



CITY OF SANTA BARBARA

COUNCIL AGENDA REPORT

AGENDA DATE: September 23, 2014

TO: Mayor and Councilmembers

FROM: Public Works Department, Water Resources Division

SUBJECT: Authorize Actions And Adopt A Resolution For Reactivating The Charles E. Meyer Desalination Facility

RECOMMENDATION: That Council:

- A. Adopt, by reading of title only, A Resolution of the Council of the City of Santa Barbara Approving the Design-Build-Operate Procurement Method for the Contract to Reactivate and Operate the Charles E. Meyer Desalination Facility;
- B. Authorize staff to prepare and present an Enabling Ordinance to the Ordinance Committee for a Design-Build-Operate contract;
- C. Authorize staff to release a Request for Proposals to prospective contractors to design, build, and operate the Desalination Facility;
- D. Authorize staff to submit a Repair and Maintenance Coastal Development Permit application as needed to reactivate the Desalination Facility; and
- E. Authorize the City Attorney to amend Professional Services Agreement Number 24,835 to increase the not to exceed amount from \$25,000 to \$100,000 for legal support services related to contracting for services to design, build, and operate the Desalination Facility, and other contractual requirements as needed.

DISCUSSION:

Background

The City conducted a public process that culminated in the adoption of the current Long Term Water Supply Plan (LTWSP) by Council in 2011. Included in the plan as a recognized drought water supply is the City's Charles Meyer Desalination Facility ("Desal Facility"), which was completed in March 1992, and put into long-term standby mode in 1997. The City is currently experiencing a drought that is drier than the historic drought of record used as the drought planning basis of the LTWSP. The City is preparing to reactivate the Desal Facility, should conditions continue to remain dry, to ensure that the community continues to have sufficient uninterrupted drinking water supplies.

Project Status Update

Study Phase Report – On May 6, 2014, Carollo Engineers, Inc. (Carollo), was authorized by City Council to create project documents for reactivating the Desal Facility. Within this scope of work, Carollo is finalizing a Study Phase Report, which includes assessments of the Desal Facility's condition, needed repairs, required equipment replacement and upgrades, and necessary work for complying with the facility's permits. Carollo, assisted by HansonBridgett and the City Attorney's Office, is also drafting contract documents and specifications to solicit proposals from contractors to perform final design, construction, and operation of the Desal Facility.

Intake Water Quality Monitoring – As required by the State Water Resources Control Board, a 12-month source-water sampling program near the Desal Facility's intake began in July 2014. The water sampling information will be used to confirm that the proposed Desal Facility will provide sufficient treatment in compliance with all State Drinking Water Regulations.

Coastal Development Permit – Technical and environmental studies associated with the City's existing California Coastal Commission (CCC) Coastal Development Permit (CDP) were authorized by City Council on July 29, 2014. A biological assessment of the seafloor surrounding the intake structure and in areas potentially affected by anchoring activities has been performed. The biological assessment characterizes the biota (coverage, type, density, estimated biomass) on the intake structure and surrounding area, the impact of removing the biomass from the structure, and recommendations for minimizing impacts from the needed repairs and maintenance. All recommendations are being incorporated into the project description. As directed by Council, Staff will submit an application for a Repair and Maintenance CDP including an assessment of Coastal Act consistency.

Funding – On July 29, 2014, City Council approved a contract with Raftelis, Inc. (Raftelis), to develop water rates to support reactivation and operation of the Desal Facility. Raftelis is currently developing water rates under three different operating scenarios for the Desal Facility. Staff has also submitted a pre-application for a low-interest State Revolving Fund loan. Other debt options, such as certificates of participation and revenue bonds, are also under consideration.

National Pollution Discharge Elimination System (NPDES) Permit for El Estero and the Desal Facility. The NPDES permit expires in early 2015 and staff is working on the renewal application to be submitted soon. Additionally, staff is working cooperatively with Regional Water Quality Control Board staff to process an amendment to the NPDES permit to address Water Code Section 13142.5(b) as it relates to the use of best available site, design, technology and mitigation measures.

Brine Discharge Modeling – Computer modeling of the El Estero Wastewater Treatment Plant's (El Estero) outfall diffuser system has been completed. The modeling demonstrates that when the Desal Facility produces 3,125 AFY or more, the existing diffuser system provides adequate mixing. When Desal water production is low, operational modifications may be needed to ensure there is adequate mixing in the diffuser system. The modeling results will be submitted to the Regional Water Quality Control Board, along with an application to renew the NPDES permit.

State Water Board - California Ocean Plan. Amendments to the California Ocean Plan were released for comments in early July 2014. Staff submitted comments to the State Water Resources Control Board on August 18, 2014. Staff is working cooperatively with the State Water Board staff and Board to confirm the status of Desal Facility as an existing facility under the Amended Ocean Plan.

Proposed Work

The next steps towards reactivating the Desal Facility are to begin the contractor selection effort, continue with the permitting process, and establish a framework for completing the project by fall of 2016, should the current drought persist. At this time, staff is recommending that Council authorize the following:

1. *Adoption of Resolution to Allow Alternate Procurement Method:* Charter Section 519 allows the City Council to authorize alternate procurement methods for Water Department projects such as the design-build-operate (DBO) method. Such exceptions to the more traditional design, bid, build method must be approved by affirmative vote of a majority of the total members of the City Council.

In this case, Council authorization to proceed under a DBO procurement method is warranted for a number of reasons. First, the DBO method is likely to result in significant time savings compared with traditional design, bid, build method. This time savings is critical to the operational needs of this project which requires that the water be available in time to meet the demand. Second, the DBO method is likely to result in significant monetary savings over the traditional design, bid, build method where multiple firms are used to provide different services. Contracting with one entity to perform all of the work provides a "best value" approach to project costs and allows more refined project pricing. Finally, when the same entity is obligated to operate the system it designs and builds, there is a greater level of certainty that the quality of construction and construction methods will be the best available.

Staff is also requesting authority to prepare and present an Enabling Ordinance to the Ordinance Committee for a DBO contract. Staff anticipates it will be ready with a draft ordinance by October 2014. The ordinance will set forth in detail the DBO procurement method including details on the selections process and a suggested not to exceed reimbursement amount to be paid to the 3 or 4 short-listed qualified firms asked to submit proposals.

Council Agenda Report

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Desalination Facility

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Staff is also requesting approval to increase the not to exceed amount of Professional Services Agreement No. 24,835 dated June 10, 2014. HansonBridgett LLP is providing critical legal services in the drafting of the Request for Qualifications, Request for Proposals and the contract document for the Design-Built-Operate Contract. This is a highly sophisticated and complex contract that requires extensive legal review and experience. Staff requests authorization to increase the Agreement from \$25,000 to \$100,000 at this time.

The decision to reactivate the Desalination Facility will be made based upon adaptive management of the City's water supplies at the end of March 2015. However, if the current drought conditions persists, the City will need the Desalination Facility to be operational by fall of 2016. The only way to meet this timeline is for Council to authorize the DBO procurement method as allowed by Charter Section 519.

2. *Contractor Selection Process:* Authorize staff to release a Request for Proposals to contractors who have been pre-qualified through a Request for Qualifications process for reactivating and operating the Desalination Facility.
3. *Permitting Process:* Authorize staff to submit a Repair and Maintenance CDP application to the CCC to enable the City to perform repair and maintenance activities on the Desalination Facility's intake structure and weir box on the beach.

PREPARED BY: Joshua Haggmark, Acting Water Resources Manager/CT/mh

SUBMITTED BY: Rebecca J. Bjork, Public Works Director

APPROVED BY: City Administrator's Office



Charles E. Meyer Desalination Facility Status Update



City Council
September 23, 2014



Purpose

1. Provide an understanding of the City's water supply planning strategy and current water supply situation leading up to Desalination
2. Provide an update on the Preliminary Design Work to Reactivate Desalination
3. Answer questions the Council may have about the Project
4. Receive direction from the Council on next steps



Agenda

- ◆ Project History
- ◆ Long Term Water Supply Plan
- ◆ Water Supply Status
- ◆ Summary of Preliminary Design Work
- ◆ Status of Required Permits
- ◆ Recommendations



Project History



Facility History

- ◆ Charles E. Meyer Desalination Facility was completed in 1992
- ◆ Placed in Long Term Standby Mode in 1994
- ◆ Permanent Permitting was Completed in 1996
- ◆ Desalination Facility has been part of the Long Term Water Supply Plan since 1994



Long Term Water Supply Plan

Long Term Water Supply Plan

- ◆ Updated and adopted by Council in 2011
- ◆ LTWSP included an extensive Public Review and Comment Process
- ◆ Plan identifies the role of Desalination in Water Shortage Contingency Plan
- ◆ Reactivation of the Desalination to be utilized in prolonged drought situations

The City Has a Long, Successful History in Water Conservation

- ◆ City's Conservation Program is a model in the State
- ◆ Savings exceed statewide and regional averages
- ◆ City helped to shape conservation BMPs for the State
- ◆ Going into this Drought, Water Usage in the City had dropped 20% since the mid 80's as a result of Conservation Efforts



The screenshot shows the website for "Water Wise Gardening in Santa Barbara County". The header includes navigation links: Garden Tours, Garden Gallery, Plants, My List, Resources, Watering Guide, and a small plant icon. The main title is "WATER WISE GARDENING IN SANTA BARBARA COUNTY" in yellow text. Below the title is a large image of yellow flowers. The footer contains contact information, a "Water Saving Tips" section, and social media icons.

Garden Tours Garden Gallery Plants My List Resources Watering Guide 

WATER WISE GARDENING IN SANTA BARBARA COUNTY



 **water wise**
IN SANTA BARBARA COUNTY

Contact us:
805-568-3545, or lflecken@cosbpw.net

Certain water purveyors in Santa Barbara County now offer "Smart Landscape Rebates"; [Click here to learn more.](#)

The biggest potential for water savings is outdoors. While a 15 minute shower uses 30 gallons, watering an average lawn for 15 minutes uses 700 gallons! Make sure your sprinklers don't overwater or spray onto hard surfaces. Turn down your irrigation controller using the watering percent adjust at www.WaterWiseSB.org. Watch a video about it [here.](#)

How to Use this Website Video

Water Saving Tips:
In general, lawns only need to be watered once every three days.

