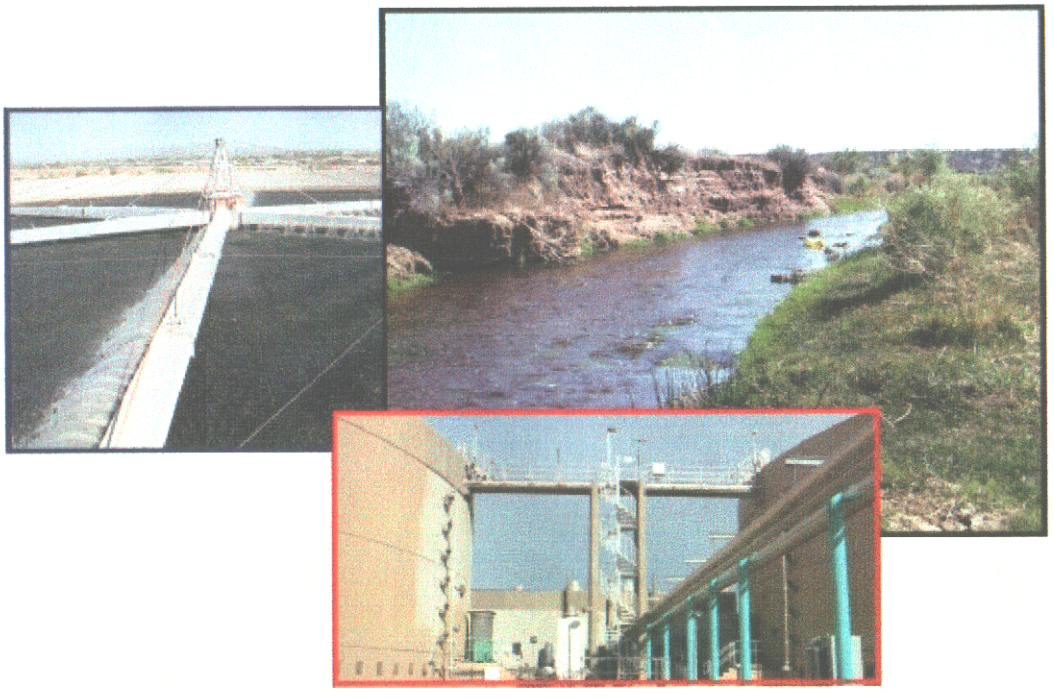
Pima County
Wastewater Management Department

Liquid Waste
Proposed 2004 Bond Program



October 2003

Pima County Bond Project Proposal

Wastewater Management

2004 Sewer Revenue Bond Proposal Summary

	2004 Sewer Revenue Authorization
Santa Cruz Interceptor: Prince to Franklin	$25,000,000
Roger Road WWTP: Infrastructure and Environmental Improvements	$20,000,000
Miscellaneous Conveyance Rehabilitation Projects	$15,000,000
Roger Road WWTF to Ina Road WPCF: Plant Interconnect/Flow Management	$23,000,000
Ina Road WPCF: Denitrification Design/Construction	$17,000,000
Ina Road Central Plant and Electrical Upgrade	$12,000,000
Ina Road WPCF: Laboratory and Office Building	$9,000,000
Marana WWTP Expansion	$10,000,000
Water Reclamation: Miscellaneous Projects	$4,000,000
Tanque Verde Interceptor - Craycroft to Tucson County Club	$5,000,000
Mount Lemmon Sewage System Improvements/ Expansion	$10,000,000
Total Proposal	**$150,000,000**

Pima County Bond Project Proposal

Wastewater Management Department

Santa Cruz Interceptor: Prince to Franklin

Scope:

Construct a new large diameter gravity interceptor sewer north from downtown near Franklin Street to Prince Road where it will connect to the 78-inch diameter interceptor tributary to the Roger Road WWTP. A section of the interceptor, between Grant Road and Miracle Mile (Phase I), was previously constructed in conjunction with a Flood Control bank stabilization project.
This project provides for the installation of Phase II and Phase III and the associated construction administration.

Location:

Located along the easterly bank of the Santa Cruz River, from downtown near Franklin Street to Prince Road.

Justification/Benefit:

This project was identified in the 1990 Facility Plan. The 1997 Bond Authorization provided $ 3.0 million for design and right-of-way acquisition. The construction of the project will provide relief for the Northwest Outfall Interceptor and provide needed conveyance capacity for future flows originating in the south and southeast areas of metropolitan Pima County.

