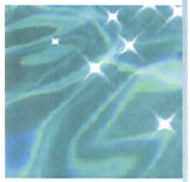



City of San Diego
PUBLIC UTILITIES
Water & Wastewater

THE CITY OF SAN DIEGO
PUBLIC UTILITIES
DEPARTMENT

Presentation to Metro Wastewater Joint Powers Authority

City of San Diego's Recycled Water Study

May 3, 2012

RECYCLED WATER STUDY
BROWN AND CALDWELL | BSV.COM

Presentation Outline

- Background and Objectives
- Stakeholder Involvement
- Key Considerations
- Reuse Opportunities
- Reuse Alternatives
- Cost Comparison to Imported Water
- Implementation Factors
- Next Steps

Background and Objectives
Point Loma NPDES Permit

- 2010 Permit Renewal Process
  - San Diego Coastkeeper and Surfrider Foundation agreed to not oppose the Waiver
  - City Council authorized the execution of a Cooperative Agreement between City and San Diego Coastkeeper/Surfrider (Jan, 2009)
  - City initiated the Recycled Water Study (July, 2009)
- EPA Approval (June 2010, Permit Effective Aug, 2010)
- California Coastal Commission (CCC) consistency determination
  - Conditioned by requiring delivery of Recycled Water Study to CCC within two years (July 2012)
- Current NPDES Permit expires July 31, 2015

Background and Objectives
Cooperative Agreement

- City Responsibilities
  - Conduct Recycled Water Study with the goal of identifying opportunities to reduce wastewater flows to Point Loma and maximize recycling
  - Complete Study within two years after the August 1, 2010 effective date of the NPDES Permit for Point Loma
  - Provide quarterly updates to environmental representatives (bimonthly updates were provided)
- San Diego Coastkeeper and Surfrider Responsibilities
  - Support the City's 2010 modified NPDES Permit renewal
  - Support completion of the study

Stakeholders and Participation

- City of San Diego
- San Diego Coastkeeper
- Surfrider Foundation
- Metro Wastewater Participating Agencies
- Independent Rates Oversight Committee
- San Diego County Water Authority

Stakeholders:

- ✓ Provided input at bi-monthly status update meetings
- ✓ Participated in technical workshops to brainstorm and refine reuse alternatives
- ✓ Reviewed and commented on all technical memoranda and project report

Recycled Water Study Objectives

- Identify opportunities to increase recycling of wastewater for Indirect Potable Reuse (IPR)and Non-Potable Reuse (NPR)
- Determine the extent recycling can reduce wastewater flows to the Point Loma Wastewater Treatment Plant
- Determine implementation costs

Indirect Potable Reuse Opportunities

Two Forms of IPR Evaluated:

