- Policy RC-P-21: In approving urban development near existing agricultural lands, the City shall take actions so that such development will not unnecessarily constrain agricultural practices or adversely affect the viability of nearby agricultural operations.

- Policy RC-P-23: Protect designated agricultural lands, without placing an undue burden on agricultural landowners.

- Policy RC-P-24: Provide buffers at the interface of urban development and farmland in order to minimize conflicts between these uses.

- Policy RC-P-26: The City shall restrict the fragmentation of agricultural land parcels into small rural residential parcels except in areas designated for estate type development in the General Plan Land Use Diagram.

- Policy RC-P-27: The City shall discourage the cancellation of Williamson Act contracts outside the Primary Urban Service Boundary line.

In particular, NU requests that the buffers described in Policy RC-P-24 include the construction and installation of protective fencing as provided for in Chapter 8, Section 8.8.2 under the City of Manteca General Plan Resource Conservation Policy RC-I-30 (See Exhibit "8") and that the provisions specified by the City of Manteca in Policy RC-P-26 restricting the fragmentation of agricultural lands allow for the routing of any RD17 levee extension in south Manteca to take into consideration farm impacts relating to the division of farm properties into smaller parcels that may result in those properties becoming impractical to farm.

Most important, NU requests that in association with the provisions stated on page 3.2-16 of the FEIR Phase 3-RD17 Levee Seepage Repair Project relating to the disturbance or removal of agricultural infrastructure, such as wells, pipelines and drainage canals, NU requests that all infrastructure affected during the project be restored as soon as possible to guard against any damage to the crop or farm property. (See Exhibit "9")

4. Minimizing Flood Risks in the Flood Hazard Areas South of the Current RD17 Levee System:

The documents reviewed, further indicate that the proposed RD17 levee seepage repairs may involve improvements to the area in and around the Weatherbee Lake/Turtle Beach Resort area.

This area is further identified in the FEIR Phase 3-RD17 Levee Seepage Repair Project as being part of a Flood Hazard Area located adjacent to and south of RD17 levee element locations VIIe and VIIg. (See Exhibit "10")

This is significant, because historically, for levee breaks south of Manteca, flood water runoff severe enough to impact the Walthall Slough Reclamation District No. 2094 area generally returns to the San Joaquin River in the area where Walthall Slough and the San Joaquin River converge. (See Exhibit "11")

This point of convergence is further identified as being situated in and around the Weatherbee Lake/Turtle Beach Resort area which is protected in part by Reclamation District No. 2096.

In addition, it is widely understood that in past floods a relief cut has been made to the levees south of the Turtle Beach Resort to allow rising flood waters accumulating against the land side of the levee to drain back into the San Joaquin River.

Further, the 2011 San Joaquin County Office of Emergency Services Flood Contingency Map (See Exhibit "3") clearly demonstrates the extent that south Manteca was impacted by flood waters in 1997.

The map includes a contour line indicating the extent that 1997 flood waters reached with the understanding that flood water impact was limited in its extent due to a relief cut being made to the levee in the area south of the Turtle Beach Resort area.

It is important to add that the portion of levee that received the relief cut has been repaired at a considerable cost which would need to be re-performed each and every time a future flood requires a relief cut to be made to that same portion of levee.

With this in mind, NU's comment is to request that consideration be made to construct gate opening/closure structures to be put in place at the Turtle Beach relief cut levee location area as detailed on pages 4-11 and 4-13 of the San Joaquin River Basin Lower San Joaquin River Feasibility Report. (See Exhibit "12")

In this way, flood waters can be efficiently drained as necessary to prevent those land side flood waters from reaching elevations that exceed those of the San Joaquin River.

This will result in protections being put in place that can ensure that future impacts due to flooding can be limited by the best means possible.

In closing, NU thanks you for the opportunity to provide the comments presented in this letter.

Please contact me if you have any questions.

Yours truly,

NEIGHBORS UNITED

Kerry Harris

Kerry Harris/President Elect

KH/jas

Enclosures:

1) Ex. "1": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 3-35
2) Ex. "2": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 3-57
3) Ex. "3": San Joaquin County Office of Emergency Services "*SJ County Flood Contingency Map, RD 2064, 2075, 2094 & 2096, SJ River East Bank*" dated April 2011
4) Ex. "4": Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Page ES-8
5) Ex. "5": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 3-4, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 5-54 and 5-55
6) Ex. "6": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 7-6 and 7-7
7) Ex. "7": Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Pages 3.2-4 and 3.2-9
8) Ex. "8": City of Manteca "*General Plan 2023, Policy Document*" Adopted October 6, 2003; Pages 8-10 and 8-11 (Resource Conservation); Pages 8-10 and 8-11
9) Ex. "9": Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Page 3.2-16
10) Ex. "10": Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Page 2-25
11) Ex. "11": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 5-23
12) Ex. "12": US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 4-11 and 4-13

Neighbors United

% MIKE F. BABITZKE, INC. 6 SOUTH EL DORADO, SUITE 305 STOCKTON, CA 95202

Ex. "1":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 3-35

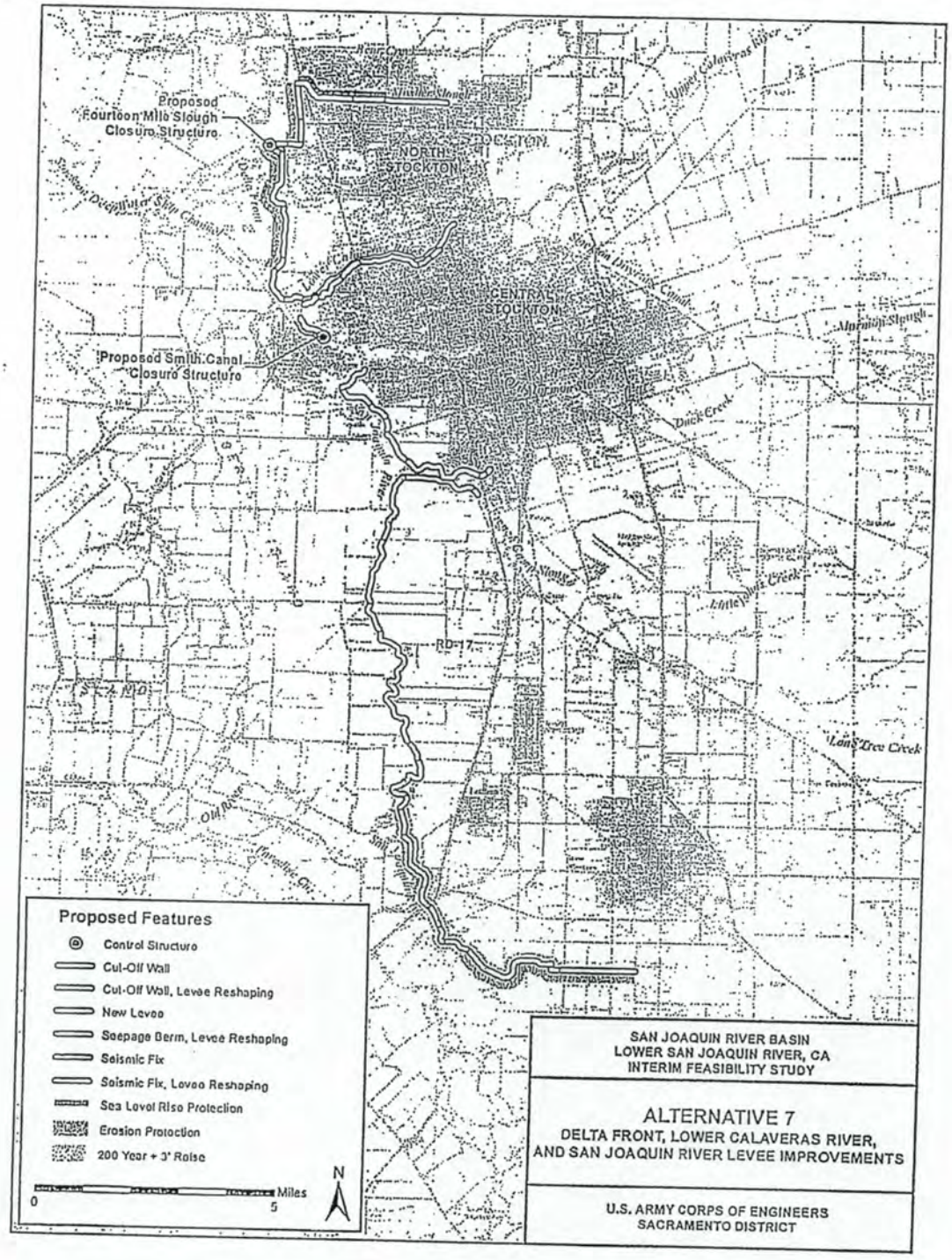


Figure 3-8. Alternative 7.

