

A One Water School for Wimberley ISD

The Cypress Creek Project was initiated in 2007, when concerned landowners, non-governmental organizations and the Meadows Center for Water and the Environment applied for state and federal 319 funds to develop a preventative and community-driven watershed protection plan (WPP) for Cypress Creek. The goal was to keep the creek from being listed as impaired on the State of Texas 303(d) List of Impaired Waters, as it had been in 2000 for inadequate dissolved oxygen (DO). That year, Cypress Creek stopped flowing due to drought conditions and pumping from the aquifer that had historically provided reliable spring flows to the Creek from the iconic Jacob's Well Spring.

The Cypress Creek WPP was approved by the U.S. Environmental Protection Agency and Texas Commission on Environmental Quality in 2014. The WPP is a proactive plan that addresses likely future nonpoint source pollution impairments of nitrogen, total suspended solids, bacteria and other water quality pollutants. Given that the quality of the water in Cypress Creek is highly dependent on ensuring sufficient source groundwater flows, the preservation of flows from Jacob's Well is an essential component of the WPP.

The effort to keep Cypress Creek clean, clear and flowing continues today with an opportunity to demonstrate the value of a *One Water* approach with the design and construction of a new primary school for the Wimberley Valley. This water smart school will serve as a model for the Valley other communities throughout the Texas Hill Country.

Key Consideration: Reduce demand on limited local groundwater resources and address potential nonpoint source (NPS) pollution to ensure the health and integrity of the Cypress Creek watershed.

Tools: Capture rainwater and AC condensate, beneficial onsite reuse, green infrastructure to reduce stormwater flows and NPS pollution, integrate infrastructure with public education opportunities

- **When considered as a whole, the above recommendations will reduce capital investment costs by a minimum of \$125,000.**
- **Annual cost savings relative to standard construction and centralized water/wastewater service expected to be between \$29,000 and \$48,000 per year.**
- **Total cost savings over 30-years to exceed \$1,000,000 in 2018 dollars.**
- **A *One Water School* for the Wimberley Valley will result in the conservation of 237 acre-feet of groundwater over 30 years. Enough to keep Jacob's Well Spring flowing at a healthy rate for 143 days!**



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Texas State University-San Marcos, founded in 1899.

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	Scudder Primary School 2017-18 [410 Students Enrolled - May 2018]	Jacob's Well Elementary 2017-18 [676 Students Enrolled - May 2018]	Standard Construction w/ Centralized Sewer Service and Minimal Conservation based on U.S. Standard for Schools (cafeteria/no gym or showers) [Assumed occupancy of 800 and 10 months full use w/ 2 months at 50% use]	Standard Construction w/ Centralized Sewer Service and Minimal Conservation based on 2011 <i>Water Consumption in Public Schools</i> (estimate for PK-2) [Assumed occupancy of 800 and 10 months full use w/ 2 months at 50% use]	WISD One Water Primary School (cafeteria/no gym or showers) [Assumed occupancy of 800 and 10 months full use w/ 2 months at 50% use]	Notes
Gallons Per Day / Student (week days only over 10 months of instruction)	8.96	3.94	15.00	9.00	1.50	
Potable Water Usage (12-month TOTAL in gallons)	882,444	596,300	2,862,857	1,717,714	286,286	
Sewer Usage (12-month TOTAL in gallons)	871,300	596,300	2,862,857	1,717,714	763,429	
Water Service Fees (12-month TOTAL)	\$7,778.00	\$12,625.00*	\$27,432.00*	\$19,488.00*	\$10,188.00*	*Includes \$8604 in "Water Base Facility Charges" from AT
Wastewater Service Fees (12-month TOTAL)	\$9,414.00	\$17,124.00*	\$37,578.00*	\$26,695.00	\$6,000.00**	*Includes "Sewer Base Facility Charges" from AT; **Assumes \$500/mo. O&M cost
Capital Infrastructure Cost (Water/Wastewater system)	n/a	n/a	\$750,000.00	\$750,000.00	\$625,000.00*	*Includes OSSF w/ beneficial reuse \$250K; infrastructure for collection of rainwater \$250K and AC condensate; Additional investment in green infrastructure and water efficient plumbing fixtures \$125K
Construction and 30-year Service/O&M cost	n/a	n/a	\$2,694,300	\$2,135,490	\$1,110,640	
Gallons of Water saved compared to U.S. Standard water usage rate over 30 years	n/a	n/a	0	34,354,286	77,297,143	A healthy Cypress Creek requires Jacob's Well Springflows of 4 CFS. This is not achieved 60% of the time. The addition of 1 CFS per day would keep Cypress clean, clear and flowing the majority of the time.
Acre-feet of groundwater conserved over 30 years	n/a	n/a	0.0	105.4	237.2	
Equivalent days of healthy spring flow from Jacob's Well	n/a	n/a	0.0	63.8	143.6	