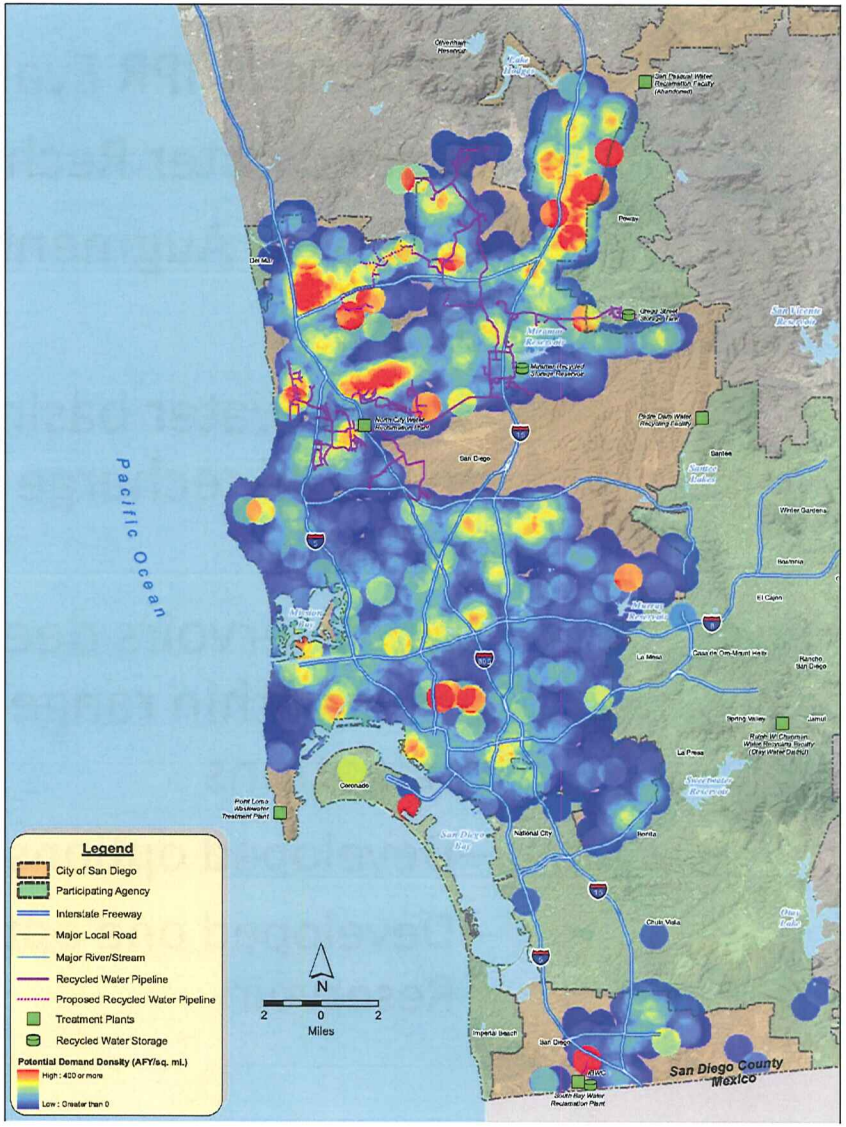
- Groundwater Recharge
- Reservoir Augmentation

Findings:

- Groundwater basin size and data insufficient to determine potential recharge projects. Revisit when more data is available
- Two reservoirs deemed large enough to provide retention times within range required in draft groundwater recharge regulations
  - –Developed options to convey 68 mgd to San Vicente Reservoir
  - –Developed one option to convey 15 mgd to Lower Otay Reservoir

Non-potable Reuse Assumptions

- Future demands assumed to be from infill customers only, due to:
  - High system expansion costs
  - Low potential Point Loma offload compared to expansion costs
- Estimated infill customer demand: 7 mgd
- Estimated 2035 total non-potable demand: 18 mgd
  - North City: 9 mgd
  - South Bay: 9 mgd

