



US Army Corps
of Engineers
Los Angeles District



SANTA CLARA RIVER LEVEE SECTION 905(b) (WRDA 86) ANALYSIS VENTURA COUNTY, CALIFORNIA



DRAFT-FINAL REPORT

DECEMBER 2014

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**SANTA CLARA RIVER LEVEE
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1. STUDY AUTHORITY

- a. The review of the Santa Clara River Levee, Ventura County, California project, is authorized under provisions of Section 216 of Public Law 91-611, the River and Harbor and Flood Control Act of 1970, which states:

"The Secretary of the Army, acting through the Chief of Engineers, is authorized to review the operation of projects the construction of which has been completed and which were constructed by the Corps of Engineers in the interest of navigation, flood control, water supply, and related purposes, when found advisable due to significantly changed physical or economic conditions, and to report thereon to Congress with recommendations on the advisability of modifying the structures or their operation, and for improving the quality of the environment in the overall public interest."

2. STUDY PURPOSE

The purpose of this study is to determine if there is a Federal interest in modifying the Santa Clara River Levee (Project) for the purposes of increasing public safety, continuing to provide flood risk management benefits, and better serve the public interest. The study will determine whether to proceed into a feasibility study based on a preliminary appraisal of the Federal interest and the consistency of potential solutions with current policies and budgetary priorities. The purpose of this Section 905(b) Analysis is to document the results of the reconnaissance phase and to establish the scope of the feasibility study phase.

The protective works of the Santa Clara River levee were originally designed in 1958 by the U.S. Army Corps of Engineers (Corps) to control the Corps' predicted Standard Project Flood discharge of 225,000 cubic feet per second (cfs) emanating from the Santa Clara River watershed. The purpose of the levee system is to provide protection against damages and potential loss of life caused by floods along the Santa Clara River and in the adjacent overflow areas immediately southeast of the levee system.

Based on recent investigations performed for Federal Emergency Management Agency (FEMA) levee certification and Corps periodic levee inspection, there is evidence that portions of the Project are requiring immediate corrections and do not meet FEMA standards for certification. The identified deficiencies seriously impair the functioning of the levee system and pose an unacceptable risk to public safety. This evaluation provides the impetus for studying required changes/modifications to the existing Santa Clara River levee. This is consistent with the general policy of the Corps that completed projects be observed and monitored to ascertain whether they continue to function as intended and whether there is a potential for modifications to better serve the public interest.

3. LOCATION OF STUDY, NON-FEDERAL SPONSOR, AND CONGRESSIONAL DISTRICTS

- a. The Santa Clara River project was authorized under Section 203 of the Flood Control Act of 1948 (Public Law 80-858), 88th Congress, 2nd Session, as approved on June 20, 1948. The Santa Clara River Levee (SCR-1) was completed in April 1961. The southernmost portion of the SCR-1 system is located along the City of Oxnard boundary in Ventura County, California (Figure 1). The remainder is in unincorporated Ventura County. SCR-1 is 4.72 miles long and is located along the southeast bank of the Santa Clara River between Highway 101 and Saticoy (Figure 2).
- b. The non-Federal sponsor for the feasibility phase of the study is the Ventura County Watershed Protection District (VCWPD).
- c. The study area lies within the jurisdiction of the following Congressional District: California 26.

4. PRIOR REPORTS AND EXISTING PROJECTS

- a. The following reports have been reviewed as a part of this study:

(1) Corps of Engineers

- *Design Memorandum No. 1, Hydrology for Santa Clara River Levee. U.S. Army Corps of Engineers, Los Angeles District. 1958.*
- *Design Memorandum No. 2, General Design for Santa Clara River Levee. U.S. Army Corps of Engineers, Los Angeles District. 1958.*
- *Flood Plain Information, Santa Clara River (Saticoy to Pacific Ocean). U.S. Army Corps of Engineers, Los Angeles District. 1968.*
- *Floods in Southern California during January and February, 1969. U.S. Army Corps of Engineers, Los Angeles District. 1969.*
- *Santa Clara River Levee, Levee and Channel Restoration Project. U.S. Army Corps of Engineers, Los Angeles District. 1971.*
- *Periodic Inspection Report No. 1, Santa Clara River 1 Levee System, Highway 101 to Saticoy, Ventura County, California. U.S. Army Corps of Engineers, Los Angeles District. August 2011.*

(2) Completed by Others

- *Santa Clara River Hydrology Update, Phase I, from Ocean to County Line. Ventura County Watershed Protection District. December 2006.*

- *Review of 2008 FEMA Santa Clara River Flood Insurance Study for City of Fillmore. Ventura County Watershed Protection District. December 2008.*
- *FEMA Levee Certification, Ventura County, California. Santa Clara River Levee (SCR-1) Highway 101 to Saticoy, Evaluation Report. 2009.*
- *FEMA Pal Response Report, Ventura County, California. Santa Clara River Levee (SCR-1) Highway 101 to Saticoy. Tetra Tech for Ventura County Watershed Protection District. November 2009.*

b. This study is investigating potential modifications to the following project:

Name of Completed Project: Santa Clara River Levee (SCR-1), Ventura County, California.

