

Regional Optimization Master Plan (ROMP) Accomplishments through 2012 and View to Completion of the ROMP Program



Pima County Regional Wastewater Reclamation Department

Jackson Jenkins, RWRD Director

April 8, 2013

Presentation Topics



- ROMP Program Accomplishments through 2012
- Remaining Work to Completion of ROMP Program
- ROMP Program Budget Update/Status
- ROMP Schedule to Completion of ROMP Program



Ina Road Upgrade & Expansion Project



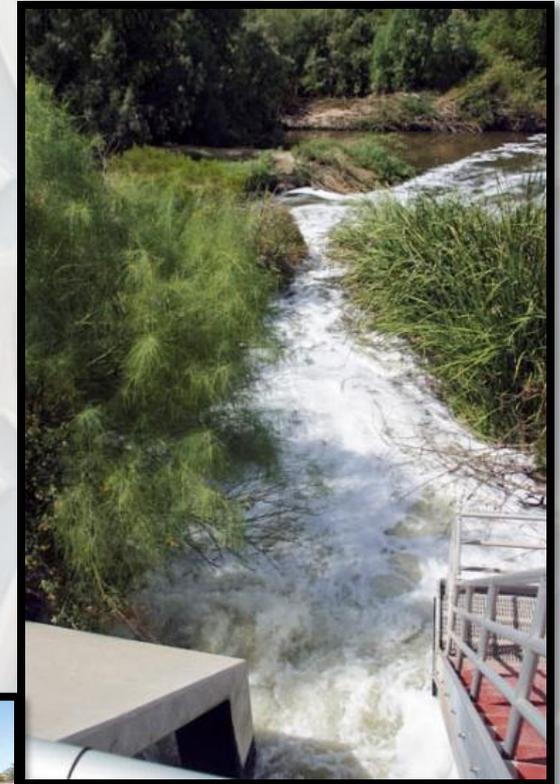
Ina Road Looking Northwest
(January 2013)

Ina Road Upgrade & Expansion Project



Purpose

- To comply with regulatory requirements to provide an effluent quality non-toxic to the aquatic environment in the Santa Cruz River.
- To produce Class A+ reclaimed water quality.
- To master plan the project to comply with envisioned future regulatory requirements.
- To expand the capacity of the Ina Road WRF to meet the population needs to 2030.



Effluent from Ina Road WRF discharged to the Santa Cruz River



Riparian area along the Santa Cruz River

Ina Road Upgrade & Expansion Project



Project

- Expand existing 37.5 MGD capacity to 50 MGD.
- Replace existing treatment processes to the Bardenpho treatment process.
- Incorporate system-wide biosolids processing and handling at Ina Road for beneficial use.
- Incorporate system-wide biogas generation at Ina Road for sustainable beneficial reuse.
- Incorporate an Operations Control Center / SCADA system for process control and system-wide monitoring.
- Incorporate a plant security system to comply with DHS “designated critical infrastructure” protection.
- Incorporate state-of-the-art odor control system and good neighbor features.



Bardenpho unit and odor control



Odor control system being installed

Ina Road Upgrade & Expansion Project



Project Schedule

- Regulatory Compliance date for expansion of the WRF and compliance with the regulatory effluent quality requirements:

January 30, 2014

- Project contract substantial completion date:

October 17, 2013

Ina Road Upgrade & Expansion Project



Installing Gates at Intermediate Pump Station



Digester Complex

Project Procurement Method

- Construction Manager at Risk (CM@R) procurement method selected which consists of two major components:
 - Pre Construction Services – CM@R coordinates with the Design Professional and the County during development of the project design. Primary services include development of construction cost estimates, constructability reviews, design recommendations, and participation in value engineering activities.
 - Construction Services – Construct the project in a series of Guaranteed Maximum Price (GMP) components.

Ina Road Upgrade & Expansion Project



GMP1



Construction Trailer Complex



Initial Excavation Activity

Budget:	\$2,400,000
Final Cost:	\$2,044,014
Completed:	November 30, 2010

Ina Road Upgrade & Expansion Project



Gravity Belt Thickener/Odor Control (GMP 2&3)



Installing Carbon Adsorbers
for Odor Control



Gravity Belt Thickener

Budget:	\$2,083,183
Final Cost:	\$2,117,541
Completed:	May 19, 2011

Ina Road Upgrade & Expansion Project

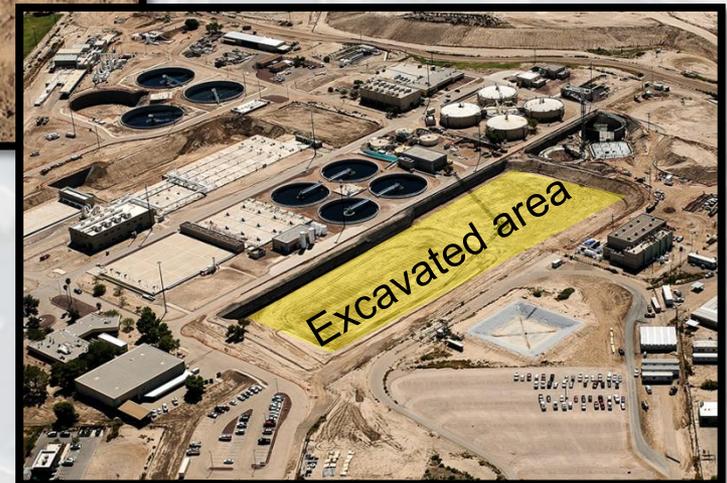


Earthwork

(GMP 4)



Total soil excavated:
350,000 cubic yards



Budget:	\$7,343,300
Final Cost:	\$3,689,118
Completed:	September 20, 2010

Ina Road Upgrade & Expansion Project



Digester Complex

(GMP 5)



Digester Complex (center) and Digesters



◆ Digester Control Building
◆ Wiring, Heat Exchangers &
HVAC Ductwork



Digester 5, Lifting Cover



Digester Complex Roof

Budget: \$20,793,470
Final Cost: **\$20,600,000**
Completed: December 16, 2011

Ina Road Upgrade & Expansion Project



Main Plant Upgrade

(GMP 6)



▲ East Process Train (25.0 MGD)

▼ West Process Train (25.0 MGD)



Budget: \$174,124,547
Projected Final Costs: **\$188,562,195**
(for GMP 6)

Ina Road Upgrade & Expansion Project



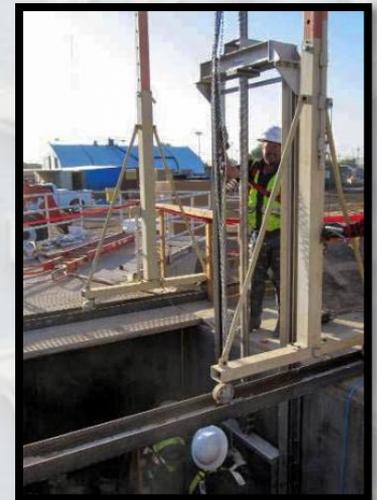
Main Plant Upgrade: East Process Train (GMP 6)

