



Public Works Agency



# RiverPark

## Neighborhood Council Meeting

### Informational Update on SCR-1 Levee

Thursday, August 27, 2015

Ventura County Watershed Protection District  
Update on SCR-1 Levee



# ***Introductions & Presenters***

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- ***Peter Sheydayi***, Deputy Director, Design and Construction, Watershed Protection District
- ***Ike Pace***, Project Manager, Tetra Tech
- ***Jason Geneau***, Emergency Planner, Tetra Tech



# Agenda

- ***Introduction*** – Peter Sheydayi
- ***Project Setting and History*** – Ike Pace
- ***FEMA Levee Certification Efforts and Levee Upgrade Project*** – Ike Pace
- ***Interim Risk Reduction Measures Plan*** – Ike Pace and Jason Geneau
- ***Funding and Look Forward*** – Peter Sheydayi
- ***Questions and Answers*** – All

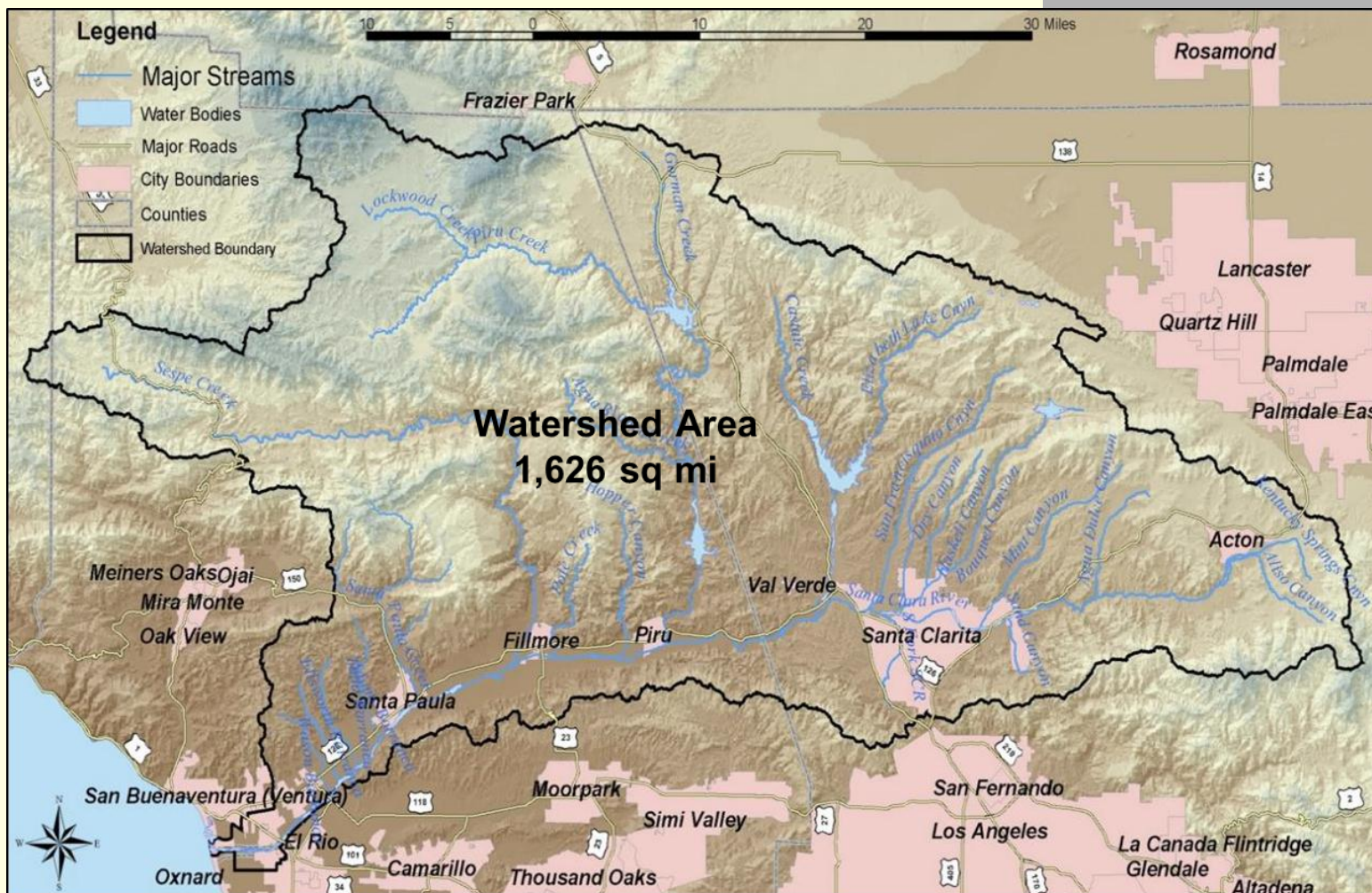


# Project Setting



# Santa Clara River Levee (SCR-1)

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# Santa Clara River Levee (SCR-1)

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# Historical Timeline



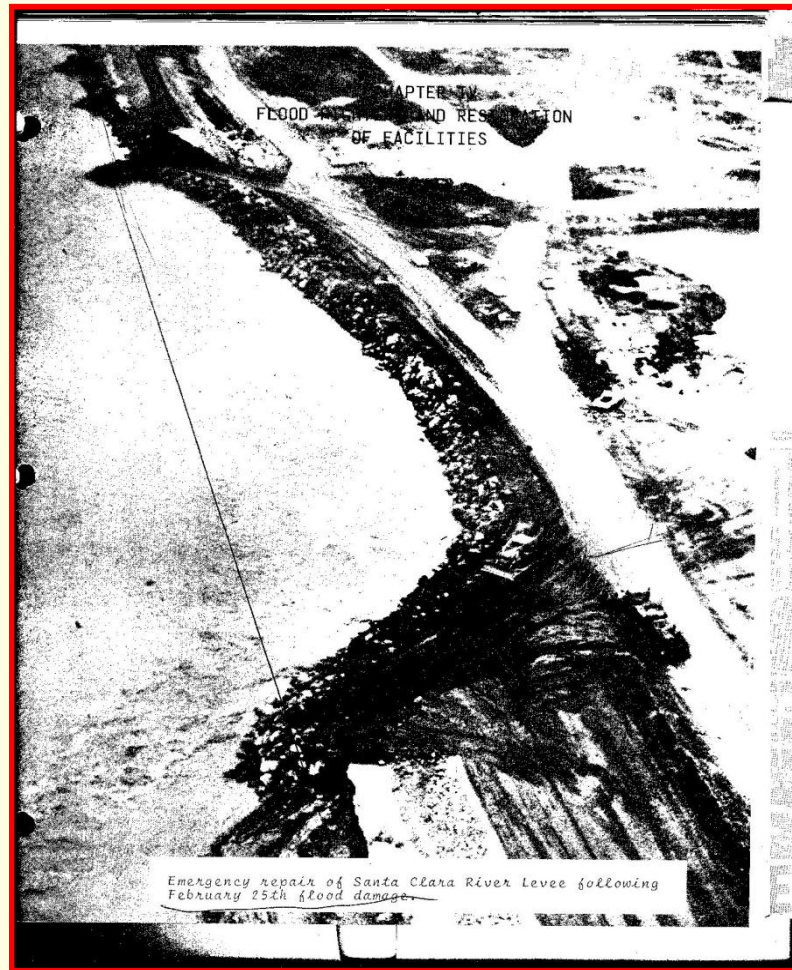
# Santa Clara River Levee (SCR-1)

