

RECLAMATION

Managing Water in the West

Draft Environmental Assessment

Cantua Creek Stream Group Improvement Project

EA-13-001



U.S. Department of the Interior
Bureau of Reclamation

November 2015

Mission Statements

The mission of the Department of the Interior is to protect and manage the Nation's natural resources and cultural heritage; provide scientific and other information about those resources; and honor its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Contents

	Page
Section 1 Introduction	1
1.1 Background	1
1.2 Need for the Proposed Action	2
Section 2 Alternatives Including the Proposed Action	5
2.1 No Action Alternative	5
2.2 Proposed Action	5
2.2.1 Proposed Action Details	6
2.2.2 Construction Details	12
2.2.3 Operation and Maintenance	13
2.2.4 Environmental Commitments	13
Section 3 Affected Environment and Environmental Consequences	17
3.1 Resources Eliminated from Further Analysis	17
3.2 Water Resources	17
3.2.1 Affected Environment	17
Hydrology	17
Creeks	17
Flood Modeling	19
3.2.2 Environmental Consequences	19
No Action	19
Proposed Action	20
Cumulative Impacts	21
3.3 Land Resources	21
3.3.1 Affected Environment	21
3.3.2 Environmental Consequences	21
No Action	21
Proposed Action	21
Cumulative Impacts	22
3.4 Biological Resources	22
3.4.1 Affected Environment	22
3.4.2 Environmental Consequences	26
No Action	26
Proposed Action	26
Cumulative Impacts	27
3.4 Cultural Resources	27
3.4.1 Affected Environment	27
3.4.2 Environmental Consequences	28
No Action	28
Proposed Action	28

Cumulative Impacts	28
3.5 Air Quality	28
3.5.1 Affected Environment.....	29
3.5.2 Environmental Consequences	29
No Action.....	29
Proposed Action.....	29
Cumulative Impacts	30
3.6 Global Climate Change.....	30
3.6.1 Affected Environment.....	30
3.5.2 Environmental Consequences	31
No Action.....	31
Proposed Action.....	31
Cumulative Impacts	31
Section 4 Consultation and Coordination.....	33
4.1 Public Review Period.....	33
4.2 National Historic Preservation Act (16 U.S.C. § 470 et seq.)	33
4.3 Executive Order 11988 – Floodplain Management	33
4.4 California Fish and Game Code (Sections 1600 et seq.)	34
Section 5 Preparers and Reviewers	35
Section 6 References	37
 Figure 1 Proposed Action Area.....	 3
Figure 2 Project Details for Basins 1 and 2	7
Figure 3 Project Details for Basins 3 and 4	8
 Table 1 Linear Feet and Fill of Raised San Luis Canal Embankments and Pump Pads.....	 9
Table 2 Linear Feet and Cubic Yards of Raised Roads	11
Table 3 Construction Equipment List for Proposed Action.....	13
Table 4 Environmental Protection Measures and Commitments	14
Table 5 Resources Eliminated from Further Analysis	17
Table 6 Modeled 50-year Flood Volumes in the Cantua Creek Stream Group...	19
Table 7 Special-Status Wildlife with Potential to Occur on or Adjacent to the Proposed Action Area	24
Table 8 Air Quality Standards of San Joaquin Valley Air Pollution Control District.....	29
Table 9 Estimated Maximum Construction Emissions.....	30
 Appendix A Cultural Resources Determination	

Section 1 Introduction

1.1 Background

The Cantua Creek Stream Group watershed originates on the eastern side of the California Coast Range and has a drainage area of approximately 201 square miles. The watershed consists of five major creeks: Arroyo Hondo, Cantua, Salt, Martinez, and Domengine Creeks (Figure 1). These creeks drain a portion of the Coast Range and generally flow easterly into the western San Joaquin Valley where they enter the San Luis Canal through drain inlet structures.

The San Luis Canal, constructed by the Bureau of Reclamation (Reclamation) in 1967 as a component of the Central Valley Project (CVP), is the federally-built and operated section of the California Aqueduct and extends 102.5 miles from O'Neill Forebay in a southeasterly direction to a point west of Kettleman City (see Figure 1). Since construction, the California Department of Water Resources (DWR) operates and maintains the San Luis Canal on Reclamation's behalf pursuant to an operating agreement.

The San Luis Canal is concrete-lined canal with a capacity ranging from 8,350 to 13,100 cubic feet per second (cfs), of which only 10 percent or less are floodwater flows, and serves both the CVP and the State Water Project (SWP). Because the San Luis Canal was designed with fewer cross-drainage features than other sections of the California Aqueduct, more floodwaters are accepted into the San Luis Canal than any other stretch of the Aqueduct. Cantua and Salt Creeks accounted for 88 percent of the total inflow volume between 1987 and 1994.

The original flood-easement lands obtained during canal construction and the inlet drains were thought to be sufficient to protect the San Luis Canal from floodwaters resulting from a 50-year flood and to accommodate 50 years of sediment deposition. However, as early as 1969, large runoff and sediment volumes from Cantua and Salt Creeks indicated that the original hydrologic and sediment transport estimates were significantly underestimated and that existing flood control measures for the Cantua Creek Stream Group watershed are insufficient to handle large flood events. Flooding in the watershed resulted in ponding of floodwater along a 13-mile stretch of the San Luis Canal. Two significant storms sent a total of 3,600 acre-feet (AF) of floodwaters from all five creeks into the canal during January and February of 1969. The peak discharge on record for Cantua Creek is 3,400 cfs (March 1, 1983), when approximately 4,800 AF of floodwater entered the canal. However, the most damaging flood in the watershed occurred in March 1995 when flows from Cantua and Salt Creeks overtopped the San Luis Canal embankments at Mount Whitney Avenue, causing damage to over 600 feet of the canal liner and depositing over 750,000 cubic yards of sediment into the canal.

Large floods pose an increasing threat to the integrity, supply reliability, and water quality of the San Luis Canal and present an annual operation and maintenance challenge to DWR staff. In 2011, DWR completed a feasibility-level hydrologic analysis and determined that additional

flood easements and modifications to embankments, roads, and pump pads are needed to protect the integrity of the San Luis Canal. In the absence of improvements, future floods continue to pose a threat to the integrity, supply reliability, and water quality of the San Luis Canal.

1.2 Need for the Proposed Action

Additional flood easements and modifications to embankments, roads, and pump pads are needed to protect the integrity of the San Luis Canal from a 50-year flood risk.

3

THIS PAGE LEFT INTENTIONALLY BLANK

Section 2 Alternatives Including the Proposed Action

This Environmental Assessment considers two possible actions: the No Action Alternative and the Proposed Action. The No Action Alternative reflects future conditions without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment.

2.1 No Action Alternative

Under the No Action Alternative, Reclamation would not approve and partially fund the acquisition of additional flood easements and modifications to embankments, roads, pump pads, and ancillary infrastructure modifications along the San Luis Canal. Conditions relative to existing potential for levee failure, road overtopping, and spread of damaging floodwater on nearby agricultural land would continue to be an issue. Any flooding would pose an annual operation and maintenance challenge to DWR staff, and subsequently Reclamation, creating a continuous demand for expenditures and resources.

2.2 Proposed Action

Under the Proposed Action, Reclamation would approve and partially fund DWR's proposed Cantua Creek Stream Group Improvements Project (Proposed Project). The Proposed Project would restore storage in the existing ponding basins along the San Luis Canal through flood easement acquisition and modifications to the San Luis Canal including: raising portions of the San Luis Canal embankment, pump pads, turnout facilities' protection embankments, and roads.

Proposed Project activities include the following:

- a) Acquiring approximately 860 acres of new flood easements to complement the existing flood easements;
- b) Raising approximately 9,900 linear feet of the San Luis Canal embankment in various sections to provide basin storage;
- c) Raising and repaving approximately 850 linear feet of Clarkson Avenue, a paved Fresno County road;
- d) Raising and paving approximately 850 linear feet of Oakland Avenue, a private dirt road;
- e) Re-grading the road and flood easements near Parkhurst Avenue (aka Excelsior Avenue), a private dirt road;
- f) Construction of embankments around four Westlands Water District turnout facilities;
- g) Raising six existing pump pads used for placement of temporary floodwater pumps;
- h) Clearing sediment build-up at the Salt Creek drain inlet at Laguna Avenue;

- i) Removing sediment from the Cantua Creek Channel to reestablish the gabion weirs at the Harlan Drain Inlet and using it as construction material;
- j) Constructing an approximately 350-foot long by 100-foot wide concrete weir in the existing San Luis Canal operations road north of Jeffrey Avenue;
- k) Removing sediment from the Parkhurst Triangle, a 25-acre Reclamation-owned parcel; the material may be used as borrow material for the project;
- l) Protecting structures and facilities such as power poles, gated culverts, pipeline utility valves/appurtenances, pumps, and irrigation crossings from damage during construction;
- m) Acquire approximately 1 acre of private land to construct an embankment around the MP 139.25 near Jeffrey Avenue; and
- n) Borrowing approximately 22,300 cubic yards of soil for construction of embankments and roads from within the Proposed Action footprint.

Specific details of each activity are included below.

2.2.1 Proposed Action Details

The Proposed Project has been divided into four project basins (see Figures 2 and 3). The basins are bounded by the San Luis Canal embankment to the east and existing private and public roads to the north and south that would be raised to provide 2 feet of freeboard above the floodwaters. Floodwaters within each basin would be contained within the flood easements and allow for controlled releases into the San Luis Canal as necessary.

Basin 1 lies between Clarkson and Cerini Avenues and receives floodwater mainly from Arroyo Hondo (San Luis Canal mileposts [MP] 128.48-132.8). Basin 2 lies between Cerini and Mount Whitney Avenues and receives floodwater from Cantua Creek (MP 132.8-134.9). Basin 3 lies between Mount Whitney and Paige Avenues and receives floodwater from Salt Creek and from Martinez Creek (MP 134.9-138.2). Basin 4 is between Paige and Oakland Avenues and receives floodwater from Domengine Creek (MP 138.2-141.6).

