Orange County Water Reuse
Peters Canyon Wash Channel
Water Capture and Reuse Pipeline Project

April 20, 2017
Agenda

History and Approach
Design and Construction
Lessons and Challenges
Questions
History and Approach

Jian Peng, PhD
Water Quality Planning, OC Environmental Resources
OC Public Works, County of Orange
Geological Sources and Hot Spots (USGS 2006)

Se-Bearing Formations

[Map with Se-Bearing Formations highlighted]
Rising Groundwater
Selenium Sources in Newport Bay Watershed

- Rising GW, 69%
- Urban Runoff, 10.4%
- GW ST Dewatering, 5.7%
- GW LT Dewatering, 1.4%
- GW ST Clean-up, 0.2%
- GW LT Clean-up, 2.8%
- Sewered GW, 9.4%
- Ag, 0.3%
- Nurseries, 0%
- Open Space, 0.9%
- Atm. Dep, 0%
The Swamp Effect
Lower Peters Canyon Mass Balance Studies - 2012

Map of Lower Peters Canyon with marked sites and flow rates.

<table>
<thead>
<tr>
<th>Sites</th>
<th>Flow (cfs)</th>
<th>Se (ppb)</th>
<th>N (ppm)</th>
<th>TDS (ppm)</th>
<th>Se (lbs/yr)</th>
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Achieved and Anticipated Selenium Reduction

Selenium Load (lbs/yr)

2005  2010  2015  2020

- Peters Canyon Project
- Diffuse Loads
- Point Source Loads

Achieved

Anticipated

- Selenium Removal Projects
Design and Construction

Ray Bennett, P.E.
Engineer
Irvine Ranch Water District
Overall Project

- Pipeline
- Moffett Diversion
- Edinger Diversion
- Como Diversion
- Bridge Crossing
- Connection to OCSD
- Caltrans

Irvine Ranch Water District
Pipeline Construction

Pipeline
- 17,000 ft of 8 to 16 inch pipe.
- Adjacent to Peters Canyon Wash and San Diego Creek
- Within OCFCD maintenance road and bike path
Four (4) major street crossings:
- Alton Parkway,
- Barranca Parkway,
- Warner Avenue and
- Edinger Avenue
Two (2) Bridge Crossings:
• Walnut Avenue and
• Barranca Parkway
Jack and Bore

One (1) 283 ft. jack and bore beneath
• Railroad,
• Metrolink and
• Como Channel

Jacking pit

Receiving pit
Diversion and Inlet Structures

Como Channel
Trapezoidal channel
Valencia Drain
Box culvert
Edinger Drain
RCP
Caltrans GWTF Facility
Como Channel Trapezoidal channel
Main Street Sewer
Edinger Drain RCP
Como Channel Diversion Structure
Edinger Avenue Diversion Structure
Cost and Construction Summary

- Construction was completed in 20 months
- Construction cost was $8,497,722
- Design and Construction Support was about 20% of construction cost
- Total project cost was $10,544,720 (as of Jan ‘17)
Lessons and Challenges

Ray Bennett, P.E.
Engineer, Water Resources
Irvine Ranch Water District
Multi Agency Involvement

• Background & Issue:
  – Multiple agencies want a regulatory solution
  – Each has unique review process, contracting limits, etc.

• Solution:
  – Development Agreement
    • Ownership & responsibilities
    • Pipeline capacity and cost allocation
    • Operation and maintenance costs
    • Allocation of nitrogen and selenium reductions
    • Legal (indemnification, successors, attorney fees, ..)
  – Coordination
    • Monthly reports and quarterly progress meetings
Right of Way

• Background & Issue:
  – Diversions will occur near Peters Canyon Channel
  – Existing maintenance road and bike path are obvious
  – OCFCD needs to reserve right-of-way for future flood control

• Solution
  – Agreement requires participants to share in risk.
  – Acknowledges the main purpose of right-of-way
  – Provides actions if future circumstances require relocation
    • Participants will confer in good faith
    • Costs of relocation will be paid by Funding Parties
• Background & Issue:
  – Diversions will be discharged to OCSD
  – Cost of treatment can exceed over $1.5 million per year
  – OCSD has an Urban Runoff Diversion Program for dry weather flows

• Solution
  – Structure part of project to meet Urban Runoff Diversion Program’s low flow limit
  – Coordinate to expand the existing cap and ensure project diversions fit beneath that cap
Project Costs

• Background & Issue:
  – Need a partner agreement to begin design
  – Estimated costs are at a feasibility level

• Solution
  – Recognize limitations of feasibility study
  – Include sufficient contingency for unknowns
  – Aggressively pursue cost savings measures:
    • Grants
    • Right of way
    • OCSD urban runoff program
    • Approach to cross bridges and roads
Summary

- Peters Canyon Diversion project is a success
  - Win for participants by meeting RWQCB requirements
  - Win for the environment by improving water quality
  - Win for the County by increasing water reuse

- Excellent example of a multi agency development

- BIG THANKS
  - All cooperating agencies, boards, consultants and contractors
  - OC Reuse