- 8.3 MGD New Bardenpho Train
- 16.7 MGD Conversion of BNRAS to Bardenpho Train

- 25.0 MGD Total Capacity of East Process Train



Bardenpho Units



Installing Gates in Pump Station

Total Capacity of East Train: 25 MGD
Bardenpho Train Completed: September 13, 2012
BNRAS Conversion to be completed by October 17, 2013
Details: East Train to Meet Regulatory Agency Effluent Quality Requirements
Class A+ Effluent Quality

Ina Road Upgrade & Expansion Project



Main Plant Upgrade: West Process Train (GMP 6)



Center Clarifier Mechanism



Secondary Clarifiers Facility

Total Capacity of West Train:	25 MGD
Scheduled Substantial Completion Date:	October 17, 2013
Regulatory Compliance Date:	January 30, 2014
Percent GMP6 Completed as of January 31, 2013:	82%

Ina Road Upgrade & Expansion Project



Central Plant

(GMP 7)



Footings



▲ Electrical Conduit



▲ Stem Walls

Budget: \$7,770,000
Projected Final Cost: **\$7,770,000**
Projected Completion Date: December 2013
Percent Complete as of January 31, 2013: 11%

Ina Road Upgrade & Expansion Project



Electrical Plant Power Distribution (GMP 8)



46kV Substation Electrical Cables Connected

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46kV Substation Take-Off Structure ▼



Substation Transformer Cooling System ▶



Substation Electrical Installation

01/27/2012 08

Budget:	\$7,750,000
Projected Final Cost:	\$6,750,000
Projected Completion Date:	April 2012

Ina Road Upgrade & Expansion Project



Warehouse/O&M Building

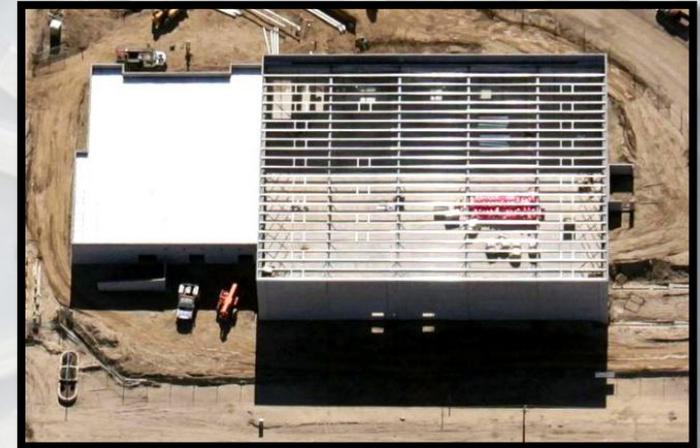
(DBB)



Warehouse, Overhead Utility and HVAC Lines



Warehouse / Office
Electrical Room



New Warehouse, Aerial



Warehouse Hazardous Waste Storage Room

Budget:	\$3,209,282
Projected Final Cost:	\$3,209,282
Projected Completion Date:	May 2013
Percent Complete as of January 31, 2013:	65%

Ina Road Upgrade & Expansion Project



Building Remodels

(DBB)



Operations Center,
HVAC Duct & Overhead Cable Tray



Administration Building



Operations Center, Screenwall

Budget:	\$8,366,973
Projected Final Cost:	\$8,366,973
Projected Completion Date:	May 2014
Percent Complete as of January 31, 2013:	22%

Ina Road Upgrade & Expansion Project



Remaining Work Items

Scheduled Completion Date

Warehouse	May 2013
Operations Control Center	June 2013
BNRAS Conversion of East Process Train	October 17, 2013
Central Plant	December 2013
Administration Building Rehab	May 2014

Ina Road Upgrade & Expansion Project



Remaining Work Items

Probable Completion Date

Mid 2014

Rehabilitation of Remaining Existing Structures



Digester Control Building



Service Water Building



Digester Control Building

Ina Road Upgrade & Expansion Project



Remaining Work Items

Probable Completion Date

Sale of Salvage Equipment

Mid 2014



Pumps at Ina Road WRF



Heat Recovery Boilers



Polymer Wetting Unit

Ina Road Upgrade & Expansion Project



Cost Summary

Original ROMP Program Budget:	\$301,290,000
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Adjusted Original ROMP Budget:	\$311,717,581
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Current ROMP Budget:	\$309,316,000
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Project Expenditures through January 31, 2013:	\$238,086,868
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Plant Interconnect



Purpose

- Convey wastewater from the Roger Road WRF service area to the Ina Road WRF.
- Convey raw sludge from the Water Reclamation Campus Treatment Facility to the Ina Road WRF via an existing sludge force main.
- Operational flexibility of flows between the Campus WRF and the Ina Road WRF.

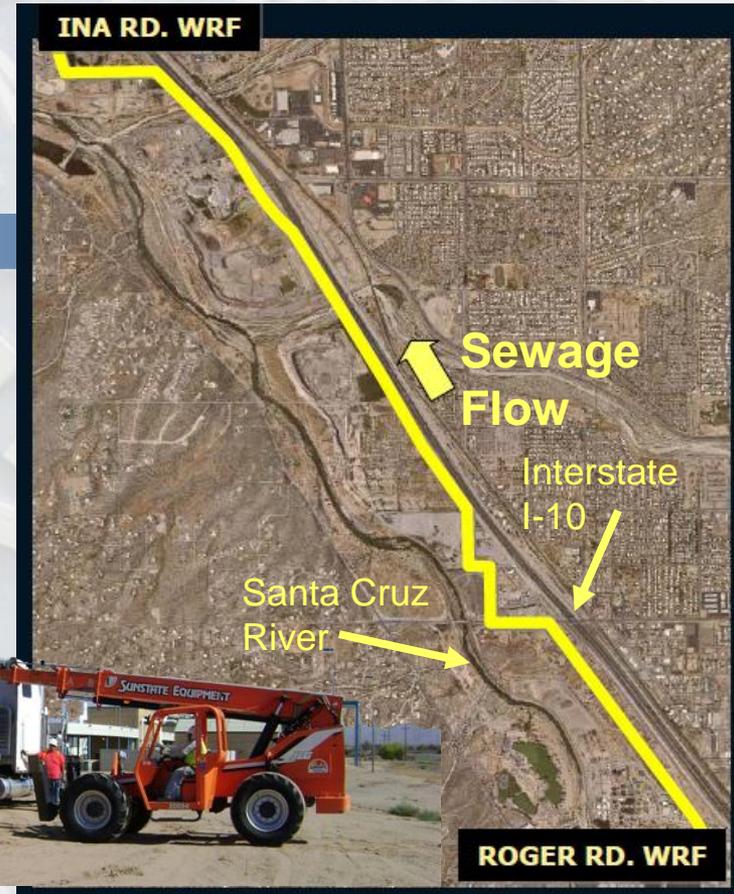


Plant Interconnect



Project

- Five miles 60" to 72" line connecting two metropolitan treatment plants.
- Capacity:
 - Average Design Flow = 36 MGD
 - Peak Flow = 81 MGD
- Stream and wash crossings.
- Dual purpose service road/bike path.
- Odor control.