Ex. "2":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 3-57

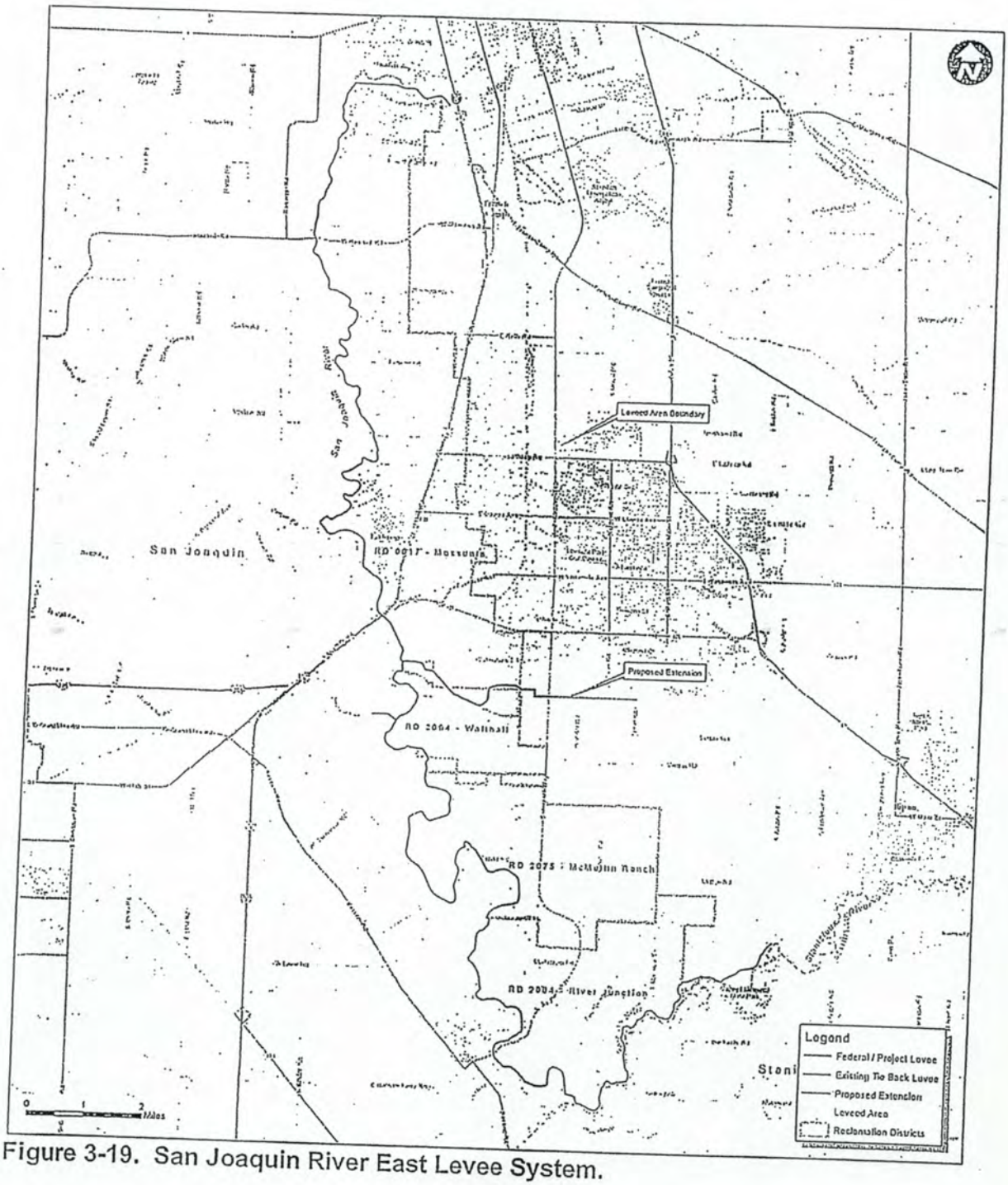
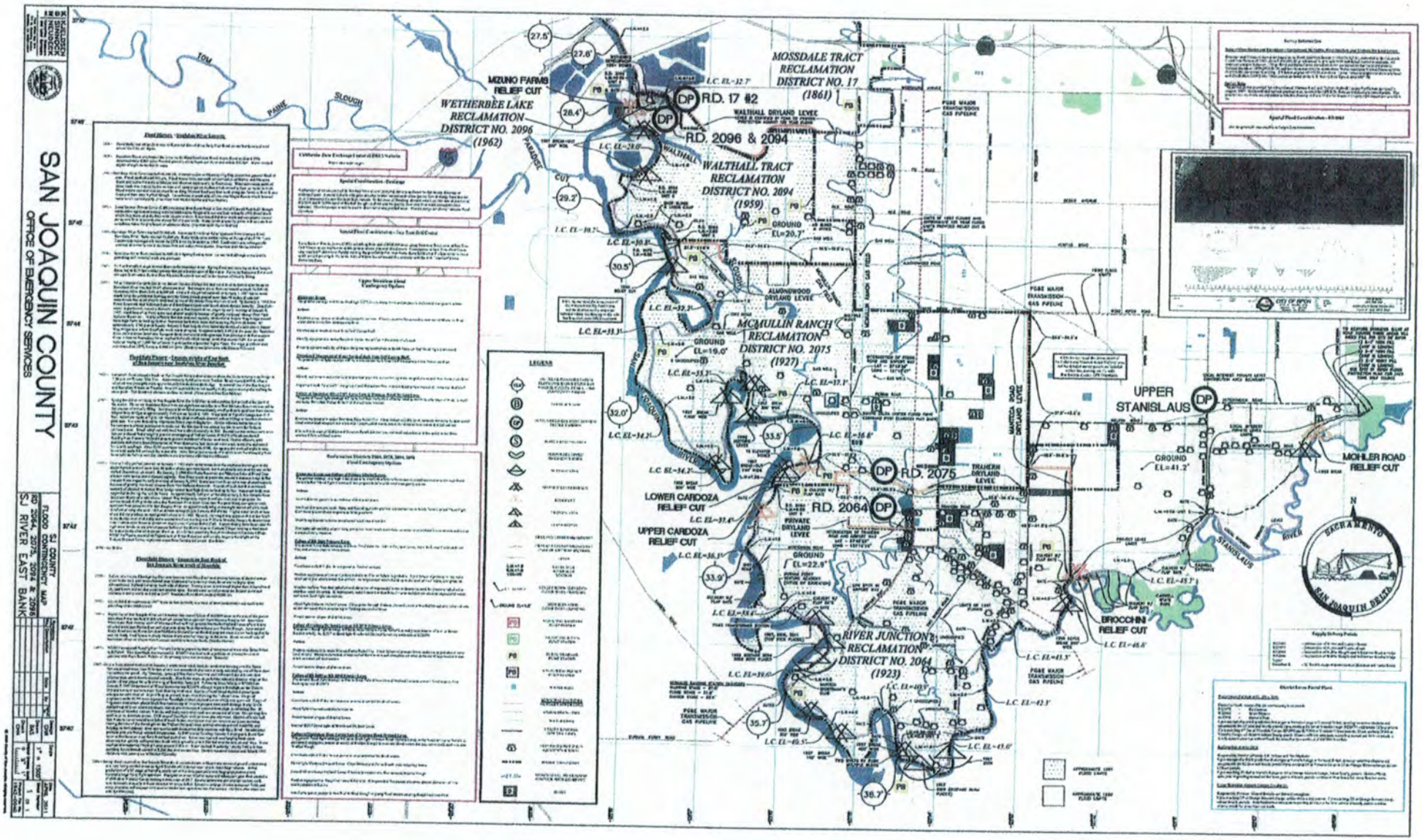


Figure 3-19. San Joaquin River East Levee System.

US Army Corps of Engineers
Sacramento District

Ex. "3":

San Joaquin County Office of Emergency Services "*SJ County Flood Contingency Map, RD 2064, 2075, 2094 & 2096, SJ River East Bank*" dated April 2011


SAN JOAQUIN COUNTY
OFFICE OF EMERGENCY SERVICES
SJ COUNTY FLOOD CONTINGENCY MAP
RD 2064, 2075, 2094 & 2096
SJ RIVER EAST BANK
TOM PAINE SLOUGH
PARADISE CUT
MIZUNO FARMS RELIEF CUT
WETHERBEE LAKE RECLAMATION DISTRICT NO. 2096 (1962)
R.D. 17 #2
R.D. 2096 & 2094
MOSSDALE TRACT RECLAMATION DISTRICT NO. 17 (1861)
WALTHALL TRACT RECLAMATION DISTRICT NO. 2094 (1959)
ALMONDWOOD DRYLAND LEVEE
McMULLIN RANCH RECLAMATION DISTRICT NO. 2075 (1927)
R.D. 2075
R.D. 2064
LOWER CARDOZA RELIEF CUT
UPPER CARDOZA RELIEF CUT
PRIVATE DRYLAND LEVEE
TRAHERN DRYLAND LEVEE
MANTECA ROAD DRYLAND LEVEE
RIVER JUNCTION RECLAMATION DISTRICT NO. 2064 (1923)
UPPER STANISLAUS
MOHLER ROAD RELIEF CUT
BROCCHINI RELIEF CUT
STANISLAUS RIVER
SACRAMENTO SAN JOAQUIN DELTA
GROUND EL=20.7'
GROUND EL=19.0'
GROUND EL=22.9'
GROUND EL=41.2'
LEGEND

Ex. "4":

Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Page ES-8

Table ES-12-1
Phase 3 Repair Project ~~EIS~~/EIR Action Alternatives

Levee		Minimum Footprint Alternative (Alternative 1)	Maximum Footprint Alternative (Alternative 2)	Preferred Alternative
Reach	Element			
I	Ia	seepage berm	seepage berm	seepage berm
	Ib	seepage berm with chimney drain	seepage berm with chimney drain	seepage berm with chimney drain
	Ie	seepage berm with chimney drain	seepage berm with chimney drain	seepage berm with chimney drain
II	**IIa**	**cutoff wall**[1]	**setback levee**	cutoff wall
	IIb	**cutoff wall**	**setback levee**	cutoff wall
III	IIIa	chimney drain in existing seepage berm	chimney drain in existing seepage berm	chimney drain in existing seepage berm
	IIIb	seepage berm with chimney drain	seepage berm with chimney drain	seepage berm with chimney drain
IV	IVa	seepage berm with chimney drain	seepage berm with chimney drain	seepage berm with chimney drain
	IVc	cutoff wall	seepage berm with chimney drain/toe drain or setback levee	*setback levee with seepage berm and cutoff wall*
V	Va	**cutoff wall**	**seepage berm with toe drain**	cutoff wall
VI	**VIa.1**	**cutoff wall**	**seepage berm with toe drain**	cutoff wall
	VIa.3	N/A	N/A	cutoff wall
	VIa.4	seepage berm with toe drain	seepage berm with toe drain	*cutoff wall*
	VIb	chimney drain in existing seepage berm	chimney drain in existing seepage berm	seepage berm with *chimney drain*/toe drain *and cutoff wall*
	VIc	seepage berm and fill	setback levee	*cutoff wall*
	VId	seepage berm and fill	setback levee	*cutoff wall*
	VIe	seepage berm and fill	setback levee	*chimney drain* and fill
VII	VIIb	seepage berm with chimney drain	seepage berm with chimney drain	*chimney drain* and fill
	VIIe	slurry cutoff wall or sheet pile cutoff wall[1]	slurry cutoff wall or sheet pile cutoff wall[1]	seepage berm with chimney drain
	VIIg	seepage berm with toe drain and fill	seepage berm with toe drain and fill	cutoff wall
VIII	VIIIa	seepage berm	seepage berm	seepage berm with *chimney drain*/toe drain
IX	IXa	seepage berm	seepage berm	*N/A*
X	Xa	seepage berm	seepage berm	*N/A*
XI	XIa	seepage berm	seepage berm	*N/A*

Notes: Bolded text indicates that the proposed method for reducing flood risk for the element is different in each of the alternatives. *Italicized text* indicates that the proposed method for reducing floodrisk for a Preferred Alternative element is different from both Alternative 1 and Alternative 2.

[1] Shallow slurry cutoff wall to be constructed with open-~~cut~~ trench method. Sheet piles to be installed using pile-driving technology.

Source: Data created by AECOM in 2011 based on information provided by Kjeldsen Sinnock Neudeck, Inc.

Ex. "5":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 3-4, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 5-54 and 5-55

Manage Land Use within Flood-prone Areas

This measure is an activity that the non-Federal sponsors would implement to meet the study objective of reducing flood risk to public health, safety and life. California SB 5 described in Section 2.2.2 is such a measure.

3.1.2 Structural Measures

Levee Raises

Raising levee height to increase the level of performance of existing levees is the focus of this measure. Increase in levee height may require additional levee footprint area to meet design requirements for minimum levee slope and top width. Levee raises would be accomplished by adding material to achieve the desired height. Height increases would be accomplished while maintaining design top width and side slopes, and may require additional landside easement(s) to allow for the increase in levee footprint and necessary access easements.

Cut-off Walls

This measure would be implemented to address through- and under-seepage issues that affect levee performance and safety. Installation of the cut-off wall is accomplished by degrading the levee to one-half height and creating the wall with a soil-bentonite mix. Once the mix has cured, the levee is restored to design height and side slopes to meet current design standards. The depth of the cut-off walls will typically be from 20 to 80 feet, depending on subsurface conditions, which will be determined more precisely during the PED phase through additional borings and corresponding depth required to stop through and under-seepage.

Deep Soil Mixing (Seismic)

This measure would be implemented to provide seismic stability to the Delta Front levees where required. The measure addresses seismic risk in the Delta Front levees due to the makeup of the foundational geomorphology. The Delta area soils are typically unconsolidated alluvial deposits. The deep soil mixing (seismic) measure would involve installation of a grid of drilled soil-cement mixed columns aligned longitudinally with, and transverse to the levee extending beyond the levee prism. This measure acts to minimize lateral deformation of the levee during seismic events.