Onsite beneficial reuse permitted through OSSF creates tremendous savings and opportunity for reinvestment in additional conservation best management practices!

- Onsite beneficial reuse system compared to connection costs and long-term service through local wastewater provider (estimated cost of construction based on 5,000 GPD system is \$250K)
 - **Capital savings of \$500,000 or more when compared to connection fees and construction of infrastructure to connect to centralized sewer service**
 - **Net reduction in annual wastewater service fees \$20,000 to \$30,000+. (\$600,000 to \$1,000,000 in savings over 30-years)**
 - Net reduction in monthly water use fees (for landscape irrigation) greater than \$200/mo. (\$72,000 over 30-years)
 - Reduced administrative costs/time burden - streamlined permitting process (1-2 months through Hays County) and limited monitoring
 - *Minimal O&M costs – estimated \$500 per month*
 - Significantly reduced land disturbance, reduced infrastructure demands and reduced risk of contributing to catastrophic environmental disaster – No need for lift station and centralized sewer line
 - One-acre multipurpose/athletic field irrigated year-round through sub-surface drip irrigation of high quality effluent
 - **Can be designed to accommodate full development of 148.4 acre parcel**

Use of efficient plumbing fixtures and collection of rainwater and AC condensate for toilet flushing and landscape watering can result in a 90% reduction in potable water demand when compared to the U.S. standard for schools!

- Rainwater Harvesting/AC Condensate Collection
 - Capital investment required - \$250,000
 - **Net reduction in annual water use fees (for toilet flushing and landscape watering) \$9,000 to \$17,000+ (\$270,000 to \$510,000 savings over 30-years)**
 - 150,000 gallon system provides 99% of water demand for toilet flushing
 - Provides significant “make-up” water for summer landscape watering demands
 - Minimal O&M costs
 - HIGHLY VISIBLE demonstration of water conservation in every facet of school life for students and the community
 - Clear pipes in hallways to demonstrate RWH collection
 - Efficient fixtures including pressurized toilets, auto shutoff basins, HE dishwashers and waterless urinals
 - Educational signage throughout building and grounds
 - U.S. standard for school with cafeteria estimates potable water demand of 15 GPD/student. Scudder currently at 9.86 GPD/student. **WISD One Water School estimated at 1.5 GPD/student.**

Green stormwater infrastructure can serve to make a developed site function like undisturbed open space!

- Bioretention/biofiltrations, permeable pavers, xeriscape
 - Capital investment recommended - \$150,000

- Reduce size of required retention pond by 50% or more
- **Reduce sediment, bacteria and nutrient loading to Cypress Creek watershed (Blue Hole) by 85%**
- Integrate infrastructure with outdoor learning opportunities
 - Riparian education
 - Native plants
 - Composting
 - School gardens
- **Fast-tracked permitting with free assistance from professional engineer retained by the Cypress Creek Project, estimated net savings of \$10,000.**
- O&M primarily provided by WISD maintenance staff
- Water quality in Cypress Creek intricately linked to enhanced quality of life for the Wimberley Valley and millions of dollars in local tax revenues annually.