Plant Interconnect



Project Schedule Status

- Project Completed
 - **December 22, 2010**
- Project Operational
 - **April 11, 2011**

Project Budget Status

- Original \$41 million over 2 years.
- Actual \$33 million over 16 months.
- Project received \$2 million ARRA grant.



◀ Laying Interconnect Piping

Final costs under budget and ahead of schedule



Water Reclamation Campus Treatment Facility



Purpose

- To replace the aging Roger Road WRF with a new state-of-the-art WRF.
- To comply with regulatory requirements to provide an effluent quality non-toxic to the aquatic environment in the Santa Cruz River.
- To produce Class A+ reclaimed water quality.
- To provide a plant capacity to meet the population needs to 2030.



Water Reclamation Campus Treatment Facility

- To provide quality reclaimed water supply to Tucson Water for their reclaimed water distribution system.

Water Reclamation Campus Treatment Facility



Project

- New 32 MDG facility.
- Incorporate Bardenpho treatment process.
- All biosolids to be transferred to Ina Road WRF via sludge force main.
- Incorporate state-of-the-art odor control and good neighbor features.
- Manage flows to the facility in conjunction with flows to Ina Road WRF for operational efficiencies.



Architectural rendering of plant entrance



Water Reclamation Campus Treatment Facility



Project Schedule Status

- Regulatory Compliance date for facility to be operational and in compliance with regulatory effluent quality requirements:

January 30, 2015

- Contract substantial completion date:

August 14, 2014

- Projected substantial completion date:

March 2014

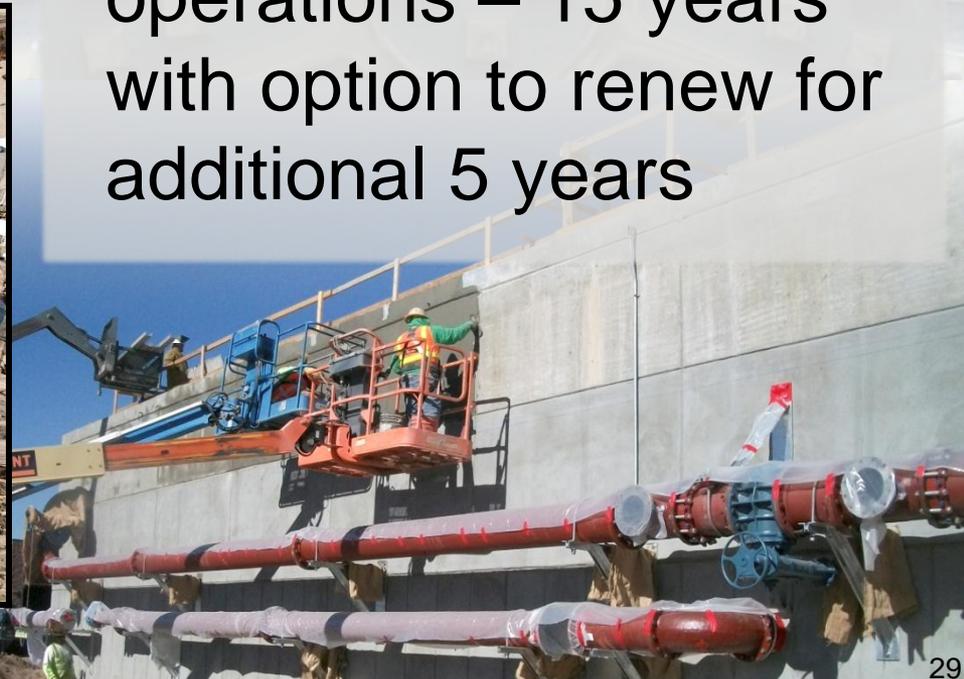
Water Reclamation Campus Treatment Facility



Project Procurement Method

Design-Build-Operate (DBO)

- County Owned
- Private sector operations – 15 years with option to renew for additional 5 years



Water Reclamation Campus Treatment Facility



Staffing Issues

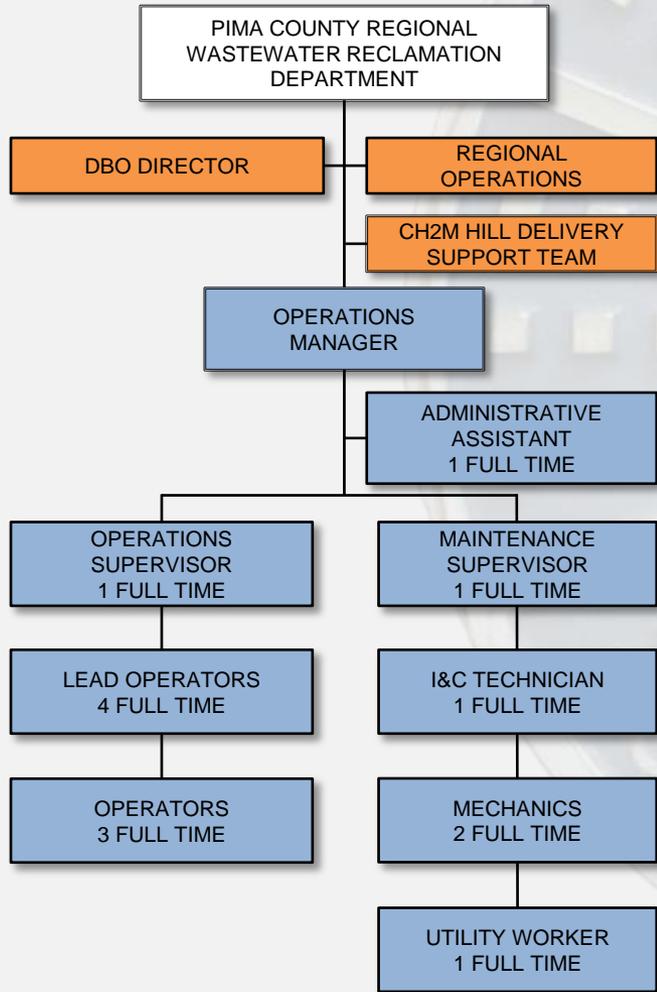
- In awarding the DBO contract to CH2MHILL, the Board of Supervisors required CH2 to hire 75% of their proposed non-management staff from RWRD staff volunteers, or 11 volunteers.
- RWRD and CH2 have conducted meetings with 68 volunteers starting in April 2012 to explain CH2 employee practices, how CH2 will conduct its selection process, how the BOS requirement of offering RWRD volunteers an “equal or better” employment package, etc.
- CH2 desires to be fully staffed at the new facility by August 2013.