Setback Levees

Where in-place improvements of levees may not be effective, and adequate footprint area exists, this measure could be implemented to improve the hydraulic capacity and overall effectiveness of the levee system. This measure would allow for ecosystem restoration measures on the water side of the new levee. Setback levees would be built to a height equal to that of the existing levee system. Typical design for a

4.3.1 Cutoff Walls

Seepage cutoff walls are vertical walls of low hydraulic conductivity material constructed through the embankment and foundation to cut off potential through- and under-seepage. In order to be effective in reducing under-seepage, cutoff walls usually tie into an impervious sub-layer. Prior to construction, the construction site and staging areas would be cleared and grubbed. The levee is typically degraded by one half the levee height to provide a sufficient working surface and prevent hydraulic fracture of the levee. The cutoff walls for the project area would be a minimum of 3-feet in width; the cutoff wall would be constructed from a working surface elevation to a design depth at least 3-feet into an impermeable layer. During construction, bentonite-water slurry is used to keep the trench open and stable prior to backfilling with the permanent wall material. Soil is mixed with bentonite (SB) and then pushed into the trench, displacing the bentonite-water slurry. After a predetermined settlement period, an impervious cap is constructed above the cutoff wall and the levee is reconstructed using suitable material (Type 1 levee fill) to the correct design elevation and current USACE levee design criteria.

The conventional slurry method for SB walls is an open trench method that uses an excavator with a long-stick boom to excavate the slurry trench. The conventional method has a maximum depth of about 70 to 80 feet. Cutoff walls in North and Central Stockton would extend up to 70 feet below the working surface elevation. Some areas in RD 17 would require cutoff walls using Deep Mixing Method and would need to be up to 120 feet below the working surface elevation. The Deep Mixing Method involves blending the existing soil with cementitious material using blade or auger based mixing tools. Figure 4-1 shows a typical plan for a cutoff wall.

4.3.2 Levee Reshaping (also called "Geometric Fix")

This measure would include reshaping the existing levees to restore them to USACE levee design criteria for side slopes and crown width. For the LSJRFS area, the minimum crest width for mainline or major tributary levees is 20 feet; the minimum crest width for minor tributary levees is 12 feet. Existing levees with landside and waterside slopes as steep as 2H:1V (i.e., for every 2 feet of horizontal distance, there is a 1 foot increase in height) may be acceptable if slope performance has been good and if the slope stability analyses determined the factors of safety to be adequate. Newly constructed levees should have 3H:1V waterside and landside slopes.

For new levees constructed in the LSJRFS area, a minimum permanent landside toe clear access easement of 20 feet is required; for existing levees within the LSJRFS area, a minimum permanent landside toe clear access easement of 10 feet is required. For both new and existing levees in the LSJRFS a minimum permanent waterside toe vegetation free zone (VFZ) of 15 feet is required unless a variance is approved by USACE.

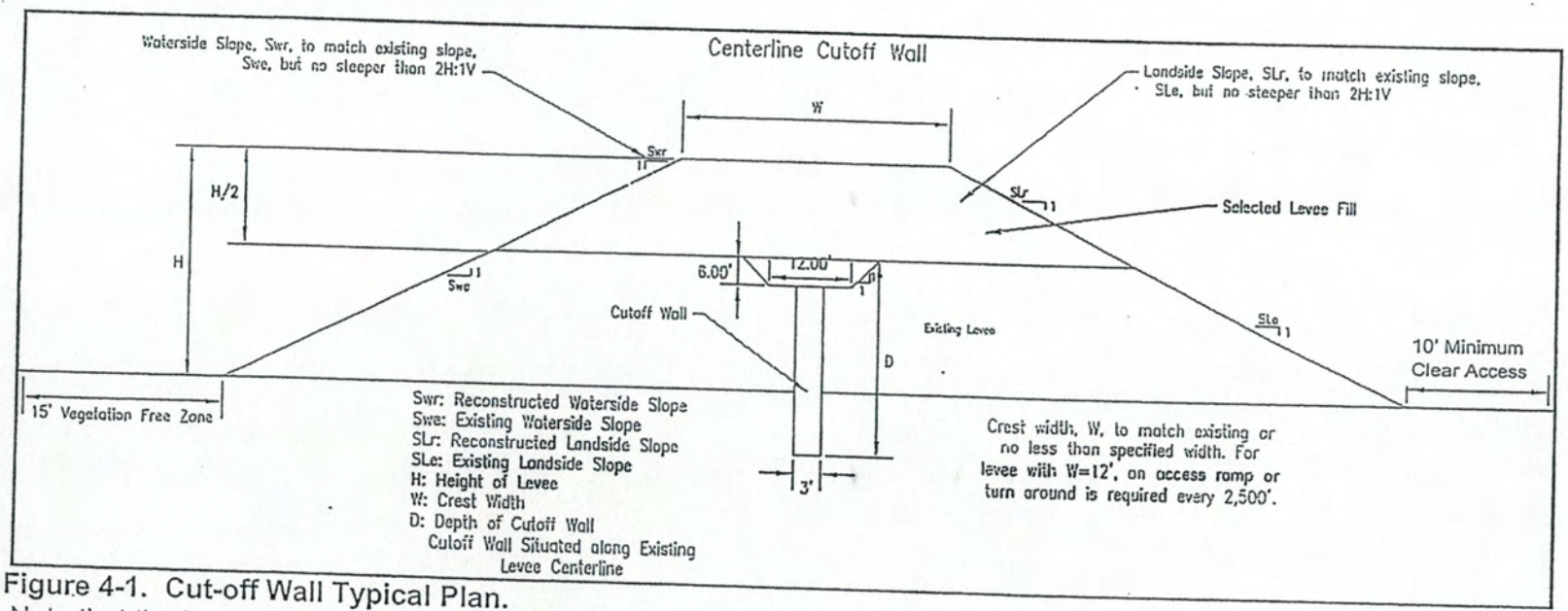


Figure 4-1. Cut-off Wall Typical Plan.

Note that the landside easement (right side) shown would be the minimum easement; landside easements would range from 10 feet to 20 feet from the levee toe.

Prior to construction, the waterside levee crest edge would be cleared and grubbed and the crown and existing landside slope would be stripped to remove at least 2 feet of material. To correct levee geometry, suitable material would be placed along the landside of existing levee slopes where needed to provide the minimum slope, required height, and crest width to meet current USACE levee design criteria, as detailed above. After construction, slopes would be hydroseeded for erosion control.

The additional area added to the landside toe by widening varies from 1 to 30 feet, depending on the existing width of the levee. The slope reshaping typical plan is shown on Figure 4-2. Slope reshaping and levee height fixes may require relocation of landside toe drains and ditches. These toe drains and ditches would be reestablished landward of the improved levee toe and would continue to function as they did before the levee improvements were constructed.

4.3.3 Levee Raise (Levee Height Fix)

This measure describes the construction action that would be taken to repair the levee height in locations where the crown has slumped and to raise the existing levee height to reasonably maximize net benefits. Where SLR was a design consideration, the height could increase up to 5 feet. An increase in levee height may require additional levee footprint area to meet design requirements for minimum levee slope and crown width. Prior to construction, the waterside levee crest edge would be cleared and grubbed and the crown and existing landside slope would be stripped to remove at least 2 feet of material. To construct a levee raise, suitable material would be placed along the crown and landside of existing levee slopes, where needed, to provide the minimum slopes, required height, and crest width that meet current USACE levee design criteria. The typical plan for a levee raise is shown in Figure 4-2.

4.3.4 Seepage Berm

Seepage berms are proposed to address levee stability, under- and through-seepage which are affecting levee performance and safety. A seepage berm is typically built adjacent to the landside of the levee and consists of layers of sand, gravel, and soil. The purpose of the berm is to control seepage flows and reduce the risk of the levee being undermined during a high-water event. The seepage berm acts as a cap, controlling the seepage flow below the berm surface and allowing the flow to reach an exit location in such a way that the undermining of levee soils is reduced or eliminated, thereby preventing boils and piping.

The seepage berm width could range from 100 to 200 feet from the landside toe of the existing levee with a maximum width of 300 feet. The seepage berms would be approximately 5 feet thick at the toe of the existing levee and would gradually slope downward to about 3 feet thick at the landside edge, with a 3:1 slope to ground level.

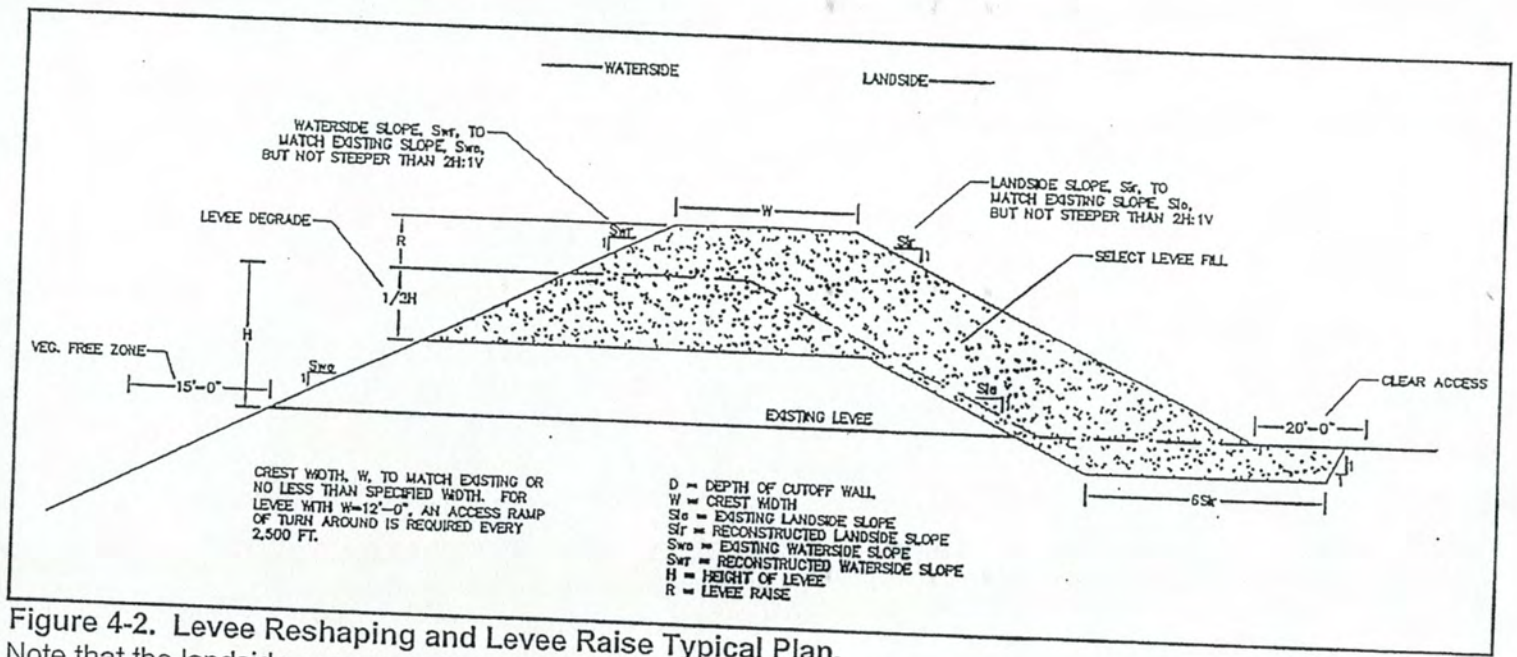


Figure 4-2. Levee Reshaping and Levee Raise Typical Plan.