Originally designed and constructed by U.S. Army Corps of Engineers

Completed in 1961, 4.72 miles of levee with 40 groins.

After the 1969 floods the Corps:

- Repaired 7 of the original 40 groins,
- Restored 2,100 linear feet of levee embankment with deeper rock revetment,
- Added 34 additional groins, completed in 1971.



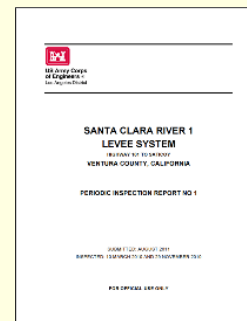
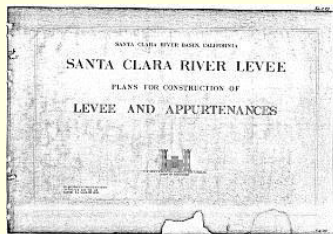




# Santa Clara River Levee (SCR-1)

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## Timeline



**USACE  
Periodic  
Inspection**



1960

1970

1980

1990

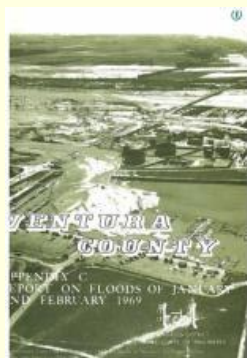
2000

2010

►1983  
Flood Damage

►2011  
Periodic Inspection

Pursue  
Partnership with  
USACE



►1969  
Flood Damage



FEMA

►2009  
PAL Response

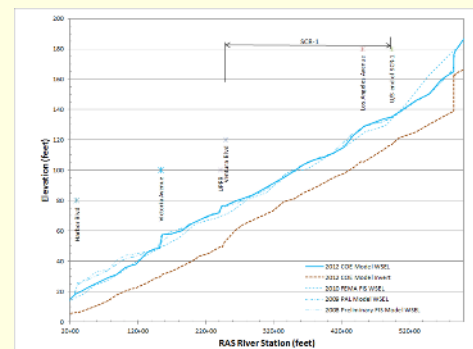
►2012  
Feasibility Studies





# Santa Clara River Levee (SCR-1)

## Timeline (cont.)



The VCWPD's proposed funding plan for stabilization is summarized in Table 4 below.

Funding Component	Funding Amount
VCWPD Funding (C&M)	\$1.8 million
Total for SCR1 (state-related items)	\$1.8 million
Federal Funding (USACE Station 210-grant-based)	\$22 million
VCWPD Funding (C&M)	\$5 million
State Funding (grants received by VCWPD and other C&M agencies)	\$5 million
Total for SCR1 (critical items)	\$46.8 million
<b>TOTAL for SCR 1</b>	<b>\$46.8 million</b>



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

► **2014**  
New Start Request for  
USACE FY16 Budget

► **2015**

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



► **March 2015**  
DWR LLAP  
Grant Package

► **Apr 2015**  
New Start for FY16  
Not in Budget  
**New Start Requested for  
USACE FY17 Budget**