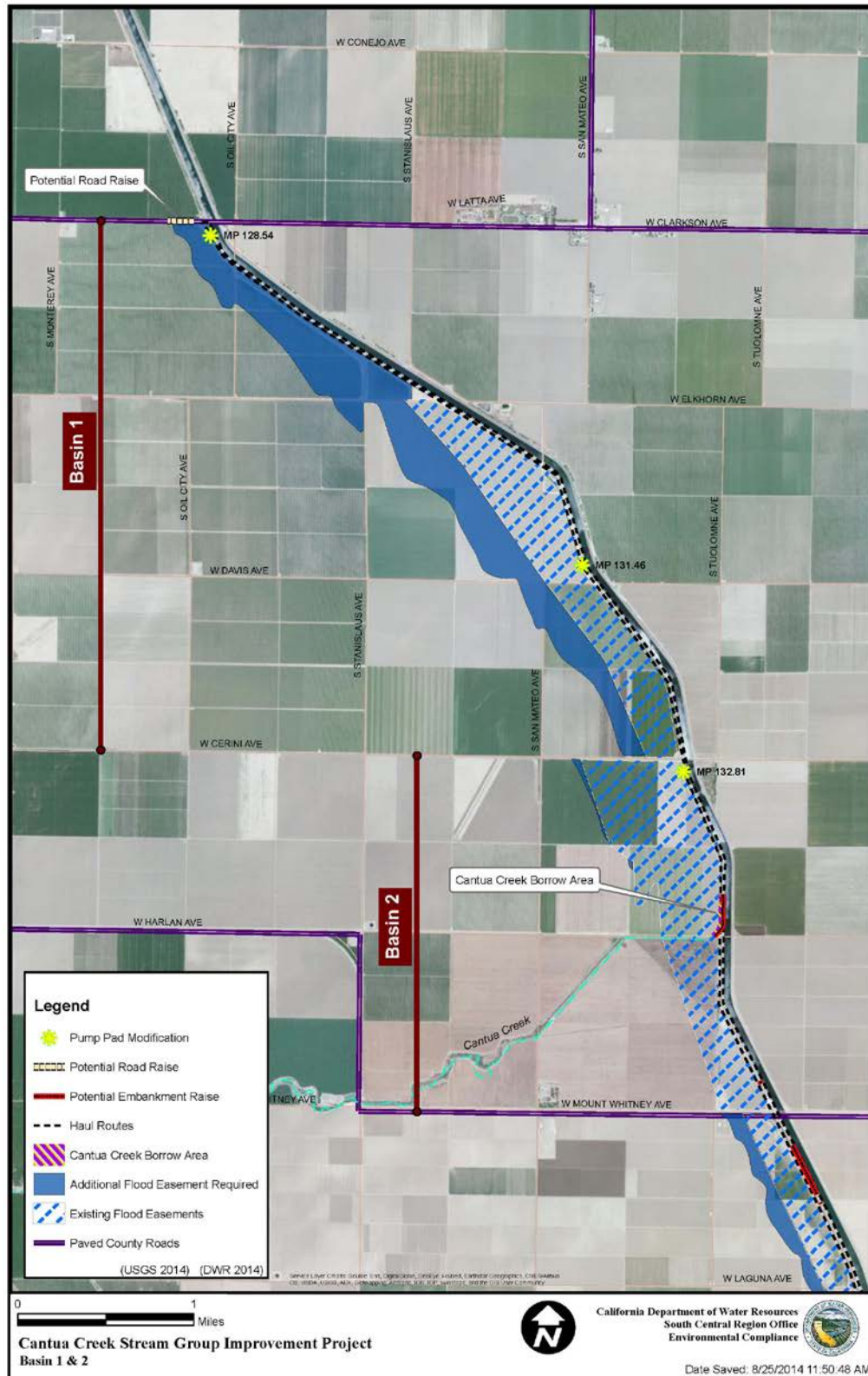


Figure 2 Project Details for Basins 1 and 2

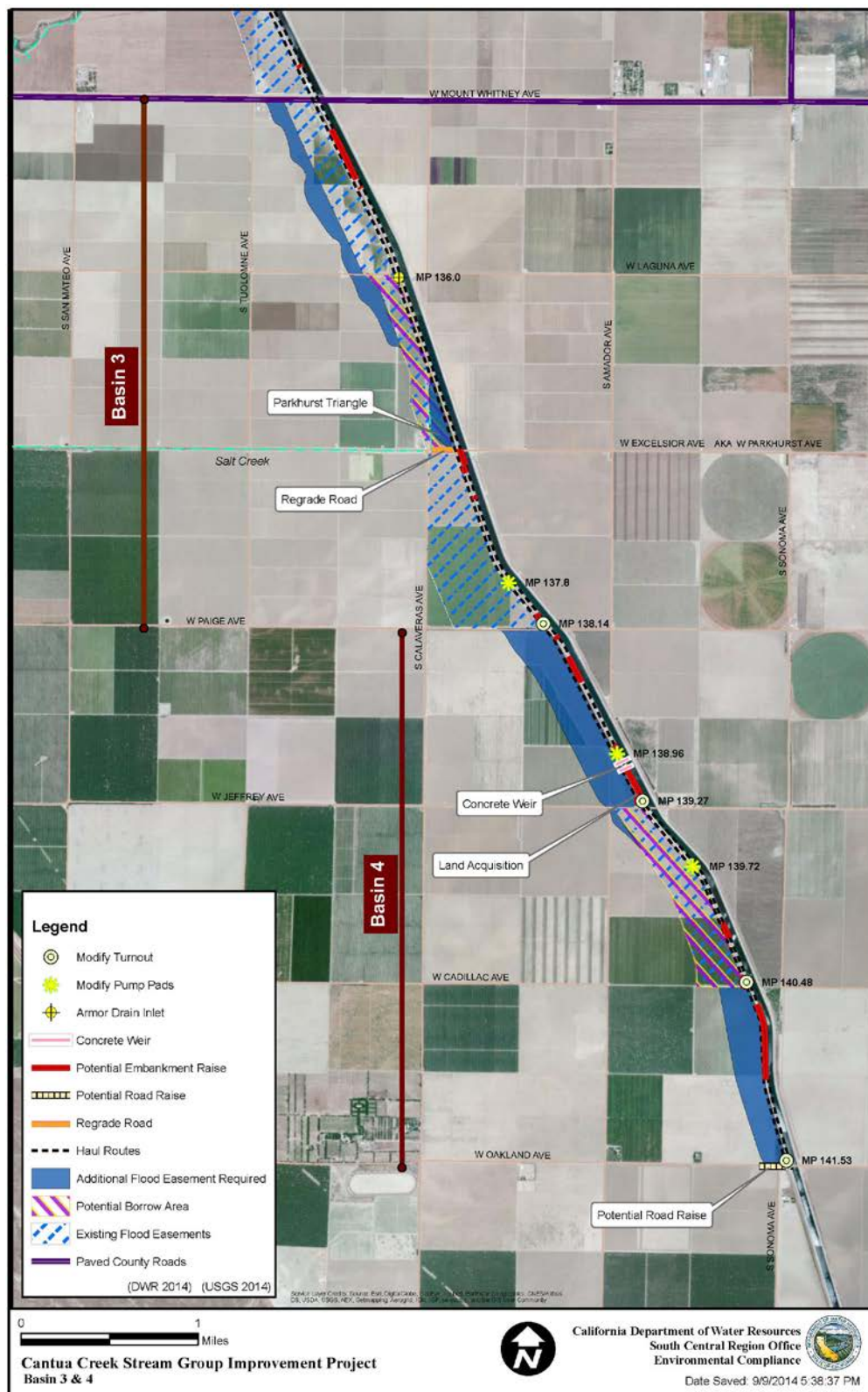


Figure 3 Project Details for Basins 3 and 4

Proposed Easement Acquisition

Currently, 1,420 acres of flood easements exist within and nearby the Proposed Action area. For the purpose of compensating landowners for ponding damage on lands west of the San Luis Canal during high floods, DWR would purchase additional flood easements on approximately 860 acres west of the San Luis Canal between Clarkson and Oakland Avenues. The proposed easement area (50-year floodplain) is delineated on the east by the San Luis Canal and on the west by an approximately 324-foot contour in Basin 1, an approximately 331-foot contour in Basins 2 and 3, and an approximately 330-foot contour in Basin 4 (Figures 2 and 3). Farming would continue within the easement area, although flood easements would prohibit the planting of permanent or semi-permanent crops to allow for flood capacity and maintenance of the ponding basins. The newly purchased easements would later be turned over to Reclamation.

Proposed Modifications

The San Luis Canal embankments would be raised 0.5 feet to 7.0 feet, depending on location. Portions of the western San Luis Canal embankment between the Cantua Creek flume and Paige Avenue would be raised to an elevation of 333.0 feet. Between Paige Avenue and Oakland Avenue, portions of the embankment would be raised to an elevation of 332.0 feet. In total, approximately 9,900 linear feet of the San Luis Canal embankment would be potentially raised (see Table 1), requiring approximately 16,000 cubic yards of fill. In raising the embankment, material would be placed in compacted lifts (6-inch thick increments) with side slope ratios of 2:1 (26.6 degree slope angle). The crest of the embankment would be built with a minimum 14-foot wide dirt road (see Figure 4).

Table 1 Linear Feet and Fill of Raised San Luis Canal Embankments and Pump Pads

Basin No.	Raise Canal Embankment (linear feet)	Pump Pads To be Raised
1	0	2
2	100	1
3	3,300	1
4	6,500	2
Total Feet	9,900	6
Total Fill (cubic yards)	16,000	3,800

At approximately MP 128.5, Clarkson Avenue would be raised a maximum of approximately 2 feet, requiring approximately 1,500 cubic yards of fill, compacted, and repaved with asphalt in order to improve floodwater containment within Basins 1 (see Table 2). Raising the road would also improve road access during flood events. Clarkson Avenue would be designed and raised according to Fresno County design standards. While construction occurs, access to private roads and entrances within the Proposed Action area would be maintained by the contractor. Clarkson Avenue would remain a thoroughfare, but would be reduced to one lane.