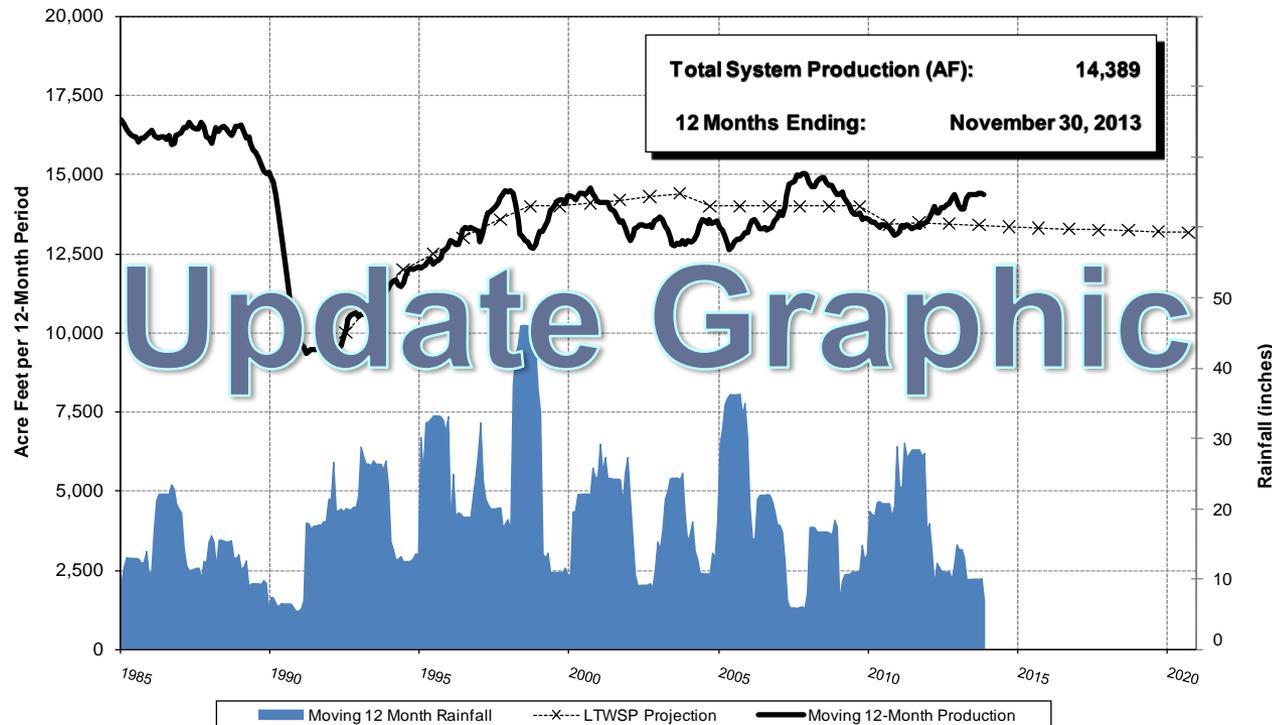
Check your irrigation controller and reduce watering times if necessary.





Water Conservation Data

City of Santa Barbara Water Demand
Moving 12-Month Water System Production by Calendar Year
("System Production" = potable + recycled water)

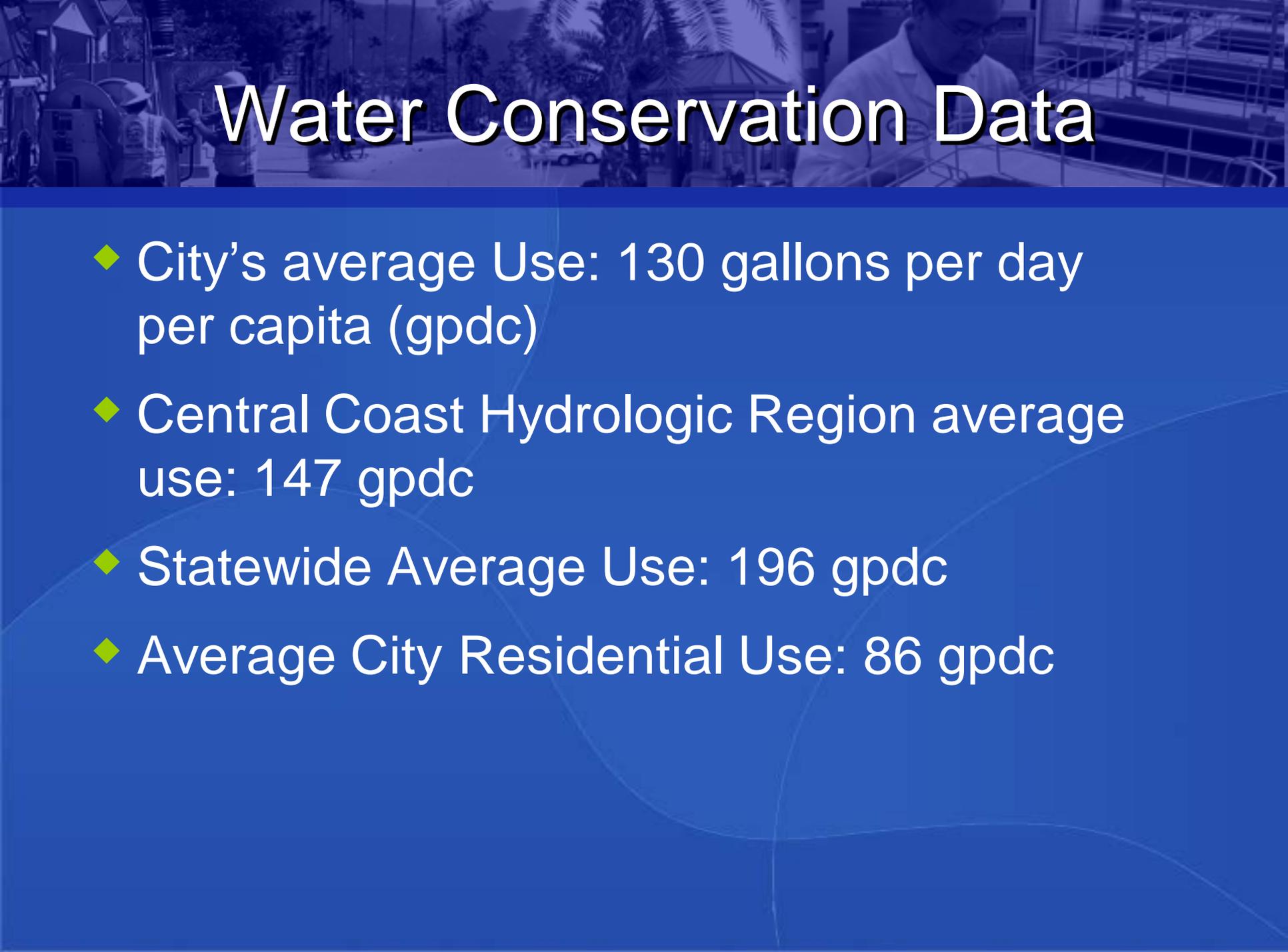


City of Santa Barbara - Public Works Department

20% Reduction in Water Usage

Despite adding 5,000 residents and entertaining nearly 5 Million Tourist per year

Planned Water Usage going out to 2030 projected to remain flat through continued improvements in conservation

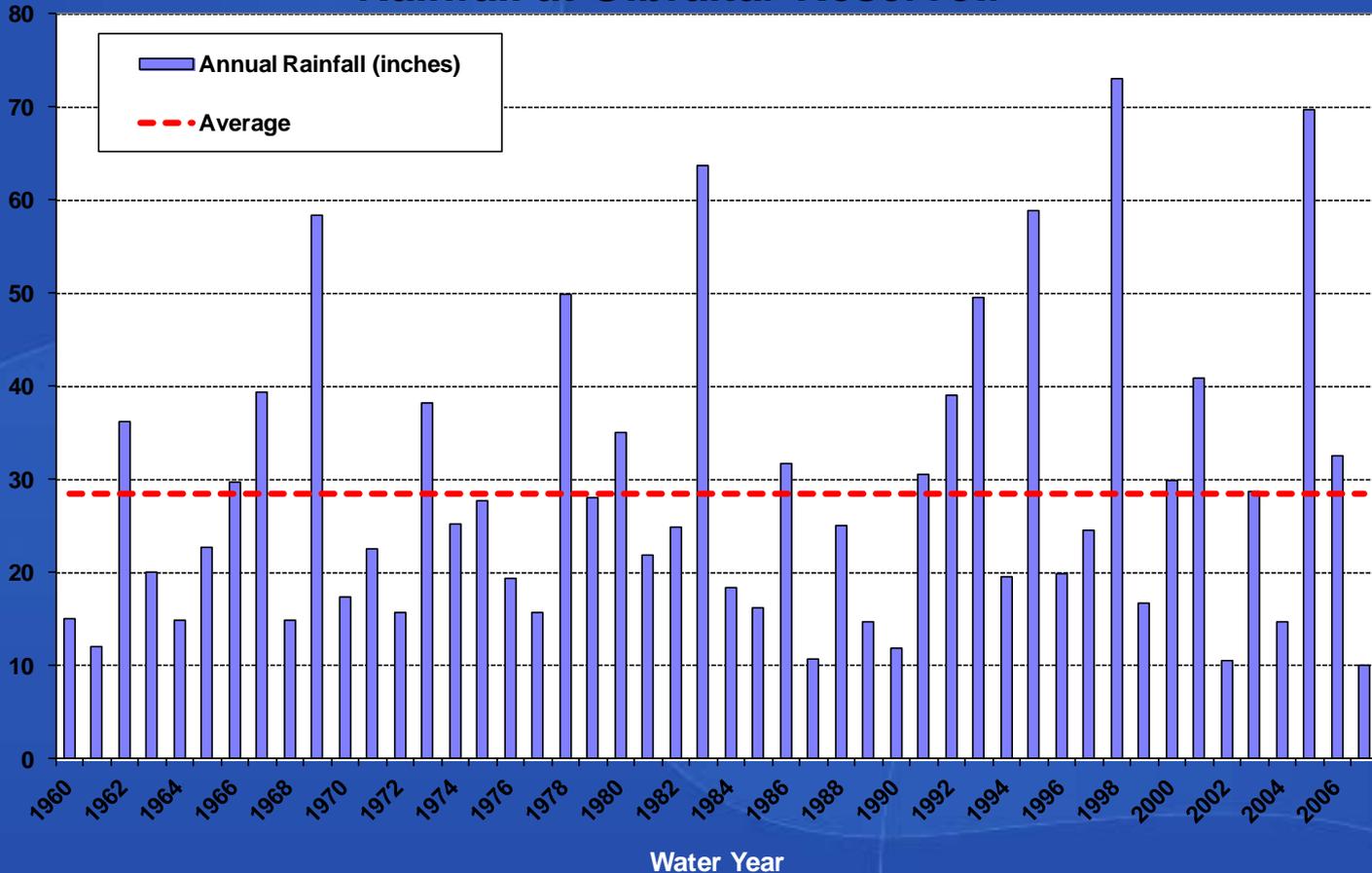
The slide features a blue background with a faint image of a water treatment facility. The title 'Water Conservation Data' is prominently displayed at the top in a large, white, sans-serif font. Below the title, four bullet points are listed, each starting with a yellow diamond icon. The text is white and clearly legible against the blue background. The background image shows workers in hard hats and safety vests near large pipes and machinery, and a man in a white lab coat looking down at something in the foreground.