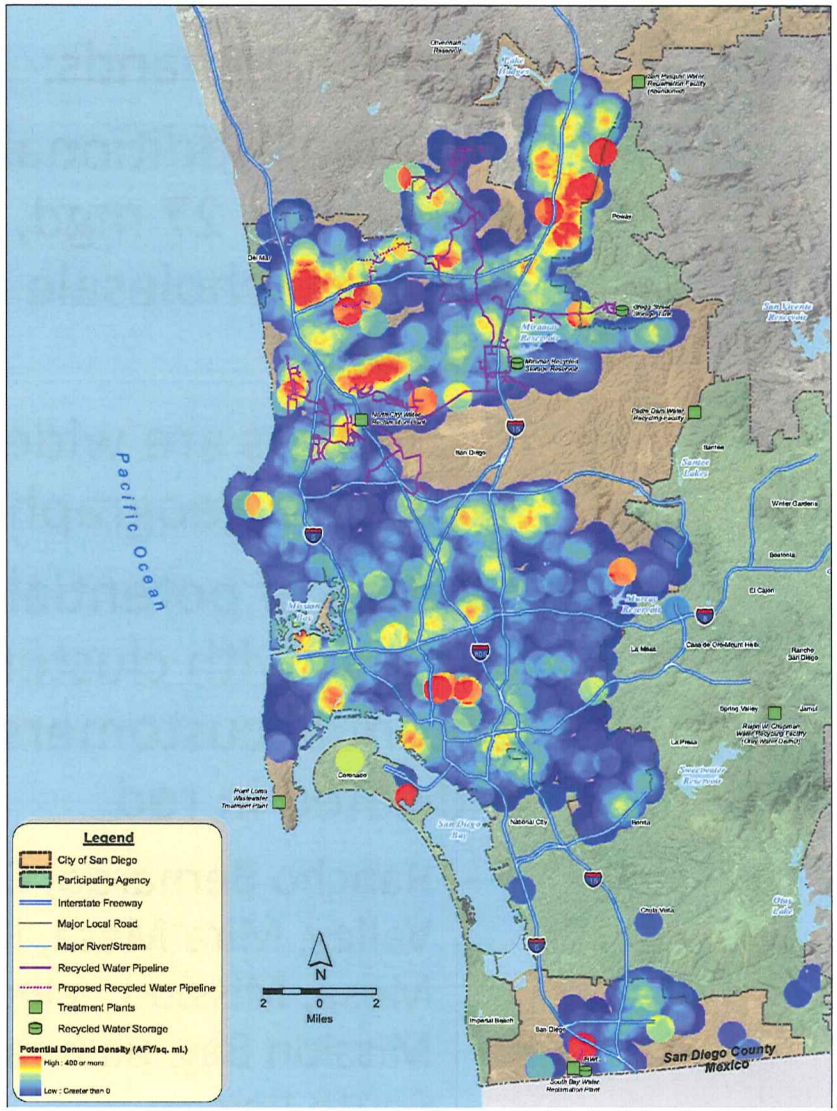


Non-potable Reuse Estimates

Infrastructure Needed to Serve Potential Clusters of Customers		
	Serve from North City	Serve via New Plants
Pipeline, miles	93	80
Pump Stations	4	4
Satellite Treatment Plants	0	3
Capital Cost	$350 to $500 Million	

