

CHAPTER 12

CIP Implementation and Financing Plans



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12.1 Introduction

The master plan utilizes a strategic financial analysis to identify the most appropriate and cost effective capital program for implementation, while assessing the potential impact on PCRWRD customers. As discussed in Chapter 11, the PCRWRD CIP includes both ROMP capital projects and Non-ROMP capital projects. ROMP capital projects are designed to address PCRWRD's requirement to meet more stringent effluent discharge standards, while Non-ROMP capital projects address infrastructure repair and replacement and capacity expansion needs within the PCRWRD service area. The master plan identifies several engineering alternatives to address the capital requirements associated with ROMP, including a Base Case scenario and 6 alternatives that are each capable of meeting the new effluent regulatory requirements by ADEQ's compliance date. However, in order to provide a conservative forecast of capital costs over the planning period, the financing plan includes the ROMP project costs identified in the Base Case rather than the engineering alternative identified in the economic analysis summarized in Chapter 11.

This chapter begins with an overview of the components of an effective strategic financial plan and discussions related to alternative capital funding options, and follows with a recommendation of the most appropriate funding strategy that will meet PCRWRD's financial objectives.

12.2 CIP Implementation Plan

12.2.1 ROMP Project Phasing

Phasing of the projects to meet the regulatory requirements for ammonia toxicity and growth needs of the community will be required across the 15-year planning horizon. Some projects are immediate, such as the plant interconnect pipeline, while other projects will be delayed, such as the demolition of Roger Road WRF, which can not occur until the new WRC is constructed and are placed into service. A project timeline driven by regulatory compliance for the new plant interconnect pipeline, new WRC and upgrade/expansion at Ina Road WRF, and conveyance system augmentation related to the regional optimization master plan is shown below. Concurrent with the expansion and upgrade projects are the projects related to the conveyance system and pump station rehabilitation and the expansion of the Non-Metro facilities to match rapid growth needs.

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**Figure 12-1
ROMP Project Timeline**

	2007	2008	2009	2010	2011	2012	2013	2014
Interconnect								
Design	→							
	\$1,447,500							
Construct		→						
			\$20,955,000					
Ina Rd								
Design 50 mgd	→							
	\$14,634,000							
Construct 50 mgd			→					
				\$212,330,352				
Construct Thermophilic Digestion								
Roger Rd								
Design 32 mgd		→						
		\$12,660,000						
Construct 24 mgd				→				
					\$149,131,375			
Demo Existing Plant								
Construct 8 mgd								

	2015	2016	2017	2018	2019	2020	2021
Interconnect							
Design							
Construct							
Ina Rd							
Design 50 mgd							
Construct 50 mgd							
Construct Thermophilic Digestion				→			
				\$17,073,000			
Roger Rd							
Design 32 mgd							
Construct 24 mgd							
Demo Existing Plant	→						
	\$23,800,000						
Construct 8 mgd		→					
		\$49,585,000					

The project timeline has been coordinated with the project financing and customer rate impacts described later in this chapter

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12.2.2 Water Reclamation Campus (WRC) Projects

The construction of the facilities will be phased to meet the needs for regulatory compliance and to match the needs of population growth. In most cases, the phasing will require the completion of Phase 1 before the commencement of Phase 2. Project delivery is listed in preferential order if more than one alternative is indicated. A description of the various project delivery methods available under Arizona law is provided in **Appendix K**. Instrumentation & Control for the WRC are assumed to be included with the Ina Road Instrumentation & Control contracts (see Ina Road Projects). Dates are given in fiscal years.

Project elements for the Roger Road wastewater facilities by phases are:

- Phase 1: Engineering, permitting and procurement services for Phases 2 and 5 to begin 2007/08 and be completed by 2010.

Project Delivery: Professional Services Procurement

- Phase 2: Facilities to be under construction by 2011 and completed by 2015 are:

- Incoming Power service/standby power generation
- Site preparation (temporary administration building)
- Headworks
- 24-mgd Bardenpho treatment (includes clarifiers, blowers/mixers)
- Solids thickening/pumping
- Disinfection facilities
- Administration/control building

Project Delivery: Construction Manager at Risk (CMAR) or Design/Build (D/B)

- Phase 3: Engineering, permitting and procurement services for Phase 4 to begin in 2014 and be completed by 2015

Project Delivery: Professional Services Procurement

- Phase 4: Facilities to be under construction by 2015 and completed by 2017 are:

- Existing Roger Road WRF demolition

Project Delivery: D/B or Design-Bid-Build (D-B-B)

- Phase 5: Facilities to be under construction by 2017 and completed by 2020 are:

- 8-mgd Bardenpho system (including clarifier)
- Additional gravity belt thickeners

Project Delivery: Construction Manager at Risk (CMAR) or Design/Build (D/B)

12.3 Ina Road WRF Projects

Project elements for the Ina Road wastewater facilities upgrades and expansions by phases are:

- Phase 1: Engineering, permitting and procurement services for Phases 2, 3, 4 and 7 to begin 2007/08 and be completed by 2010.

Project Delivery: Professional Services Procurement

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- Phase 2: Power facilities to be under construction by 2010 and completed by 2012 are:
 - Power unification/biogas power generation

Project Delivery: Construction Manager at Risk (CMAR) or Design/Build (D/B) or (biogas power could be constructed under a public/private partnership arrangement)

- Phase 3: Wastewater reclamation facilities to be under construction by 2010 and completed by 2014 are:
 - Site preparation
 - Primary clarifier
 - Bardenpho treatment (including clarifiers, blowers/mixers)
 - Disinfection facilities
 - Demolish HPO and oxygen system

Project Delivery: CMAR or D/B or D-B-B

- Phase 4: Biosolids facilities to be under construction by 2010 and completed by 2014 are:
 - Mesophilic digestion (4 new, 4 existing)
 - Gravity thickening (primary sludge)
 - Gravity belt thickening (WAS sludge)
 - Centrifuge dewatering
 - Sludge storage

Project Delivery: CMAR or D-B-B

- Phase 5: Engineering, architectural, permitting and procurement services for Phase 6 to begin 2007/08 and be completed by 2010.

Project Delivery: Professional Services Procurement

- Phase 6: Support facilities to be under construction by 2010 and completed by 2012:
 - Centralized laboratory

Project Delivery: Design/Build (D/B) or Construction Manager at Risk (CMAR)

- Phase 7: Biosolids facilities to be under construction by 2017 and completed by 2020 to coincide with additional wastewater facilities at Roger Road WRF are:
 - Additional mesophilic digester
 - Additional centrifuge thickener

Project Delivery: D/B or CMAR

- Phase 8: Engineering, permitting and procurement services for Phase 9 to begin 2018/19 and be completed by 2020.

Project Delivery: Professional Services Procurement

- Phase 9: Future biosolids facilities to be under construction after completion of system-wide biosolids management plan and 2020 are:
 - Thermophilic digesters or heat drying or other (Class A) process

Project Delivery: Design/Build/Operate (D/B/O) or D/B or CMAR or (could be constructed earlier under a public/private partnership arrangement)



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12.3.1 Conveyance System Projects

The plant interconnect pipeline is a critical part of the upgrade and expansion of the treatment facilities at Roger Road WRF and Ina Road WRF. The need for the construction of the pipeline is immediate. The conceptual route layout has been developed and a fatal flaw and preliminary development analysis is nearing completion. Procurement of professional services for the design and permitting is underway. A construction manager at risk will be selected shortly after the selection of the professional services firm to commence the construction process. The goal of the procurement process is to have the pipeline in service as quickly as possible, but not later than 2010.

In addition to the ongoing series of rehabilitation projects in the conveyance system, there are several sewer segments that will require augmentation to be able to carry the increased capacity cause by population growth in the service areas. The projects are describe in Chapter 6 and are listed below.

Project Cost

<u>Project No.</u>	<u>Description (MH to MH)</u>	<u>(in 2006 \$)</u>
Year 2010		
■ 4	5627-08A to 9907-49	\$2.76 million
■ 6	8149-05 to 1726-29	\$2.30 million
	3983-05 to 8149-05	\$0.48 million
	1726-29 to 1726-26	\$0.87 million
	1726-26 to 1726-19	\$2.35 million
■ 8	1751-09 to 1751-01	\$2.57 million
■ 9	8626-01 to 6804-15A	\$0.04 million
Year 2015		
■ 2	6036-21 to 3979-101	\$0.74 million
	3919-101 to 8031-01	\$1.32 million
■ 5	8130-01 to 1779-02	\$0.45 million
	9917-20 to 9910-21	\$3.95 million
	5667-01 to 5662-01	\$3.31 million
	1779-02 to 5667-01	\$1.21 million
	9910-21 to 9910-19	\$0.40 million
■ 7	4630-09 to 4630-02	\$0.73 million
Year 2020		
■ 1	4636-30A to 4190-05A	\$4.35 million
■ 3	8635-11 to 8635-10	\$0.31 million
■ 10	9521-02 to 9549-05	\$0.46 million
■ 11	1708-22 to 6804-15A	\$1.57 million

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Costs of sewer augmentation by 5-year periods are:

<u>YEAR</u>	<u>TOTAL COSTS (IN 2006 \$)</u>
2010	\$12.94 million
2015	\$12.11 million
2020	\$5.12 million

12.3.2 Non-Metro Facilities Projects

Population growth in the Non-Metro regions is creating pressure to expand wastewater facilities at a rapid pace. The goal is to provide the needed facilities when required, but not sooner. The projected expansion(s) of the facilities are provided below.

