

Bridgeland Purple Pipe and Water Reuse System

Cypress, Texas

West Houston Association Sustainability Stars Program Application



Bridgeland Purple Pipe and Water Reuse System

Project Owner:
Howard Hughes Corp. on behalf of
Harris County WCID 157

Project Engineer:
BGE, Inc.

Sustainability Star:
Integration Star

Project Type:
Residential Community and
Infrastructure

The integration of sustainable infrastructure was a major consideration when planning the Bridgeland development, an 11,400-acre master-planned community in Northwest Harris County. The developer, Howard Hughes Corp., aimed to create a community that seamlessly blended natural features with modern facilities and amenities while being environmentally conscious.

BGE helped the developer achieve this goal by incorporating more than 3,000 acres of lakes, trails, and parks into the design. The development's vast areas of greenspace are supported by an innovative and forward-thinking water reuse and purple pipe system that reduces the community's overall demand for treated, potable (drinking) water.

3,000 acres of greenspace are maintained with forward-thinking water reuse program



Top: Purple pipes are installed in a trench in the Bridgeland development. The pipes will carry non-potable water to irrigate common green spaces, saving millions of gallons of potable (drinking) water.

Bottom: A worker tightens a bolt linking two segments of purple pipes together.

The Purple Pipe and Water Reuse System

The purple pipe system takes advantage of two sources of non-potable water that the vast majority of other developments do not utilize. First, Bridgeland's wastewater treatment plant was designed to treat water to Type 1 effluent standards, water that is clean enough to discharge into public lakes. Second, Bridgeland has rights to a certain volume of water in the adjacent Cypress Creek. These two sources of water are pumped into Bridgeland's interconnected lake system to keep it at a steady level.

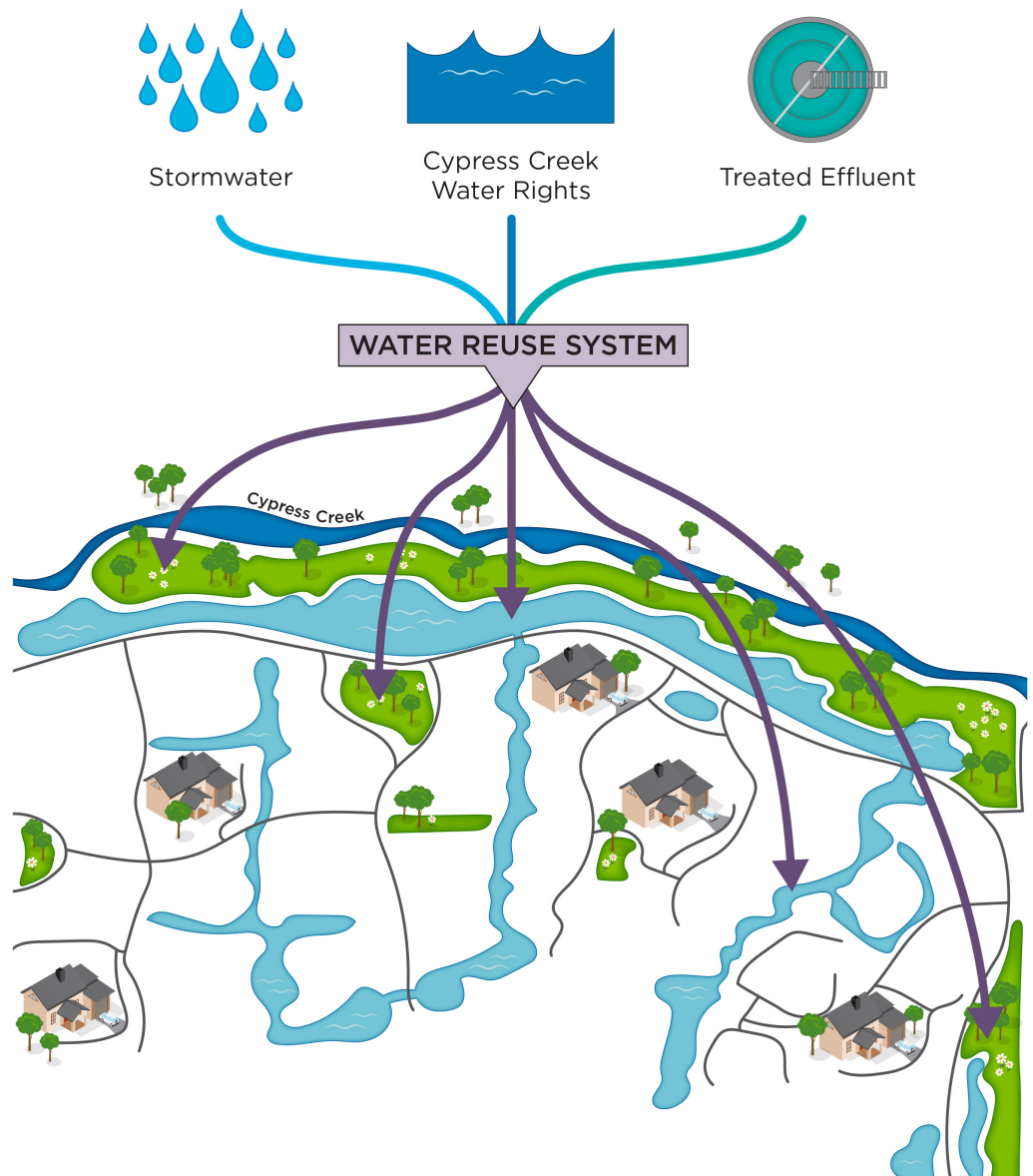
When planning the reuse system's lakes, BGE engineers took into account historical weather data to project water loss due to evaporation, estimated irrigation for various seasons of the year, and estimated rainfall that will make its way into the lakes through the community's storm sewers.