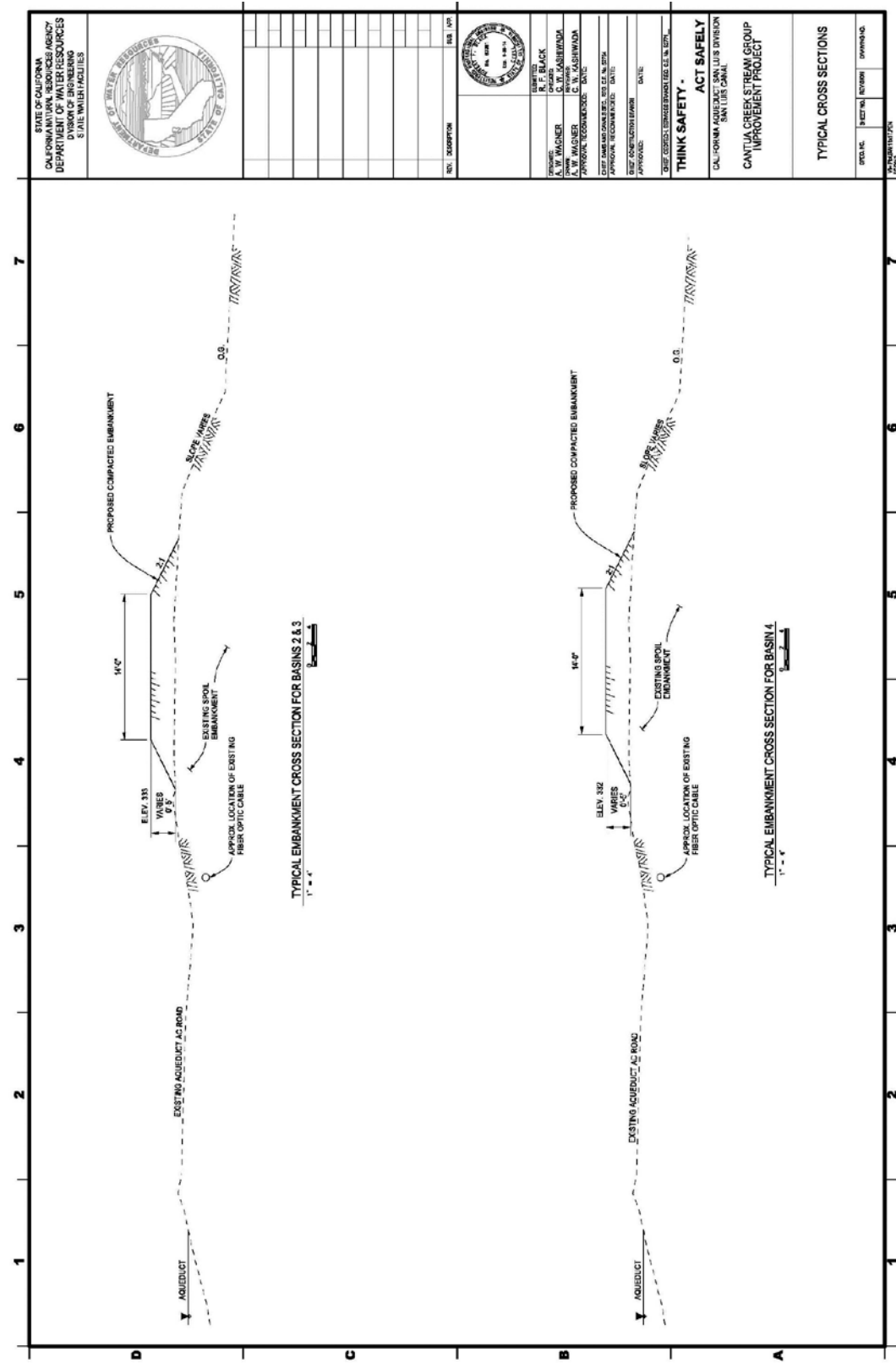


Figure 4 Embankment Raise

Oakland Avenue, which is a private dirt road at the terminus of the Proposed Action area, has a low area that would be raised to an elevation of 332.0 feet for approximately 850 linear feet, requiring approximately 1,000 cubic yards of fill (Table 2). At its lowest current elevation, the road would increase 3.5 feet in vertical height. The width at the top of the raise will essentially remain the same as the current width of the road; however, the base may be wider.

Table 2 Linear Feet and Cubic Yards of Raised Roads

Road to be Raised	Length (linear feet)	Volume Fill (cubic yards)
Clarkson Avenue	850	1,500
Oakland Avenue	850	1,000
Total	1,700	2,500

Parkhurst Avenue, the roadway and adjacent land within the flood easement, would be re-graded. The modification to Parkhurst would help maintain connectivity within Basin 3. As floodwaters rise, water would be able to pass over the road.

Embankments surrounding Westlands Water District turnouts located at MPs 138.14, 139.27, 140.48, and 141.53 on the San Luis Canal would be constructed approximately 2 feet higher than existing conditions or a new embankment would be constructed. These semi-impervious flood embankments would tie into adjacent farm roads and the San Luis Canal embankment.

Existing pump pads adjacent to the western San Luis Canal embankment used for temporary pumps would be raised to the approximate elevation of the new embankment, requiring approximately 3,800 cubic yards of fill. Pump pads to be raised are located at MPs 128.54, 131.46, 132.81, 137.8, 138.96, and 139.72.

The Salt Creek drain inlet at Laguna Avenue would be cleared of built-up sediment around the concrete lip and existing rip rap.

The Cantua Creek Drain Inlet channel at Harlan Avenue would be graded to remove accumulated sediment and reestablish the weir to allow decanting of floodwater at this inlet once again. Approximately 7,500 cubic yards of material would be removed from the Cantua Creek Channel at the Harlan Drain Inlet from a 2-acre area.

A 350-foot long by 100-foot wide by 6-inch thick reinforced concrete weir would be constructed in the San Luis Canal operating road in Basin 4, north of Jeffrey Avenue. The weir would be designed for a 50-year flood, similar in design to the existing Salt Creek weir. Approximately 500 cubic yards of rock would be used to armor the western edge of the weir. Basin 4 previously had no discharge facilities into the San Luis Canal. The addition of this weir would allow time for water to pond and suspended sediment to drop out before entering the San Luis Canal.

Existing built up sediment deposits would be graded and excavated to depths to 9 feet in a 25-acre area known as the Parkhurst Triangle to direct flood flows through Basin 3. The area is located just north of Parkhurst Avenue and is owned by Reclamation, but it is under an agreement with the California Department of Fish and Wildlife (CDFW) to be managed as wildlife habitat. Since the site is being managed for wildlife, DWR would develop a work plan

for the area in cooperation with CDFW so as to avoid most large shrubs and other vegetation to the greatest extent practicable. Where possible, sediment would be removed around the shrubs and used for raising embankments. This site is a small section of a larger 89-acre borrow site within the Proposed Action area.

Several irrigation crossings could have intakes/outlets that are in the proposed areas of borrow excavation and haul routes. These intakes/outlets would be located and flagged so that construction equipment can avoid them. Other structures or facilities that would be protected to preserve existing use during construction activities include power poles, gated culverts, pipeline utility valves/appurtenances, and pumps. Protection during construction would occur through fencing, flagging, signage, and similar methods as necessary.

To properly construct a new embankment around the Westlands Water District turnout at MP 139.25 near Jeffrey Avenue, a small amount (less than 1 acre) of privately-owned agricultural land would be acquired by DWR and converted from agricultural land to DWR maintained right-of-way.

The raising of the San Luis Canal embankment, roads, and pump pads, would require approximately 22,300 yards of onsite borrow material. This material would be excavated from three borrow sites situated within the Proposed Action area on DWR right-of-way lands that total 232 acres. Borrow is described in more detail in Section 2.2.2.

2.2.2 Construction Details

The work window for the Proposed Action would occur sometime between December 2015 and October 2017. From the start date, actual construction is anticipated to last approximately six months. All roads within the Proposed Action area would remain open, although one-lane traffic control would occur on Mount Whitney and Clarkson Avenues. Traffic control would occur during working hours (6:00 a.m. to 5:30 p.m.). All work would take place during daylight hours, beginning after 6:00 a.m. and ending by 5:30 p.m. each day.

The 141-acre borrow site would require removal of planted crops (newly planted saplings) before borrow construction activities. This would occur during the site preparation phase and would likely consist of some hand removal of irrigation/planting structures as needed (i.e. poly vinyl chloride piping, wooden planting stakes, etc.) and grading of the land to remove excess plant matter and other material so that borrow material can be extracted easily.

Post-construction, all borrow sites would be graded level and conformed to adjacent ground to allow continued agricultural uses. At the 2-acre site within Cantua Creek, the channel would be contoured to establish proper channel elevations to prevent sediment from depositing into the San Luis Canal. Temporary spoil locations, if any, would be located on the existing embankment, pump pads, and other similar locations within DWR right-of-way.

Average daily commuter trip miles are estimated at 25 miles each way from Coalinga, California, south of the Proposed Action footprint. The estimated travel miles for equipment (expected to come from Fresno, California) to reach the Proposed Action site is 50 miles one way. Heavy equipment would be dropped off at the site prior to construction and is expected to remain on-site through all phases of construction. Since borrow would be obtained from within

the project footprint, there would be little need for equipment to travel outside of the project area during construction. Table 3 below describes the individual types of heavy equipment that would be used during construction and the estimated horsepower of each apparatus.

Table 3 Construction Equipment List for Proposed Action

Equipment Type	Horsepower	Equipment Type	Horsepower
Generator	9	Fork Lift M25D	50
Water Truck 3600 Gal	400	Asphalt Paving Machine	224
Backhoe	75	Asphalt Pickup Machine	127
Bobcats	50	Compressor 750 CFM	275
Excavator (325L)	168	Concrete Finisher	Elec
Compactor (815F Sheepfoot)	240	Concrete Pump 28' Boom	427
Compactor (Paving)	130	Concrete Vibrator	Elec
Roller (Paving)	84	Off Highway Truck 18-22 Ton	381
12H Motor Grader	165	Foreman Cement Mason 4x2 Pick Up	250
140H Motor Grader	185	Foreman Iron Worker 4x2 Pick Up	250
Rough Terrain Crane 20 Ton	152	Foreman Operator 4x2 Pick Up	250
Rough Terrain Crane 60 Ton	270	Flatbed Truck	250
D-8N Dozer	270	4x2 Pick Up	250
623F Self Load Scraper	365	4x4 Pick Up	250
Tandem Steel Drum Compactor 8-12 Ton	130	Cut Off Saw	3.8

2.2.3 Operation and Maintenance

Once construction is completed, DWR would maintain the four basins and related facilities in a similar manner to existing maintenance of the San Luis Canal and related facilities. This would include sediment and vegetation maintenance, embankment and pump pad repair, road grading and mowing, and other activities which occur in accordance with the Joint Use Facilities agreement between Reclamation and DWR and similar to existing facilities in the area.

2.2.4 Environmental Commitments

DWR and the contractors would implement the following environmental protection measures to avoid and/or reduce environmental consequences associated with the Proposed Action (Table 4). Environmental consequences for resource areas assume the measures specified would be fully implemented.