Authorized Purpose: Section 203 of the Flood Control Act of 1948 (Public Law 80-858), 88th Congress, 2nd Session, as approved on June 20, 1948.

Date Constructed: The construction of Santa Clara River Levee was completed in April 1961.

Non-Federal Project Sponsor: Ventura County Watershed Protection District, California.

Project Location and Description: The project is located on the Santa Clara River in the City of Oxnard and adjacent unincorporated areas in Ventura County, California, approximately 64 miles west of Los Angeles. The approximately 4.72-mile-long levee system extends along the southeast bank of the Santa Clara River from Highway 101, at its downstream terminus, to the west end of South Mountain, at its upstream terminus. The height of SCR-1 varies from approximately 4 feet to 13 feet. The compacted fill embankment that forms SCR-1 has a top width of 18 feet. The levee embankment slopes are 2 horizontal to 1 vertical (2H:1V) on both the landward and riverward sides.

5. PLAN FORMULATION

During a Corps of Engineers Feasibility Study, there are six planning steps that are set forth in the Water Resource Council's Principles and Guidelines to focus the planning effort and eventually to select and recommend a plan for authorization. The six planning steps are:

- (1) Specify problems and opportunities
- (2) Inventory and forecast conditions
- (3) Formulate alternative plans
- (4) Evaluate effects of alternative plans
- (5) Compare alternative plans
- (6) Select recommended plan

These steps are meant to be iterative based on the emphasis that is placed on each of the steps. In the early iterations, those conducted during the reconnaissance phase, the step of specifying problems and opportunities is emphasized. That is not to say, however, that the other steps are ignored since the initial screening of preliminary plans that results from the other steps is very important to the scoping of the follow-on feasibility phase studies. The sub-paragraphs that follow present the results of the initial iterations of the planning steps that were conducted during the reconnaissance phase. This information will be refined in future iterations of the planning steps that will be accomplished during the feasibility phase.

a. National Objectives

- (1) The national or Federal objective of water and related land resources planning is to contribute to national economic development consistent with protecting the nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements. Contributions to National Economic Development (NED) are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and the rest of the nation.
- (2) The Corps has added a second national objective for Ecosystem Restoration in response to legislation and administration policy. This objective is to contribute to the nation's ecosystems through ecosystem restoration, with contributions measured by changes in the amounts and values of habitat.

b. Public Concerns

A number of public concerns have been identified by the potential non-Federal sponsor as well as the studies referenced in Section 4 above. Public concerns that are related to the establishment of planning objectives and planning constraints are:

- (1) During a FEMA levee certification process, it was discovered that the SCR-1 does not have sufficient toedown for scour protection. The depth of the levee revetment toedown and the volume of the stone toe, along with shallow burial depth of the groins, are insufficient to prevent the scour of the levee in the event the current channel thalweg migrates toward the levee. Due to this deficiency, the ability of the existing revetment to provide continued flood protection during future floods is in question.
- (2) A comparison of computed and as-built groin rock size indicates that the as-built groin rock size is undersized to withstand the predicted hydraulic forces during the design flood event. For much of levee length, the rock groins are not buried deep enough to prevent their failure from undermining due to lateral migration and scour. The rock originally used as erosion protection of the levee slopes has weathered and degraded into smaller fragments making it unsuitable for its design purpose.
- (3) Flood flows and the erosive nature of the river continue to threaten both property and infrastructure.

- (4) Stakeholders have expressed a desire to see recreational opportunities along the Santa Clara River.
- (5) Stakeholders have expressed a desire for less levees and more water retention and infiltration on the floodplain adjacent to the river.

c. Problems and Opportunities

The evaluation of public concerns often reflects a range of needs which are perceived by the public. This section describes these needs in the context of problems and opportunities that can be addressed through water and related land resource management.

(1) Problems

Performance History. Numerous severe storms prior to the completion of SCR-1 had been documented in the Corps 1968 report, “*Flood Plain Information, Santa Clara River (Saticoy to Pacific Ocean), Ventura County, California*”. These include the February/March 1938 flood that damaged the Highway 118 Bridge (Los Angeles Avenue); the January 1943 flood that caused severe damage to agricultural land, crops, and bridges; and the January 1952 flood that caused damage to properties along the river.

The most damaging floods of record along the Santa Clara River occurred in January and February 1969 when the levee failed with an estimated peak discharge of 165,000 cfs (approximately a current 40- to 50-year return event) based on a stream measurement made around the time of the peak. The following is an excerpt from the 1969 Corps report, “*Floods in Southern California during January and February, 1969*”, describing the damage to the reach of SCR-1 located between Highways 118 and 101. The location of the levee failure is shown on Figure 3.

