

The



Arizona Water & Pollution Control Association

Newsletter

TOWN OF CHINO VALLEY WATER RECLAMATION FACILITY

By Mike Young, Fann Environmental, Inc.

THE TOWN OF CHINO VALLEY is located in northern Arizona approximately 10 miles north of the former Arizona Territorial Capital of Prescott. The Town, Established in 1970, has a rich history rooted in agriculture. As northern Arizona grew, Chino Valley began to transform into a bedroom community of nearby Prescott and Prescott Valley. This growth created a growing residential community utilizing conventional septic systems as a means of sewage disposal.

In the late 1990s it was determined that the high density residential area of the Town was contributing nitrates and other pollutants to the groundwater aquifer. With continued rapid growth, the Town realized that it was time to work towards a regional wastewater system and avoid Consent Order challenges by the Arizona Department of Environmental Quality (ADEQ) that have plagued other northern Arizona communities.



Plant in operation seeded with 20,000 gallons mixed liquor

With diminished financial resources, the Town searched for creative ways to build the needed facilities. Ultimately, this facility was built using a unique public/private partnership that included the Town, private developers, and Fann Contracting, Inc. (Fann). The Town utilized the services of Aqua Engineering, Inc. (Aqua) of Bountiful, Utah to provide engineering design and permitting assistance.

When Aqua completed the design of the treatment facility to a 60% level, the Town (utilizing the Construction Manager @ Risk Procurement model) solicited contractors for the project. They creatively developed a request for qualifications with a price component that included construction, operations and

maintenance for ten years, and financing for the project.

Fann was selected and awarded the contract and joined the team all with a common goal, to build a quality project on time and budget. Fann was involved early on in the decision making process regarding technology. The team selected Enviroquip's Kubota membrane wastewater treatment system as the best system for the project. With the help of all team members, including suppliers, the facility was constructed and placed into service within twelve months from the start of construction.

The initial facility includes 2 miles of 18-inch gravity collection system, five 1-acre Rapid Infiltration Basins, a headworks sized at 1mgd, a septage receiving facility, a 3-meter belt press, an effluent pump station, a 0.25 MGD Lift Station, and a Membrane Bio-Reactor sized for 0.5 MGD with an initial membrane treatment capacity of 0.125 MGD.

The Water Reclamation Facility was seeded in August 2004 and operated solely on septage (3200 gal/day) through December of 2004. Residential sewage has steadily increased during 2005. Currently the facility is seeing residential flow of approximately 8,000 gal/day and septage of 3000 gal/day.

The plant's performance has been excellent from the start, even with septage being the main source of supply. The septage of 3,000 to 4,000 gallons-per-day had BOD's from 700mg/l to 1300 mg/l, TSS from 10,000 mg/l to 20,000 mg/l and TKN in the 200 mg/l range. With increased aeration being

maintained at higher rates (approximately 400scfm), the septage was freshened to minimize odors optimizing the nitrification denitrification process. R.A.S. recirculation was also set at higher than normal rates (700 to 800 gpm.), keeping the MLSS from returning to a septic state.

PLANT PERFORMANCE AT START-UP

Parameter	Influent Average	Effluent Average
BOD	1,000 mg/l	< 5 mg/l
TSS	~ 15,000 mg/l	< 5 mg/l
TKN	~ 200 mg/l	4.2 mg/l
Fecal		< 1 cfu

Plant Operating Conditions:

- Temperature: 11-19 deg C
- Influent Flow: 250,000 gallons per month or 8,333 gpd
- Operating SRT: 80 days; MLSS in MBR 17,000-13,000

PRESENT PLANT PERFORMANCE/ PARAMETERS

Parameter	Influent Characteristics	Effluent Criteria
Q average	.125 MGD	.93 MGD
Q peak	.250 MGD	.93 MGD
BOD	300 mg/l	< 5 mg/l
TSS	250 mg/l	< 5 mg/l
TKN	50 mg/l	---
TN	---	< 8 mg/l
Turbidity	---	< 0.2 NTU



Overview of the MBR

During the first year of operation, over 1.7 million gallons of water was recharged to the local aquifer. In future years this recharge of the aquifer will be a crucial item in the ability of the Town reaching safe yield.

The Town was awarded the “Governor’s Award of Excellence in Rural Development for 2004” for the project.

The Chino Valley WRF is a symbol of modern wastewater treatment and what a town can accomplish with the assistance of a team of engineers, developers, and a knowledgeable construction professional. The town utilized alternative procurement methods to select the most qualified contractor and brought together private developers to finance a \$7.7 million project without the use of bonds, loans, or other public financing. Indeed the private developers benefited from the project, but it is the Town and its citizens that have benefited the most. For years to come the Town will reap the benefits of groundwater recharge and will have taken a proactive approach to eliminating groundwater contamination.

To learn more about this project, contact Mike Young at Fann Environmental, Inc., msyoung@cablone.net.

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Sludge dewatering belt press