Non-Metro Facilities

Siting, land procurement, and design must be completed before construction of a new Southland WRF and the existing Non-Metro facilities will be expanded to meet the increasing wastewater flows. The project delivery method for the new construction of the Southland WRF will be CMAR, while all the Non-Metro facility expansions will be Design/Build. The Non-Metro facility expansions and new construction phases are listed by each region below.

- Southwest Region
 - Avra Valley WRF
 - ❖ 2006/2007 Expansion 1 (from 1.2 to 2.2 mgd)
 - ❖ 2008/2009 Expansion 2 (Phase out existing BNROD and start up two new BNROD trains providing a total treatment capacity of 4.0 mgd)

- Southeast Region
 - Corona de Tucson WRF
 - ❖ 2006/2007 Expansion 1 (from 0.3 to 1.3 mgd)
 - ❖ 2018/2019 Expansion 2 (from 1.3 to 2.3 mgd)
 - ❖ 2027/2028 Expansion 3 (from 2.3 to 3.3 mgd)
 - Southland WRF
 - ❖ 2009/2010 New Facility Construction (from 0.0 mgd to 2.0 mgd)
 - ❖ 2010/2011 Expansion 1 (from 2.0 mgd to 3.0 mgd)
 - ❖ 2012/2013 Expansion 2 (from 3.0 mgd to 4.0 mgd)
 - ❖ 2014/2015 Expansion 3 (from 4.0 mgd to 8.0 mgd)
 - ❖ 2022/2023 Expansion 4 (from 8.0 mgd to 12.0 mgd)

- South Region
 - Green Valley WRF
 - ❖ 2011/2012 Expansion 1 (from 4.1 mgd to 6.1 mgd)

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- Northwest Region
 - Marana WRF
 - ❖ 2010/2012 Expansion 1 (from 0.5 to 2.0 mgd)
- Mt. Lemmon WRF
 - No change unless changes in area restrictions.

12.4 CIP Financing Plan

12.4.1 Financial Planning Overview

When developing a financing plan for a major capital program, a utility must take into account a number of key considerations. These factors are:

- **Risk/Reward Relationship:** Typically, the lower the costs associated with a particular financing model, the greater the risks associated with that model. Therefore, a utility must carefully weigh financial rewards associated with a particular financing mechanism against the levels of risk associated with that mechanism. For example, while short-term debt offers lower interest rates, the interest-rate risk that results from the need to refinance as the debt matures is greater. In this case the utility must decide whether the lower costs justify the increased risks.
- **Multi-year Planning Horizon:** When developing a financing plan, a utility must take into consideration future capital needs and the financial circumstances that may exist in the future. This will ensure that financing capacity is available for future needs as well as current needs.
- **Rate Stability:** A primary goal of any County utility is rate stabilization. Therefore, when developing a financing plan, the impact of the financing plan on rates should be examined carefully. A low-cost financing plan that causes dramatic rate volatility may not be as desirable as a more expensive plan that allows debt service to be structured in a way that will reduce rate volatility.
- **Equitable Distribution of Costs:** It is commonly agreed that each utility customer should pay a fair share of the costs associated with providing service. Therefore, when developing a financing plan for a specific capital project, a utility must take great care to ensure existing customers are not forced to pay an inordinate share of the costs of a project that will actually be of more benefit to future customers. Forcing future customers to recover too much of a project's costs should also be avoided. This intergenerational equity can be achieved in a number of ways, including the use of system development charges or structuring debt service, or both, to be spread in such a way that current and future customers end up paying for the portion of the project that benefits them.

After considerable discussion with PCRWRD staff, it was determined that the most appropriate strategy for evaluating different financing approaches and assessing customer impacts is to establish a baseline financing plan that uses traditional public financing instruments, and then evaluate non-traditional financing alternatives, both public and private, that could provide a more cost-effective strategy for funding certain components of the CIP. In each case, only the financing options that were relevant to

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PCRWRD and its capital planning initiatives were evaluated. An analysis was then performed whereby each financing tool considered was evaluated with respect to ten key criteria that were developed to assess each financing tools adherence to the to the previously described financial planning considerations and the PCRWRD's financing objectives. These criteria are:

- **Applicability.** Indicates relevance or practicality of using a particular financing tool for PCRWRD's capital planning initiatives. Financing options that are inappropriate or not relevant for these types of projects are eliminated upfront. Therefore, this criterion is used to assess each option relative to the other options being evaluated for consideration.
- **Legality.** Is a broad characterization as to whether the financing tool under consideration is in adherence with federal, state and local legal guidelines. This characterization was developed based on conversations with Pima County's legal advisors; Hawkins, Delafield & Wood; representatives of state financing agencies and various financial advisors and bond counsels. One of the major factors considered when applying this criterion was whether the financing tool had been utilized before on similar projects in the United States.
- **Administrative and Compliance Requirements.** Deals with the level of effort that must be undertaken to administer and provide proof of compliance with applicable requirements in order to take advantage of the financing tool being considered.
- **Issuance Costs.** Is a relative evaluation of the level of costs, exclusive of interest rate costs, associated with being able to utilize the financing tool under consideration. Among the many costs that were considered are costs associated with preparing and printing official statements, loan closing costs, and professional advisory fees.
- **Effective Interest Rate.** Is a relative evaluation of the effective interest rate costs associated with each financing option. Interest rate costs are the main component of financing costs and therefore, to a great extent, determine the economic attractiveness of a particular financing tool.
- **Attractiveness to Vendors.** Is a relative measurement of the willingness of private water service contractors to participate in projects that utilize the financing tool under consideration. Obviously, this criterion is particularly important with respect to those alternative project delivery methods that require the participation of private contractors.
- **Rate Stability.** Is a relative evaluation of the rate stabilizing capabilities that the financing tool under consideration offers to the County utility. Of primary importance is the degree to which creative structuring of debt service schedules are possible when using the financing tool under consideration. Another important consideration is the practicality of using the tool being evaluated in conjunction with other financing tools.
- **Off Balance Sheet Financing Effects.** Is a broad characterization of how each financing option might impact a County utility's apparent financial strength. It is important since the financing used on one project can affect a County utility's ability to obtain financing for future projects.



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- ***Economic Risk of Tax Requirement Non-Compliance.*** Different financing tools are viewed in different ways by the Internal Revenue Service (IRS). Use of some financing tools brings with it a greater risk of non-compliance with IRS guidelines. In some cases, the economic impact of non-compliance may be quite large in other cases, non-compliance ramifications may be acceptable. This criterion is a relative evaluation of the economic impact that may ensue if the County utility were to fail to adhere to IRS rules and regulations.

12.4.2 Capital Financing Options and Alternatives

The baseline financing plan described in Section 12.3 was designed to provide a reasonable assessment of the financial and customer impacts of the PCRWRD CIP. In order to evaluate all possible funding alternatives, more non-traditional financing sources and strategies, both public and private, which have been used successfully by municipalities across the country were also considered. Portions of these descriptions have been adapted from the following sources:

- *Comprehensive Guide to Water and Wastewater Finance and Pricing* by George Raftelis
- Government Finance Review, August 2005 Issue, “Understanding Municipal Derivatives”

12.4.2.1 Traditional Public Financing

In the United States, wastewater utilities are typically financed using some type of public funding. Sources of public funding include debt, internal/reserve funds, and federal or state grants. Debt can either take the form of a bond or a loan. A bond, which is the primary instrument of County utility debt, is a written promise to repay borrowed money on a definite schedule usually at a fixed rate of interest for the life of the bond. The key element of utility bonds for Pima County is that they are tax-exempt, meaning that investors do not pay taxes on the interest proceeds from the bonds. As a result, utilities are able to set much lower interest rates on their bonds and still have them be attractive to investors. These lower interest rates represent a significant savings to the issuing government when compared to the interest rates they would be required to offer if their bonds were not tax-exempt.

A loan differs from a bond in that it is a temporary provision of the specific amount of funds for an expenditure that must be repaid in a set amount of time, typically with interest.

A number of typical public financing options and their advantages and disadvantages are described below. Portions of these descriptions have been adapted from the following sources:

- *Comprehensive Guide to Water and Wastewater Finance and Pricing* by George Raftelis;
- AWWA Manual M29, “Water Utility Capital Financing”;
- “A Guidebook of Financial Tools: Paying for Sustainable Environmental Systems” prepared by the U.S. EPA’s Environmental Financial Advisory Board, dated April 1999; and

Short-Term Tax-Exempt Debt. Short-term tax-exempt debt consists primarily of short-term municipal bonds and short-term securities known as notes. These instruments generally have maturities ranging

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from a few months to a few years, have fixed interest rates, and are issued in anticipation of a bond issue, grant proceeds, or tax collections. Examples include bond anticipation notes (BANs) which are issued in anticipation of the sale of long-term bonds; grant anticipation notes (GANs), issued in anticipation of receipt of state or federal grants; tax anticipation notes (TANs), issued in anticipation of the receipt of taxes; revenue anticipation notes (RANs), issued in anticipation of revenues to be generated by the issuing County utility; and tax and revenue anticipation notes (TRANs).

