



# Santa Clara River Levee Improvements Upstream of Highway 101 (SCR-1) Pre-Scoping Meeting



# Today's Road Map

- Who is VCWPD and what is their mission?
- Who are the stakeholders?
- What is the project setting?
- What is a levee, what is SCR-1, why should I care?
- How do we solve the flood protection problem?
- What are some of the local challenges?
- Can a flood protection project provide other benefits?
- How will this be paid for?
- What are the next steps?
- What can be done to protect people in the meantime?
- Questions? Comments?

# Introductions & Presenters

- *Glenn Shephard* Director, Ventura County Watershed Protection District (VCWPD)
- *Kirk Norman* Project Engineer, VCWPD
- *Gerard Kapuscik* Levee Certification Program Manager, VCWPD
- *Ike Pace* Project Manager, Tetra Tech
- *Ewelina Mutkowska* Manager, Ventura County Stormwater Program
- *Robert Richardson* Associate Engineer, United Water Conservation District
- *Angela Bonfiglio Allen* Project Environmental Planner, VCWPD



## OUR MISSION

Protect life, property and community infrastructure from flood events, improve water resources management, and enhance the health and natural function of watersheds in Ventura County



## OUR VISION

We champion an environmentally-resilient and economically-sustainable future for Ventura County watersheds through regional leadership and building community alliances benefiting current and future generations.



# Stakeholders

Federal Emergency Management Agency

US Army Corps of Engineers

City of Oxnard

Riverpark Neighborhood Council

United Water Conservation District

Ventura County Farm Bureau

US Fish and Wildlife Service

California Department of Fish & Wildlife

National Marine Fisheries Service

Ventura County Stormwater Program

CalTrans

Native American Groups

State Coastal Conservancy

Fox Canyon Groundwater Management Agency (GW Sustainability Agency)