# FEMA Levee Certification Efforts

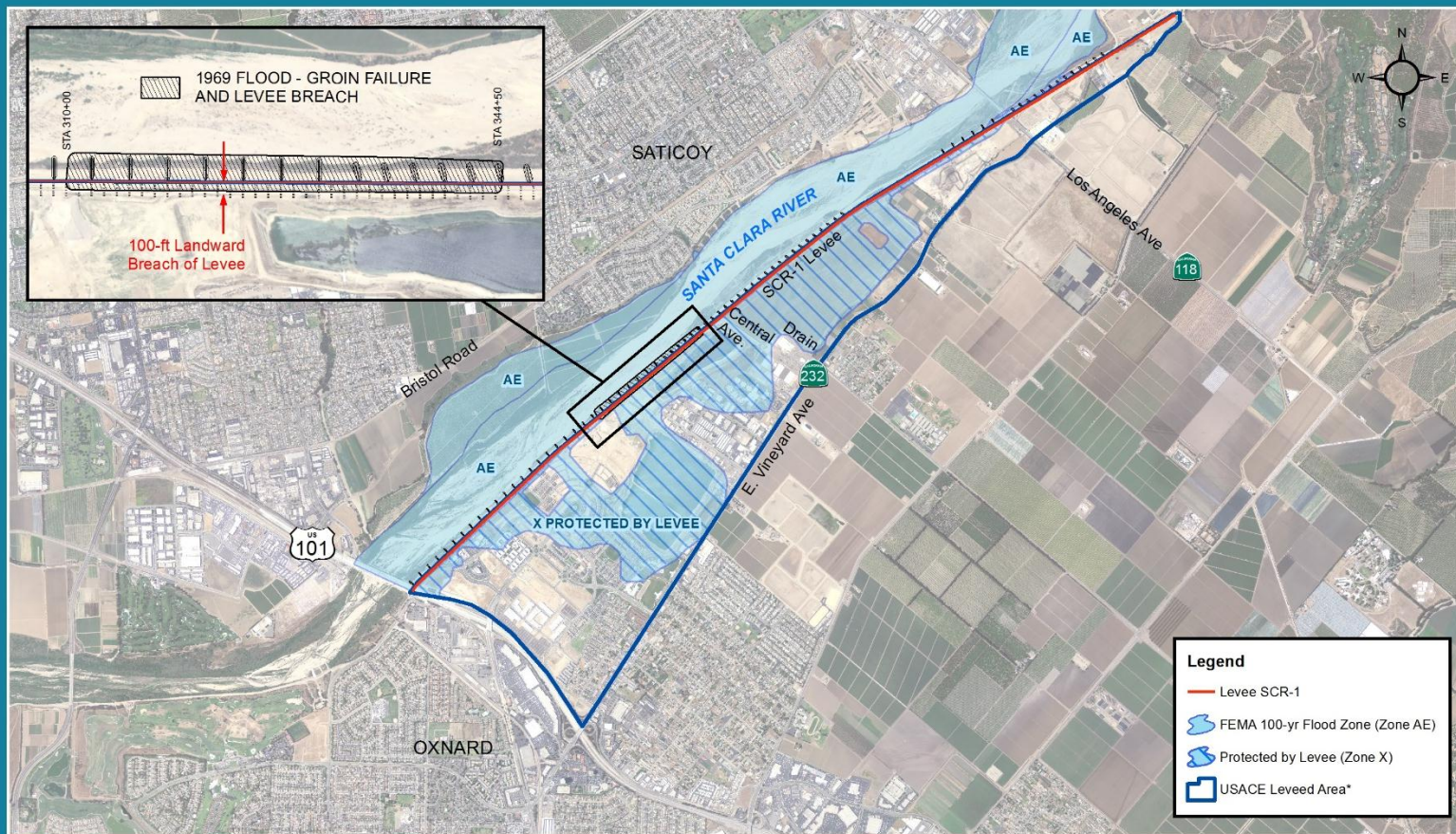


# Santa Clara River Levee (SCR-1)

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## SANTA CLARA RIVER LEVEE (SCR-1) FEMA 100-YR FLOOD ZONE

Graphic Developed as Part of  
VCWPD Technical Studies



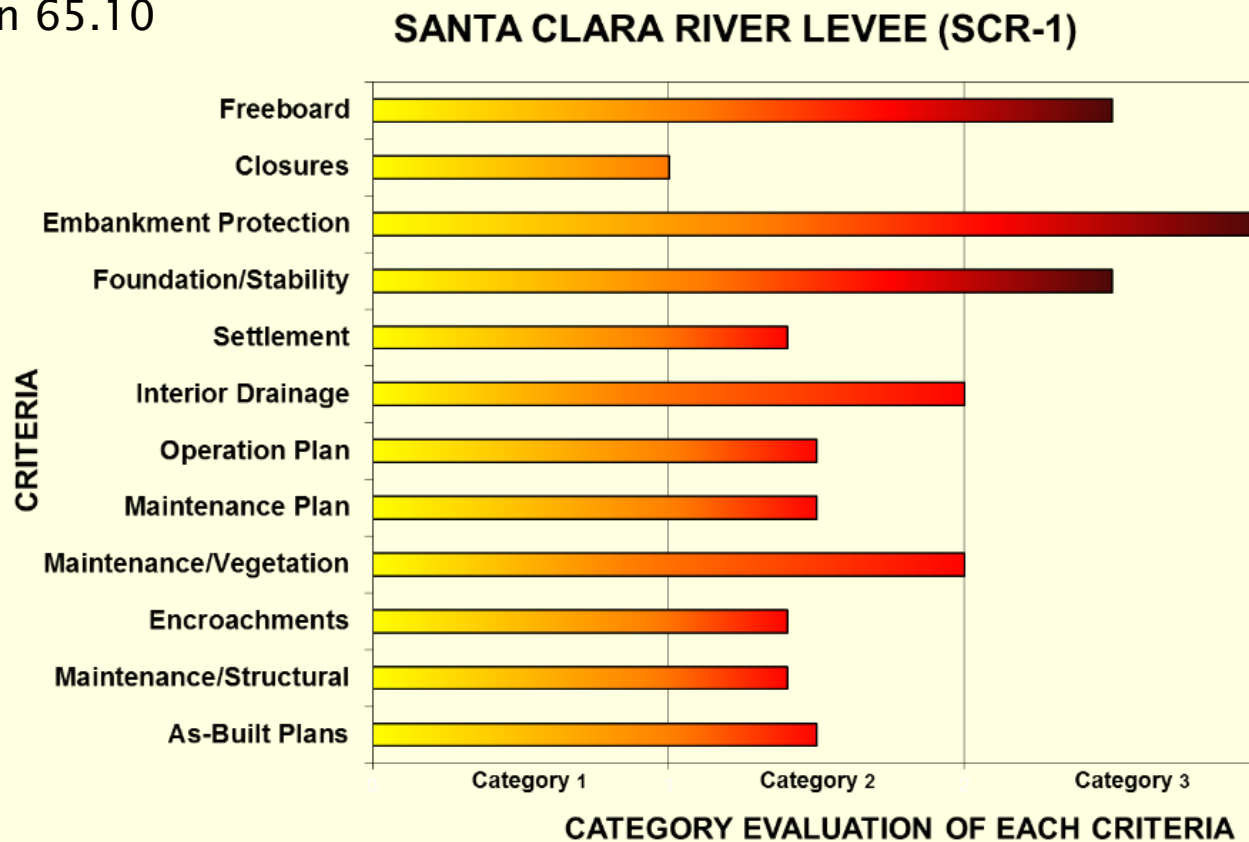
\*Per USACE National Levee Database. Analysis area determined by flood zones.