Note that the landside easement (right side) shown would be the maximum clear access easement; landside easements would range from 10 feet to 20 feet from the levee toe. Half levee degradation is generally not proposed unless a cutoff wall would be installed. Instead, an internal drain may be constructed between the existing levee materials and the new fill.

Prior to construction the landside construction area would be cleared and grubbed for the new berm, right of way, and temporary easement. A layer of sand would then be placed on the natural ground surface to help eliminate the movement of fine-grained materials from underneath the levee. Gravel would then be placed on top of the sand to create a drainage layer. The drainage layer would allow the water to flow in a controlled manner and exit the face of the seepage berm to reduce the water pressure on the landside of the levee. A soil layer would then be placed on top of the gravel to further reduce the risk that seepage flows would pipe or create boils. Filter fabric would be placed between the soil and gravel layer to avoid migration of the soil into the gravel, which could clog the gravel and reduce its ability to carry seepage flows. A typical plan for a seepage berm is shown on Figure 4-3.

4.3.5 New Levee

This measure would involve constructing new levees to reduce the flood risk to some areas or to prevent waters from outflanking (i.e., flowing around the ends of the levees and entering the area intended to be protected) the existing levee system during high water events. To construct the new levees, the construction footprint area would be cleared and grubbed and a new levee foundation would be excavated. A levee inspection trench would be excavated across the entire proposed centerline of the new levee. The depth of the inspection trench would vary depending upon levee height, as required by USACE guidance and the State's Urban Levee Design Criteria (ULDC). For the purposes of the impact analysis, a depth of 3 to 6 feet is assumed.

Construction of the new levee section would proceed in accordance with USACE levee design criteria, with suitable material placed in 6- to 8-inch lifts, moistened, and compacted to design specification until the design elevation has been reached. If needed, a cut-off wall would be constructed prior to the levee construction. Once the wall was complete, the levee prism would then be constructed of impermeable fill (Type 1 levee fill material). For new levees that require erosion protection, quarry stone riprap would next be applied to armor the newly completed levee's waterside slope and provide protection against erosion. Fill material for levee construction would be obtained from local construction borrow areas and commercial sources, and would be delivered to the levee construction sites using haul trucks. A gravel road would be constructed on the crown of the new levees. Following construction, the levee slopes would be reseeded with natural grasses to prevent erosion. A typical plan for a new levee with a cutoff wall is shown on Figure 4-4.

4.3.6 Erosion Protection

This measure would consist of protection of the landside levee slopes should landward areas flood and subject the levee to wind and wave run-up of flood waters. For the purpose of this study, riprap was used to describe erosion protection features and the associated impacts. In PED, other erosion protection methodologies besides riprap may be explored.

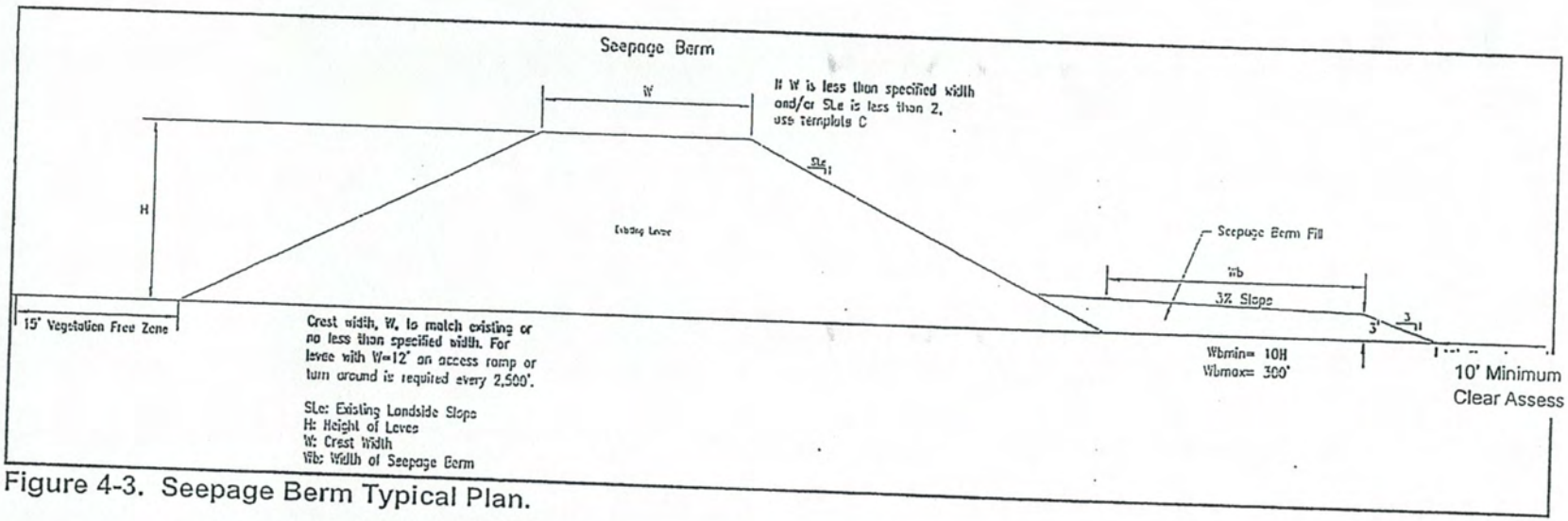


Figure 4-3. Seepage Berm Typical Plan.

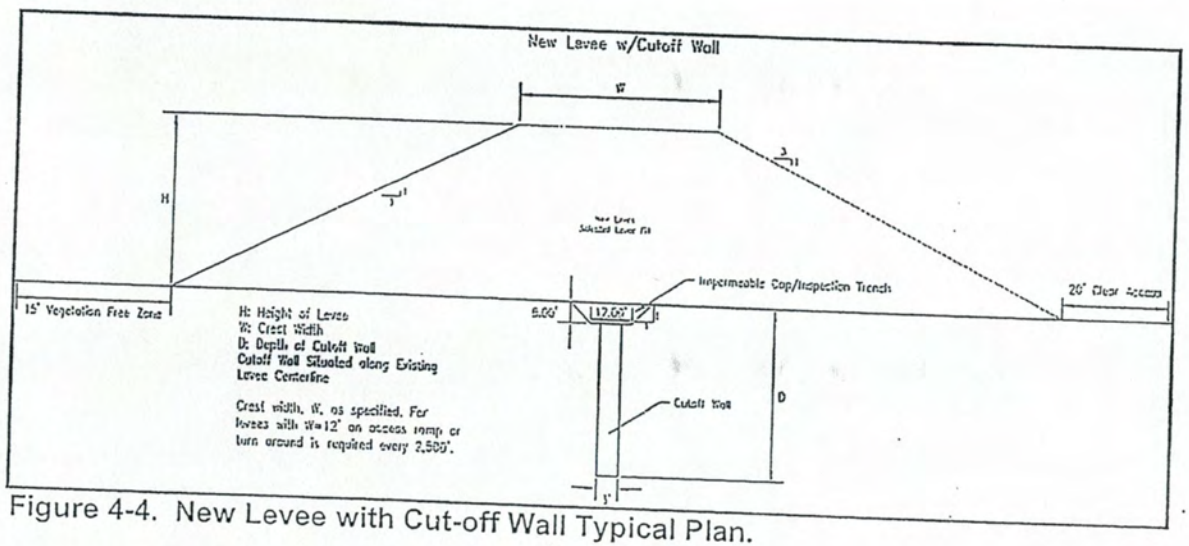


Figure 4-4. New Levee with Cut-off Wall Typical Plan.

preexisting nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted), or

- substantially affect the quality of the groundwater supply.

5.6.3 Alternative 1 - No Action

Development within Stockton and surrounding areas could reduce recharge rates as the area of impervious surfaces increases and a larger volume of surface flows are collected by surface drains. If current groundwater management practices continue, levels will continue to decline, storage will continue to be reduced, and portions of the aquifer could become unusable due to the advancing inflow of higher salinity water from the west. In addition, potential groundwater contamination resulting from a flood event could limit the availability of groundwater.

The maximum sustainable yield from the aquifer is 0.75 to 1 acre-foot per acre per year. For the Delta Water Supply Project (DWSP), the City of Stockton selected a target extraction rate of 0.6 acre-feet per acre per year to reverse the historic overdraft and saline intrusion (City of Stockton 2007a, 2008a). The DWSP includes a storage and recovery program to address the City's long-term groundwater needs. In addition, the Eastern San Joaquin Groundwater Basin Management Plan also includes groundwater banking and recharge projects, although specific implementation measures have not been outlined. Although current groundwater supply is not sufficient for the anticipated growth, groundwater impacts would be reduced to **less-than-significant** through implementation of target extraction rates, banking projects, and recharge projects. Further, compliance with local, Federal, and state requirements would be implemented to reduce potential degradation of groundwater quality. Therefore, the No Action Alternative would have a **less-than-significant** impact on groundwater availability.

5.6.4 Alternative 7a

Under Alternative 7a, cutoff walls would be installed along about 20 miles of levees around North and Central Stockton. This alternative would reduce the risk of flooding to areas behind the levee. The areas receiving increased protection from improved levees are urban and are mostly built out. Therefore, the current pattern of groundwater recharge and extraction would be expected to continue.

Use of cutoff walls introduces the potential for groundwater contamination during construction. Primary construction-related contaminants that could reach groundwater include sediment, oil and grease, and hazardous materials. The slurry wall material is relatively benign and would not remain in a liquid state long enough to allow for significant lateral movement within the aquifer. Nevertheless, the release of contaminants into the groundwater would be a **significant** impact.

In addition, cutoff walls could restrict the movement of groundwater towards and away from adjacent rivers, streams and canals. This could change localized near-

surface groundwater levels in areas immediately adjacent to the cutoff wall. Shallow wells adjacent to the cutoff wall could be affected by the changes in radial flow, either increasing yields or increasing pumping costs. If yields decrease, a corresponding decrease in water quality could occur as the aquifer lowers and pumps take in more sediment. Cutoff walls may provide a potential benefit to the extent that they disrupt the eastward movement of saline waters.

Although some shallow wells near the slurry wall could be affected, recharge and overall flow to supply wells would not be appreciably affected. The proposed cutoff walls would reach depths of up to 70 feet. Since the upper water-bearing zone, the Victor Formation, extends from the ground surface to a maximum depth of approximately 150 feet and is hydraulically connected to the underlying Laguna Formation, the cutoff wall would not isolate any portion of the shallow water-bearing zone. The cutoff wall should not affect the utility of existing or future water supply wells.

The potential effects of cutoff walls on groundwater and subsurface water flows have become the subject of study only in recent years. In the Central Valley, two detailed technical studies of potential effects of cutoff walls on groundwater were completed in the Sacramento Basin. These studies were for the Natomas Levee Improvement Project and the Feather River West Levee Project/Sutter Basin Pilot Feasibility Study (SAFCA 2007, USACE and SBFCA 2013). Both of these studies found that the groundwater elevation would change by 3 feet or less. No similar studies have been conducted in the San Joaquin Basin. In the absence of any other data, this impact analysis assumes that the potential impact of cutoff walls on groundwater in the project area would be similar to what was identified for the two studies in the Sacramento River Basin and changes to groundwater elevations would be a fraction existing groundwater elevations of 10 to 50 feet or more below ground surface in the project area (San Joaquin County 2007). Further, the implementation of the project would not change land use such that the rate of groundwater recharge would decrease or effect well yields. Therefore, Alternative 7a would have a **less-than-significant** impact on groundwater supplies.