Tax-exempt variable-rate demand notes differ from the traditional fixed-rate notes in that their interest rate is tied to market conditions. These instruments are sold to investors who, after some time, have the right to "demand" payment of the face value of the notes. Because of the high liquidity of variable-rate demand notes, they are very attractive to investors and tend to carry a lower rate of interest than less flexible, more traditional fixed-rate financing instruments.

Tax-exempt commercial paper is another short-term financing tool. These instruments are short-term, unsecured promissory notes, backed, for liquidity purposes, by a line or letter of credit from a commercial bank. Maturities normally range from one to 270 days.

Short-term debt markets are easily accessed and the interest rates associated with these instruments are typically low. As a result, short-term instruments are commonly used to meet short-term capital needs for design and initial construction while waiting for long-term financing. The use of several consecutive short-term debt issues to fund projects with a long useful life can be risky in that interest rates could rise significantly meaning that the next short-term issue could be significantly more expensive.

General Obligation Bonds. General obligation bonds are secured by the full faith and credit of the issuing entity. Typical issuers of general obligation bonds include municipalities, counties, special service districts with taxing authority, and other government entities. General obligation bonds have a major advantage in that they are backed by the full taxing capacity of the government entity, and consequently this credit is usually regarded as having the strongest security pledge available and therefore, the lowest available net interest cost.

There are, however, disadvantages to general obligation bonds. Since the issuance of general obligation debt typically requires legislative or voter approval, project funding can be delayed significantly particularly when the project being funded has a high cost or is politically sensitive. In addition, municipalities typically have a limit on the amount of general obligation debt that they can hold at any one time. Therefore, it is important to take long-term capital needs into account when considering the use of general obligation bonds.

Revenue Bonds. Revenue bonds are debt instruments for which interest and principal are payable solely from the revenue generated from a specific project or utility. In most states, the holders of revenue bonds do not have recourse to have taxes levied to pay required debt service. A major advantage of revenue bonds is that they preserve the issuer's general obligation debt capacity for other projects. Revenue bonds are generally tax-exempt and would be issued at interest rates lower than taxable debt but higher than general obligation debt. PCRWRD has historically utilized revenue bonds to fund the majority of its significant capital projects. The current rate on AAA rated, tax exempt insured revenue bond is approximately 4.5%.

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Revenue bonds can have greater flexibility in market timing, and reduced risk if they are presold and can have greater flexibility in timing the repayment of principal. One disadvantage of revenue bonds is that they are often encumbered with indentures or ordinances, such as the requirement to establish reserve funds and debt coverage ratio requirements. In addition, in Arizona, revenue bonds also require the prior approval of the issuing agency's voters.

Double Barrel Bonds. A "double barrel bond" can be viewed as a hybrid of revenue bonds and general obligation bonds. These bonds are secured in a two-tiered manner: (1) the first source of funds used in the debt service payments on the bonds is derived from a designated revenue source generated by the project, such as user fees; and (2) if the revenue stream is inadequate to pay debt service, ad valorem taxes, or the general tax revenue of the government entity, is used. The double barrel bond will have almost the same credit ratings as a general obligation bond and will have interest rates close to if not the same as the general obligation bond.

Zero Coupon Bonds and Capital Appreciation Bonds. Zero coupon bonds are securities that have a zero interest rate. They are typically issued at a fraction of their par value and investors receive par value when the bonds mature. Capital appreciation bonds (CABs) are similar to zero coupon bonds in that no periodic interest payments are made. Instead, the investor receives a lump sum payment of interest and principal when the bond matures. These instruments are attractive to long term investors in that there is no need to reinvest periodic interest payments and the return is guaranteed. From a County utility's standpoint, these securities are often used as a means of structuring debt service in a way that will minimize the short-term impact on rate payers and are often used in conjunction with other debt instruments. The current implied interest rate for zero coupon bonds depends on the terms of the bonds.

State Revolving Funds. The 1996 Safe Drinking Water Act Amendments authorized the funding of Drinking Water State Revolving Loan Funds (SRFs) to assist drinking water systems in financing the infrastructure costs of complying with the Act and to protect the public health. SRFs provide low-cost loans to publicly and privately owned water and wastewater systems, as well as nonprofit community ones, for periods up to 20 years. Many states, including Arizona, leverage funds provided from the federal and state government by issuing SRF revenue bonds.

SRF revenue bonds are issued to expand, or leverage, loan funding sources for local projects that meet the eligible project criteria under the Drinking Water SRFs. In Arizona, the Water Infrastructure Finance Authority (WIFA) serves as an independent agency of the state and is authorized to issue SRF revenue bonds (WIFA revenue bonds) to finance the construction of water, wastewater, wastewater reclamation, and other water quality projects. WIFA's main source for providing funding for wastewater systems is the Clean Water Revolving Fund, which is capitalized by contributions from both the federal and state level. WIFA revenue bonds are issued under the bond leveraging approach and are secured first by local general obligation or revenue bond pledges as collateral on loan repayments, and then by debt reserve funds underlying the WIFA revenue bond.

In Arizona the interest rate for SRF loans is indexed to the average current tax-exempt bond interest rate with the actual interest rate being a fraction of this index. The current index is approximately 4.5%. The fraction of the current tax-exempt bond rate that the SRF will charge an individual County utility is determined based on evaluation of the fiscal capacity of County utility. Specifically, the SRF looks at a

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County utility's mean annual income, current wastewater rates and charges, credit rating and the cost-effectiveness of the particular project for which the loan is being obtained.

SRFs probably represent the lowest cost funding for capital projects; however, there are a number of administrative hurdles that must be overcome before this financing tool can be utilized. In addition to a fairly stringent application process, voter approval is required before a County utility can access SRF funds. Also, the amount of SRF funds is fairly limited and competition for these funds has been relatively intense. In addition, the decision as to whether a County utility is eligible for SRF funds is to a certain extent based on need. Although recently the County has been successful securing SRF funds for certain capital projects, it may be difficult for a utility like Pima County, which is financially sound, to continue to have access to these funds.

Current Revenues/Reserve Funding. Internal funding involves a utility using reserve funds as a source of funding for a project. Reserve funds are cash, or cash equivalents, that the utility has accumulated over a period of time, either for the purpose of funding specific projects or to be used on an as needed basis. Utility reserve funds are typically funded through contributions from user charge revenues and supplemented with earnings derived from investing. Reserve funds can also be acquired through the use of system development charges, which require new customers of the system to pay for their proportional share of the costs to provide available capacity to serve these customers. It should be noted, however, that revenues derived from system development charges can be restricted for use on only the projects that will provide capacity to serve growth. PCRWRD currently assesses system development charges, or “connection fees”, with the revenue derived from these fees being accounted for through a System Development Fund and used solely for growth related projects.

Typically, reserve funding can be a very low cost means of financing capital projects since the only cost associated with this type of funding is the opportunity cost associated with not being able to earn a return on these funds through investing. Since most municipalities restrict their reserve fund investing to relatively low risk and therefore low yield investments, this opportunity cost can be quite low. However, internally funding fund capital projects can put significant pressure on user rates and charges and/or system development fees. Therefore, utilities must carefully balance the use of current revenues and reserve funds with the short-term and long-term implications on customers.

One disadvantage of reserve fund financing is that any depletion of reserve funds hinders a utility's ability to access these funds in the case of an emergency. To address this issue, PCRWRD has recently instituted a policy whereby their goal for an Emergency Reserve Fund balance is 50% of annual O&M expenditures. As of June 30, 2006, the balance in the PCRWRD's Emergency Reserve Fund was approximately \$10 million, which represents approximately 14.3% of budgeted operating expenditures in FY 2007.

Leasing/Lease-Purchase. Under lease financing, one party owns a capital item and leases it to a "using" party. The party owning the capital item is called a lessor, and this party leases the item to a lessee. The lessor retains tax advantages of asset ownership with the lessee paying a rent or lease payment to the lessor. In some cases, there is a purchase provision in the lease. This provision allows the lessee to purchase the capital item during or at the end of the lease period for some predetermined amount, based on an agreed-on formula. This scenario is known as a lease-purchase agreement.

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Leasing and lease-purchase financing is particularly relevant in Arizona where municipalities can establish tax-exempt entities that have the capacity to issue debt. These entities, called municipal property corporations (MPCs), issue debt, with the proceeds used to purchase or construct capital facilities. These facilities are then leased back to the sponsoring utility. In this way, municipalities are able to circumvent the voter approval process for both general obligation and revenue bonds that is required in Arizona.

Interest rates on debt issued by an MPC are usually similar to the interest rates on municipal revenue bonds.

Certificates of Participation. Certificates of participation (COPs) are used in conjunction with a leasing or rental arrangement. COPs are securities that are backed by an interest in a stream of rental or lease payments. The issuer is typically a governmental entity such as an MPC. COPs are typically only used in situations where the issuing entity is unable to issue bonds, since the interest rates on COPs are usually somewhat higher.

Federal/State Grants. Federal and state grants are another potential funding source for County utility capital projects. A grant is a sum of money awarded to an eligible entity without a demand for repayment. Typically, grants are awarded by the federal government to State or local governments, or by States to local governments, for the purpose of financing a particular activity or facility.

Grant funding, particularly for wastewater facilities, used to be much more prevalent. In fact, a large portion of the country's sewer infrastructure was financed with Clean Water Act grants. However, over the past several years, the federal government has all but eliminated its grant programs reflecting the philosophy that utilities should be self-sustaining.

