

PUBLIC
VENTURA COUNTY
WORKS



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



Watershed Protection District

Thursday, October 19, 2017

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

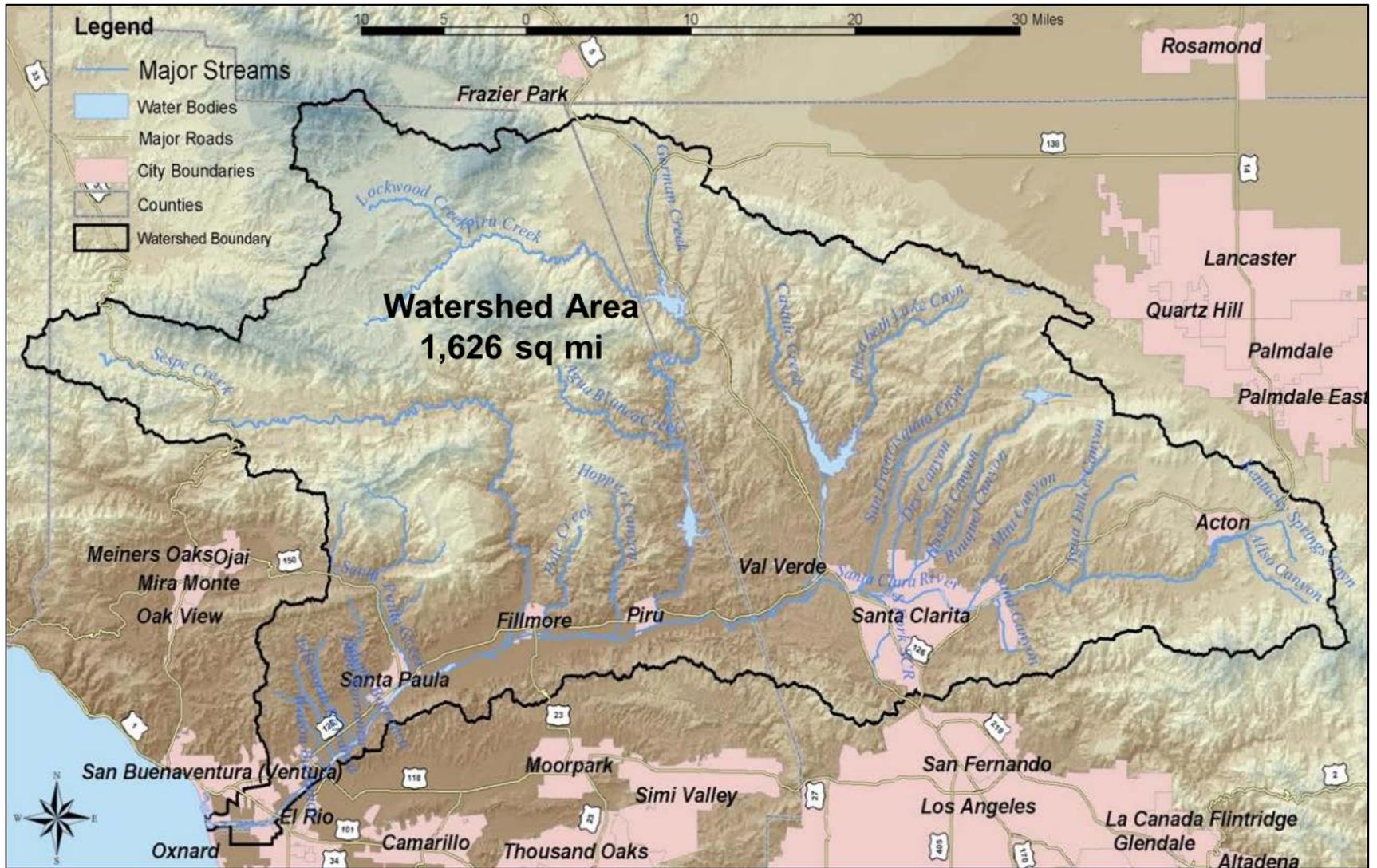
Friends of the Santa Clara River

Ventura Audubon Society

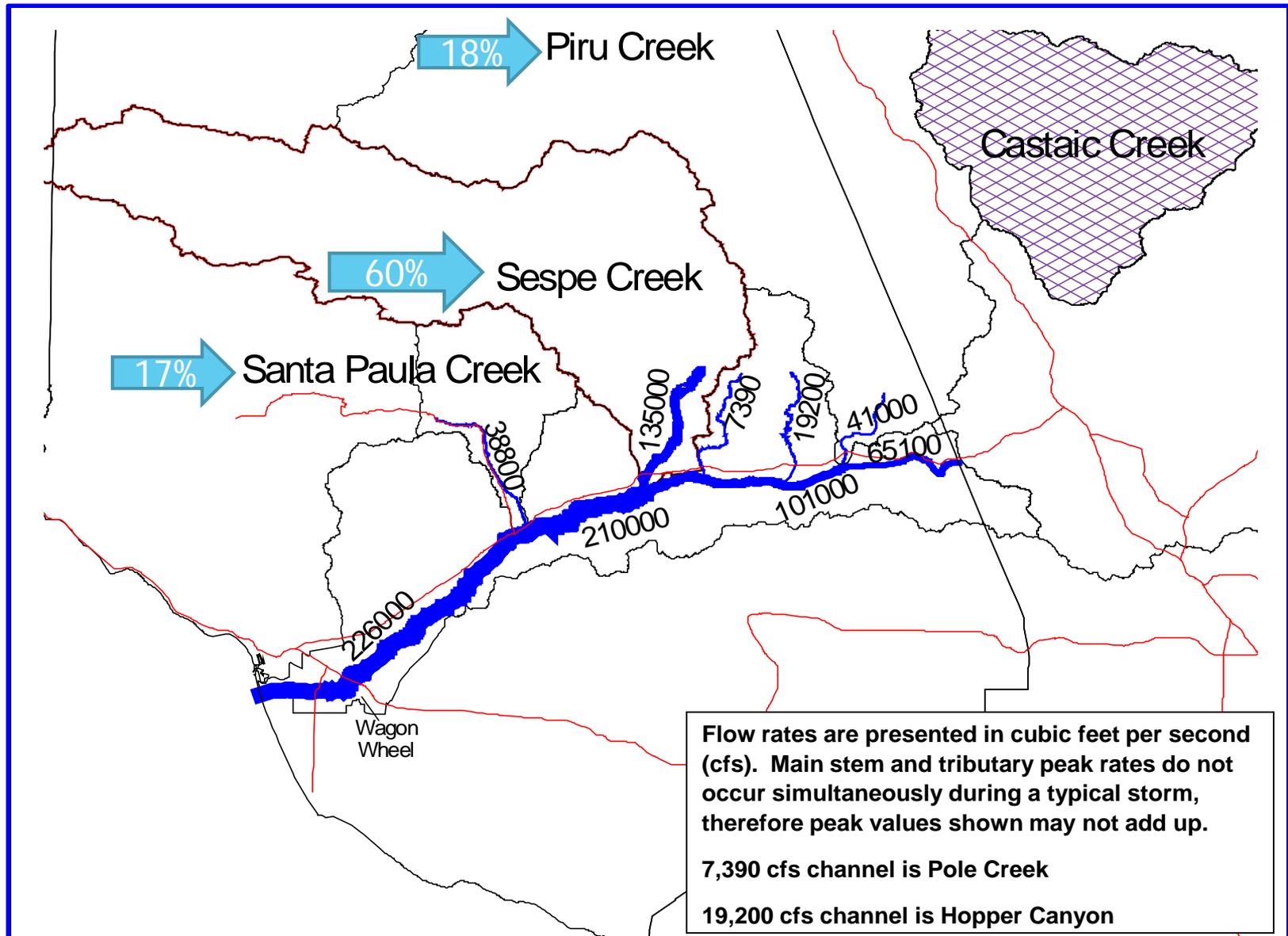
CalTrout

Sierra Club

Setting

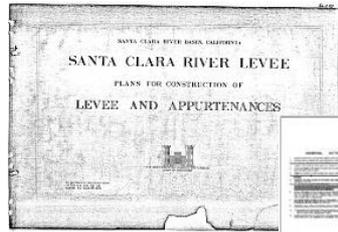


Lower Santa Clara River Watershed: One Percent Annual Chance Flood Flow Volumes



Historical Timeline

USACE Periodic Inspection



1960

► **1961**
SCR-1
Constructed

1970

1980

► **1983**
Flood
Damage

2005

Katrina

2007

FEMA PAL

2011

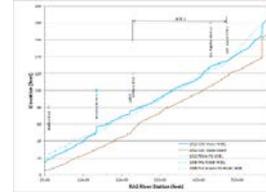
► **Oct 2011**
► **Apr 2013**
► **Aug 2015**
Community
Presentations

► **March 2015**
DWR LLAP
Grant Package



RiverPark

► **Mar 2017**
BOS Accepts
DWR LLAP
Grant Award



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

Implemented
Structural IRRMs
• Stockpile
• Visual Markers

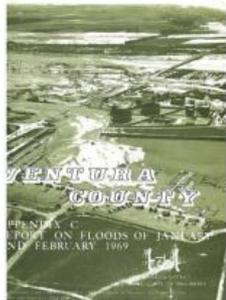


► **May 2017**
Contracts Awarded
Final Design/CEQA



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

► **Oct 2017**
Community
Presentation



► **1969**
Flood Damage



► **2009**
PAL Response

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

**Pursue
Partnership
with USACE**

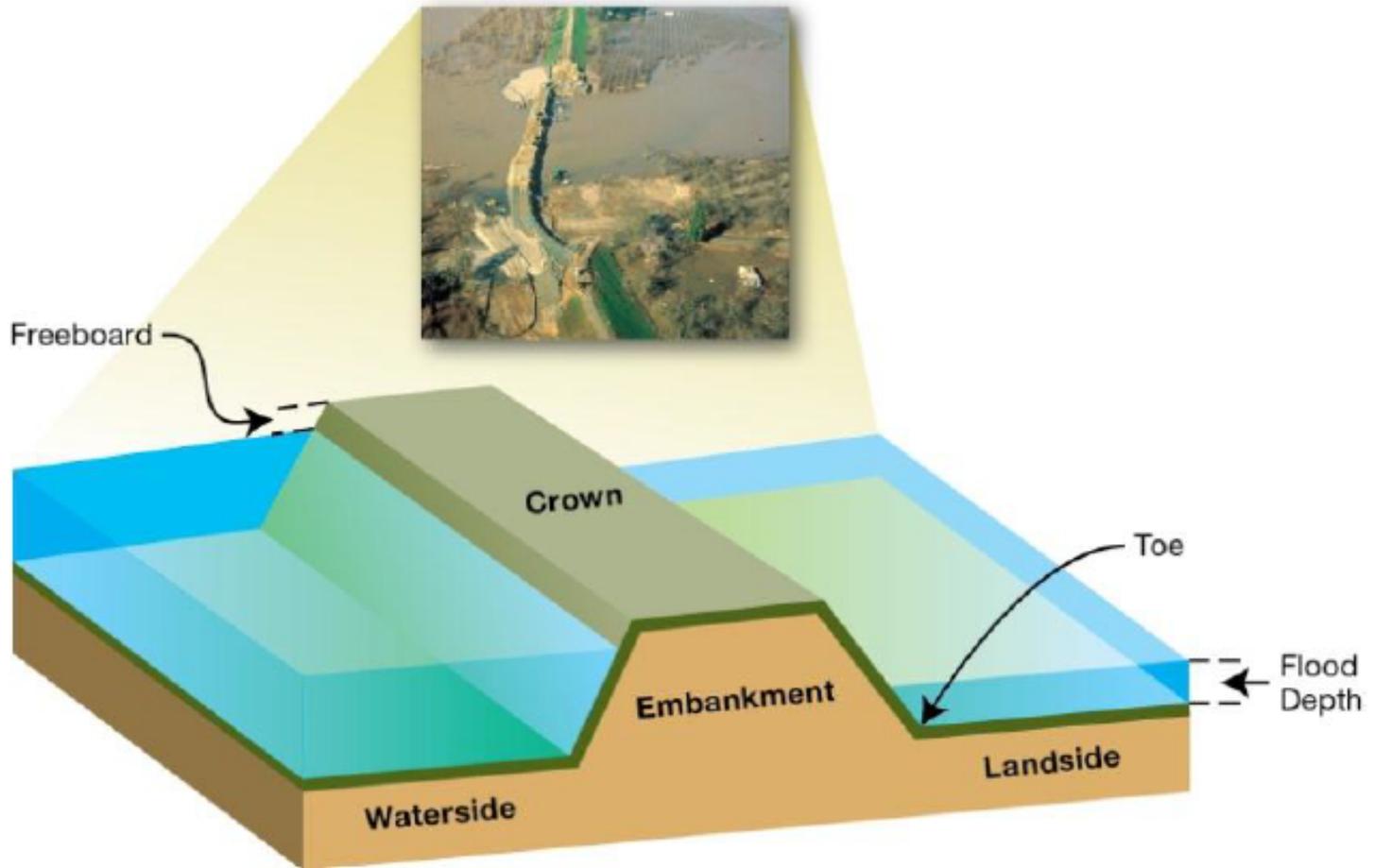
► **Dec 2015**
Table Top Exercise
Conducted

Item	Assigned To	Due Date	Status
1. Review and update the IRRM Plan.	John Smith	12/31/15	Complete
2. Conduct a table top exercise.	Jane Doe	12/15/15	In Progress
3. Review the structural IRRMs.	Bob Johnson	12/31/15	Not Started
4. Review the stockpile and visual markers.	Alice Brown	12/31/15	Not Started