Table 4 Environmental Protection Measures and Commitments

Resource	Protection Measure
Air Quality	Prepare Dust Control and Asbestos Dust Control Plans, and implement all applicable dust and asbestos dust control measures, as required by the San Joaquin Valley Air Pollution Control District
	DWR and its construction contractors shall implement all Applicable Emission Control Measures for construction equipment, as required by law, whenever such equipment is operating within the San Joaquin Valley Air Basin.
	DWR and its construction contractors shall comply with the San Joaquin Valley Air Pollution Control District's Regulation VIII, "Fugitive Dust PM ₁₀ Prohibitions," and the California Air Resources Board's "2002-07-29 Asbestos Airborne Toxic Control Measures for Construction, Grading, Quarrying, and Surface Mining Operations" (Asbestos ATCM) and implement all applicable control measures, as required by law.
Water and Biological Resources	A Storm Water Pollution Prevention Plan shall be prepared to limit erosion impacts from construction.
Biological Resources	DWR shall provide a copy of the Streambed Alteration Agreement to Reclamation prior to start of construction
Biological Resources	A CDFW and U.S. Fish and Wildlife Service -approved biologist will conduct pre-construction protocol level surveys for San Joaquin kit fox no fewer than 14 days and no more than 30 days prior to the onset of any ground disturbing activity (USFWS 2011), and the results from that survey provided to Reclamation before initiating the project. DWR and its construction contractors will implement the U.S. Fish And Wildlife Service Standardized Recommendations For Protection Of The Endangered San Joaquin Kit Fox Prior To Or During Ground Disturbance (USFWS 2011).
Biological Resources	If, prior to construction, it is determined that burrows for special-status kangaroo rats cannot be avoided during construction, DWR, as applicable, in coordination/consultation with U.S. Fish and Wildlife Service, and CDFW and following standard U.S. Fish and Wildlife Service and CDFW guidelines, may conduct trapping for small mammals (kangaroo rats) to further ascertain likely presence or absence of listed kangaroo rats.
	In the event that special-status kangaroo rat species are present, DWR will avoid the species and its habitat to the maximum extent possible, and if the species cannot be avoided and trapping finds the species is listed as endangered, obtain a California Endangered Species Act Incidental Take Permits (ITP) from CDFW, a Biological Opinion (BO) with an Incidental Take Statement from the U.S. Fish and Wildlife Service for present species. All conditions of the ITP and BO would be implemented by DWR in coordination with CDFW and U.S. Fish and Wildlife Service and strictly adhered to minimize the effects to the species.
Biological Resources	If proposed project activity is scheduled to occur during the nesting season (March 1-September 15), focused surveys for raptors will be conducted by a qualified biologist before commencement of activities to identify active nests at and in the vicinity of the proposed project site. Surveys for Swainson's Hawk nests will include all areas of suitable nesting habitat within 0.25 mile of the proposed project site. Surveys for other raptors will include suitable nesting habitat within 1,000 feet of the construction area.

Resource	Protection Measure
	<p>If active nests are found during the surveys, appropriate buffers shall be established to minimize impacts and CDFW will be notified as to the location of the nests. No proposed project activity shall commence within the buffer area until a qualified biologist confirms that the nest is no longer active. The size of the buffers may be adjusted, depending on the proposed project activity and stage of the nest, if a qualified biologist determines that the activity within a reduced buffer would not impact the adults or their young.</p>
Biological Resources	<p>Prior to any ground-disturbing proposed project-related construction activity, a focused survey for burrowing owls shall be conducted by a qualified biologist in accordance with CDFW protocols to identify active burrows on and within 1,000 feet of the proposed project site. The surveys shall be conducted no more than 30 days prior to the beginning of construction.</p>
	<p>If an occupied burrow is found, a buffer shall be established – 50 to 500 meters during the nonbreeding season (October 1 through March 31) or 200 to 500 meters during the breeding season (April 1 through October 31), where distance would be determined by the level of disturbance – for all proposed project-related construction activities. The size of the buffer may be adjusted if a qualified biologist and CDFW determine proposed project-related construction activities would not be likely be impacted. No proposed project-related construction activity shall commence within the buffer area until a qualified biologist confirms that the burrow is no longer occupied, or consultations with CDFW specifically allow certain construction activities to continue.</p>
	<p>If avoidance of occupied burrows is infeasible for proposed project-related construction activities, DWR would consult with CDFW about potential on-site passive relocation techniques. No occupied burrows shall be disturbed by proposed project-related construction activities during the nesting season unless a qualified biologist verifies through noninvasive methods that the burrow is no longer occupied.</p>

THIS PAGE LEFT INTENTIONALLY BLANK

Section 3 Affected Environment and Environmental Consequences

This section identifies the potentially affected environment and the environmental consequences involved with the Proposed Action and the No Action Alternative, in addition to environmental trends and conditions that currently exist.

3.1 Resources Eliminated from Further Analysis

Reclamation analyzed the affected environment and determined that the Proposed Action did not have the potential to cause direct, indirect, or cumulative adverse effects to the resources listed in Table 5.

Table 5 Resources Eliminated from Further Analysis

Resource	Reason Eliminated
Environmental Justice	The Proposed Action would not cause dislocation, changes in employment, or increase flood, drought, or disease nor would it disproportionately impact economically disadvantaged or minority populations.
Indian Sacred Sites	The Proposed Action would not limit access to ceremonial use of Indian Sacred Sites on federal lands by Indian religious practitioners or adversely affect the physical integrity of such sacred sites.
Indian Trust Assets	The Proposed Action would not impact Indian Trust Assets as there are none within 25 miles of the Proposed Action area.

3.2 Water Resources

3.2.1 Affected Environment

Hydrology

The 201 square-mile drainage area of the Cantua Creek Stream Group is approximately 12 miles wide and 20 miles long. Elevations range from 315 feet near the San Luis Canal to over 5,100 feet at Santa Rita Peak in the Cantua Creek watershed (MFG 2004). The alluvial fan deposits have fan slopes from about 20 feet per mile near the San Luis Canal to almost 80 feet per mile near the foothills. In the upland areas, grades are steep and can exceed 60 percent (MFG 2006).

Creeks

Based on the study performed by MFG (MFG 2006), all the creeks within Cantua Creek Stream Group flow toward the San Luis Canal and their incised channels terminate at a point west of the San Luis Canal. The cumulative natural and human-induced degradation of the natural channels has created large channels that can carry significant floodwater and sediment volumes to the San Luis Canal basins and into the San Luis Canal. However, some of the creeks still do not have sufficient capacity to contain major flood events, which may result in breakouts upstream of the

San Luis Canal. The following provides a description of the flooding patterns that occur on the creeks of the Cantua Creek Stream Group.

Arroyo Hondo: The Arroyo Hondo is an incised channel that terminates about 0.5 mile downstream of Interstate 5 (I-5). As the flow continues from the creek toward the San Luis Canal, floodwater travels along a 3-mile wide overland floodplain. Floodwater generally arrives at the San Luis Canal south of Clarkson Avenue, though on occasion flow reaches the San Luis Canal further north. The MFG study assumed that Arroyo Hondo floodwater flows to the San Luis Canal south of Clarkson Avenue. Flows from a local drainage south of Arroyo Hondo also drains toward the San Luis Canal and adds to the flow in the area. Water from Arroyo Hondo is currently confined within the existing Basin 1.

Cantua Creek: Cantua Creek is a well-defined channel that has retained its natural meandering shape until about 1-mile west of the San Luis Canal. The March 1995 flood demonstrated that significant floods will break out of the Cantua Creek channel about 1-mile upstream of I-5. In the MFG analysis, the channel over I-5 was assumed to have a capacity of 2,500 cfs and larger flows would “breakout” of the channel and sheet flow into the surrounding farmlands. The breakout flows would disperse 40 acre-feet and 290 acre-feet north of Cerini Avenue for the 25 and 50-year floods, respectively. The remaining flow would be directed toward the San Luis Canal south of Cerini Avenue. Water from Cantua Creek is currently confined within the existing Basin 2, with the exception of approximately 290 Acre-feet (estimated via DWR modeling), which spills into Basin 1.

Martínez Creek: Martínez Creek flows in a defined channel until crossing Derrick Avenue just west of I-5. Beyond this point the channel loses its definition and water sheet flows for about a mile toward I-5. A guide levee along I-5 then directs Martínez Creek flows to the south toward a 7 foot by 7 foot box culvert and to the north toward two 48-inch diameter corrugated metal pipes under I-5. East of I-5, floodwater flows in a defined channel and terminates into Salt Creek about three miles upstream of the San Luis Canal.

Salt Creek: Historically, flood flows from Salt Creek were directed to two undersized culverts under I-5 that resulted in the flooding of I-5. In 2000, subsequent to the 1995 flood, Caltrans improved a bridge crossing under I-5, to direct flows towards the San Luis Canal. East of I-5, Salt Creek floodwater would travel in a channel along Parkhurst Avenue constructed by adjacent landowners. Due to cumulative degradation of the creek bed, the Salt Creek channel has been severely eroded, enlarging the channel’s cross-section to the point where, currently, it may have sufficient capacity to carry significant flows until, at approximately 0.5 miles upstream of the San Luis Canal, the eroding processes transform into a depositing process, significantly decreasing the channel capacity. Flood flows from Salt Creek are generally directed toward the San Luis Canal north of Parkhurst Avenue. However, breakouts from the main channel may also send floodwaters south towards Paige Avenue. Water from Salt and Martínez Creeks is currently confined in Basin 3.

Domengine Creek: Domengine Creek flows in a farmer-constructed channel for most of its 4 mile path from I-5 to the San Luis Canal. The channel generally follows section lines and has at least three 90 degree bends before it heads to the San Luis Canal along Paige Avenue. Though the channel is relatively small, it is assumed that it could handle significant flood flows. Any

significant breakouts would likely flow back into the channel or may occur close to the San Luis Canal. In the MFG (MFG 2006) report, it states that historically, flows from Domengine Creek brokeout along Paige Avenue and flowed to the north and south of Paige Avenue. The flow was highly variable and was generally influenced by the most local landowner channel modifications. However, more recent grading resulted in Domengine Creek's floodwaters flowing towards the San Luis Canal south of Parkhurst Avenue. Water from Domengine Creek is currently confined in Basin 4.