California Department of Water Resources

State Water Resources Control Board

Los Angeles Regional Water Quality Control Board

Rio School District

Santa Clara River Watershed Committee

The Nature Conservancy

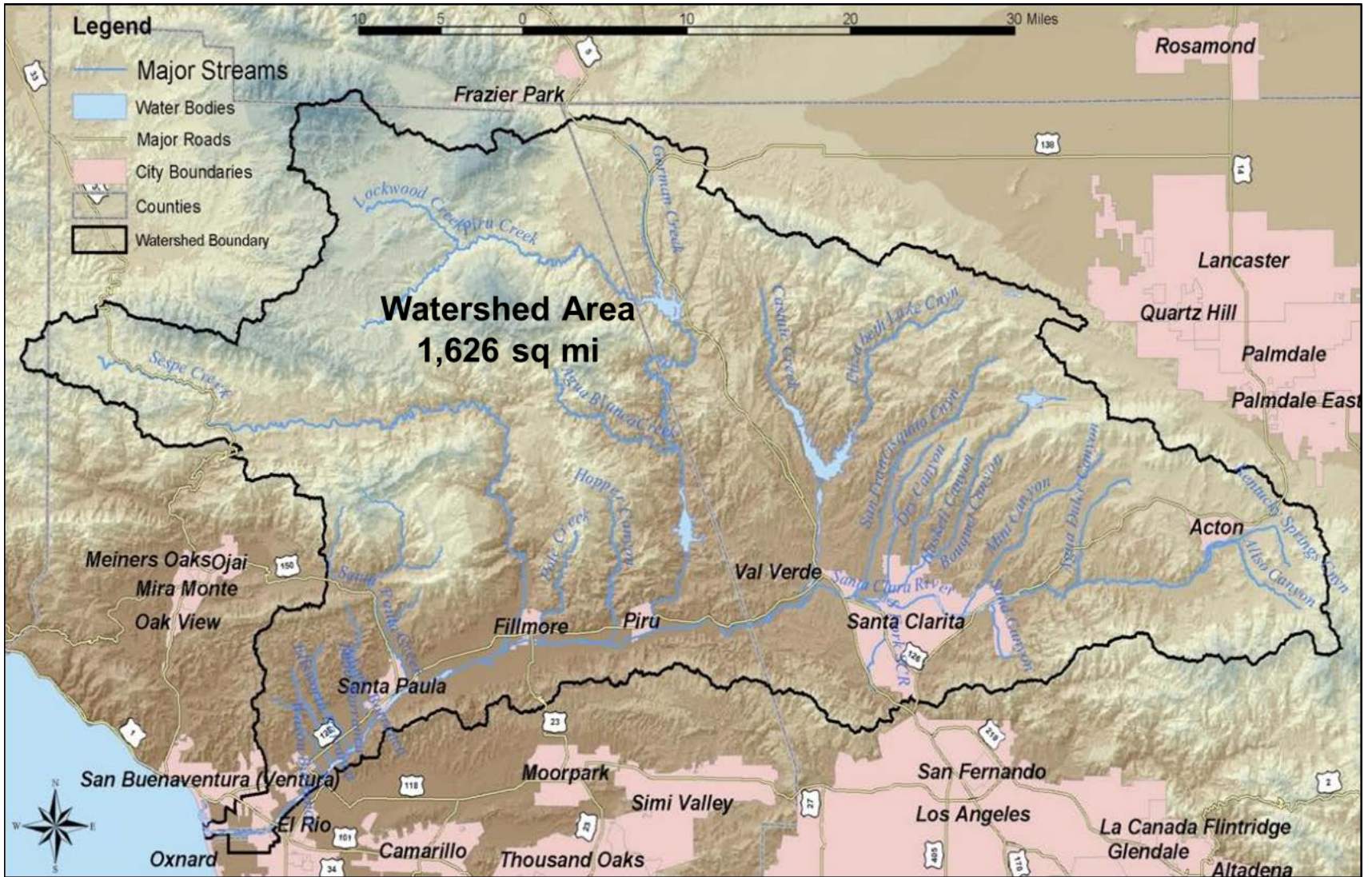
Friends of the Santa Clara River

Ventura Audubon Society

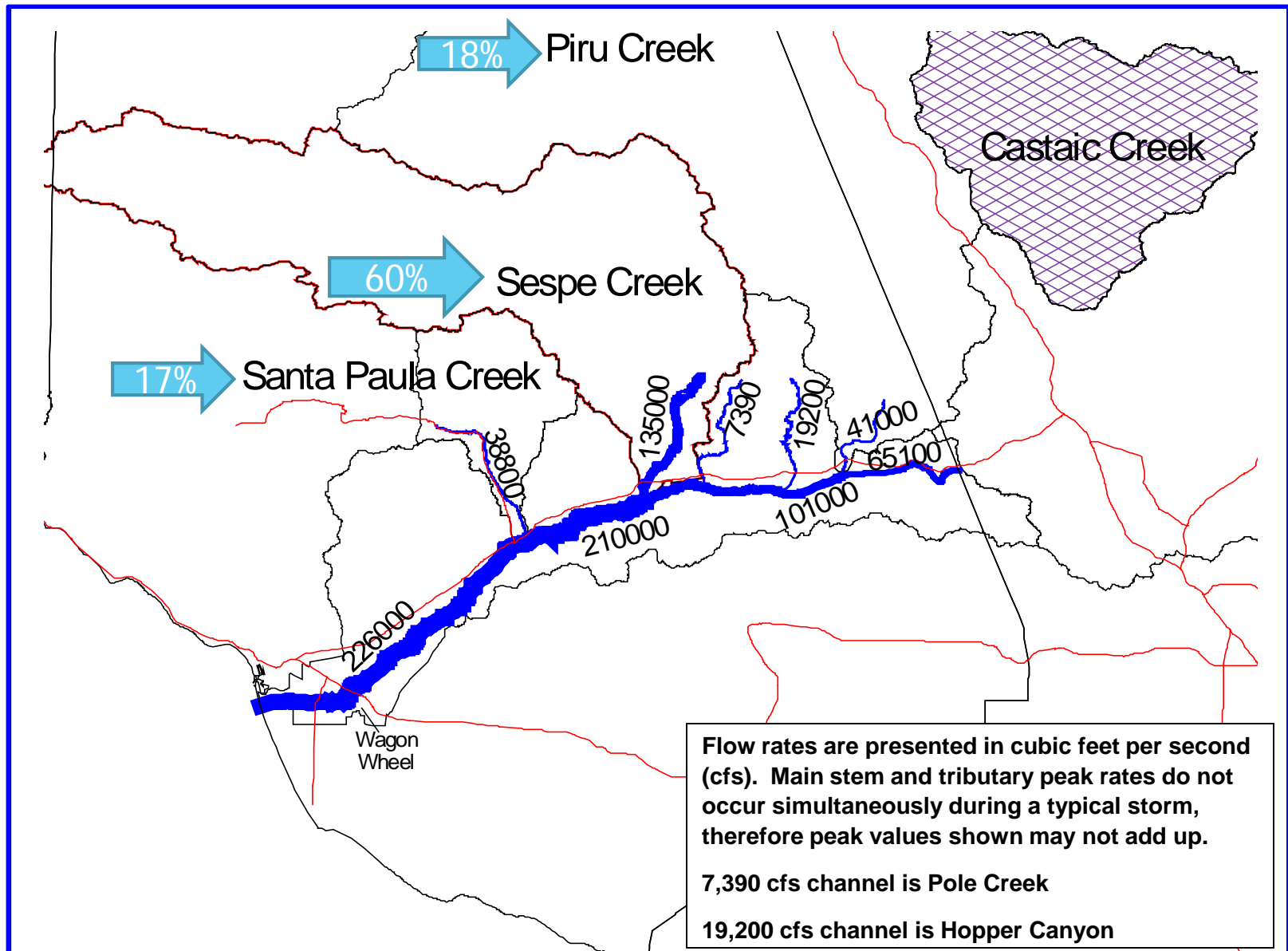
CalTrout

Sierra Club

# Setting

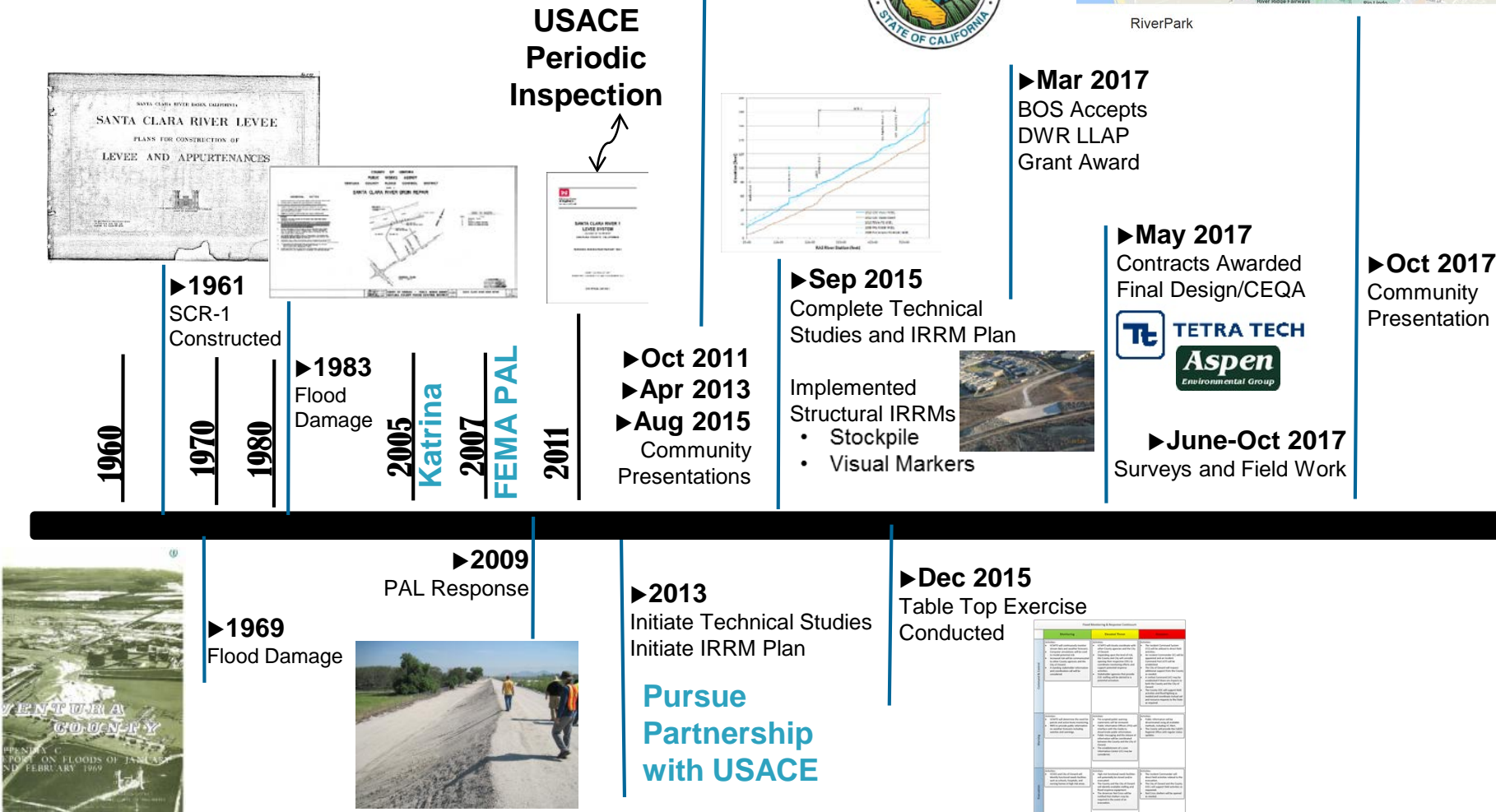


# Lower Santa Clara River Watershed: One Percent Annual Chance Flood Flow Volumes





# Historical Timeline



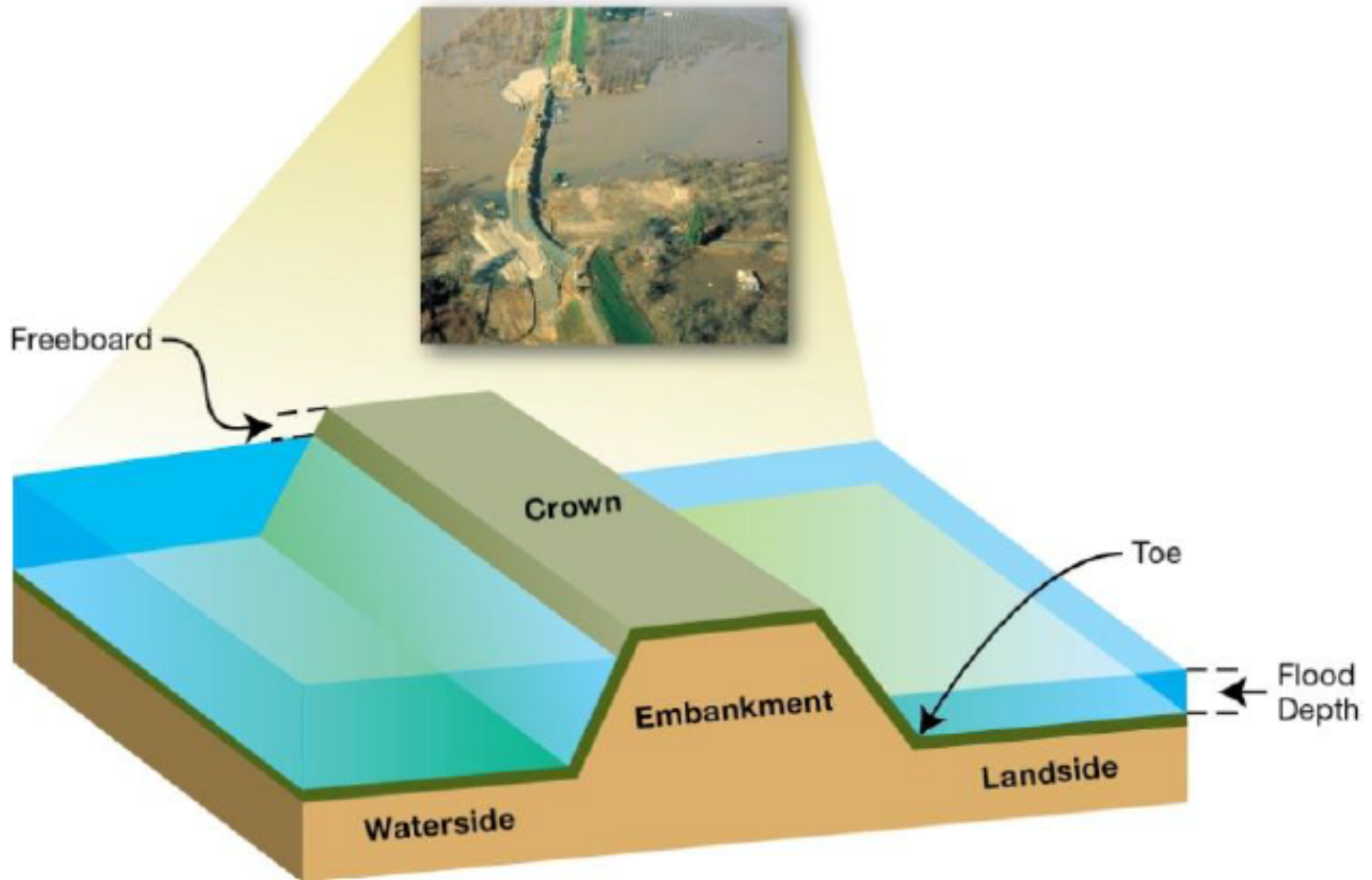


# Santa Clara River Levee (SCR-1)





# Anatomy of a Levee





**Legend**

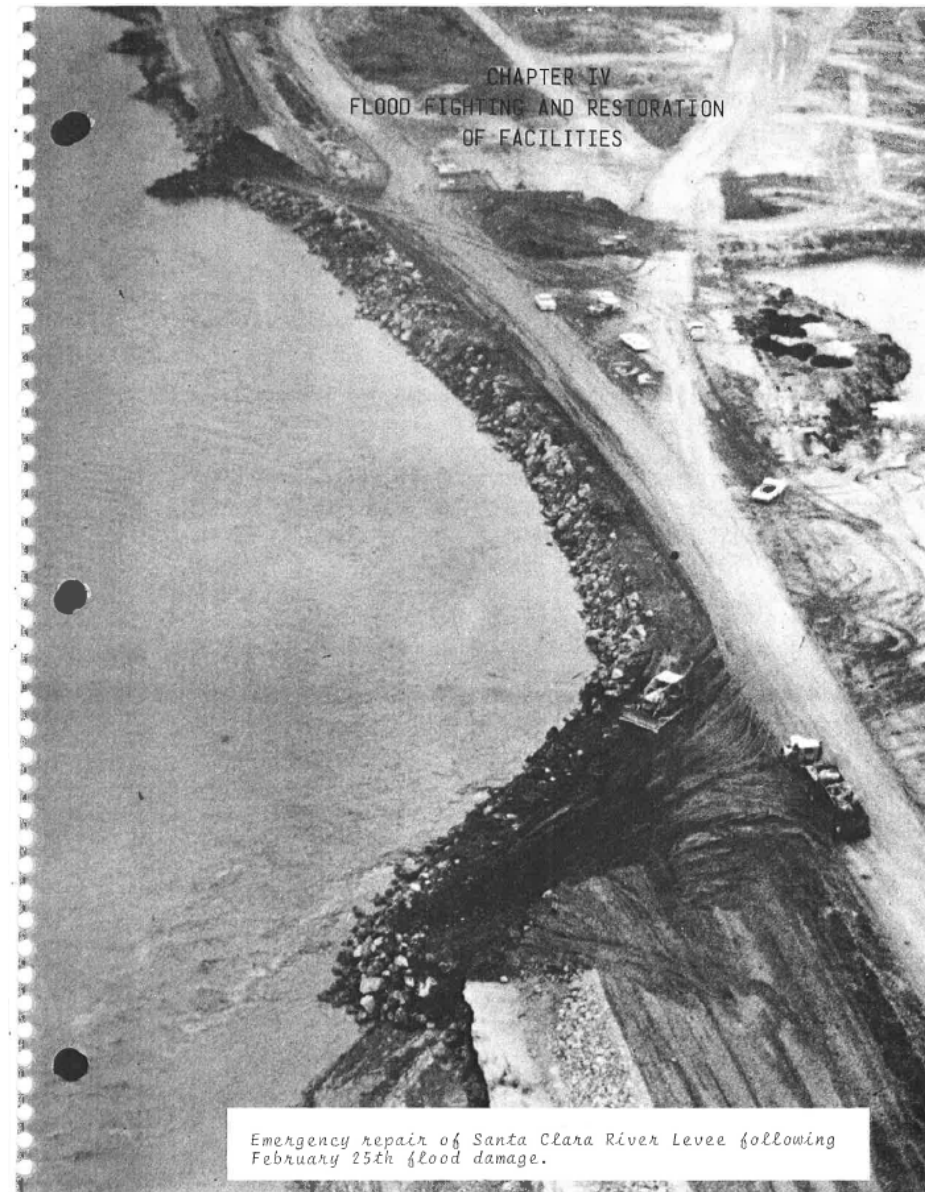
- Levee SCR-1
- FEMA 100-yr Flood Zone (Zone AE)
- Protected by Levee (Zone X)
- USACE Leveed Area





# Background

- Originally designed and constructed by U.S. Army Corps of Engineers
- Completed in 1961, 4.72 miles of levee with 40 groins.
- 1969 floods breached 2,100 linear feet of the levee and groins
- 1983 floods damaged groins





# Historic Floods: 1969



Wells Road Bridge

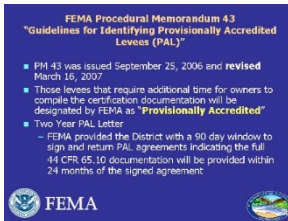


# FEMA Levee Certification Process Milestones



August-2005

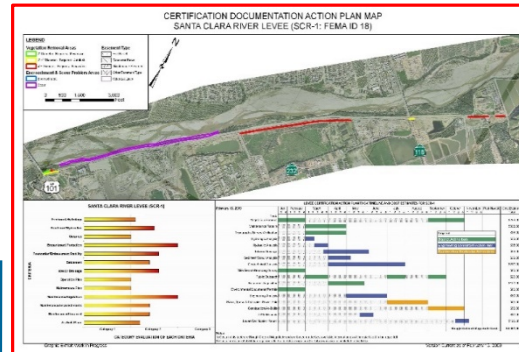
2006  
►2006 Preliminary Levee Certification Program Guidelines issued by FEMA



2007

►3/16/07 FEMA Issues REVISED Procedural Memo (PM43) for Provisionally Accredited Levee (PAL) Documentation Package Submittals

2008-2009

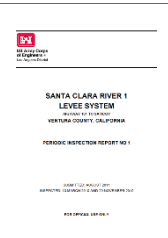


►November 2008-2009: SCR-1 Levee Field Inspections, Geotech Evaluations and Required Engineering Analysis Performed

2010-2011

►3-26-10 FEMA Notifies District of SCR-1 Levee De-Accreditation Status

USACE Periodic Inspection (2011)



2012 District Begins Work To:

Pursue Project Partnership Development with USACE

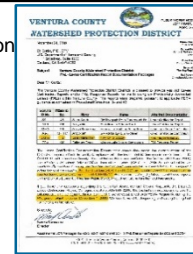
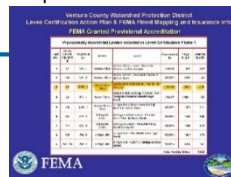
Initiate Project Feasibility Studies

Seek Grant Funding



►11-20-07 District Submits 24-Mos. PAL-Designation Request Letter to FEMA

►June 2008 FEMA Approves PAL-Designation Request



►11-24-09 District submits PRR to FEMA informing them that SCR-1 Levee, in its current condition, **is not able to meet all of** the 44 CFR 65.10 Requirements

# Federal Levee Certification Requirements and SCR-1 Assessment Results

## FEMA Levee Certification Requirements

### Code of Federal Regulations (44 CFR 65.10)

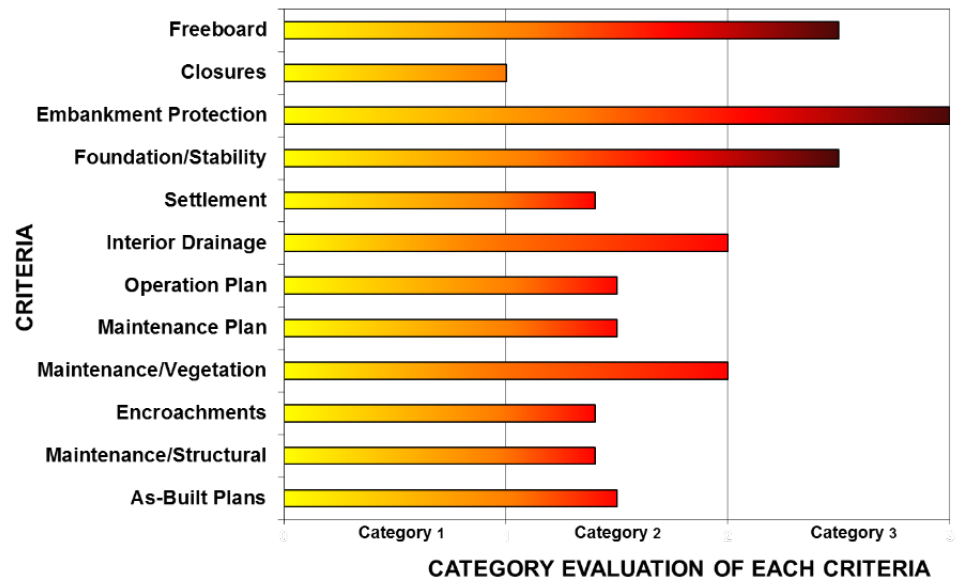
- For the purpose of NFIP maps, FEMA will **only** recognize levee systems that *meet* and *continue to meet* design, operational and maintenance criteria of the Code of Federal Regulations, Title 44, Section 65.10 ([44 CFR 65.10](#)), which was adopted on August 25, 1986
- Certification Criteria broken down into 6 **key** components:
  - Operations and Maintenance Plan
  - Freeboard
  - Closures
  - Embankment and foundation stability
  - Interior Drainage
  - Other Design Criteria