Water Conservation Data

- ◆ City's average Use: 130 gallons per day per capita (gpdc)
- ◆ Central Coast Hydrologic Region average use: 147 gpdc
- ◆ Statewide Average Use: 196 gpdc
- ◆ Average City Residential Use: 86 gpdc

Droughts Are a Reoccurring Water Supply Challenge in the Santa Barbara Region

Rainfall at Gibraltar Reservoir



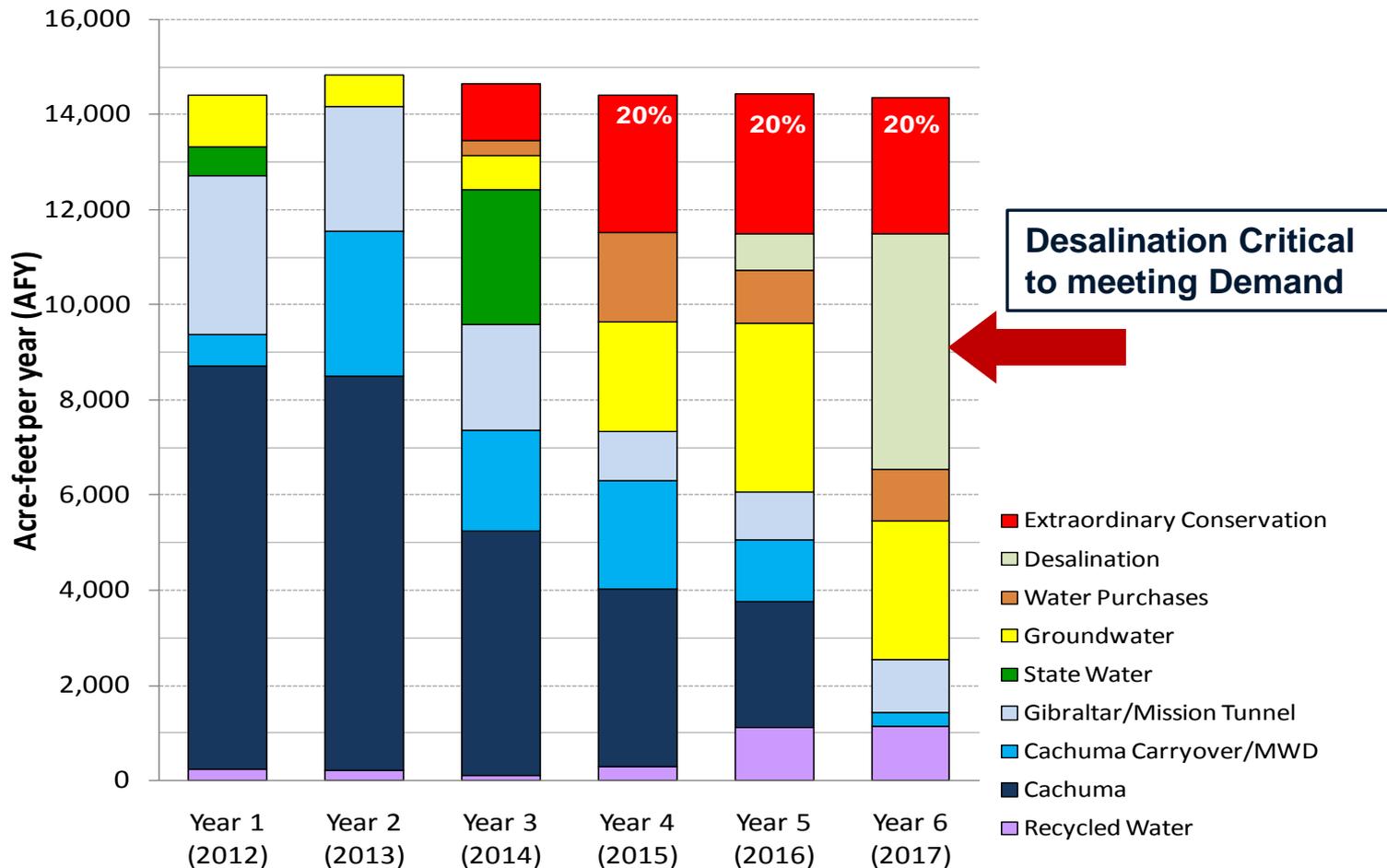
Source: 2011 Long-Term Water Supply Plan



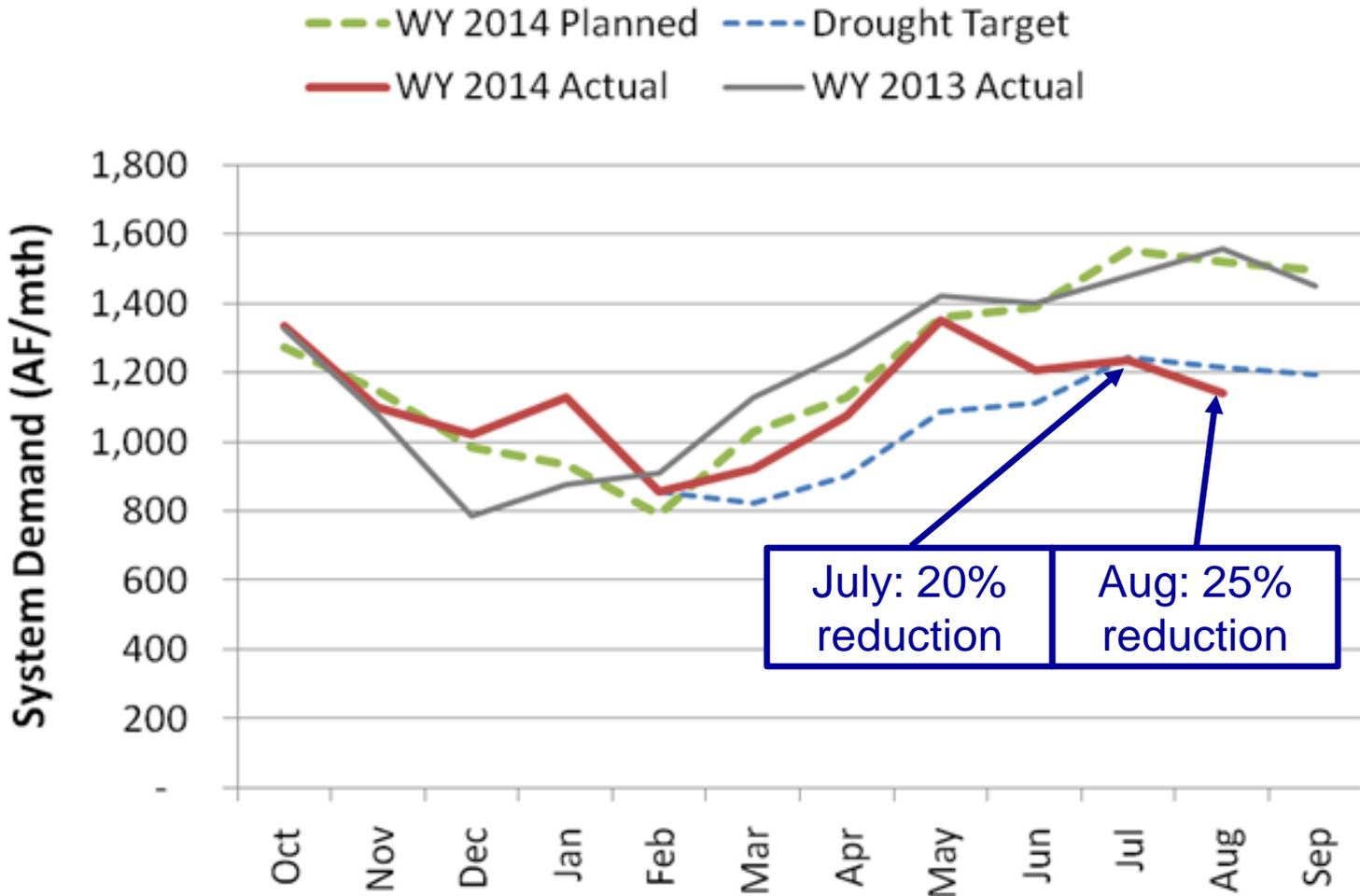
Water Supply Status

Current Supply Strategy

(based on no reservoir inflows, no State Water)