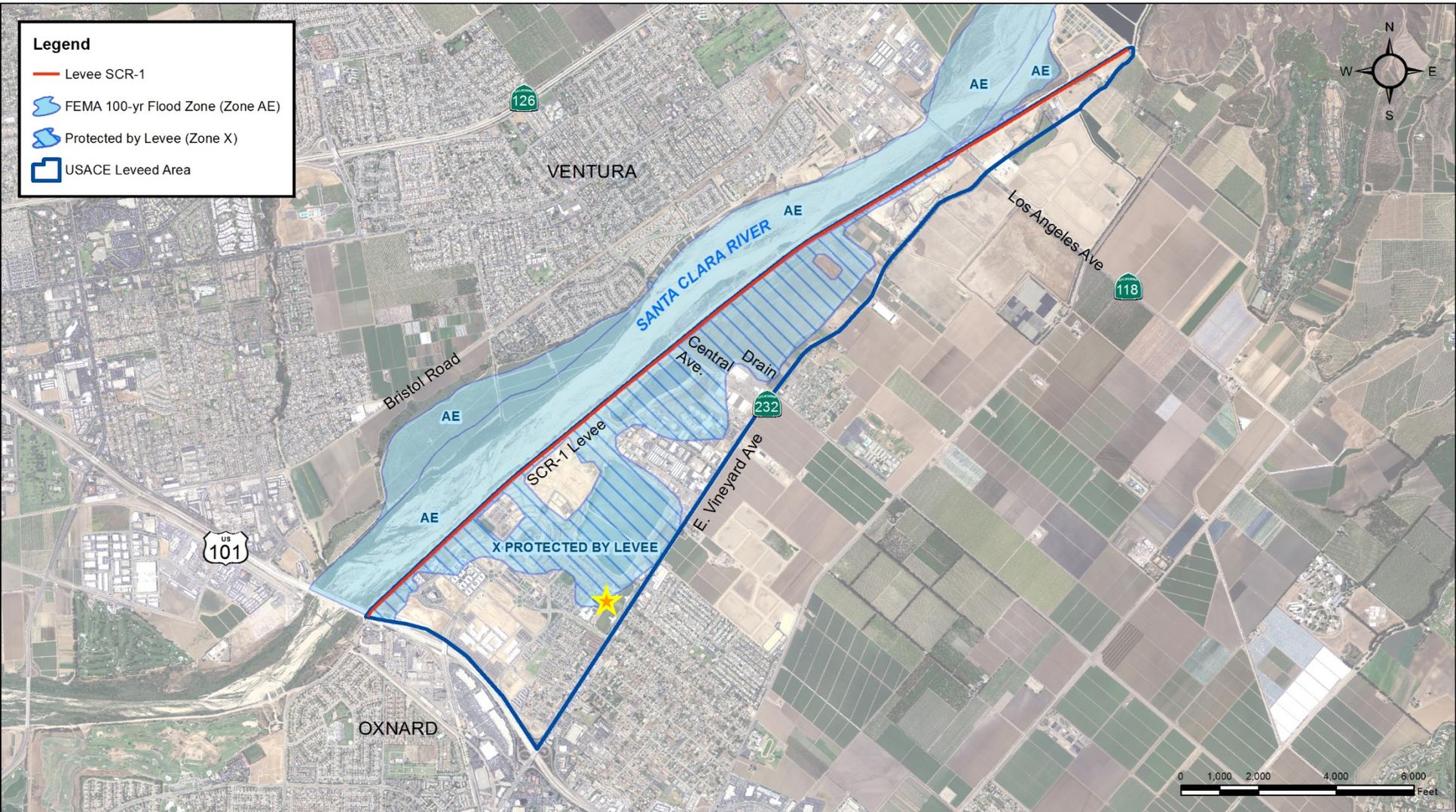
Santa Clara River Levee (SCR-1)



Anatomy of a Levee

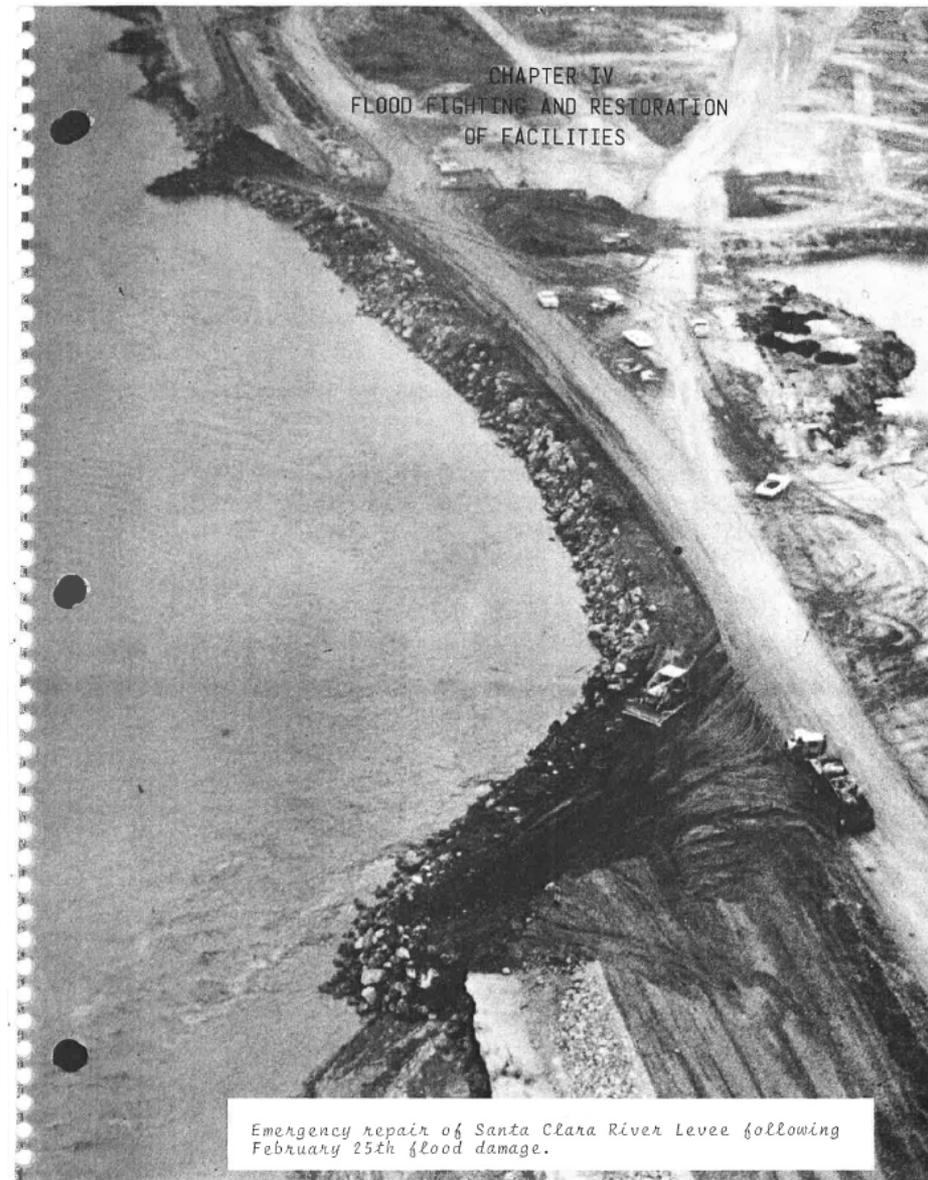


Santa Clara River Levee (SCR-1)



Background

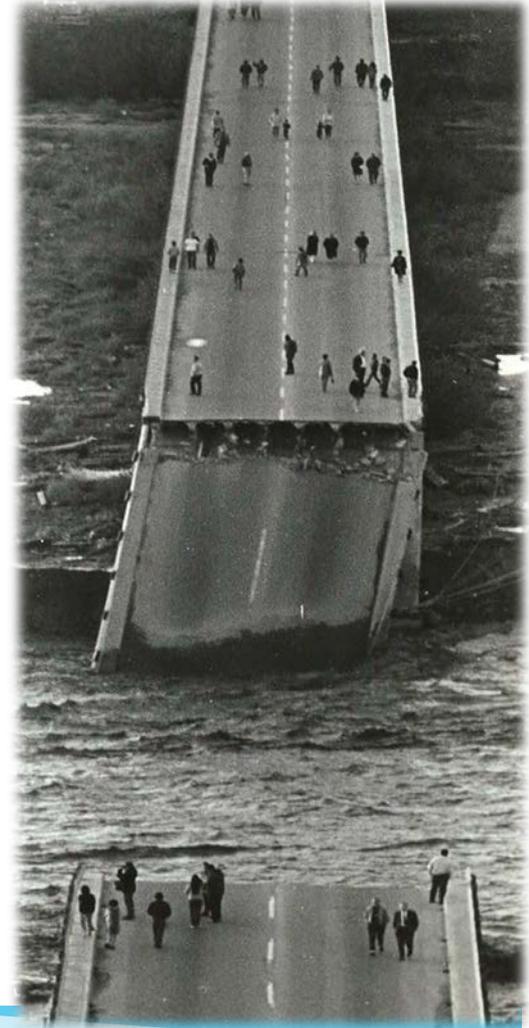
- Originally designed and constructed by U.S. Army Corps of Engineers
- Completed in 1961, 4.72 miles of levee with 40 groins.
- 1969 floods breached 2,100 linear feet of the levee and groins
- 1983 floods damaged groins



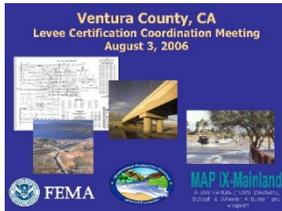
Historic Floods: 1969



Wells Road Bridge



FEMA Levee Certification Process Milestones



August-2005



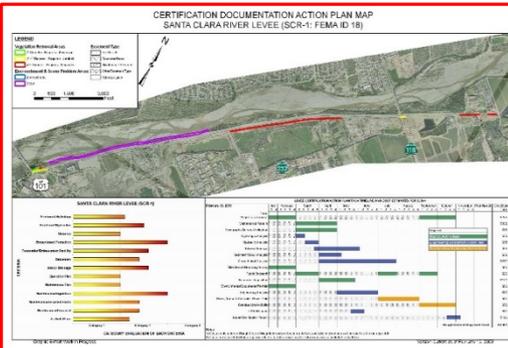
2006

►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

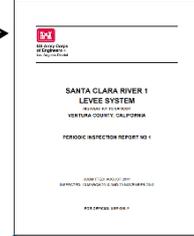


►November 2008-2009: SCR-1 Levee Field Inspections, Geotech Evaluations and Required Engineering Analysis Performed

2010-2011

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

USACE Periodic Inspection (2011)



2012 District Begins Work To:

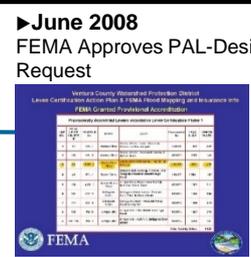
Pursue Project Partnership Development with USACE

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



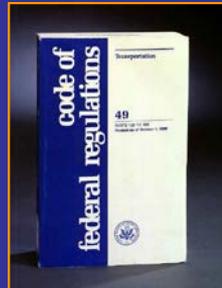
►11-24-09 District submits PRR to FEMA informing them that SCR-1 Levee, in its current condition, is not able to meet all of the 44 CFR 65.10 Requirements

Federal Levee Certification Requirements and SCR-1 Assessment Results

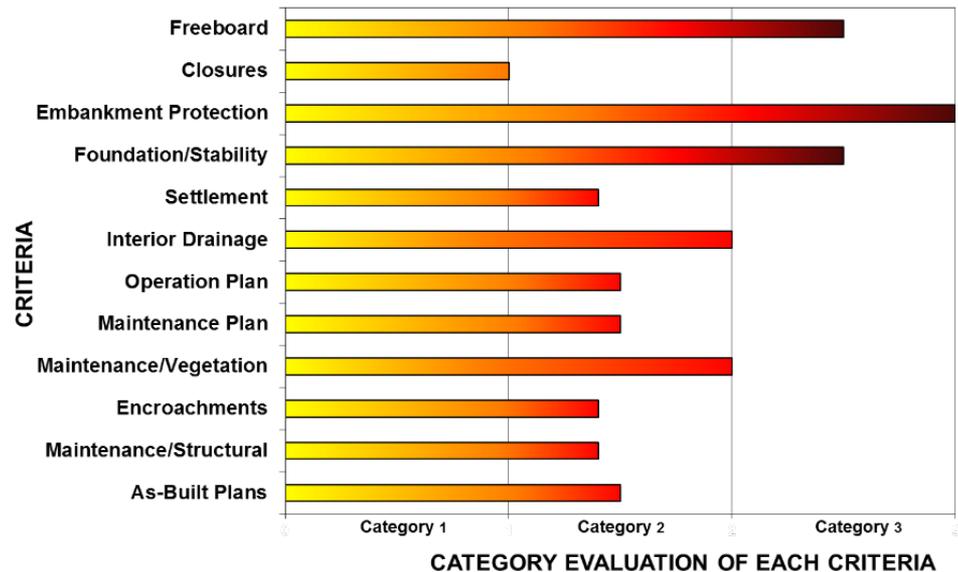
FEMA Levee Certification Requirements

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



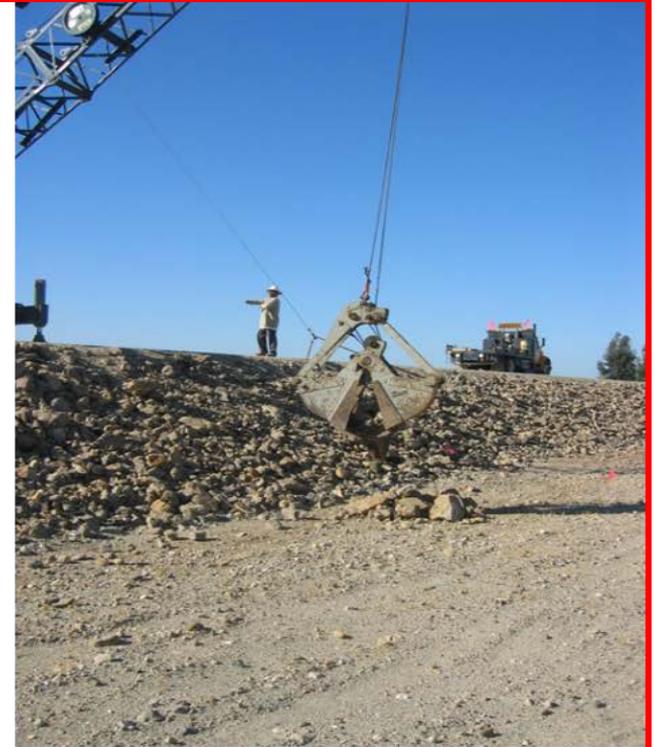
SANTA CLARA RIVER LEVEE (SCR-1)



