

Funding Projects and Programs in a Time of Scarce Resources

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## Innovative Solutions to Funding of Capital Improvement Projects

Michael Gritzuk, P.E., Consultant Pima County Regional Wastewater Reclamation Department

## History of Design-Bid-Build Projects in Arizona = History of Litigation

Ina Road WRF 12.5 MGD Expansion 35.2% over budget 38 months over schedule Litigation recently settled Green Valley Sub-Regional WRF Expansion

> 34.8% over budget

15 months over schedule

Litigation recently settled City of Phoenix 91st Ave. WTF Expansion 121% over budget 30 months over schedule

Litigation recently settled

### **Breaking the Cycle of Cost Over-Runs** and Litigation

### **Pima County Regional Optimization Master Plan (ROMP)**

**Regulatory Requirements** 

Infrastructure Rehabilitation/ Replacement

Major planning effort to meet future infrastructure needs and comply with regulatory requirements

### **Regional Optimization Master Plan**

Expand Ina Road WRF to 50 MGD Construct new 32 MGD Water Reclamation Facility Plant Interconnect

### **ROMP Budget**

**ROMP** planning level estimated cost (2006 dollars):

### \$536 million

\$720 million

# **ROMP** budget (including construction cost inflation):

## **ROMP** Philosophy

- Romp project budgets are not to be exceeded
- Aggressive professional negotiations
- Value engineering to stay within budget
- Recognition of current marketplace pricing
- Avoidance of project scope creep

Budget has been reduced to \$660 million (and more reductions to come)

### **Project Delivery Alternatives Evaluated for All ROMP Projects**

### **Design-Bid-Build (DBB)**

**Construction-Manager-at-Risk (CM@R)** 

**Design-Build (DB)** 

**Design-Build-Operate (DBO)** 

**Design-Build-Finance-Operate (DBFO)** 

### **Delivery Methods Selected**

### **Benefits**

### Construction-Manager-at-Risk (CM@R)

### Ina Road WRF Upgrade and Expansion

### **Plant Interconnect**



- Early involvement of contractor in complex projects
- Transfer of construction risk to contractor
- Ongoing negotiation of contract price
  - Reduces change orders
- Project successes
  - Plant Interconnect completed on time, \$6.8 million under budget of \$41.2 million
  - Ina Road Upgrade currently under budget of \$323 million

### **Delivery Methods Selected**

#### **Benefits**

## Design-Build-Operate (DBO) Water Reclamation Campus WRF



- All costs associated with designing, permitting, constructing and commissioning are transferred to the DBO Company <u>without any</u> <u>additional cost to the County</u>
- DBO company contractually agreed to a fixed price for its services including compliance with all County and regulatory requirements
- DBO company is responsible for correcting and paying for any failures to comply with its contractual responsibilities <u>without</u> <u>any increase in contract cost</u>

### **Delivery Methods Selected**

#### Benefits

## **Design-Build-Operate (DBO)** Water Reclamation Campus WRF



- Contract \$75.9 million (31%) under ROMP design-build budget of \$240 million
- O&M budget of \$8+ million at Roger Road WRF will be reduced to \$6 million
  - Roger Road WRF staff level of 56 will be reduced to 15 at new facility
- RWRD staff transition to DBO staff strictly voluntary
  - Staff guaranteed equal or better salary, benefits, longevity
  - Remaining RWRD staff: no layoffs; reduction by attrition, reassignment to other RWRD facilities

## **DBO Experiences**

Location	System Type	Plant Size (MGD	Estimated Cost Savings
Pima County, AZ	DBO WW	32	\$75.9 million (31%)
Phoenix, AZ	DBO Water	80	\$27 million (7%)
Seattle, WA	DBO Water (Tolt)	120	\$70 million (40%)
Seattle, WA	DBO Water (Cedar)	180	\$50 million (30%)
Tampa Bay, FL	DBO Water	66	\$85 million (21%)

### Decommission of Roger Road WRF: Invitation to Private Sector for Innovative Solutions

### **Request for Expressions of Interest (in progress)**

Roger Road WRF Equipment Salvage Ina Road Powerhouse Equipment Salvage Ina Road Pure Oxygen Generation Facility & Other



## Decommission of Roger Road WRF: Invitation to Private Sector for Innovative Solutions

### **Request for Expressions of Interest (in progress)** Economic Development at Existing Roger Road WRF

Solar
Energy
Facility

Compliance laboratory, Compliance and Regulatory Affairs Office facilities, Training center

32 MGD Water Reclamation Facility

#### Future Development

#### **INTERESTED PARTIES**

- Parks & Natural Resources Sports Park
- Residential / Commercial Development
- Education Center (Audubon Society)
- Water and Energy Sustainability Technology Center

### National Perspective – Legislative Approaches to Project Funding

- Amendment to Clean Water Act
- Continuation and enhancement of State Revolving Fund Appropriation
- Advocate for Water Protection and Reinvestment Trust Fund
- Advocate for National Infrastructure Bank

### **Proposed Arid West Watersheds Wastewater Grant Program**

- Authorizes grants for construction of wastewater conveyance and treatment facilities in arid west watersheds
- Authorizes up to \$500,000,000 for direct grants and grants through State Revolving Funds



## Innovative Program Management in a Time of Scarce Resources

Jackson Jenkins, Director Pima County Regional Wastewater Reclamation Department

### Innovative Staffing Solutions: Multi-Skill Program



Typical industry practice is *strictly defined job duties*.