FEMA



### SANTA CLARA RIVER LEVEE (SCR-1)





# SCR-1 Levee Certification Deficiency Results

## Four Most Critical Elements

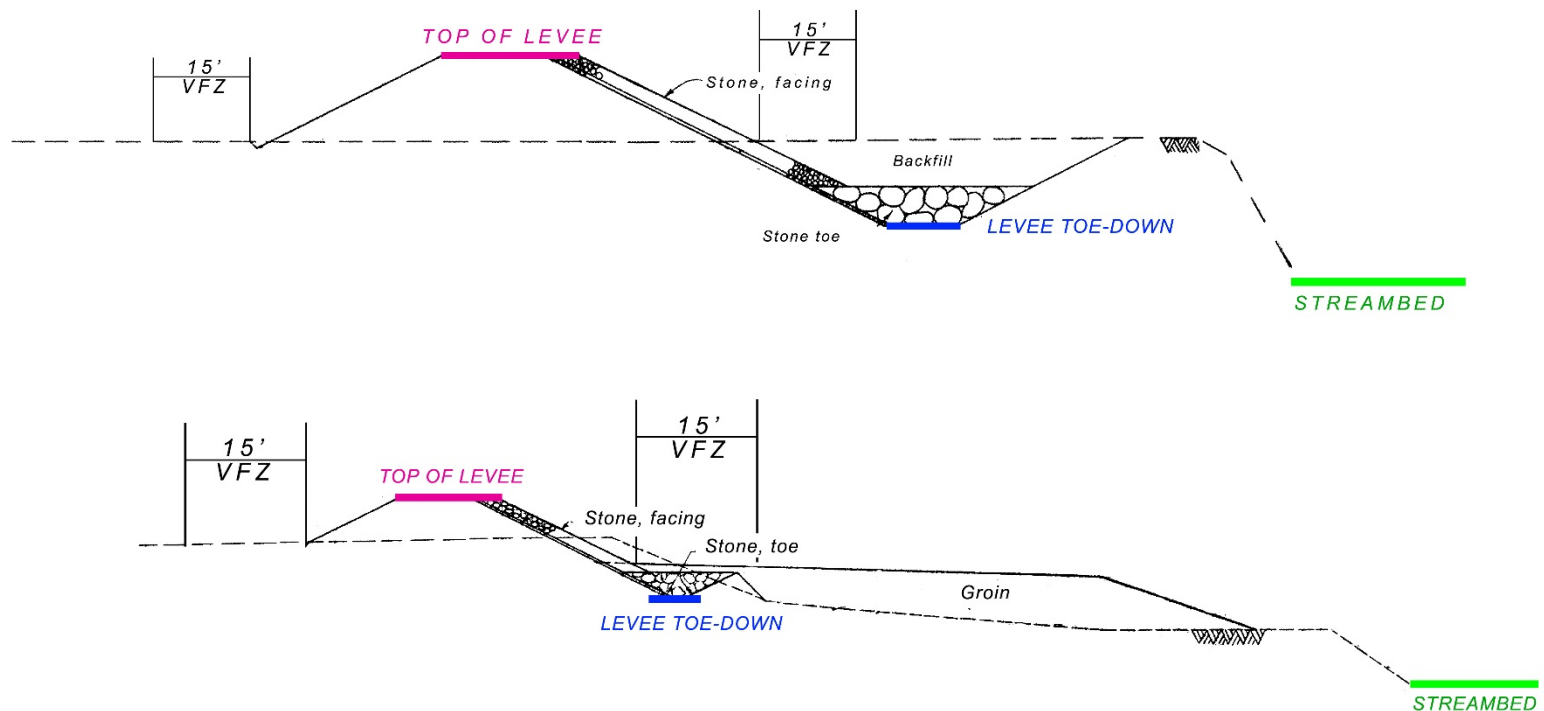


- **Inadequate Toe-Down Protection Depth**
- **Inadequate Riprap Revetment Size and Durability**
- **Inadequate Weighted Stone Toe Volume and Rock Size**
- **Inadequate Rock Groin Depth and Rock Size**



# FEMA Levee Certification Results

*VFZ = Vegetation Free Zone*



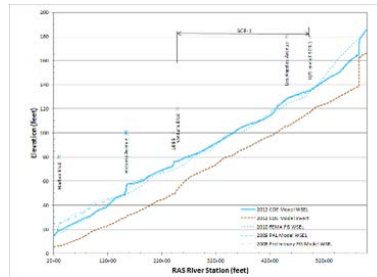
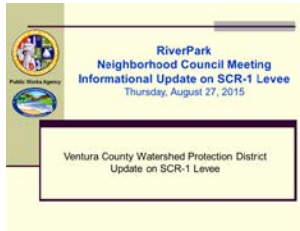
# How Do We Solve the Problem?

# Project Development Timeline



► **Apr 2013**  
Community  
Presentation

► **Aug 2015**  
Community  
Presentations



► **Sep 2015**  
Complete Technical Studies  
and IRRM Plan

Implemented  
Structural IRRMs  
• Stockpile  
• Visual Markers



► **2016**  
Consultant  
Contract Scoping  
Final Design/CEQA



RiverPark

► **May 2017**  
Consultant  
Contracts Awarded  
Final Design/CEQA  
**TETRA TECH**  
**Aspen**  
Environmental Group

► **Oct 2017**  
Community  
Presentation

► **June-Oct 2017**  
Surveys and Field Work

► **2013**  
Initiate Technical Studies  
Initiate IRRM Plan

**Pursue  
Partnership  
with USACE**

► **March 2015**  
DWR LLAP  
Grant Package



► **Dec 2015**  
Table Top Exercise  
Conducted

| Item  | Priority | Status      |
|---|----------|-------------|
| 1. Complete Technical Studies and IRRM Plan               | High     | Complete    |
| 2. Implement Structural IRRMs (Stockpile, Visual Markers) | High     | In Progress |
| 3. Complete Final Design/CEQA                             | High     | In Progress |
| 4. Award Consultant Contracts                             | High     | In Progress |
| 5. Conduct Surveys and Field Work                         | High     | In Progress |
| 6. Complete Final Design/CEQA                             | High     | In Progress |
| 7. Award Consultant Contracts                             | High     | In Progress |
| 8. Conduct Surveys and Field Work                         | High     | In Progress |
| 9. Complete Final Design/CEQA                             | High     | In Progress |
| 10. Award Consultant Contracts                            | High     | In Progress |
| 11. Conduct Surveys and Field Work                        | High     | In Progress |
| 12. Complete Final Design/CEQA                            | High     | In Progress |
| 13. Award Consultant Contracts                            | High     | In Progress |
| 14. Conduct Surveys and Field Work                        | High     | In Progress |
| 15. Complete Final Design/CEQA                            | High     | In Progress |
| 16. Award Consultant Contracts                            | High     | In Progress |
| 17. Conduct Surveys and Field Work                        | High     | In Progress |
| 18. Complete Final Design/CEQA                            | High     | In Progress |
| 19. Award Consultant Contracts                            | High     | In Progress |
| 20. Conduct Surveys and Field Work                        | High     | In Progress |

► **Mar 2017**  
BOS Accepts  
LLAP Grant



► **Jul 2017**  
DWR Issues  
LLAP Grant



# Screening Preliminary Alternatives

- ❖ 12 Preliminary Alternatives Evaluated
- ❖ 3 Carried Forward

| Alternative | Present Value of Future Benefits | Present Value of Discounted Costs | Benefit/Cost Ratio |
|-------------|----------------------------------|-----------------------------------|--------------------|
| 1           | \$42,424,176                     | \$74,979,284                      | 0.566              |
| 2           | \$42,424,176                     | \$118,139,430                     | 0.359              |
| 3           | \$42,424,176                     | \$105,106,753                     | 0.404              |