# Santa Clara River Levee (SCR-1)

## FEMA Levee Requirements

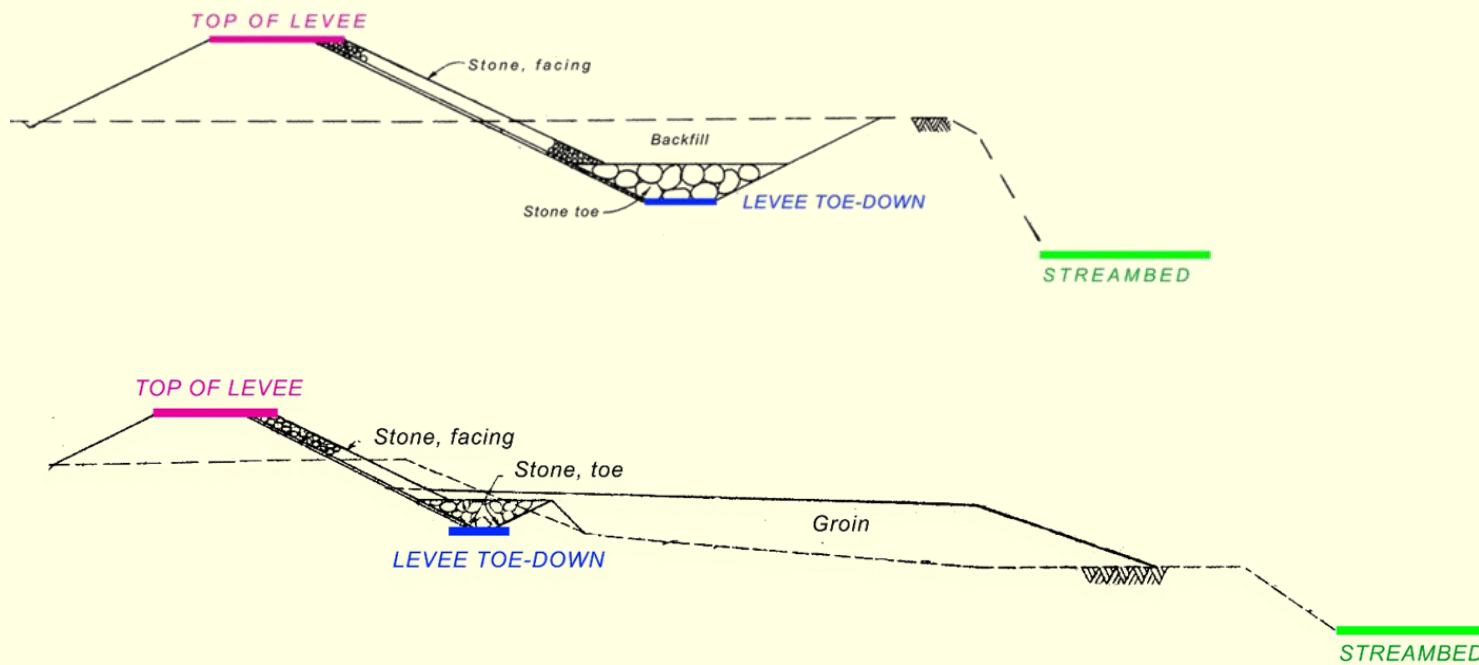
- CFR 44 Section 65.10





# Santa Clara River Levee (SCR-1)

## Critical Items





# USACE Periodic Inspection



# Santa Clara River Levee (SCR-1)

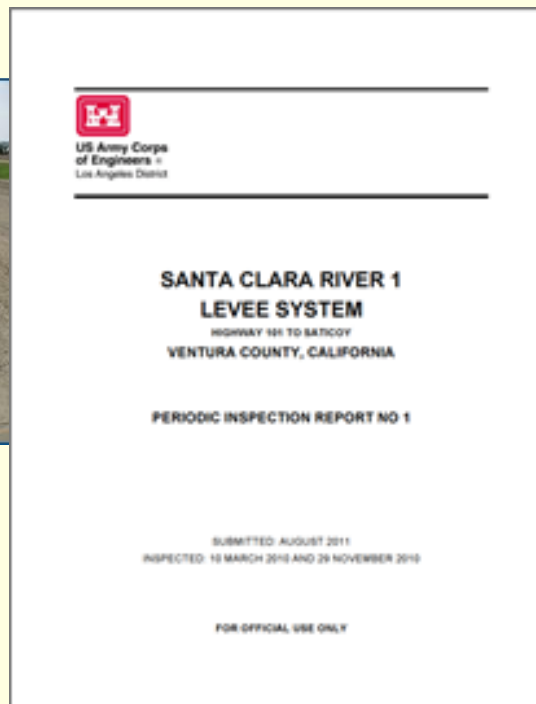
## 2011, USACE – Periodic Inspection Rating

- *Unacceptable*



Non-Critical Items

Critical Items







# Santa Clara River Levee (SCR-1)

## Non-Critical Items

### Deficiencies Corrected by VCWPD

- Clearing of vegetation free zone
- Repair of access ramps
- Repair of embankment erosion
- Removal of sediment/obstructions
- Repair of grate inlets and flap gates
- Video inspections of side-drain pipes

## ▶ Periodic Inspection

County working to correct Unacceptable rated items

Santa Clara River 1 Levee System - Deficiencies Corrections Status

Item ID	Item Name	Event ID	Agreement Date/Status	Contractor/Status	Start Date/Status	Issue Status	Deficiency Description	Deficiency Details	Images/Photos	Corrective Action/Status	Inspected By	Reviewed By	Item ID
SCR-1-001	Side Drain Pipe	2015-08-15	Open	VCWPD	2015-08-15	Unacceptable	Side drain pipe blocked by debris	Blocked side drain pipe		Clearing debris	VCWPD	VCWPD	SCR-1-001
SCR-1-002	Access Ramp	2015-08-15	Open	VCWPD	2015-08-15	Unacceptable	Access ramp damaged	Access ramp photo		Repair ramp	VCWPD	VCWPD	SCR-1-002
SCR-1-003	Embankment Erosion	2015-08-15	Open	VCWPD	2015-08-15	Unacceptable	Embankment erosion	Embankment erosion photo		Regrading/repair	VCWPD	VCWPD	SCR-1-003
SCR-1-004	Sediment/Obstructions	2015-08-15	Open	VCWPD	2015-08-15	Unacceptable	Sediment/obstructions	Sediment/obstructions photo		Removal	VCWPD	VCWPD	SCR-1-004
SCR-1-005	Grate Inlets and Flap Gates	2015-08-15	Open	VCWPD	2015-08-15	Unacceptable	Grate inlets and flap gates	Grate inlets and flap gates photo		Repair	VCWPD	VCWPD	SCR-1-005
SCR-1-006	Side-Drain Pipes	2015-08-15	Open	VCWPD	2015-08-15	Unacceptable	Side-drain pipes	Side-drain pipes photo		Video inspection	VCWPD	VCWPD	SCR-1-006

Printed: 8/24/2015

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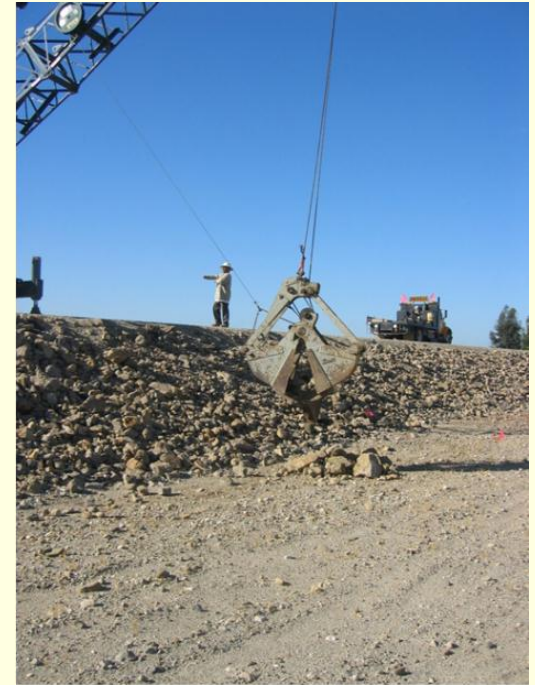