Cost Estimate:

$25,000,000

Funding Sources:

$25,000,000 Sewer Revenue Bonds

Project Duration:

Planning/Design/Procurement:	12 Months
Construction:	18 Months
Total:	30 Months

Project Considerations

Multi-jurisdictional Considerations:
Districts 3 and 5.

Right-of-Way Impacts:
Most easement and ROW costs to be funded with design funds from the 1997 Bond Authorization. Construction will utilize jacking & boring technology to minimize disturbance to many existing surface features.

Environmental Concerns:
A portion of the interceptor will cross an old landfill and will parallel the Santa Cruz River, crossing several drainageways. Normal construction project environmental precautions will be included.

O&M Impacts/Funding:
$2,200/year.

Pima County Bond Project Proposal

Wastewater Management Department

Roger Road WWTP: Infrastructure and Environmental Improvements

Scope:

Portions of the Roger Road WWTP site have been in service since the early 1950s. The plant has been expanded and improved a number of times. Staff and consultant evaluations indicate that older elements of the plant are in need of either significant rehabilitation and/or replacement. Plant process modifications and environmental upgrades have also been recommended. This project will include the design and construction of:

- Additional Odor Mitigation Facilities
- Biotower Modification/Improvements
- Thickener Improvements
- Plant Modifications to enhance TSS removal

In addition, this project will provide study /design work for the following future work elements:

•Digester Facilities Upgrade
•Electrical System Upgrades
•Plant Influent Flow Management

Location:

Sweetwater Drive West of I-10 near Santa Cruz River.

Justification/Benefit:

The Roger Road WWTP provides for treatment of approximately 60% of the total metropolitan area wastewater. Because of this, it is important to keep the facility in good operating condition. This allows the Wastewater Management Department to continue to provide safe, effective wastewater treatment in compliance with Federal and State environmental laws.

Cost Estimate:

$20,000,000

Funding Sources:

$20,000,000 Sewer Revenue Bonds

Project Duration:

Planning/Design/Procurement and Construction of the various projects.	60 months
Total	60 months

Project Considerations

Multi-jurisdictional Considerations:
Roger Road WWTF treats wastewater flows in the Tucson Metropolitan Area south of the Rillito River and north of Sahuarita. Roger Road WWTP is in District 5.

Right-of-Way Impacts:
None.

Environmental Concerns:
Projects will help further reduce odors and odor complaints in the Roger Road vicinity. This will reduce the potential for mechanical and structural failures due to age/condition of certain plant components and will also help ensure the facility continues to meet discharge requirements in an environmentally sound and cost effective manner.

O&M Impacts/Funding:
These projects are necessary to maintain maintenance costs at their current levels.

Pima County Bond Project Proposal

Wastewater Management Department

Miscellaneous Conveyance Rehabilitation Projects

Scope:

The current conveyance condition assessment projects (both the Closed Circuit TV and the Sewer System Inventory) are identifying areas within the regional sewage conveyance system in need of repair, rehabilitation or augmentation. It is estimated that re-lining will cost between $200 - $300 per linear ft. to rehabilitate the larger sewers. These projects will be completed based on order of need identified by the CCTV and SSIIP evaluation projects. This funding will allow for the re-lining of approximately 11.25 miles of gravity conveyance lines and rehabilitation of miscellaneous associated inlet and outlet chambers and manholes/junction chambers. The interceptors being examined include:

1. Santa Cruz Central (circa 1948).
2. Santa Cruz East (circa 1916).
3. Old Nogales Hwy. (circa 1980s).
4. North Rillito (circa 1960s).
5. Continental Ranch Pumping System.
6. Southeast Interceptor. (circa 1969).

Location:

Area-wide project.

Justification/Benefit:

Recent experience indicates that unlined concrete sewer pipe, initially designed to last 50 years, may last only 35 to 40 years when high levels of hydrogen sulfide are present. It is prudent to proactively inspect all unlined concrete pipe, as well as other older reaches of the system, in order to identify and rehabilitate those sections of the system that have experienced deterioration.

Planned rehabilitation of the interceptors will reduce the possibility of potential failures, and their associated liabilities, including large regulatory fines. Emergency repairs can be 10 times the cost of planned repairs/rehabilitation. Some sections of the interceptors and trunks with limited capacity require augmentation in order to continue to safely and efficiently convey the increasing flows.