Water is pumped from the interconnected lakes into the purple pipe system to irrigate common green areas, such as parks, esplanades, and a disc golf course.

Benefits

Bridgeland's purple pipe system dramatically reduces the development's need for potable water, making the community more sustainable. If the purple pipe system had not been implemented, Bridgeland would need to use hundreds of millions of gallons of drinking water annually for irrigation. Last year, 437.5 million gallons of non-potable water were pumped through the purple pipe system, with 58.5 million gallons coming from treated wastewater and the remaining 379 million from the adjacent Cypress Creek and stormwater that runs into Bridgeland's amenity lakes. The purple pipe system completely eliminates the need to use more expensive, potable water to irrigate the greenspace.

The purple pipe system uses stormwater, Cypress Creek, and treated effluent to fill its system of interconnected lakes. Water is then pumped from the lakes into the purple pipe system to irrigate common green areas.



437.5 million gallons of non-potable water pumped through purple pipe system saving \$1 million

If not for the purple pipe system, Bridgeland would spend more than \$1 million on potable water for irrigation.

Setting aside its environmental benefits, Bridgeland's water reuse and purple pipe system have cost savings benefits. The development's treated wastewater, water rights from Cypress Creek, and stormwater runoff provide sustainable sources of water. Drinking water, meanwhile, is purchased from the local water authority for \$2.45 per 1,000 gallons of water. If Bridgeland did not have a purple pipe system, it would need to spend more than \$1 million annually on irrigation.



Houston communities that did not originally include a purple pipe and water reuse system are now facing challenges as they try to implement them retroactively. These neighborhoods want to implement purple pipe systems because of the rising cost of potable water and increasing regulation of groundwater usage. However, they must design a system that circumvents existing infrastructure and disturbs landscaping, which increases costs. The decision to design Bridgeland to include the water reuse system from the start was forward-thinking and economically sensible.

Additionally, the sustainability of the community has become a selling point to potential home buyers. Now more than ever, Texans want to live in communities that are environmentally friendly. By including a purple pipe system in Bridgeland's design, BGE is responding to residents' sense of environmental responsibility and stewardship.

Future Expansion

The water reuse system is operational in Bridgeland, but there are also plans for expansion in the near future. BGE and Howard Hughes Corp. are developing plans for an additional pump station to the lake system and another wastewater treatment plant that treats wastewater to Type I standards and expanding the purple pipe system. Currently, only about a quarter of the 11,400-acre development is complete and occupied by residents. As the development expands, so will the water reuse and purple pipe system.