Matilija Dam Ecosystem Restoration Project

Fall 2022 Community Updates
October 6, 2022

Project Management and Overview Updates

Glenn Shephard, Director
Ventura County Public Works Agency – Watershed Protection
Matilija Dam Ecosystem Restoration Project

Brief Chronology 1998-2017

1998: County of Ventura Board of Supervisors resolves to remove Matilija Dam – USBR Appraisal Study begins
2000: Appraisal Study completed – DOI Secretary Babbitt visits for Dam removal demonstration project
2001: Matilija Dam Ecosystem Restoration Study initiated between VCPWA-WP and US Army Corps of Engineers
2004: USACE Feasibility Study completed – Board of Supervisors certifies MDERP Final EIS/EIR
2005: Design phase of Federal Project initiated between VCPWA-WP and USACE
2007: Congressional authorization of the Federal (USACE) Project – Fine Sediment controversy emerges
2010: Fine Sediment Study Group convened to explore potential Sediment Management alternatives
2012: Technical Advisory Committee finalizes proposed Scope of Work for review of alternatives
2014: Board of Supervisors approves Consultant contract for Review of Sediment Management Alternatives
2015: Draft Report presented to Stakeholders via the MDERP Design Oversight Group
2016: Consensus reached by County and Stakeholders on new approach to Sediment Management
2017: CDFW Grant for $3.3M for 65% Design Planning Studies based on new approach to Sediment Management
Downstream Infrastructure
- Camino Cielo Bridge Replacement
- Robles Diversion and Fish Passage
- Meiners Oaks Flood Protection
- Live Oak Acres Levee Improvements
- Santa Ana Blvd. Bridge Replacement
- Casitas Springs Levee Improvements

Matilija Dam Removal
- Orifice Installation
- Reservoir Area and Other Site Prep
- Storm Event Sediment Flush
- Dam Demolition / Site Restoration

Related Elements
- Easements and Acquisitions
- Water Supply Improvements
- Environmental Compliance
- Recreation / Equitable Access
- Giant Reed / Habitat Restoration
- Monitoring / Adaptive Management
Project Management Updates

- VCPWA/Watershed Protection
  - New D&C Management (Matt Ehret)
  - New MDERP Management (Kirk Norman)
  - Environmental Services (Pam Lindsey)
    - Now integrated into D&C
    - New/replacement staff hires in process
    - Increased consultant support via CDFW CF request
  - Other MDERP support
    - Management Assistant (Anne Duval)
    - Grants Administration (help for Martha Symes)
- Roads and Transportation
  - Santa Ana Blvd. Bridge Replacement Construction Management
  - Camino Cielo Final Design and Construction
Project Management Updates

- VCPWA/Watershed Protection
  - New D&C Management (Matt Ehret)
  - New MDERP Management (Kirk Norman)
  - Environmental Services (Pam Lindsey)
    - Now integrated into D&C
    - New/replacement staff hires in process
    - Increased consultant support via CDFW CF request
  - Other MDERP support
    - Management Assistant (Anne Duval)
    - Grants Administration (help for Martha Symes)
- Roads and Transportation
  - Santa Ana Blvd. Bridge Replacement Construction Management
  - Camino Cielo Final Design and Construction
Funding Updates

David Yardas, Consultant
Resources Legacy Fund
MDERP Funding Updates
Fall 2022 Presentation Overview

- Funding Awards 2017-2022
- Awards and Approvals since Spring 2022 Updates
- Current and Pending CA Requests
- Federal Funding Updates
- Projected Costs and Funds Secured/Likely
- Questions/Discussion
# Funding Awards 2017-2022