“The only significant damage that occurred in this reach during the January flood was damage to the revetment of an existing levee constructed by the Corps of Engineers. February floodflows washed out about 500 feet of State Route 118 Bridge, damaged agricultural property and utilities, and severely damaged flood-control improvements constructed by the Corps of Engineers. ... The flood eroded the south bank near the existing Corps levee, damaging some groins; then deflected, ricocheted from the State Route 118 Bridge, and returned to the south bank – where the floodflows cut in close to the Corps levee, bounced off to the north bank, and carved a long arch. The floodflows then deflected to the south bank where they undercut the toe protection on the Corps levee, causing the failure of about 2,000 feet of levee and eroding the ground behind the levee for a distance of about 100 feet.”

The original construction, as completed in 1961, contained 40 rock groins. After the 1969 floods, the Corps repaired seven of the original 40 rock groins (between Stations 330+00 and 344+50), restored 2,100 linear feet of levee embankment and provided deeper rock revetment (between Stations 311+00 and 332+00), and constructed 35 additional rock groins (between Stations 246+00 and 330+00 and Stations 421+80 and 436+80). These repairs and restoration were completed in 1971. Currently, 75 rock groins are in place

along the SCR-1 extending from Station 246+00 to Station 470+00.

In December 1985, Ventura County restored five groins in the vicinity of the 1969 levee failure location. The damages may have been caused by a 1983 flood, which had an estimated peak discharge of 100,000 cfs. The damage to the rock groins was likely due to the low flow channel encroaching and washing out the top portion of the groin tips. The repairs included the removal of approximately two feet of existing stone and placement of two-ton stone riprap back to the design dimensions and backfilling with uncompacted fill. (This is the only known non-Corps stone added to the system.)

Embankment Protection. The most recent periodic inspection conducted by the Corps in 2010 rated SCR-1 as “unacceptable.” In the report, the primary factors driving the unacceptable rating were broken down into critical and non-critical items. The critical items affect the entire length of the levee system and seriously impact the functioning of the levee system. Non-critical items occur at intermittent locations along the levee but should not prevent the system from performing as intended during the next significant runoff event.

As identified in the periodic inspection report, the most significant issues are related to inadequate scour and erosion protection along the entire length of the levee system. These issues are discussed below.

Inadequate Toedown. The revetment toedown along SCR-1 varies between 5 to 10 feet below the river thalweg between Highway 101 and a distance approximately 8,500 feet upstream, beyond which the depth of toedown changes significantly from approximately 5 feet below the streambed to approximately 10 feet above the streambed. The varying depths of rock revetment along SCR-1 are documented in the 1958 Corps General Design Memorandum (GDM). According to the GDM, the original design concept called for the riverside slope of the levee to be protected by a continuous stone revetment that extends to a depth of 12 feet below the streambed. Based on the recommendations of a board of consultants, the design was modified to reduce the depth of toedown and to place additional stone at the toe of the revetment. In addition, groins were recommended in areas experiencing direct attack by stream flows.

Assessment of the current streambed profiles (based on 2005 LIDAR information) indicates that the channel thalweg is lower than the toedown of the rock revetment starting at Station 335+00 and continuing upstream through the Highway 118 Bridge (approximately Station 441+00). If the thalweg were to impinge upon the levee, failure of the levee by erosion would be likely since the rock revetment would be undermined. A review of the 1971 as-built toedown of the riverward tips of the groins indicates that the burial depth of the groin tips is above the current thalweg location between Stations 360+00 and 392+00. Migration of the channel thalweg would result in undermining of these groins and would potentially lead to failure of the levee by erosion. The review of the rock revetment toedowns and rock groins concluded that there is insufficient burial depth of both features to prevent the erosion of the levee in the event the channel thalweg migrates toward the levee. This condition occurs from Stations 360+00 to 421+00.

Inadequate Rock Size and Quality. In May 2009, a field reconnaissance and geotechnical investigation along SCR-1 was conducted by consultants under contract with VCWPD. A comparison of computed and as-built groin rock size indicates that the as-built groin rock is undersized to withstand the predicted hydraulic forces during the design flood event. Recent analyses indicate that, at one test location, the lower portion of the rock gradation is smaller than the lower bound of the required rock size. A visual assessment indicated approximately 9,000 linear feet of the levee (Station 262+00 to Station 350+00) and 7,000 linear feet upstream (Station 420+00 to Station 490+90) have rock revetment similar to the reference test location. The results of this evaluation are consistent with the observed damage to the groins from the flood events in 1969 and early 1980s, where river flows came into direct contact with the rock groins and caused portions of the groins to fail.

Inadequate Rock Groins. As mentioned earlier, the original flood control improvements completed in 1961 included 40 groins. After restoration and repairs were completed in 1971 following the floods in 1969, 75 rock groins are currently in place along the SCR-1 project reach (Station 246+00 to Station 470+00).

As indicated in the November 2009 *FEMA PAL Response Report* (Tetra Tech 2009), the rock groins are not adequate to prevent the migration of the channel for the following reasons: the rock groins are undersized to withstand the hydraulic forces of the design flood and they are not buried deep enough, for much of their length, to prevent failure due to undermining from lateral migration and scour.