# *Santa Clara River Levee (SCR-1)*

## Critical Items



- **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**





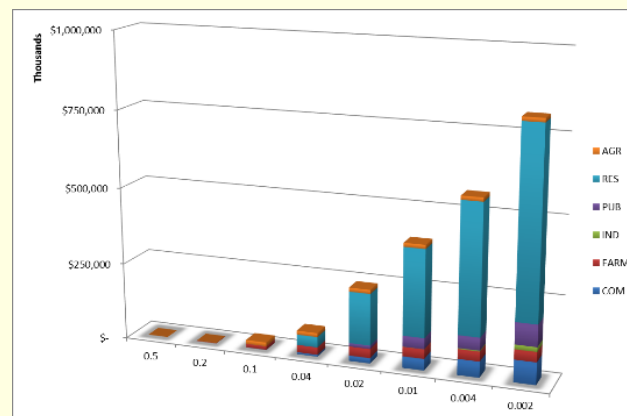
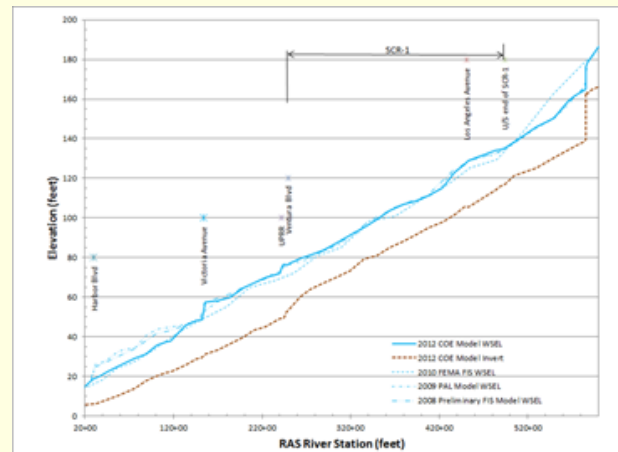
# Technical Studies and Alternatives



# Santa Clara River Levee (SCR-1)

## Technical Studies

- Data Collection
- Topographic Mapping
- Hydrologic Review
- Hydraulic Analysis
- Sediment Transport and Scour Analyses
- Risk and Uncertainty
- Alternatives Analysis
- Economic Analysis



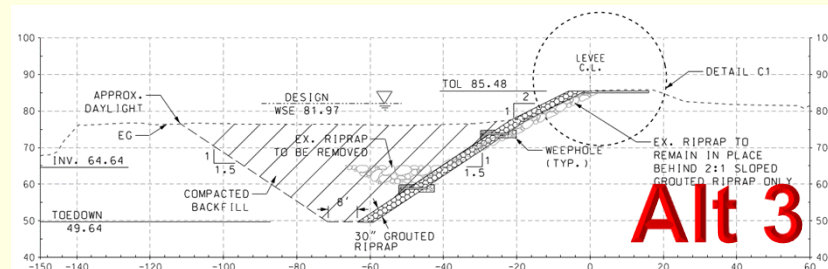
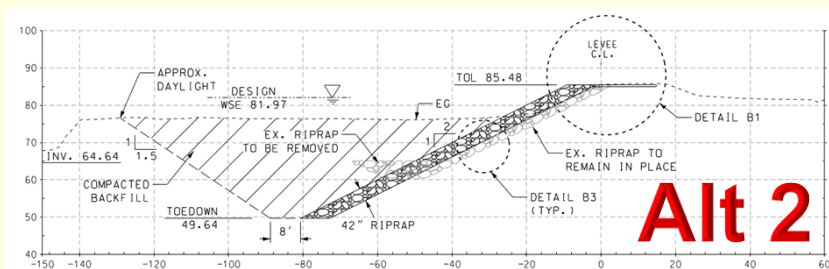
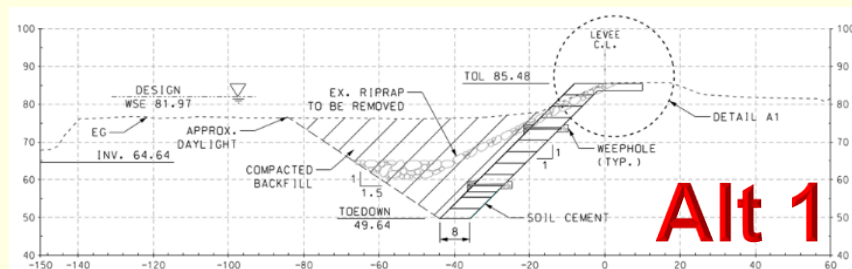


# Santa Clara River Levee (SCR-1)

## Alternatives

### Initial Screened 12 Alternatives

- Erosion Protection Type
  - Alternative 1 – Soil Cement
  - Alternative 2 – Loose Riprap
  - Alternative 3 – Grouted Riprap
- Alignment Based on Current Levee Location
- Design Flow (250,000 cfs); 200-Yr (303,970 cfs)
- Environ Impacts a Significant Factor (mit costs)





# Santa Clara River Levee (SCR-1)

## Alternatives/Economics

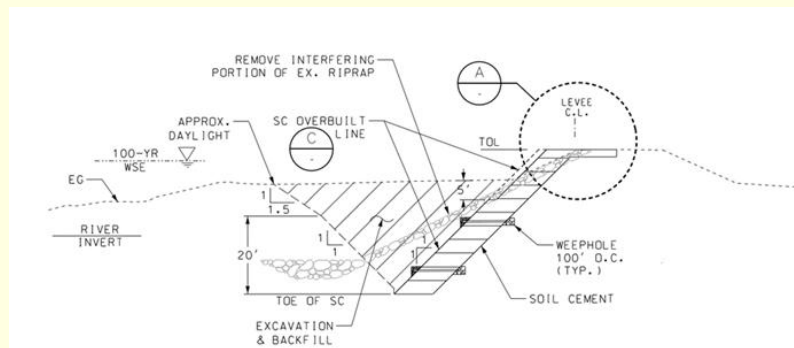
Alternative	Design Option	Cost Excluding Mitigation	Total Cost	Benefit Cost Ratio
<b>Alternative 1</b>	Design flow	\$66,741,000	\$98,841,000	<b>0.57</b>
<b>Alternative 2</b>	Design flow	\$104,936,000	\$151,736,000	<b>0.36</b>
<b>Alternative 3</b>	Design flow	\$97,320,000	\$138,270,000	<b>0.40</b>
<b>Alternative 1</b>	Corps 200-yr flow	\$68,794,000	\$101,644,000	<b>0.56</b>
<b>Alternative 2</b>	Corps 200-yr flow	\$109,060,000	\$156,910,000	<b>0.35</b>
<b>Alternative 3</b>	Corps 200-yr flow	\$105,431,000	\$147,285,000	<b>0.38</b>



