is unavailable, ensuring the facility will remain operable.

The Water Recycling Facility has a design capacity of 4.3 million gal-

lons per day (average dry weather flow). The facility can be expanded to 6.8 mgd as the ISD service population expands. In this way, the facility will be able to serve the needs of the community and meet state regulations well into the future. The facility places the communities of Oakley, Bethel Island and other unincorporated areas within ISD's service area well ahead of the curve with regard to more sustainable wastewater treatment.

### PLANT FACTS AT A GLANCE

Groundbreaking: April 22, 2009  
Completed: October 12, 2011  
Cost: \$54.5 million

Average operating capacity: 4.3 million gallons per day  
Future expansion capacity: 6.8 million gallons per day  
Contractor: Western Water Constructors, Inc.

## ...BUT THIS STATE-OF-THE-ART PLANT IS EQUIPPED FOR THE TASK