Monthly Demands

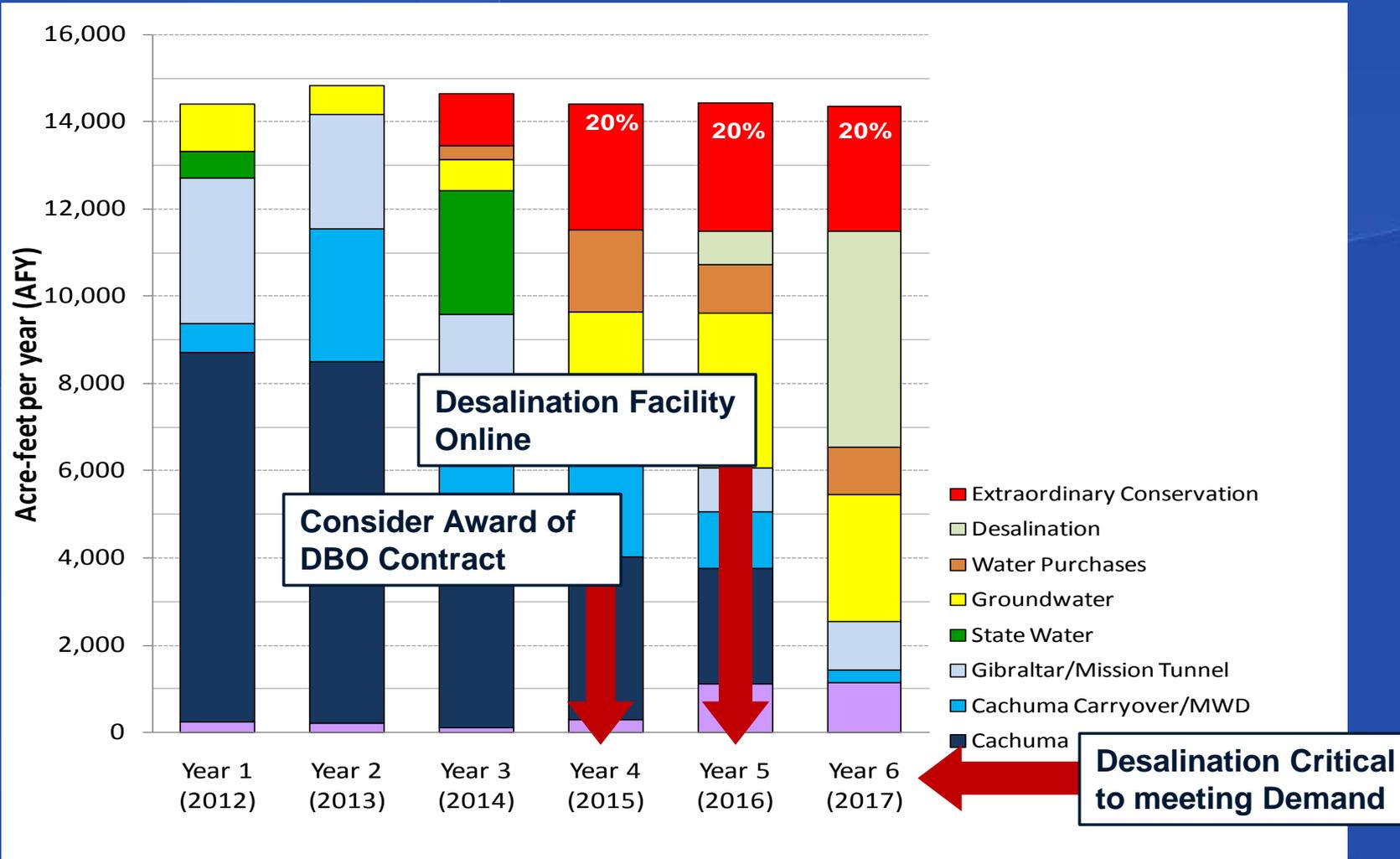




Project Need

Supply Strategy/Desal Timeline

(based on no reservoir inflows, no State Water)



Drought Supply Summary

- ◆ Increased groundwater pumping
- ◆ Import Banked and Purchased Water
- ◆ Demand reduction
 - Rates
 - Regulations
- ◆ Desalination

*Based upon current drought –
desalination will be needed in 2016*



Charles Meyer Desalination Plant



Preliminary Design Work



Preliminary Design Work

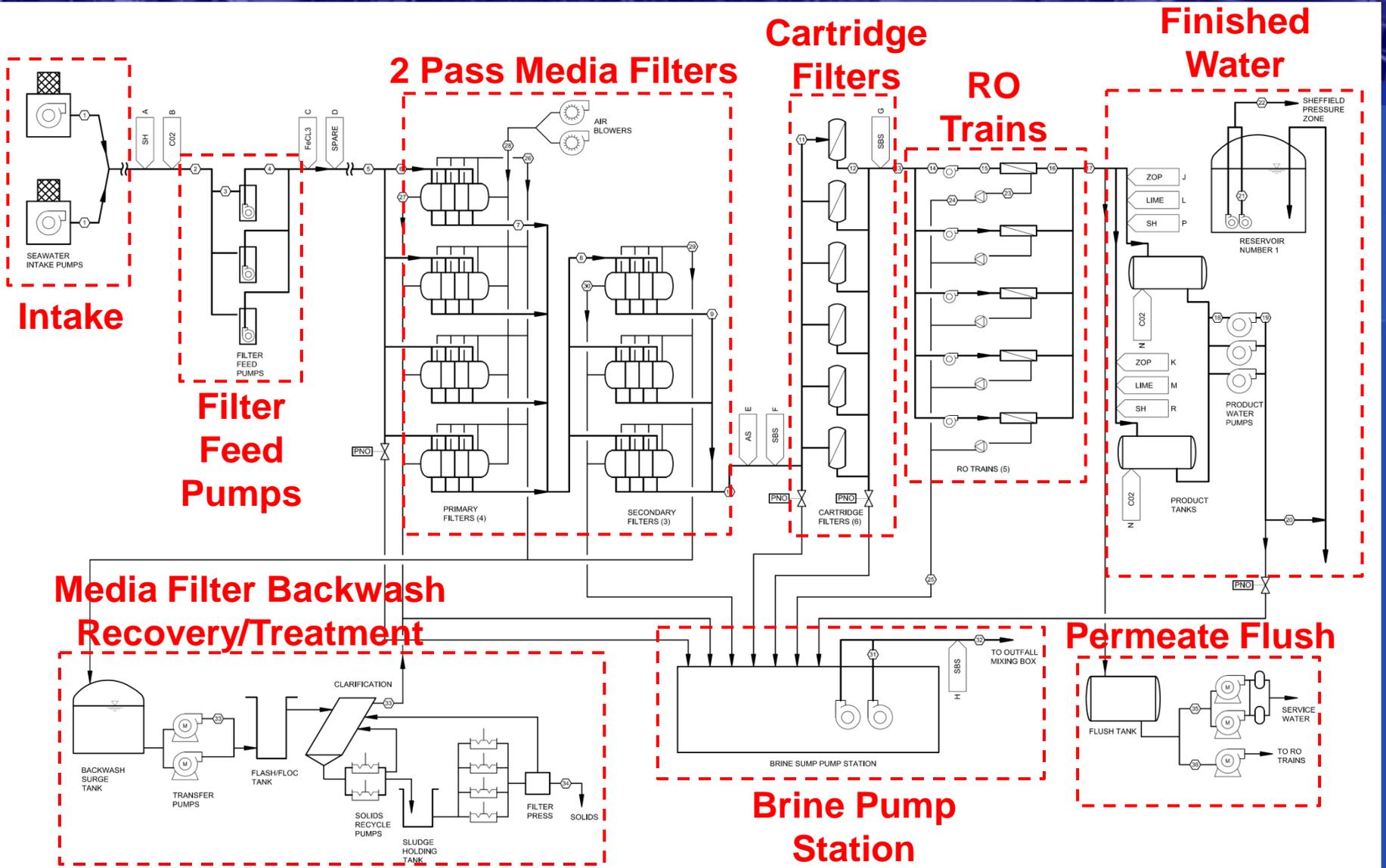
- ◆ On-Shore Facilities Work
- ◆ Off-Shore Facilities Work
- ◆ Operating Scenarios
- ◆ Estimated Project Cost

Overview of Desalination Facilities and Scope of Reactivation Project

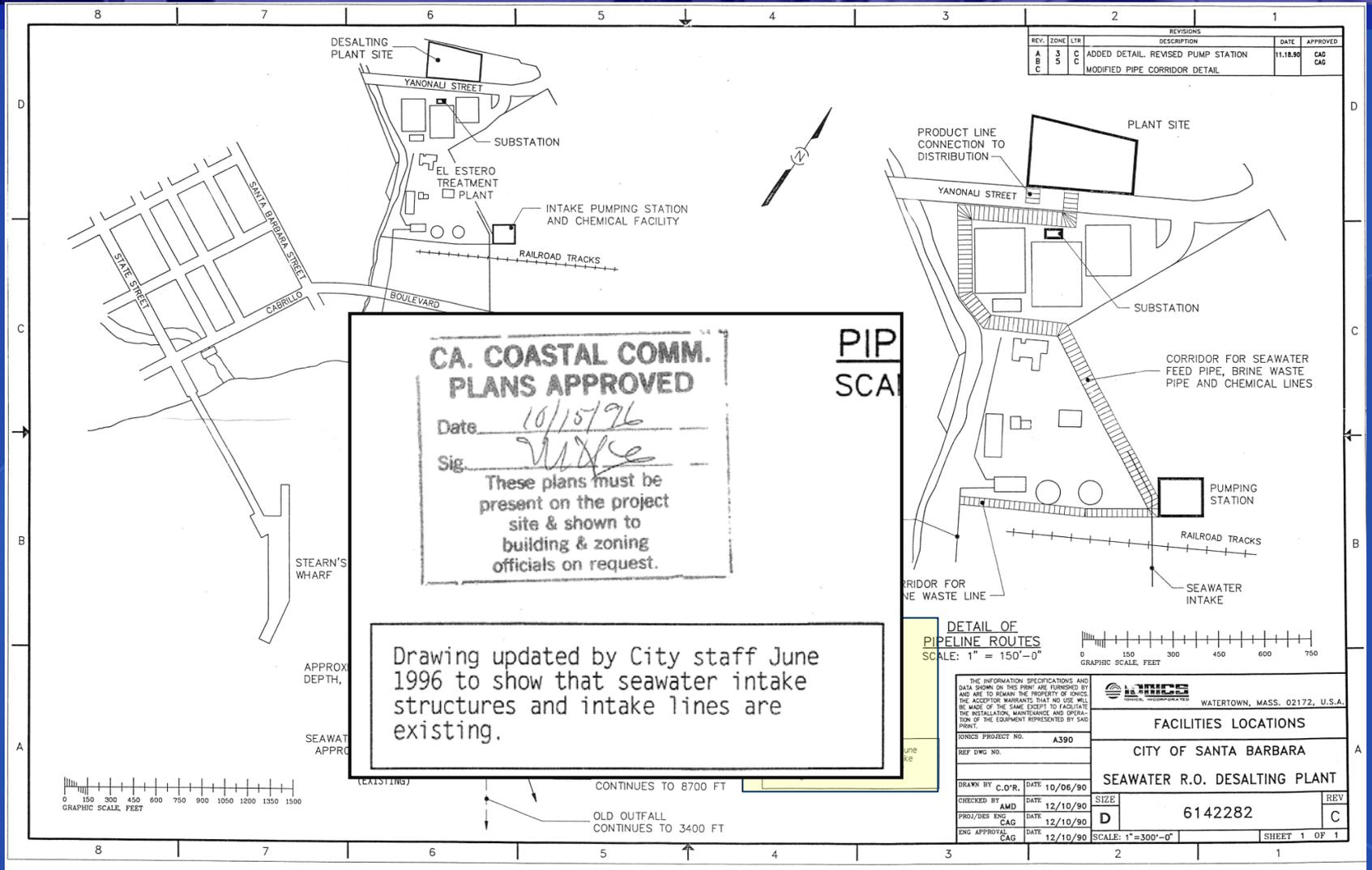
- ◆ Intake: 2,500-ft off shore
- ◆ Pump Station / Chemical Area: 420 Quinientos Street
- ◆ Desalination Plant: 525 Yanonali Street
- ◆ Outfall: 8,720-ft off shore shared with El Estero WWTP