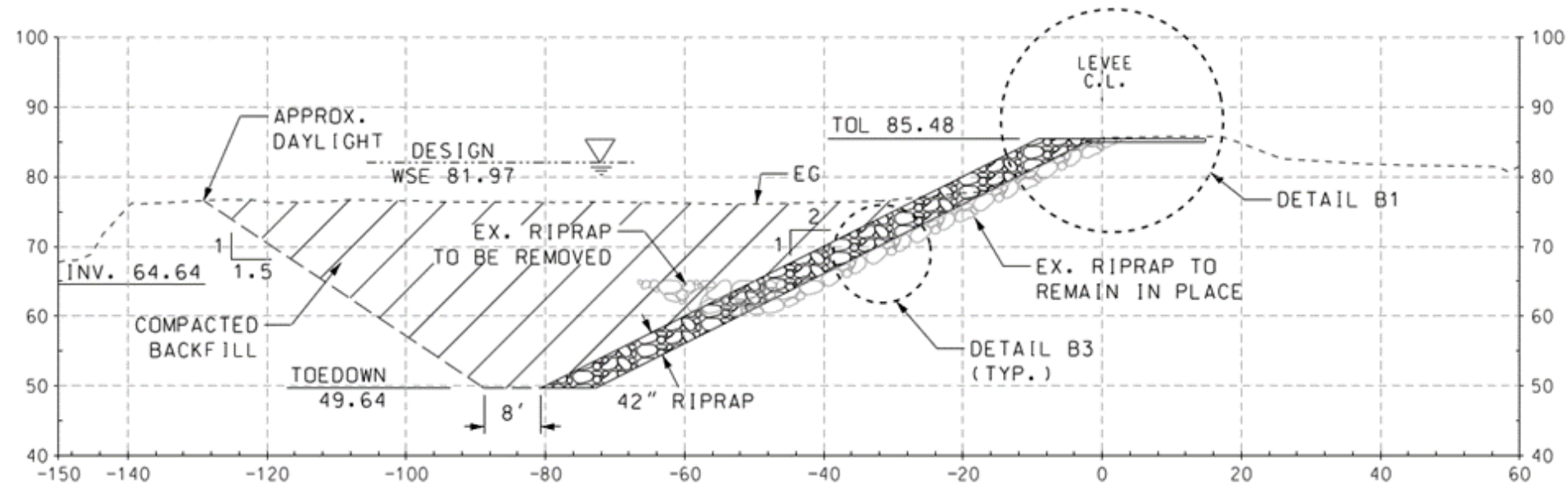


# Proposed SCR-1 Alignment



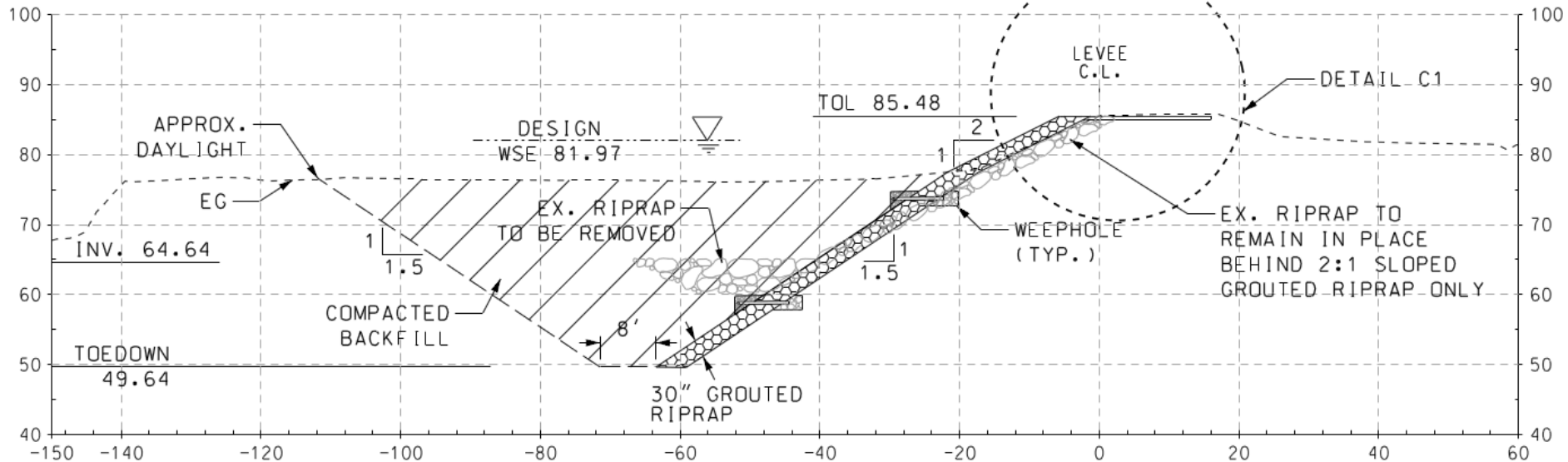


# Alternatives



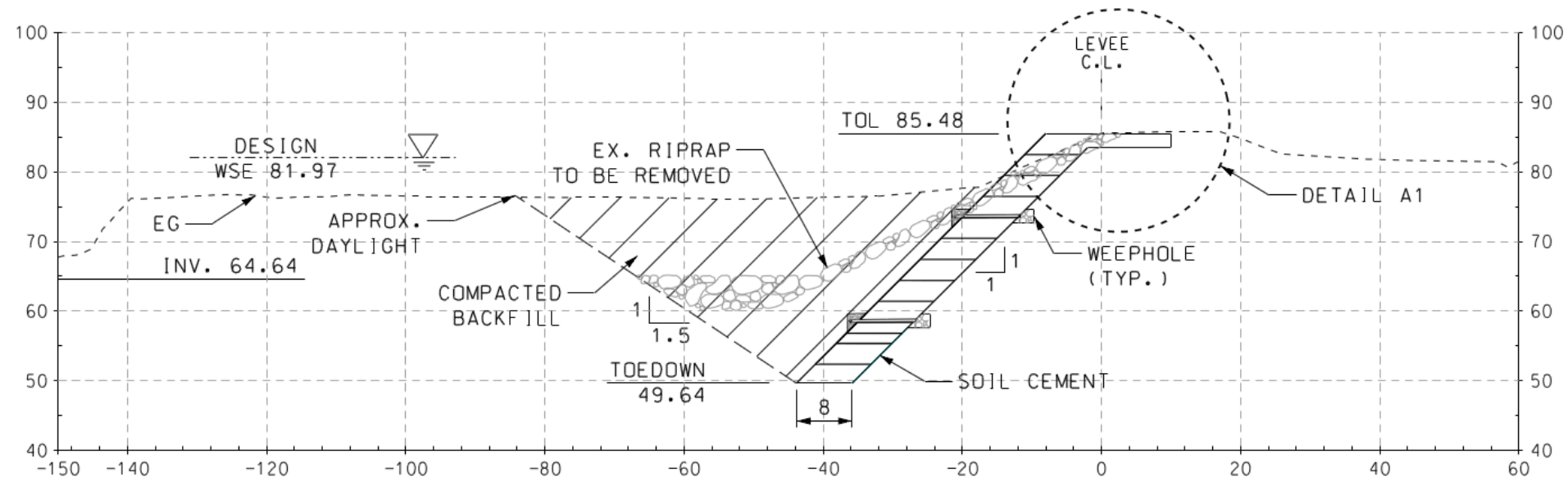
Typical Cross Section – Rock Riprap

# Alternatives



## Typical Cross Section – Grouted Rock Riprap

# Preferred Alternative



## Typical Cross Section – Soil Cement

# Local Challenges

- Periodic Flooding
- Development Pressures – Land Use Changes
- Threatened & Endangered Species (steelhead trout, southwestern willow flycatcher, least Bell's vireo, etc.)
- Limited Community Recreational Opportunities
- Water Quality Degradation
- Declining Groundwater Levels
- Seawater Intrusion – Groundwater Overdraft
- Water Availability (for Human and Ecosystem Uses)
- Climate Change Impacts

# Recreational Opportunities

## City of Oxnard Planned Santa Clara River Trail

**PUBLIC**  
VENTURA COUNTY  
**WORKS**

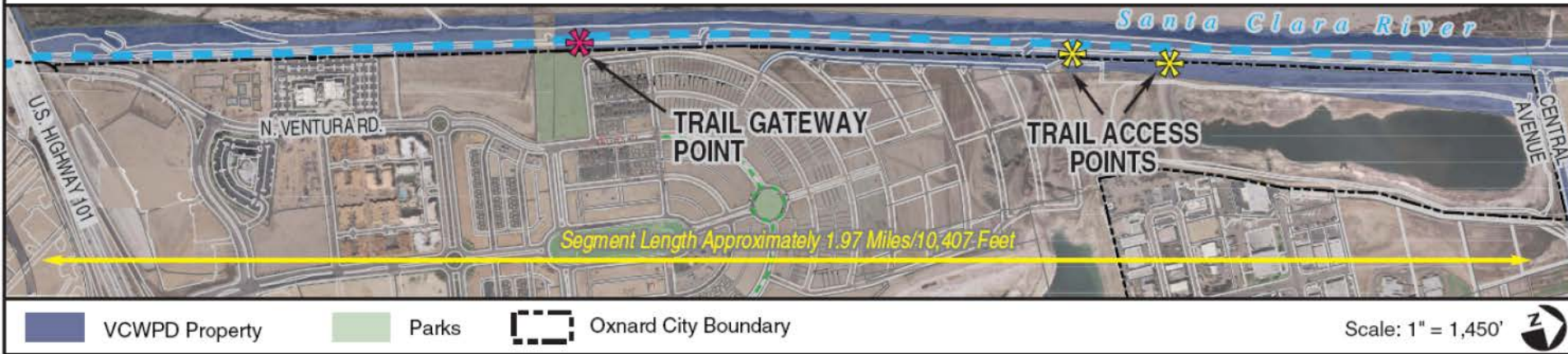
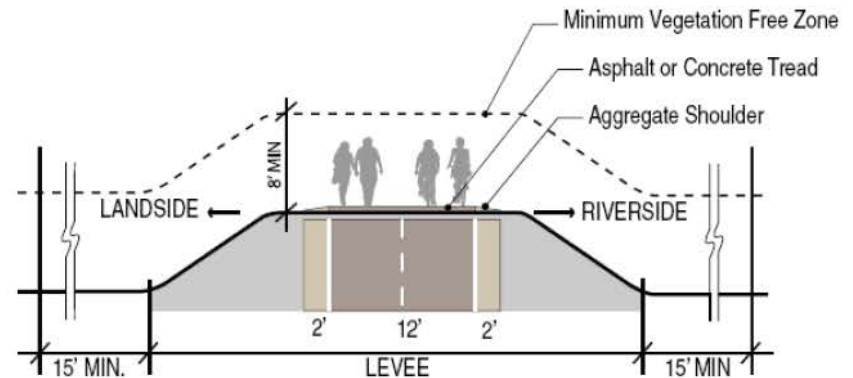


Slide 26  
VENTURA  
COUNTY



# Recreational Opportunities

## City of Oxnard Planned Santa Clara River Trail



VCWPD Property

Parks

Oxnard City Boundary

Scale: 1" = 1,450'





# Educational Opportunities



## STEAM Academy Partnership

### PUBLIC WORKS AGENCY HOSTS TOUR OF SANTA CLARA RIVER FOR RIO SCHOOL DISTRICT SUPERINTENDENT

🕒 Published: 25 August 2017

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🐦 Tweet

in Share

📌 Save



Watershed Protection District

OXNARD, Calif. – The Public Works Agency's Watershed Protection District recently hosted a tour of the Santa Clara River for the Rio School District Superintendent's office.

The Rio School District is building a new, 11-acre, K-8 STEAM Academy that will back up to the Santa Clara River



Other Potential Benefits:

Water Quality Enhancement

Stormwater / Dry Weather  
Runoff Conservation

# SCR-1 Multibenefit Project: Stormwater Capture at Ferro Basin



# County Stormwater Capture and Treatment Projects

## Regulatory Drivers:

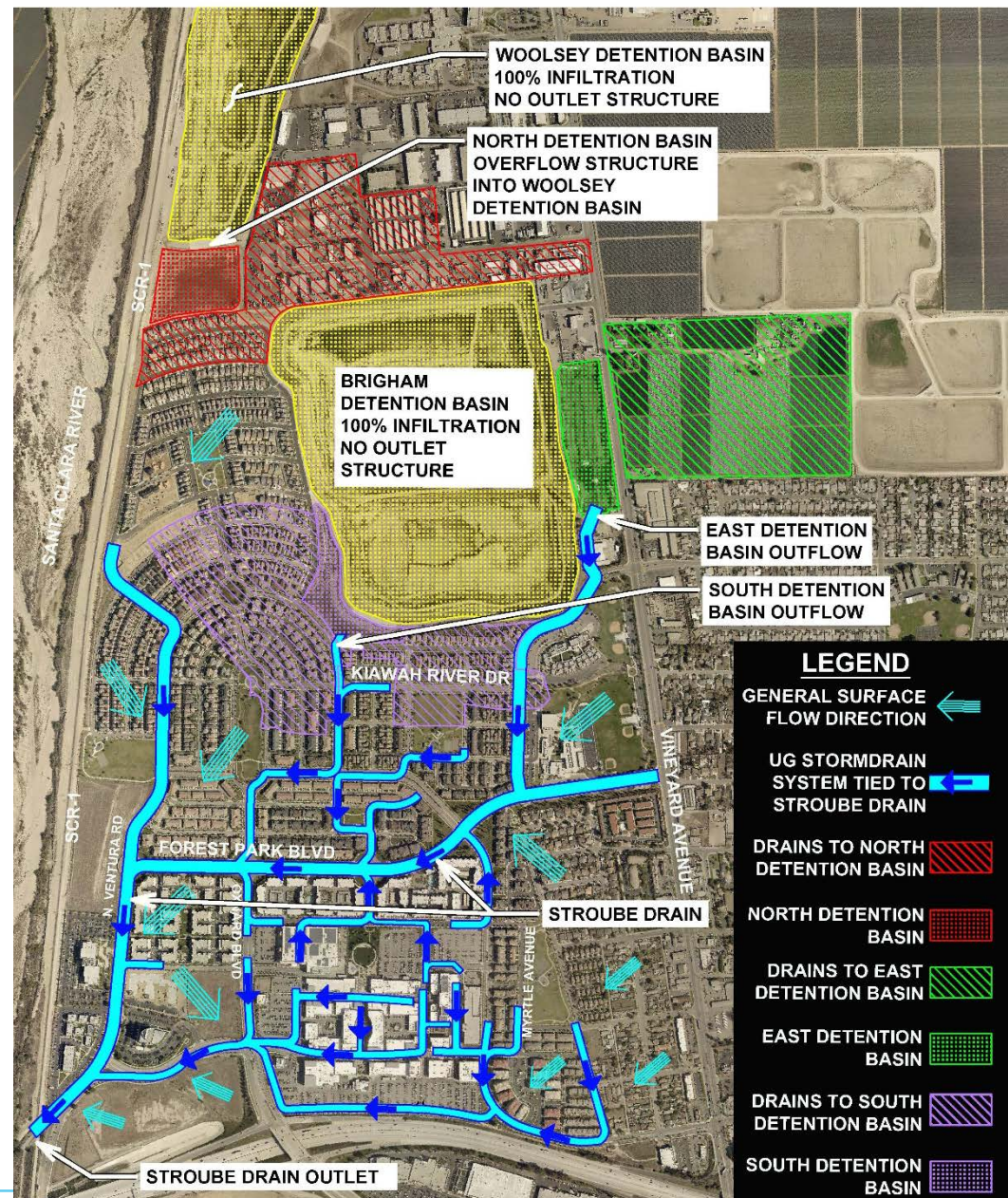
1. Federal Clean Water Act of 1972
2. National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit
  - New Development, Redevelopment
  - Retrofit of public facilities
  - BMPs to address exceedances
3. Santa Clara River Bacteria Total Maximum Daily Load (TMDL)



