Direct Reuse for Vineyard Viticulture: A Partnership of Yavapai College and City of Cottonwood

Debbie Breitkreutz Wastewater Superintendent City of Cottonwood

*Yavapai* COLLEGE







- 1988- Cottonwood built it's first treatment facility and collections system with 4 lift stations. Which consisted of a Sequence Batch Reactor plant, with tertiary treatment and Chlorine disinfection. The treatment plant is located uphill of the Verde River near the Mingus Mountain Foothills.
- 2000- Cottonwood expanded the wastewater treatment plant to a Modified University of Cape Town activated sludge process. They utilized the original basins and sand filters, added new treatment basins, clarifiers and retrofit the CL2 contact chamber to house the Ultraviolet disinfection which provides Class A+ reclaimed water.

## **Cottonwood Reuse** history

With the expansion came a need to reuse the growing amount of reclaimed water produced by the plant. The City created a riparian area in Del Monte wash (a ephemeral wash near the plant) and a year later started to supply the nearby Cottonwood Ranch subdivision. They use the reclaimed water for parks and landscape irrigation.





## **Cottonwood Reuse history**

The use of potable water for construction purposes is prohibited by City ordinance. This led to the creation of the Reclaimed Water Station. The station is available 24/7 with customers prepaying and using a PIN code for access.





## Cottonwood Reclaimed Rates-What a deal.

Small stand pipe users are charged 92 cents per 1000 gallons. They are required to set up a prepaid account with a one-time \$3.00 account activation fee. They can prepay any amount up to \$500.00.

Large metered users pay a \$12.50 monthly administrative fee which includes the first 1000 gallons. They are then charged 92 cents per 1000 gallons.

## Yavapai College-Viticulture

Yavapai College began to develop a viticulture program in 2012 that would include a 13 acre vineyard development and full-production teaching winery, located at the Verde Valley Campus.



## Yavapai College



They began planting vines in 2012, irrigating from a ¾" domestic connection, but soon realized a more cost effective permanent solution was required.

## **Potable Water pumping**

In 2013 talks between the City of Cottonwood, Yavapai College and the Town of Clarkdale commenced. The Town of Clarkdale supplies potable water to the College. The College knew that drilling its own well could potentially impact the neighboring Haskell Springs Community. This area has seen a drop in the water table due to seasonal pumping rates and the Town and citizens were concerned.

#### Cottonwood has an idea

The parties involved started to look at using reclaimed water, since the City already sends it to the Cottonwood Ranch community that is adjacent to the College, would that work? Unfortunately no, the reclaimed line that feeds Cottonwood Ranch is too small to deliver the water required by the College. We still want to use reclaimed but how?

# Hmm, we can see it but how do we get there?



## **Cottonwood offers a solution**

The City offered to design and manage the a project to construct a reclaimed line YAVAPAI COLLEGE **RECLAIMED WATER LINE** for the College. It was **COTTONWOOD, ARIZONA** decided to utilize the City's Job Order Contracting bid process for construction services. The City and the College agree to terms and SITE MA sign an Intergovernmental Agreement.

The College is tasked with obtaining the easements from the adjacent subdivisions.

## The College Reclaimed pipeline plan



## The Cost

Kinney Construction Services wins the bid process with the lowest most responsive cost of \$220,000.00. The City pays for the cost of construction which is reimbursed by the College.

#### **Project Specifications**

The project consisted of the installation of 5,800 feet of 6 inch purple PVC pipe, 500 feet of 6 inch ductile iron (for encased wash crossings), gate valve sets and air release valves. The elevation difference is 220 feet from the meter to the College's pump house.

## **The Construction**







A VINYLTECH 6" DR-14 CIS 305 PSI AMA C-900-07 VACHESC CAUTION: RECLAIMED





## **More Construction**



#### **Behind the Scenes -Cottonwood**

The City purchases a 2-25 HP Grundfos boosterpaQ system for dedicated pumping to Yavapai College.



But wait --there's more The City also decided it was a good time to upgrade the existing Cottonwood Ranch reclaimed tank and pump system. The City repurposed and refurbished two steel tanks from an old City well site. Each tank has a 150,000 gallon capacity.



## And still more

The City also repurposed a gently used 4-10 HP Grundfos boosterpaQ pump system from a potable water well site. This system is dedicated to Cottonwood Ranch, Mesquite Hills and future reclaimed expansion.



The College starts using reclaimed Fast forward to April 2014 and the reclaimed line is completed, the College installed their filtration system, tanks and back-up pumps.

"Using the highest quality solenoids and emitters and having a self-flushing filtration system have been important aspects to this projects success." says Nikki Bagley-Director of Viticulture at Yavapai College.

Nikki states the water quality is pretty good although the Calcium, Magnesium and Sodium build up in the root zone will probably have to be managed in the future with soil amendments.

#### How much water is being used?

- In June of 2014 the College started taking reclaimed water consistently.
- Between June and December of 2014 they used <u>932,000</u> gallons of reclaimed water.
- Starting in 2015 from January to June they have used <u>1,407,000</u> gallons of reclaimed water.



## What about the grapes? Where is the wine?

This is the second season of producing wine at the Southwest Wine Center. The harvest for this season is small, due to grape production. The tasting rooms open Fall of 2015 and the estate fruit will bottle spring/summer 2016.



## **Questions?**

Debbie Breitkreutz-City of Cottonwood Wastewater Superintendent dbreitkreutz@cottonwoodaz.gov

Nikki Bagley-Yavapai College Director of Viticulture nikki.bagley@yc.edu

*Vavapai* COLLEGE life explored