Through 09/30/2022

<table>
<thead>
<tr>
<th>Date</th>
<th>Agency</th>
<th>Project Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2017</td>
<td>CDFW</td>
<td>65% Design Planning Project</td>
<td>$3,300,500</td>
</tr>
<tr>
<td>Sep 2017</td>
<td>NFWF</td>
<td>Estuarine and Coastal Modeling</td>
<td>$278,000</td>
</tr>
<tr>
<td>May 2019</td>
<td>CDFW</td>
<td>Santa Ana Bridge Replacement</td>
<td>$13,426,900</td>
</tr>
<tr>
<td>May 2020</td>
<td>WCB</td>
<td>Final Design Planning Project</td>
<td>$5,025,000</td>
</tr>
<tr>
<td>Mar 2021</td>
<td>SCC</td>
<td>Camino Cielo Design/CEQA</td>
<td>$734,700</td>
</tr>
<tr>
<td>Dec 2021</td>
<td>WCB</td>
<td>Camino Cielo Final Design</td>
<td>$1,190,300*</td>
</tr>
<tr>
<td>Dec 2021</td>
<td>SCC</td>
<td>MDERP Robles Design Planning</td>
<td>$379,350</td>
</tr>
<tr>
<td>Jan 2022</td>
<td>NRCS</td>
<td>PL-566 Preliminary Investigation</td>
<td>$50,000^</td>
</tr>
<tr>
<td>Feb 2022</td>
<td>SCC</td>
<td>Camino Cielo VE Review</td>
<td>$75,000</td>
</tr>
<tr>
<td>Jun 2022</td>
<td>CDFW</td>
<td>Robles Design Planning Phase 2A</td>
<td>$1,557,900</td>
</tr>
<tr>
<td>2017-2022</td>
<td>NGO</td>
<td>Strategic Project Support</td>
<td>$2,002,700</td>
</tr>
</tbody>
</table>

**TOTAL** $28,020,900

* Award Notification total - Board approval 8/25/22 for $1.310M incl. 10% contingency

^ Funds awarded by NRCS for Ventura-Matilija PIFR Contract, June 2022
Funding Awards and Approvals since Spring 2022

**CAMINO CIELO BRIDGE RE-DESIGN**

- SCC $810K approved Mar 2021, augmented Feb 2022
- WCB $1.19M (plus contingency) approved Aug 2022
- Consolidated Final Design Project
  - Value Engineering (VE) Review of Draft 30% Design
  - 30% Re-Design
  - CEQA Initial Studies and Subsequent EIR
  - 70% Design thru Final Design
- Project Launch Nov 2022, “shovel ready” mid-2025

Spring 2018 - embankment repairs after washout

Fall 2022 – anticipated work area and approaches
Funding Awards and Approvals since Spring 2022

**ROBLES-MEINERS OAKS RE-DESIGN**

- SCC $379K Phase 2 Alternatives - approved Dec 2021
- CDFW $1.55M Robles Phase 2 Alts through 10% Design
  - Total Phase 2 request - $3.1M in March 2022
  - 50% award notification June 2022 *focused on Robles*
  - Revised work plan and budget to CDFW July 2022
- Consolidated Phase 2 Project
  - Consultant selection Jun-Dec 2022
  - Anticipated work start April 2023
  - Still need 30% Design funding (both components)
CDFW 2022 Contingency Funding Request

- Augment CDFW 2017 Grant - Fall 2022 thru Spring 2025
- Consultations and proposal development June-August 2022
  - 65% Design Planning Studies ITR Consultant and Expert Panel
  - Pre-Public Landowner/Stakeholder outreach
    - Administrative Draft Subsequent EIR for Matilija Dam removal
    - Final Draft 65% Design Planning studies and reports
  - Additional funds for Public Draft SEIR and Final SEIR
  - Environmental Offset Master Permit Plan
  - DSOD 65% design review fees
- Final $1.731M request submitted to CDFW Sep 9, 2022
  - Funding source evaluations in-progress, award decision ASAP
State Funding Applications Planned/Pending

Fall 2022 – Spring 2023

• WCB 2022 – pending $3.5M augmentation request
  o Subsequent EIR subtasks for Live Oak Acres, Casitas Springs and Meiners Oaks
  o Funding for increased Final Design costs for LOA, CS, MO and Dam removal
  o Contingency reserve to grapple with future cost increases, other uncertainties
  o Defer extension request for Final Design elements until more is known

• CDFW 2023 – anticipated $3M+ request under Prop 1/68 PSN
  o Meiners Oaks conforming Alts thru 30% design ($1M)
  o Robles 10% Design thru 30% Design ($500K+)
  o Subsequent EIR funding for Robles ($1.3M est. Feb 2022)
  o Other priority requests
Federal Funding Elements - Sep 2022