SCR-1 Levee Certification Deficiency Results Four Most Critical Elements

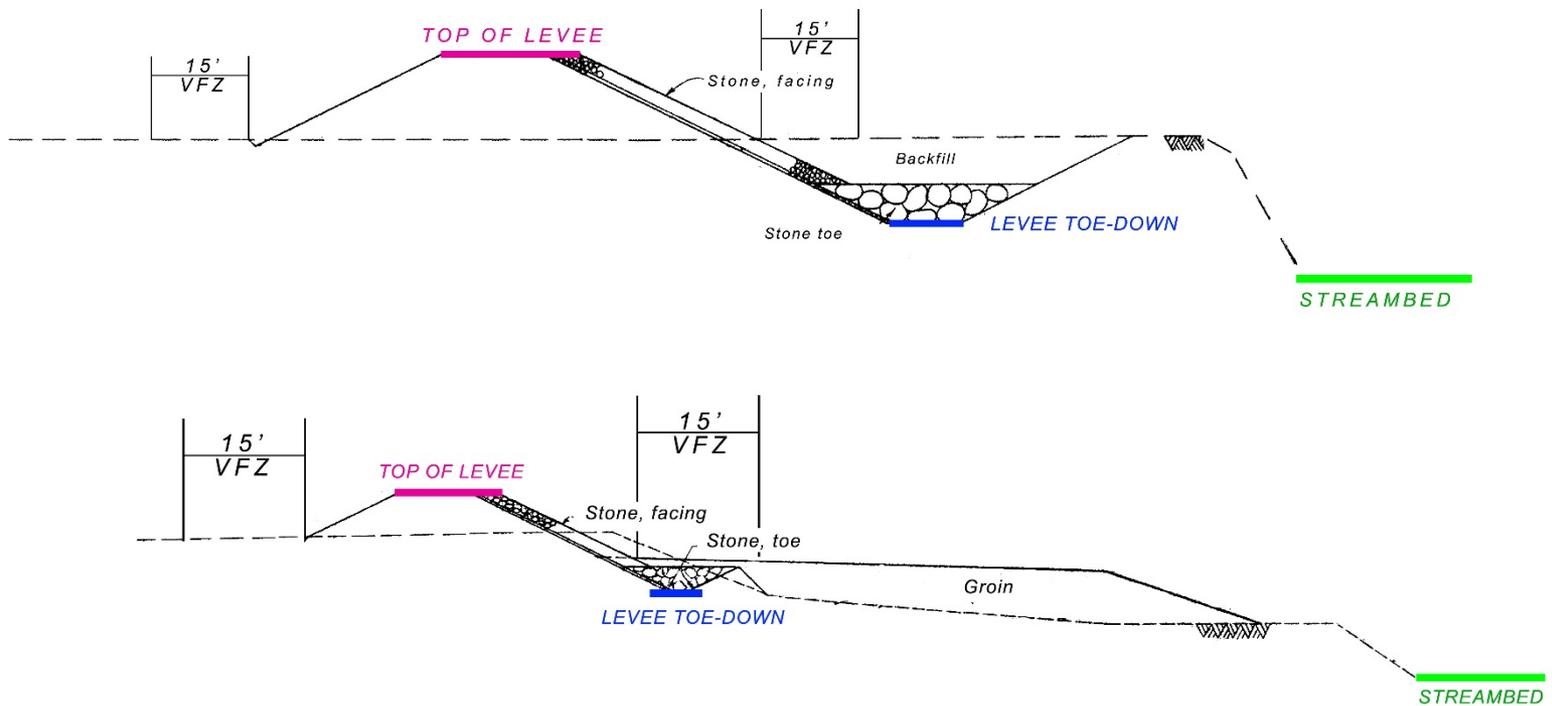


- **Inadequate Toe-Down Protection Depth**
- **Inadequate Riprap Revetment Size and Durability**
- **Inadequate Weighted Stone Toe Volume and Rock Size**
- **Inadequate Rock Groin Depth and Rock Size**



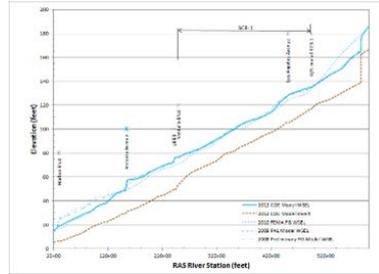
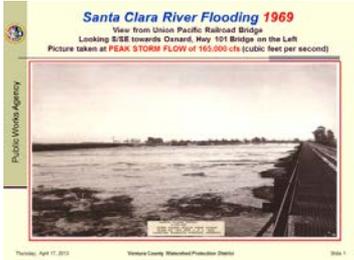
FEMA Levee Certification Results

VFZ = Vegetation Free Zone



How Do We Solve the Problem?

Project Development Timeline



RiverPark



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

► **May 2017**
Consultant
Contracts Awarded
Final Design/CEQA



► **Oct 2017**
Community
Presentation

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

► **Apr 2013**
Community
Presentation

► **Aug 2015**
Community
Presentations

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

Implemented
Structural IRRMs

- Stockpile
- Visual Markers



► **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	Responsible Party	Status
1. Review and update the IRRM Plan	High	WPD	Complete
2. Conduct a table top exercise	High	WPD	In Progress
3. Review and update the IRRM Plan	High	WPD	Complete
4. Review and update the IRRM Plan	High	WPD	Complete
5. Review and update the IRRM Plan	High	WPD	Complete
6. Review and update the IRRM Plan	High	WPD	Complete
7. Review and update the IRRM Plan	High	WPD	Complete
8. Review and update the IRRM Plan	High	WPD	Complete
9. Review and update the IRRM Plan	High	WPD	Complete
10. Review and update the IRRM Plan	High	WPD	Complete

