

SEWER SYSTEM

SYSTEM OVERVIEW
REGULATIONS
FUTURE PLANS
CAPITAL BUDGET

Sewer System Overview

- Sewer systems have two basic aspects
 - Collections
 - Treatment
- Collections include
 - Lift stations
 - Manholes
 - Sewer mains
- Treatment is what takes place at the plant on east Maley

Sewer System Overview

- Collections
 - There are three lift stations in the system
 - Magic Circle RV park
 - Railroad Ave. & Downen St.
 - Wood St.
- Primary issues with lift stations
 - Pump wear
 - Pumps get clogged
 - Backup generator maintenance

Sewer System Overview

- Railroad Lift station has been approved to replace pumps. The budget was \$45,000
- Wood street is in the budget for pump replacement this fiscal year as well. The budget is \$45,000

Sewer System Overview

- Collections
 - There are 376 manholes in the system
- Manhole issues
 - Sewer gases, specifically hydrogen sulfide, erode the concrete of the manhole.
 - Any area where significant turbulence is generated, hydrogen sulfide gas will be concentrated.
 - Manhole construction varies from mortar-set-brick to pre-cast concrete
 - Over the years, street work has left many manholes below street grade. The Utilities section is actively rectifying this.

Manholes

- Water infiltration at manholes allows grit and additional water flows into the treatment system. Over the past 4 years manhole seals have been installed to reduce this.
- Repair budget
 - The 2012-2013 budget includes \$32,000 to replace / repair deteriorated manholes.

System Overview

- Collections
 - The system consist of approximately 35 miles of sewer mains providing service to approximately 1,326 service connections.
 - Sewer mains are comprised primarily of clay, asbestos concrete and SDR 35 PVC
 - Currently one line serves the NW side of I-10.
 - There are two lines under the railroad feeding the WWTP.
 - 15" at the Grant Street alignment.
 - 8" at the Delos Street alignment.

System Overview

- Collections
 - Primary concerns with the sewer mains include
 - Tree roots which can easily access clay & asbestos concrete mains and cause breakage and clogs.
 - Maintenance of lines under the railroad
 - Line needs to be evaluated periodically with a sewer camera to determine its integrity.

Regulatory compliance

- Arizona Department of Environmental Quality (ADEQ)
 - The City must maintain An Aquifer Protection Permit (APP) and an Arizona Pollution Discharge Elimination System permit (AZPDES)
 - We are also required to have certified operators.
 - Raymond Osornio is the qualifying operator for the WWTP as well as the Water system
 - With the loss of two certified operators we are down to 5 Public Services & Works staff members.
 - Dave Bonner, John Bowen, Raymond Osornio, Eddie Nunez, Frank Bracomonte

Regulatory Compliance

- In addition to the APP & AZPDES permits a discharge permit is required to allow treated effluent to be used on the golf course. This requires Class B effluent.
- The City is current operating under a consent order due to several non-compliance issues.
- As part of the WWTP project engineering, all permits will be updated and will go into effect when the new plant is completed.

Future Plans

- The approval of the contract revision for Wilson Engineers has the WWTP project underway.
 - Wilson Engineers along with Dave Bonner & John Bowen met with ADEQ's permitting unit for a pre-application meeting.
 - ADEQ's response to many of the issues may result in cost saving for the City of Willcox.

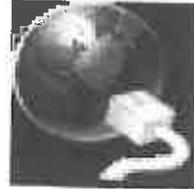
Future Plans

- Wilson Engineers design will follow the recommendation of the 2012 Preliminary Engineering Report (PER)
 - The design will be for a .6 MGD oxidation ditch plant. Two side by side raceways, two clarifiers, a return activated sludge (RAS) station, waste activated sludge (WAS) station, sludge holding tank(s), septage receiving station and a disinfection raceway.
 - Plans will also include a filter station which is something that was not included in the PER.

Future Plans

- The PER provides for optional methods of handle certain aspects of the treatment process.
 - Septage Receiving Station
 - Disinfection
 - Bio-solids Disposal
 - Bio-solids processing
 - Bio-solids De-watering

Option Evaluation



Capital Budget



PER Option Provisions

Three options for Septage receiving station were evaluated in the PER. Option 3 proposes a 6000 gal holding tank to hold & aerate septage. The septage can then be pumped to a sludge holding tank which would provide alternating aeration and still cycles to stabilize sludge and reduce nitrogen content. The PER recommends this Option and staff agrees that this option will prevent problems that have been experienced with the current system.

The PER discusses two options for disinfection of the water at the end of secondary treatment. City Staff prefers Hypochlorite disinfection because of its effectiveness and reliability. As long as the hypochlorite is evaluated periodically to verify its concentration problems are infrequent. The UV system that was evaluated is effective. However, UV systems are somewhat complicated in design which requires highly technical staff members to keep well maintained.