5.6.5 Alternative 7b

Alternative 7b proposes the same repairs as Alternative 7a for North and Central Stockton, but would also include a new levee section on Duck Creek, levee improvements on the northern, western, and southern levees in RD 17, and a section of new levee in the southern part of RD 17. Cutoff walls would be constructed on about 34 miles of levee around North and Central Stockton and RD 17. Potential impacts are the same as those described for Alternative 7a. Like north and central Stockton, the future growth anticipated by the proposed General Plan for RD 17 would not substantially deplete groundwater supplies if the proposed target extraction rate of 0.6 acre-feet per acre per year is met (City of Stockton 2007a, 2008a).

Ex. "6":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 7-6 and 7-7

Socioeconomics and Environmental Justice Compliance are also discussed in Chapter 5, Section 5.13. Once all public comments have been received and addressed, as appropriate, the project will be in full compliance with EO 12898.

7.1.8 Executive Order 13112: Invasive Species

Executive Order 13112, signed February 3, 1999, directs all Federal agencies to prevent and control the introduction of invasive species in a cost-effective and environmentally sound manner. The order established the National Invasive Species Council, which is composed of Federal agencies and departments, and the supporting Invasive Species Advisory Committee, which is composed of state, local, and private entities. The council's national invasive species management plan recommends objectives and measures to implement Executive Order 13112 and to prevent the introduction and spread of invasive species (National Invasive Species Council 2008). Executive Order 13112 requires consideration of invasive species in NEPA analyses, including their identification and distribution, their potential effects, and measures to prevent or eradicate them.

7.1.9 Farmland Protection Policy Act (7 U.S.C. 4201, et seq.)

The Farmland Protection Policy Act was authorized to minimize the unnecessary and irreversible conversion of farmland to nonagricultural use due to Federal projects. This Act protects Prime and Unique farmland, and land of statewide or local importance. The Farmland Protection Policy Act protects forestland, pastureland, cropland, or other land that is not water or urban developed land. The Farmland Protection Policy Act requires a Federal agency to consider the effects of its action and programs on the Nation's farmlands. This Act is administered by the NRCS. The NRCS is authorized to review Federal projects and if farmland is being affected determine a farmland conversion impact rating for the farmland affected by the Federal project. USACE is required to provide the NRCS with project maps and descriptions to assist in determining impacts to Prime and Unique farmlands.

In California, NRCS uses a land evaluation and site assessment system (LESA) to establish a farmland conversion impact rating score on proposed sites of Federally-funded and assisted projects. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level. Farmlands are scored on a scale of 260 points, and under the FPPA, farmlands receiving a total score of less than 160 points need not be given further consideration for protection and no alternative sites need to be evaluated (FPPA Rule 401.24, Section 658.4). Coordination with NRCS is on-going. The LESA evaluation will be completed and included in the final report. Preliminary review indicates that the permanent impacts on Prime Farmlands resulting from construction of the TSP would be considered less than significant since construction would primarily occur within the footprint of existing flood risk management infrastructure. New areas affected would mainly be within lands already converted to urban uses. Once the

Farmland Impact Rating is received from NRCS the project will be in full compliance with this Act.

7.1.10 Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661, et seq.)

The Fish and Wildlife Coordination Act (FWCA) of 1958 requires that all Federal agencies consult with USFWS, NMFS, and the affected state wildlife agency for activities that affect, control, or modify surface waters, including wetlands and other waters. Under the FWCA, USFWS and NMFS and the applicable state fish and wildlife agency (CDFW) have an extended responsibility for project review that encompasses concerns about plant and wildlife species that may not be addressed under NEPA and the Federal ESA. This extended responsibility may include a project's secondary effects on jurisdictional waters, including wetlands. USFWS and NMFS review CWA Section 404 permit applications, as well as other Federal actions perceived to modify waters, and prepare a coordination act report to document the coordination between the Federal agency and the appropriate state regulatory agencies (Cylinder et al. 2004). The USFWS and CDFW have participated in evaluating the proposed project, and a draft CAR is provided in Appendix A-2. USACE will be in full compliance with this act once USFWS has issued the final CAR and USACE given full consideration to the USFWS' recommendations and included the final CAR with the study report to Congress for project authorization.

7.1.11 Magnuson-Stevens Fishery Conservation and Management Act (16. U.S.C. 1801, et seq.)

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) establishes a management system for national marine and estuarine fishery resources. Essential Fish Habitat (EFH) is defined as "waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The legislation states that migratory routes to and from anadromous fish spawning grounds should also be considered EFH. The phrase "adversely affect" refers to the creation of any effects that reduce the quality or quantity of EFH. Federal activities that occur outside an EFH but that may, nonetheless, have an effect on EFH waters and substrate must also be considered in the consultation process. Under the Magnuson-Stevens Act, effects on habitat managed under the Pacific Salmon Fishery Management Plan must also be considered.

This law requires all Federal agencies to consult with NMFS regarding all actions or proposed actions permitted, funded, or undertaken that may adversely affect EFH. In consulting, the action agency must provide NMFS with a written assessment of the effects of their action on EFH. If NMFS determines that a proposed Federal or State activity would adversely affect EFH, then NMFS is obligated to provide EFH conservation recommendations to the action agency. The Federal action agency that receives the conservation recommendations must provide a detailed response in writing to NMFS within 30 days after receiving EFH conservation recommendations. The

Ex. "7":

Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Pages 3.2-4 and 3.2-9

51293[e][1]) because the ~~proposed project~~ Phase 3 Repair Project would consists of work to reduce potential flood damage. The preliminary notice to ~~the California Department of Conservation~~DOC, provided before lands actually ~~are~~ is ~~actually~~ acquired, would demonstrate the Phase 3 Repair Project area purpose ~~of the project~~ and the exemption from the findings.

Farmland in RD 17 that is in an agricultural preserve and ~~that is~~ currently is held in Williamson Act contracts is shown in Figure 3.2-2.

3.2.1.3 Regional and Local

San Joaquin County General Plan

The *San Joaquin County General Plan 2010* (County General Plan) contains objectives and policies that guide land use decisions in the unincorporated parts of the county (San Joaquin County 1992). The Resources Element of the County General Plan includes goals and policies addressing agricultural land uses, including the following policy relating to preserving agricultural lands and compatible uses:

- Policy 5: Agricultural areas shall be used principally for crop production, ranching, and grazing. All agricultural support activities and nonfarm uses shall be compatible with agricultural operations and shall satisfy the following criteria:

  (a) The use requires a location in an agricultural area because of unusual site area requirements, operational characteristics, resource orientation, or because it is providing a service to the surrounding agricultural area;

  (b) The operational characteristics of the use will not have a detrimental impact on the management or use of surrounding agricultural properties;

  (c) The use will be sited to minimize any disruption to the surrounding agricultural operations; and

  (d) The use will not significantly impact transportation facilities, increase air pollution, or increase fuel consumption.

City of Lathrop General Plan

The *Comprehensive General Plan for the City of Lathrop, California* divides the city of Lathrop into three subplan areas (City of Lathrop 2004:1-2). The Phase 3 Repair Project ~~A~~area is adjacent to Sub-plan Area #3, located on the east side of the San Joaquin River and west of Interstate 5, and to Sub-plan Area #1 located east of Interstate 5, adjacent to the east levee of the San Joaquin River. Lands located within the subplan areas are planned for development and policies related to agricultural land generally support maintaining agricultural uses on lands outside the subplan areas.

City of Manteca General Plan

The *City of Manteca General Plan 2023 Policy Document* (City of Manteca 2003), Resource Conservation Element, Goal RC-9, promotes the continuation of agricultural uses in the Manteca area and discourages the premature conversion of agricultural land to nonagricultural uses, while providing for the urban development needs of Manteca. Policies relevant to the proposed project include the following:

- Policy RC-P-19: The City shall support the continuation of agricultural uses on land designated for urban use, until urban development is imminent.

- Policy RC-P-20: The City shall provide an orderly and phased development pattern so that farmland is not subjected to premature development pressure.
- Policy RC-P-21: In approving urban development near existing agricultural lands, the City shall take actions so that such development will not unnecessarily constrain agricultural practices or adversely affect the viability of nearby agricultural operations.
- Policy RC-P-23: Protect designated agricultural lands, without placing an undue burden on agricultural landowners.
- Policy RC-P-24: Provide buffers at the interface of urban development and farmland in order to minimize conflicts between these uses.
- Policy RC-P-26: The City shall restrict the fragmentation of agricultural land parcels into small rural residential parcels except in areas designated for estate type development in the General Plan Land Use Diagram.
- Policy RC-P-27: The City shall discourage the cancellation of Williamson Act contracts outside the Primary Urban Service Boundary line.

3.2.2 Environmental Setting

Within the Phase 3 Repair Project ~~A~~area, agricultural land uses are located on nonurbanized lands along the east levee of the San Joaquin River and on either side of the dryland levee located east of the San Joaquin River and within the eCity of Manteca. Table 3.2-1 shows existing land uses and Important Farmland classifications for lands within the project footprint for each element.

Table 3.2-1
Existing Land Uses and Important Farmland Classifications for Phase 3 Repair Project Elements

Element	Jurisdiction	Existing Land Use	Important Farmland Classification
Ia	San Joaquin County	Agriculture	Prime/Statewide Importance
Ib		Agriculture	Prime
Ie		Agriculture/rural residence and River Mill Event Center (commercial) adjacent on downstream side	Prime
IIab		Agriculture/rural residence/human-made lake/ Haven Acres Marina at south end of element	Prime/Rural Residential/Non-agricultural or Natural Vegetation/Semi-agricultural and Rural Commercial Land
IIIa	City of Lathrop	Existing levee and seepage berm	Not applicable
IIIb		Agriculture	Prime
IVa		Agriculture/residential subdivision	Prime/Non-agricultural or Natural Vegetation
IVc		Undeveloped open space on riverside/residential subdivision on landside	Prime/Non-agricultural or Natural Vegetation
Va–Via.1		Agriculture/rural residence/farm complex/ subdivision and City of Lathrop park	Prime/Statewide Importance/Unique/ Non-agricultural or Natural Vegetation
VIa.4		Agriculture	Prime/Local Importance
VIb		Existing levee and seepage berm	Not applicable
VIcde		Union Pacific Railroad; San Joaquin County Park—Mossdale Crossing Regional Park	Urban and Built Up

Ex. "8":

City of Manteca "*General Plan 2023, Policy Document*" Adopted October 6, 2003 (Resource Conservation); Pages 8-10 and 8-11

Goal RC-9. To promote the continuation of agricultural uses in the Manteca area and to discourage the premature conversion of agricultural land to nonagricultural uses, while providing for the urban development needs of Manteca.

8.8.1 Policies: Agricultural Resources

RC-P-19. The City shall support the continuation of agricultural uses on lands designated for urban use, until urban development is imminent.

RC-P-20. The City shall provide an orderly and phased development pattern so that farmland is not subjected to premature development pressure.