Since there are no requirements for the repayment of grants, these are very low cost financing tools. However, there is intense competition for a very limited supply of grant funding and typically these grants are reserved for municipalities that are unable to utilize other financing tools. In addition, grant funds often have conditions that affect the scope, intent, nature or cost of the project or program in question, therefore, by accessing these funds, a County utility may have to forfeit a significant amount of control over the project.

Government Loans. There are a number of government agencies that offer loans to municipalities to fund infrastructure improvements. In fact, the SRFs discussed previously are a form of government loan. The U.S. Department of Agriculture has a number of loan programs designed to aid communities in need of funds to construct utility improvements; however, most of these programs are designed for use by rural utilities and therefore are typically not available to large municipalities. As with SRF funds and government grants, competition for these funds is fierce and priority is generally given to municipalities that are disadvantaged in some way.

Direct Source. Direct source is a financing mechanism whereby the supplier of a piece of equipment provides financing. The utility then makes regularly scheduled payments to the supplier. This financing tool is generally not appropriate for large scale projects and is typically only used to finance individual components of a project. However, some of the private financing methods described later in this report

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are, in a sense, forms of direct source financing whereby the private contractor that builds a facility is the direct source supplier and the utility agrees contractually to make regular payments to the contractor.

12.4.2.2 Non-Traditional Public Financing Options

12.4.2.2.1 Interest Rate Swaps, Synthetic Fixed or Variable Rate Debt, and other Derivative Products

The municipal derivatives market has grown significantly over the past decade. A number of state and local governments are now executing derivative transactions to reduce borrowing costs, hedge existing assets and liabilities, and improve strategic timing for market access, among other reasons.

Most common use for derivatives in the municipal market is the execution of interest rate swaps. An interest rate swap is a contractual agreement between two parties, generally the issuer and a counterparty (usually a bank or investment bank), to exchange interest rates for a set period of time. In a typical interest rate swap transaction one party agrees to pay a fixed rate in exchange for a floating rate from the other party. Interest payments are calculated based on a “notional” amount and include only interest; no principal is exchanged. Another form of interest rate swap, referred to as a “basis swap”, involves the two parties making payments to each other based on separate floating rates. Basis swaps are less common with municipal issuers.

An interest rate swap often can be used to achieve financing objectives at a cost lower than with more traditional financing methods. For example, an issuer considering long-term financing may issue fixed rates bonds and then enter into a *variable payer swap* for the construction period. In a variable payer swap the issuer agrees to make floating payments and receive fixed payments over the swap term. In doing so, the issuer has established the equivalent of variable rate construction period financing and has avoided the costs associated typically with issuing variable rate debt (e.g. letter of credit fees, remarketing fees). Conversely, in a *fixed payer swap* the issuer pays a fixed rate and receives a variable rate. Issuers typically enter into a fixed payer swap to hedge against the interest rate volatility of variable-rate debt. Floating rate payments received by the issuer will effectively cancel out the issuer’s variable rate debt exposure, which essentially converts the issuer to a net fixed rate payer. These types of bond related swaps provide what is known as *synthetic rate debt*.

Synthetic rate debt may be either fixed or variable, and it may provide some significant advantages. As discussed above, synthetic variable rate debt can be used as an alternative to other types of short-term variable tax-exempt debt (VRDOs, notes, commercial paper, etc.) to avoid the additional costs associated with a securing a liquidity facility, credit facility, and/or remarketing services. Additionally, at times the swap market may yield opportunities in which fixed rate synthetic debt or variable rate synthetic debt could actually provide lower rates than what is available through traditional sources of financing.

Another common type of derivative used by municipal issuers is called a *swaption*. A swaption provides a means of synthetic bond refunding by allowing an issuer to sell a counterparty an option to enter into a future swap. The premium paid by the counterparty is an upfront payment, which results in an immediate savings to the issuer. A swaption may be attractive to an issuer that is considering an advanced refunding of existing fixed rate debt. An advanced refunding means that the issuer will actually issue new bonds

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prior to the call-date on the existing bonds in an effort to invest the proceeds at a rate higher than what will be paid on the new bonds. An effective advanced refunding provides the issuer a positive carry, or arbitrage opportunity, as it will be earning the incremental return above its new cost of money. However, at certain times conditions will not facilitate an opportunity for arbitrage, as the interest rate an issuer could earn on newly borrowed funds is not sufficient to cover the interest rate on the existing bond; this is known as negative arbitrage. For example, an issuer with fixed rate debt contemplating an advanced refunding finds that negative arbitrage prohibits an effective refunding. As an alternative, the issuer sells to a counterparty the option to enter into a swap at some future date, which is usually the call date of the existing fixed rate bonds. The swap would require the issuer to pay the counterparty a fixed rate while receiving a variable rate. The agreement can usually be structured such that the issuers continuing payments under the swap agreement, if exercised, would be virtually the same as its existing fixed payments. If the swap is exercised the issuer would call the old bonds and issue variable rate refunding bonds. The variable rate received by the counterparty would offset the variable rate payments due by the issuer, and the issuer would continue to make fixed rate payments at the same level as before. Savings to the issuer would be the premium it retained for entering into the swaption, which could be quite large depending on the market rates of interest at the time of the option sale.

Although interest rate swaps can be an attractive mechanism to lower borrowing costs they are not without risk. An issuer considering an interest rate swap or similar transaction needs to fully understand the obligations of the agreement, as well as the associated risks which generally include:

- *Interest Rate Risk* – Risk that rates will increase or decrease affecting the interest rate swap’s cash flow and market value.
- *Basis Risk* – At times, there can be a mismatch between the interest rate received by the issuer and the interest rate payable on the issuer’s related debt service obligation. For example, in a fixed payer swap the floating rate received by the issuer may not exactly equal the floating rate payable by the receiver on the variable rate bonds it is hedging.
- *Termination Risks* – An interest rate swap could be terminated prior to its scheduled termination date as a result of various circumstances outlined in the agreement. The termination could be related to either party for reasons such as payment default, bankruptcy, covenant default, or certain ratings downgrades. Upon an early termination, a substantial mark-to-market payment could be due or payable based on the current value of the transaction.
- *Amortization Risk* – Risk of a mismatch between the principal value and notional amount of the related interest rate swap.

It is important for a utility to consider all of these risks prior to entering into a derivative transaction. If a utility is considering the use of derivatives, it should first determine whether it has the legal authority to engage in such a transaction. Should legal authority exist, bond counsel should be consulted to determine whether the existing indenture requires revision to cover these types of transactions.

12.4.2.2.2 Alternative User Fees and Charges

Many utilities develop alternative user fees or charges when operating and capital costs related to a specific purpose are readily identifiable and can be determined with reasonable accuracy. When this is the case, it can make sense for a utility to un-bundle the specific costs associated with a particular cost-category or driver, and develop an alternative fee or charge as a method of cost recovery. Although

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specific user fees usually require that customers only be assessed the fee if they exercise the option to use the service, a number of utilities have developed alternative fees or charges that apply to all customers as a result of specific utility initiatives, such as meeting regulatory requirements. For example, a utility faced with significant capital costs to meet environmental regulations may consider recovering these costs through an “Environmental Fee”. Environmental Fees should be based on cost of service principles and be assessed proportionately to all customers. It is important to remember, however, that although costs associated with an Environmental Fee would not be recovered through general user rates, the ultimate impact on customers would be essentially the same.

12.4.2.3 Private Financing

As discussed in Section 12.3, tax-exempt public financing offers to local government wastewater utilities in the United States the opportunity to finance wastewater capital facilities at extremely low costs. Nowhere else in the world do utilities have the ability to borrow at rates that are at tax-exempt levels. As a result, there has to be persuasive reasons why a government utility eligible for tax-exempt financing would consider private financing for wastewater utility assets. This section discusses the background of private sector financing and evaluates private financing as an alternative for water and wastewater utility facilities in the United States and internationally.

12.4.2.3.1 Overview of Private Financing

Globally, private sector capital has become commonplace in supporting water and wastewater utility construction and permanent financing. At one time, industrialized and newly developing countries primarily used host country governmental funds to finance utility assets. In disadvantaged, developing countries, it is challenging, if not impossible, to generate adequate funds to support environmental, as well as other public works infrastructure. As a result, international lending organizations were established as a response to an overwhelming infrastructure need worldwide. Prominent “nonprofit” lenders that were created to address these needs include the World Bank, the Inter-American Development Bank, and the Asian Development Bank.

The private sector has emerged as a major force in institutionalized financing of global water and wastewater infrastructure. In addition to serving industrialized countries, sophisticated international private contractors have developed a strong understanding of the role of worldwide lending institutions and have assisted needy countries in gaining access to low interest loans and grants to build water and wastewater facilities. Particularly over the last ten years, international private contractors have become more sophisticated in understanding the risks of providing water service in various international locations. At the same time, international lending institutions have become more sophisticated in developing relevant financing products that have been used creatively to finance worldwide infrastructure at affordable costs. Increased financing sophistication of private contractors and improved financing methods offer attractive alternatives to countries that may not otherwise be able to afford or construct needed water improvements.

In the United States, a different approach to financing water and wastewater facilities has evolved in addressing environmental requirements and public demands. As Americans have become aware of the health requirements to have safe, potable water supplies for public and commercial purposes, the water industry emerged as a major force in public works in the United States. Americans have prioritized water

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quality as a major public policy issue, and through its political representatives, passed laws to mandate improved water supply and delivery systems.