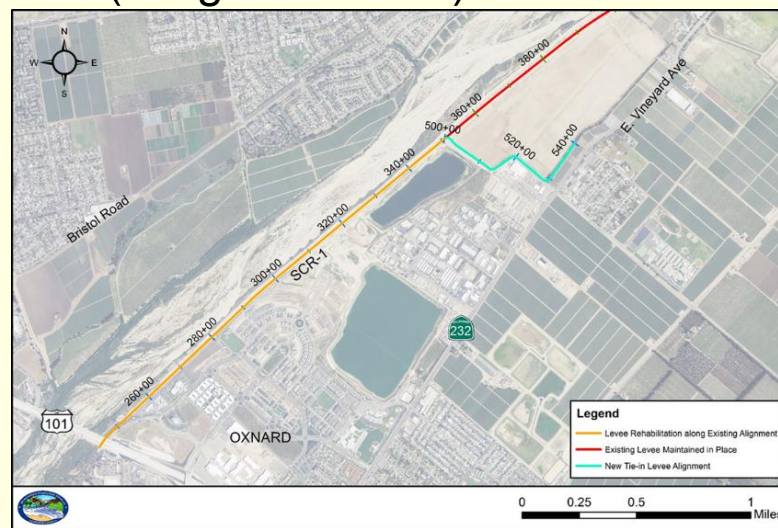
# Santa Clara River Levee (SCR-1)

## Preferred Alternative

- Erosion Protection – Soil Cement
- Reduced Length - Alignment Turns at Central Ave Drain
- Environ Impacts Significantly Reduced (mitigation costs)
- Additional Benefits/Opportunities



<b>Design Flow</b>	<b>250,000 cfs</b>
<b>Cost Excluding Mitigation</b>	<b>\$35,097,000</b>
<b>Total Cost</b>	<b>\$40,767,000</b>
<b>Benefit Cost Ratio</b>	<b>1.33</b>





# *Santa Clara River Levee (SCR-1)*

## Additional Benefits/Opportunities

- Non-Native Plant Species Removal
- Plantings in or adjacent to the river
- Off-channel water storage/groundwater recharge
- Trail access
- Recreation connectivity
- Educational interpretive







# Interim Risk Reduction Measures (IRRM) Plan



# Santa Clara River Levee (SCR-1)

## Interim Risk Reduction Measures (IRRM) Plan

- USACE Guidance
- Failure Scenarios



US Army Corps of Engineers

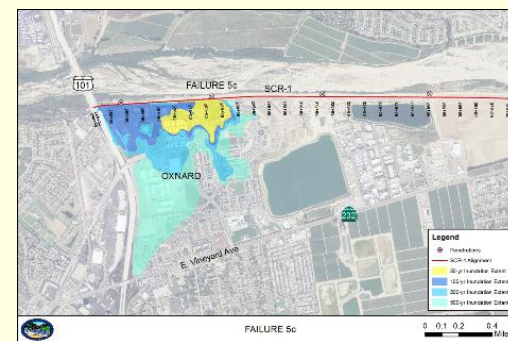
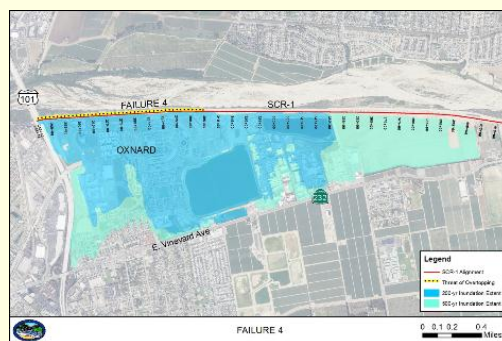
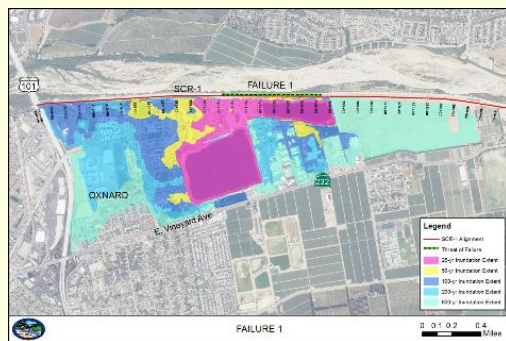
ENGINEERING AND CONSTRUCTION BULLETIN

No. 2012-1

Issuing Office: CECW-CE

Issued: 20 Jan 2012

Expires: 20 Jan 2014



Public Works Agency



# Santa Clara River Levee (SCR-1)

## 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
1. FWEPP
2. Update Hydrologic/Hydraulic Study
3. Update Scour Study
4. Develop Local NLD
5. GIS Performance Database
6. Develop Supplemental O&M Manual
7. Visual Markers
8. Stockpile Materials
9. Diversion to Gravel Pit
10. Diversion to Upstream Reservoir
11. Launchable Rock
12. Improve Groins
13. Full Bank Protection
14. Landside Protection
15. Levee Raising