Cost Estimate:

$15,000,000

Funding Sources:

$15,000,000 Sewer Revenue Bonds

Project Duration:

Planning/Design/Procurement and Construction of the various projects.	60 months
Total	60 months

Project Considerations

Multi-jurisdictional Considerations:
All Districts – Projects throughout collection system for rehabilitation of existing system.

Right-of-Way Impacts:
None expected.

Environmental Concerns:
If the required repair, rehabilitation and augmentation work is not achieved, sewage release can occur.
Sanitary sewer overflows (SSO's) can have public health impacts or result in enforcement actions.

O&M Impacts/Funding:
Emergency and/or unscheduled maintenance costs average $ 4400/mi. After rehabilitation preventive maintenance costs are $600/mi. saving $ 3800 /mi.

Pima County Bond Project Proposal

Wastewater Management Department

Roger Road WWTF to Ina Road WPCF: Plant Interconnect/Flow Management

Scope:

Design, acquire easements and construct approximately 5 miles of sewer (gravity/pressure) to provide operational flexibility to treat tributary flows at either the Roger Road or the Ina Road facility.

Cost Estimate:

$23,000,000

Funding Sources:

$23,000,000 Sewer Revenue Bonds

Location:

Within the corridor bounded on the west by Silverbell Road and on the east by I-10 from Sweetwater Drive to Walker Road, as well as a location along the Rillito River between Campbell Road and Craycroft Road. Actual alignment will be determined by an initial project study.

Project Duration:

Planning/Design/Procurement:	30Months
Construction:	30 Months
Total:	60 Months

Justification/Benefit:

This project was identified in the 1990 Facility Plan as a future mechanism to assist in managing flows between the existing Ina Road and Roger Road treatment plants. A 12.5 MGD expansion is nearly complete at the Ina Road WPCF.

The Plant interconnect will provide the ability/flexibility to convey flows normally tributary to the North Rillito Interceptor through the South Rillito Interceptor, which was recently completed. It will also provide the ability to convey portions of the flow normally tributary to the Roger Road WWTP to the Ina Road WPCF, and vice-versa. The overall goal is to use conveyance and treatment capacity to maximize the efficiency of the sewerage system.

Project Considerations

Multi-jurisdictional Considerations:
All Districts.

Right-of-Way Impacts:
To be determined based on alignment.

Environmental Concerns:
Treat wastewater to meet Federal and State environmental laws.

O&M Impacts/Funding:
O&M costs for the new installation are estimated at $30,000/yr.

Pima County Bond Project Proposal

Wastewater Management Department

Ina Road WPCF: Denitrification Design/Construction

Scope:

The project provides for planning, design and construction to denitrify the effluent from the existing 25 MGD wastewater treatment process at the Ina Road WPCF.

Location:

Ina Road at I-10.

Justification/Benefit:

Nitrification/Denitrification is the biological treatment process that removes ammonia and nitrogen that can be harmful to human health and aquatic life. This process reduces the total nitrogen load by converting ammonia to nitrite, nitrate, and subsequently nitrogen gas.

The original 1978 Ina Road. WPCF plant did not incorporate denitrification; the recent plant expansion of 12.5 MGD produces denitrified effluent.

State and federal water quality standards will ultimately require denitrification prior to discharge to the Santa Cruz River. The pilot study will evaluate alternative denitrification processes and timeframes to select the most efficient, cost effective method for the facility.

Cost Estimate:

$17,000,000

Funding Sources:

$17,000,000 Sewer Revenue Bonds

Project Duration:

Planning/Design/Procurement:	24 Months
Construction:	36 Months
Total:	60 Months

Project Considerations

Multi-jurisdictional Considerations:
All Districts.

Right-of-Way Impacts:
None.

Environmental Concerns:
None.

O&M Impacts/Funding:
The additional equipment required by this increased treatment will increase O & M costs by $600,000 per year.

Pima County Bond Project Proposal

Wastewater Management Department

Ina Road Central Plant and Electrical Upgrade

Scope:

This project will supplement and continue the work at the Ina Rd. WPCF 12.5 million gallons per day (MGD) expansion in regard to electrical and HVAC. There are two major elements in this project. The first is replacement of the temporary overhead on-site power system installed during the construction of the 12.5 MGD expansion with permanent underground power distribution facilities. The second is installation of additional heating, ventilation and air conditioning for the new 12.5 MGD facility expansion and the new laboratory building (which is included elsewhere in this bond authorization). The Central Plant will contain chillers, boilers, pumps and back-up generators for the heating and cooling of the new Biological Nutrient Removal (BNR) plant processes, buildings and most particularly, the proposed new laboratory.