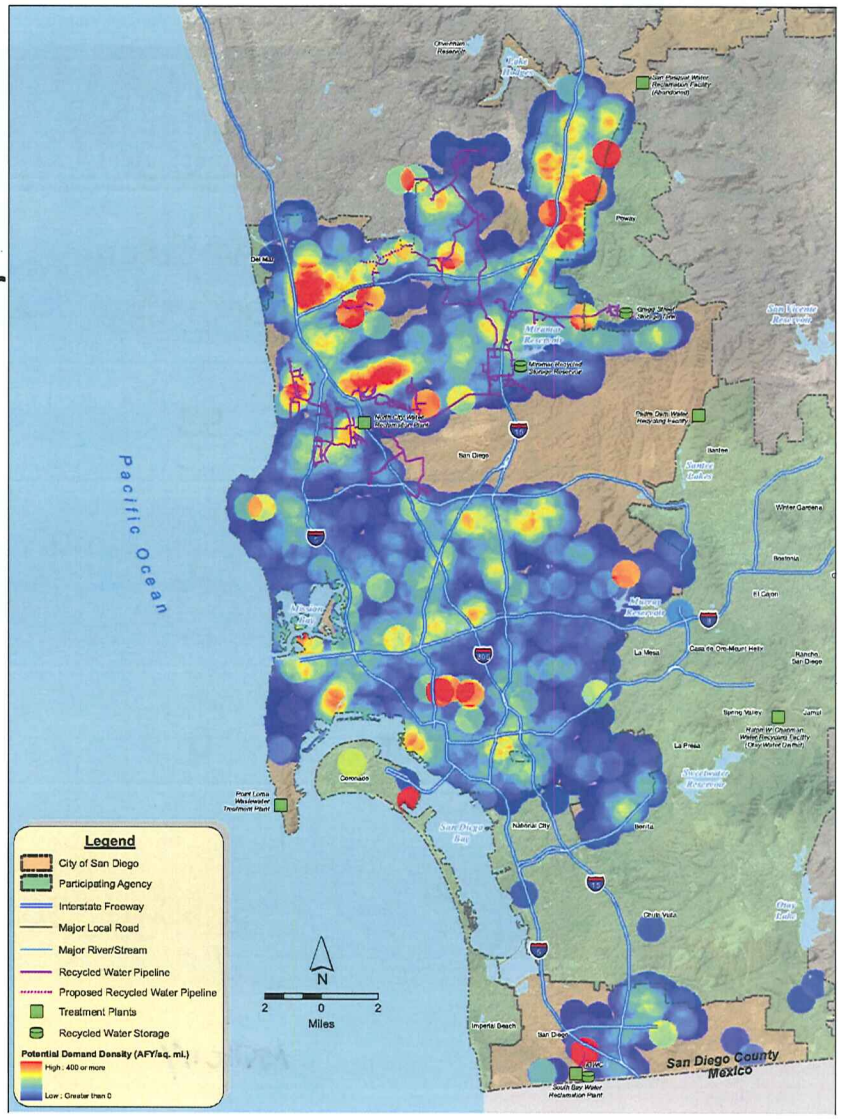
NORTH CITY

PLANTS



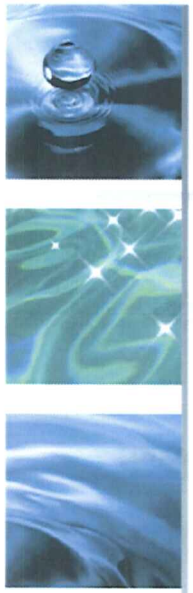
Non-potable Reuse Estimates

- Existing Demands: 11 mgd
- Potential Additional 2035 Demands: 27 mgd, which includes wholesale customer demands
- Customers are widely dispersed geographically
- ~8 mgd of potential demand in areas with clusters of potential customers, indicated in red
  - Rancho Bernardo, Carmel Valley, Mira Mesa, Kearny Mesa, Mission Valley/ Mission Bay, Balboa Park, South Bay



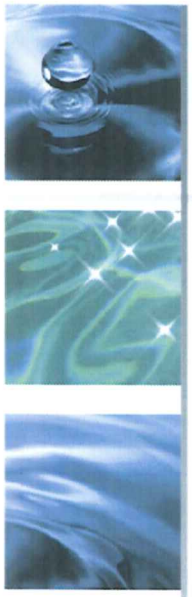
Non-potable Reuse Opportunities

- Updated the market assessment prepared during the 2005 Water Reuse Study
  - Identified large irrigation and cooling tower customers
  - Obtained potential future non-potable demands from adjacent water agencies
  - Applied historical connection rates to refine estimated potential demand
- Most-likely customers to connect:
  - Within 0.05 miles (270 feet) of the distribution system
  - Consume more than 100 acre-feet/year



Identifying and Quantifying the Opportunities

- Evaluated Metropolitan Wastewater System flow – Projected Total Average Daily 2050 Flow is 278 mgd
- Utilized Metropolitan Wastewater mass-balance model (to determine total suspended discharge and other parameters) to couple wastewater quality information with flow projections
- Identified strategic locations in the system to divert flows to reuse facilities
- Evaluated both non-potable and indirect-potable reuse opportunities



Eight Technical Memoranda

TM 1	Non-potable Reuse Market Assessment	Nov 2009
TM 2	Regional Non-potable Reuse Recycled Water Demand	Nov 2009
TM 3	Frame Work Planning	Apr 2010
TM 4	Wastewater Supply and Treatment	Oct 2010
TM 5	Recycled Water Demand and Delivery	Nov 2011
TM 6	Coarse Screening Session	Jan 2011
TM 7	Fine Screening Session	Feb 2011
TM 8	Financial Analysis	May 2011

Key Considerations

- High Cost to Upgrade Point Loma to Secondary
- Uncertainty of Future Waivers
- Regional Evaluation of Metro Sewerage System
- Balancing Stakeholder Interests
- Long-term Water Supply Challenges for the San Diego Region
- Regulatory and public approval of Indirect Potable Reuse (IPR) are needed