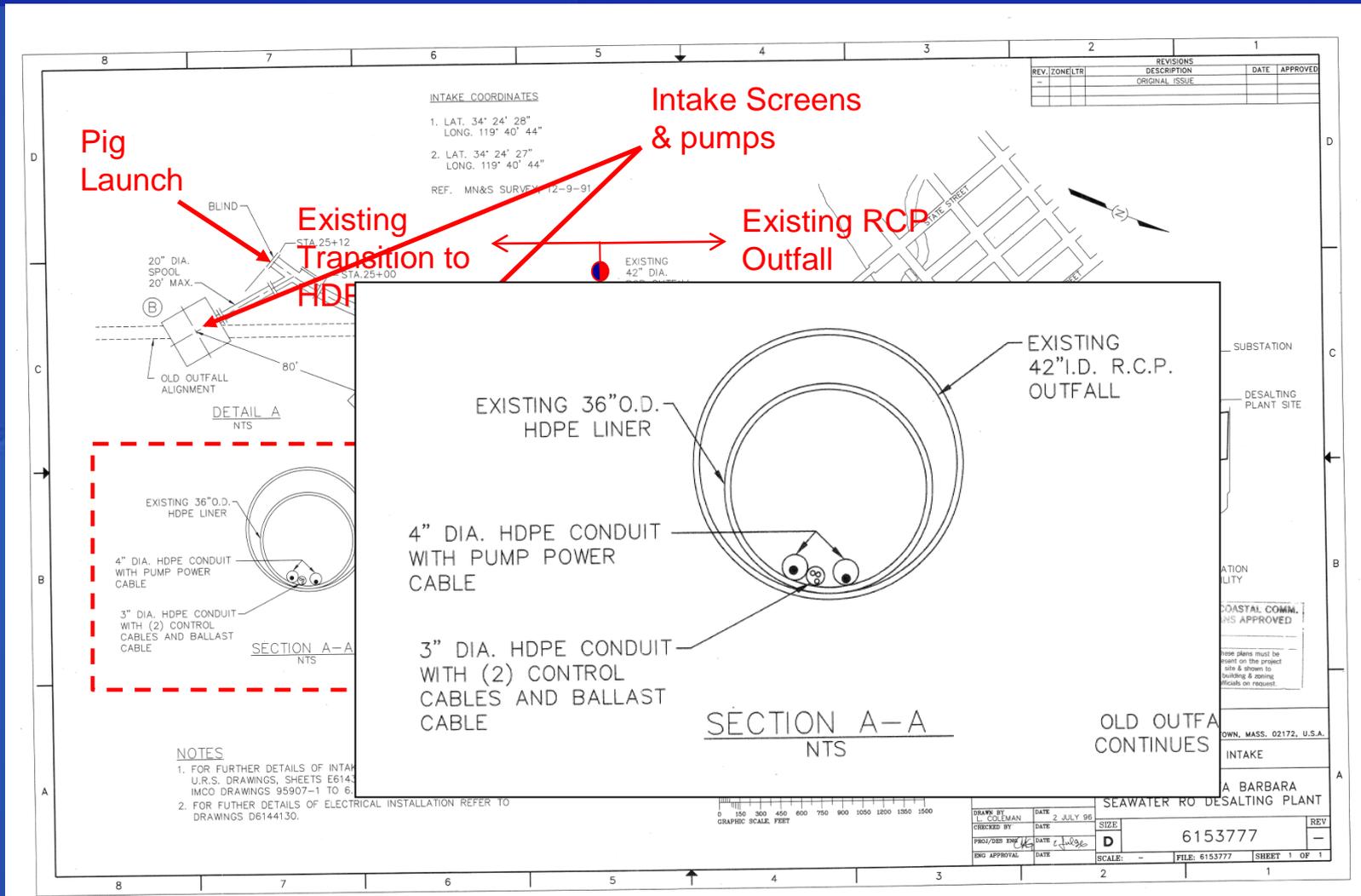
Overview of Desalination Facilities



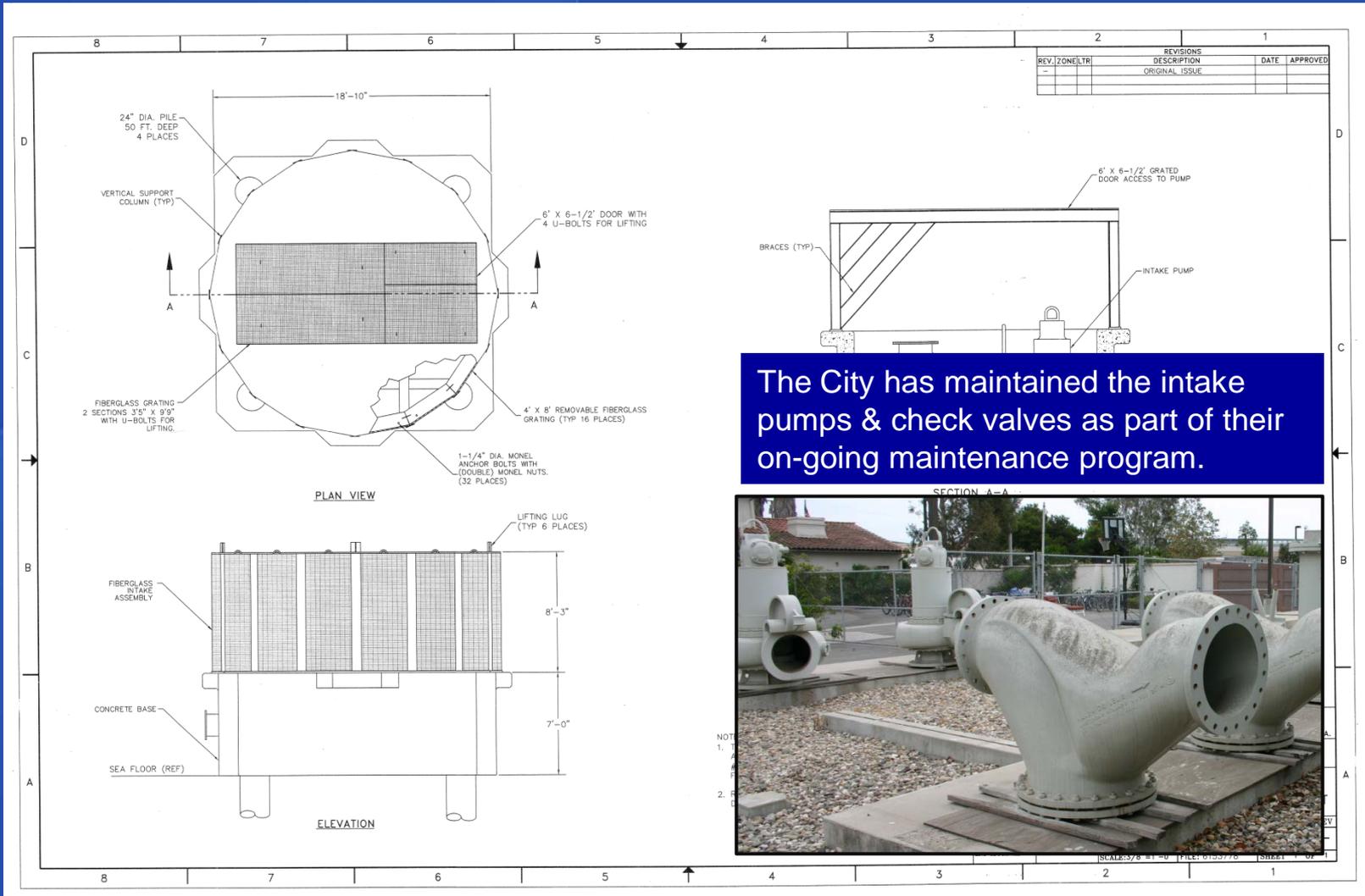
The Intake Plans for the Permanent Facility Were Approved by the CCC on Oct 15, 1996



The Intake Is Located 2,500 Feet Offshore in ~30 Feet of Water



Screens and Intake Pumps Will Be Re-installed Offshore



The City has maintained the intake pumps & check valves as part of their on-going maintenance program.



Scope of Off-shore Reactivation Activities for Intake

- ◆ Redeploy existing pumps & check valves
 - Replace power & control wire
- ◆ Redeploy screens
 - Update screen technology to cylindrical wedge wire
 - Design consistent with prior environmental reviews



The City has maintained the pumps & check valves as part of their on-going maintenance program.



Update removable screen system to cylindrical wedge wire screens.