• NRCS PL 83-566
  ➢ Preliminary Investigation and Feasibility Report (PIFR) - Nov 2022
  ➢ Application for ~$1M for Watershed Plan/NEPA – early 2023
  ➢ Future $50M+ for Robles Facility and Flood Protection Improvements
    o 100% federal for planning and design
    o 100% federal for flood control implementation
    o 75% federal to implement ag water diversion improvements

• Bureau of Reclamation
  ➢ 65% design planning project review - RLF 2018, new grant under development
  ➢ Pending $1.5M federal appropriation (FY23) for Robles Facility design support
  ➢ Potential future design/implementation cost share for Robles Facility improvements

• Federal Emergency Management Agency
  ➢ Matilija Dam removal – $62k for structural analysis/design of proposed orifices

• Army Corps of Engineers

• Other Prospects
  ➢ America the Beautiful Challenge (primarily USDOI)
  ➢ National Drought and Infrastructure Funding FY23-FY26
| Cost Category                | Projected Total Cost as of Mid-2020 (*) | Funded thru 9/30/2022 | NRCS/BOR 2022-2030 | CA Surplus 2023-2027 | CA/Other TBD 2028-2032+
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add'l Env Compliance</td>
<td>$6,207,000</td>
<td>$477,000</td>
<td>$1,050,000</td>
<td>$4,680,000</td>
<td>$-</td>
</tr>
<tr>
<td>Add'l Design Planning</td>
<td>$14,543,333</td>
<td>$8,773,333</td>
<td>$2,500,000</td>
<td>$3,270,000</td>
<td>$-</td>
</tr>
<tr>
<td>Real Estate/Utilities</td>
<td>$21,697,000</td>
<td>$147,000</td>
<td>-</td>
<td>$16,162,500</td>
<td>$5,387,500</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Santa Ana Bridge</td>
<td>$13,426,938</td>
<td>$13,426,938</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Camino Cielo Bridge</td>
<td>$10,409,165</td>
<td>-</td>
<td>-</td>
<td>$10,409,165</td>
<td>-</td>
</tr>
<tr>
<td>Live Oak Acres Levee</td>
<td>$14,079,115</td>
<td>-</td>
<td>$14,079,115</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Casitas Springs Levee</td>
<td>$13,546,496</td>
<td>-</td>
<td>$13,546,496</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Meiners Oaks Levee</td>
<td>$13,564,536</td>
<td>-</td>
<td>$13,564,536</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Robles Diversion Facility</td>
<td>$14,105,000</td>
<td>-</td>
<td>$10,578,750</td>
<td>$3,526,250</td>
<td>-</td>
</tr>
<tr>
<td>Dam Removal</td>
<td>$29,483,000</td>
<td>-</td>
<td>-</td>
<td>$14,741,500</td>
<td>$14,741,500</td>
</tr>
<tr>
<td>Subtotal, Construction</td>
<td>$108,614,250</td>
<td>$13,426,938</td>
<td>$51,768,897</td>
<td>$28,676,915</td>
<td>$14,741,500</td>
</tr>
<tr>
<td>Post-Dam Removal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring &amp; Adaptive Mgt</td>
<td>$16,808,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$16,808,000</td>
</tr>
<tr>
<td>Habitat/Rec/Park/Other</td>
<td>$4,471,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$4,471,000</td>
</tr>
<tr>
<td>Subtotal, Post-Removal</td>
<td>$21,279,000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>$21,279,000</td>
</tr>
<tr>
<td>Program Management</td>
<td>$18,749,000</td>
<td>$3,906,042</td>
<td>-</td>
<td>$4,947,653</td>
<td>$9,895,306</td>
</tr>
<tr>
<td>Grand Total</td>
<td>$191,089,583</td>
<td>$26,730,313</td>
<td>$55,318,897</td>
<td>$57,737,088</td>
<td>$51,303,306</td>
</tr>
</tbody>
</table>

Updated 05 Oct 2022

(*) June 2020 cost estimates PLUS ~$11M for actual and anticipated Design Planning and CEQA cost increases to-date.