Location:

Ina Road at I-10.

Justification/Benefit:

The current central plant and electrical power plant grid is only capable of handling the electrical needs of the existing 25 MGD plant. Initially, it was proposed to construct power generation facilities on-site for the new 12.5 MGD plant, however, a financial analysis indicated that purchase of outside power was more cost effective. To provide power to the new 12.5 MGD treatment train, a temporary overhead power distribution system was installed. The first element of this project will install an underground in-plant distribution system with switchgear and transformers to increase personnel safety and efficiency of plant operations.

The second element will include additional heating, cooling and pumping facilities for the new 12.5 MGD plant (presently under construction) as well as for the proposed new laboratory, in order to provide a climate controlled environment for certain facilities at the new treatment train and the new laboratory.

Cost Estimate:

$18,000,000

Funding Sources:

$12,000,000 Sewer Revenue Bonds
$ 6,000,000 System Development Funds

Project Duration:

Planning/Design/Procurement:	36 Months
Construction:	24 Months
Total:	60 Months

Project Considerations

Multi-jurisdictional Considerations:
All Districts; facility in District 5.

Right-of-Way Impacts:
Not applicable.

Environmental Concerns:
Air Quality permits will be required for the generators and boilers.

O&M Impacts/Funding:
The O & M costs are presently estimated at $2 M/yr which includes the purchase of electrical power from an outside source for the 12.5 mgd plant.

Pima County Bond Project Proposal

Wastewater Management Department

Ina Road WPCF: Laboratory and Office Building

Scope:

This project is for the construction of a new laboratory and office building at the Ina Road WPCF. The design for this project was completed in conjunction with the Ina Road 12.5 MGD expansion. This project is to be constructed in combination with the Central Plant and Electrical Upgrade project.

Location:

Ina Road at I-10.

Justification/Benefit:

Over the last decade the number and complexity of regulatory permits has increased significantly (AZPDES and APP). This has resulted in an increased requirement for analytical tests to monitor surface water discharge, groundwater, and biosolids compliance with these permits.

Currently the Department operates an ADHS certified lab which produces the compliance information required for the state and federal permits.

The existing laboratory facilities are currently scattered among three separate buildings and occupy space originally designated for offices. As a result, the current laboratory spaces lack adequate ventilation, power availability and the square footage required to house the necessary analytical equipment. Laboratory analyses that cannot be accommodated in-house are often sent out to contract laboratories at an additional expense.

The existing laboratory does not meet the County's increasing wastewater compliance testing needs for existing and projected future regulations.

The new building will allow the laboratory to be located at a single facility as well as provide necessary office space for the Industrial Waste Group and Permitting and compliance personnel.

Cost Estimate:

$12,000,000

Funding Sources:

$9,000,000 Sewer Revenue Bonds
$3,000,000 System Development Funds

Project Duration:

Planning/Design/Procurement:	12 Months
Construction:	24 Months
Total:	36 Months

Project Considerations

Multi-jurisdictional Considerations:
All Districts; facility in District 5.

Right-of-Way Impacts:
Not applicable.

Environmental Concerns:
Meet State of Arizona laboratory compliance requirements.

O&M Impacts/Funding:
O & M costs will increase slightly for power and water service to the facility. HVAC costs are in the Central Plant Project.

Pima County Bond Project Proposal

Wastewater Management Department

Marana WWTP Expansion

Scope:

This project includes an expansion of at least 1.0 million gallons per day (MGD) to the existing Marana WWTP which will provide capacity for the growth in the area, as well as produce reclaimed water for reuse and/or recharge.

Location:

East of Trico Road and North of Marana Road near the Santa Cruz River.

Justification/Benefit:

Expanding population in the Marana WWTP service area necessitates increased wastewater treatment capacity. Wastewater flows are rapidly increasing. In cooperation with the town of Marana, a 208 Plan was developed for the entire Marana sewer system, which includes utilizing the existing facility location for an expanded treatment facility for the Northwest Marana area. These bond funds will be augmented by the $2 million from the 1997 authorization originally envisioned to relocate and construct a much smaller facility. The capacity of the Marana facility has been 23,000 gallon per day (GPD) through the 1990s. This facility was upgraded to 150,000 GPD in 2002. This project will continue the expansion of the facility to at least 1.0 MGD in coordination with growth in the area. The expansion will provide effluent for reuse, recharge and/or environmental restoration.