Updated Screens Qualify as “Best Technology Available” for Open Intakes (USEPA & SWRCB Expert Panel)

Final report submitted to Dominic Gregorio, Senior Environmental Scientist, Ocean Unit, State Water Resources Control Board (SWRCB) in fulfillment of SWRCB Contract No. 09-052-270-1, Work Order SJSURF-10-11-003

State Water Resources Control Board (SWRCB) in fulfillment of SWRCB Contract No. 09-052-270-1, Work Order SJSURF-10-11-003

By: Michael S. Foster, Moss Landing Marine Laboratories
Gregor M. Cailliet, Moss Landing Marine Laboratories
John Callaway, University of San Francisco

Because optimal conditions for subsurface intakes are often impossible to find in the vicinity of the desalination plant site, the application of this type of intake technology to date worldwide has been limited to plants of relatively small capacity. As indicated in WaterReuse Association's White Paper titled "Overview of Desalination Plant Intake Alternatives,"¹³ the largest seawater desalination facility with a subsurface intake in operation at present is the first 17 MGD phase of

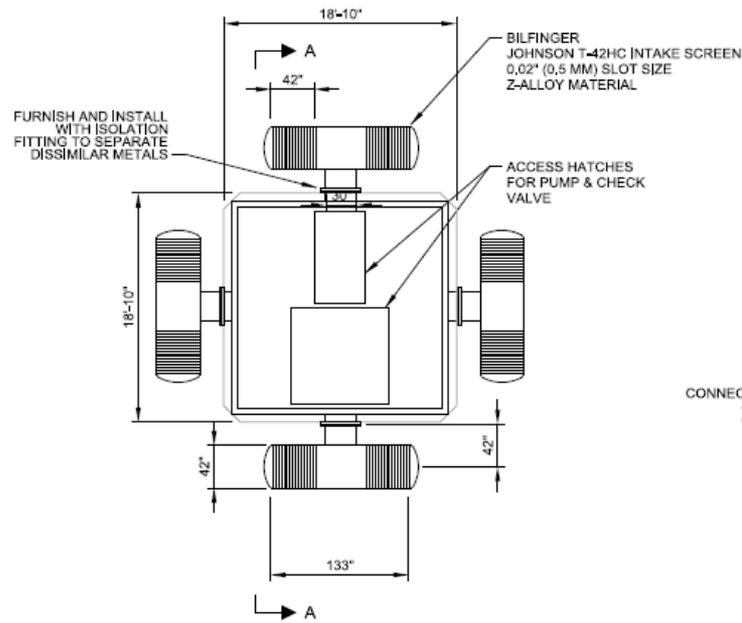
Wedgewire Screen Intakes

Wedgewire screens are cylindrical metal screens with trapezoidal-shaped “wedgewire” slots with openings of 0.5 to 10 mm. They combine very low flow-through velocities, small slot size, and naturally occurring high screen surface sweeping velocities to minimize impingement and entrainment. This is the only open intake technology approved by US EPA as Best Technology Available. Such approval, however, is granted provided that sufficient ambient conditions exist to promote cleaning of the screen face; the through screen design intake velocity is 0.5 feet/sec or less; and the slot size is appropriate for the size of eggs, larvae, and juveniles of any fish and shellfish to be protected at the plant intake site¹⁶.

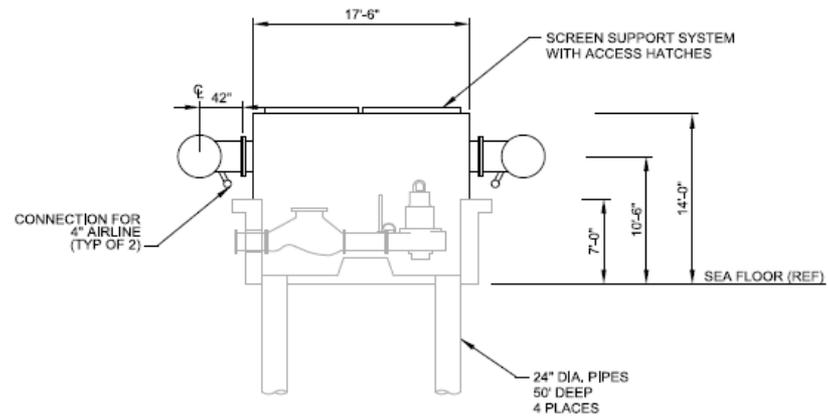
Triennial Review 2011-2012 Work-plan at
http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2011/rs2011

¹³ <http://www.watereuse.org/node/1340>
¹⁶ <http://edocket.access.gpo.gov/cfr/2006/julabr/pdf40cfr125.99.pdf>

Updated Screens Qualify as “Best Technology Available” for Open Intakes (USEPA & SWRCB Expert Panel)



PLAN
SCALE: 1/8" = 1'-0"



ELEVATION
SECTION A-A
SCALE: 1/8" = 1'-0"

Seawater Intake – Updated Screen
Design (Option 2)

FIGURE 4.8B

CITY OF SANTA BARBARA
CHARLES MEYER DESALINATION PLANT REACTIVATION

Scope of Reactivation Work for 420 Quinientos Street

- ◆ Filter Feed Pump Station
 - Testing piping
 - Service pump motors, coating systems, valves & pumps
 - Replace parts as needed
- ◆ Chemical Storage Facility
 - Update chemical feed equipment consistent with City standards
 - Consistent with original installation - install CO₂ storage & feed system



Filter feed pump station was maintained as part of the annual maintenance program.



Chemical tanks were drained and cleaned prior to long-term standby.



Aerial Photo of Desalination Plant as Originally Constructed in 1992 (7,500 AFY)

- 3,125 AFY RO Equipment, Filter Equipment, or Product Tanks
- 3,125 AFY Electrical Trailers
- Reactivation to 7,500 AFY RO Equipment or Filter Equipment
- Reactivation to 7,500 AFY Electrical Trailers
- Reactivation to 10,000 AFY RO Equipment or Filter Equipment
- Reactivation to 10,000 AFY Electric Trailers



Desalination Plant Reactivating to 3,125, 7,500, or 10,000 AFY Capacity

Site Plan for Reactivated Desalination Plant

FIGURE 4.15

CITY OF SANTA BARBARA
CHARLES MEYER DESALINATION PLANT REACTIVATION

Scope of Reactivation Work for 525 Yanonali Street

◆ Desalination Plant

- Test and repair tanks, small pumps and piping
- Replace filter media
- Update electrical, instrumentation & control equipment
 - ✓ EE switchgear damaged by arc flash event
 - ✓ Reliability / spare parts
- Update membrane equipment



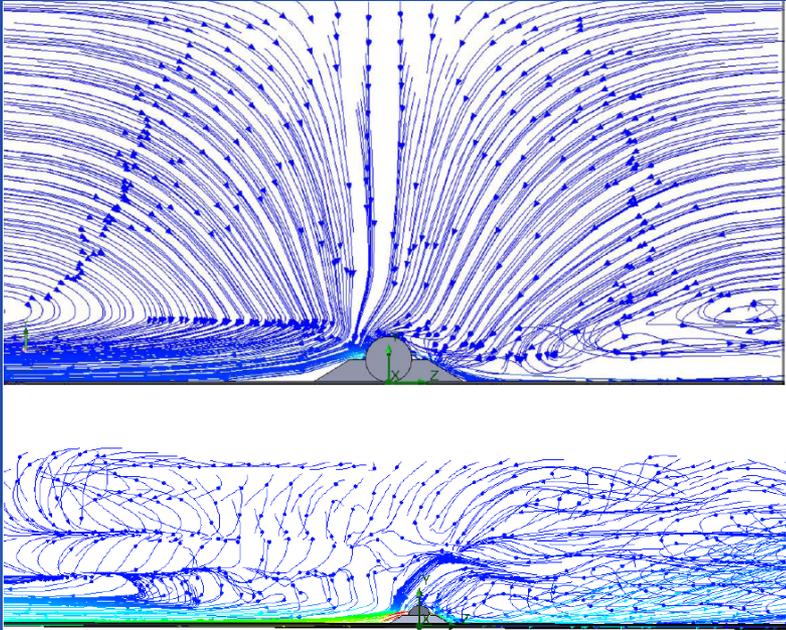
Preliminary Design identified upgrades to membrane equipment that can reduce power use from 7,393 kWh/AF to 5,307 kWh/AF.



Brine Discharge Studies

- ◆ Benthic (bottom dwelling) organisms are sensitive to high salinity
 - Good mixing/dilution required at the outfall
- ◆ Discharge modeling
 - Modeling results were adopted in El Estero WWTP's Discharge Permit, which requires 44:1 minimum initial dilution ratio (MIDR) when desal plant is operating
- ◆ Draft Ocean Plan Amendments
 - 44:1 criteria is still valid, however a more stringent standard was also proposed
 - Updated modeling shows that the City meets both existing and more stringent standard

Successful conservation & recycled water program result in less effluent for brine dilution



Outfall mixing was modeled by Dr. Scott Jenkins of UCSD, Scripps Institute of Oceanography based on data collected at the City's Outfall at the most conservative natural conditions

- ◆ At night, there may be no effluent for several hours
- ◆ Operational practice required to meet discharge requirements
 - High brine flows (*typical of drought operation*) – brine only discharge is ok
 - Low brine flows – requires at least 1.4 mgd of effluent to meet most stringent discharge standard



Operating Scenarios

- ◆ 3,125 Acre Feet Per Year (AFY) Facility
 - Sizing for initial Reactivation
- ◆ 7,500 AFY Facility
 - Should Drought condition continue
 - Decision in April 2016 time frame
- ◆ 500 AFY – Standby Mode