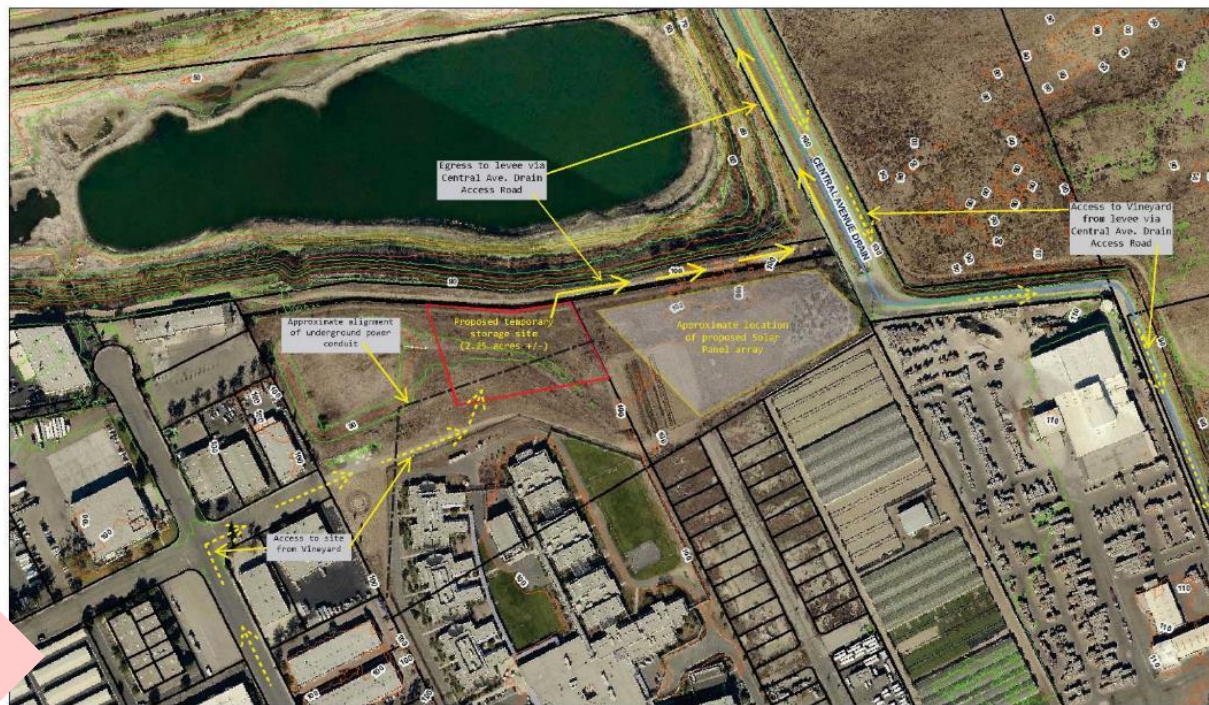


# Santa Clara River Levee (SCR-1)

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## IRRM # 8 - Stockpile Materials

- Rock
- Gravel
- Lighting
- Sheeting



Scheduled for Implementation this Fall

Ventura County Watershed Protection District  
Prepared by Operations & Maintenance Division  
Santa Clara River Levee (SCR-1)  
Interim Risk Reduction Measures - Temporary Storage Area

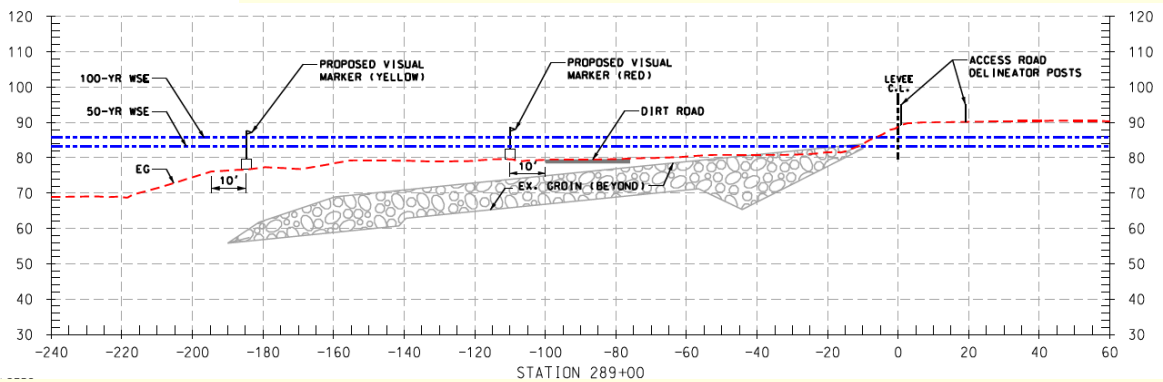
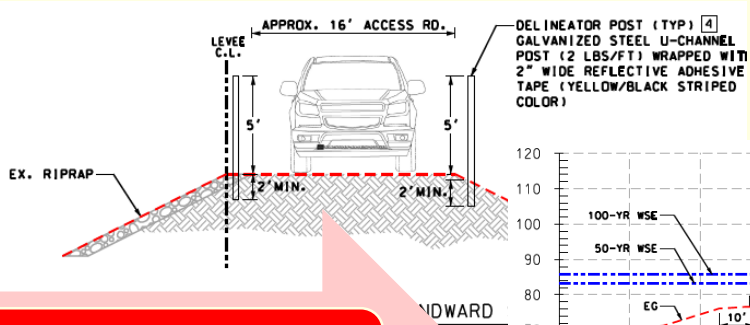
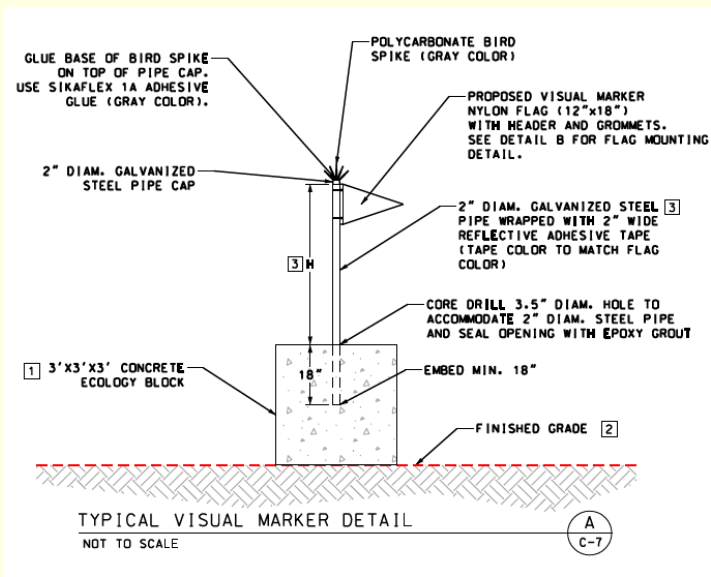
State Plane Coordinate System California Zone V - NAD 27  
0 100 200 400 600 800 Feet



# Santa Clara River Levee (SCR-1)

## IRRM # 7 – Visual Markers

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



Scheduled for Implementation this Fall



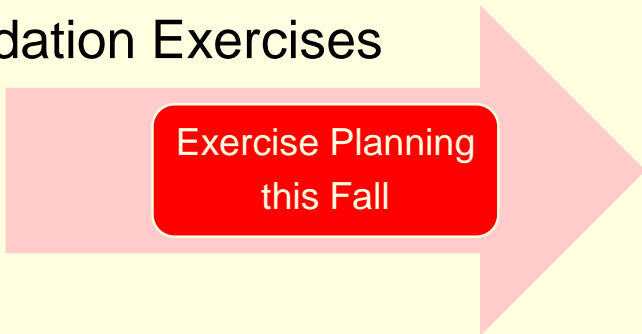
# Santa Clara River Levee (SCR-1)