Also as documented in the *FEMA PAL Response Report*, based on historical aerial photos and lateral migration evaluation, the Santa Clara River has the potential to erode the river bank terrace and expose the rock revetment and groins during a single large flood event. Since the rock groins are not adequate to prevent lateral migration of the river thalweg against the levee side slope, the levee to remain stable must resist the hydraulic force and the attendant scour that would occur with the thalweg located against the toe of the levee. Therefore, the current configuration of levee protection is deemed not adequate to resist the resulting forces and scour.

Vegetation and Encroachments. Field investigations of SCR-1 conducted as part of the levee certification in 2008 and the Corps' periodic inspection in 2010 indicate that significant vegetation, consisting of large trees and dense brush, present a levee safety issue and reduce the overall reliability of the system. Significant vegetation prevents adequate inspection and interferes with maintenance and flood fighting activities.

Encroachments identified during the inspection include encroachments on both the riverward and landward levee banks. These primarily comprise of vehicles, power poles, unwanted fill, fence and debris, and unauthorized access ramps, stairs, and utility lines. These encroachments prevent proper maintenance, inspection, and access to the levee. In addition, two side drainage structures and one sluice gate structure were found that were not on the as-built drawings. Permits were not found on file with the Corps for one of the drainage structures. However, final permit records were not available; hence, their impact on the overall levee system is not known.

Since the 2010 inspection, VCWPD has made progress toward correcting identified non-critical items. Corrective actions included removal of unwanted vegetation, repair of access ramps and embankment erosion, removal of miscellaneous unauthorized/unpermitted encroachments, removal of sediment obstruction to interior drainage facilities, repair of grate inlets, and evaluation of the need for flap gates on two side drains.

Lack of Recreation Opportunities and Access. Recreational opportunities associated with the river are limited. The project site currently provides undeveloped recreational opportunities for walking, biking, and nature viewing, as well as a remote control plane airfield. The top of the levee is maintained as a flood control maintenance road; however, due to infrequent traffic, it has become a popular route for passive uses.

(2) Opportunities

There are opportunities to increase public safety while addressing the issues identified for the levee system in its current condition with minimal toedown. This may result in reduced risk to lives and properties currently protected by the levee.

As part of on-going studies, the VCWPD has compiled estimates of the area protected by SCR-1 Levee system. According to the National Levee Database (NLD), the leveed area is approximately 2.2 square miles. The leveed area, shown on Figure 4, includes approximately 344 acres of residential and public land use, 367 acres of spreading grounds and farmland, 254 acres of commercial and industrial land use, and 443 acres of vacant lots and abandoned gravel pits. The daytime and nighttime population at risk in the protected zone is 7,025 and 7,364, respectively. It is estimate that as many as 1,410 structures would be inundated by levee failure with property damages estimated at \$291 million. Failure of the levee could result in millions of dollars of urban infrastructure and commercial/residential property losses, not to mention the potential for significant loss of life—particularly if a portion of the levee were to collapse suddenly during the night.

Additional opportunities include restoration of ecosystem function and values throughout the study area. This could include restoration strategy to support VCWPD's large-scale eradication efforts of primarily two non-native invasive species that have the greatest impact in the Santa Clara River: giant reed (*Arundo donax*) and tamarisk (*Tamarisk* spp.). Where large tracts of arundo or tamarisk are to be removed, eradication efforts should be followed by revegetation with native riparian species to replace lost nesting habitat. Least Bell's Vireo and Southwestern Willow Flycatcher, both endangered bird species, typically nest in willow scrub habitat.

There is also an opportunity to divert floodwaters from the Central Avenue Drain to the spreading grounds adjacent to the drain (approximately Station 350+00 and 404+00, between the SCR-1 Levee and E. Vineyard Avenue). The United Water Conservation District owns and operates the spreading grounds. The water diversion would address multiple purposes by providing storage for local runoff in a manner which facilitates groundwater recharge and helps support habitat restoration throughout the study area. As part of this effort, groundwater contaminant sources, including nonpoint source pollution,

should be identified and evaluated. Any necessary treatment required for surface waters should be identified prior to recharge into the groundwater basin to prevent further degradation of the aquifer.

While the Santa Clara River Levee system modification is a single-purpose flood risk management project, the constructed features may also provide some opportunity to achieve incidental recreational benefits. The site's proximity to residential areas and the scenic views it provides make it an accessible and aesthetically pleasing area for urban recreation. This could include multi-use trails and associated recreational use that may be accommodated on top of the levee without hindering the primary purpose of the project. These opportunities would be compatible with City of Oxnard's Santa Clara River Trail Master Plan (Alta Planning Design 2011). As identified in the Master Plan, the multi-use trails would provide connectivity for alternative transportation and linkage to schools, parks, and residential neighborhoods. Recreational opportunities and features would comply with the Corps' mission and requirements, VCWPD's goals, and local plans.

d. Planning Objectives

The national objectives of National Economic Development and National Ecosystem Restoration are general statements and not specific enough for direct use in plan formulation. The water and related land resource problems and opportunities identified in this study are stated as specific planning objectives to provide focus for the formulation of alternatives. These planning objectives reflect the problems and opportunities and represent desired positive changes in the without project conditions.