In the 1900s a two-tiered approach to providing water service emerged. In many cases, government utilities were formed to address water service requirements of growing communities. Many times these utilities took the form of water departments of city and county governments. As an alternative, stand-alone government utility authorities were created. Given the priority placed on water quality, grant and low interest loans became available to assist government agencies in building needed infrastructure. At the same time, private water companies took the initiative to build water infrastructure to address existing residential, commercial, and industrial consumer requirements. In some cases, developers built and operated water facilities to support property and housing sales. As a result, water service by the private sector also became a well-established institution in the United States.

To protect the public from the potentially monopolistic position of investor-owned water companies, public service commissions were established. The objective of these commissions was primarily to insure through regulation, affordable, cost-effective, and environmentally safe water supply to the public. Today, major investor-owned water utilities (IOUs) that are regulated by public service commissions, such as Arizona Corporation Commission, include:

- American Water Works Company
- Aqua America (Philadelphia Suburban Water Company)
- Elizabeth Town Water Company
- California Water Company
- Middlessex Water Company
- United Water Services

To assist government agencies in providing water service, tax laws were passed which allowed government agencies to borrow at attractive tax-exempt interest rates. An entire financing industry developed around the planning, structuring, and delivery of tax-exempt debt to government agencies. Tax-exempt instruments such as revenue bonds and general obligation bonds (described in Section 13.3), have become commonplace in offering low cost, tax-exempt financing to government utilities. Major investment banking firms that specialize in issuing tax-exempt debt on behalf of their government utility clients include:

- Paine Webber
- Bank of America
- Merrill Lynch
- Bear, Stearns
- Morgan Stanley
- Goldman Sachs
- J.P. Morgan
- Citigroup

Initially, public policy limited tax-exempt financing to only governmental agencies. Private water companies were not eligible for these favorable financing instruments. As a consequence, private water companies have had to borrow at levels historically two to three percentage points higher than tax-exempt

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debt. Financing methods of the private sector have therefore been more expensive with additional interest rate costs being passed to consumers, typically through water rates.

Today, private activity bonds (PABs) and state revolving funds (SRFs) have become available to the private sector under certain circumstances for financing needed water facilities. These long-term debt instruments carry with them interest rates comparable to tax-exempt debt, and provide additional opportunities to the private sector to compete with public financing approaches.

In general, public tax-exempt financing is the “method of choice” for government agencies, such as Pima County, for financing major water and wastewater infrastructure. This option is appealing, primarily because of easy access to low cost, tax-exempt debt. There are instances, however, when private financing offers an attractive alternative to public financing. Approaches have been developed internationally as well as in the United States to provide competitive financing alternatives. In this section, private financing approaches within the United States will be discussed, as will the merits of private financing to Pima County.

12.4.2.3.2 Private Financing within the United States

As discussed earlier, the private sector’s entry into the water industry was primarily through IOUs or as private water companies supporting a real estate development, industrial operation, or commercial activity. In the United States, there are over 80,000 private water service providers. The vast majority of these providers serve very small systems.

In the last twenty years, however, a paradigm shift has taken place in the water and wastewater industry. Smaller service providers are being purchased by government utilities or larger water companies. At the same time, private contractors are taking a more aggressive role in providing contract operations to government utilities. Even though there are some exceptions, (e.g., Houston, New Orleans, Atlanta, etc.) the vast majority of privatized operations are for small to medium size communities. Furthermore, contract operations have focused primarily on treatment plants rather than distribution systems, customer services, and administrative support. Major private contractors providing contract operations around the United States include:

- US Water (Bechtel Enterprises)
- AnglianAmerican Environmental Technologies (American Water Works Company and Anglian Water Company)
- United Water Resources (Suez Lyonnaise)
- Operations Management International (CH2M Hill)
- Earthtech (TYCO International Limited, LTD)
- Aqua Alliance – Veolia Water

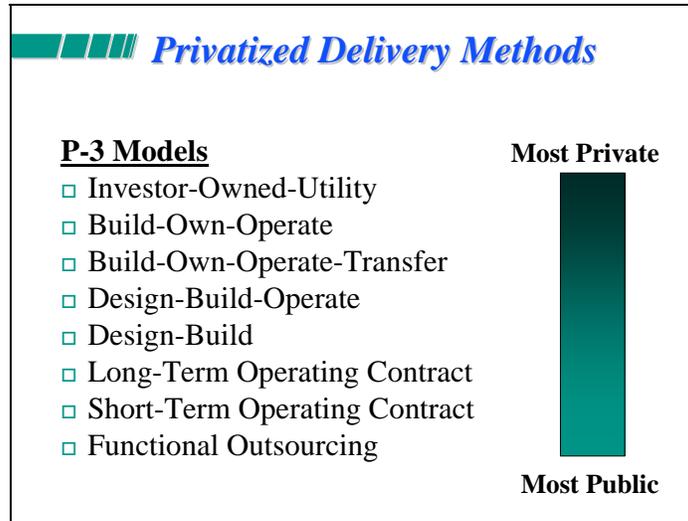
Most of these organizations have legal and financial affiliations with larger worldwide international private contractors. (These affiliated larger firms are indicated above in parentheses.) As a result of the evolution of the water industry in the United States, the major private service providers are investor-owned water utilities and large private contractors with international affiliates. As depicted in **Figure 12-2** these companies provide a wide variety of privatization services ranging from functional outsourcing

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(contracting out functional activities of the utility) to full privatization (investor-owned utility ownership and operations).

Figure 12-2
Privatized Delivery Methods



The alternative delivery study currently being performed for Pima County has focused on assessing privatization delivery methods (with certain variations) with traditional build-own operate approaches.

12.4.2.3.3 Private Financing Approaches in the United States

There are several methods used by IOUs and private contractors in financing capital facilities in the United States. These financing methods are discussed below.

Short-term Taxable Debt. Short-term notes, commercial paper, and commercial loans are used extensively by private contractors to finance smaller capital items (vehicles, equipment, capitalized repairs, etc.). In addition, these sources are used, along with equity, to provide bridge financing for permanent long-term financing. Many times the short-term market is used when long-term lending rates are unfavorable, and the private contractor would like to “buy some time” before the permanent financing is used.

The short-term market has the advantage of being relatively simple to access with little issuance and administrative costs. The major disadvantage of short-term financing is that it does not offer a long-term, permanent solution to a utility’s financing needs. When short-term borrowing is used (less than five years), attractive taxable interest rates of 5 ½ to 6% can usually be realized by preferred borrowers in today’s market.

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Private Activity Bonds (PABs). PABs are the creation of Congress and the Internal Revenue Service whereby private developers can borrow at tax-exempt rates to build facilities used for specific public purposes. Each state is authorized to issue PABs based on a ceiling of \$50 per capita in the state.

Each state has specific rules for the use of PABs. In Arizona, the PABs are distributed accordingly:

- 35% – Single-family mortgages
- 20% – Student loans
- 15% – Manufacturers
- 15% – Director’s discretion
- 15% – All others

Only 30% of the PABs are available for water and wastewater related projects. According to Arizona Department of Commerce staff, the director’s allocation is used to promote manufacturing jobs, which leaves only 15% of the PABs available for water and wastewater projects, as well as other needs. As a result, very few PABs have been used for public water and wastewater projects. There is a move to explore removing the PABs cap for water and wastewater projects, but it is unlikely this will occur in time to potentially benefit the PCRWRD.

PABs have the advantage of being tax-exempt and can compete at interest rates comparable to public finance. There are several administrative steps that are required before PABs can be issued. Typically, an economic agency of the government is required to sponsor PABs. In the case of Pima County, it is the Arizona Department of Commerce. PABs are popular to private contractors because they allow them to reduce their overall cost of capital by using tax-exempt debt. It is highly unlikely, however, that PABs would provide a meaningful level of funding for PCRWRD’s CIP.

Taxable Bonds. Historically, taxable debt has been used routinely by IOUs and private water companies in financing capital facilities. As with tax-exempt bonds, all of the major investment banking firms are heavily involved in structuring and issuing taxable bonds. In today’s market, taxable bond interest rates are about 1½ to 2% higher than tax-exempt debt; this premium translates into taxable bond interest rates of 6½-7%. Many times, because of major corporate guarantees, taxable debt can be issued without specific credit enhancements such as bond coverage requirements, insurance, reserve fund requirements, and high issuance expense.

Equity. Equity is defined as investment of capital for the purpose of earning a return to owners or investors. For water IOUs, state public service commissions typically mandate that utility capital structures include a significant portion of equity. Even though the mandated percentage of equity varies from state to state, public service commissions usually require about 30-50% of the capital structure to be equity. While the ACC previously had a mandated percentage of equity, according to ACC staff, this requirement has been removed. Commercial lenders tend to be somewhat more flexible than public service commissions in allowing a lower percent of equity to be required in structuring a deal. In today’s capital markets, lending institutions usually require a minimum requirement of about 20% equity.

The advantage of equity is that it is flexible, requires little administration to issue and to use, and can be accessed relatively easily. The major disadvantage of equity is that it requires a higher rate of return to reward stockholders for their investment in a specific project.