Proposed Water Campus Facility Operations Staff



ON-SITE PERSONNEL

OFF-SITE PERSONNEL



Water Reclamation Campus Treatment Facility



Remaining Work Items

- Construction is currently 86 percent complete.
- Transitions of RWRD staff to DBO Contractor employment.
- Start up of operations.



Water Reclamation Campus Treatment Facility



Cost Summary

Original ROMP Program Budget:	\$275,100,000
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Awarded Contract Amount:	\$163,143,573
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Current ROMP Budget:	\$188,200,000
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Project Expenditures through January 31, 2013:	\$141,565,148
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Central Laboratory Complex



Project Schedule Status

- Project Completed
March 2012
- Project Operational
December 2011

Project Purpose

- Provide a state-of-the-art water laboratory to provide all regulatory compliance testing.
- Collaborate laboratory activities with other government agencies and universities.
- Modernize RWRD training facilities.



Central Lab Complex Exterior



Central Lab Complex Laboratory



Central Lab Computer
Training Facility

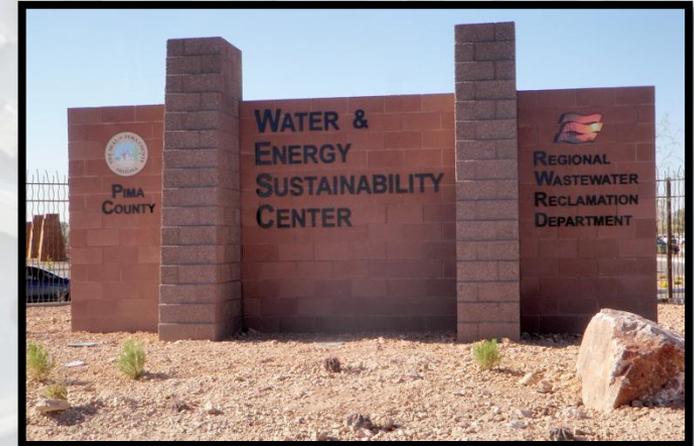
Central Laboratory Complex



Project Procurement Method

- Laboratory Structure
 - Design-Bid-Build (DBB)

- Laboratory Complex Site Work
 - Design-Bid-Build (DBB)



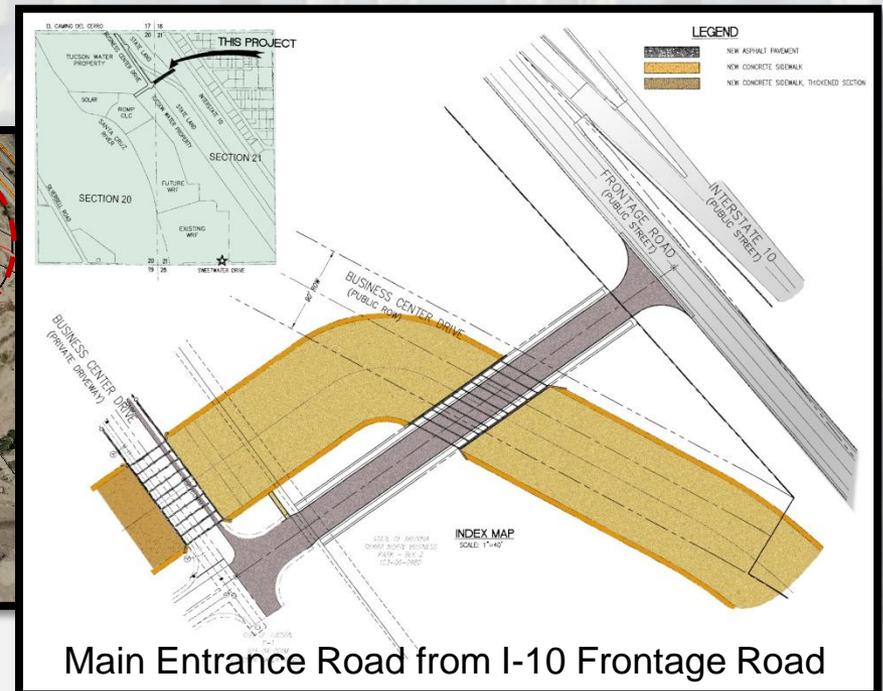
Lab Facility Exterior

Central Laboratory Complex



Remaining Work Items

- Facility access road from I-10 Frontage Road.
- Laboratory expansion design and construction.



Main Entrance Road from I-10 Frontage Road

Central Laboratory Complex



Cost Summary

Original ROMP Program Budget:	\$28,870,000
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Current ROMP Budget:	\$27,611,000*
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Project Expenditures through January 31, 2013:	\$21,531,350
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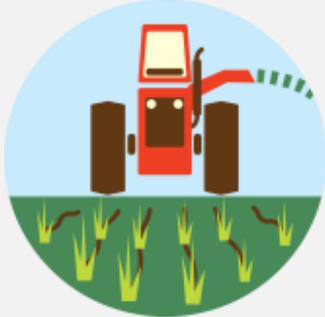
* Current ROMP Budget includes the amount of \$6,080,000 for pending laboratory expansion.

Biosolids / Biogas Utilization Master Plan



Purpose

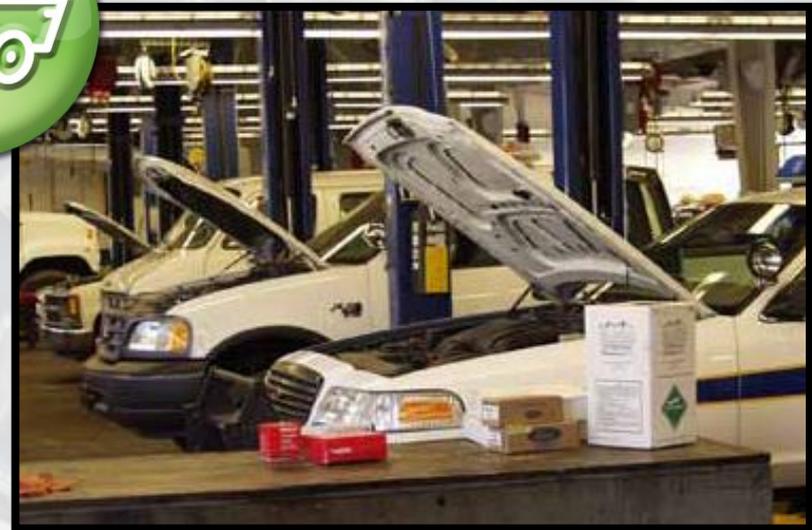
- Develop a regional master plan for the current and future treatment and reuse of system-wide biosolids.
- Develop a master plan for the complete beneficial utilization of biogas.