The planning objectives are specified as follows:

- (1) Reduce flood risks by addressing issues identified along the SCR-1 Levee system.
- (2) Use environmentally sustainable design practices in addressing the flood risk management purpose of the project wherever possible within the levee system reach.
- (3) Cooperate with the mutually beneficial goals of related plans, projects, and agencies.
- (4) Fully coordinate with other Federal, state, local agencies, and stakeholders.

e. Planning Constraints

Unlike planning objectives that represent desired positive changes, planning constraints represent restrictions that should not be violated. The planning constraints identified in this study are as follows:

- (1) Maintain the current level of flood protection with any recreation opportunities investigated.
- (2) Under the Endangered Species Act, any potential project would be required not to jeopardize the continued existence of threatened or endangered species, or to destroy or adversely modify their critical habitat. Project modifications should be sited so that

habitation by those species does not adversely impact the non-Federal sponsor's ability to maintain flood control function and perform maintenance on channels.

(3) Any potential project would be required to comply with State-adopted, USEPA-approved water quality standards.

(4) Comply with local, state, and Federal laws and regulations.

f. Measures to Address Identified Planning Objectives

A management measure is a feature or activity at a site, which addresses one or more of the planning objectives. A variety of measures can be considered to achieve the objectives identified above. Each measure will be assessed and a determination made regarding whether it should be retained in the formulation of alternative plans.

(1) *Flood Risk Management Measures*

- Grouted riprap toedown extension
- Deeper, more robust rock groins
- Soil cement
- Steel sheet pile

(2) *Habitat Measures*

- Non-native plant species removal
- Plantings in channel
- Off-channel water storage/groundwater recharge

(3) *Recreation Measures*

- Trail access
- Recreation connectivity
- Educational interpretive

g. Preliminary Screening

The No Action Alternative is required pursuant to the National Environmental Policy Act (NEPA). This alternative assumes the future conditions in the study area without implementation of any action alternatives by the Federal Government or by local interests to achieve the planning objectives. This alternative is carried forward and analyzed to provide a basis from which to assess the advantages and disadvantages of the action alternatives.

Twelve preliminary design alternatives have been developed to remediate the current deficiencies found with the SCR-1 Levee system and protect it against long-term channel degradation and scouring. Preliminary cost estimates were developed for comparison

purposes. Based on preliminary screening of the 12 alternatives, three were selected based on engineering feasibility, environmental impacts, and overall construction cost. These alternatives are as follows:

- Alternative 1 – Soil Cement: This alternative consists of soil cement bank protection with a side slope of 1H:1V from the top of levee to the toedown depth.
- Alternative 2 – Riprap: This alternative consists of 42-inch-thick loose riprap with a slope of 2H:1V from the top of levee to the toedown depth.
- Alternative 3 – Grouted Rock: This alternative consists of 30-inch-thick grouted riprap with a slope of 2H:1V from the top of levee to the riverside toe and a slope of 1.5H:1V from the riverside toe elevation to the toedown depth.

The summary of costs for the above design alternatives are shown in the following table. These include mobilization; clearing and grubbing; levee slope protection; improvements under Highway 101; access ramps; storm drain penetration improvements; planning, engineering, and design; construction management; and contingencies.

Alternative	Cost Estimate¹
1 – Soil Cement	\$97,376,000
2 – Riprap	\$151,736,000
3 – Grouted Rock	\$137,771,000
¹ Including mitigation costs. The mitigation area requirements for impacted area are approximately 5:1 and 3:1 for permanent and temporary impacts, respectively.	

Preliminary screening shows a potential for implementation of alternatives that address the current deficiencies and conditions of the SCR-1 Levee system. The Santa Clara River Levee protects nearly \$291 million of property and structures, and implementation of the above design alternatives would maintain the protection that was originally intended. Impacts to environmental resources of any levee repair alternative are expected to occur mostly within the existing levee footprint. Negative impacts would be avoided or minimized through mitigation measures.

In addition, there is potential for implementation of alternatives that would address public concerns on ecosystem restoration and recreation in the study area.

h. Establishment of a Plan Formulation Rationale

The conclusion from the preliminary screening forms the basis for the next iteration of the planning steps that would be conducted in the feasibility phase. The likely array of alternatives that would be considered in the next iteration includes some combination of the

measures outlined above, an alternate levee alignment, as well as a No Action alternative. Future screening and formulation of alternatives would be carried out in a feasibility study.

It is assumed that the primary objective of the study would be to evaluate the necessary changes and/or modifications to the Santa Clara River Levee to continue its operation and primary purpose of providing flood risk protection.

Additional benefits may be provided by addressing availability of recreation and floodwater recharge opportunities within the study area.