Updates in-progress will include additional cost increases based on more detailed designs, inflation and contingencies.
Matilija Dam Removal

**Status:** Draft 65% Design Report mid-2022 under CDFW 2017 grant

**Est. remaining design cost:** $1.5M in WCB 2020 grant; augmentation request pending Fall 2022

**Shovel ready target date:** 2025-2028 coordinated funding campaign
- For reservoir prep, orifice construction, sediment release, structural demolition and post-removal site/habitat restoration

**Est. construction cost:** $29.5M (2020); current best est. $44M+

**Completion target date:** ready for sediment flush by end of 2030
- 1-2 years thereafter to complete Dam removal
- Sediment release timeline also depends on hydrologic conditions

**Comments:**
- Dam removal is also the focus of current Subsequent EIR in-progress
- *All downstream improvements must be complete prior to sediment release*
For additional information please contact:

David Yardas
Matilija Project Consultant,
Resources Legacy Fund
David.Yardas@gmail.com
530.559.0885

And/or check out:
https://MatilijaDam.org/
Matilija Dam Ecosystem Restoration Project

Fall 2022 Community Updates
October 6, 2022

Technical Meeting Highlights

Christopher Solis
Ventura County Public Works Agency – Roads and Transportation

Kirk Norman
Ventura County Public Works Agency – Watershed Protection
Santa Ana Blvd. Bridge

Construction 2/18/2022
Santa Ana Blvd. Bridge
Construction 9/1/2022
Goal: Upgrade existing structures to address current and future sediment transport, water supply, fish passage and flood protection challenges.

Status: Phase 1 Summary Report June 2021; Phase 1 Independent Technical Review, Final Report April 2022; Phase 2 Consultant Selection underway.

Est. remaining design cost: Up to $6m total.

Shovel ready target date: End of 2028.

Potential Funding Partners for Construction:
• NRCS PL 566, BOR (up to 75% federal); SCC/CDFW, other non-federal (25% cost share)

Completion target date: End of 2030.

Comments:
• Conforming adjustments to Meiners Oaks preliminary design?
Current sediment issues

- Forebay sedimentation
- Canal sedimentation
- Fish screen blockage
- Potential fishway blockage

Spring 2021 Sediment Removal
Robles Phase 1 Independent Technical Review
Final Report Alternatives (NHC 2022)
Levee Locations

- Live Oak Acres Levee
  - Existing Levee
  - Right Bank of River
  - 5,635 ft (1.07 mi) Long

- Casitas Springs Levee
  - Existing Levee
  - Left Bank of River
  - 5,877 ft (1.11 mi) Long
Matilija Dam Removal 65 % Design Updates
Dam Removal 65% Design – Phase 1
Drawings: Pilot Channel through Reservoir Sediment
Dam Removal 65% Design – Phase 1
Drawings: Vegetation Clearing Areas & Staging Areas
Hydraulic and Sediment Transport Modeling Tasks completed to support 65% Design Phase:

1) DREAM-2: 1D Sediment, completed 2020
2) HEC-RAS: 1D Hydraulics, completed 2020
3) SRH-2D: 2D Hydraulics, completed April 2021
4) SRH-2D: 2D Sediment Transport (coarse mesh), completed October 2021
5) SRH-2D 2D Sediment Transport (fine mesh), completed April 2022
   • Two separate reaches
   • Two hydrologic scenarios modeled in upper reach
Project Purpose: Ecosystem Restoration

- Project benefits Ventura River Communities and Ecosystem
- Increase water supply resiliency
- Release of sediment with flood safety benefits
- Rapid recovery of wildlife and habitat

Matilija Creek downstream of dam

Black and white warbler 6/16/21
Photo: Larry Hunt
Matilija Dam Ecosystem Restoration Project

Fall 2022 Community Updates
October 6, 2022

Environmental Planning and Compliance

Pam Lindsey
Ventura County Public Works Agency – Watershed Protection
ENVIRONMENTAL UPDATES