Biosolids



Biogas

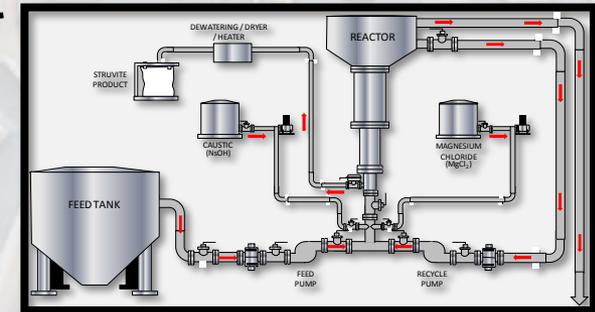


Biosolids / Biogas Utilization Master Plan



Master Plan Schedule/Status

- Contract to develop the master plan awarded in January 2011.
- A Request for Expressions of Interest (RFEI) to obtain interest and recommendations from the marketplace has been completed.
- Master Plan with recommendations completed August 2012.



Biosolids / Biogas Utilization Master Plan



RWRD

Master Plan Recommendations

- Biogas cleaned to pipeline quality (“biomethane”) and sold to premium commercial markets via regional pipelines.
- Cogeneration of biogas to produce electricity and heat to dry sludge to produce Class A biosolids.
- Compress biomethane to make Compressed Natural Gas (CNG) to fuel RWRD and County vehicles.
- Side stream (digested sludge centrate) treatment to retrieve struvite and nutrients for beneficial reuse and to improve treatment plant operations.
- Contingency plan for land application of biosolids.

Biosolids / Biogas Utilization Master Plan



Remaining Projects

1. Sale of Biogas

- | | |
|---|------------------|
| a. Draft Request for Proposals (RFP)
issued for public comment on: | January 28, 2013 |
| b. Final RFP to be issued: | Spring 2013 |
| c. Contract award: | Late 2013 |
| d. Project operational: | Late 2014 |
| e. Preliminary cost estimate: | \$10,000,000 |

Biosolids / Biogas Utilization Master Plan



Remaining Projects

2. Side Stream Treatment of Digested Sludge Centrate

a. Study recommendation to control and retrieve struvite and nutrients for beneficial reuse:

March 2013

b. Award of design contract:

TBD

c. Award of construction contract:

TBD

d. Project operational:

TBD

e. Preliminary cost estimate:

\$9,146,000

Biosolids / Biogas Utilization Master Plan



Remaining Projects



3. CNG Vehicle Fuel Program

- a. White Paper recommending development of County CNG vehicle fuel program: January 2013
- b. County approval to proceed to develop program: February 2013
- c. Replace County gasoline/diesel vehicles with CNG vehicles: 1-10 years
- d. Design and construction of 3 CNG fueling stations: 36 months
- e. Preliminary cost estimate for initial phase: \$7,300,000

Biosolids / Biogas Utilization Master Plan



Remaining Projects

4. Carbon Dioxide Separation and Reuse

- | | |
|--------------------------------------|--------------------|
| a. Study contract awarded to U of A: | September 13, 2012 |
| b. Final report: | April 2013 |
| c. Contract amount: | \$20,000 |
| d. Marketing and Pilot Study: | \$605,000 |

Biosolids / Biogas Utilization Master Plan



Remaining Projects

5. Fats, Oils and Grease (FOG) / Food Waste Co-digestion Study

a. Scope of study under preparation.

b. Study preliminary cost estimate:

\$175,000

c. Initial capital cost items:

\$425,000



Biosolids / Biogas Utilization Master Plan



Remaining Projects



6. Biosolids Land Application Property Purchase

- a. Purchase of approximately 1,200 acres of State owned land within economic hauling distance from Ina Road WRF. Evaluation currently underway.
- b. Preliminary cost estimate: \$3,139,000

Biosolids / Biogas Utilization Master Plan



Remaining Projects



7. Conversion to Class A Sludge Demonstration Project

- a. Contract for demonstration project for Mine Tailing Reclamation currently under negotiations.
- b. Demonstration period: 12 months
- c. Preliminary cost estimate: \$450,000*

* O&M Cost. Not part of ROMP Budget.

Supervisory Control and Data Acquisition (SCADA)



Purpose

- Comprehensive system-wide SCADA system will incorporate the following:
 - Operations Control Center to be located at the Ina Road WRF to provide system-wide 24/7 SCADA Management.
 - Process control / process monitoring of Ina Road WRF operations.
 - System-wide SCADA control / monitoring of Sub-Regional Facilities and Conveyance System.
 - System-wide security monitoring.
 - RWRD dispatch operations.
 - SCADA monitoring of Water Reclamation Campus DBO Facility.

Supervisory Control and Data Acquisition (SCADA)



Project Status

- Construction underway for Operations Control Center at Ina Road WRF. Schedule is coordinated with Ina Road project schedule.
- SCADA systems to be phased in at all Sub-regional Facilities.



Supervisory Control and Data Acquisition (SCADA)



Remaining Work Items

- SCADA installations are coordinated with the construction schedules at the Ina Road Upgrade and Expansion Project and the Water Reclamation Facility Project.
- SCADA system installations at Sub-Regional Facilities to be phased in over 5 years.



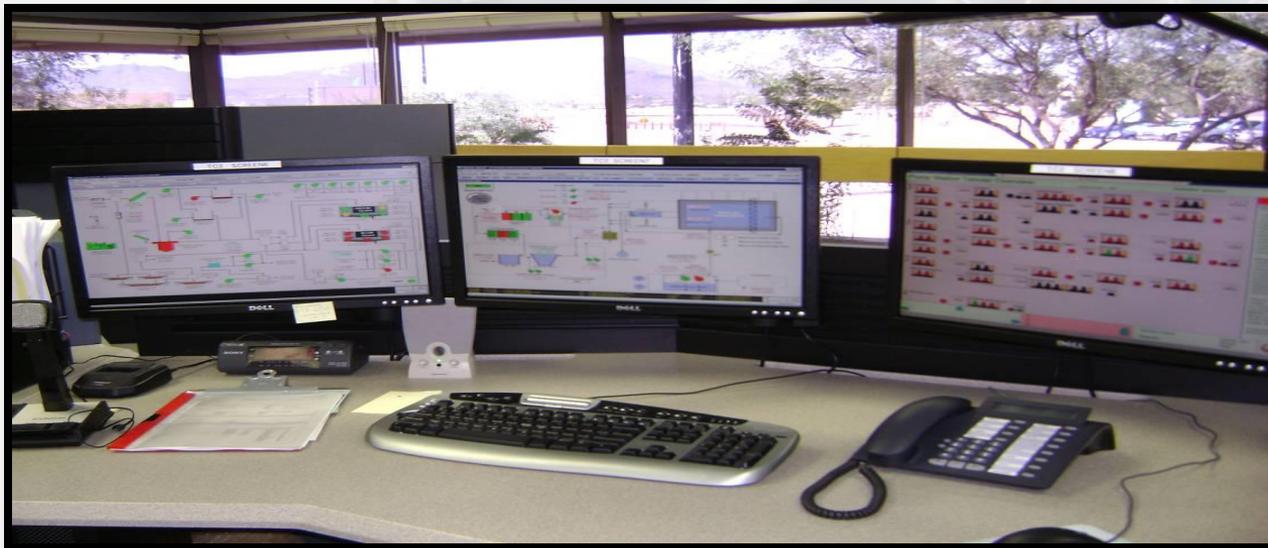
Supervisory Control and Data Acquisition (SCADA)



Cost Summary

Original ROMP Program Budget:	\$13,460,000
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Current ROMP Budget:	\$13,960,000
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Roger Road WRF Decommissioning / Deconstruction Program



Purpose

- Upon the start-up of operations of the Water Reclamation Campus Facility scheduled for March 2014, the existing Roger Road WRF will be decommissioned and closed in accordance with regulatory requirements.