6. FEDERAL INTEREST

To be determined – Corps of Engineers

7. PRELIMINARY FINANCIAL ANALYSIS

As the local sponsor, the VCWPD will be required to provide 50 percent of the cost of the feasibility phase. Cost sharing for implementation is 65 percent Federal, 35 percent local, with credit for lands and easements toward the local share. A letter of intent from the local sponsor stating a willingness to pursue the feasibility study and to share in its cost, and an understanding of the cost sharing that is required for project construction is included as Enclosure C.

8. ASSUMPTIONS AND EXCEPTIONS

a. Feasibility Phase Assumptions

The following critical assumptions provide a basis for the Feasibility Study:

- (1) The Project was constructed prior to the Water Resource Development Act of 1986. It is understood that any feasibility study or resulting construction would be carried out under current cost share requirements. NEPA documentation would be prepared as part of the feasibility study.
- (2) There are several potential partnering options to proceed into a feasibility study.
 - i. Section 216, River and Harbor and Flood Control Act of 1970: This draft 905(b) has been drafted for a Section 216 study. This would require a new start Appropriation to be implemented.
 - ii. Section 205, Flood Control Act of 1948: A small flood control project such as Section 205 could be considered for the SCR-1 Levee; however, the current estimate indicates that this project would exceed the program limit.
 - iii. Santa Clara River Watershed Study: The Corps, Los Angeles District, Los Angeles County Department of Public Works, and VCWPD have partnered in this feasibility study to support comprehensive flood risk management, ecosystem restoration, and other water resources decision-making planning throughout the watershed. The SCR-1 Levee system is located at the downstream terminus of the

watershed and could be included in the ongoing watershed study. Incorporation of the SCR-1 Levee system into the watershed study would require the Corps, Los Angeles District, to revise the Santa Clara River Watershed Study Report and the District Engineer to recommend that the SCR-1 Levee be added as a spin-off alternative carried forward into a feasibility phase.

- iv. Levee Safety Action Classification: The funding for this Federal program is still being determined, and it is likely that the initial funding will go to Federally owned and operated levees. Based on the 2010 Periodic Inspection, the SCR-1 Levee system was rated with an *Unacceptable* rating. As such, the SCR-1 levee system is currently not eligible for Federal funding through Public Law 84-99 for repairs if damaged during a flood event in the future. Once the non-Federal sponsor presents the Corps with proof that all items rated *Unacceptable* have been corrected, the system will be inspected for eligibility in the program.

b. Policy Exceptions and Streamlining Initiatives

The study would be conducted in accordance with the Principles and Guidelines and Corps of Engineers regulations. Exceptions to established guidance have been identified that will streamline the feasibility study process that will not adversely impact the quality of the feasibility study. Approval of the Section 905(b) Analysis by HQUSACE results in the approval of the following policy exceptions and streamlining initiatives:

- (1) SMART Planning – Specific, Measurable, Attainable, Risk-Informed, and Timely: Supports the Corps of Engineers Planning Modernization goal of completing high-quality feasibility studies with shorter timeframes and lower costs. The Deputy Commanding General for Civil and Emergency Operations has directed the Corps to follow a “3x3x3” Rule: complete all (new) feasibility studies with a target of 18 months, but no more than three years, at a cost of no more than \$3 million, and require three levels of vertical coordination. Feasibility studies will be of a reasonable report length, with a target of 100 pages or less for the main report.

With SMART planning, the Corps’ Planning process and outputs are decision-focused, rather than task-focused. This emphasis on decision-making is from the beginning of the study and relies on early engagement and accountability of each level of the vertical team (District, Division, and Headquarters). Early engagement on critical decisions from all levels of the Corps will result in a more timely and cost efficient delivery of decision documents to address the water resources needs of the Nation. SMART Planning also offers opportunities to encourage efficient, thorough, environmental reviews that will result in quicker and better-informed decisions. In addition, targeted total costs of \$3 million, including non-Federal Sponsor’s cost share, improves the ability of the Corps and the Sponsor to estimate future budgetary needs.

c. Other Approvals Required

Unknown at this time.

9. SMART FEASIBILITY STUDY MILESTONES

Milestone	Description	Duration (months)	Cumulative (months)
-	Feasibility Study Kickoff		
Milestone 1	Alternative Milestone		
Milestone 2	Tentatively Selected Plan		
Milestone 3	Agency Decision		
Milestone 4	Civil Works Review Board		
Milestone 5	Chief's Report		

10. FEASIBILITY PHASE COST ESTIMATE

WBS#	Description	Cost
JAA00	Feas – Surveys and Mapping except Real Estate	
JAB00	Feas – Hydrology and Hydraulics Studies/Report (Coastal)	
JAC00	Feas – Geotechnical Studies/Report	
JAE00	Feas – Engineering and Design Analysis Report	
JB000	Feas – Socioeconomic Studies	
JC000	Feas – Real Estate Analysis/Report	
JD000	Feas – Environmental Studies/Report (Except USFWL)	
JE000	Feas – Fish and Wildlife Coordination Act Report	
JF000	Feas – HTRW Studies/Report	
JG000	Feas – Cultural Resources Studies/Report	
JH000	Feas – Cost Estimates	
JI000	Feas – Public Involvement Documents	
JJ000	Feas – Plan Formulation and Evaluation	
JL000	Feas – Final Report Documentation	