► **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

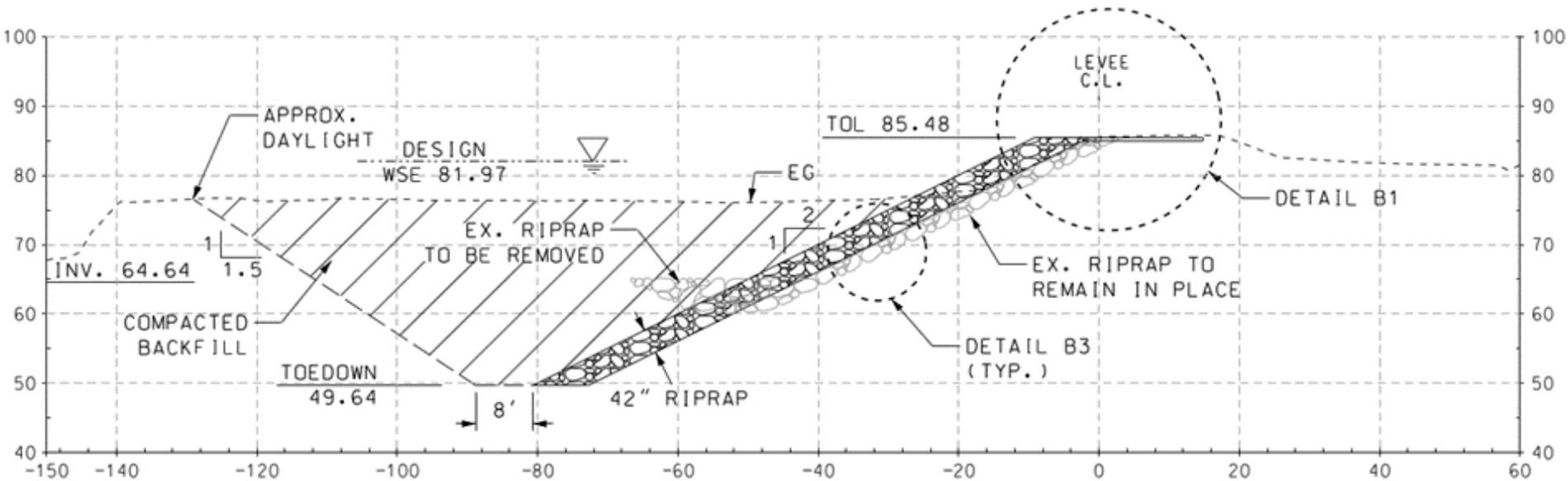
Proposed SCR-1 Alignment

Legend

- New Levee Alignment
- Existing Levee Maintained in Place

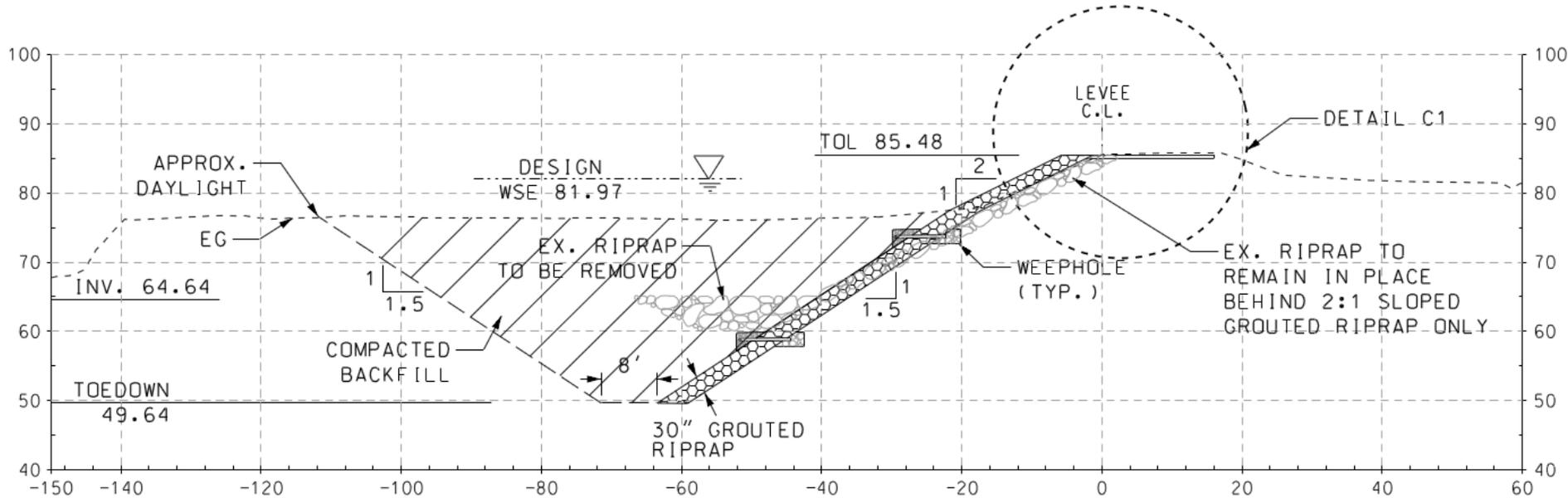


Alternatives



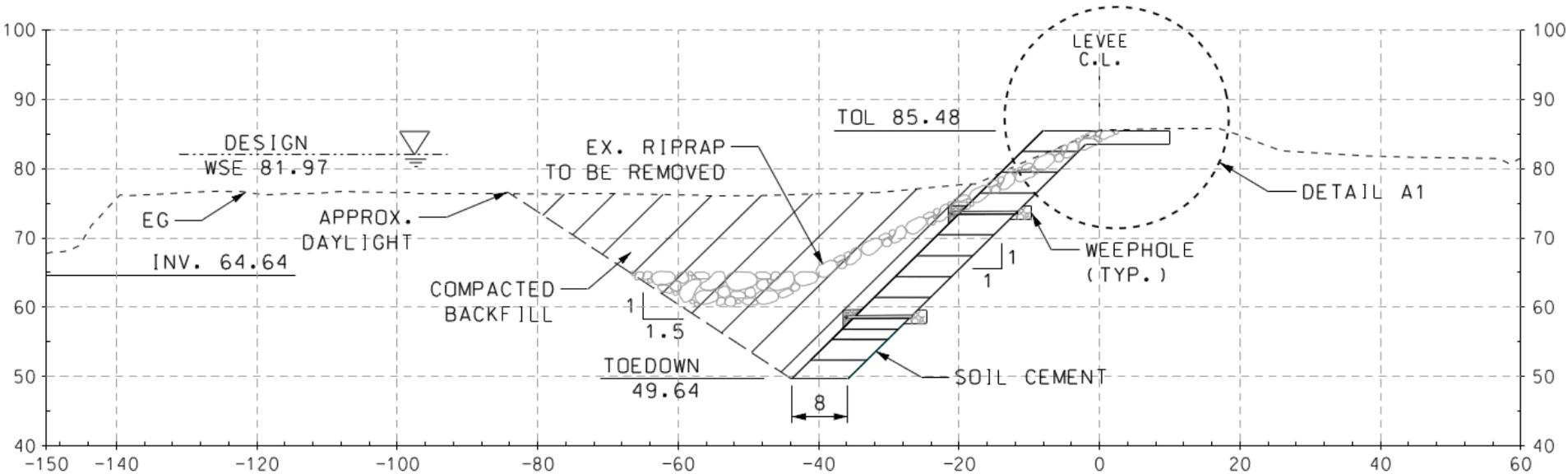
Typical Cross Section – Rock Riprap

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

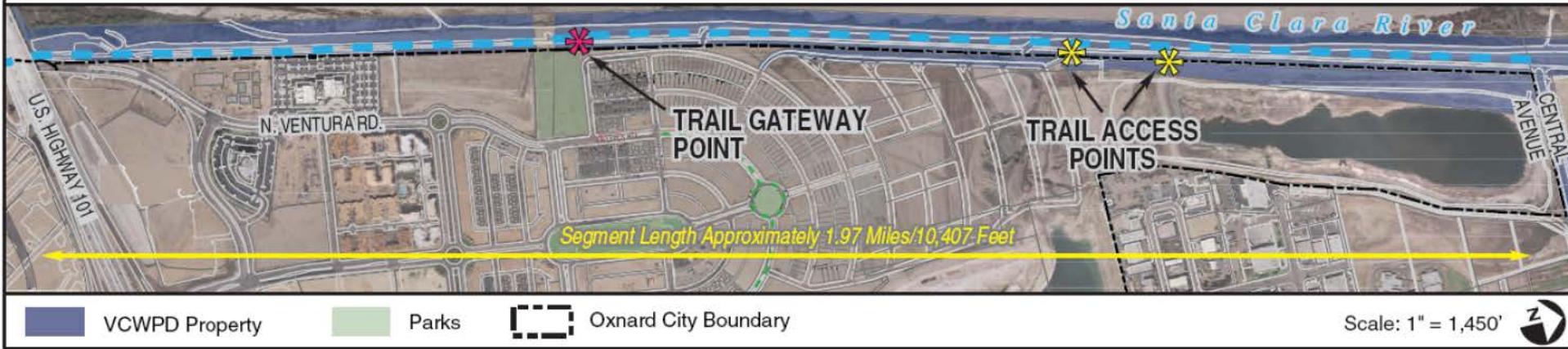
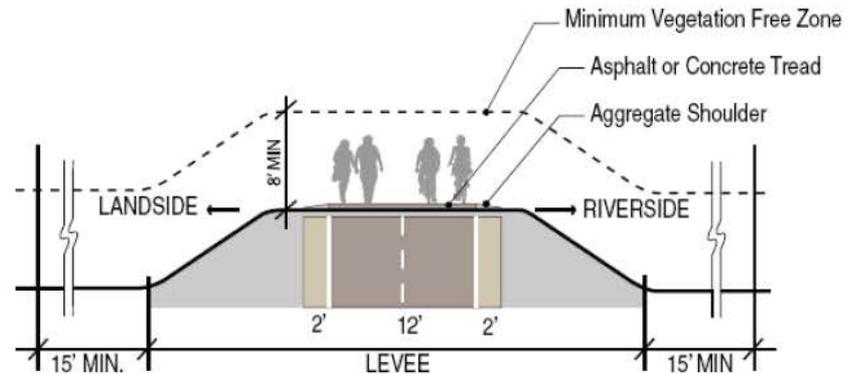
Recreational Opportunities

City of Oxnard Planned Santa Clara River Trail



Recreational Opportunities

City of Oxnard Planned Santa Clara River Trail





Educational Opportunities

STEAM Academy Partnership



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

DISTRICT SUPERINTENDENT

📅 Published: 25 August 2017

👍 Like 7

f Share

🐦 Tweet

in Share

📌 Save

PUBLIC
VENTURA COUNTY
WORKS

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.

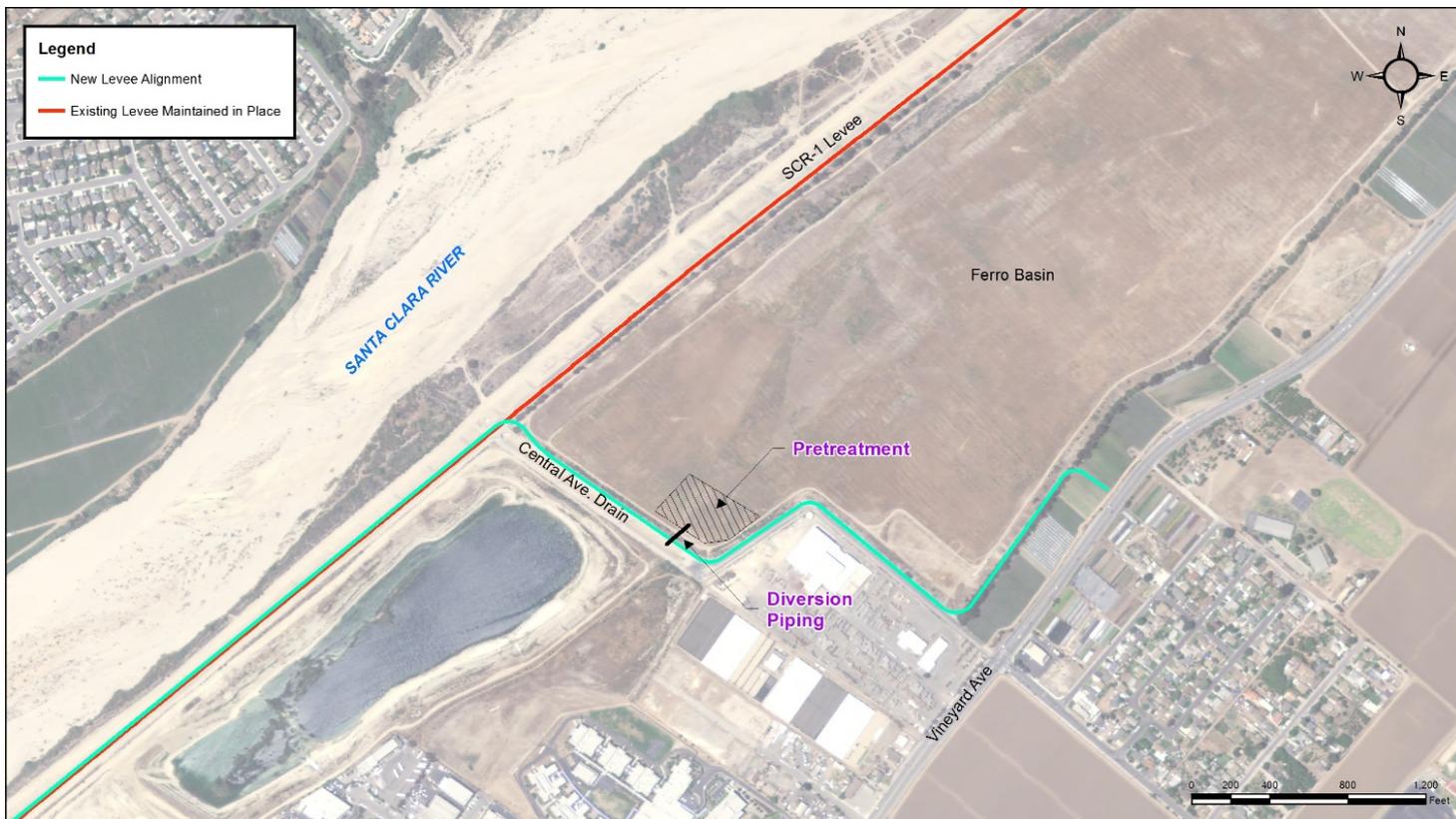
The Rio School District is building a new, 11-acre, K-8 STEAM Academy that will back up to the Santa Clara River

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

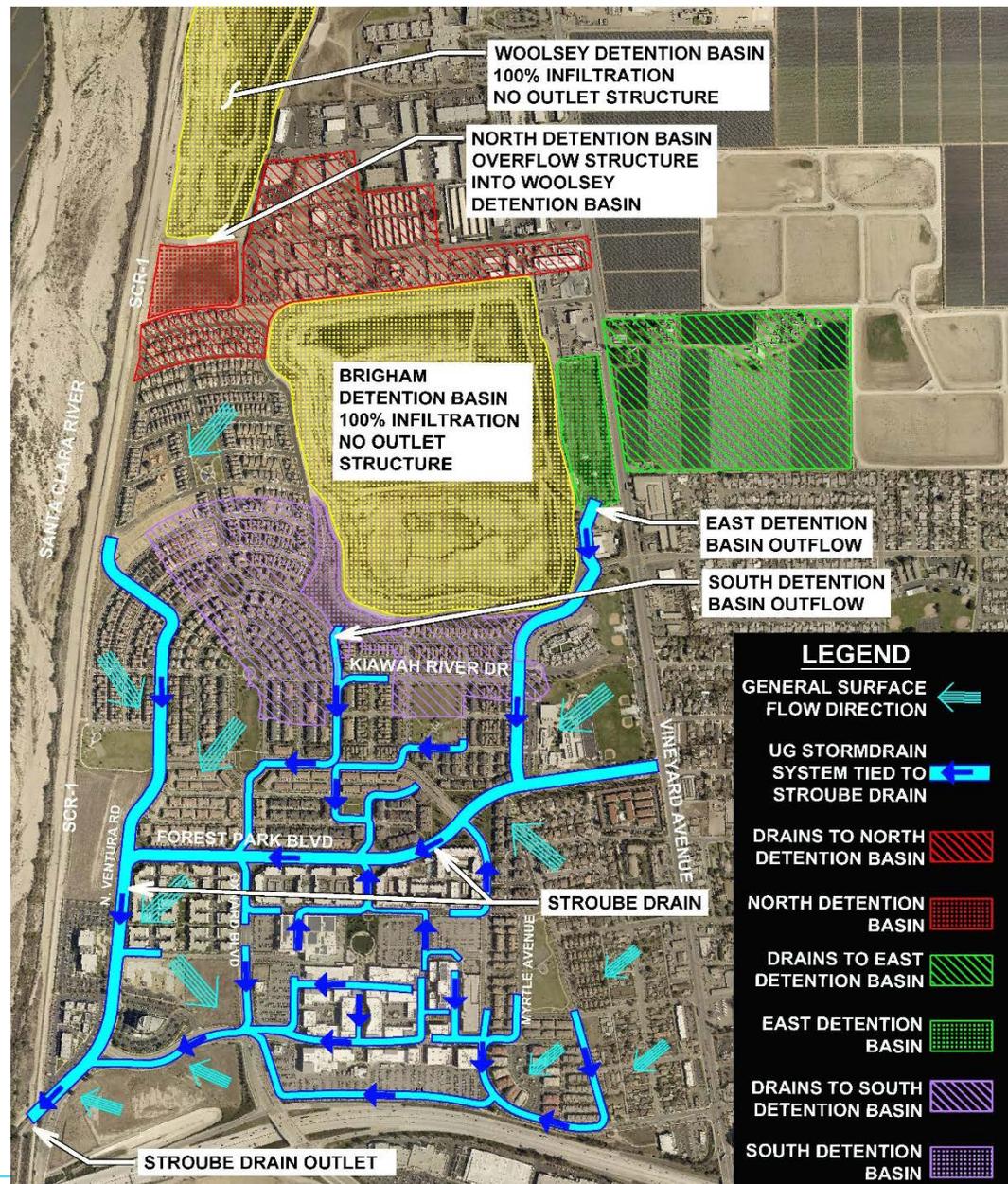
Regulatory Drivers:

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)