## Funding challenges

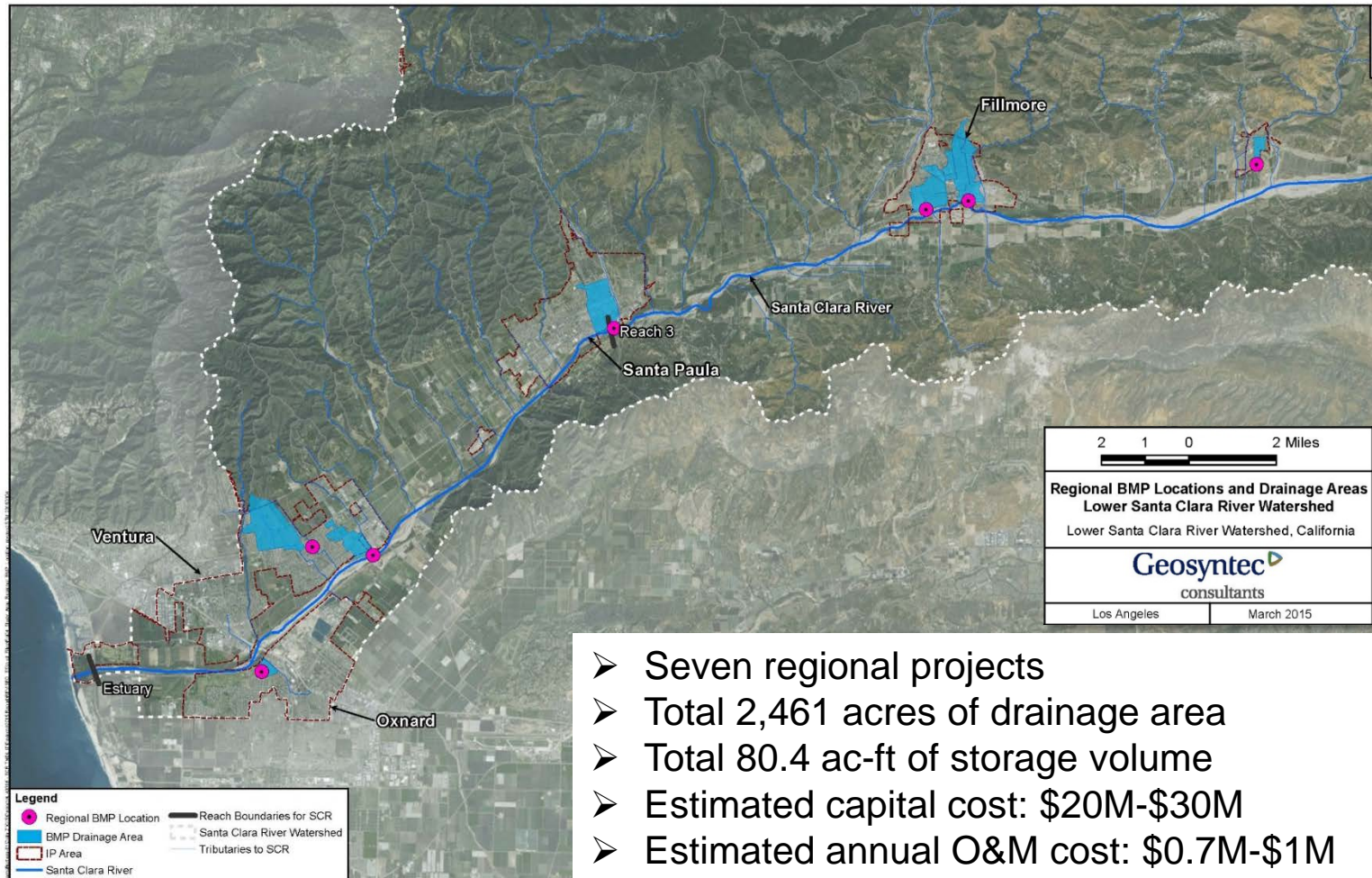


# Existing Storm Water Conservation: Riverpark Community





# 2015 TMDL Implementation Plan for Lower SCR Bacteria TMDL

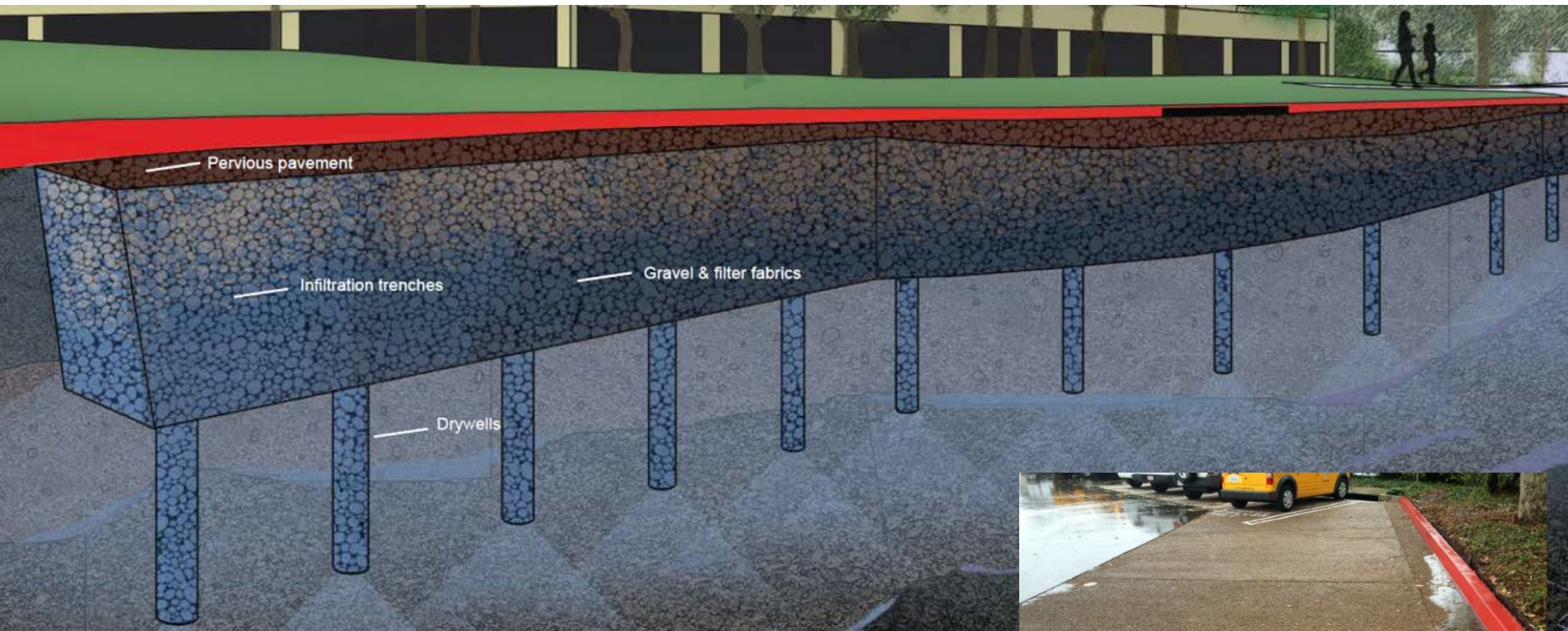


- Seven regional projects
- Total 2,461 acres of drainage area
- Total 80.4 ac-ft of storage volume
- Estimated capital cost: \$20M-\$30M
- Estimated annual O&M cost: \$0.7M-\$1M





# County Government Center Green Streets Urban Retrofit





# El Rio Retrofit for Groundwater Recharge



# Piru Stormwater Capture

**BMP Type:** Spreading grounds

**Construction:** Summer 2018

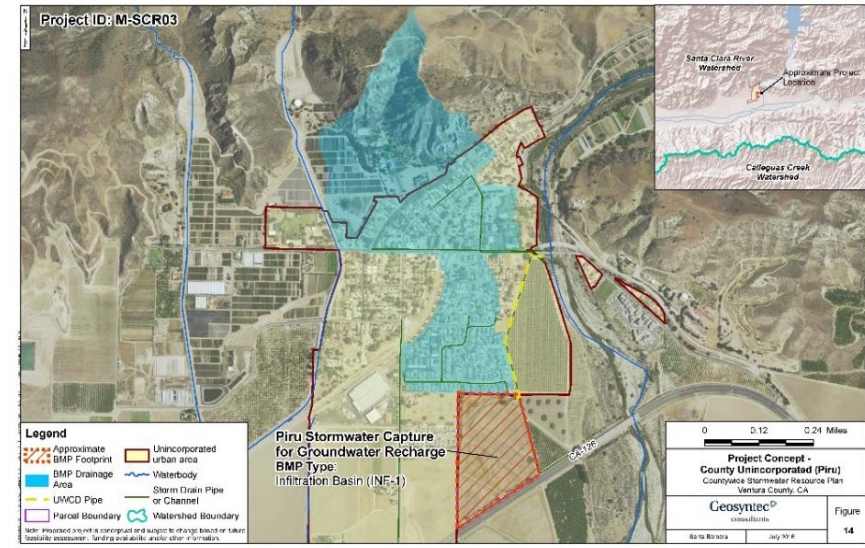
**Drainage Area:** 123 acres

**Stormwater Capture:** ~39 ac-ft/yr

**Pollutant Reduction:**  $9.2 \times 10^{12}$  MPN/yr

**Project Collaborator:** UWCD

**Funding Source:** Proposition 1 SWGP



# Saticoy Stormwater Infiltration



**BMP Type:** Subsurface infiltration basin

**Drainage area:** 41 acres

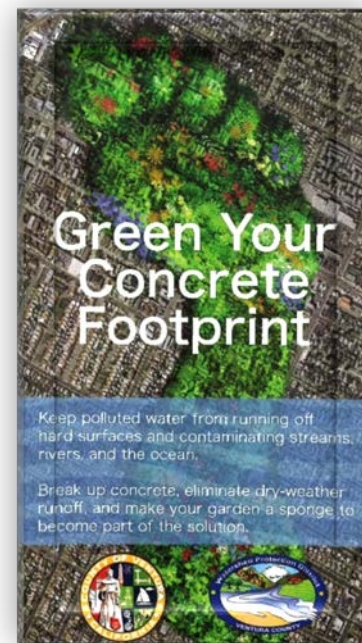
**Construction:** 2022 (estimate)

**Collaborator:** Caltrans

**Funding:** Caltrans (planning, design, & construction); County (long-term O&M)



# Project Educational Outreach



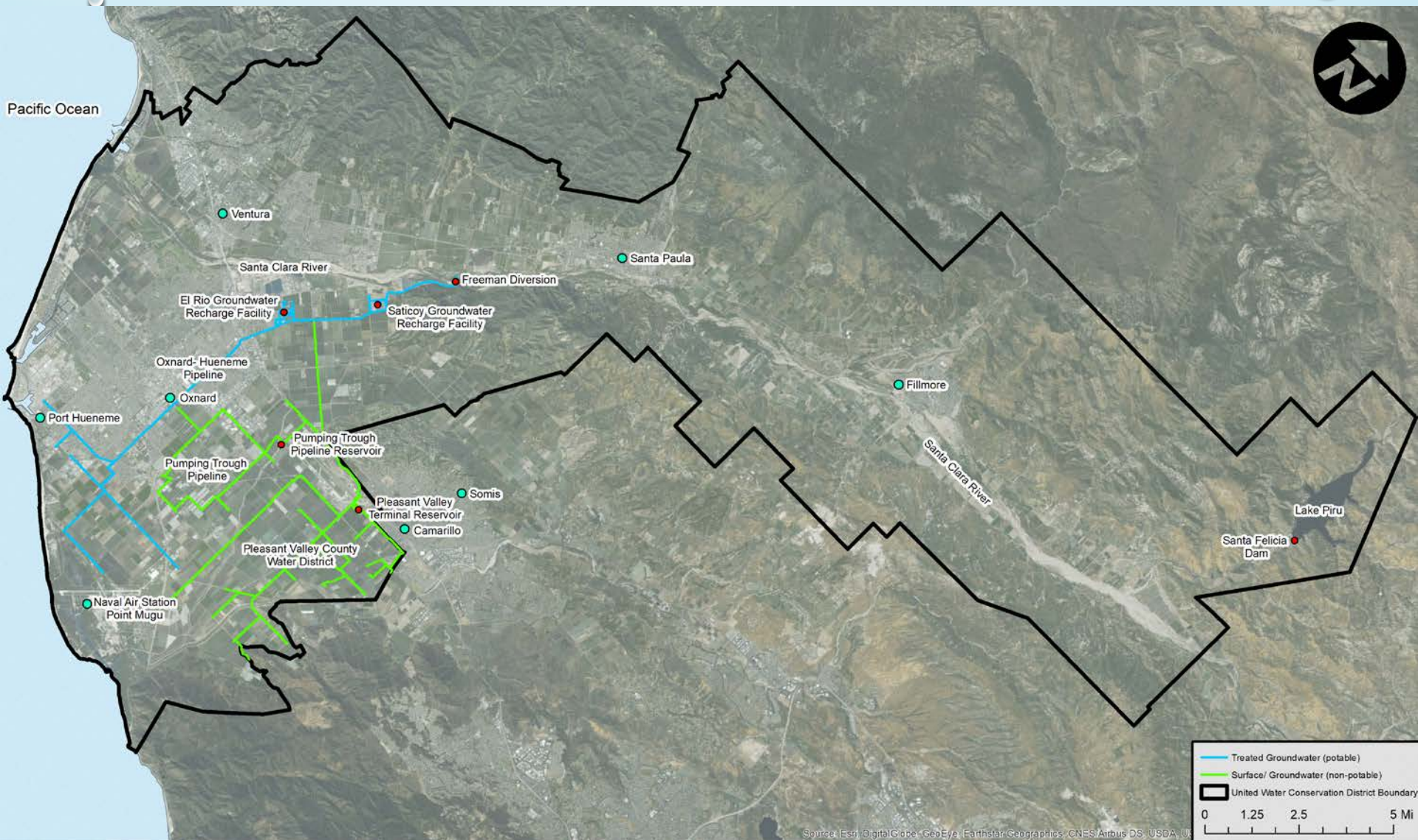


# UNITED WATER CONSERVATION DISTRICT

*United Water Conservation District works to manage, protect, conserve and enhance the region's water supply. Through careful monitoring and management, United maintains the water resources of the Santa Clara River, its tributaries and associated aquifers, in an environmentally balanced manner.*