WBS#	Description	Cost
JLD00	Feas – Technical Review Documents	
JM000	Feas – Washington Level Report Approval (Review Support)	
JPA00	Project Management and Budget Documents	
JPB00	Supervision and Administration	
JPC00	Contingencies	
L0000	Project Management Plan (PMP)	
Q0000	PED Cost Sharing Cost Agreement	
TOTAL		

11. VIEWS OF OTHER RESOURCE AGENCIES

Because of the funding and time constraints of the reconnaissance phase, only limited and informal coordination has been conducted with other resource agencies. Views that have been expressed are as follows:

Resource agencies' input to be included as project progresses.

12. POTENTIAL ISSUES AFFECTING INITIATION OF FEASIBILITY PHASE

Continuation of this study into the cost-shared feasibility phase is contingent upon an executed Feasibility Cost Sharing Agreement (FCSA). Failure to achieve an executed FCSA within 18 months of the approval date of the Section 905(b) Analysis will result in termination of the study. Issues that could impact the initiation of the feasibility phase include:

- Availability of Federal funds
- Availability of non-Federal funds

There are no additional issues at this time that may impact the initiation of the feasibility phase.

The schedule for signing the FCSA is _____. Based on the schedule of milestones in Paragraph 9, completion of the feasibility report would be in _____, with a potential Congressional Authorization in a WRDA _____.

13. LOCATION/PROJECT AREA MAPS

Maps of the Study area and watershed are included as Figures 1–3.

14. RECOMMENDATIONS

I recommend that the Santa Clara River Levee Feasibility Study proceed into the feasibility phase.