## IRRM # 1 – FWEEP

### Flood Warning Emergency Evacuation Plan

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

### ■ Validation Exercises



Flood Monitoring & Response Continuum			
	Monitoring	Elevated Threat	Response
Command & Control	<p>Activities:</p> <ul style="list-style-type: none"> <li>VCWPD will continuously monitor stream data and weather forecasts.</li> <li>Computer simulations will be used to model potential risk.</li> <li>Increased risk will be communicated to other County agencies and the City of Oxnard.</li> <li>A standing stakeholder information and coordination call will be considered.</li> </ul>	<p>Activities:</p> <ul style="list-style-type: none"> <li>VCWPD will closely coordinate with other County agencies and the City of Oxnard.</li> <li>Depending upon the level of risk, the County and City will consider opening their respective EOCs to coordinate monitoring efforts and support potential response activities.</li> <li>Stakeholder agencies that provide EOC staffing will be alerted to a potential activation.</li> </ul>	<p>Activities:</p> <ul style="list-style-type: none"> <li>The Incident Command System (ICS) will be utilized to direct field activities.</li> <li>An Incident Commander (IC) will be appointed and an Incident Command Post (ICP) will be established.</li> <li>The City of Oxnard will request additional support from the County as needed.</li> <li>A Unified Command (UC) may be established if there are impacts to both the County and the City of Oxnard.</li> <li>The County EOC will support field activities and flood fighting as needed and coordinate mutual aid and resource requests to the State as required.</li> </ul>
Warning	<p>Activities:</p> <ul style="list-style-type: none"> <li>VCWPD will determine the need for patrols and active levee monitoring.</li> <li>NWS to provide public information on weather forecasts including watches and warnings.</li> </ul>	<p>Activities:</p> <ul style="list-style-type: none"> <li>Pre-scripted public warning statements will be reviewed.</li> <li>Public Information Officers (PIO) will interface with the media to disseminate public information.</li> <li>Public messaging and the release of information will be coordinated between the County and the City of Oxnard.</li> <li>The establishment of a Joint Information Center (JIC) may be considered.</li> </ul>	<p>Activities:</p> <ul style="list-style-type: none"> <li>Public information will be disseminated using all available methods, including VC Alert.</li> <li>The County will provide the CalOES Regional Office with regular status updates.</li> </ul>
Evacuation	<p>Activities:</p> <ul style="list-style-type: none"> <li>VCOES and City of Oxnard will identify functional needs facilities such as schools, hospitals, and nursing homes in high risk areas.</li> </ul>	<p>Activities:</p> <ul style="list-style-type: none"> <li>High-risk functional needs facilities will potentially be closed and/or evacuated.</li> <li>The County and the City of Oxnard will identify available staffing and flood response equipment.</li> <li>The American Red Cross will be notified that shelters may be required in the event of an evacuation.</li> </ul>	<p>Activities:</p> <ul style="list-style-type: none"> <li>The Incident Commander will direct field activities related to the evacuation.</li> <li>The City of Oxnard and the County EOCs will support field activities as requested.</li> <li>Red Cross shelters will be opened as needed.</li> </ul>



# *Santa Clara River Levee (SCR-1)*

## IRRM # 1 – FWEEP Stakeholders

- County of Ventura
  - Watershed Protection District
  - Sheriff's Office – OES
  - Fire Department
- City of Oxnard
  - Fire Department – Emergency Management
- U.S. Army Corps of Engineers



# Funding and Look Forward

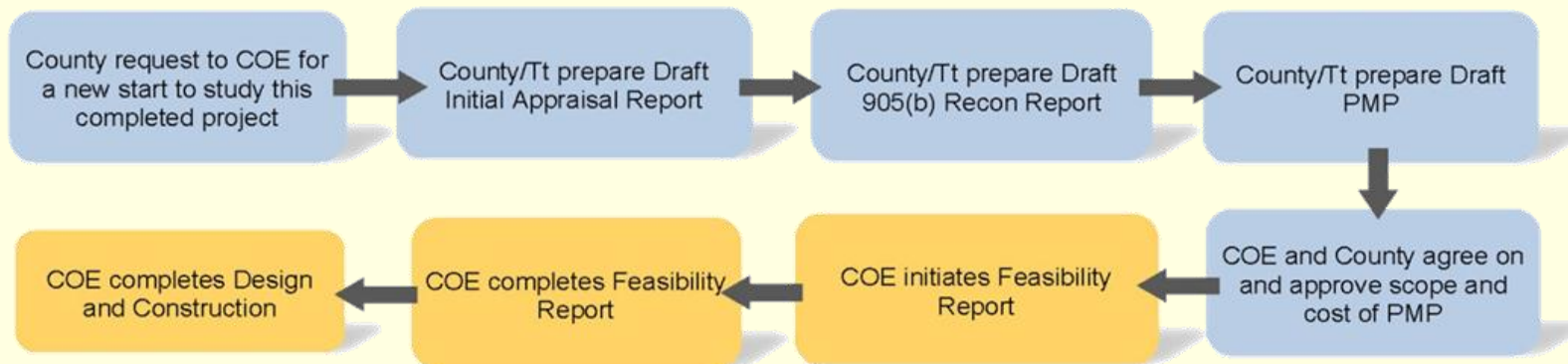




# Santa Clara River Levee (SCR-1)

## USACE New Start Planning Documents

- Initial Appraisal Report
- Reconnaissance Report 905(b)
- Project Management Plan







# *Santa Clara River Levee (SCR-1)*

## Funding

Federal  
USACE

State Grants

VCWPD

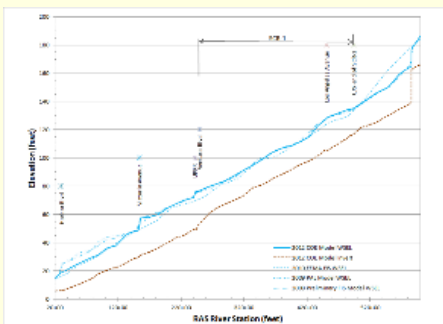
City of  
Oxnard

Local  
Assessments



# Santa Clara River Levee (SCR-1)

Public Works Agency



## Timeline

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

► **Jan 2016**  
Start CEQA and Final Design

**Local and State Grant Funded Path**



► **Aug 2015**  
DWR LLAP  
Grant Decision

**Local, State Grant, and Federal Funded Path**



► **Apr 2016**  
USACE FY17 New Start Budget  
Request Workplans Comes Out





# *Santa Clara River Levee (SCR-1)*

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## Questions and Answers