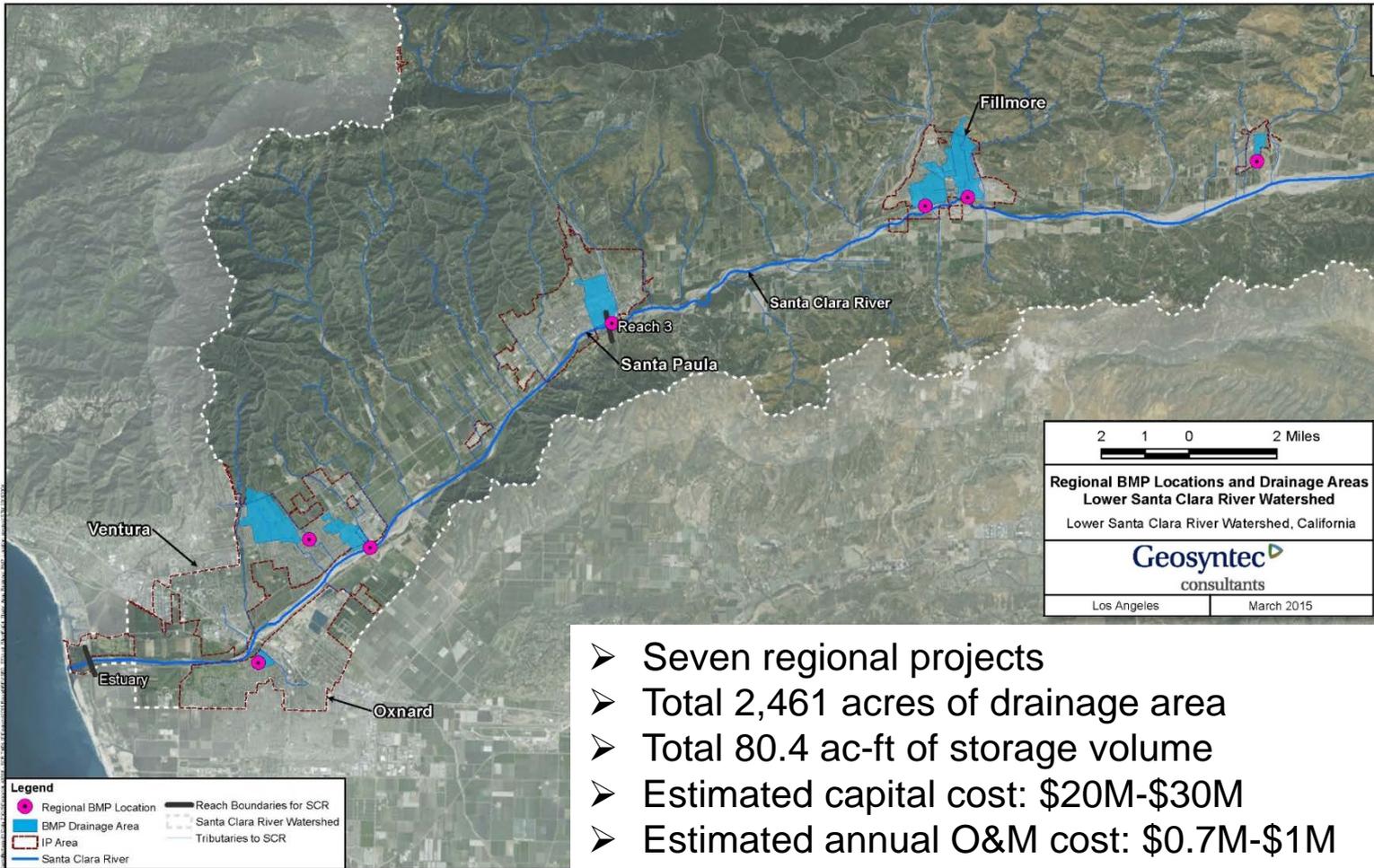


Funding challenges

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



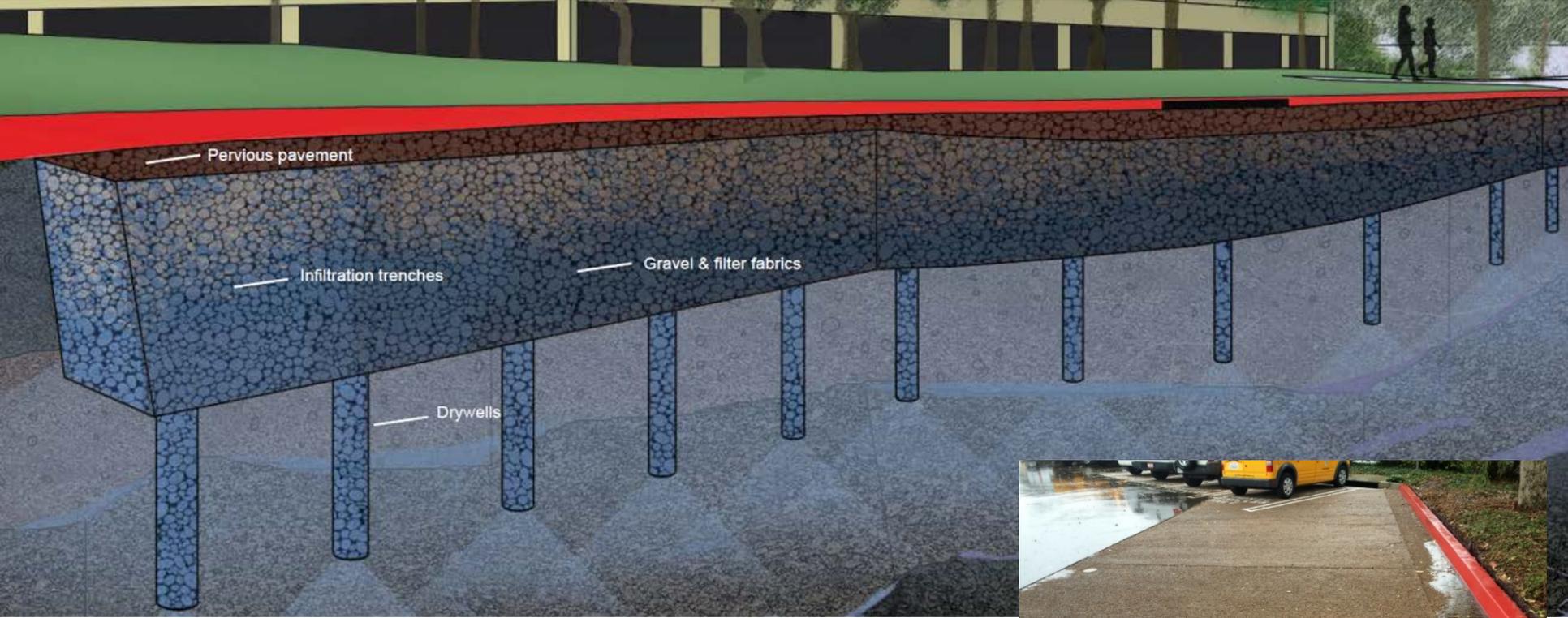
County Government Center Green Streets Urban Retrofit

Clean Drain
Drenaje Limpio

Cleaning stormwater before it makes its way to the Ventura River
*Limpiar los drenajes de aguas pluviales antes
de que cojan su camino al Rio Ventura*



<http://uninc.vcstormwater.org>



El Rio Retrofit for Groundwater Recharge



Piru Stormwater Capture

BMP Type: Spreading grounds

Construction: Summer 2018

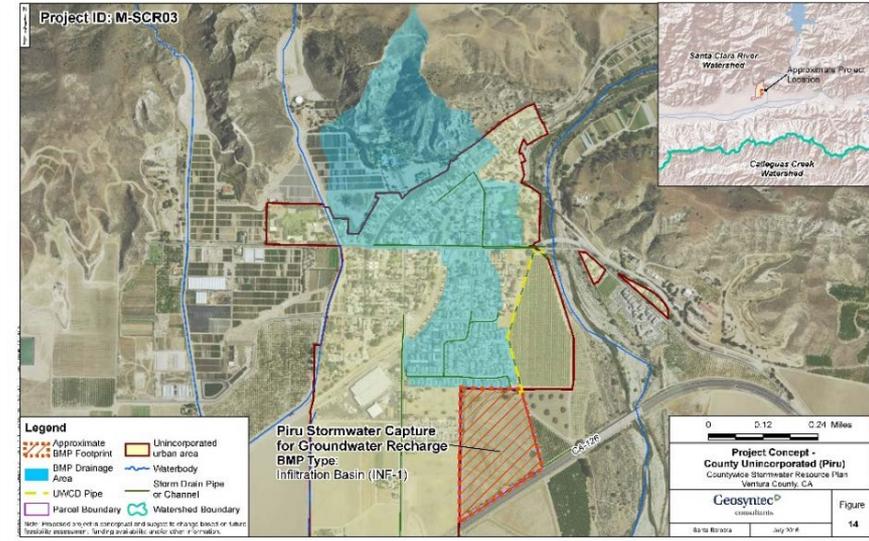
Drainage Area: 123 acres

Stormwater Capture: ~39 ac-ft/yr

Pollutant Reduction: 9.2×10^{12} MPN/yr

Project Collaborator: UWCD

Funding Source: Proposition 1 SWGP



Saticoy Stormwater Infiltration



BMP Type: Subsurface infiltration basin

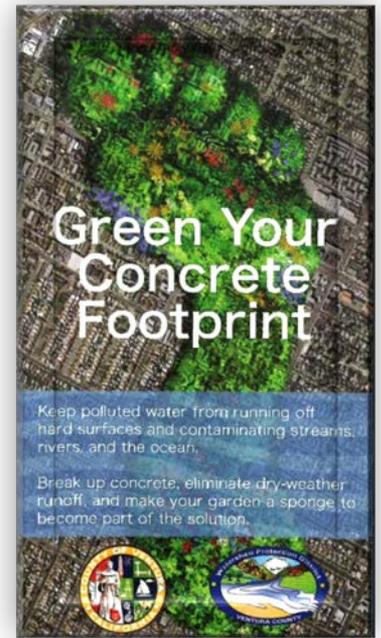
Drainage area: 41 acres

Construction: 2022 (estimate)