Roger Road WRF Decommissioning / Deconstruction Program



Project

- A Clean Closure Plan will be developed and submitted to ADEQ and PDEQ for approval.
- The Clean Closure Plan must address various environmental issues and provide a remediation plan for any negative environmental issues.
- Upon shut down of the Roger Road Facility, the RWRD will offer a public sale of salvaged equipment such as mechanical equipment, power plant equipment, etc.
- After the Clean Closure the RWRD will issue a RFEI to request recommendations from the marketplace on ways to market the 44 acres of Roger Road plant property.

Roger Road WRF Decommissioning / Deconstruction Program

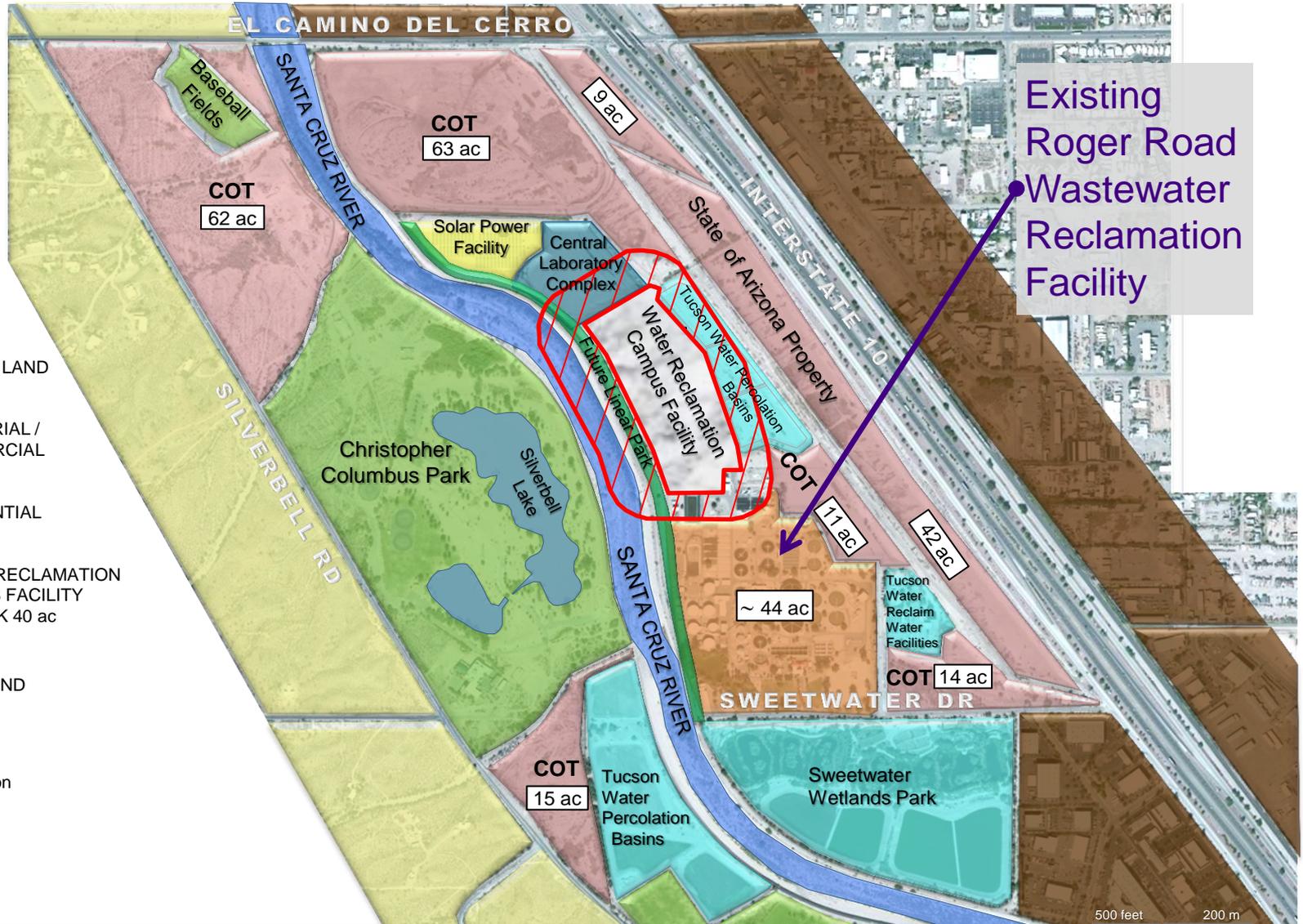


LEGEND

- VACANT LAND
- INDUSTRIAL / COMMERCIAL
- RESIDENTIAL
- PARK LAND
- WATER RECLAMATION CAMPUS FACILITY SETBACK 40 ac

ac = ACRES

COT = City of Tucson

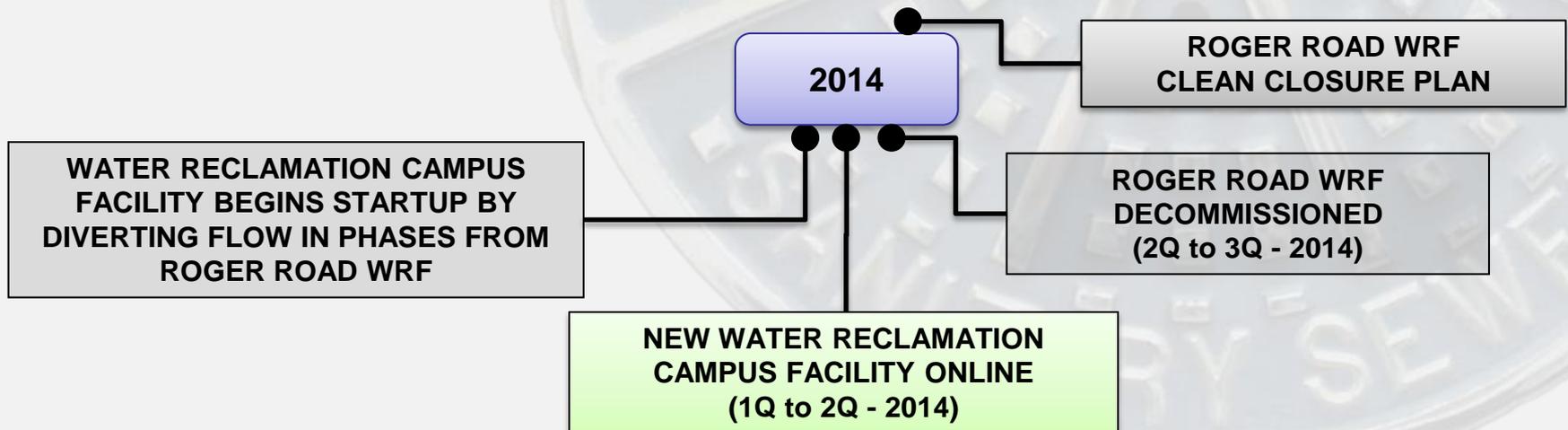


Roger Road WRF Decommissioning / Deconstruction Program



Overview - Milestones