RC-P-21. In approving urban development near existing agricultural lands, the City shall take actions so that such development will not unnecessarily constrain agricultural practices or adversely affect the viability of nearby agricultural operations.

RC-P-22. Nonagricultural uses in areas designated for agriculture should be redirected to urban areas.

RC-P-23. Protect designated agricultural lands, without placing an undue burden on agricultural landowners.

RC-P-24. Provide buffers at the interface of urban development and farmland; in order to minimize conflicts between these uses.

RC-P-25. The City shall ensure, in approving urban development near existing agricultural lands, that such development will not unnecessarily constrain agricultural practices or adversely affect the economic viability of nearby agricultural operations.

RC-P-26. The City shall restrict the fragmentation of agricultural land parcels into small rural residential parcels except in areas designated for estate type development in the General Plan Land Use Diagram.

RC-P-27. The City shall discourage the cancellation of Williamson Act contracts outside the Primary Urban Service Boundary line.

RC-P-28. The City shall not extend water and sewer lines to premature urban development that would adversely affect agricultural operations.

RC-P-29. The City shall encourage Manteca Unified School District and the Delta Community College District to maintain the school farm facilities and associated education programs in the City.

RC-P-30. The City of Manteca will participate in a county-wide program to mitigate the conversion of Prime Farmland and Farmlands of Statewide Importance to urban uses.

8.8.2 Implementation: Agricultural Resources

RC-I-30. Apply the following conditions of approval where urban development occurs next to farmland.

- Require notifications in urban property deeds that agricultural operations are in the vicinity, in keeping with the City's right-to-farm ordinance.
- Require adequate and secure fencing at the interface of urban and agricultural use.
- Require phasing of new residential subdivisions; so as to include an interim buffer between residential and agricultural use.

RC-I-31. Work with San Joaquin County on the following issues:

- Pesticide application and types of agricultural operations adjacent to urban uses.
- Support the continuation of County agricultural zoning in areas designated for agricultural land use in the Area Plan.

Ex. "9":

Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Page 3.2-16

~~also~~ result in permanent conversion of Important Farmland for construction of setback levees in Elements IIab, ~~and~~ Ivc, and VIcde~~IVe~~. The Important Farmland on the waterside of the setback levee would be converted to nonagricultural uses, such as habitat or open space. ~~The~~This impact on the permanent conversion of Important Farmland ~~under Alternative 2~~ would be significant.

Applicant's Preferred Alternative

Table 3.2-2 shows the acreage of Important Farmland that would be converted to nonagricultural uses under the Applicant's Preferred Alternative. Under this alternative, Important Farmland acreage would be required for construction of seepage berms, a setback levee, and an access road. As described under Alternative 1, construction of seepage berms would be considered a permanent conversion of Important Farmland to nonagricultural uses. This impact on the permanent conversion of Important Farmland would be significant.

Mitigation Measure 3.2-a: Minimize Important Farmland Conversion to the Extent Practicable and Feasible.

RD 17 shall implement the following measures ~~listed below~~ concerning Prime Farmland, Unique Farmland, and Farmland of Statewide Importance to minimize adverse effe~~imp~~acts on these lands:

a) During ~~project~~ Phase 3 Repair Project construction, utilities disturbance ~~of utilities~~ that ~~are~~ is needed for agricultural purposes (including wells, pipelines, and power lines) and agricultural drainage systems ~~shall~~ will be minimized so that agricultural operations are not substantially disrupted. If any agricultural infrastructure, such as wells, pipelines, and drainage canals, ~~must~~ need to be removed during project construction, ~~restore~~ the function of these facilities will be restored as soon as possible for lands that are to remain in agricultural production.

b) Disturbance of agricultural land and agricultural operations during Phase 3 Repair Project construction ~~shall~~ will be minimized by locating construction staging areas on sites that are fallow, that already are ~~already~~ developed or disturbed, or that are to be discontinued for use as agricultural land, and by using existing roads to the extent possible to access project construction ~~areas~~sites.

To the extent practicable and feasible, when expanding the footprint of a flood ~~damage reduction~~control facility (e.g., levee or berm) onto agricultural land, the most productive topsoil from the project construction footprint ~~shall~~ will be salvaged and redistributed to less ~~-~~productive agricultural lands near the project construction ~~area~~ site that ~~could~~ can benefit from the introduction of good ~~-~~quality soil. By agreement between the implementing agencies or landowners of affected properties and the recipient(s) of the topsoil, the recipient(s) ~~shall~~ will be required to use the topsoil for agricultural purposes. RD 17 shall implement all terms and conditions of agreements.

Responsibility: ~~Project proponent~~RD 17.

Timing: Minimize loss of Important Farmland and reuse topsoil before construction and avoid disruption to current agricultural operations during construction. Replace function of agricultural infrastructure as soon as possible after construction in ~~the~~ a particular ~~area~~ location is complete.

~~Implementing~~ Implementation of Mitigation Measure 3.2-a would reduce ~~this~~ the impact on Important Farmland associated with the three a~~A~~lternative~~s 2~~, but not to a less-than-significant level. The impact would remain **significant and unavoidable** for ~~both~~ all alternatives because of the permanent conversion of Important Farmland to nonagricultural uses.

Ex. "10":

Reclamation District No. 17 (Prepared by AECOM) "*Final Environmental Impact Report Phase 3-RD 17 Levee Seepage Repair Project*" dated March 2015 (SCH #2010042073); Page 2-25

Sources: Data provided by Kjeldsen, Sinnock & Neudeck, ENGEO, and MacKay & Somps in 2010, adapted by AECOM in 20102014

Figure 2-9c

Phase 3 Repair Project Levee Elements in Reaches VI–VII

Ex. "11":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Page 5-23

narrows to approximately 500 feet. However, there is one oxbow reach where the floodway is approximately 2,000 feet wide. Flood stages within this reach are dominated by runoff from the San Joaquin River.

Approximately 1 mile downstream of Paradise Cut on the right bank is Wetherbee Lake and the upstream tieback levee of RD 17. The Wetherbee Lake levee segment along the San Joaquin River was a feature of the San Joaquin Flood Control Project which cut off Walthall slough from the San Joaquin River to reduce damages to a resort development along the river. The RD 17 tieback levee is located downstream of Walthall Slough and extends east along the right bank of the slough to high ground. The RD 17 tieback levee is higher than the right bank levee of the San Joaquin River and diverts any floodwaters on the right overbank back into the San Joaquin River. This situation occurred in the flood of January 1997 and is shown on Plate 10. Flood stages within this channel reach are dominated by runoff from the San Joaquin River. Flood stages in the right overbank are dominated by runoff from the San Joaquin River and Stanislaus River.

Old River to French Camp Slough. Old River defines the upstream extent of this reach. Old River is a distributary from the San Joaquin River and conveys floodwaters west into the Sacramento-San Joaquin Delta. There is no hydraulic structure to manage the flow split. The flow split is defined by the hydraulic characteristics of Old River and the San Joaquin River downstream of the flow split.

Within this reach the San Joaquin River further transitions to a less sinuous plan form. The main channel varies in width from 200 to 300 feet. The floodway is contained by left and right bank levees that are approximately 10 to 15 feet tall. From Burns Cutoff to approximately 4 miles downstream, the right bank levee is approximately 3 feet taller than the left bank. The floodway width between the levees varies from 300 feet to 400 feet and widens to 1,400 feet at a few meander bends. The waterside levee face forms the channel bank along most of this reach. Flood stages within this reach are dominated by runoff from the San Joaquin River.

French Camp Slough to Burns Cutoff. French Camp Slough defines the upstream extent of this reach. French Camp Slough is a tributary to the San Joaquin River. The reach characteristics of French Camp slough are described below. The main channel varies in width from 200 to 300 feet. The floodway is contained by left and right bank levees that are approximately 10 to 15 feet tall. The floodway width between the levees varies from 300 feet to 400 feet. The waterside levee face is next to the channel bank along most of this reach. Flood stages within this reach are dominated by runoff from the San Joaquin River. However, influence of ocean tides is evident in flood stage hydrographs.

Burns Cutoff to Deep Water Ship Channel. Burns Cutoff defines the upstream extent of this reach. Burns cutoff is a secondary channel of the San Joaquin River which conveys water on the west side of Rough and Ready Island. Burns cutoff flows

Ex. "12":

US Army Corps of Engineers, Sacramento District "*San Joaquin River Basin Lower San Joaquin River, CA DRAFT Integrated Interim Feasibility Report/Environmental Impact Statement/Environmental Impact Report*" dated February 2015; Pages 4-11 and 4-13

the levee to the proposed toe shown in Figure 4-5. The proposed toe could be located along an imaginary line extending from the landward face of the proposed levee to existing grade. During the current feasibility planning the maximum extent of the reconstruction berm is shown in order to show the maximum impacts which could occur.

Deep soil mixing augers would be used to construct a continuous grouping of cells spaced equally in both the longitudinal and transverse direction to the levee alignment as shown in the plan view in Figure 4-5. The deep soil mixing is a seismic strengthening feature meant to keep the levee from liquefying during seismic activity. After construction is completed, the levee crest would then be topped with a 6-inch aggregate road, and slopes would be hydroseeded for erosion control. This degrading and reconstruction effort would occur along 3 miles of Fourteenmile Slough and Tenmile Slough.

4.3.10 Closure Structures

This measure would include construction of closure structures at the mouths of backwater sloughs at Smith Canal and Fourteenmile Slough to provide flood risk management along those sloughs. The closure structures would control back-flooding from the San Joaquin River and Delta during high water events. The gates would be operated typically between November 1st to April 30th which covers the rainy season and the period when high tides occur in this area. Specifically, the gates will be operated when the high tide is forecast to reach, or exceed +8.00 ft NAVD88 to prevent high flows from entering the canal/slough. The gate would be closed at the lowest tide prior to the forecasted high tide and remain closed until the high tide begins to recede. The gate would then be opened to allow any accumulated interior drainage behind the gate structure to flow out. This would limit the level and duration of water saturation and reduce the risk of levee damage or failure. Due to the tidal influence of the Delta, high water events could last from a few days to a few weeks, depending on river conditions. During development of the alternatives, Smith Canal and Fourteenmile Slough were identified as appropriate locations for closure structures.

The proposed closure structures would consist of a fixed sheet pile wall structure with an opening gate structure sufficiently large to allow for the safe passage of boats and other watercrafts. Fish and other aquatic organisms would also be able to pass through these gates when they are open. The opening portion of the closure structure would be an automated gate that may open upward or outward. The gate would be approximately 50-feet wide, and would be constructed of stainless steel. The gate would be attached to a concrete foundation using stainless steel anchor bolts. A small building would be built on land directly adjacent to the closure structures to store equiopment required to operate the gate. As needed, a sheet pile floodwall would be constructed adjacent to the control structures to tie the structures into the adjacent levee or high ground areas.

Construction would require dredging or draglining, construction of a temporary cofferdam, in-water excavation, and placement of some structural features in the water.