Two options are proposed for bio-solids disposal. The first option is land application and the second is landfill. City staff would recommend that the bio-solids be sent to the landfill initially. The new system will have enough challenges without adding a land application component to the mix. At some point when the operation of the system is stable, staff may approach ADEQ to pursue permits for land application.

Bio-solids may be processed a number of ways. The PER evaluated two methods, aerated bio-solids lagoon and aerobic digestion. City staff recommends the Aerobic Digestion method for two primary reasons. The first addresses continually removing the bio-solids; an aerated lagoon does not readily lend itself to that process. Secondly, with the septage receiving station, the sludge will become more homogenous before being removed for disposal.

In order to remove the bio-solids for disposal the moisture content needs to be reduced to less than 18%. This will reduce hauling and disposal cost by eliminating a portion of the water contained in the bio-solids. The PER discusses three methods of dewatering. Drying beds require a lot of space and tend to generate odor and insects. A belt press is a reliable method of de-watering however, the equipment consumes a lot of floor space in relation to the Rotary Screw Press. The Rotary Screw Press is also a very simple machine with few moving parts which translates to fewer maintenance issues. City Staff recommends the Rotary Screw Press.

The new oxidation WWTP will be constructed in the front lagoon. It will occupy about 25 % of the lagoon footprint.

Pond 6 at the golf course is used to store irrigation water for the golf course. The pond will be dredged and lined to allow for more storage and prevent loss of water through percolation.

Three bio-reactor ponds located at the golf course will be tested and cleaned as necessary. These ponds will be back filled and leveled to blend with the golf course.

Staff met with Wilson Engineers and ADEQ to conduct a pre-application meeting for the Aquifer Protection Permit (APP). During the meeting we discussed setbacks, bio-solids and other permit requirements. Since the plant will be constructed in the existing footprint and the permitted capacity is the same as the current plant; additional setbacks will not be required.

Depending on the results of bio-solids testing, it is possible that existing bio-solids can be used on site either by direct burying or by blending in to top soil.

Since we are under a consent order an "Other APP Amendment" will not be required to operate the plant during the interim of constructing the new plant.

Sewer Utilities Budget for 2013 to 2023

Capital Purchase

Description	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	TOTAL
Sewer Camera System	\$ 15,000										\$ 15,000
"Gator" for WWTP (to replace vehicle)							\$ 15,000				\$ 15,000
WWTP Laboratory Equipment Replacement/Upgrade							\$ 30,000				\$ 30,000
3/4 Ton Service Truck (replace unit 57)	\$ 11,667										\$ 11,667
Plate Tamper	\$ 667										\$ 667
Metal Locator	\$ 333										\$ 333
GPS/Mapping Capabilities	\$ 4,000										\$ 4,000
3/4 ton service truck (replace Unit 61)		\$ 11,667									\$ 11,667
Mobile Phones/radio system (push to talk - 11 each)		\$ 6,333									\$ 6,333
On-Call Laptop		\$ 333									\$ 333
Security System for Wells, Tank, WWTP, Gas Regulator Station		\$ 6,000									\$ 6,000
1 Ton Dump Truck (Used)			\$ 8,333								\$ 8,333
Replace Backhoe			\$ 25,000								\$ 25,000
3/4 Ton 4 x 4 Service Truck (Replace Unit 51)				\$ 12,667							\$ 12,667
Replace Pothole Machine/Vac Trailer				\$ 20,000							\$ 20,000
1 Ton Service Truck (Replace Unit 55)				\$ 16,667							\$ 16,667
Replace On-Call Laptop				\$ 333							\$ 333
3/4 Ton Service Truck (Replace Unit 03)				\$ 13,333							\$ 13,333
3/4 Ton Supervisor Truck (Replace Unit 50)							\$ 12,667				\$ 12,667
Replace Trencher							\$ 13,333				\$ 13,333
Replace On-Call Laptop							\$ 667				\$ 667
Replace Bobtail Dump Truck (used)								\$ 13,333			\$ 13,333
Replace Portable Welder on 12-03								\$ 2,000			\$ 2,000
Replace Three (3) Compressors								\$ 3,000			\$ 3,000
Replace Bobtail Water Truck (Used)									\$ 1,333		\$ 1,333
Replace 3/4 ton Service Truck (12-01)									\$ 11,667		\$ 11,667
SUB TOTAL	\$ 31,667	\$ 24,333	\$ 33,333	\$ 32,667	\$ 17,000	\$ 13,333	\$ 71,667	\$ 18,333	\$ 13,000		\$ 255,333