Flood Modeling

Basin hydrology models were developed for much of the Cantua Creek Stream Group watershed by DWR in 1987. Four separate models were developed using the US Army Corps of Engineers HEC-1 Flood Hydrograph Package (US Army Corps of Engineers 1985). The models were developed to incorporate the entire watershed to the San Luis Canal. The models divide the Cantua Creek Stream Group into flood basins and stream reaches; model parameters were used to characterize runoff, losses, and routing for each flood basin and creek/stream. Precipitation depth/duration frequency curves were developed from historical gaging to develop rainfall for different frequencies. Precipitation events are based on 96-hour storm duration. Peak flow and flow duration frequency events were based on the Cantua Creek at Cantua stream flow gage, the only gaged stream in the watershed. The HEC-1 model was used to simulate the 96-hour precipitation and flow frequency events from the gage to develop flood frequency events for the entire watershed. The design flood for this analysis is a 50-year return period flood that could result from a 96-hour storm in the watershed. Table 6 shows the estimated flood peaks and volumes resulting from the 50-year design storm/flood (MFG 2006).

Table 6 Modeled 50-year Flood Volumes in the Cantua Creek Stream Group

Basin	Creek	Volume (AF)
Basin 1	Arroyo Hondo Creek	3,020
	Cantua Creek	290 (from Basin 2)
	Total	3,310
Basin 2	Cantua Creek	4,200
		290 (To Basin 1)
	Total	3,910
Basin 3	Salt Creek	2,480
	Martinez Creek	750
	Total	3,230
Basin 4	Domengine Creek	1,840
	Total	1,840
Source: MFG 2006		

3.2.2 Environmental Consequences

No Action

Under the No Action Alternative, the existing flood control features, including the San Luis Canal levee, weirs, culverts, adjacent roads, and basins, would be inadequate to contain flood flows as they have been in the past storm events at the 50-year level storm event and greater.

This would continue to result in levee failure to the San Luis Canal, degradation of water quality in the San Luis Canal, and flooding of adjacent farmland and rural housing, as it has in the past.

Proposed Action

Under the Proposed Action, any exposed slopes and graded contours during construction could be subject to rainfall and erosion and could cause temporary discharges of sediment and other contaminants in stormwater runoff to surrounding areas, including the aforementioned local waterways.

The Proposed Action would not alter hydrology or groundwater recharge such that the groundwater table would be significantly altered. There would be no additional impervious surfaces created as part of the Proposed Action that would reduce surface area capable of percolation. A small amount of water would enter the San Luis Canal through the proposed weir during high flows (50-year flood event), though this amount would not be substantial enough to cause a net deficit in aquifer volume or lowering of the local groundwater table.

The Proposed Action would not substantially alter the existing drainage pattern of the area, which is the stormwater runoff/flood flows that run easterly into the existing flood basins along the San Luis Canal right-of-way. Modifications to these basins, construction of a weir into the San Luis Canal, and other small modifications would not result in an altered drainage pattern that would result in substantial erosion or siltation on- or off-site post-construction. Existing modeled 50-year flood patterns would be maintained in a 50-year storm event and/or be more thoroughly contained by the modified existing flood basins on-site.

The Proposed Action's modifications to the existing flood basins' storage, construction of a weir, and other modifications would enhance the capacity of the flood basins to hold sediment and silt contained in floodwaters. Excess floodwater that would exceed current capacity of floodwater basins could result in a levee embankment failure, thus resulting in the discharge of sediment-laden flows to the San Luis Canal. The Proposed Action would be a beneficial impact to the surrounding areas as it would enhance the protection to the San Luis Canal and prevent a levee embankment failure in an event of a 50-year flood.

As described above, construction of the Proposed Action could result in potential temporary discharges of sediment and other contaminants in stormwater runoff to surrounding areas, including the aforementioned local waterways.

There would be no housing constructed as part of the Proposed Action, nor would there be a change in the 100-year flood hazard area. However, improvements to the flood basins and construction of a weir along the San Luis Canal would improve existing flood conditions in the area. Therefore, the Proposed Action would not result in an impact to structures in the area. There would be a beneficial effect to surrounding agricultural land and infrastructure.

The Proposed Action would enhance flood capacity in existing flood basins, correct deficiencies in the San Luis Canal embankment/levee, and correct deficiencies in the existing flood infrastructure to mitigate the risk of failure in a 50-year flood event. No exposure to loss, injury, or death from flooding would occur from the Proposed Action. The Proposed Action is in a flat

area subject to slow moving runoff and flooding. The area is not close enough to a water feature that could be subject to a seiche, tsunami, or mudflow. With implementation of the Environmental Protection Measures mentioned above, there would be no substantial changes.

Cumulative Impacts

As described above under the Proposed Action, correction of deficiencies in the San Luis Canal embankment and other infrastructure improvements would have a net beneficial effect on the hydrology and drainage pattern/flood-related conditions of the area surrounding the Proposed Action.

3.3 Land Resources

3.3.1 Affected Environment

Land use in the surrounding affected communities ranges from agricultural lands with scattered residences along county roads, small rural communities, elementary schools, interstate and state highway corridors, and water conveyance via the San Luis Canal.

According to the 2000 Fresno County General Plan, the surrounding area is designated as an Agriculture zone within the valley floor, and as Westside Rangeland closer to the foothills (Fresno County 2013). Major land uses in and surrounding the Proposed Action area include agriculture such as row crops, orchards, cattle and sheep grazing. No urban areas are located within the immediate vicinity of the Proposed Action; however, there are several small communities nearby. Farrell Ranch, a small ranch community consisting of about 25 houses is located approximately 2 miles east of the Proposed Action footprint on West Mount Whitney Avenue. Three Rocks, a rural community with less than 60 houses, is located at the intersection of West Clarkson Avenue and Highway 33, approximately 2 miles west of the northernmost end of the Proposed Action footprint. Cantua Creek is the nearest town to the Proposed Action footprint, approximately 1.3 miles east of the Proposed Action footprint along West Clarkson Avenue.

3.3.2 Environmental Consequences

No Action

Under the No Action Alternative, land use would remain the same as it is under existing conditions. Land use may be affected temporarily if flooding occurs, as crop damage is likely to occur on row crops, however rural land uses would likely remain unchanged as extensive structural damage is not likely to occur. In the short-term, damage to the San Luis Canal levee and roads may impair their ability to provide their intended uses and construction maintenance would occur to repair any damages, which could hinder neighboring land uses temporarily.

Proposed Action

Executive Order 11988 requires that all Federal agencies take action to reduce the risk of flood loss, to restore and preserve the natural and beneficial values served by floodplains, and to minimize the impact of floods on human safety, health, and welfare.

The Farmland Protection Policy Act of 1981 (Public Law 97-98) spells out requirements to ensure that Federal programs, to the extent practical, are compatible with state, local and private

programs and policies to protect farmland. As required by section 1541(b) of the Act, 7 U.S.C. 4202(b), Federal agencies are (a) to use the criteria to identify and take into account the adverse effects of their programs on the preservation of farmland, (b) to consider alternative actions, as appropriate, that could lessen adverse effects, and (c) to ensure that their programs, to the extent practicable, are compatible with State and units of local government and private programs and policies to protect farmland.

The Proposed Action would provide a 50-year level of flood protection to the San Luis Canal and adjacent farmlands in the Cantua Creek watershed. Although some temporary construction-related traffic disturbances affecting access from one side of the San Luis Canal to the other could occur, the Proposed Action would not physically divide an established community because the Proposed Action is outside the boundaries of any city or community. No long-term operational effect would occur.

Construction within the Proposed Action footprint would involve restoring/improving storage in the existing ponding basins, improving infrastructure capacity, and acquiring easements or properties in close vicinity to existing ponding basins. Private properties within or in the vicinity of the Proposed Action footprint are on land currently designated and zoned by Fresno County as agriculture and rangeland. Easements maintaining existing or similar land use would be acquired on over 800 acres of lands in the vicinity of the Proposed Action. Neither construction nor the easement acquisition would result in the conflict with local regulations regarding land use. Thus, there would be no change in land use as a result of the Proposed Action.

Cumulative Impacts

Over time, the Proposed Action would reduce or minimize effects of small flood events up to 50-year flood events in the area immediately surrounding and nearby to the San Luis Canal in the Cantua Creek watershed. Land uses would be protected to the extent possible as maintenance and damage would be minimized. Cumulatively they are expected to provide a benefit to existing land uses.

3.4 Biological Resources

3.4.1 Affected Environment

The Proposed Action is located on the landside of the western embankment of the San Luis Canal in western Fresno County between Clarkson Avenue and Oakland Avenue, approximately 36 miles southwest of Fresno. The Proposed Action includes a 13-mile stretch of the right-of-way and approximately 100 feet to the west of the center of the San Luis Canal.

The San Luis Canal right-of-way is highly disturbed due to maintenance activities, access by trespassers, and encroachment by adjacent farmland. Vegetation along the San Luis Canal is maintained by biannual mowing and grading of the roads and levee.

The habitat within the narrow right-of-way is mostly ruderal with scattered areas containing fragments of quail bush scrub habitat. The ruderal community consists of exotic and native weedy plant species, usually without a strong grass component. The ruderal habitat present on the western San Luis Canal embankment is composed primarily of tocalote (*Centaurea*

melitensis), sunflower (*Helianthus annuus*), Russian thistle (*Salsola tragus*), telegraph weed (*Heterotheca grandiflora*), London rocket (*Sisymbrium irio*), and fiddleneck (*Amsinckia* sp.), with localized, dense thickets of quail bush (*Atriplex lentiformis*) (dead and alive), and mulefat (*Baccharis salicifolia*). Wildlife species that have been observed in this area include California ground squirrel (*Spermophilus beecheyi*), desert cottontail (*Sylvilagus audubonii*), and killdeer (*Charadrius vociferous*).

The habitat within the area known as the Parkhurst Triangle is ruderal with some attributes of quail bush scrub habitat. Within this area there is a large tree that had been used by a nesting Swainson's Hawk (*Buteo swainsoni*). Approximately two to three years ago this area was burned and the tree was damaged. Since the fire, a number of branches have fallen from the tree and nesting has not been observed. Wildlife species that utilize the thick stands of quail bush scrub are limited, consisting primarily of songbirds (*Passeriformes* sp.) and desert cottontail.

Agriculture is the dominant land use along the San Luis Canal on the west side of the San Joaquin Valley.