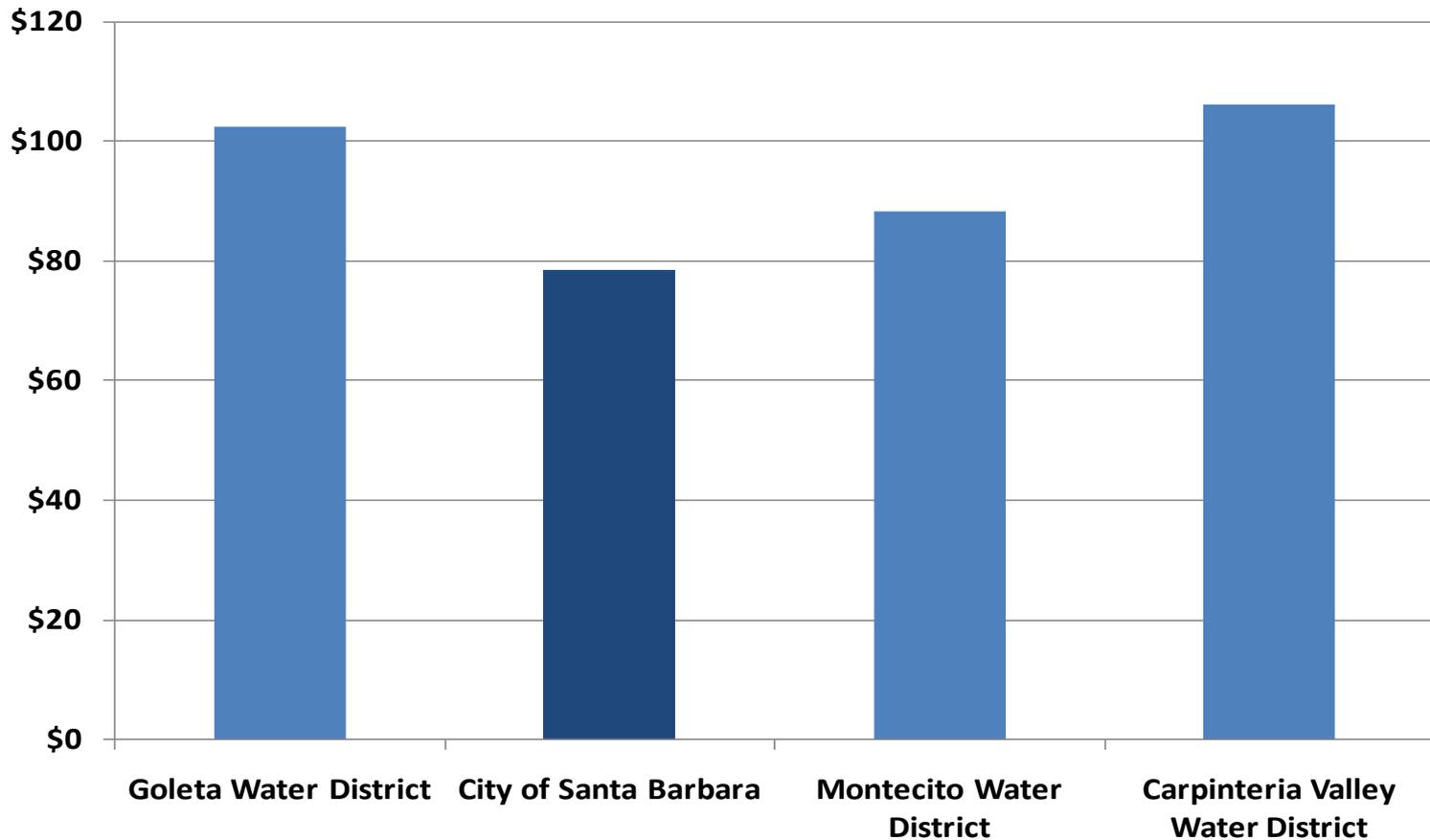


Project Cost

- ◆ 3,125 AFY Capacity Facility
 - \$32M - Capital Reactivation Costs
 - \$5.2M - Operational Cost

Current South Coast Water Rates

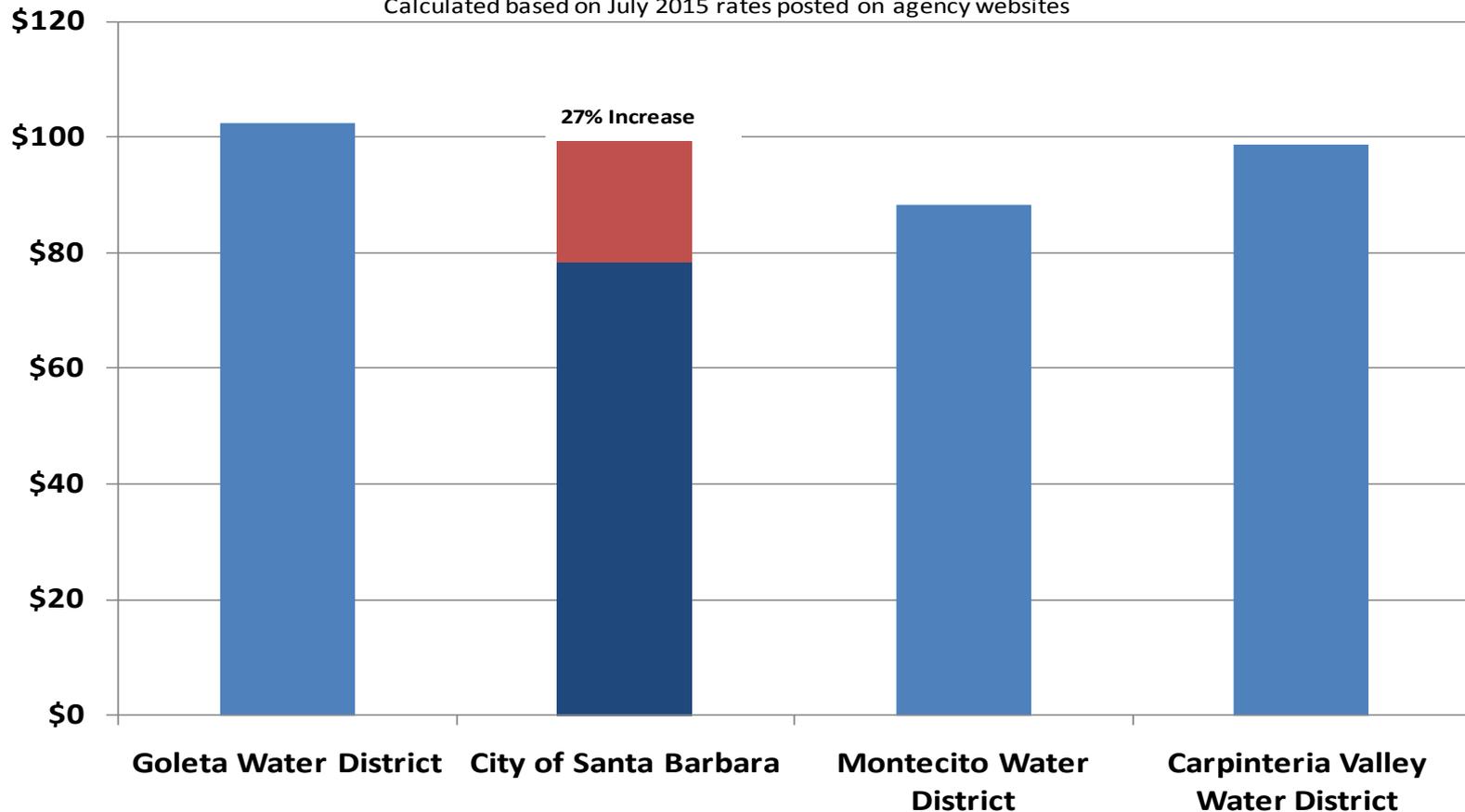
**FY 15 South Coast Monthly Charges for 12 HCF Use
Single Family Residential Customer with 5/8" meter**



Proposed South Coast Water Rates with Desal

FY 15 South Coast Monthly Charges for 12 HCF Use Single Family Residential Customer with 5/8" meter

Calculated based on July 2015 rates posted on agency websites





Permit Status



Permit Status

◆ Coastal Development Permit

- Coastal Commission Staff Determination
 - Existing CDP is valid for Operation
 - New CDP for “Repair and Maintenance” is needed for reactivation activities

◆ NDPES Permit

- Renewal required in 2015
- Currently working with SWRCB and RWQCB
 - Amendment pursuant to Section 13142.5(b) of the Water Code



Permit Status

- ◆ CA State Lands Lease
 - No Action Required – activities are within Legislative Grant Area of the City
- ◆ CA Dept of Public Health
 - City's Operating Permit will be amended during the desalination plant reactivation
- ◆ US Army Corps 404/Section 10 Permit
 - Currently in Consultation with Army Corp for construction in navigable waters of the US

Seawater Intakes Receive Increase Attention as a Result of New Regulations

- ◆ USEPA – Clean Water Act 316(b)
 - Regulates intakes for power plants that use water for once-through cooling
 - ✓ Water use is significantly greater than desalination
 - ✓ New alternatives exist for power plant cooling
- ◆ California Ocean Plan Amendments
 - Draft seeks to adapt requirements to desalination plants

Open Ocean Intakes Like the City's Have Environmental Effects

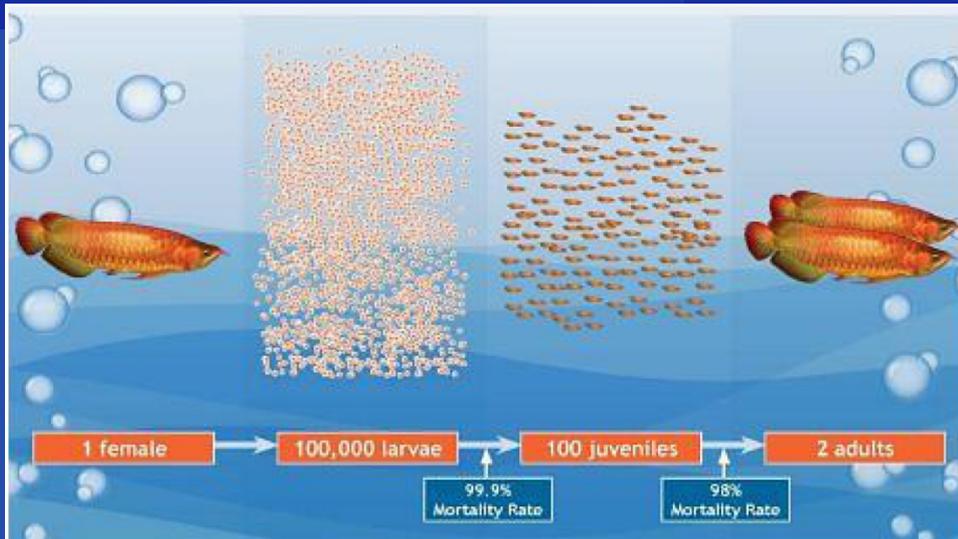
- ◆ **Impingement** – Fish stuck against a screen
 - Mitigated through the use of new intake screen design (no impact)
- ◆ **Entrainment** – Fish larva smaller than the screen size can be entrained by the intake
 - Mitigated to the greatest extent possible by screen size & type

What is the Magnitude of the Intake's Environmental Effects?

- ◆ Entrainment impacts only with updated screen design
- ◆ Based upon SWRCB Report (2010), the City's impact would be:
 - 3,125 AFY: 17 Million larva/yr
 - 7,500 AFY: 38 Million larva/yr

These estimates are high considering the updated screen design planned

What is the Magnitude of the Intake's Environmental Effects?