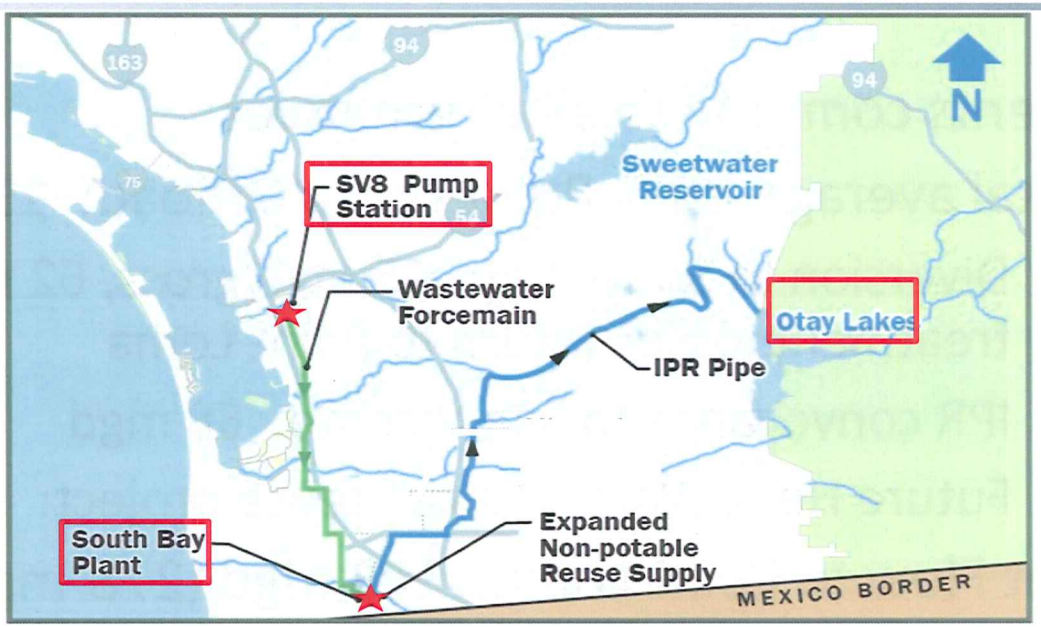
San Vicente Options

- From North City:
  - Treat up to 30 mgd of projected flow
    - Sufficient for 15 mgd conveyance to San Vicente after non-potable demands are met
  - Divert flows from Morena Blvd
    - Increases North City's potable reuse to 27 mgd

San Vicente Options (cont'd)

- From Harbor Drive:
  - Convey 41 to 53 mgd depending on total from other plants
  - Option 1: locate all treatment at Harbor Drive
  - Option 2: locate up to tertiary facilities at Harbor Drive and advanced-treatment facilities in Mission Valley; needed if detailed site study concludes space limitations
  - Option 3: include a facility to treat flows to East Mission Gorge Pump Station to reduce Harbor Drive capacity need and convey 7 mgd to San Vicente

South Bay – One Option



- Divert 47 mgd at a new Spring Valley 8 Pump Station
- Expand the existing South Bay Plant to treat 65 mgd
  - 9 mgd recycled water demand
  - 15 mgd IPR project with Lower Otay Reservoir
  - Up to 47 mgd discharged through South Bay Outfall
  - 3 mgd solids returned to Point Loma

Five Reuse Alternatives

Elements common to all alternatives:

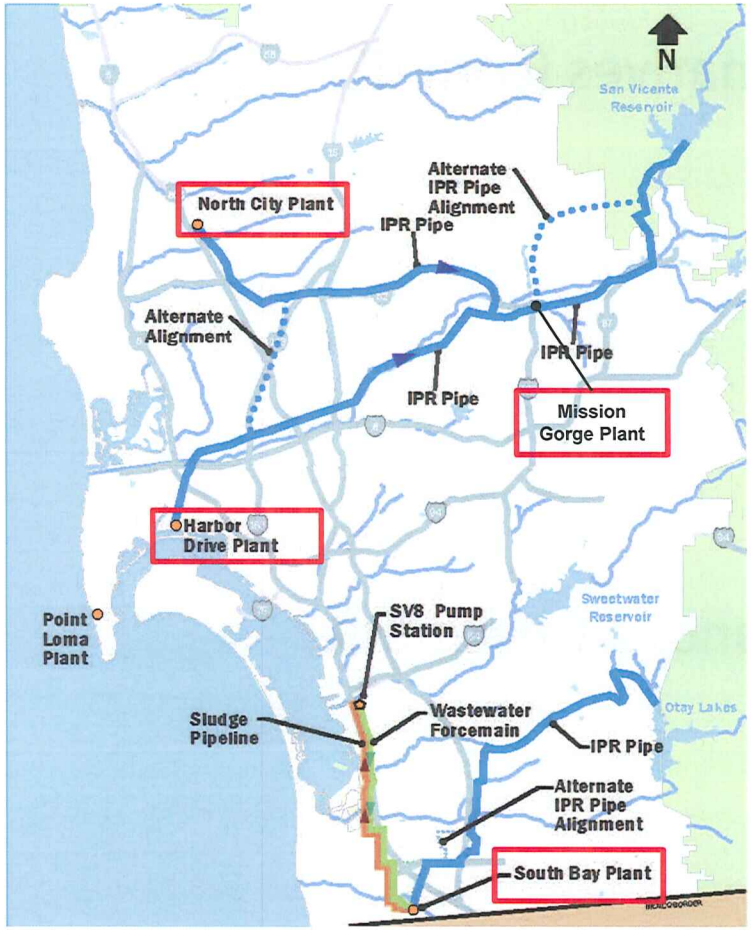
- Total average-daily Point Loma Offload: 135 mgd
  - Diversion to South Bay: 65 mgd gross, 62 mgd net after treatment losses return to Point Loma
  - IPR conveyance to San Vicente: 68 mgd
  - Future Helix Water District reuse project: 5 mgd
- Net Flow to Point Loma: 143 mgd (278-mgd Metro System Total)