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State Revolving Funds (SRFs). As discussed in Section II, SRFs are available for privately owned projects in Arizona. The major advantage of SRF financing is that it provides access to capital markets at interest rates somewhat lower than taxable debt. In Arizona, SRF interest rates for private projects are calculated at 75% of the prime commercial rate. In today's market, this calculation translates into a lending rate of about 5-6% interest. Private contractors have argued that the heavy administrative and compliance requirements to get SRF financing authorized for a project does not justify the interest rate differential over taxable debt. In Arizona, SRFs have been used by private contractors for smaller projects (\$10,000-50,000). In summary, SRF funds will not likely be a strong alternative to private contractors for funding major aspects of the PCRWRD capital plan because:

- The amount of funding will likely be small;
- The County's recent use of SRF funds may limit the amount of SRF funding available for County projects;
- The availability of funds will be in competition with small priority projects in Arizona;
- The interest rate differential between SRFs (5-6%) and taxable bonds (6-7%) does not offer a significant financing cost advantage; and
- The administration to apply for and comply with SRF requirements adds cost and effort for the private contractor.

Tax-Exempt Corporation. It may be possible for a private company to use tax-exempt MPCs to secure project financing. This might be accomplished in much the same way that the Pima County could utilize the CIC, as described in the discussion on public financing options. The only difference would be that in this case the private company, instead of Pima County, would make lease payments to the CIC. However, conversations with bond counsel, financial advisors and representative of state financing agencies indicate that financing obtained in this way would be subject to the volume cap restrictions that apply to PABs. Therefore, there may not be any advantages to using a tax-exempt corporation when compared to traditional PABs.

12.4.2.3.4 Private Financing Case Studies in the United States

Historically, most IOU and private water company projects have been privately financed. Over the past ten years, these companies have been aggressive in seeking PABs at tax-exempt interest rates. Examples of water projects that have been financed through PABs include:

- Boise, Idaho
- Illinois American
- Tennessee American
- United Water New Jersey
- United Water New York

In addition, private capital has been used on projects that involved a partnership relationship with the local municipality and government utility. Successfully financed projects include:

- Town of Cranston, Rhode Island Wastewater Plant
- City of Franklin, Ohio Water Plant

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- Design/Build/Operate Improvement and Operate Contracts with:
 - City of Wilmington, Delaware
 - Miami Conservancy District, Ohio
 - City of North Brunswick, New Jersey

12.4.2.3.5 Evaluation of Private Financing Options

The advantages and disadvantages of various finance methods available to the private contractor are summarized in **Figure 12-3**.

**Figure 12-3
Evaluation of Private Financing Options**

	Evaluation Criteria									
	Applicability	Legality	Administration and Compliance Requirements	Issuance Cost	Effective Interest Rate	Interest Rate Risk	Attractiveness to Vendors	Rate Stability	Off Balance Sheet Financing Effects	Economic Risk of Tax Requirement Non-Compliance
Short-Term Taxable Debt	3	5	4	3	2	3	4	3	5	5
Private Activity Bonds	4	4	2	3	4	4	5	4	4	2
Taxable Bonds	4	5	4	2	2	4	3	3	5	5
Investment Capital	4	5	5	5	1	5	1	5	5	5
State Revolving Funds	1	3	1	4	5	5	5	2	3	1
Tax-exempt Corporation	2	2	3	4	4	4	3	3	5	1

5 – Most effectively addresses the evaluation criteria
1 – Least effectively addresses the evaluation criteria

While private financing may have some benefits for PCRWRD, it does not appear that any of the private financing tools discussed above are applicable for inclusion in the Baseline Financing Plan for the PCRWRD. However, PCRWRD should continue to explore private financing opportunities that may be utilized in conjunction with the alternative project delivery methods discussed in Chapter 10.

12.4.3 Baseline Financing Plan

12.4.3.1 PCRWRD Long-term Capital Needs

The annual cash needed to construct the required facilities over the next 15 years is provided on **Figure 12-4** (ROMP Projects) and **Figure 12-5** (Non-ROMP Projects). The entire PCRWRD CIP is presented in **Figure 12-6**.

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Figure 12-4
PCRWRD CIP - ROMP Projects (\$ Millions)

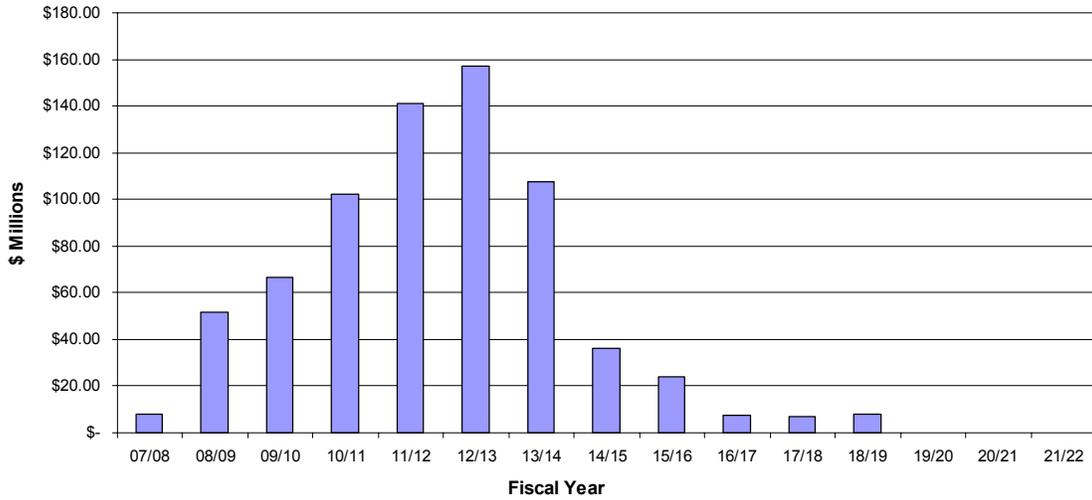
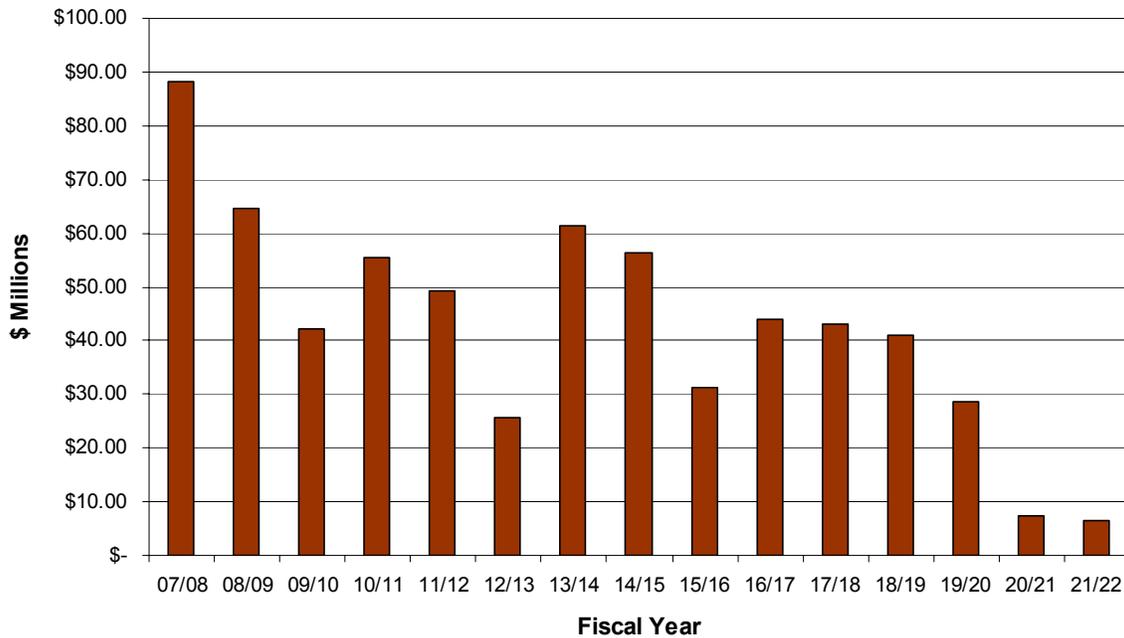


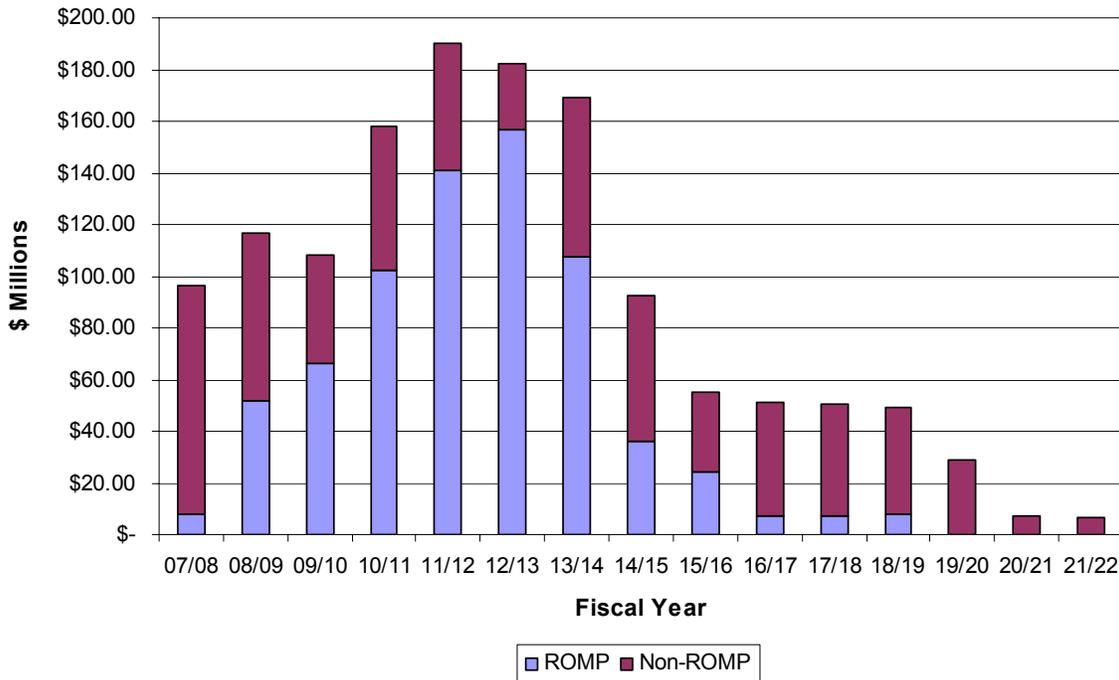
Figure 12-5
PCRWRD CIP – Non-ROMP Projects (\$ Millions)