- CA Environmental Quality Act (CEQA)
  - Subsequent Environmental Impact Reports
- National Environmental Policy Act (NEPA)
  - Subsequent Environmental documents
- Public Outreach
- Regulatory Permitting
- Giant Reed & Tamarisk Removal
- Matilija Lake Status
### CEQA & NEPA Estimated Schedules

<table>
<thead>
<tr>
<th>Project Component</th>
<th>CEQA*</th>
<th>NEPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matilija Dam Removal with Natural Sediment Transport</td>
<td>In progress</td>
<td>USACE (?) Begin 2026</td>
</tr>
<tr>
<td>Camino Cielo Bridge</td>
<td>Begin Winter 2023</td>
<td>Not Needed</td>
</tr>
<tr>
<td>Live Oak Acres Levee Improvements</td>
<td>Begin Fall 2023</td>
<td>NRCS PL83-566 2023</td>
</tr>
<tr>
<td>Casitas Springs Levee Improvements</td>
<td>Begin Fall 2023</td>
<td>NRCS PL83-566 2023</td>
</tr>
<tr>
<td>Robles Diversion</td>
<td>Begin Spring 2025</td>
<td>NRCS PL83-566 2024</td>
</tr>
<tr>
<td>Meiners Oaks Flood Protection</td>
<td>Begin Spring 2025</td>
<td>NRCS PL83-566 2024</td>
</tr>
</tbody>
</table>

*Watershed Protection Lead Agency for CEQA*
## CEQA/NEPA Issues for Dam Removal

### PRELIMINARY ANALYSES

<table>
<thead>
<tr>
<th>Significant Impacts</th>
<th>Less than Significant or Beneficial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Resources</td>
<td>Beaches and Sand Dunes</td>
</tr>
<tr>
<td>Agricultural Resources &amp; Land Use</td>
<td>Energy and Energy Conservation</td>
</tr>
<tr>
<td>Biological Resources</td>
<td>Greenhouse Gases and Climate Change</td>
</tr>
<tr>
<td>Geology and Soils</td>
<td>Community Character</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Mineral Resources</td>
</tr>
<tr>
<td>Biological Resources</td>
<td>Noise and Vibration</td>
</tr>
<tr>
<td>Hazards &amp; Hazardous Materials</td>
<td>Population and Housing</td>
</tr>
<tr>
<td>Flooding</td>
<td>Public Services</td>
</tr>
<tr>
<td>Cultural/Tribal Resources</td>
<td>Recreation</td>
</tr>
<tr>
<td>Wildfire</td>
<td>Scenic Resources</td>
</tr>
<tr>
<td></td>
<td>Transportation/Pipelines</td>
</tr>
<tr>
<td></td>
<td>Utilities</td>
</tr>
</tbody>
</table>
CEQA SEIR PROCESS

- Summarize 2004 impact thresholds and conclusions
- Document changes in environmental conditions
- Obtain and consider public and stakeholder input on new project description, potential impacts and mitigations
- Analyze new project with updated impact thresholds
- Update mitigation measures
- Compare 2004 to new impact conclusions
- Publish Draft SEIR for 45-day Public Comment Period
- Consider comments; prepare Final SEIR
- Notice and hold Public Hearing on Final SEIR
CEQA SEIR for Dam Removal

CEQA Public Scoping
Notice of Preparation
September 14 to October 14, 2020

Additional Outreach and Informational Meetings
Prepare Draft SEIR
January-June 2023

Public Draft SEIR 45-Day Comment Period
Publish Draft SEIR
Fall 2023

Respond to Public Comments

Public Hearing
Certify Final SEIR*
Spring 2024

*Ventura County Board of Supervisors will consider analyses and public testimony prior to considering SEIR certification and project approval.

Additional Outreach and Informational Meetings

12' Diameter Unlined Orifice (Typ.)

Left Abutment

Elevation 975' (NAVD 88)

Upstream Face Elevation (Not to Scale)

Right Abutment
Additional Public Outreach for Dam Removal

January to June 2023

• Receiving input key to filling community needs
• We want to listen to:
  • Landowners
  • Community groups/neighborhoods
  • Utilities/water agencies
  • General public
• We will make it easy with meetings, websites, and personal communications, etc.
Concurrent Public Outreach
Community-Based Visioning Project
Land Use and Stewardship after Matilija Dam Removed

• Ojai Valley Land Conservancy conducting initial community engagement on Ventura-Matilija watershed priorities in Fall 2022 to early Summer 2023.