# UNITED'S SERVICE AREA AND FACILITIES



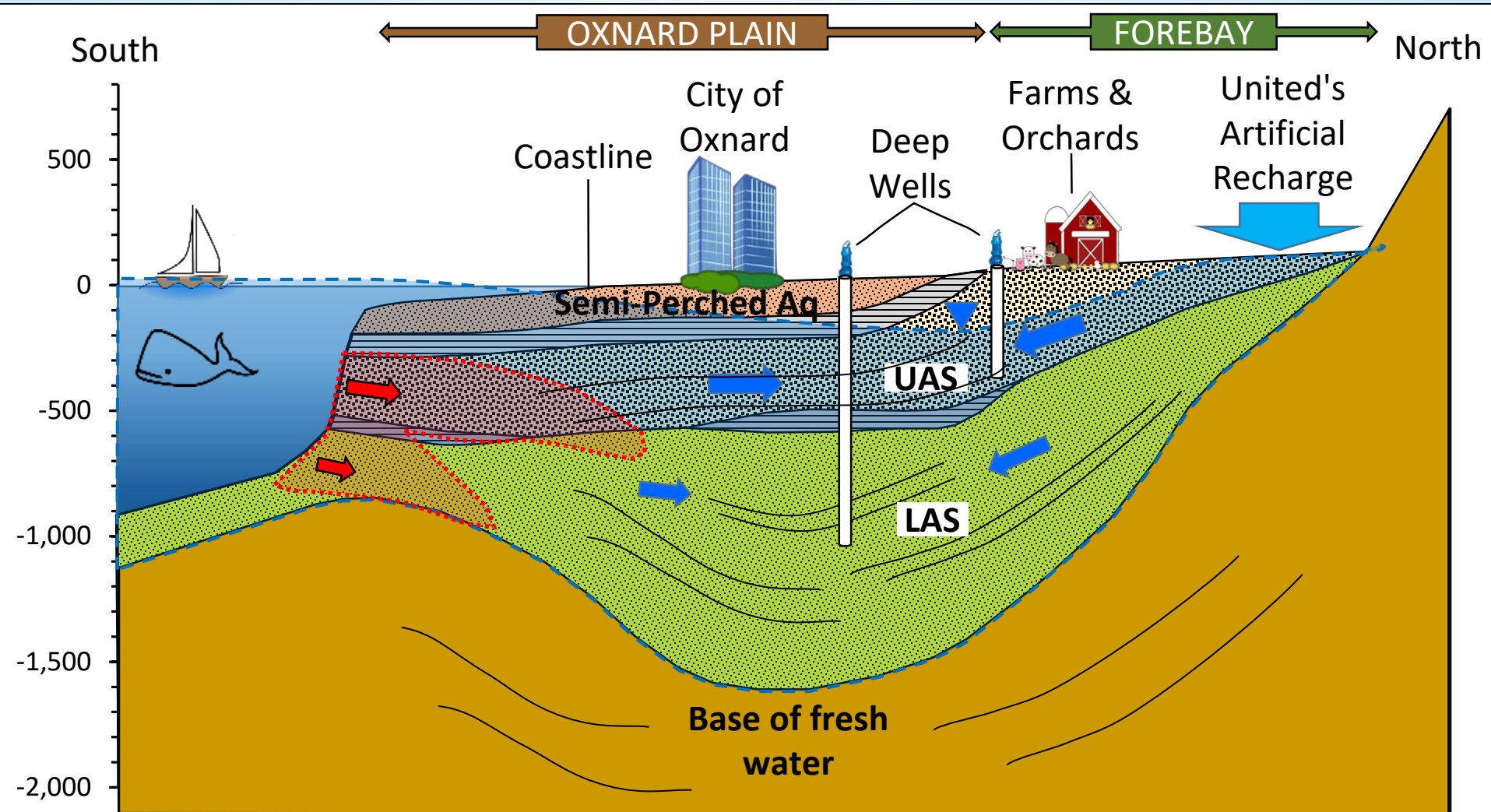


# FREEMAN DIVERSION AND UNITED'S GROUNDWATER RECHARGE BASINS

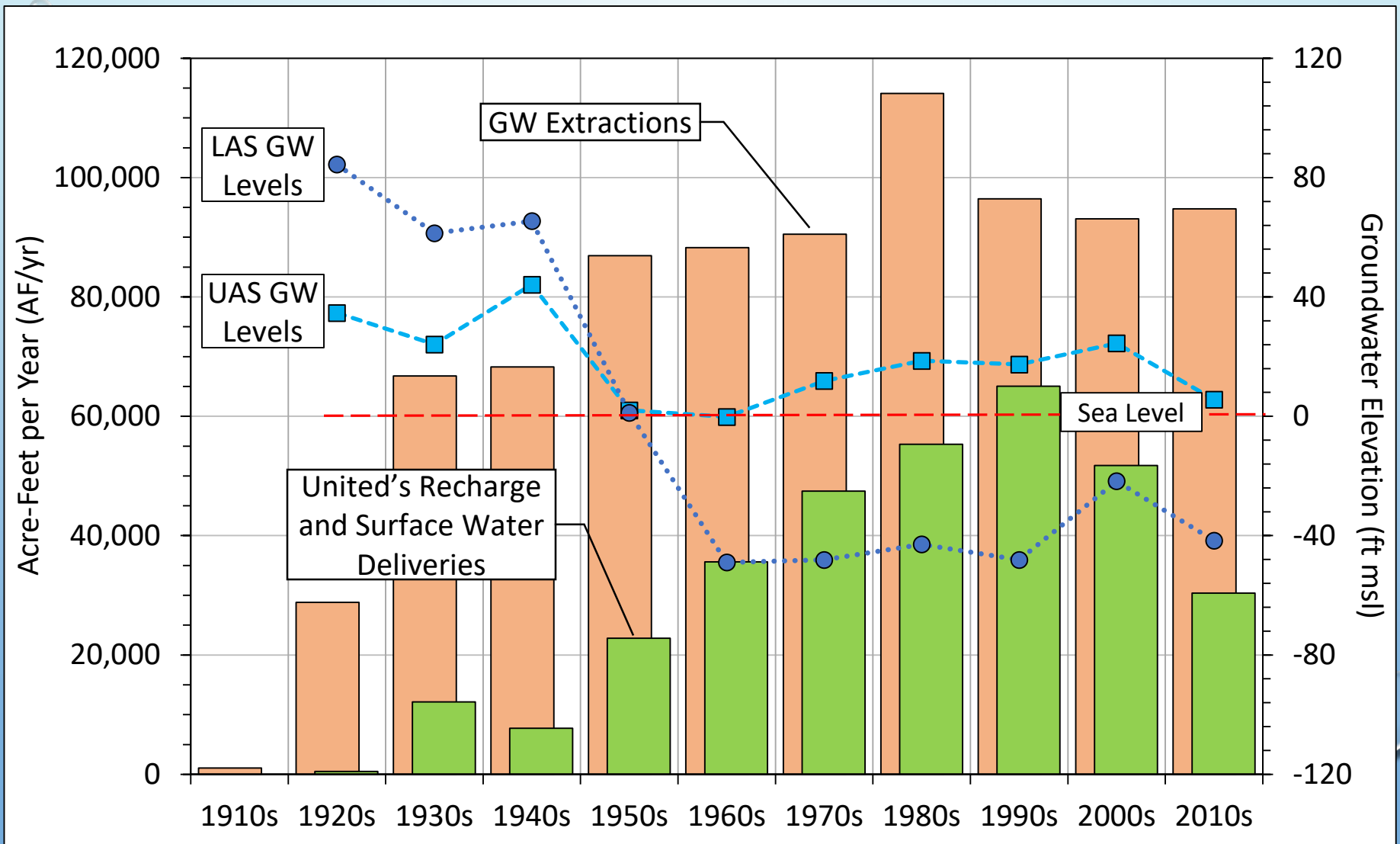


Photo date: April 2005

# ROLE OF THE OXNARD FOREBAY



# GROUNDWATER EXTRACTIONS AND UNITED'S RECHARGE AND SURFACE WATER DELIVERIES





# FREEMAN DIVERSION CONVEYANCE SYSTEM PROPOSED IMPROVEMENTS

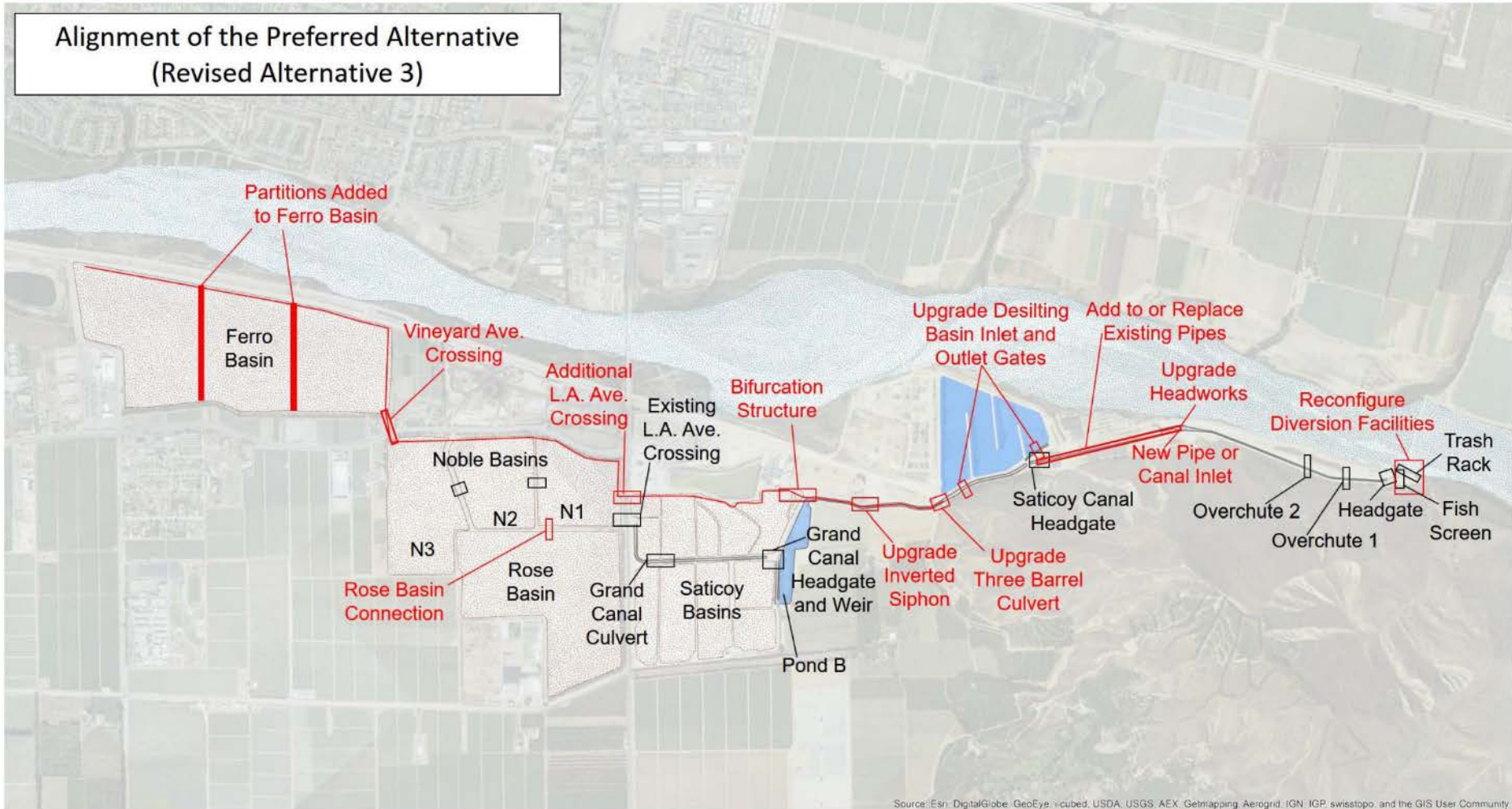
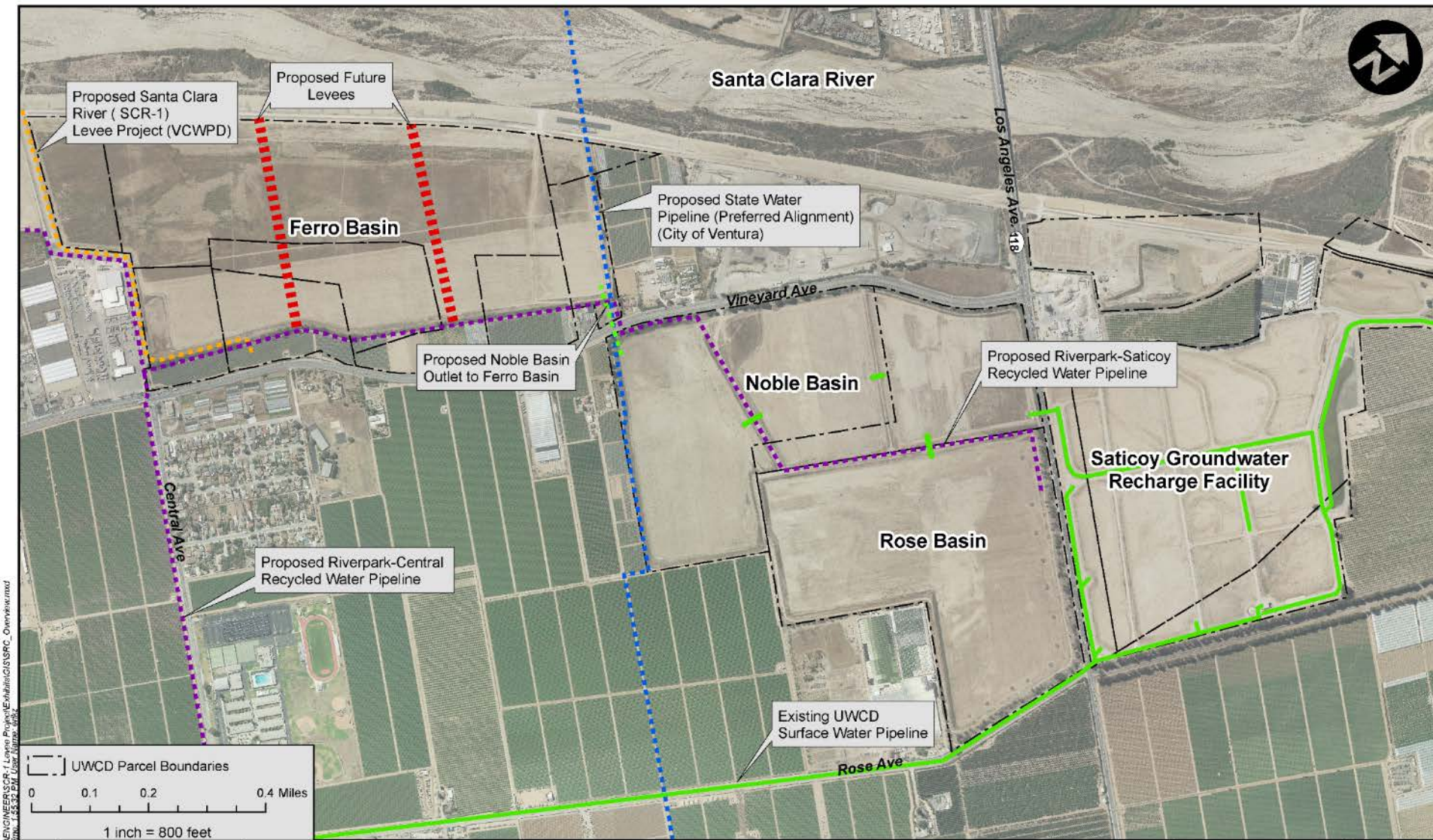