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**Figure 12-6
PCRWRD Capital Improvements Plan (\$ Millions)**



12.4.3.2 Identification of Funding Sources

No attempt was made to include the entire universe of financing options that are available in today’s financial markets. However, a concerted effort was made to explore all financing tools that might be relevant to capital planning scenarios outlined for PCRWRD. Those financing tools that were considered to be relevant were described in the previous section of this report. After additional examination of each of these financing options, it was determined that while all of the listed tools had relevance to the PCRWRD’s capital program, the probability that some of the options would or could be utilized was low. As a result, several of the financing tools were eliminated prior to final evaluation. Some of the financing options that were eliminated from consideration were disregarded because of marginal ratings with regard to several of the previously described evaluation criteria. For instance, direct source financing received low ratings for Effective Interest Rate, Applicability to a project of this size, and Attractiveness to Vendors. Other financing options were eliminated from consideration because they were rated extremely low in one particular category. For example, government loans received a very low Applicability rating because these loans are typically reserved for borrowers that are unable to access other funding sources and since PCRWRD is capable of receiving funding from a variety of other sources, it was decided that government loans were a very unlikely source of funding for the project.

Figure 12-7 presents the public financing tools that were included in the final evaluation and shows their ratings with regard to each of the different evaluation criteria. Each financing tool received a 1 to 5 rating

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in each of the criteria, with a 5 indicating that the financing tool is most effective in addressing PCRWRD’s financing objectives with regard to the corresponding criterion, and a 1 rating indicates that the tool is not effective in addressing the PCRWRD’s objectives

**Figure 12-7
Matrix for the Evaluation of Public Financing Options**

	Evaluation Criteria									
	Applicability	Legality	Administration and Compliance Requirements	Issuance Cost	Effective Interest Rate	Interest Rate Risk	Attractiveness to Vendors	Rate Stability	Off Balance Sheet Financing Effects	Economic Risk of Tax Requirement Non-compliance
Short-Term Tax-Exempt Debt (notes, commercial paper, etc.)	4	5	2	3	4	2	4	3	1	3
Revenue Bonds/Double Barrel Bonds	5	5	4	4	3	4	4	5	1	4
General Obligation Bonds	2	5	3	4	4	4	4	5	1	3
Current Revenues/Reserve Funds	5	5	4	5	5	5	5	1	1	5
Lease-Purchase	2	4	3	4	3	2	4	3	3	3
State Revolving Funds	5	5	2	4	4	4	4	5	1	2
Miscellaneous (COPs, CABs, Zero Coupons, etc.)	4	4	3	4	3	2	4	3	2	3

5 – Most effectively addresses the evaluation criteria

1 – Least effectively addresses the evaluation criteria

Based on the results of the evaluation matrix, the two financing options that appear to be particularly effective for use in a baseline financing plan are revenue bonds and current revenues/reserve funds. These two financing options are discussed in more detail below.

Revenue Bonds. PCRWRD has utilized revenue bonds historically to fund the majority of its major capital initiatives. Although several of the alternatives identified above, such as general obligation bonds and SRF loans, could provide PCRWRD with a more cost-effective source of funding, certain non-economic issues related to each make revenue bonds a more attractive choice. Specifically, due to the size of the PCRWRD capital program, authorizing general obligation bonds to fund the majority of these projects could limit funding sources available for other services provided by Pima County. Even though it may be possible for PCRWRD to access a certain level of WIFA funds, the administrative hurdles would be significant and the amount of funds available would not likely be significant. Other short-term

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financing alternatives could be considered initially during project construction phases as a means of lowering PCRWRD’s overall cost of capital, but continuing to utilize short-term funds for long-term financing needs would place significant interest rate risk on Pima County. Since the purpose of a baseline financing plan is to provide PCRWRD a conservative estimate of the financial impacts of its capital planning initiatives, utilizing traditional financing vehicles such as revenue bonds provide a sound foundation to evaluate the potential impacts on Pima County wastewater customers.

Current Revenues – System Development Charges. As noted previously, PCRWRD assesses system development charges to new customers to offset the capital cost of growth. Since a number of the projects outlined in the CIP are related to system expansion to meet forecast demand, the baseline financing plan assumes that PCRWRD will continue to use system development charges to fund these types of projects.

Capital Funding Sources and Uses. Pima County approved \$150 million in revenue bond funding in its 2004 Revenue Bond Program (“Series 2004 Bonds”). Based on the capital cost phasing plan described in Section 12.2, approximately \$32.2 million of the Series 2004 Bonds will need to be used to fund ROMP projects with the remainder being used to fund other projects in the CIP. Also, Pima County would need to authorize an additional \$565 million in bonds in its 2008 Revenue Bond Program (“Series 2008 Bonds”), approximately \$399 million in its 2012 Revenue Bond Program (“Series 2012 Bonds”) and approximately \$153 million in its 2016 Revenue Bond Program (“Series 2016 Bonds”). The remaining funding requirements will be addressed with balances in the System Development Fund. **Figure 12-8** provides a summary of the baseline financing plan.

**Figure 12-8
Capital Funding Sources and Uses**

1997 Bonds	\$	3,945,440
	<i>Other CIP</i>	\$ 3,945,440
2004 Bonds	\$	150,000,000
	<i>ROMP Projects</i>	\$ 32,283,125
	<i>Other CIP</i>	\$ 117,716,875
SDF's	\$	144,964,660
	<i>Other CIP</i>	\$ 144,964,660
2008 Bonds	\$	565,000,000
	<i>ROMP Projects</i>	\$ 445,000,000
	<i>Other CIP</i>	\$ 120,000,000
2012 Bonds	\$	398,698,624
	<i>ROMP Projects</i>	\$ 227,228,957
	<i>Other CIP</i>	\$ 171,469,666
2016 Bonds	\$	153,341,187
	<i>ROMP Projects</i>	\$ 1,767,905
	<i>Other CIP</i>	\$ 151,573,282
Total ROMP Projects	\$	706,279,987
Total Other CIP Projects	\$	709,669,924
Total Capital Plan	\$	1,415,949,911

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As shown above, the CIP will, for the most part, be funded with a combination of the proceeds for revenue bonds, cash reserves and rate revenues. However, the County and the Project Team will continue to pursue financing options that will ultimately reduce the financial impact of the CIP on PCRWRD's customers.

12.4.3.3 Customer Rate Impacts

In order to assess the potential financial impact of the proposed CIP and financing plan, a model was developed to calculate the estimated impact on the bill of a typical customer. The model allowed for the input of project cost and project phasing/sequencing information, which was used to develop annual capital needs for each year of the planning period. These annual capital needs were then translated into capital revenue requirements based on the Baseline Financing Plan described in this chapter. These capital revenue requirements consist of debt service and cash needed to either fund projects or ensure that the PCRWRD would meet its debt service coverage requirements. These capital revenue requirements are then combined with O&M expenses to arrive at the utility's total revenue requirements for each year as shown in **Figure 12-9**. Total revenue requirements represent the amount of money that PCRWRD must generate each year from its various revenue sources, including User Charges and Connection Fees, to provide service and support the proposed CIP.

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**Figure 12-9
Revenue Requirements**

	2007	2008	2009	2010	2011	2012	2013	2014
Revenue Requirements (\$ Mil.)								
Operating & Maintenance (1)	\$ 75.4	\$ 77.9	\$ 81.2	\$ 84.3	\$ 87.5	\$ 90.8	\$ 94.2	\$ 99.0
Capital								
Debt Service	\$ 15.5	\$ 26.2	\$ 26.2	\$ 43.4	\$ 43.4	\$ 75.8	\$ 75.3	\$ 108.7
Direct CIP Funding (Cash)	\$ 22.5	\$ 22.9	\$ 48.1	\$ 9.2	\$ 15.4	\$ 6.8	\$ 2.0	\$ 2.0
Total Revenue Requirements	\$ 113.4	\$ 127.0	\$ 155.5	\$ 136.9	\$ 146.3	\$ 173.4	\$ 171.6	\$ 209.6
<i>% Change</i>		12.0%	22.5%	-12.0%	6.9%	18.5%	-1.1%	22.2%

	2015	2016	2017	2018	2019	2020	2021	2022
Revenue Requirements (\$ Mil.)								
Operating & Maintenance (1)	\$ 104.6	\$ 108.7	\$ 112.3	\$ 116.1	\$ 120.0	\$ 124.0	\$ 128.1	\$ 132.4
Capital								
Debt Service	\$ 109.3	\$ 124.6	\$ 116.3	\$ 120.6	\$ 120.6	\$ 128.1	\$ 128.1	\$ 129.2
Direct CIP Funding (Cash)	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0	\$ 2.0
Total Revenue Requirements	\$ 215.9	\$ 235.3	\$ 230.6	\$ 238.6	\$ 242.5	\$ 254.1	\$ 258.2	\$ 263.6
<i>% Change</i>		3.0%	9.0%	-2.0%	3.5%	1.6%	4.8%	1.6%

(1) Includes departmental capital outlays.