A list of species to be evaluated for their potential to occur in the Proposed Action area (Table 7) was compiled based on the following:

- CDFW California Natural Diversity Data Base (CNDDDB) search, which included a 1-mile radius from the Proposed Action area (CNDDDB 2014)
- U.S. Fish and Wildlife Service website (http://sacramento.USFWS.gov/es/spp_list.htm) for the Huron, Guajarral Hills, Coalinga, Alcalde Hills, Five Points, Westside, Harris Ranch, Calflax, Tres Pecos Farms, Lillis Ranch, Joaquin Rocks, Domengine Ranch, San Joaquin, Levis, and Cantua Creek 7.5 Minute USGS quadrangles (USFWS 2014)
- Results of surveys and site visits of the Proposed Action area and the San Luis Canal conducted by DWR May and June 2013
- Habitat conditions in the Proposed Action area

All raptors are protected under the California Fish and Game Code Section 3503.5 that prohibits take or destruction of raptors, including their nests and eggs and the Migratory Bird Treaty Act of 1918 (MBTA). Raptor species that have the potential to nest and forage within the Proposed Action area include: American Kestrel (*Falco sparverius*), Western Burrowing Owl (*Athene cunicularia*), Ferruginous Hawk (*Buteo regalis*), Northern Harrier (*Circus cyaneus*), Red-tailed Hawk (*Buteo jamaicensis*), Swainson's Hawk, and White-tailed Kite (*Elanus leucurus*).

From the initial data searches thirteen special-status wildlife species were identified and evaluated for their potential to occur in the Proposed Action area (Table 7). Of these thirteen species considered, five species have potential (low to high) to occur on or adjacent to the Proposed Action area.

No critical habitat is found in the Proposed Action area.

Table 7 Special-Status Wildlife with Potential to Occur on or Adjacent to the Proposed Action Area

Common and Scientific Names	Status ^a		Habitat	Potential to Occur
	Federal	State		
Mammals				
Fresno kangaroo rat <i>Dipodomys nitratoide exilis</i>	E	E	Uses alkali scrub habitat and needs protection from complete flooding of habitat.	The Proposed Action area is within the short-nosed kangaroo rat's range, which is distinct from that of the other two subspecies (one possible Fresno/Tipton population may occur at the Lemoore Naval Air Station, which is outside the Proposed Action area).
San Joaquin antelope squirrel <i>Ammospermophilus nelsoni</i>	—	T	San Joaquin Valley along slopes and ridge tops.	No suitable habitat is present in the Proposed Action area.
short-nosed kangaroo rat <i>Dipodomys nitratoide brevinasus</i>	—	SSC	Desert scrub, and open grassland areas	Low. Due to continuous disturbance, potential habitat is sparse throughout the Proposed Action area.
San Joaquin kit fox <i>Vulpes macrotis mutica</i>	E	T	Found in grassland and scrub habitats.	Low. May use the San Luis Canal as a corridor. No sightings recorded within Proposed Action area.
giant kangaroo rat <i>Dipodomys ingens</i>	E	E	Found in grassland and scrub communities.	Low. Due to continuous disturbance, potential habitat is sparse throughout the Proposed Action area.
Tipton kangaroo rat <i>Dipodomys nitratoide nitratoide</i>	E	E	Found in saltbush and arid grassland habitat.	The Proposed Action area is within the short-nosed kangaroo rat's range, which is distinct from that of the other two subspecies (one possible Fresno/Tipton population may occur at the Lemoore Naval Air Station, which is outside the Proposed Action area).
Birds				
California Condor <i>Gymnogyps californianus</i>	E	E	Uses mountain ranges rimming the southern San Joaquin Valley and feeds on carrion of deer and cattle.	Low. It is possible, but unlikely, that a condor could pass by overhead, but they would not roost or forage in the Proposed Action area.
Tricolored Blackbird <i>Agelaius tricolor</i>	—	SSC	Nests in cattail or tule marshes and forages in open fields.	No suitable nesting or foraging habitat is present in Proposed Action area.
Western Burrowing Owl <i>Athene cunicularia</i>	—	SSC	Nests and forages in grasslands, agricultural areas, deserts, and levee berms with an abundance of insects and small mammals; where ground squirrels are present.	High. Potential habitat occurs along the San Luis Canal throughout the Proposed Action area; nesting has been recorded.
Swainson's Hawk <i>Buteo swainsoni</i>	—	T	Nests in isolated trees; forages in grasslands, and alfalfa fields.	Moderate. Potential foraging habitat is present; known nest tree in the Proposed Action area burned a number of years ago and nesting has not been observed since.
Northern Harrier <i>Circus cyaneus</i>	—	SSC	Inhabit marshland, wet meadows and damp grassland areas.	Low to Moderate. Foraging habitat is present in the Proposed Action area.
Yellow-headed Blackbird <i>Xanthocephalus xanthocephalus</i>	—	SSC	Marshlands and wetlands.	No suitable nesting or foraging habitat is present in Proposed Action area.
Reptiles				

blunt-nosed leopard lizard <i>Gambelia sila</i>	E	E	Found in sparsely vegetated, alkali flats, low foothills, canyon floors, washes and arroyos.	No suitable habitat is present in Proposed Action area.
coast horned lizard <i>Phrynosoma blainvillii</i>	—	SSC	Found in sparsely vegetated, alkali flats, low foothills, canyon floors, washes and arroyos.	No suitable habitat is present in Proposed Action area.
giant garter snake <i>Thamnophis gigas</i>	T	T	Uses slow-moving streams and associated wetlands and requires emergent aquatic vegetation and adjacent uplands.	The species no longer occurs in the Proposed Action area due to historic losses of wetland habitat.
San Joaquin whipsnake <i>Masticophis flagellum ruddocki</i>	—	SSC	Occurs in open grassland and saltbush scrub habitat.	Low. Marginal habitat exists within the Parkhurst triangle area.
Amphibians				
California red-legged frog <i>Rana draytonii</i>	T	SSC	Occurs in streams and ponds in Coast Range foothill areas and foothills of the Northern Sierra Nevada Range.	No suitable habitat is present in the Proposed Action area. The creeks are intermittent and the area is too far downstream (the species has been extirpated from the valley floor).
California tiger salamander <i>Ambystoma californiense</i>	T	T	Breeds in vernal pools and other seasonal ponds and uses rodent burrows in upland areas within 1.25 miles of the ponds during the non-breeding season.	No vernal pools or other suitable areas that seasonally pond water in the Proposed Action area.
Western spadefoot <i>Scaphiopus hammondi</i>	—	SSC	Inhabits grasslands with temporary pools, but some populations are known to occur in valley-foothill woodlands.	No vernal pools or other suitable areas that seasonally pond water in the Proposed Action area.
Fish				
Delta smelt <i>Hypomesus transpacificus</i>	T	E	Occurs in the brackish waters of the Sacramento-San Joaquin Delta.	The species' range is outside of the Proposed Action area.
Invertebrates				
valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T	—	Requires elderberry shrubs with stems at least one inch in diameter at ground level	No elderberry shrubs are present in the Proposed Action area.
vernal pool fairy shrimp <i>Branchinecta lynchi</i>	T	—	Requires vernal pools or other similar seasonal wetland areas	No vernal pools or other suitable areas that seasonally pond water in the Proposed Action area.
Plants				
California jewelflower <i>Caulanthus californicus</i>	E	E	Occurs in arid grasslands.	No suitable habitat occurs in the Proposed Action area due to routine disturbance and incompatible land uses.
San Joaquin woolly-threads <i>Monolopia congdonii</i>	E	—	Occurs in arid grasslands and saltbush scrub.	No suitable habitat occurs in the Proposed Action area due to routine disturbance and incompatible land uses.
^a Legal Status Definitions: <div> <div>U.S. Fish and Wildlife Service (USFWS)</div> <div> E Endangered T Threatened </div> </div> <div> <div>Department of Fish and Wildlife (CDFW)</div> <div> E Endangered T Threatened SSC Species of Special Concern </div> </div>				

3.4.2 Environmental Consequences

No Action

Under the No Action alternative, there would be no effects to biological resources since conditions would remain the same as existing conditions.

Proposed Action

The nearest CNDDDB record of short-nosed or giant kangaroo rat is approximately 7.6 and 3.5 miles, respectively, to the west of the Proposed Action area. Although sparse within most of the Proposed Action area, potential kangaroo rat burrows could be affected during construction through direct equipment use and ground vibration. Based on the information provided above in Section 3.3.1 (*Affected Environment*), special-status kangaroo rats are unlikely to inhabit the Proposed Action area due to the ongoing disturbance of the embankment areas where the burrows occur. With the incorporation of Environmental Protection Measures listed above, there would be no effect to special-status kangaroo rats.

The nearest CNDDDB record of San Joaquin kit fox is five miles southwest of the Proposed Action area along the rangelands of the Coast Range. During construction or subsequent operation, it is unlikely that a San Joaquin kit fox would be present in the Proposed Action area due to the ongoing disturbance in the area and high traffic along the right-of-way. No potential dens have been observed along this portion of the San Luis Canal right-of-way. With the incorporation of Environmental Protection Measures listed above, potential impacts to San Joaquin kit fox and their habitat would be avoided.

The nearest CNDDDB record of a San Joaquin whipsnake is approximately 9.3 miles northwest of the Proposed Action area. The whipsnake is unlikely to be found along the project footprint because of the conversion of large areas of suitable habitat adjacent to the San Luis Canal right-of-way to row crops and orchards. The conversion eliminates the snake's food base and the mammal burrows it uses for refuge.

As stated above in Section 3.3.1 (*Affected Environment*), both the burrowing owl and the Swainson's Hawk have moderate to high potential to occur within and/or near the Proposed Action. The nests of all raptor species are protected under Section 3503.5 of the California Fish and Game Code and the MBTA. The Proposed Action would not remove any known or potential nesting trees for special-status birds and/or common raptors. However, if a nest/burrow occurs in close proximity (varies by species and individuals); noise, vibration, and presence of personnel and equipment due to construction could result in abandonment of nest(s) or burrow(s) and/or reduced parental care of chicks. Loss of an active special-status bird nest or raptor nest or individual of the species by the Proposed Action would be avoided. Implementation of the Environmental Protection Measures listed above would reduce the potential for construction-related disturbance of nesting and foraging special-status birds, including raptors.

Reclamation has determined that the Proposed Action would not affect any Federally listed or proposed species or any critical habitat. The Proposed Action would not result in any take of migratory birds, as defined under the MBTA.