Figure 50 Alignment of the preferred alternative



# FERRO BASIN PLANNED USES



# How will the SCR-1 Project be Funded?

## The Challenge:

- ❖ Project Cost Estimate: \$41+ Million (2015 dollars)
- ❖ Current Annual Total Property Tax Contributions to WPD Zone 2 from Parcels Within the City of Oxnard: ~\$4 Million
- ❖ Therefore, SCR-1 Levee Improvement Project Funds Will Need to Be Cobbled-Together from Sources Below



Federal  
USACE

State  
Grants

VCWPD  
(CIP)

City of  
Oxnard

Local  
Assess-  
ments



# State Local Levee Assistance 2017 Grant Award for SCR-1

## Santa Clara River Levee in Oxnard (SCR-1)

|  |              |
|--|--------------|
| Structures Protected:                        | 1,411        |
| Estimated Damages from 1% ACE <sup>1</sup> : | \$54,223,000 |

|   |              |
|---|--------------|
| Estimated Levee Rehab<br>Project Construction Cost <sup>2</sup> : | \$40,767,100 |
|---|--------------|

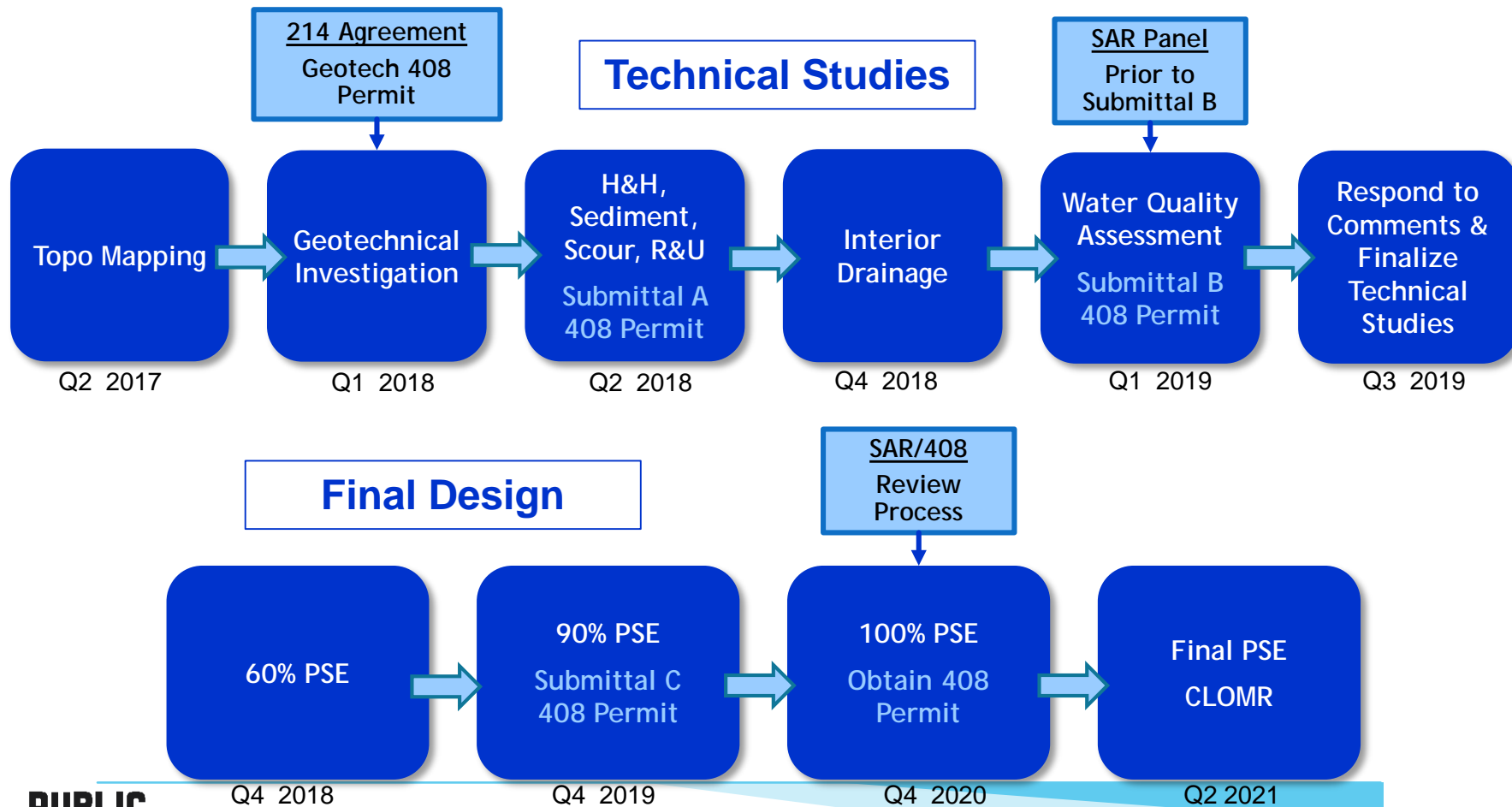
|  |             |
|--|-------------|
| 55% State-Share - LLAP Grant LLCR Funds <sup>3</sup> : | \$1,284,000 |
| 45% Local Match - VCWPD Zone Funds <sup>3</sup> :      | \$1,051,000 |

|  |             |
|--|-------------|
| Total Estimated Annual Flood Insurance<br>Premiums with Uncertified Levee <sup>4</sup> : | \$3,014,000 |
|--|-------------|

# What Are the Next Steps?

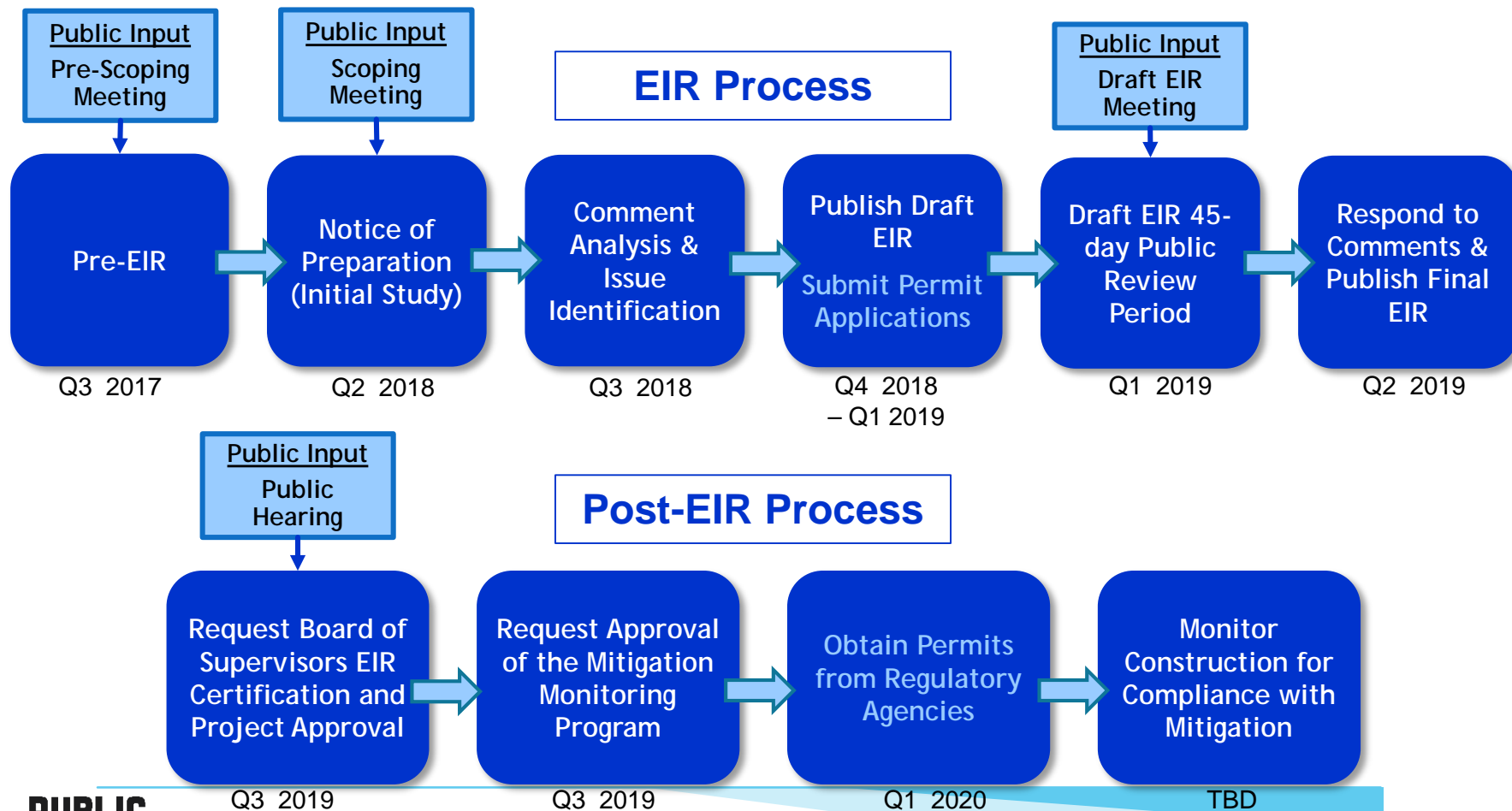
## Design and Environmental Process Overview

# Engineering Design Process





# Environmental Review Process



# Project Surveys Completed to Date

- ❖ Cultural and archaeological pedestrian surveys completed (June 2017)
- ❖ Extensive biological surveys completed (April-August 2017)
- ❖ Inventoried all plants and wildlife along the channel and proposed levee (500-foot buffer)
- ❖ Mapped and identified sensitive and common vegetation
- ❖ Delineated State and federal waters/wetlands

Ventureño Chumash, painting at Ventura County Museum



David J. McLaughlin © Pentacle Press 2006. Indian-Village



# Biological Resources - Results

- SCR-1 supports a wide variety of plants and wildlife
- No rare plants found
- Least Bell's Vireo (FE/SE)
- Nesting Cooper's hawk
- Steelhead trout (FE)
- Pond turtles (CSSC)
- Coast horned lizards (CSSC)