Also shown on the above figure is the percent change in revenue requirements from year to year. This number gives a general indication of the magnitude of the increase in rates and charges that will be required. **Figure 12-10** shows how the increases in revenue requirements might impact the bills that customers pay.

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**Figure 12-10
Impacts on Customer Bills**

	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Typical Customer Bill (1)	\$ 18.98	\$ 21.56	\$ 25.21	\$ 27.90	\$ 30.89	\$ 34.23	\$ 37.33	\$ 40.71
% Change		13.6%	16.9%	10.6%	10.7%	10.8%	9.0%	9.1%
Connection Fee (2)	\$ 4,724	\$ 5,308	\$ 6,364	\$ 7,151	\$ 8,035	\$ 9,028	\$ 9,953	\$ 10,973
% Change		12.4%	19.9%	12.4%	12.4%	12.4%	10.3%	10.3%

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Typical Customer Bill (1)	\$ 40.71	\$ 43.12	\$ 43.12	\$ 43.86	\$ 46.05	\$ 46.05	\$ 46.05	\$ 46.05
% Change		0.0%	5.9%	0.0%	1.7%	5.0%	0.0%	0.0%
Connection Fee (2)	\$ 10,973	\$ 11,698	\$ 11,698	\$ 11,899	\$ 12,494	\$ 12,494	\$ 12,494	\$ 12,494
% Change		0.0%	6.6%	0.0%	1.7%	5.0%	0.0%	0.0%

(1) Represents the monthly sewer bill for a 10ccf customer.

(2) Non-participating connection fees.

12.4.3.4 Financing Terms

PCRWRD typically uses 15-year bonds rather than 20-year or 30-year bonds to fund its major capital projects. The primary benefit of using 15-year bonds is that the overall cost of borrowing to the County is lower than if longer-term financing is selected. However, since principal repayment on 15-year bonds, as compared to 20-year or 30-year bonds, is required more quickly, there is additional pressure on revenue requirements over the short-term to meet debt service payments, including coverage. Although the continued use of 15-year bonds represents a reasonable, prudent funding strategy, in light of the significant size of the PCRWRD CIP, the financial analysis included an assessment of the potential impacts of extending the repayment terms in the Baseline Financing Plan beyond the traditional 15 years. **Figure 12-11** and **Figure 12-12**, respectively, present the potential customer impacts of using 20-year and 30-year bonds.

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Figure 12-11

Impacts on Customer Bills (20-Year Bonds)

	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Typical Customer Bill (1)	\$ 18.98	\$ 21.56	\$ 25.21	\$ 27.45	\$ 29.90	\$ 32.57	\$ 34.91	\$ 37.43
% Change		13.6%	16.9%	8.9%	8.9%	9.0%	7.2%	7.2%
Connection Fee (2)	\$ 4,724	\$ 5,308	\$ 6,364	\$ 7,017	\$ 7,736	\$ 8,529	\$ 9,225	\$ 9,977
% Change		12.4%	19.9%	10.3%	10.3%	10.3%	8.2%	8.2%

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Typical Customer Bill (1)	\$ 37.43	\$ 39.97	\$ 39.97	\$ 39.97	\$ 42.73	\$ 42.73	\$ 42.73	\$ 42.73
% Change	0.0%	6.8%	0.0%	0.0%	6.9%	0.0%	0.0%	0.0%
Connection Fee (2)	\$ 9,977	\$ 10,740	\$ 10,740	\$ 10,740	\$ 11,483	\$ 11,483	\$ 11,483	\$ 11,483
% Change	0.0%	7.6%	0.0%	0.0%	6.9%	0.0%	0.0%	0.0%

(1) Represents the monthly sewer bill for a 10ccf customer.

(2) Non-participating connection fees.

Figure 12-12

Impacts on Customer Bills (30-Year Bonds)

	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
Typical Customer Bill (1)	\$ 18.98	\$ 21.56	\$ 25.21	\$ 27.00	\$ 28.91	\$ 30.98	\$ 32.63	\$ 34.39
% Change		13.6%	16.9%	7.1%	7.1%	7.1%	5.3%	5.4%
Connection Fee (2)	\$ 4,724	\$ 5,308	\$ 6,364	\$ 6,884	\$ 7,445	\$ 8,053	\$ 8,543	\$ 9,064
% Change		12.4%	19.9%	8.2%	8.2%	8.2%	6.1%	6.1%

	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Typical Customer Bill (1)	\$ 34.39	\$ 36.86	\$ 36.86	\$ 36.86	\$ 39.85	\$ 39.85	\$ 39.85	\$ 39.85
% Change	0.0%	7.2%	0.0%	0.0%	8.1%	0.0%	0.0%	0.0%
Connection Fee (2)	\$ 9,064	\$ 9,803	\$ 9,803	\$ 9,803	\$ 10,597	\$ 10,597	\$ 10,597	\$ 10,597
% Change	0.0%	8.2%	0.0%	0.0%	8.1%	0.0%	0.0%	0.0%

(1) Represents the monthly sewer bill for a 10ccf customer.

(2) Non-participating connection fees.

A longer term repayment structure reduces PCRWRD's annual debt service obligation and lowers the potential impacts on customers over the planning period. However, by extending the repayment terms the total cost of borrowing increases as bond principal is retired over a longer period of time. **Figure 12-13** summarizes total borrowing costs, both principal and interest, associated with using 15-year, 20-year, or 30-year bonds in the Baseline Financing Plan.

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**Figure 12-13
Total Cost of Borrowing**

Term	Principal (1)	Interest	Total
15	\$ 1,150,551,004	\$ 540,364,603	\$ 1,690,915,607
20	\$ 1,150,551,004	\$ 735,254,630	\$ 1,885,805,634
30	\$ 1,150,551,004	\$ 1,159,189,348	\$ 2,309,740,352

(1) Principal value represents funding needs in the 2008, 2012 and 2016 revenue bonds, plus 3% issuance costs.

12.4.4 Additional Financing Consideration

Our analysis of the PCRWRD’s options for funding its capital program indicates that from a broad perspective, the Baseline Financing Plan, which uses a mix of revenue bonds and cash reserves to fund the PCRWRD CIP, is the most efficient and cost effective overall capital funding approach. However, the analysis also revealed several opportunities that should be pursued further during the implementation of the CIP.

Specifically, PCRWRD should:

- **Use alternative charges to increase revenues.** The use of alternative charges such as Environmental Fees or Repair & Rehabilitation Fees may be more politically attractive than simply increasing the current rates and charges by the amount needed to generate the cash needed to implement the Baseline Financing Plan. While the out-of-pocket cost for most customers will be the same if alternative charges are developed, the use of these charges can make the increased costs more palatable.
- **Optimize current rates and charges.** In general, current Connection Fees are designed to recover the costs associated with making capacity available to new customers and User Charges are designed to recover the costs associated with the day-to-day operation, maintenance, repair and replacement of the system. Ensuring that these charges are only recovering the costs they were designed to recover from the appropriate customers should help to increase customer acceptance of the rate increases that will be necessary to implement the CIP.
- **Issue bonds with terms consistent with the life of the assets they are being used to fund.** The use of bonds with terms of 20 to 30 years more closely approximates the useful life of the assets that are included in the CIP. While the total cost of borrowing associated with longer term bonds is greater, the matching of bond terms to asset useful life has multiple benefits

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including increased intergenerational equity and greater rate stability as costs are amortized over longer periods.

- **Continue to investigate the use of WIFA funds for a portion of its CIP.** While the relative lack of availability of these funds and the more stringent administrative requirements that accompany their use reduces their attractiveness, the lower interest rates associated with WIFA funds could help to mitigate adverse rate impacts.
- **Utilize short-term instruments, interest rate swaps and other derivatives.** While the use of these creative financing techniques would change PCRWRD's risk profile, other utilities in Arizona and throughout the country have demonstrated that these techniques, if used responsibly, can significantly reduce financing costs without an inordinate increase in risk.

Explore private financing options. In terms of the cost of borrowing, it is very difficult to beat tax-exempt bonds; however, the costs associated with creative financing approaches that utilize private funds have been approaching the cost of tax-exempt funding. As implementation of the CIP progresses, PCRWRD should continue to explore financing options that may be offered by private funding sources, particularly in cases where private partners are already involved in the delivery of the project. Additionally, recent legislative efforts have sought to increase the availability of Private Activity Bonds. If these efforts are successful, private financing costs could decrease dramatically.



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Appendices

Pima County Regional Wastewater Reclamation Department

FINAL—November 2007



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