Date

Name of District Commander
Colonel
Corps of Engineers
District Engineer

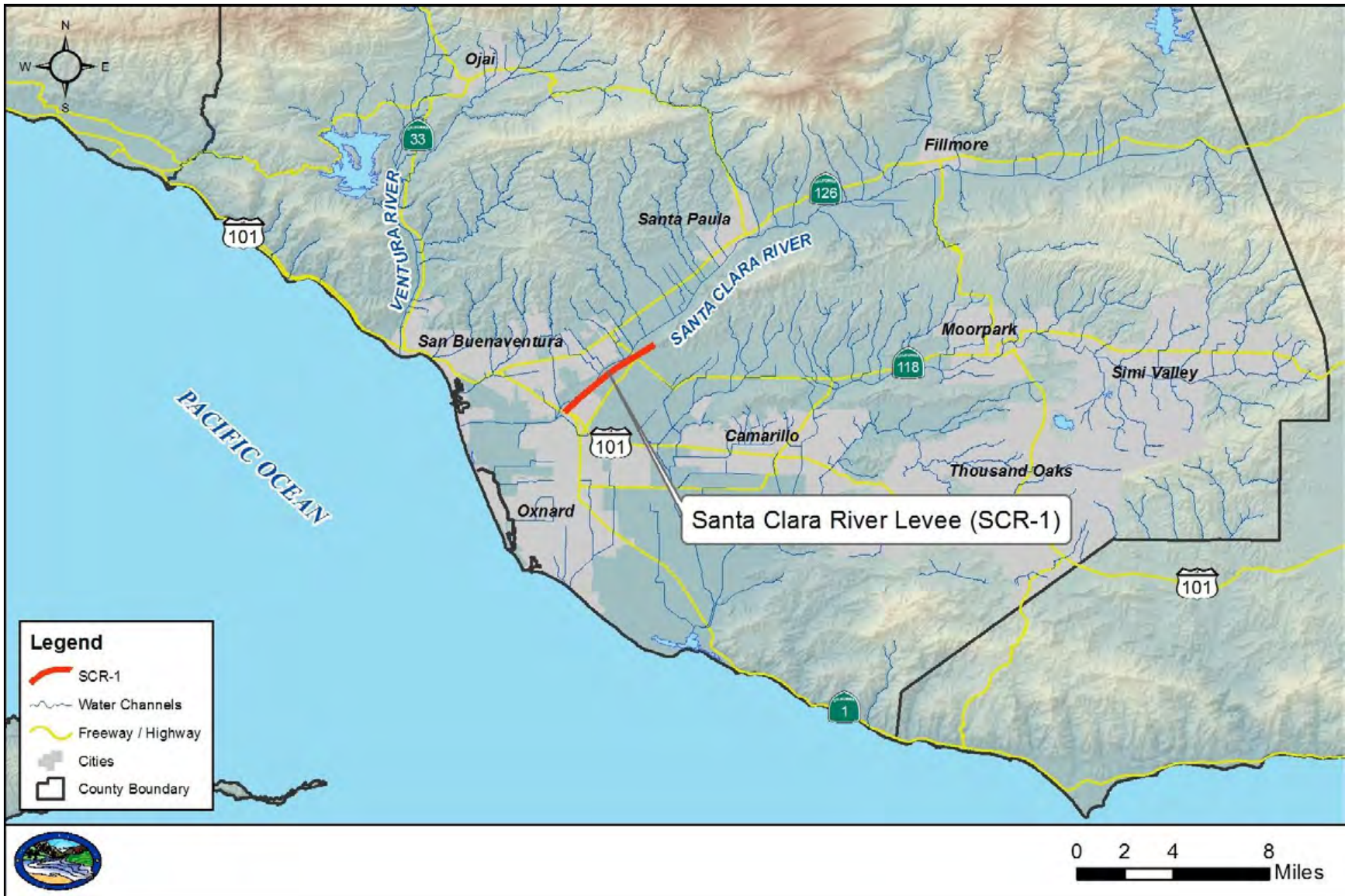


Figure 1: Santa Clara River Levee (SCR-1) Vicinity Map



Figure 2: Santa Clara River Levee (SCR-1) Location Map

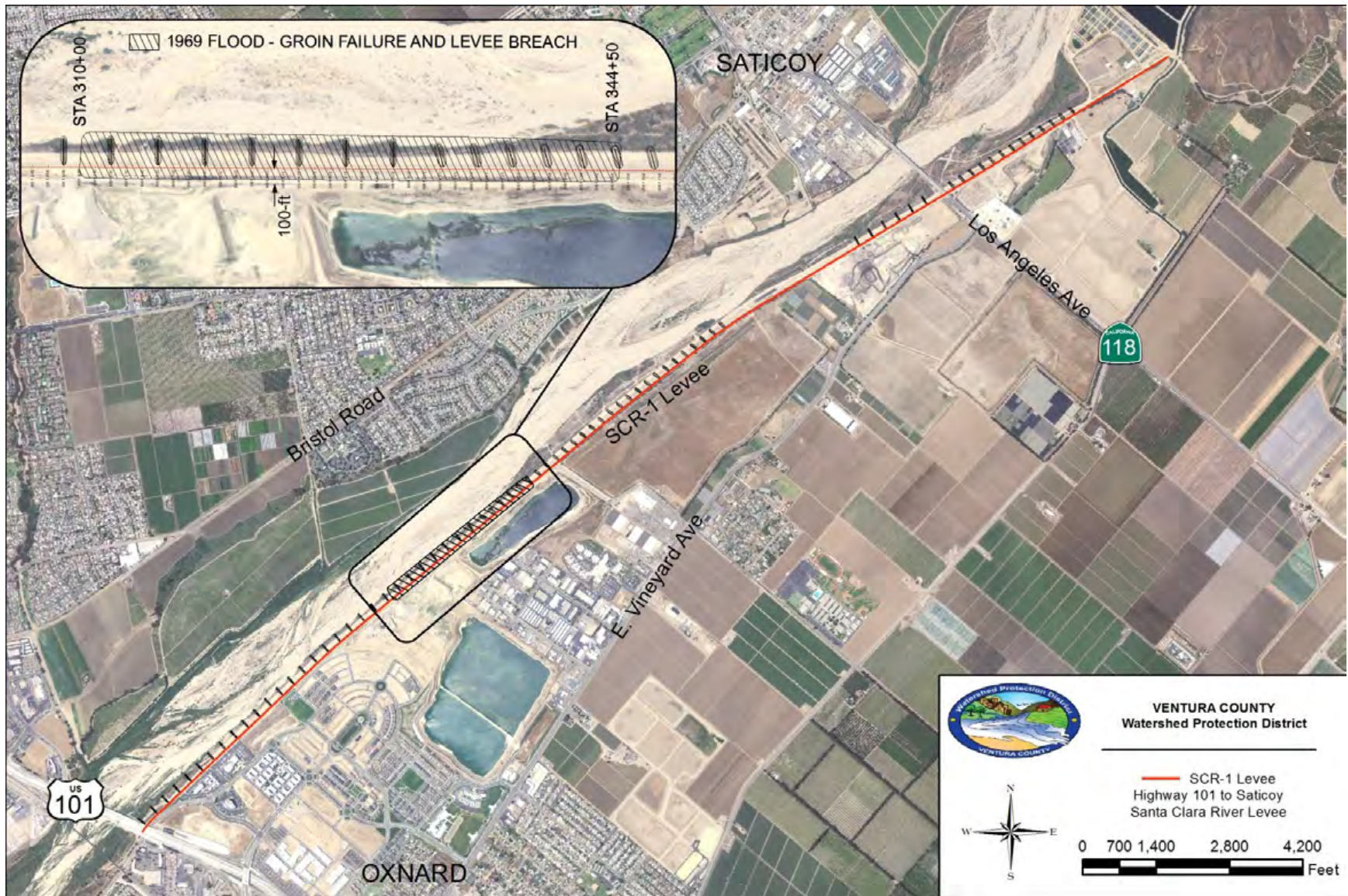


Figure 3: 1969 Flood Damage along SCR-1



Figure 4: SCR-1 Leveed Area

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