The Multi-Skill Program breaks down job silos and creates a smaller, flexible and efficient workforce.

### Multi-Skill Program: Workplace Benefits



### WORKFORCE

- Provides a career-development program
- Increases level of job skills/ certifications
- Creates structure for continuous learning/ improvement
- Encourages a team culture
- Ends dead-end-job attitudes

### **MANAGEMENT TEAM**

- Reduces layers of supervision
- Increases use of automation and control technology
- Increases communication and coordination
- Increases flexibility and job coverage

## Multi-Skill Program: Overview

- Combine Operator and Mechanic positions into a multi-skilled Operation & Maintenance Technician position
- Reduce the workforce by 22 positions over 2 years
  - Workforce reduction achieved through attrition only – no layoffs
- Program began July 4, 2010
- Once fully implemented, cost savings are approximately \$1 million per year

### Multi-Skill Program: Implementation

- Multi-skill employee job track
  - Series of skill blocks, higher pay levels

	Operations	Maintenance	Process Control
	03	МЗ	PC3
	02	M2	
	01	M1	
Employee Advancement	TRAINEE		

Innovative Commodity Solutions: Ina Road WRF Expansion and Upgrade Project

> 2009 commodity contracts to lock in prices for major commodity purchases

### **Concrete commodity award**

- Locked in price per cubic yard
- \$66.75 vs. current price of \$80-100
- Projected cost savings \$1.2 million



### Steel commodity award

- Locked in price per pound for rebar (\$0.295 + fixed escalation cost)
- Now \$0.31 vs. current price of \$0.35-0.40
- Projected cost savings \$600,000



### **Innovative Energy Solutions: Buying Natural Gas on the Spot Market**

- Natural gas traditionally bought through local gas company at commercial rate
- Can be bought on the spot market, then wheeled through agreement with local company
- Program began in August 2009



### Innovative Energy Solutions: Power Co-generation at the Ina Road WRF

- RWRD began to use methane as a power source in 1977 to reduce costs
  - Co-generation power plant at Ina Road WRF
- Rare for water sector utilities to utilize methane gas for power generation



## **Innovative Solutions: ROMP Biosolids/Biogas Master Plan**

### Goals

- 100% utilization of biogas
- Multiple outlets for beneficial utilization of biosolids



### **Biosolids/Biogas Master Plan: Full Utilization of Biogas**

- Methane will be <u>100% utilized</u>
- **RFEI under development**
- Private sector invited to submit recommendations including:
  - Use of methane to heat sludge and convert it from Class B to A
  - Construction of another cogeneration plant for other uses or sale to the grid
  - Cleaning of methane sufficient for commercial sale

### **Biosolids/Biogas Master Plan: Biosolids Utilization**

- RWRD currently has an efficient system for biosolids utilization (and limited transport charges)
- Further cost savings may include:
  - Increase in solids concentration
  - Production of concentrated fertilizer



## Meeting Sustainability Goals in a Time of Scarce Resources



Pima County Sustainability Program

- Green building
- Renewable energy
- Alternative fuels
- Waste reduction
- Green purchasing
- Water conservation and management
- Social well-being, opportunity & equity

Goal: Develop renewable resources for a sustainable future

Integrate into all wastewater infrastructure planning

## **Pima County Sustainable Action Plan: Action Goals**

- Transition to renewable energy sources to meet 15% of the energy needs of County facilities by 2025
- Maximize methane use to help power County wastewater operations
- Maximize county water resource assets, including groundwater rights, surface rights and effluent for natural resource protection
- Reduce water use in County facilities by 15% by 2025



### Implementing Sustainability Goals: Opportunities in Capital Improvement Projects



New Central Compliance Laboratory will have LEED Silver Certification

Every phase of the Regional Optimization Master Plan incorporated investigation of sustainability projects including LEED Silver Certification, solar projects, water harvesting and energy recovery

### **Implementing Sustainability Goals: Renewable Energy**



- Two new 1-megawatt solar facilities to augment power at Ina Road and Roger Road WRFs
- Wind-driven aerators for Arivaca Junction WRF

### Future Challenges: Regulatory Changes

**Emerging contaminants, PCPs,** and other regulatory issues

- Trace contaminants are ubiquitous in water
  - Pharmaceuticals, endocrine disruptors, perchlorate, phosphorus
- Ecological impacts demonstrated, human impacts unclear
- Public perception and trust are critical for water reuse
- Regulations move slowly, but are coming

### **Future Challenges: Infrastructure Reinvestment**



Miscellaneous Conveyance Rehabilitation and Repair



Capacity Augmentation Program



### Utility Relocation Program

# Future Challenges: Supporting the True Cost of Reclaimed Water

#### Cost of Production \$1100 per Acre Foot



#### Cost to Users \$800 per Acre Foot





## Questions