- Water Reclamation Campus Facility in Service by Early 2014.
- Phase-out of Roger Road WRF Begins Early 2014.
- Roger Road WRF Completely Offline by Mid 2014.



Roger Road WRF Decommissioning / Deconstruction Program



Projected Cost

Original ROMP Program Budget:	\$38,290,000
Current ROMP Budget:	\$41,962,000

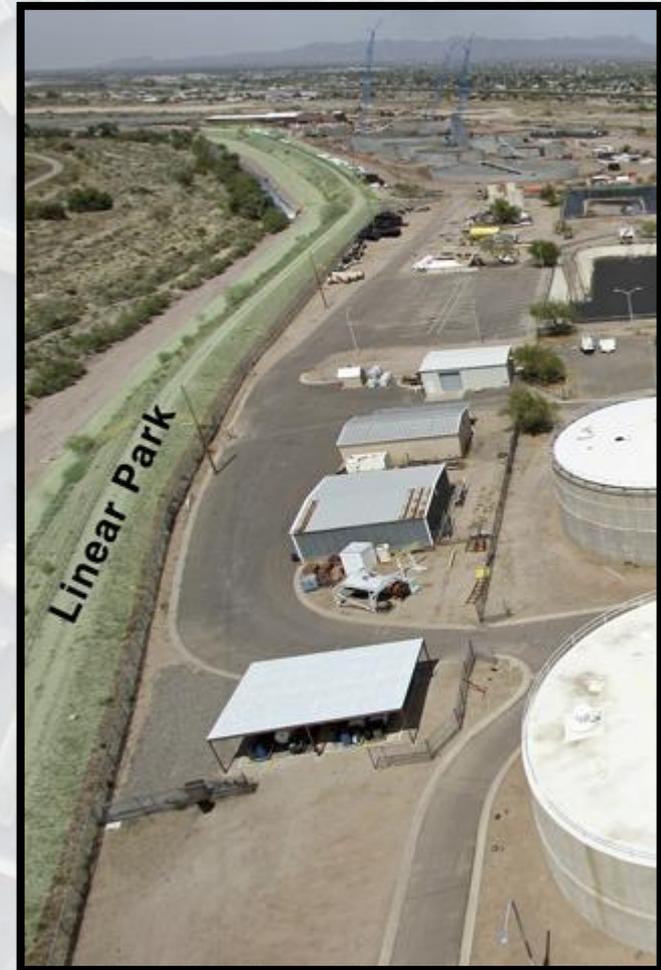
NOTE: The Current Budget for this Project may be significantly reduced in the event of diminished extent of demolition of existing plant structures or in the event of sale or lease of the property. It may be possible to delay demolition activities for an extended period of time.

Linear Park



Project

- A Linear Park is proposed in a narrow right-of-way between the Santa Cruz River dike and the existing Solar Energy Project, the Central Laboratory Complex, the Water Reclamation Campus Facility and the existing Roger Road WRF.
- Initially the Park will commence at Sweetwater Drive and terminate at Camino del Cerro.