Source: Tenera Environmental

Example: Halibut

- ◆ Annual entrainment impact equal to the bio-productivity of:
 - 3,125 AFY: 0.4 adult fish
 - 7,500 AFY: 0.8 adult fish

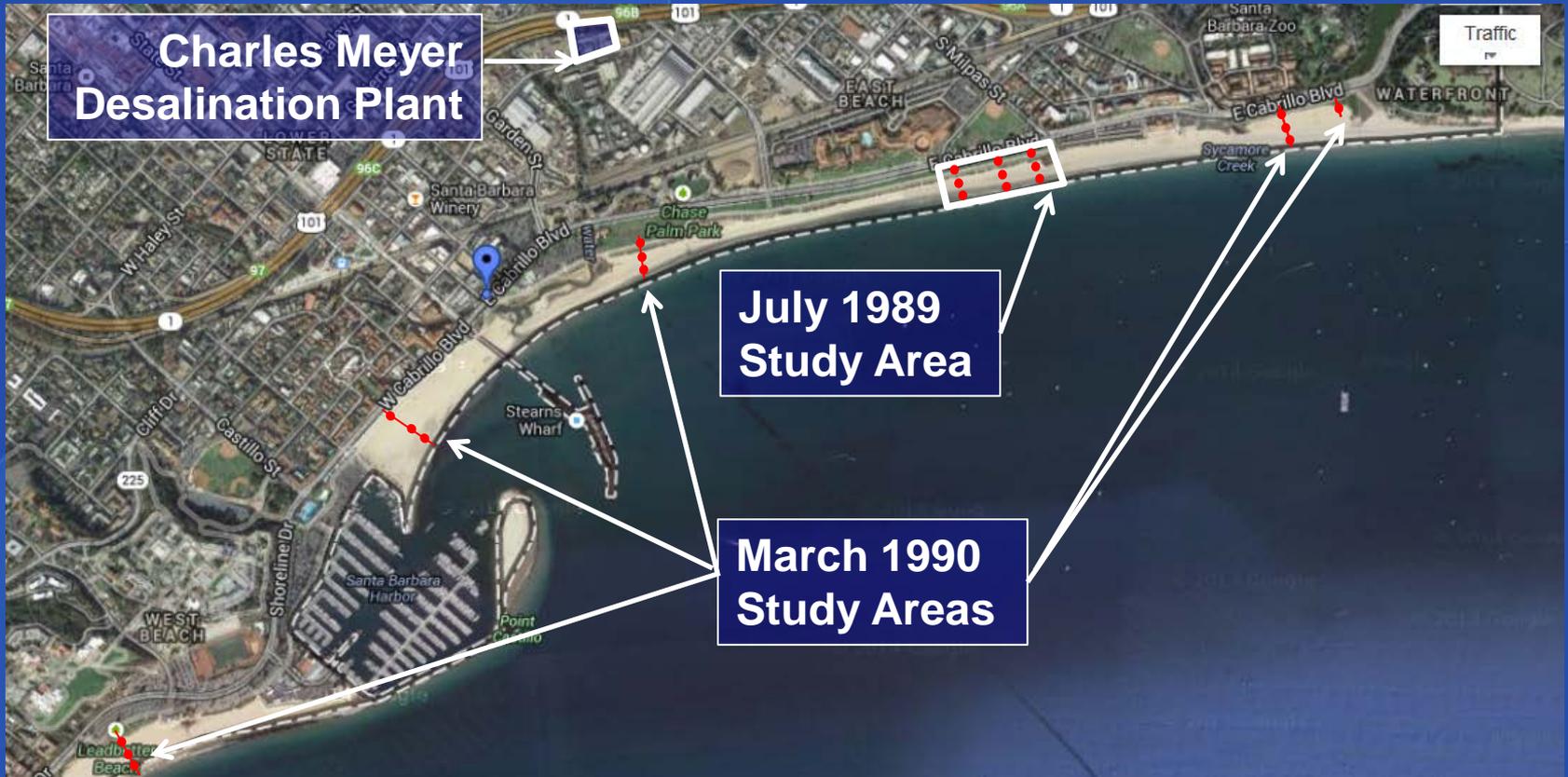
*Daily catch limit is
1 halibut / fisherman*

Alternative Intakes Were Evaluated in the Studies Leading Up to 1990 Desalination Proposals



Source: TM2 - Seawater Desal Project Technical & Cost Considerations, CH2M Hill, November 11, 1988

Two Separate Field Studies Were Conducted to Verify Hydrologic Conditions





Subsurface Intakes Determined Not Feasible

- ◆ 1990 Feasibility Report Conclusion
 - *If the 3,500 AFY capacity option is selected, beach front wells should not be pursued further and further beach front testing will not be necessary*
- ◆ Note
 - Preliminary studies evaluated a smaller capacity facility compared to the regional 7,500 AFY facility ultimately constructed
 - All subsurface intake alternatives were compared against a new 7,500-ft off-shore open intake instead of the 2,500-ft slip lined open intake that was ultimately constructed

New Subsurface Intake Alternatives Exist But Have Impacts that Should be Considered

- ◆ Offshore filter basin
- ◆ Advocated by NGOs for Huntington Beach



Subsurface Infiltration Gallery (SIG)

- ◆ Few large scale examples
 - May be difficult to finance
- ◆ Time Impact for Implementation due to Permits From Multiple Agencies

SIG Performance May Impact City's Water Supply Reliability

- ◆ SWRCB Expert Panel Was Skeptical About SIG Performance
(SWRCB 2012, Appendix 3, Page 11)
 - Fukuoka Japan intake reduced plant capacity by 25%
 - Treatment Costs High Do to Poor Quality Water
- ◆ Long Beach Demo Project Problems
 - Capacity reduced by over 2 times in only 6 months of operation
 - Treatment costs significantly higher than expected

Construction Impacts Are Evasive – Over 5 Acres Of Ocean Floor Excavation Required



The City's Schedule Is Based Upon Water Supply Projections and Is Consistent with the 2011 LTWSP

- ◆ May – July 2014 Study Phase: Consult regulatory agencies to ensure reactivation activities comply with existing permits; Refine project scope;
- ◆ Aug – Oct 2014 Develop Contract Documents: Prequalify & develop docs to procure services for a contractor to reactivate & operate facility
- ◆ Nov – Jan 2015 Bid Phase: Bids due January 2015
- ◆ Feb 2015 **Bids received**
- ◆ May 2015 **Award contract**
- ◆ Summer 2016 **Begin Production**



Recommendation

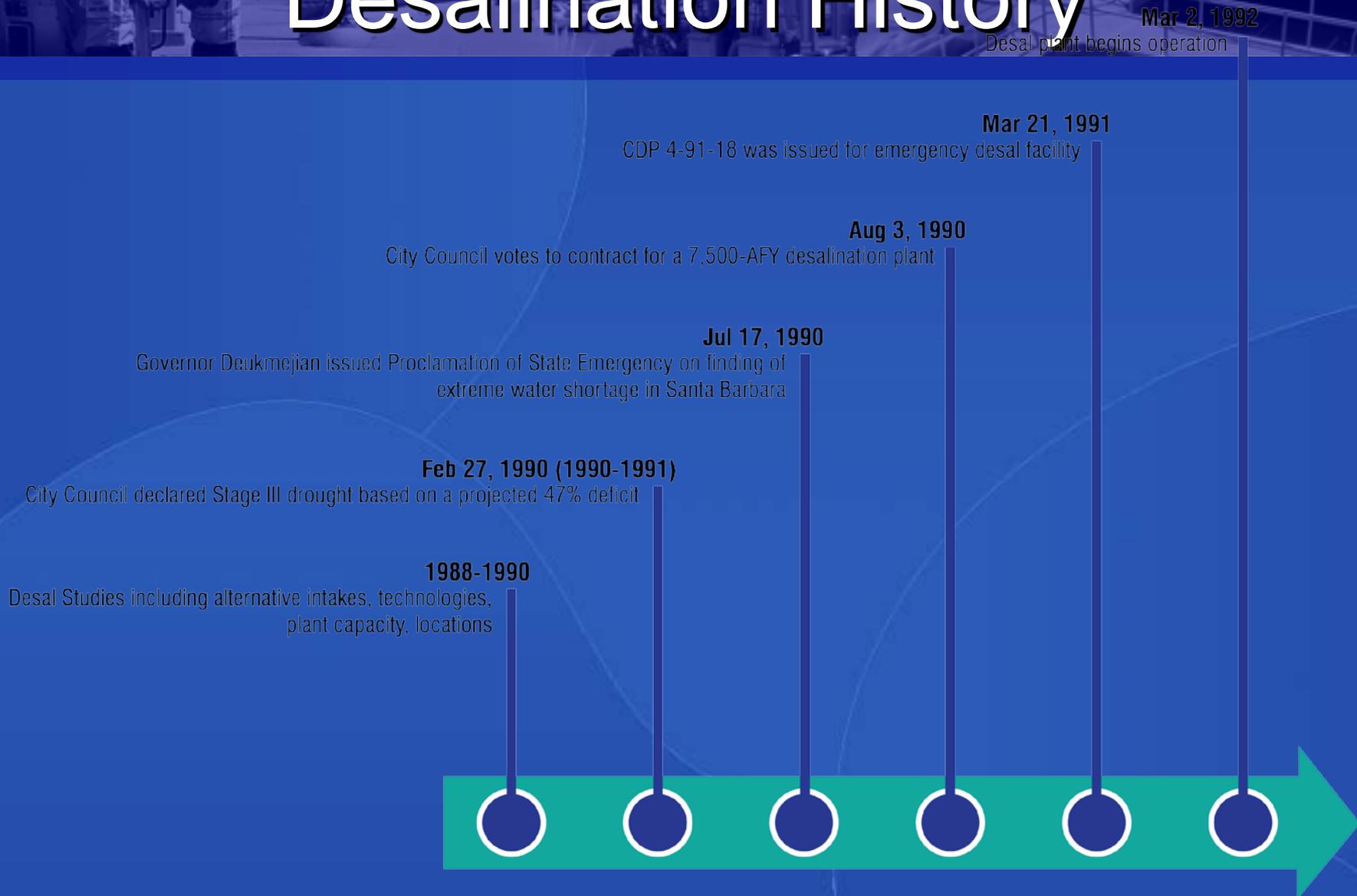


Recommendations

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Overview of City's Early Desalination History



The City Converted Temporary Facilities to Permanent Facilities

Jun 14, 2011

City updated their LTWSP, which continues to include the desal plant as permanent facility used for drought relief/recovery

Sep, 2010

City updated General Plan EIR, which continues to include the desal plant for drought relief/recovery

May 13, 2010

City renewed NPDES permit for EL Estero WWTP/Desal Plant

Oct 9, 1996

CCC approved CDP 4-96-119 for permanent desal facility

Jul 2, 1996

City submitted CDP Application to convert plant to permanent facility

Dec 7, 1995

City Planning Commission adopted Resolution 069-95, approving CDP for permanent desal plant

May 24, 1994

LTWSP FEIR includes conversion of temporary desal plant to permanent facility

Dec, 1993

Intake screen removed for repair onshore

Jun 4, 1991

City voters overwhelmingly support permanent desal