Collaborator: Caltrans

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

Project Educational Outreach

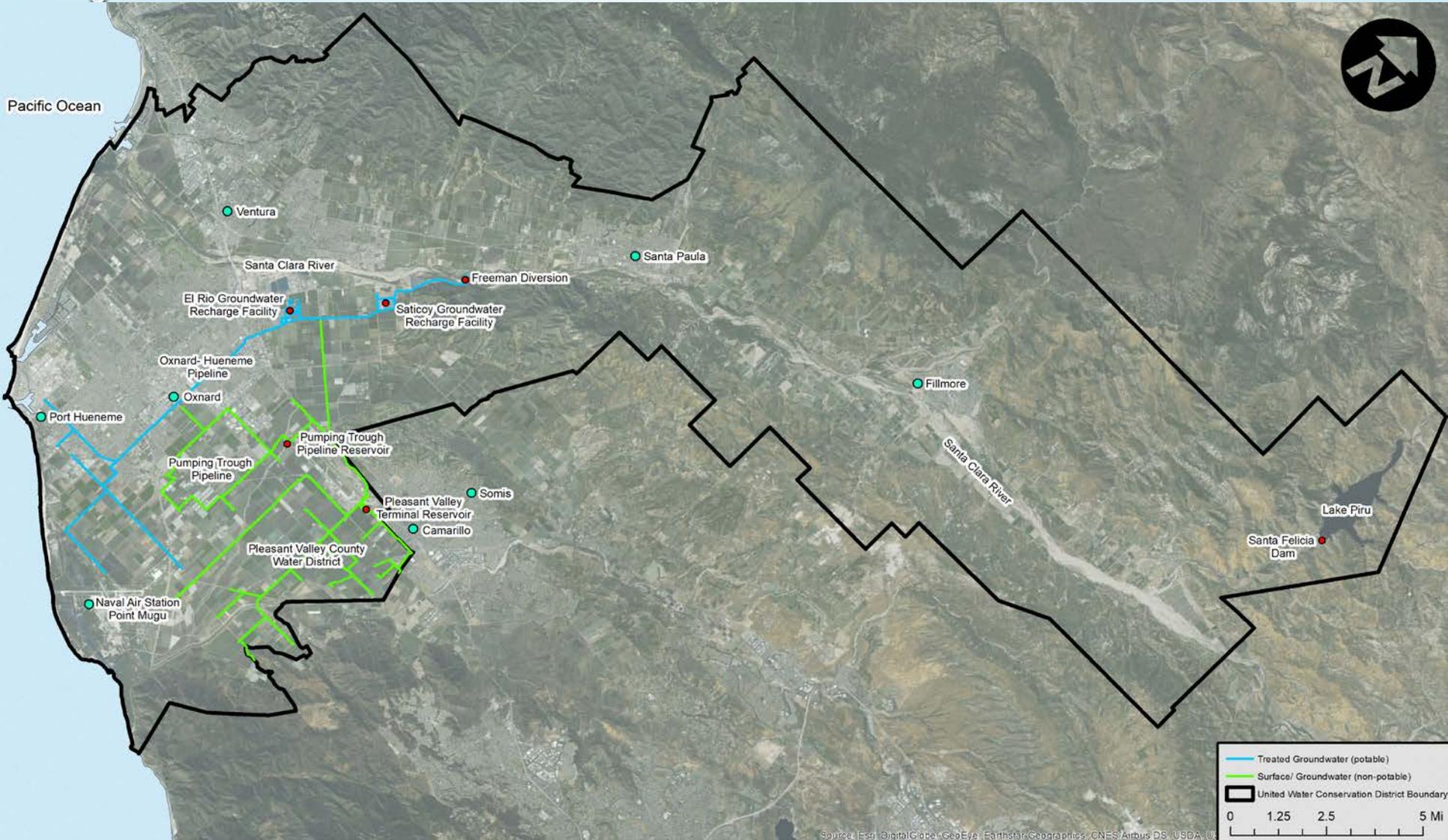




UNITED WATER CONSERVATION DISTRICT

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

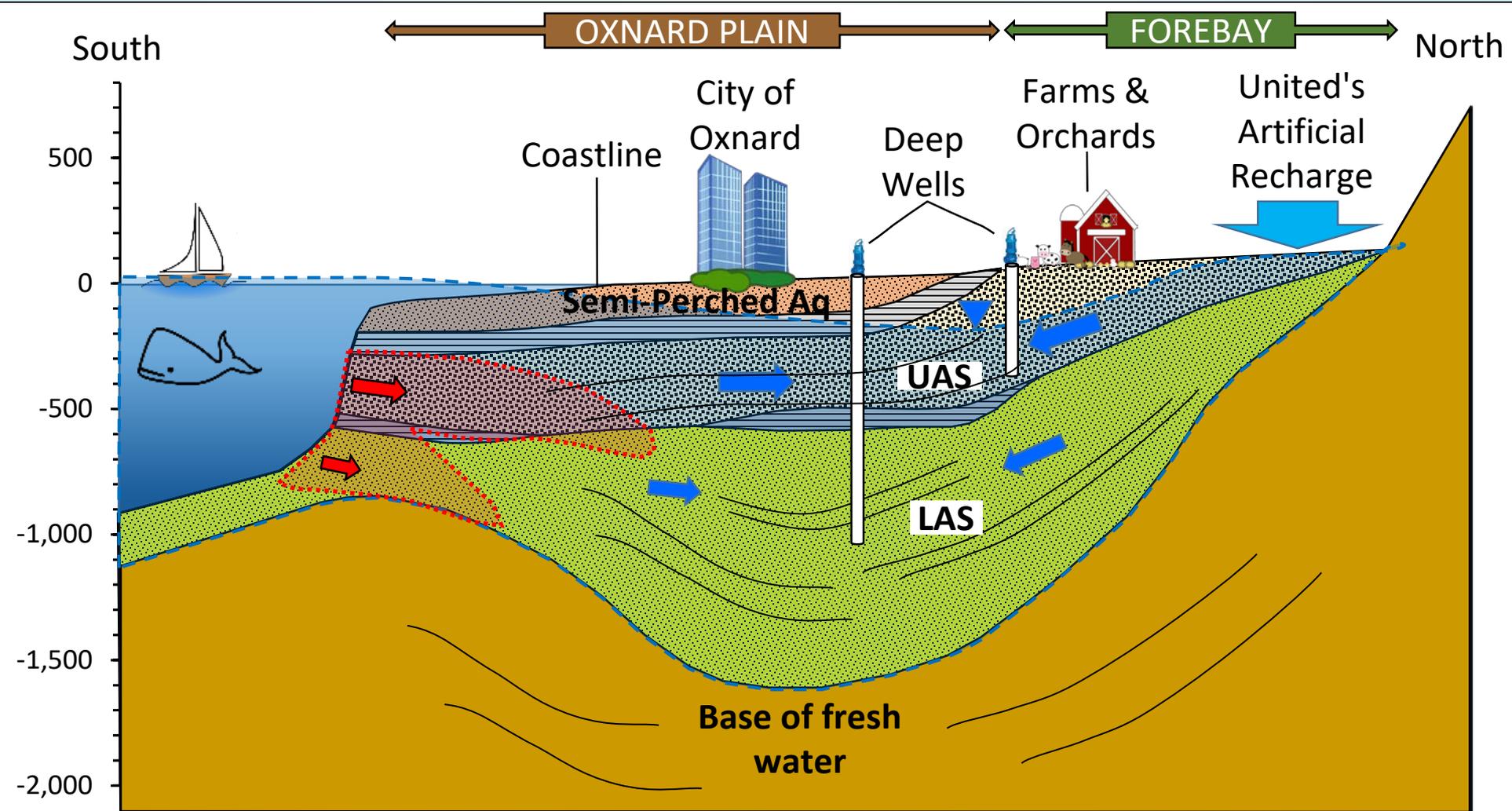


FREEMAN DIVERSION AND UNITED'S GROUNDWATER RECHARGE BASINS

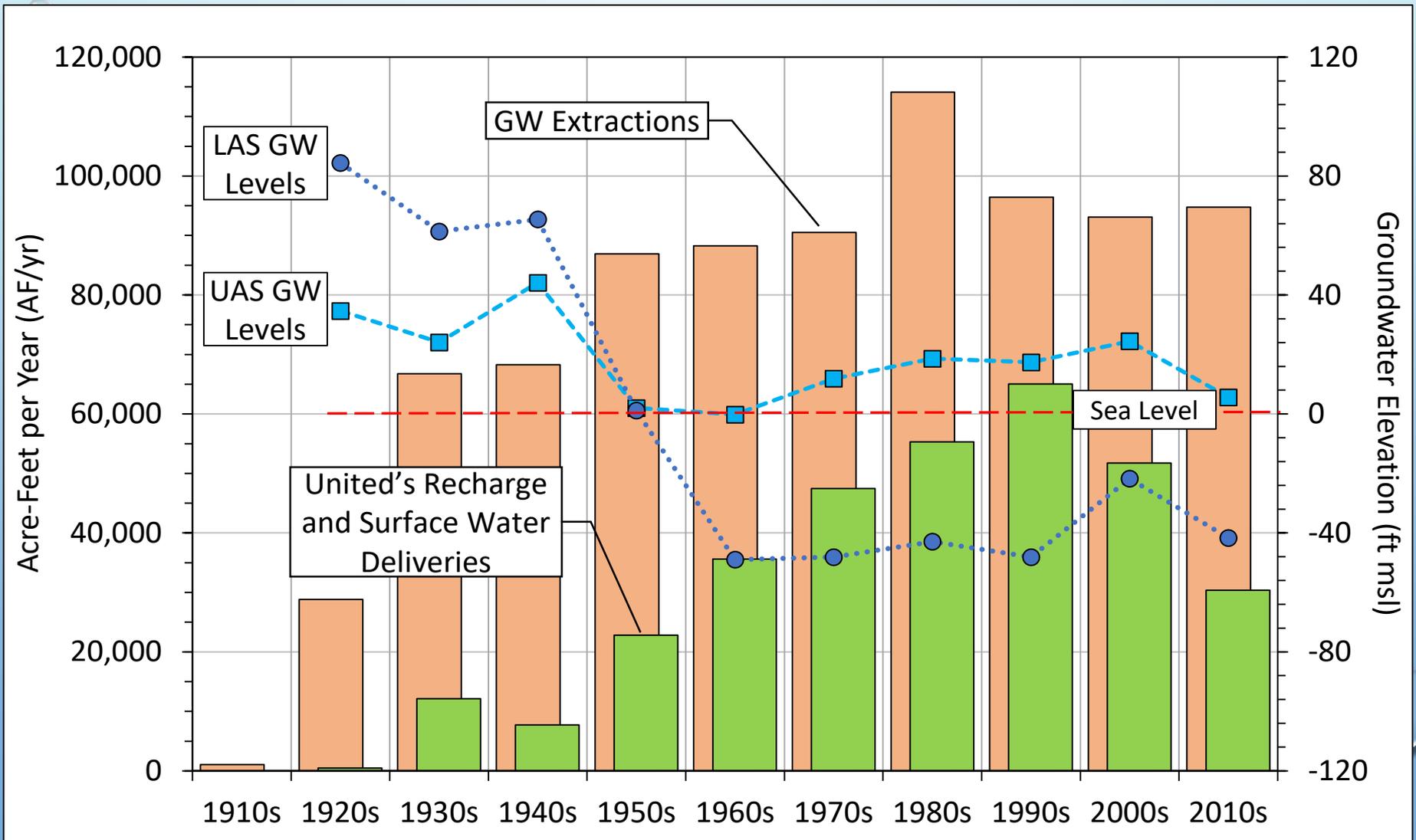


Photo date: April 2005

ROLE OF THE OXNARD FOREBAY



GROUNDWATER EXTRACTIONS AND UNITED'S RECHARGE AND SURFACE WATER DELIVERIES



FREEMAN DIVERSION CONVEYANCE SYSTEM PROPOSED IMPROVEMENTS

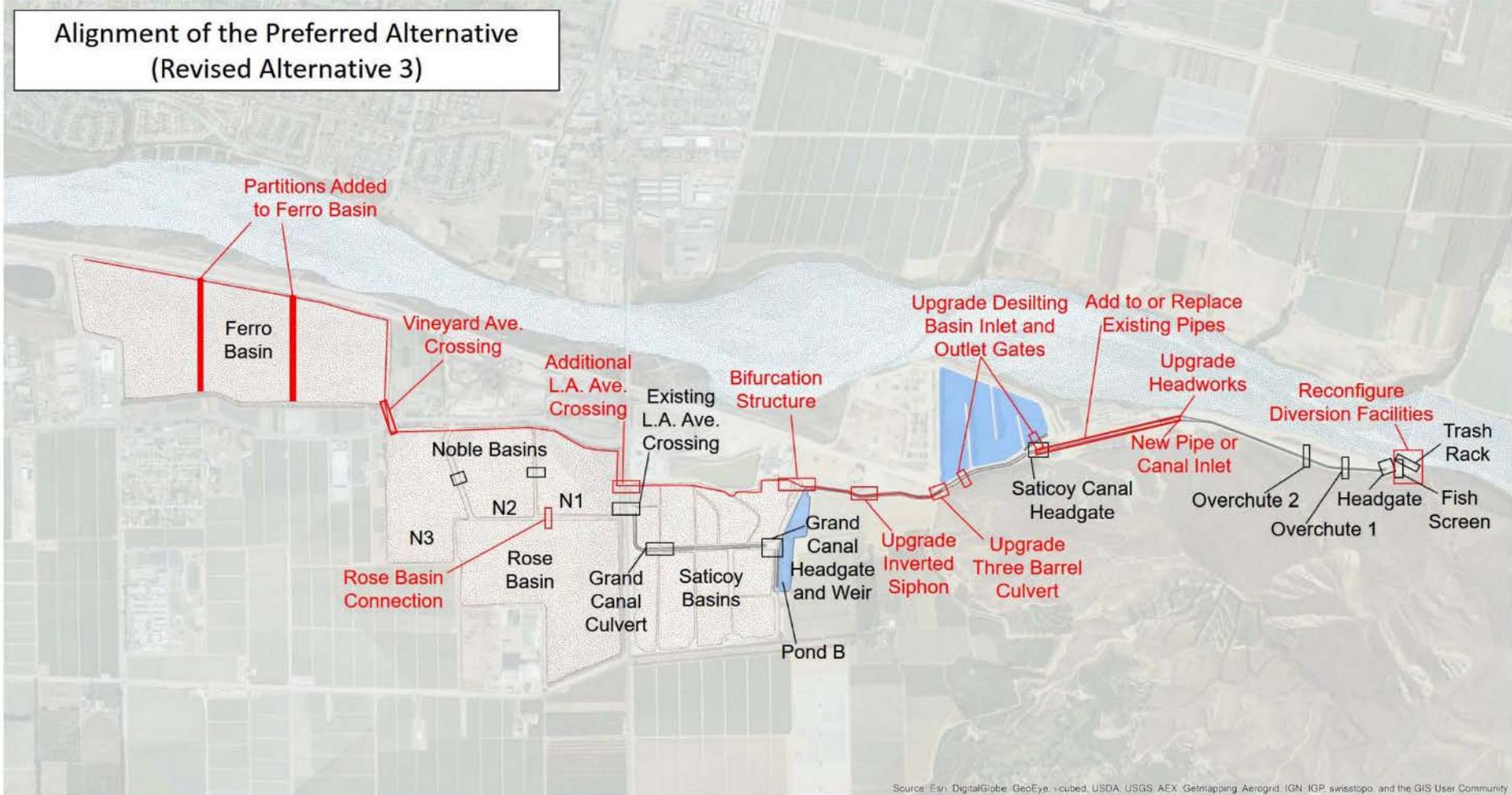
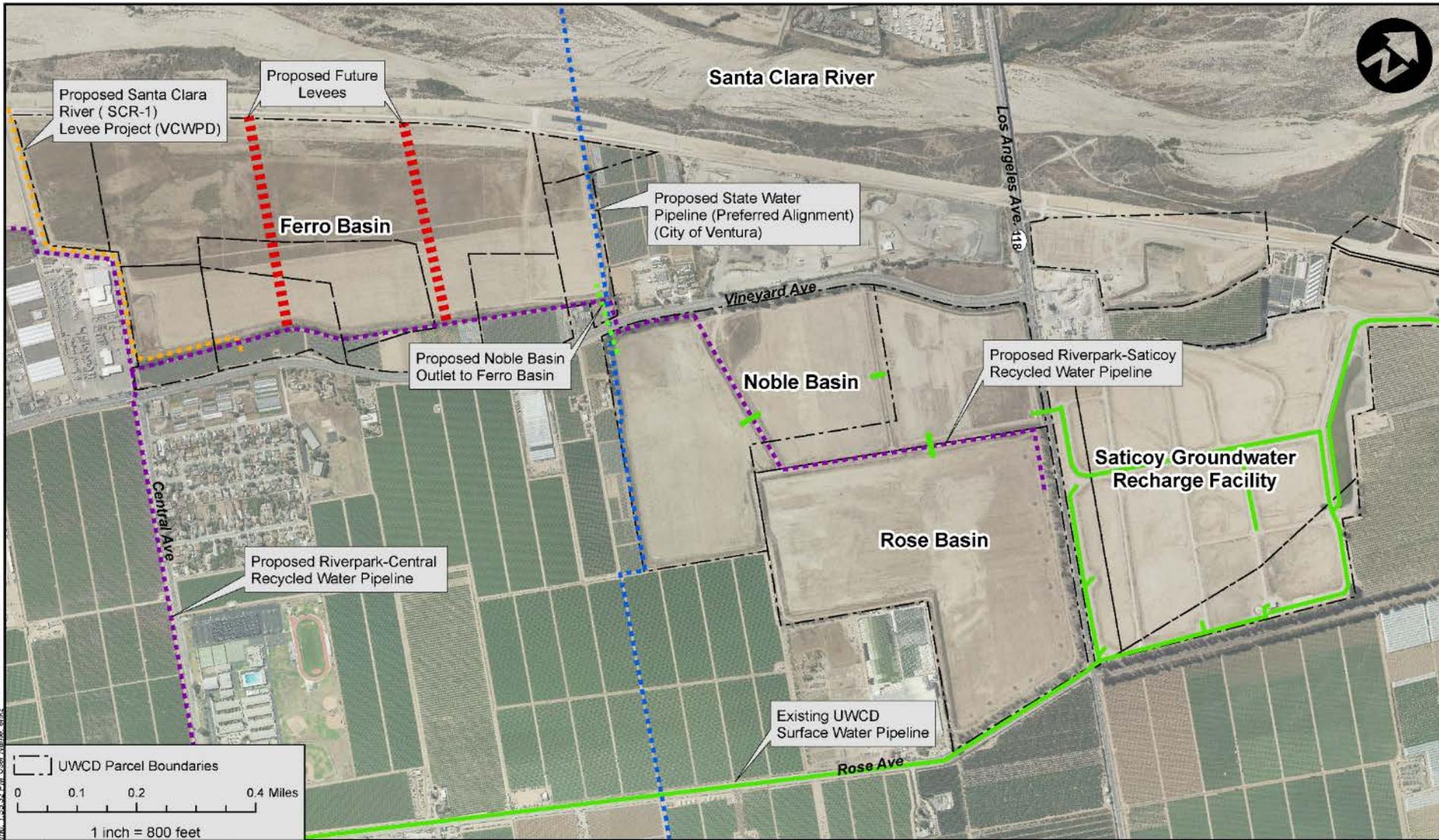