Five Reuse Alternatives

Elements common to all alternatives (cont'd):

- Total Reuse: 106 mgd
  - North City NPR: 9 mgd
  - South Bay NPR: 9 mgd
  - San Vicente IPR: 68 mgd
  - Lower Otay NPR: 15 mgd
  - Helix: 5 mgd
- Five potential sites for advanced treatment
  - North City
  - South Bay
  - Harbor Drive
  - Mission Valley
  - Mission Gorge

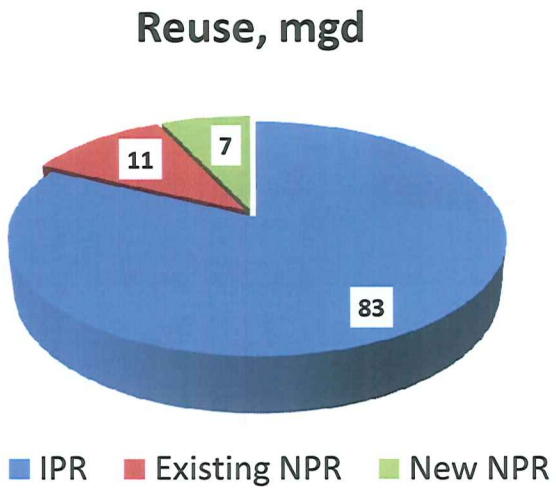
Reuse Alternatives



Alternative	A1	A2	B1	B2	B3
Expand South Bay recycling capacity and divert additional flows to the facility	X	X	X	X	X
Maximize use of current North City recycling capacity			X	X	X
Expand North City recycling capacity. and divert flows from Morena Boulevard	X	X			
Build new Harbor Drive Treatment Plant for both recycling and advanced treatment		X		X	
Build new Mission Valley Treatment Plant to relieve Harbor Drive capacity need	X		X		
Include City-Padre Dam MWD joint-agency Mission Gorge Treatment Plant					X
Least cost: Alternative B2 Highest cost: Alternative B3					