Least Bell's Vireo



Coast Horned Lizard



Southwestern Pond Turtle



Steelhead Trout



Cooper's Hawk

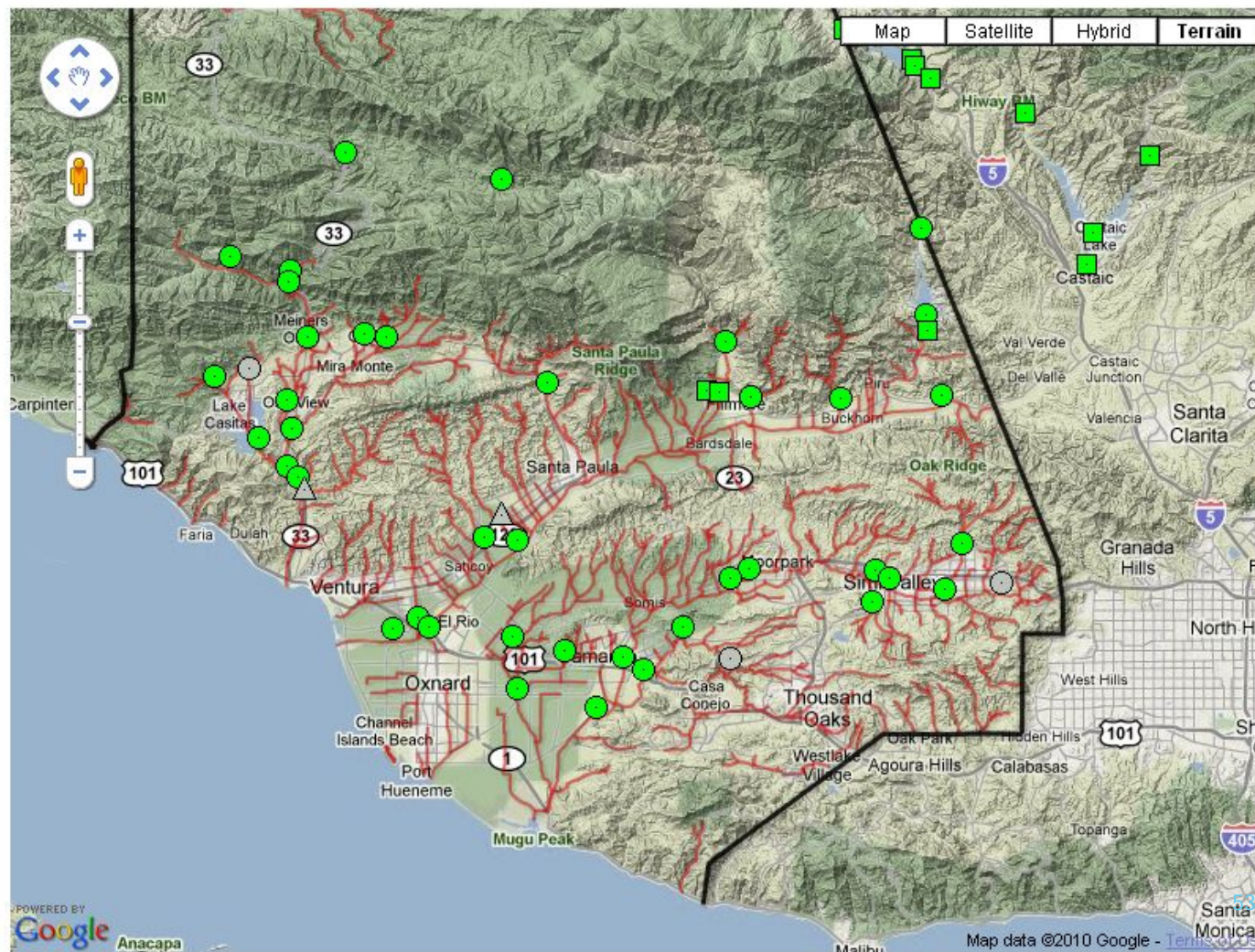


# How Do We Protect People in the Interim?

# Ventura County Advance Hydrologic Prediction System (VCAHPS) Map Viewer

Dataset/Model: Observed Stream Flow

Status: Stations Loaded



## Legend

### VCAHPS Stream Sites

- = Observed Hydrograph Available
- = Both Forecasted and Observed Hydrographs Available
- △ = Forecasted Hydrograph Only

- Major Flooding
- Moderate Flooding
- Minor Flooding
- Near Flood Stage
- No Flooding
- No Data Available
- Gage is out of service

## Layers

- ☐ 100/500-year Flood Plain
- ☐ Letter of Map Revision (LOMR)
- ☐ Base Flood Elevations (BFE)
- ☒ Ventura County Boundary
- ☒ Streams





# Interim Risk Reduction Measures (IRRM) Plan

- USACE Guidance
- Failure Scenarios



US Army Corps  
of Engineers®

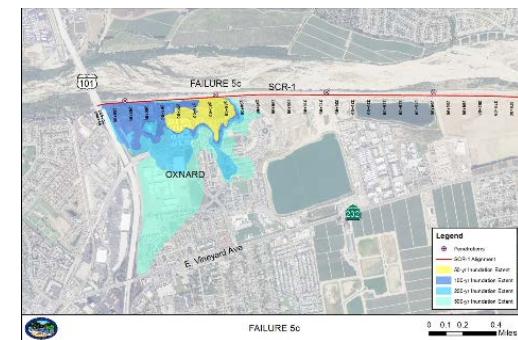
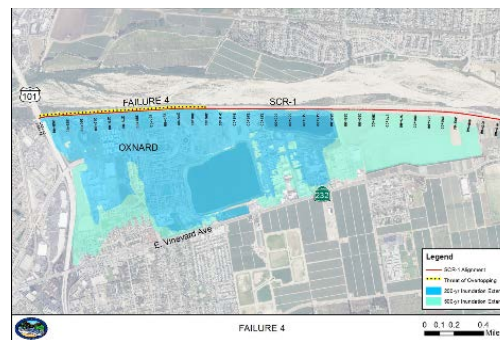
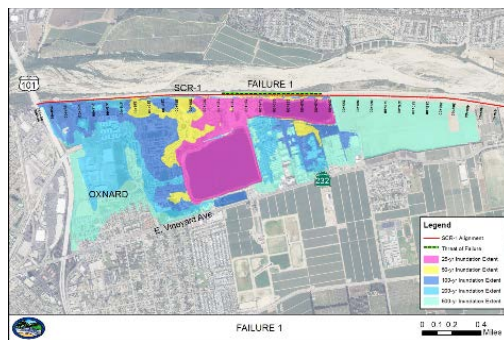
## ENGINEERING AND CONSTRUCTION BULLETIN

No. 2012-1

Issuing Office: CECW-CE

Issued: 20 Jan 2012

Expires: 20 Jan 2014





# Interim Risk Reduction Measures (IRRM) Plan

## ❖ Structural Measures

- ▶ Visual Markers
- ▶ Stockpile Materials

## ❖ Non-Structural Measures

- ▶ Flood Warning Emergency Evac Plan (FWEPP)
- ▶ Update Hydrologic/Hydraulic Study
- ▶ Update Scour Study
- ▶ Develop Local NLD
- ▶ GIS Performance Database
- ▶ Develop Supplemental O&M Manual

| Measure                              | Status   |
|--------------------------------------|----------|
| 1. FWEPP                             | Complete |
| 2. Update Hydrologic/Hydraulic Study | Complete |
| 3. Update Scour Study                | Complete |
| 4. Develop Local Levee Database      | On-going |
| 5. GIS Performance Database          | On-going |
| 6. Develop Supplemental O&M Manual   | Complete |
| 7. Visual Markers                    | Complete |
| 8. Stockpile Materials               | Complete |

# Interim Risk Reduction Measures (IRRM) Plan

## IRRM # 1 – FWEEP

### Flood Warning Emergency Evacuation Plan

- Monitoring Activities
- Command and Control
- Public Warning
- Evacuation
- Validation Exercise

Exercise Planning  
Fall 2015



Ventura County  
Watershed Protection District

**Santa Clara River Levee (SCR-1)**  
**NLD FC System ID No. 3805010085**

**Ventura County, California**

**Flood Warning and Emergency  
Evacuation Plan**

**March 2015**



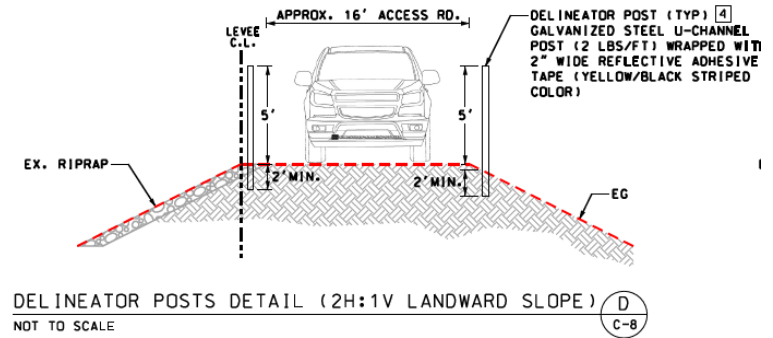
Tetra Tech  
17885 Von Karman Avenue, Suite 500  
Irvine, California 92614

# Interim Risk Reduction Measures (IRRM) Plan

## IRRM # 7 – Visual Markers

- ❖ During Storm Event
  - ▶ Gage River Erosion
  - ▶ Viewed from Levee Top

Implemented  
Fall 2015

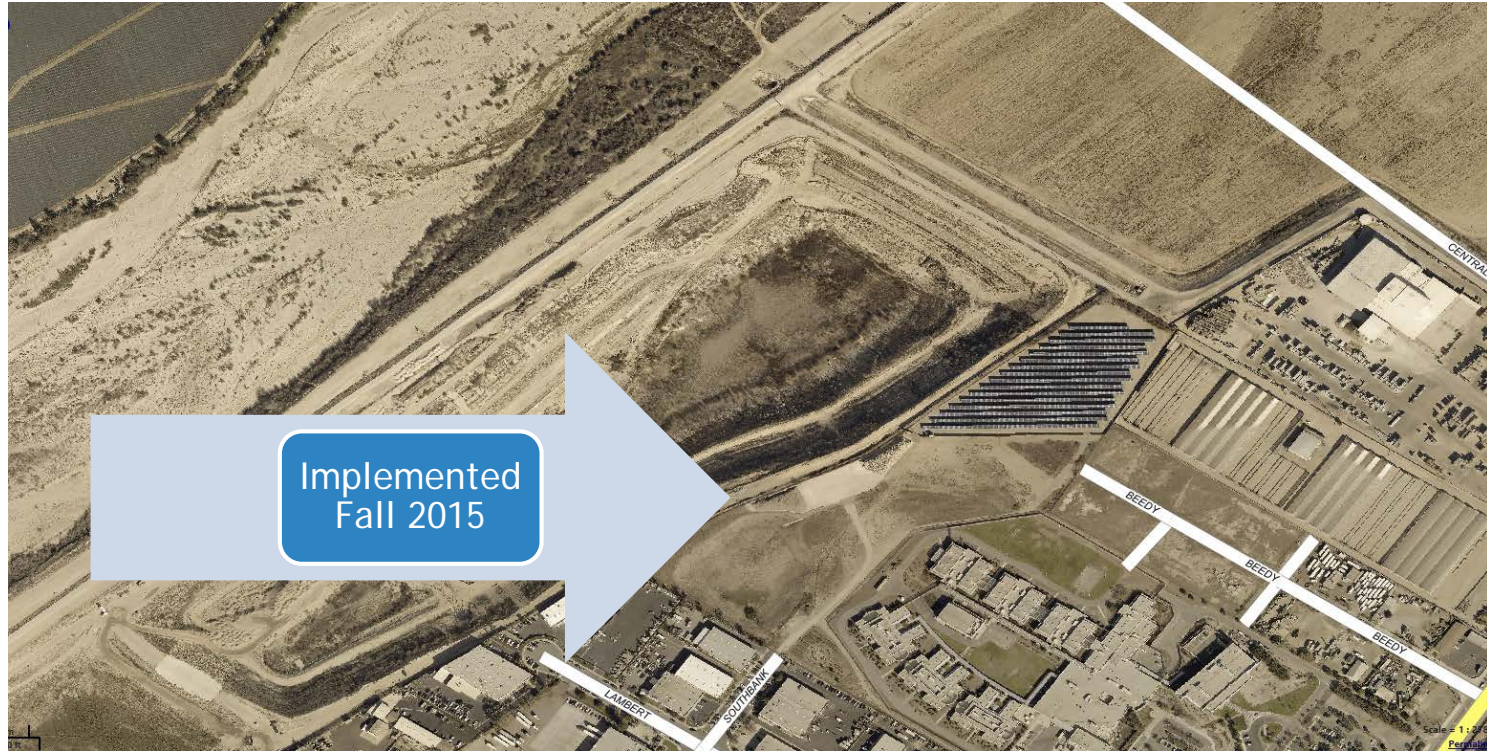




# Interim Risk Reduction Measures (IRRM)

## IRRM # 8 - Stockpile Materials

- ❖ Rock
- ❖ Gravel
- ❖ Lighting
- ❖ Sheeting



# Project Information and Resources

- ❖ Ventura County Watershed Protection District:  
[www.vcwatershed.org](http://www.vcwatershed.org)  
(go to Programs and Projects)
- ❖ County of Ventura:  
[www.vcfloodinfo.com](http://www.vcfloodinfo.com)
- ❖ FEMA:  
[www.floodsmart.gov/floodsmart/](http://www.floodsmart.gov/floodsmart/)

# Contact Information

❖ Email:

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❖ Kirk Norman, Project Engineer:

➤ (805) 654-2017

❖ Gerard Kapuscik, Levee Certification Program:

➤ (805) 648-9284

❖ Angela Bonfiglio Allen, Environmental Planner:

➤ (805) 477-7175



# What You Can Do



**VENTURA COUNTY  
WATERSHED PROTECTION DISTRICT**

## Pre-Scoping Comments

## Santa Clara River Levee Improvements Upstream of Highway 101 (SCR-1) Project

**Name\*:** \_\_\_\_\_

**Affiliation (if any):\*** \_\_\_\_\_

Address:\*

City, State, Zip Code: \* \_\_\_\_\_

**Telephone Number:\*** \_\_\_\_\_

**Email:\*** \_\_\_\_\_

**Comment:\*** \_\_\_\_\_

*\*Please print or write legibly. Your name, address, and comments become public information and may be released to interested parties if requested. Thank you for your comments.*

Please either deposit this sheet at the sign-in table before you leave today, or fold, stamp, and mail. Insert additional sheets if needed. Comments must be postmarked by November 18, 2017. Comments may also be e-mailed to: [SCRInfo@ventura.org](mailto:SCRInfo@ventura.org).



# Questions?