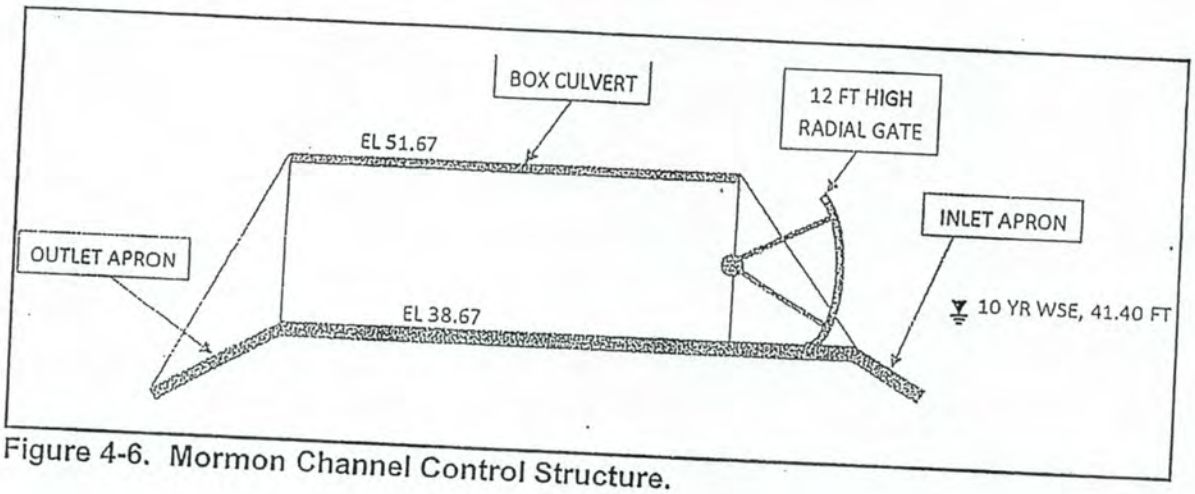


Figure 4-6. Mormon Channel Control Structure.

4.4 ALTERNATIVES

4.4.1 Alternative 1 – No Action

Under no action, the USACE would not participate in flood risk management in the study area as part of the LSJRFS. Although State or local agencies would likely repair area levees in the future to meet Federal (FEMA) or State (SB 5 200-year protection) flood protection obligations, this alternative assumes that flood risk management measures would not be implemented and that the current level of risk of flooding would continue. This risk, as represented by conditions in the study analysis area, would continue to leave both residents and property in and near the cities of Stockton, Lathrop, and Manteca vulnerable to flooding.

In response to major floods in the early 1950s, the USACE constructed several dams, miles of levees, and other features in and near the study analysis area as part of the Lower San Joaquin River and Tributaries project. Since that time, the engineering performance and potential reliability of these project levees have decreased due to identified structural deficiencies, including through- and under-seepage, slope stability, overtopping, and erosion. Under no action, these deficiencies would continue and likely become worse, increasing the risk of future levee failure during high flows.

Climate change also appears to be affecting world-wide temperatures and seasonal climate patterns. Future projections show rises in sea level and changes in inland climate patterns that could result in higher future water-surface elevations in the lower San Joaquin River and tributaries. The no action alternative would not include design features, such as raising levees, to account for potential effects of these higher elevations combined with the identified deficiencies on levee performance. An estimated 264,000 residents and $21 billion in damageable property would continue to be at risk of unexpected levee failure and flooding in the study analysis area.

JOHN MINNEY; CIVIL ENGINEER
17137 Road 37
Madera CA 93636
559-275-5937 559-645-0870

March 31, 2015

Job F14030

Ms. Tanis Toland
U.S. Army Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814-2922

SUBJECT: LOWER SAN JOAQUIN RIVER PROJECT INTERIM REPORT

Dear Ms. Toland:

As requested by an almond grower in the RD 17 area of the proposed levee project, I have reviewed relevant portions of the overall project as it relates to an existing almond orchard operation. Specifically, the almond operation is on the extreme southern end of the levee project.

I am a civil engineer, geotechnical engineer and licensed well drilling contractor in the State of California. I have previously been licensed in Oregon, Missouri and Michigan. I have been in the construction business with emphasis on soil and water for 45 years. I did a substantial amount of work on the USACE Lock & Dam 26 project just outside St. Louis in the 1970's.

The increased flood protection afforded by levee projects such as this is clearly a public benefit. However, the levees and associated construction also can adversely affect immediately adjacent property. The primary adverse effect that I am referring in the specific case of the almond orchards on the extreme south end of the levee project are changes in the groundwater table. Groundwater in that area is historically known to be shallow and the almond trees are susceptible to damage if the root zone is flooded.

Typically, the levees will impound water but can have seepage going under the levee driven by the impounded head of water. That seepage can adversely affect the structural stability of the levees so there typically is a seepage control mechanism incorporated under the levee. The seepage control mechanisms are typically some combination of cutoff walls and/or drainage trenches.

The issue of cut-off walls is discussed in numerous places in the document. Attached are portions of the document where the same comment is inserted on multiple locations. My comment is as follows:

THIS DISCUSSION SECTION APPEARS INCOMPLETE BECAUSE IT DOES NOT CONSIDER THE USE OF DRAINS AS OPPOSED TO, OR IN CONJUNCTION WITH, CUT-OFF WALLS TO ENHANCE STRUCTURAL PERFORMANCE DURING HIGH WATER IMPOUNDMENT PERIODS. THE CUT-OFF WALL WOULD TYPICALLY BE MORE COST-EFFECTIVE FROM THE STANDPOINT OF BUILDING AND MAINTAINING THE LEVEES BUT THE CROPS, PARTICULARLY ALMOND TREES, CAN BE FLOODED OUT IN THE ROOT ZONE IN ANY TIME OF HIGH GROUNDWATER BECAUSE THE NATURAL SUBSURFACE DRAINAGE IS LITERALLY CUT-OFF BY A CUT-OFF WALL. THIS ROOT ZONE FLOODING CAN HAPPEN EVEN IF NO ABOVE-GROUND FLOODING OCCURS. BY INSTALLING ONLY A CUTOFF WALL BARRIER UNDER THE PROPOSED LEVEES, THE CURRENT DESIGN EFFECTIVELY GUARANTEES THAT THERE WILL BE MORE

PROBLEMS WITH SHALLOW ROOT ZONE FLOODING AND TREE ROOT DROWNING EVEN IF NO FLOODING WOULD HAVE OCCURRED. THIS IS BECAUSE THE MINIMAL NATURAL DRAINAGE WHICH PERIODICALLY RESULTS IN TREE KILLS WILL BE SUBSTANTIALLY WORSENED BY THE CUTOFF BARRIER. A DRAIN SYSTEM IN COMBINATION WITH THE CUTOFF WALL IS ABSOLUTELY ESSENTIAL TO LONG TERM TREE GROWTH BEHIND THE LEVEES.

MY RECOMMENDATION IS TO INSTALL A SUBDRAIN SYSTEM ON THE INSIDE TOE OF THE LEVEE WHICH WOULD MAINTAIN THE GROUNDWATER LEVEL AT LEAST 5 FEET BELOW THE BOTTOM OF THE ROOT ZONE OF THE ALMOND TREES. THE SYSTEM WOULD INCLUDE A GRAVEL INTERCEPTOR TRENCH TO WITHIN NOMINALLY 3 FEET OF THE ORIGINAL GROUND SURFACE WITH THE GRAVEL ENCAPSULATED IN FILTER FABRIC AND A PERFORATED COLLECTOR PIPE IN THE BASE OF THE GRAVEL. A DEDICATED PUMP WOULD LIFT THE COLLECTED WATER FOR DISPOSAL ELSEWHERE. THE PUMP WOULD ACTIVATE AUTOMATICALLY BY FLOAT CONTROL.

THE WATER SO COLLECTED WOULD REQUIRE DISCHARGE OFF-SITE. BECAUSE THE SHALLOW GROUNDWATER SO COLLECTED IS MORE THAN LIKELY TO CONTAIN CONSTITUENT LEVELS HIGHER THAN THE LARGE FLOOD WATERS, A WAIVER TO ALLOW AUTOMATIC DISCHARGE OF THE COLLECTED GROUNDWATER WOULD NEED TO BE OBTAINED.

If you have any questions or comments in this regard, please do not hesitate to contact me.

Respectfully submitted,

John Minney, CE 32537

LOWER SAN JOAQUIN RIVER PROJECT INTERIM REPORT

SAN JOAQUIN COUNTY, CALIFORNIA

DRAFT

INTEGRATED INTERIM FEASIBILITY REPORT/ENVIRONMENTAL IMPACT STATEMENT/ENVIRONMENTNAL IMPACT REPORT

FEBRUARY 2015

JOHN MINNEY COMMENTS INSERTED IN BOLD RED TYPE

Type of Statement: Draft integrated Feasibility Report/Environmental Impact Statement/Environmental Impact Report (FR/EIS/EIR)

Lead NEPA Agency: U.S. Army Corps of Engineers, Sacramento District

Lead CEQA Agency: San Joaquin Area Flood Control Agency

Cooperating/Responsible Agency: State of California Central Valley Flood Protection Board

Abstract: The U.S. Army Corps of Engineers and its non-Federal sponsors, the San Joaquin Area Flood Control Agency (SJAFCA) and the State of California Central Valley Flood Protection Board, propose to improve flood risk management to North and Central Stockton by repairing and enhancing the levees that surround the city, and by constructing and operating closure structures on Fourteenmile Slough and Smith Canal. The draft FR/EIS/EIR describes the environmental resources in the project area; evaluates the direct, indirect, and cumulative environmental effects of the seven alternative plans; and identifies avoidance, minimization, and mitigation measures. Most potential adverse effects would be either short term, or would be avoided or reduced using best management practices. However, there are some significant and unavoidable impacts associated with this project.

Public Review and Comment: The public review period will begin on February 27, 2015 and the official closing date for receipt of comments on the draft FR/EIS/EIR will be April 13, 2015. A public workshop will be held Wednesday, April 8, 2015, at the Stockton Civic Auditorium, South Hall, 525 North Center Street, Stockton, CA from 6:00-8:00 p.m. All comments received will be considered and incorporated into the final EIS/EIR, as appropriate. Written comments or questions concerning this document should be directed to the following: U.S. Army Corps of Engineers, Sacramento District; Attn: Ms. Tanis Toland; 1325 J Street; Sacramento, California 95814-2922, or by .e-mail: Tanis.J.Toland@usace.army.mil or San Joaquin Area Flood Control Agency; Attn: Mr. Juan Neira, 22 East Weber Avenue, Suite 301, Stockton, California 95202-2317, or by email at Juan.Neira@stocktongov.com.