Reuse Benefits

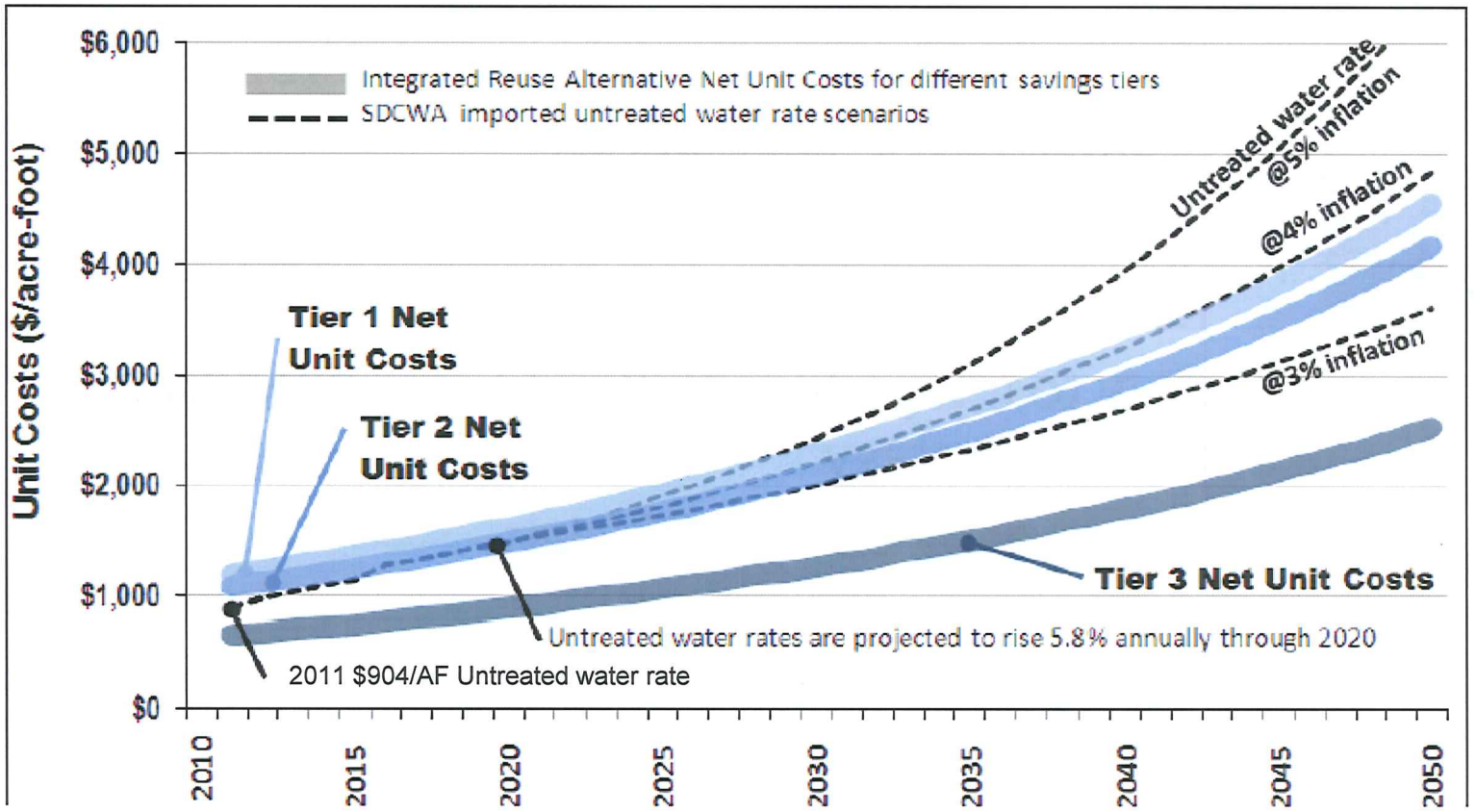
- Capital cost to upgrade Point Loma reduced by approximately 37%, to $710M
- Elimination of wastewater CIP projects results in $557M CIP and $27.6M annual O&M savings
- Creates local water resource
- Reduces water supply salinity
  - Water treatment plant O&M savings estimated at $100/ac-ft



Estimated Costs to Produce the Water

	$ per Acre-Foot
Gross Cost	$1700 - $1900
Less Savings due to Eliminated Wastewater CIP Projects	$1100 - $1300
Less Savings due to Reduced Salinity	$1000 - $1200
Less Savings for Completely Foregoing Point Loma Upgrades	$600 - $800

Comparing the Cost of Water



Implementation Factors

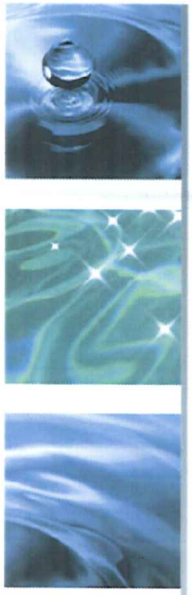
- Water Purification Demonstration Project Results
- Potable Reuse Regulations
- Agreement on Cost Allocation
- Rate Impacts
- How to integrate with Point Loma 2015 NPDES Permit Strategy
- Approval by Elected Officials

Recycled Water Study
Roll-Out Schedule

- Natural Resources and Culture Committee – May 2012
- Independent Rates Oversight Committee – May 2012
- City Council – June 2012
- Submit Study Report to Coastal Commission – July 2012
- Coastal Commission - to be determined

Recycled Water Study
Next Steps

- Financial and Policy Considerations
  - Determine wastewater/water cost allocation and rate impacts
  - Determine San Diego County Water Authority policy on regional supply benefit and level of participation
  - Further evaluation of potential joint-agency projects
- Technical Considerations
  - Perform detailed site studies
  - Refine solids handling strategy
  - Integrate with other water and wastewater master planning efforts



Recycled Water Study
Next Steps (cont'd)

- Regulatory Considerations
  - Coordinate with 2015 NPDES permit renewal process
  - Coordinate with regulatory framework developed in the City's Water Purification Demonstration Project
- Continue to refine reuse alternatives

Questions

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