Cumulative Impacts

Past impacts to biological resources include habitat loss because of canal construction and the conversion of native lands into agricultural use. A riparian area on the right-of-way that was used by Swainson's hawks was burned in the recent past, and is no longer used for nesting. Current impacts that are expected to continue include routine disturbance and pesticide use on neighboring agricultural lands and routine operations and maintenance along the San Luis Canal (which is in compliance with the ESA and MBTA but still has some impact). The measures incorporated into the Proposed Action would reduce the cumulative contribution toward impacts to biological resources.

3.4 Cultural Resources

Cultural resources is a broad term that includes prehistoric, historic, architectural, and traditional cultural properties. The National Historic Preservation Act of 1966 is the primary Federal legislation that outlines the Federal Government's responsibility to cultural resources. Section 106 of the National Historic Preservation Act requires the Federal Government to take into consideration the effects of an undertaking on cultural resources listed on or eligible for inclusion in the National Register of Historic Places (National Register). Those resources that are on or eligible for inclusion in the National Register are referred to as historic properties.

The Section 106 process is outlined in the Federal regulations at 36 CFR Part 800. These regulations describe the process that the Federal agency (Reclamation) takes to identify cultural resources and the level of effect that the proposed undertaking will have on historic properties. In summary, Reclamation must first determine if the action is the type of action that has the potential to affect historic properties. If the action is the type of action to affect historic properties, Reclamation must identify the area of potential effects, determine if historic properties are present within that area of potential effects, determine the effect that the undertaking will have on historic properties, and consult with the State Historic Preservation Office, to seek concurrence on Reclamation's findings. In addition, Reclamation is required through the Section 106 process to consult with Indian Tribes concerning the identification of sites of religious or cultural significance, and consult with individuals or groups who are entitled to be consulting parties or have requested to be consulting parties.

3.4.1 Affected Environment

The only cultural resource present in the area of potential effects is the San Luis Canal segment of the California Aqueduct. The California Aqueduct is a 444-mile-long canal designed as part of the State Water Project to deliver water from northern California to southern California. The San Luis Canal segment of the California Aqueduct extends from O'Neill Forebay near Los Banos, California, to a point west of Kettleman City, California. The California Aqueduct was evaluated in 2012 and determined eligible for the National Register of Historic Places (National Register) under Criteria A and C, with consensus reached by the State Historic Preservation Officer on July 3, 2012. As a part of the California Aqueduct, the San Luis Canal shares in its eligibility determination. No other historic properties were identified within the Area of Potential Effects during the investigative process.

3.4.2 Environmental Consequences

No Action

The No Action Alternative would have no effect on cultural resources. Reclamation would have no requirement to comply with Title 54 USC § 306108, commonly known as Section 106 of the National Historic Preservation Act, as no undertaking would be established.

Proposed Action

Reclamation's proposed approval and partially funding to DWR for construction activities to create storage in the ponding basins adjacent to the San Luis Canal segment of the California Aqueduct to protect the canal from flooding and sediment deposition would be a federal undertaking as defined in Section 301(7) of the National Historic Preservation Act (16 USC 470), as amended, and requires compliance with Section 106 of the National Historic Preservation Act.

Reclamation applied the criteria of adverse effect [36 CFR § 800.5(a)] for the proposed project and determined that the proposed activities would result in no significant alterations to the function and character-defining features of the San Luis Canal (e.g., its open trapezoidal shape, concrete lining, and ancillary infrastructure) that would make it eligible for listing under Criteria A and C. As required, Reclamation notified California the State Historic Preservation Officer of this finding of effect.

Cumulative Impacts

As there would be no effects to cultural resources or historic properties under either alternative, there would be no cumulative impacts.

3.5 Air Quality

Section 176 (C) of the Clean Air Act (42 U.S.C. 7506 (C)) requires any entity of the Federal government that engages in, supports, or in any way provides financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan required under Section 110 (a) of the Federal Clean Air Act (42 U.S.C. 7401 [a]) before the action is otherwise approved. In this context, conformity means that such federal actions must be consistent with State Implementation Plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards and achieving expeditious attainment of those standards. Each federal agency must determine that any action that is proposed by the agency and that is subject to the regulations implementing the conformity requirements would, in fact conform to the applicable State Implementation Plan before the action is taken.

On November 30, 1993, the Environmental Protection Agency (EPA) promulgated final general conformity regulations at 40 CFR 93 Subpart B for all federal activities except those covered under transportation conformity. The general conformity regulations apply to a proposed federal action in a non-attainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutant caused by the Proposed Action equal or

exceed certain *de minimis* amounts thus requiring the federal agency to make a determination of general conformity.

3.5.1 Affected Environment

The Proposed Action area lies within the San Joaquin Valley Air Basin under the jurisdiction of the San Joaquin Valley Air Pollution Control District. The pollutants of greatest concern in the San Joaquin Valley are carbon monoxide, ozone, ozone precursors such as reactive organic gases (ROG) or volatile organic compounds (VOC), inhalable particulate matter between 2.5 and 10 microns in diameter (PM₁₀) and particulate matter less than 2.5 microns in diameter (PM_{2.5}). The San Joaquin Valley Air Basin has reached Federal and State attainment status for carbon monoxide, nitrogen dioxide, and sulfur dioxide. Although Federal attainment status has been reached for PM₁₀, the State standard has not been met and both are in non-attainment for ozone and PM_{2.5} (San Joaquin Valley Air Pollution Control District 2015a). There are no established standards for nitrogen oxides (NO_x); however, they do contribute to nitrogen dioxide standards and ozone precursors (San Joaquin Valley Air Pollution Control District 2015a). For a list of current established air pollution thresholds for the San Joaquin Valley Air Basin, please see Table 8.

Table 8 Air Quality Standards of San Joaquin Valley Air Pollution Control District

Constituent	Threshold
Reactive Organic Gases (ROG)	10 tons/year
Nitrogen Oxide (NO _x)	10 tons/year
Particulate Matter - 10 microns (PM ₁₀)	15 tons/year
PM _{2.5}	15 tons/year
Carbon Monoxide (CO)	100 tons/year
Source: San Joaquin Valley Air Pollution Control District 2015b	

3.5.2 Environmental Consequences

No Action

Under the No Action Alternative, baseline conditions would remain the same. Typical emissions from agricultural equipment, rural vehicle traffic, and other emissions sources (e.g. portable generators, etc.) would remain similar. Should a failure of the San Luis Canal embankment occur, heavy equipment would likely be used to repair and restore the failed area and other affected appurtenances, which would have emissions which could affect air quality.

Proposed Action

The Proposed Action involves temporary earthmoving and minor appurtenance improvements in the San Joaquin Valley area. The air quality impacts of the Proposed Action would be primarily construction-related emissions that are temporary and short-term in nature. The air quality impacts of the Proposed Action would primarily be construction-related emissions that are temporary and short-term in nature. Construction under the Proposed Action would result in the temporary generation of ROG, NO_x, PM₁₀, and PM_{2.5} emissions.

Table 9 summarizes the predicted construction emissions for the Proposed Action within the affected air district. Emissions were estimated using CalEEMOD (Version 2011.1.1) software using the equipment in Table 3 and hours listed in Section 2.2.2 (*Construction Details*).

Table 9 Estimated Maximum Construction Emissions

Constituent	San Joaquin Valley Air Pollution Control District (assumes 1 year of construction) ^{1,2}
Reactive Organic Gases (ROG)	0.56 tons/year
Nitrogen Oxide (NO _x)	4.03 tons/year
Particulate Matter - 10 microns (PM ₁₀)	0.34 tons/year
PM2.5	0.26 tons/year
Carbon Monoxide (CO)	2.20 tons/year
¹ Estimates modeled by DWR in June 2013 using CalEEMOD (Version 2011.1.1). ² Although construction is expected to last two years, for the purposes of this analysis, the "worst case" scenario of all construction occurring in one calendar year was used for emissions estimates	

The Proposed Action would not impact the air district's plans to achieve or maintain attainment for various air quality pollutants. As such, the Proposed Action would not obstruct implementation of applicable air quality plans.

Cumulative Impacts

The Proposed Action would not contribute to an exceedance of applicable air quality standards and thresholds via emissions. The emissions would be temporary and would not substantially contribute to a cumulative impact within the San Joaquin Valley Air Basin.

3.6 Global Climate Change

3.6.1 Affected Environment

Climate change refers to significant change in measures of climate (e.g., temperature, precipitation, or wind) lasting for decades or longer. Many environmental changes can contribute to climate change [changes in sun's intensity, changes in ocean circulation, deforestation, urbanization, burning fossil fuels, etc.] (EPA 2014a).

Gases that trap heat in the atmosphere are often called greenhouse gases. Some greenhouse gases, such as carbon dioxide (CO₂), occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases (e.g., fluorinated gases) are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are: CO₂, methane (CH₄), nitrous oxide, and fluorinated gasses (EPA 2014a).

In 2006, the State of California issued the California Global Warming Solutions Act of 2006, widely known as Assembly Bill 32, which requires California Air Resources Board (CARB) to develop and enforce regulations for the reporting and verification of statewide greenhouse gases emissions. CARB is further directed to set a greenhouse gases emission limit, based on 1990 levels, to be achieved by 2020.

In addition, the EPA has issued regulatory actions under the Clean Air Act as well as other statutory authorities to address climate change issues (EPA 2014b). In 2009, the EPA issued a rule (40 CFR Part 98) for mandatory reporting of greenhouse gases by large source emitters and

suppliers that emit 25,000 metric tons or more of greenhouse gases [as CO₂ equivalents (CO_{2e}) per year] (EPA 2009). The rule is intended to collect accurate and timely emissions data to guide future policy decisions on climate change and has undergone and is still undergoing revisions (EPA 2014b).

3.5.2 Environmental Consequences

No Action

Under the No Action Alternative, greenhouse gases emission trends would be unaffected.

Proposed Action

Greenhouse gas emissions would be produced by the vehicles and equipment necessary to raise embankments and roadways, grading roads and lands with flood easements, and sediment movement. Estimated greenhouse gas emissions due to the proposed action is 597.41 metric tons per year, which is less than the greenhouse gas emissions reporting requirements for stationary facilities. There are no reporting requirements for emissions during construction.

Cumulative Impacts

Greenhouse gases emissions generated by the Proposed Action are expected to be extremely small. While any increase in greenhouse gases emissions would add to the global inventory of gases that would contribute to global climate change, the Proposed Action would result in potentially minimal to no increases in greenhouse gases emissions and a net increase in greenhouse gases emissions among the pool of greenhouse gases would not be detectable.