Cost Estimate:

$12,000,000

Funding Sources:

$10,000,000 Sewer Revenue Bonds
$ 2,000,000 1997 Bond Authorization

Project Duration:

Planning/Design/Procurement:	18 Months
Construction:	24 Months
Total:	42 Months

Project Considerations

Multi-jurisdictional Considerations:
District 3.

Right-of-Way Impacts:
Land purchase, rights of way or covenants may be needed to provide necessary setbacks.

Environmental Concerns:
Provides additional effluent for reuse and recharge.

O&M Impacts/Funding:
Based on similar plants (such as the Avra Valley WWTF) O&M costs of $750,000/yr are estimated.

Pima County Bond Project Proposal

Wastewater Management Department

Water Reclamation: Miscellaneous Projects

Scope:

To conduct studies, identify suitable sites, acquire land, prepare construction documents and other necessary work required for the development of sub-regional water reclamation facilities within the Tucson Metropolitan area, including the Southeast and South areas, as identified by the Metropolitan Facility Plan Update.

Location:

Area wide study, especially the South and Southeast portions of the wastewater service area.

Justification/Benefit:

Minimize the costs of further augmenting regional interceptors and expanding the regional treatment capacity of the Roger Road WWTP and/or Ina Road WPCF by directing flows normally tributary to those facilities to new sub-regional facilities. Produce high quality effluent closer to the ultimate reuse sites to minimize pumping and system costs.

The effluent produced will be suitable for either reuse, recharge or environmental restoration in upgradient riparian areas and/or wheeling through the City of Tucson's reclaimed water distribution system, to points of beneficial reuse.

Identification and purchase of appropriate sites now will minimize future costs.

Cost Estimate:

$4,000,000

Funding Sources:

$4,000,000 Sewer Revenue Bonds

Project Duration:

Planning/Design/Land Acquisition	60 Months
Total:	60 Months

Project Considerations

Multi-jurisdictional Considerations:
All Districts.

Right-of-Way Impacts:
To be determined upon identification of suitable sites.

Environmental Concerns:
To be determined upon identification of suitable sites.

O&M Impacts/Funding:
O&M costs for a typical 3.0 MGD WRF with lift station estimated at $1M/yr.

Pima County Bond Project Proposal

Wastewater Management Department

Tanque Verde Interceptor - Craycroft to Tucson Country Club

Scope:

This project includes the design and construction as well as right-of-way purchase for approximately 8,500 linear feet of 36-inch diameter sewer, in conjunction with approximately 3,250 feet of soil cement bank protection.

Location:

Sewer alignment along the south bank of the Tanque Verde Wash – from Craycroft road to the Tucson Country Club.

Justification/Benefit:

The 1997 Bond Election project entitled the Tanque Verde Interceptor: Craycroft to Tucson Country Club called for a 36-inch diameter interceptor sewer. Even though every reasonable effort has been taken to find the most cost effective route, the resulting alignment entails a structural crossing, bank protection and additional easements along the Pantano Wash and pipe protection along the southerly side of the Tanque Verde Wash. Larger flow management structures have been added to provide a high level of safety for workers and the ability to reroute flows to the other interceptors. All of these features have added to the level of complexity of this project and are beyond the scope of the project's initial cost estimate. The available route is both environmentally and topographically challenging and adds to the overall cost of the project.

This project is a vital component of the region's interceptor system. With the completion of this portion of the Tanque Verde Interceptor system, flows will be rerouted from the North Rillito Interceptor system to the South Rillito Interceptor system.

Cost Estimate:

$9,050,000

Funding Sources:

$5,000,000 Sewer Revenue Bonds
$4,050,000 1997 Bond Authorization

Project Duration:

Planning/Design/Procurement:	12 Months
Construction:	24 Months
Total:	36 Months

Project Considerations

Multi-jurisdictional Considerations:
District 4. Collaboration with local property owners, Pima County Flood Control Department and the US Army Corps of Engineers.

Right-of-Way Impacts:
Minimal expected.

Environmental Concerns:

Construction of bank protection within tributary wash crossings.

O&M Impacts/Funding:
O&M is estimated to be $1,440/yr.