Figure 50 Alignment of the preferred alternative

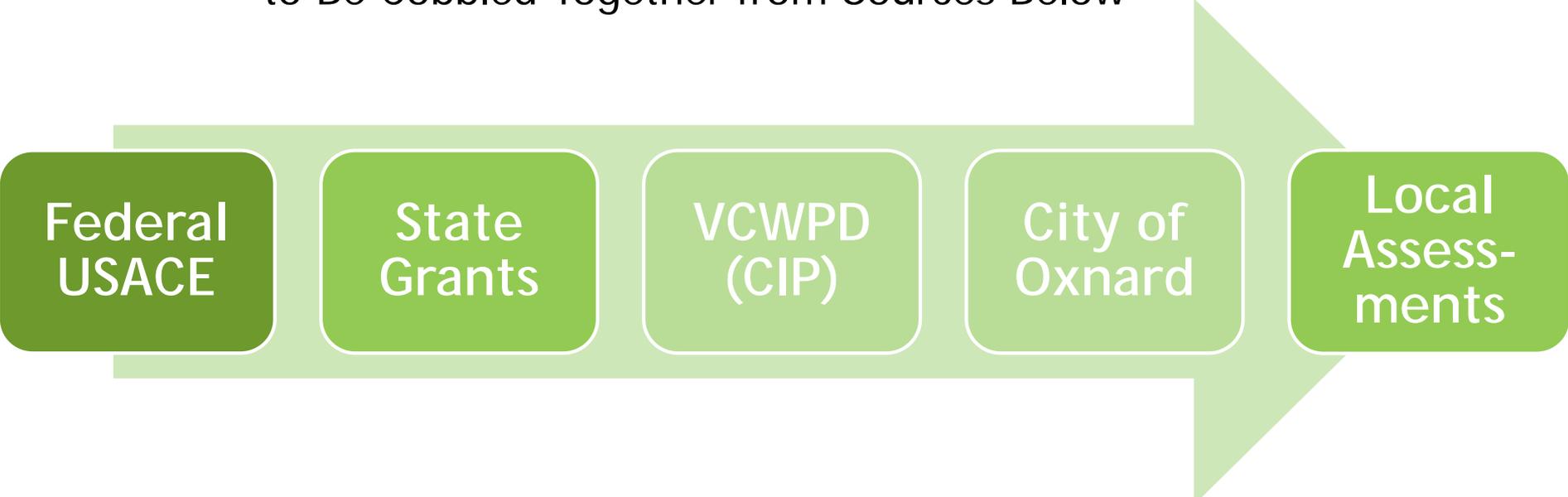
FERRO BASIN PLANNED USES



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

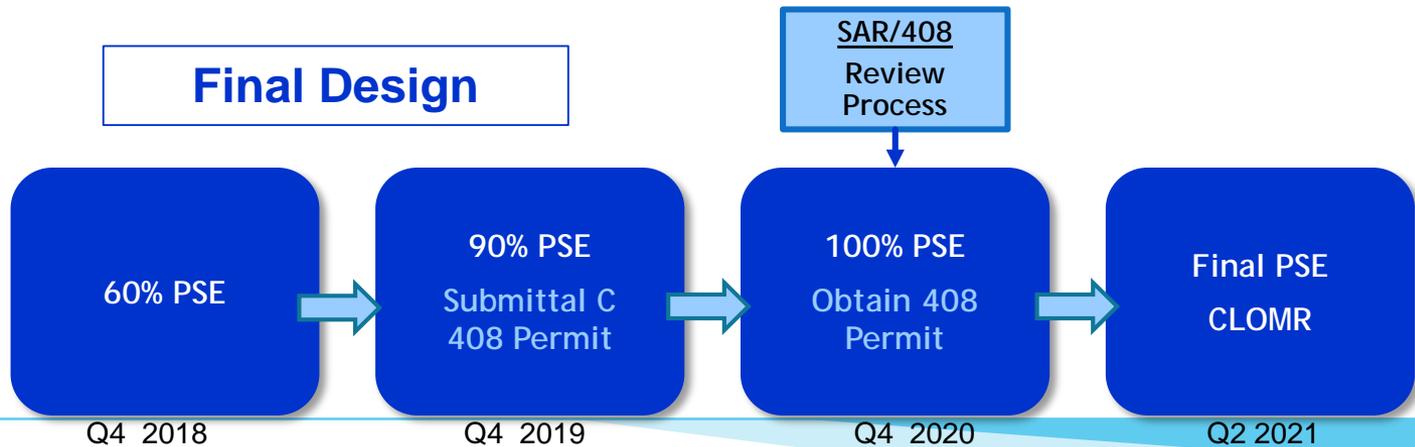
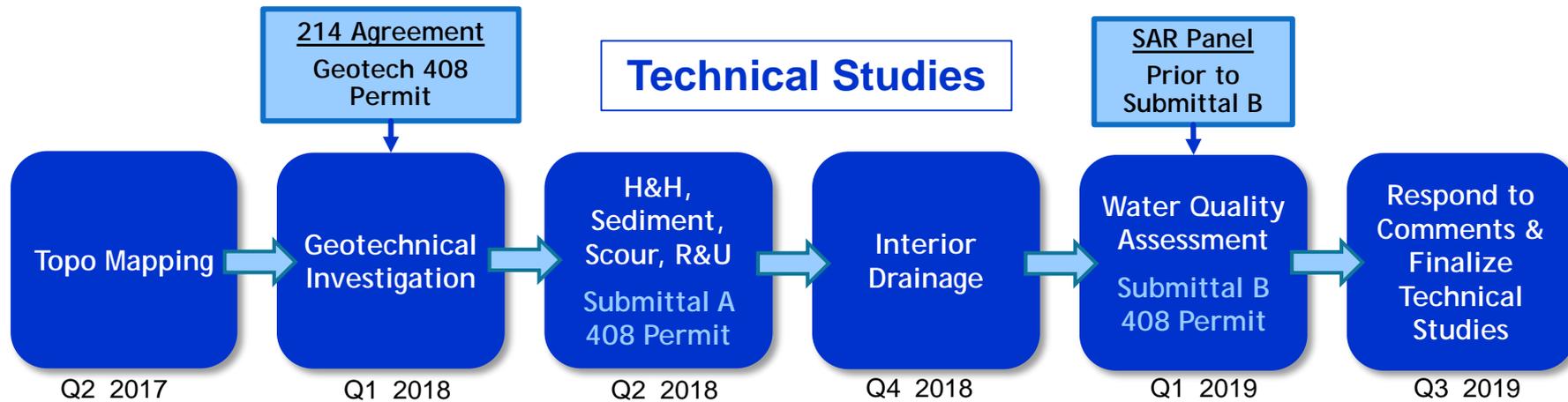
Santa Clara River Levee in Oxnard (SCR-1)

Structures Protected:	1,411
Estimated Damages from 1% ACE ¹ :	\$54,223,000
Estimated Levee Rehab Project Construction Cost ² :	\$40,767,100
55% State-Share - LLAP Grant LLCR Funds ³ :	\$1,284,000
45% Local Match - VCWPD Zone Funds ³ :	\$1,051,000
Total Estimated Annual Flood Insurance Premiums with Uncertified Levee ⁴ :	\$3,014,000

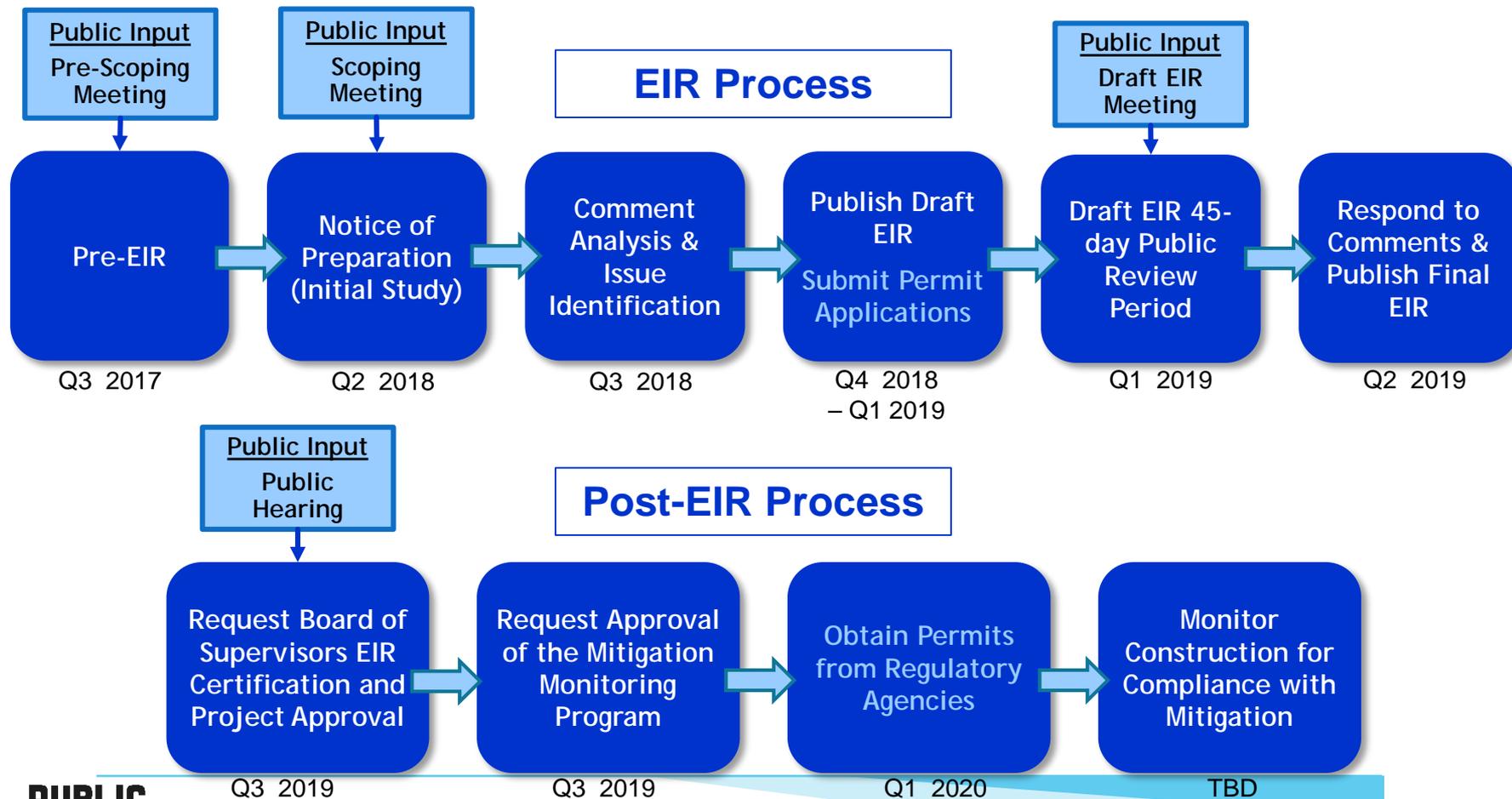
What Are the Next Steps?