THIS PAGE LEFT INTENTIONALLY BLANK

Section 4 Consultation and Coordination

4.1 Public Review Period

Reclamation intends to provide the public with an opportunity to comment on the Draft Finding of No Significant Impact and Draft Environmental Assessment during a 30-day public review period.

4.2 National Historic Preservation Act (16 U.S.C. § 470 et seq.)

The National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 et seq.), requires that federal agencies give the Advisory Council on Historic Preservation an opportunity to comment on the effects of an undertaking on historic properties, properties that are eligible for inclusion in the National Register. The 36 CFR Part 800 regulations implement Section 106 of the National Historic Preservation Act.

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of federal undertakings on historic properties, properties determined eligible for inclusion in the National Register. Compliance with Section 106 follows a series of steps that are designed to identify interested parties, determine the area of potential effects, conduct cultural resource inventories, determine if historic properties are present within the area of potential effects, and assess effects on any identified historic properties.

Reclamation initiated consultation with California the State Historic Preservation Officer on December 15, 2014 with a determination of No Adverse Effects for the proposed project. California the State Historic Preservation Officer concurred with the determination in a letter dated January 22, 2015.

4.3 Executive Order 11988 – Floodplain Management

Executive Order 11988 requires that all Federal agencies take action to reduce the risk of flood loss, to restore and preserve the natural and beneficial values served by floodplains, and to minimize the impact of floods on human safety, health, and welfare. The Proposed Action is partially located within a floodplain; however, Reclamation has determined that a floodplain assessment is not necessary for the Proposed Action. The floodplain will be returned to its existing conditions when construction pursuant to the Proposed Action has been completed.

4.4 California Fish and Game Code (Sections 1600 et seq.)

Section 1602 of the California Fish and Game Code requires an entity to notify CDFW of any proposed activity that may substantially modify a river, stream, or lake. In order to ensure adherence to California Fish and Game Code 1602 and potential riparian/streambed resources, prior to construction, DWR shall apply for and if deemed necessary by CDFW, enter into a Streambed Alteration Agreement for work in jurisdictional waterways. Measures imposed by CDFW through the permitting process could include but are not limited to preconstruction surveys for special-status species, revegetation, avoidance of sensitive resources as feasible, and protection of aquatic organisms and habitat as stipulated by the CDFW as conditions of the Streambed Alteration Agreement.

Section 5 Preparers and Reviewers

Jennifer L. Lewis, Natural Resources Specialist, SCCAO

Shauna McDonald, Wildlife Biologist, SCCAO

Mark Carper, Archaeologist, MP-153

John Mercado, Project Manager, SCCAO – reviewer

J. Carl Dealy, Project Manager, SCCAO - reviewer

Michael Inthavong, Resources Management Specialist, SCCAO – reviewer

David E. Hyatt, Resources Management Division Chief, SCCAO – reviewer

THIS PAGE LEFT INTENTIONALLY BLANK

Section 6 References

California Department of Water Resources (DWR). 2013. DWR estimated the maximum construction emissions for this project using the online California Emissions Estimator Model (CalEEMod) Version 2011.1.1. California Air Pollution Control Officers Association. Accessed: <http://www.caleemod.com/>. June 2013.

California Natural Diversity Database (CNDDDB). 2014. California Natural Diversity Database, Government Version. California Department of Fish and Wildlife.

Environmental Protection Agency (EPA). 2009. Mandatory Reporting of Greenhouse Gases, Final Rule (40 CFR Parts 86, 87, 89 et al.) *Federal Register*. 74(209): 56260-56519.

Environmental Protection Agency (EPA). 2014a. Climate Change – Basic Information. Website: <http://www.epa.gov/climatechange/basicinfo.html>.

Environmental Protection Agency (EPA). 2014b. Climate Change – Regulatory Initiatives. Website: <http://www.epa.gov/climatechange/initiatives/index.html>.

Fresno County. 2013. *Draft Revised 2000 General Plan Policy Document*. General Plan Documents and Maps. Fresno, CA. Fresno County Public Works and Planning. Document viewed on line at: <http://www.co.fresno.ca.us/DepartmentPage.aspx?id=19705>. Accessed February 1, 2013. Last updated: January 2013.

MFG, Inc. 2004. Assessment of the Little Panoche and Cantua Creek Watersheds. Arcata and Reedley, CA. pp 1-65. CALFED Contract No. 4600001642. MFG Project No. 240004. Prepared by MFG, Inc. consulting scientists and engineers. Prepared for Westside Resource Conservation District.

MFG, Inc. 2006. An Addendum to the existing Cantua Watershed Assessment. DWR Contract No. 4600002408. Arcata, CA. pp 1-61. MFG Project No. 240038. Prepared by MFG, Inc. consulting scientists and engineers. Prepared for the Cantua/Salt Creek Watersheds Coordinated Resource Management and Planning Group & the Westside Resource Conservation District.

San Joaquin Valley Air Pollution Control District. 2015a. Ambient Air Quality Standards and Valley Attainment Status. Website: <http://www.valleyair.org/aqinfo/attainment.htm>. Accessed: July 20, 2015.

San Joaquin Valley Air Pollution Control District. 2015b. Air Quality Thresholds of Significance – Criteria Pollutants. Website: <http://www.valleyair.org/transportation/0714-gamaqi-criteria-pollutant-thresholds-of-significance.pdf>. Accessed: July 20, 2015.

US Army Corps of Engineers. 1985. HEC-1 Flood Hydrograph Package, Computer Implementation Guide. The Hydrologic Engineering Center, Davis, California. July.

U.S. Fish and Wildlife Service (USFWS). 2011 Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance. Sacramento Fish and Wildlife Office, US Fish and Wildlife Service, January, 2011.

U.S. Fish and Wildlife Service (USFWS). 2014. Federal Species List (document No. 141201062026). Website: http://www.fws.gov/sacramento/ES_Species/Lists/es_species_lists-form.cfm.

Appendix A

Cultural Resources Determination

CULTURAL RESOURCE COMPLIANCE
Mid-Pacific Region
Division of Environmental Affairs
Cultural Resources Branch

MP-153 Tracking Number: 13-SCAO-065

Project Name: Cantua Creek Stream Group Improvement Project

NEPA Document: EA-13-001

MP 153 Cultural Resources Reviewer: Mark Carper 

NEPA Contact: Michael Ithavong

Determination: No Advrse Effect to Historic Properties

Date: 4 February 2015

This proposed undertaking by Reclamation to approve right-of-way (ROW) access to, and partially fund, the California Department of Water Resources (DWR) for construction activities to create storage in the ponding basins adjacent to the San Luis Canal segment of the California Aqueduct to protect the canal from a 50-year flood and to accommodate 50 years of sediment deposition. Reclamation's issuance of the land use authorization and use of Federal funding constitute an undertaking as defined in Section 301(7) of the NHPA (16 USC 470), as amended, and requires compliance with Section 106 of the NHPA.

The CCSG consists of five major creeks: Arroyo Hondo, Cantua, Salt, Martinez, and Domengine. Floodwaters from these creeks terminate at four existing basin locations along a 13-mile-long span of the San Luis Canal. The original flood-easement lands, obtained during canal construction, and drains in these locations were thought to be sufficient to protect the San Luis Canal from floodwaters resulting from a 50-year flood and to accommodate 50 years of sediment deposition. However, large flood events occurring in 1969, 1983, and 1995 have shown that this is not the case. Through a feasibility-level hydrologic analysis completed in April 2011, DWR determined that additional flood easements and modifications to San Luis Canal embankments, roads, and pump pads are needed to protect the integrity of the canal in this area from future flood events. To address the issue, DWR proposes to increase storage in the ponding basins through flood easement acquisition and by raising portions of the canal embankment and associated canal components.

CULTURAL RESOURCE COMPLIANCE
Mid-Pacific Region
Division of Environmental Affairs
Cultural Resources Branch

In an effort to identify historic properties within the APE, DWR contracted ESA to conduct a record search at the Southern San Joaquin Information Center, pedestrian survey of the APE, and a geoarchaeological survey which included limited hand-auger testing of the APE. Architectural surveys consisted of identifying the built environment within the APE, and archaeological surveys were conducted in areas where ground disturbance may result from project activities. Due to anticipated limited effects in proposed flood easement areas of the project consisting of potential periodic inundation of plow-zone soils, ESA's indirect APE was field surveyed at only a reconnaissance level, primarily to identify any potential built environment historic properties

The only previously documented cultural resource within the APE is the San Luis Canal segment of the California Aqueduct. The California Aqueduct is a 444-mile-long canal designed as part of the State Water Project to deliver water from northern California to southern California. The San Luis Canal segment of the California Aqueduct extends from O'Neill Forebay near Los Banos, California, to a point west of Kettleman City, California. The California Aqueduct was evaluated in 2012 and determined eligible for the National Register of Historic Places (National Register) under Criteria A and C, with consensus reached by the State Historic Preservation Officer on July 3, 2012. As a part of the California Aqueduct, the San Luis Canal shares in its eligibility determination. No other historic properties were identified within the APE during the investigative process.

Reclamation applied the criteria of adverse effect [36 CFR § 800.5(a)] for the proposed project and determined that the proposed activities would result in no significant alterations to the function and character-defining features of the San Luis Canal (e.g., its open trapezoidal shape, concrete lining, and ancillary infrastructure) that would make it eligible for listing under Criteria A and C.

Pursuant to 36 CFR § 800.3(f)(2), Reclamation identified the California Valley Miwok Tribe, the Ione Band of Miwok Indians, and the Santa Rosa Rancheria as Indian tribes likely to have knowledge of historic properties or attach religious and cultural significance to historic properties within the APE. Reclamation sent letters to these tribes requesting their participation in the Section 106 process and assistance in identifying sites of religious and cultural significance pursuant to 36 CFR § 800.4(a)(4). Reclamation received no responses from the identified tribes.

CULTURAL RESOURCE COMPLIANCE
Mid-Pacific Region
Division of Environmental Affairs
Cultural Resources Branch

Reclamation initiated consultation with California the State Historic Preservation Officer (SHPO) on December 15, 2014 with a determination of No Adverse Effects for the proposed project. SHPO concurred with the determination in a letter dated January 22, 2015.

This memorandum is intended to convey the completion of the NHPA Section 106 process for this undertaking. Please retain a copy in the administrative record for this action. Should changes be made to this project, additional NHPA Section 106 review, possibly including consultation with the State Historic Preservation Officer, may be necessary. Thank you for providing the opportunity to comment.