Linear Park

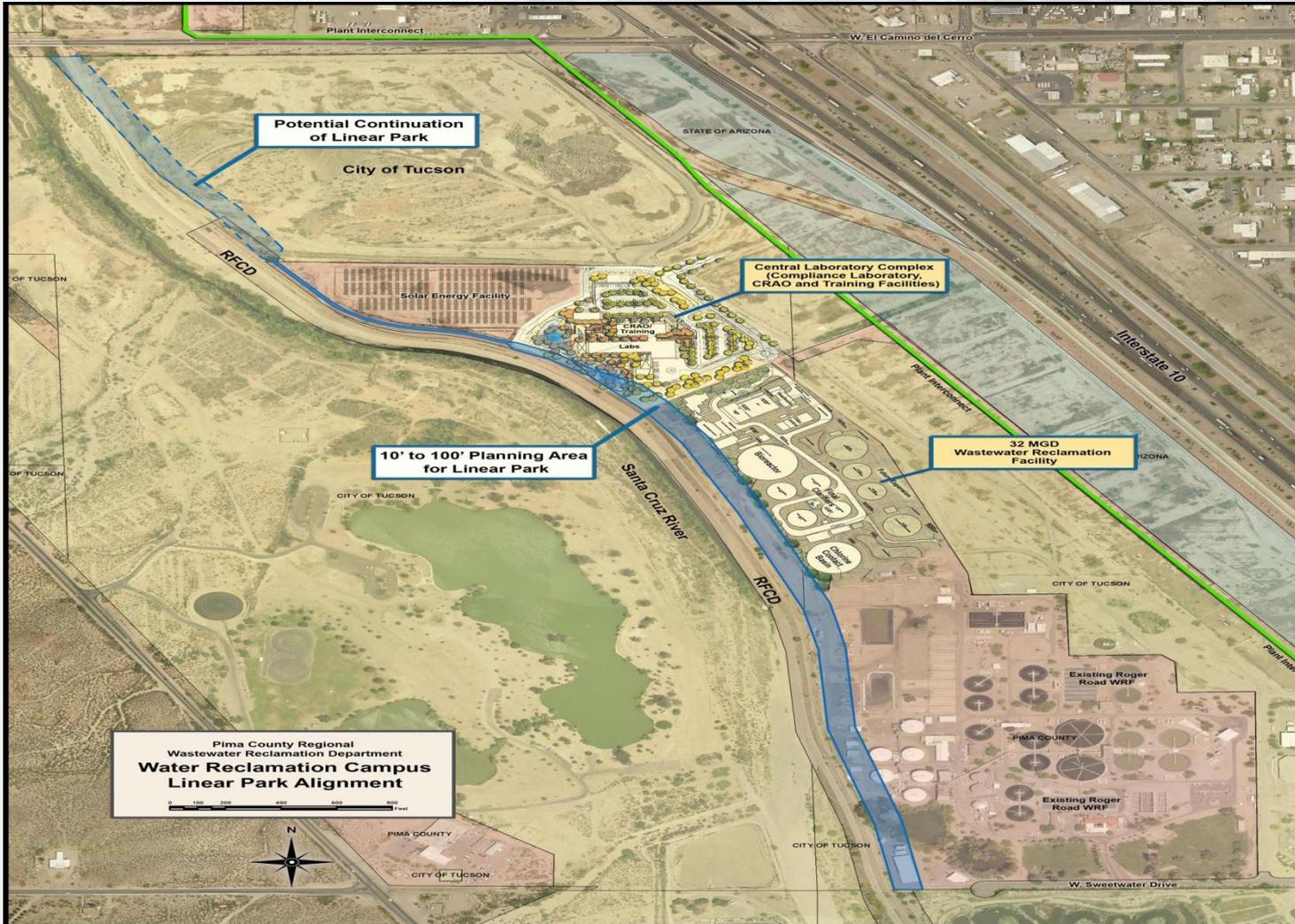


Project

- The Park is a partnership between the RWRD, the Flood Control District and the Parks and Recreation Department with the following specific roles:
 - RWRD – Retain and fund a consultant to develop the design.
 - Flood Control District – Provide the capital cost to construct the park.
 - Parks and Recreation Department – Operate and maintain the park.



Linear Park



Linear Park



Schedule

- The Linear Park will be constructed after completion of the Water Reclamation Campus Facility and closure of the Roger Road WRF.



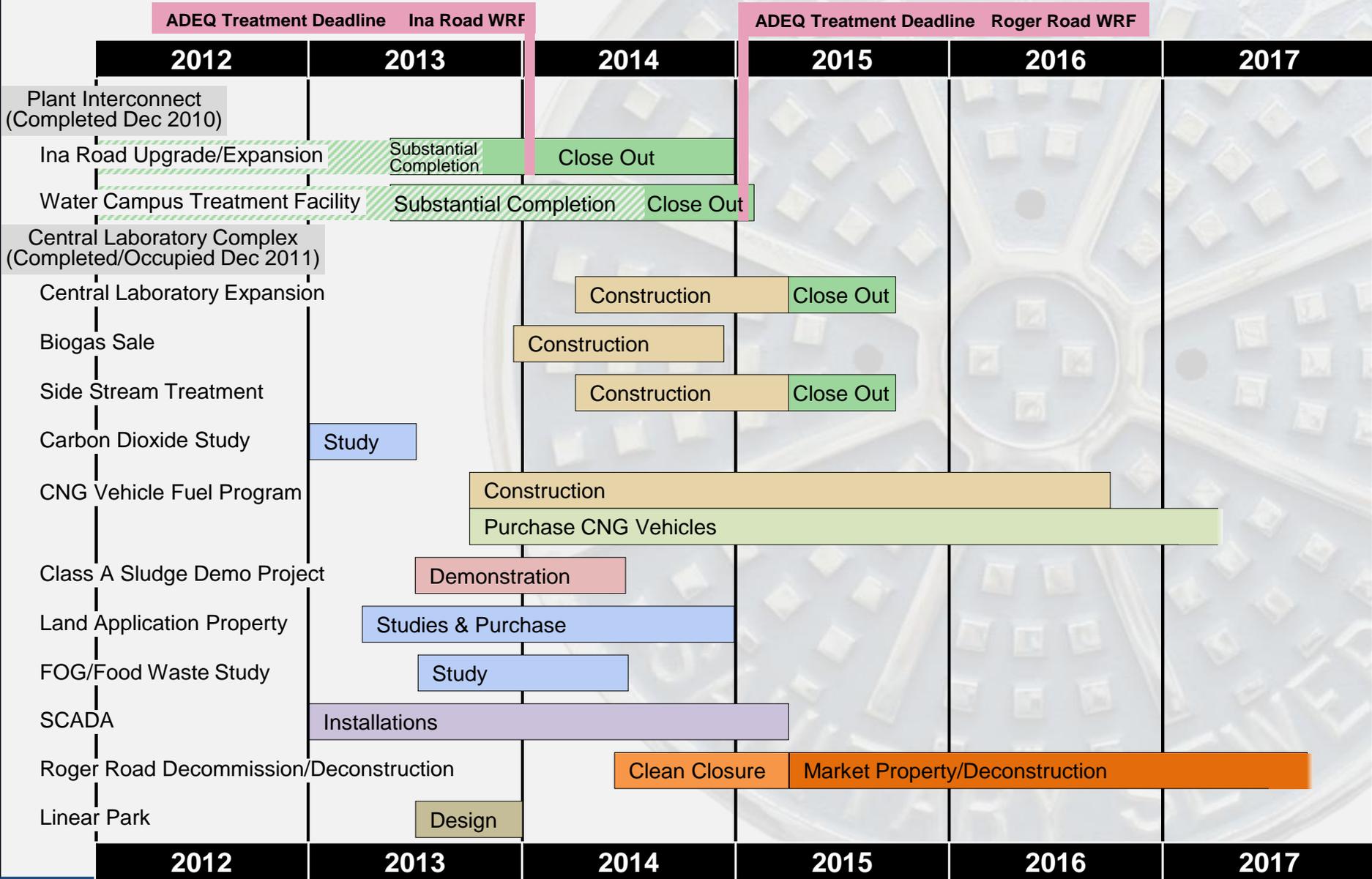
Linear Park



Issues

- RWRD has budgeted \$50,000 for the design of the park.
- A funding source has not been budgeted by Flood Control District for the construction of the park.
- The 100 foot right-of-way adjacent to the Roger Road WRF contains various structures that must be decommissioned and removed.
- A proposed three party IGA has been prepared but has not been executed.

ROMP Project Schedules



ROMP Project Budget

ROMP Project	ORIGINAL ROMP BUDGET	CURRENT BUDGET
Ina Road Upgrade and Expansion	\$301,290,000	\$309,316,000
Plant Interconnect	41,190,000	33,167,000
Water Campus Treatment Facility	275,100,000	188,200,000
Central Laboratory Complex & Expansion	28,870,000	27,611,000
Biosolids / Biogas Master Plan	21,810,000	30,810,000
Biogas Sale/Utilization		10,000,000
Side Stream Treatment of Centrate		9,146,000
CNG Vehicle Fuel Program		7,300,000
CO ₂ Separation & Reuse Study Pilot		625,000
FOG/Food Waste Co-digestion Study		600,000
Land Application Property Purchase		3,139,000
Class A Sludge Demo Project		450,000 ⁽²⁾
SCADA	13,460,000	13,960,000
Roger Road WRF Decommissioning / Deconstruction	38,290,000	41,962,000
Linear Park		50,000 ⁽³⁾
TOTALS	\$720,010,000	\$645,026,000⁽¹⁾

(1) Current Official Overall ROMP Program Budget is \$660,000,000.

(2) Demonstration Project Costs are to be offset by savings in O&M costs and are not included in the ROMP Budget.

(3) Linear Park design budget included in Roger Road WRF Decommissioning/Deconstruction Budget.

Questions?



Pima County Regional Wastewater Reclamation Department