Design and Environmental Process Overview

Engineering Design Process



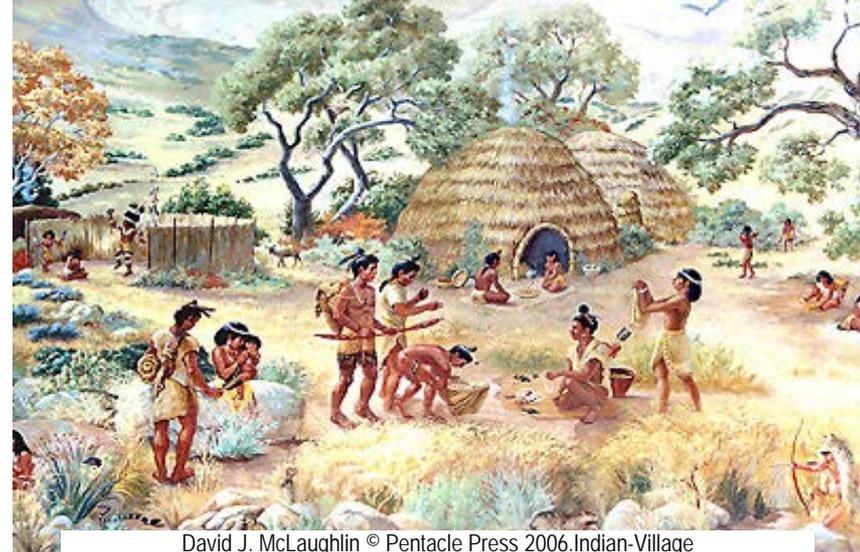
Environmental Review Process



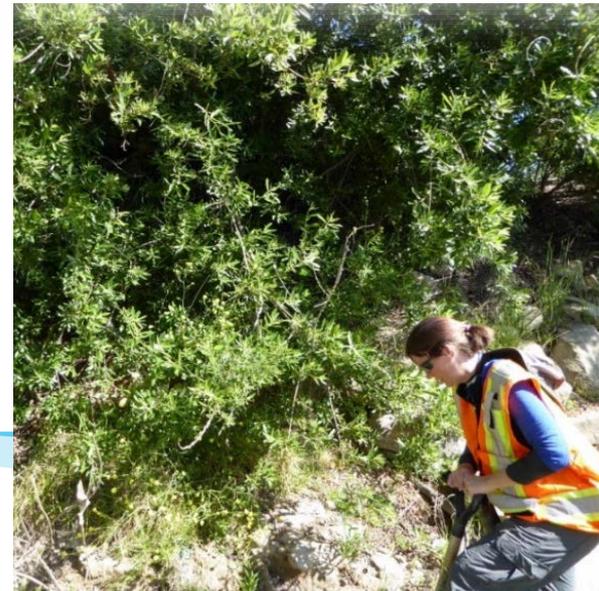
Project Surveys Completed to Date

- ❖ 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

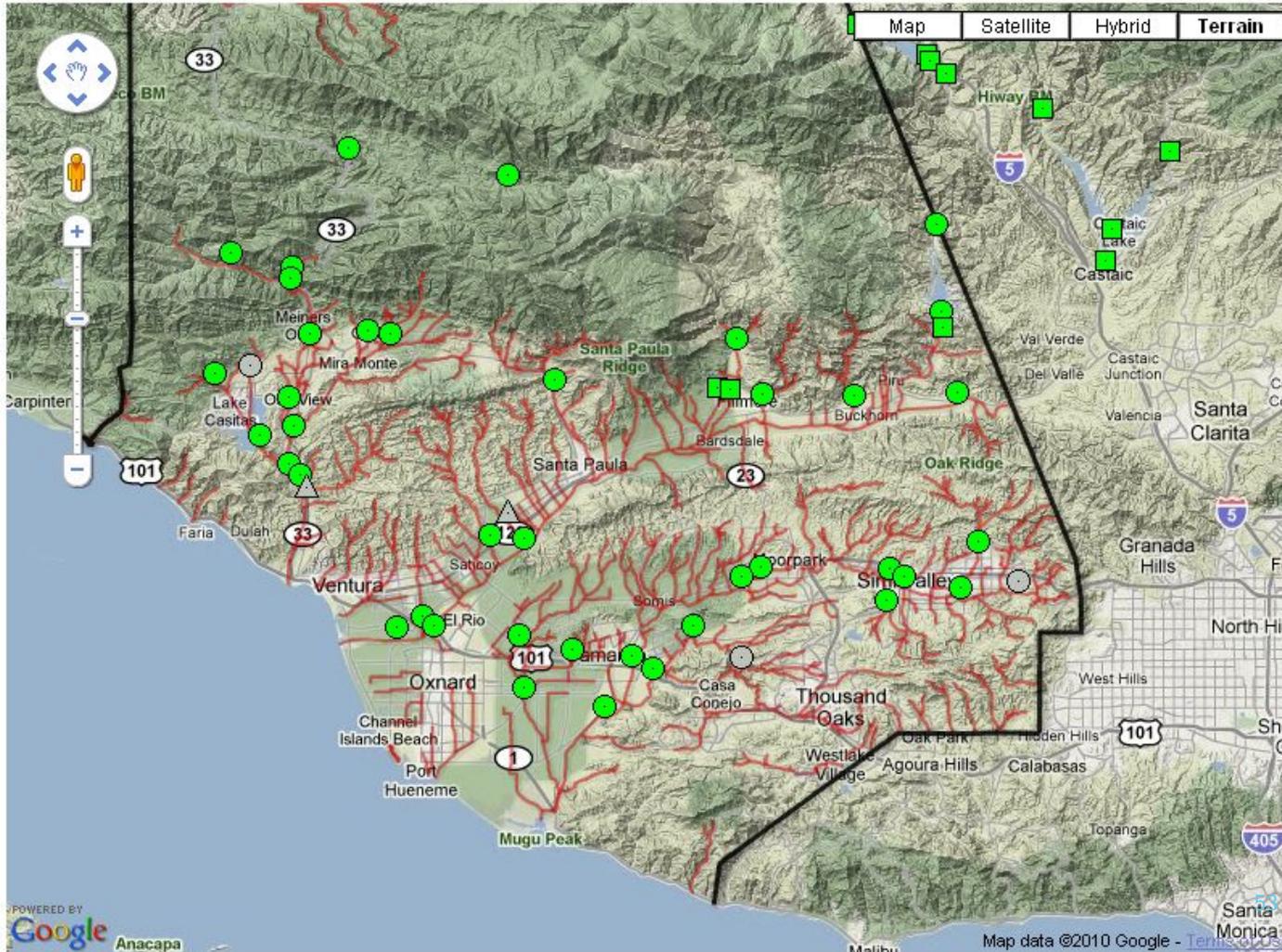


Cooper's Hawk

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®

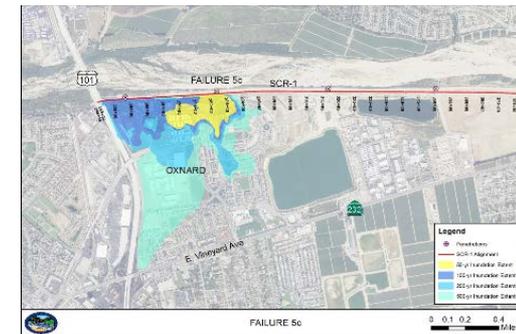
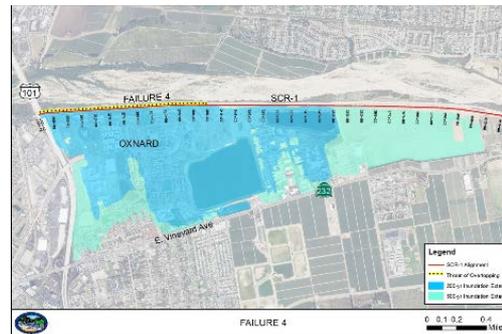
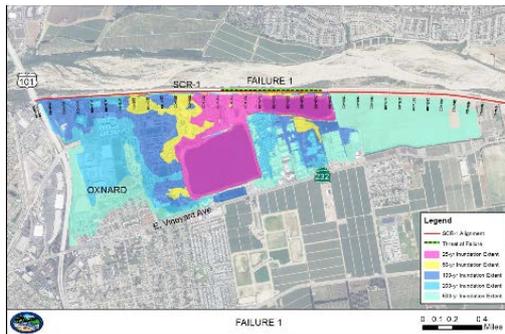
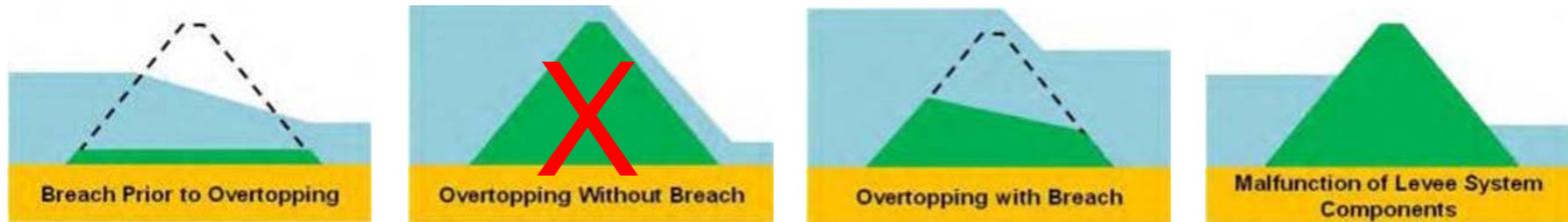
ENGINEERING AND
CONSTRUCTION BULLETIN

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

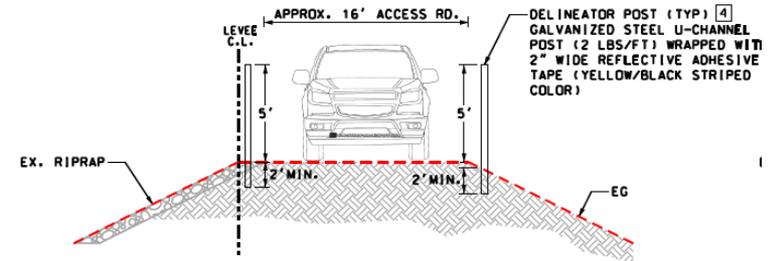
**Flood Warning and Emergency
Evacuation Plan**

March 2015



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

Interim Risk Reduction Measures (IRRM) Plan



DELINEATOR POSTS DETAIL (2H:1V LANDWARD SLOPE) D
C-8
NOT TO SCALE

IRRM # 7 – Visual Markers

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

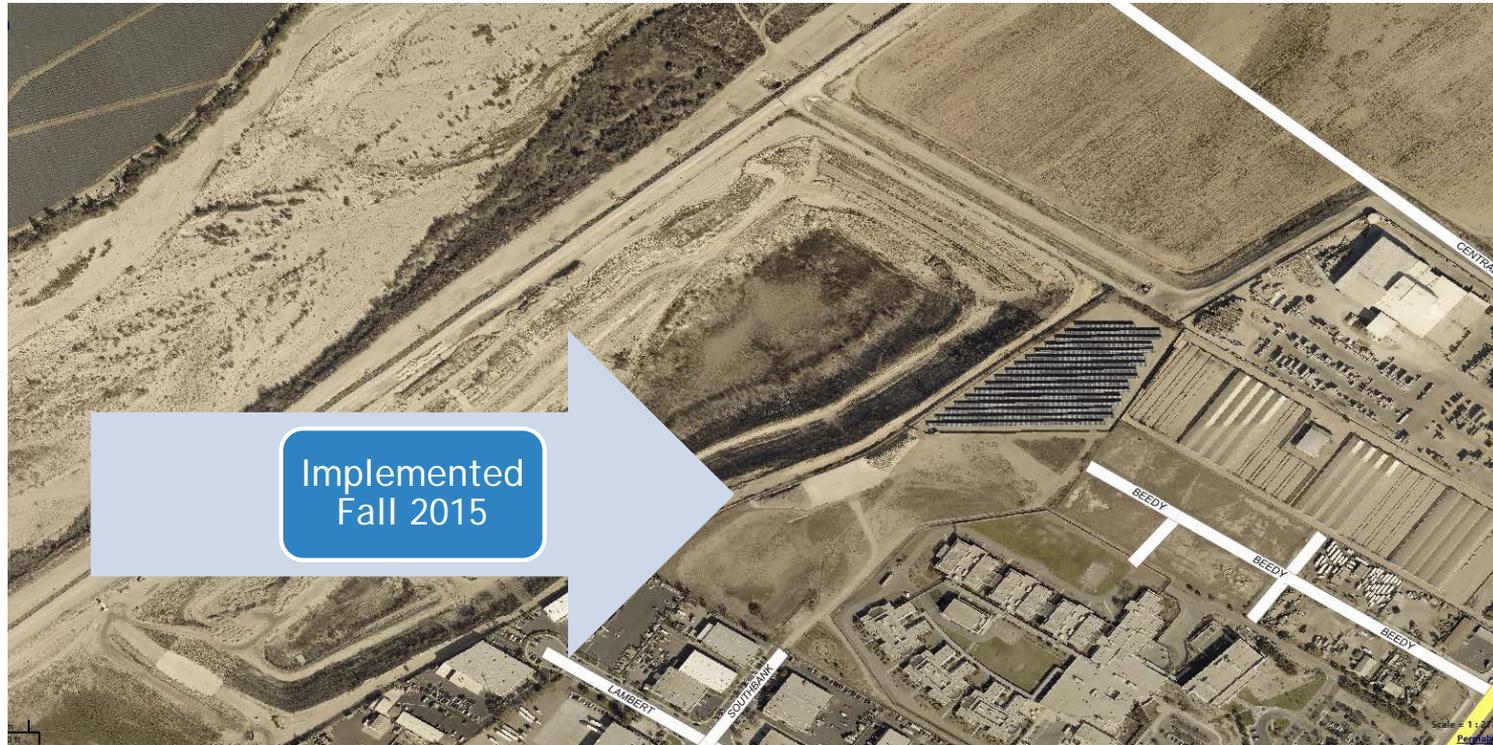
Implemented
Fall 2015



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
(go to Programs and Projects)
- ❖ County of Ventura:
www.vcfloodinfo.com
- ❖ FEMA:
www.floodsmart.gov/floodsmart/

Contact Information

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➤ (805) 477-7175



Questions?