• Accepting ideas for public use and access, recreational amenities, historic and cultural resources preservation, ecological sustainability, long-term stewardship and other community priorities.

• Made possible by a grant from the Resources Legacy Fund
REGULATORY PERMITTING

- Streamlined Master Permit Processes for All Components
- Dam Removal Benefits Offset Project/Component Impacts

Regulatory Agencies:

- US Army Corps of Engineers
- Regional Water Quality Control Board
- CA Dept. of Fish and Wildlife
- National Marine Fisheries Service
- US Fish and Wildlife Service
GIANT REED & TAMARISK REMOVAL

• Began in Fall 2007; 1,200+ acres (gray)
• Retreatment #21 Spring/Summer 2022 Completed
  • Included remnant giant reed patch near USFS gate
• Annual Retreats through Spring/Summer 2025

Removed non-native plants May 20, 2022

All images: Larry Hunt
MATILIJA LAKE LEVEL

- CA Division of Safety of Dams requires lake level at least 7 ft. below dam crest
- Winter water capture allowed for Casitas MWD
- Drained by March each year
- Winter 2021-22 valves remained open (=no lake)
Matilija Lakebed Natural Revegetation Process

- No ponded water since July 2021
- Lakebed ➔ Cattail Marsh ➔ Willow Thicket

Workers removing tamarisk in newly exposed lakebed September 2021
Workers in 5-foot high vegetation July 2022

All images: Larry Hunt
QUESTIONS?

https://matilijadam.org/
Matilija Dam
ECOSYSTEM RESTORATION PROJECT

Matilija Dam Removal Ecosystem Restoration Project
Estuarine and Coastal Modeling

Prepared by
Ventura County Watershed Protection District
800 S. Victoria Ave, #1610
Ventura, CA 93009

Prepared by
integral
200 Washington Street
Suite 201
Santa Cruz, CA 95060

November 2019

Robles Diversion Phase 1 Report
Independent Technical Review

Summary Report on Biological Surveys, Permit Compliance
Monitoring, and Inspection, Matilija Creek
Giant Reed Re-Treatment Project,
Ventura County, California

Re-Treatment No. 18 (28 May 2019 – 18 June 2019)
Specification No. WP19-08(1), Project 41652
Comparison of SRH-2D-simulated Sediment Deposition with Past Studies
Summary of Results from SRH-2D Sediment Transport and Hydraulic Modeling
Robles Diversion Facility
Current and Future Sediment Loads
With and Without Matilija Dam Removal

Figure 6.17 Changes in future sediment load reaching Robles over time.
NHC Robles Diversion Phase 1 ITR Draft Report - Jan 2022
M2: Enhanced Sluicing Operation

Sluicing during rising limb. No diversion or fish passage. Back to normal during receding limb.

Sluicing Based on Bed Levels
Sluicing Based on Hydrographs
Dam Removal 65% Design – Phase 1
Drawings: Optional Gates
Live Oak Acres Levee

Alt 1

Compacted Fill

8' Horizontal Spill for Protection

10' Bank Elevation

10' Height

30' Thick Ground Stone

Transition

Remove Ex. Loose and Concrete Rippin

And Reuse Acceptable Material

Approach

Backfill

Design Flow

WTEL 430 ft

20'

20'

1:1

Alt 2

Compacted Fill

8' Horizontal Spill for Protection

10' Bank Elevation

10' Height

30' Thick Ground Stone

Transition

Remove Ex. Loose and Concrete Rippin

And Reuse Acceptable Material

Approach

Backfill

Design Flow

WTEL 430 ft

Legend

System Name

Live Oak Acres Levee System

VENTURA COUNTY
Watershed Protection District
Monvers Oaks and Live Oak Acres

0 0.5 1.0 1.5 2.0 2.5 3.0 3.5

km

Public Works
Casitas Springs Levee

1:1

2:1 Riprap

1.5:1 Concreted Riprap

Slide 56