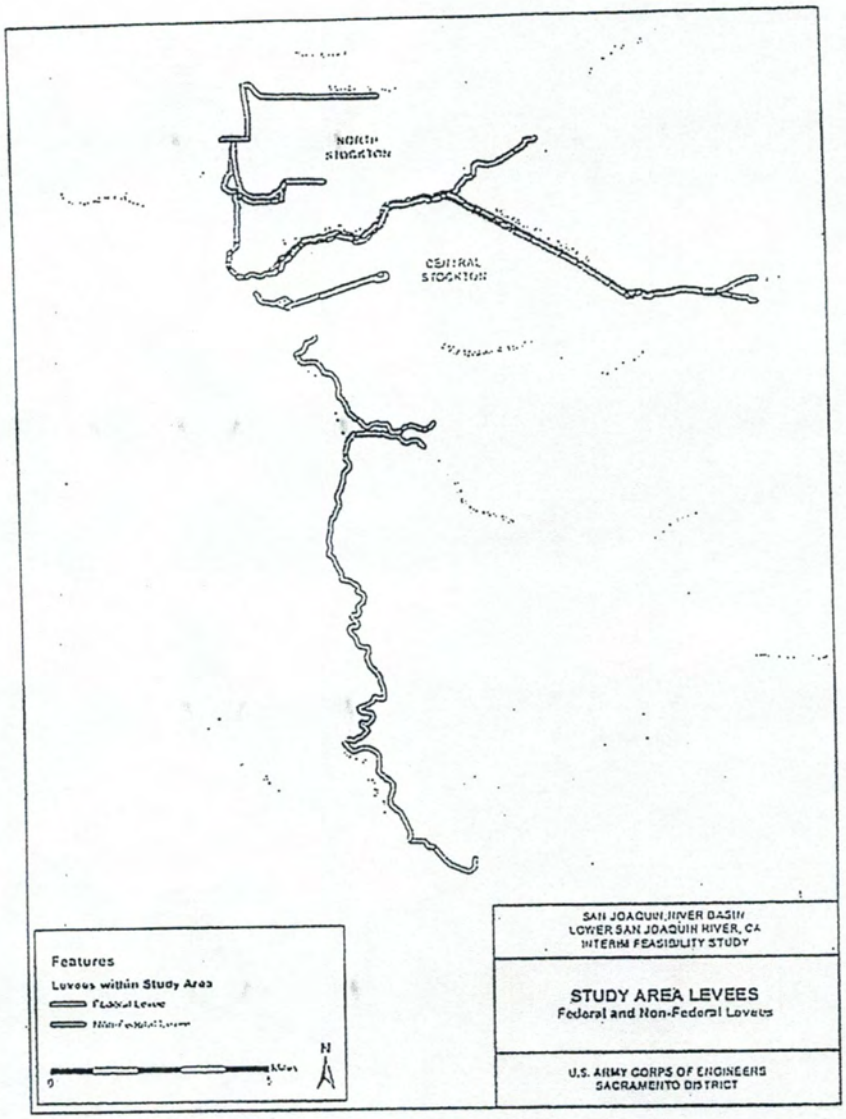


Figure 2-5: Study Area Levees.

The primary risk of flooding in the study area is geotechnical failure of the existing project levees, and not hydrologic or hydraulic factors that result in levee overtopping. Recent geotechnical analysis and evaluation of historical performance during past flood events have resulted in a greater understanding of under-seepage and a revision of levee design criteria. Geomorphologic and geotechnical studies identified subsurface features, such as former river channels, and meanders. The potential for seepage problems to occur along the existing levees in the project area is created by discontinuous layers of coarse-grained pervious soils (i.e., sands and gravels). These are found at varying depths of up to 100 feet. During high-water events, water from the river can enter the pervious soil layers and then move laterally through these layers under/through the levee. Excessive seepage can erode soil within the levee and lead to a rapid collapse and subsequent breach. Historically, foundation conditions were evaluated assuming homogeneous materials, but the floods of 1986 and 1997 and the resulting levee failures throughout the Central Valley resulted in a revision of the criteria for the evaluation of under-seepage. The risk of levee failure is not due to design deficiency or to lack of O&M of the existing levees, but to a better understanding of the mechanics of under-seepage in the Central Valley. The project levees within the study area do not meet current USACE levee design criteria and are at risk of breach failure at stages considerably less than levee crest elevations. This is evidenced by historical levee boils and heavy seepage at river stages less than design flows.

Geotechnical related issues such as under-seepage breach failures result in large volume flood flows at high velocities that are sudden and unpredictable. These failures have minimal warning time and minimal time for effective implementation of evacuation and emergency plans. Study area flood events generally occur during the winter months when colder air and water temperatures significantly increase the risk of death by exposure. The risk probability of unexpected levee failure coupled with the consequence of basin-wide flooding presents a continued threat to public safety, property, and critical infrastructure in the Lower San Joaquin River basin.

The existing levee system within the study area protects over 71,000 acres of mixed-use land with a current population estimated at 264,000 residents and an estimated $21 billion in damageable property. In addition to the residents and property, the levee system protects approximately 23 structures considered to be critical infrastructure (hospitals, police and fire stations, etc.) as well as the Interstate 5 and State Highway 99 corridors.

Ring Levees for Critical Infrastructure

This measure would protect specific critical infrastructure or facilities through placement of ring levees around those features. Ring levees would be built to a height adequate to reduce expected frequency of inundation of the structure without modifying the flood plain (See Section 3.1). Typical design for a ring levee would include a top width of 12 to 20 feet and side slopes with a ratio of 3 to 1. A cut-off wall for seepage issues may be required depending on the geotechnical analysis of the levee foundation.

Relocations/Buy-outs

This measure would remove at-risk structures and individuals from the flood plain. Structures would either be moved to sites outside the flood plain or demolished and the material recycled or disposed of as appropriate.

Comprehensive Flood Warning Emergency Evacuation Planning

Flood Warning System

This measure would allow for timely warning and evacuation of at-risk areas. This could be accomplished through media announcements and reverse 911 automated calling to residents and businesses with the area.

Implement Emergency Evacuation Plan

This measure is an activity that the non-Federal sponsors would implement to meet the study objective of reducing flood risk to public health, safety and life. Evacuation routes from areas within the flood plain would be identified and provided to the public on maps showing the routes, emergency response staging areas, and contact information for emergency service agencies.

Flood Plain Management

Restrictive Zoning/Land Use Planning

This measure would implement land use planning and zoning restrictions for areas within the flood plain to minimize risk in those areas. Implementation of this measure would include the creation and use of a Flood Plain Management Plan (FMP) for the project area in accordance with Section 402 of the Water Resources Development Act of 1986, as amended (33 USC 701b-12), when a project is implemented.

Manage Land Use within Flood-prone Areas

This measure is an activity that the non-Federal sponsors would implement to meet the study objective of reducing flood risk to public health, safety and life. California SB 5 described in Section 2.2.2 is such a measure.

3.1.2 Structural Measures

Levee Raises

Raising levee height to increase the level of performance of existing levees is the focus of this measure. Increase in levee height may require additional levee footprint area to meet design requirements for minimum levee slope and top width. Levee raises would be accomplished by adding material to achieve the desired height. Height increases would be accomplished while maintaining design top width and side slopes, and may require additional landside easement(·s) to allow for the increase in levee footprint and necessary access easements.

Cut-off Walls

This measure would be implemented to address through- and under-seepage issues that affect levee performance and safety. Installation of the cut-off wall is accomplished by degrading the levee to one-half height and creating the wall with a soil-bentonite mix. Once the mix has cured, the levee is restored to design height and side slopes to meet current design standards. The depth of the cut-off walls will typically befrom 20 to 80 feet, depending on subsurface conditions, which will be determined moreprecisely during the PED phase through additional borings and corresponding depth required to stop through and under-seepage.

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Deep Soil Mixing (Seismic)

This measure would be implemented to provide seismic stability to the Delta Front levees where required. The measure addresses seismic risk in the Delta Front levees due to the makeup of the foundational geomorphology. The Delta area soils are typically unconsolidated alluvial deposits. The deep soil mixing (seismic) measure would involve installation of a grid of drilled soil-cement mixed columns aligned longitudinally with, and transverse to the levee extending beyond the levee prism. Thismeasure acts to minimize lateral deformation of the levee during seismic events.

Setback Levees

Where in-place improvements of levees may not be effective, and adequate footprint area exists, this measure could be implemented to improve the hydraulic capacity and overall effectiveness of the levee system. This measure would allow for ecosystem restoration measures on the water side of the new levee. Setback levees would be built to a height equal to that of the existing levee system. Typical design for a setback levee would include a top width of 12 to 20 feet and side slopes with a ratio of 3 to 1. A cut-off wall for seepage issues may be required depending on the geotechnical analysis of the levee foundation. Depending on goals, the existing levee could be degraded, breached or left in place after construction of the setback levee.

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Seepage / Stability Berms

Installation of seepage/stability berms in areas where land-side footprint allows, would increase levee stability and reduce through- and under-seepage resulting in increased levee performance and safety. The berm would be installed on the land-sideof the existing levee to control seepage exit gradients that occur during an event. Typically the berms are five to 10 feet thick and vary in width extending landward from the landside levee toe from 100 to 200 feet. Actual dimensions will vary depending on the seepage gradients present.

Erosion Protection

This measure would consist of protection of the water-side banks of levees to prevent or reduce erosion due to high flows, tides, or wave action. Bank protection could be placed on existing banks or at the toe and side of the levee to above the design water surface elevation, as necessary. Protection would consist of rock sized to withstand expected flows, tidal action, and wave run-up for the reach of levee installed on which the protection is placed.

Bridge Modifications for Flow Conveyance

This measure would be used to address areas where existing bridges may be identified as a localized limit to hydraulic capacity. Bridge modifications could include raising or widening bridges to increase hydraulic capacity through the bridge crossing. Low water road crossings will be replaced by bridges as a component of this measure.

Upstream Bypass of High Flow

This measure would consist of increased diversion of high flows from the mainstem of the San Joaquin River via bypass channels such as Paradise Cut and the Mariposa bypass. New bypass areas could potentially be identified and implemented. Increasing bypass of flows could be accomplished by widening the bypasses via levee setbacks, or redesign of diversion structures to maximize efficiency at specified flows.

Channel Modifications for Conveyance Improvements

This measure would be implemented for improvements to the channels of Paradise Cut or Mormon Channel. Conveyance improvements would reduce stages on the mainstem of the San Joaquin River, the Stockton Diverting Canal and Lower Calaveras River. Channel modification would entail removal of material (vegetation and soil) from within the channel to allow for greater capacity. Existing channel width would be maintained during implementation of this measure. Removed material could potentially be used for levee improvements or would be disposed of appropriately. Currently, channel maintenance is not required under the existing Operation, Maintenance, Repair, Replacement and Rehabilitation (OMRR&R) manuals, but implementation of this measure would include updates to the OMRR&R manuals to include requirements for maintenance to maintain design capacities.

Bypass Channels

This measure involves improvements to bypass channels such as Paradise Cut and Mormon Channel. Improvements to these channels would potentially result in stage decreases on the San Joaquin River, Diverting Canal and Lower Calaveras River. Improvements to the bypass channels would include channel modifications as described above, the addition of a diversion structure at Mormon Channel and modification to the existing diversion structure at Paradise Cut. Channel modifications would include removal of vegetation and soil as required for flow efficiencies. Diversionstructure modifications would include height or width changes upstream of Paradise Cut to allow maximum flows at the desired flow elevations.

Mormon Channel Control Structure

This measure would involve construction of a control structure at the upstream end of the Diverting Canal to divert flows into Mormon Channel. The control structurewould

consist of gated culverts placed in the Stockton Diverting Canal left bank levee to allow flow into Mormon Channel. The culverts would be sized to allow control of flows up to the design capacity of the Mormon Channel.

Levee Extensions

This measure would involve extension of the southern tie-in levee on the south end of RD 17 to an appropriate elevation to reduce flood risk in the southern Manteca area. The levee extension would be combined with repairs or improvements to the existing tie-in levee to meet current standards. Levee extension may also be implemented for the right bank levee of French Camp Slough in RD 404. The levee extensions would be built to a height equal to that of the existing levee system, or to meet the height of included improvements. Typical design for an extension levee would include a top width of 12 to 20 feet and side slopes with a ratio of 3 to 1. A cut-off wall to reduce seepage may be required depending on the geotechnical analysis of the levee foundation.

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RD17-G, SJR Setback and Tieback Extension: This alternative addresses the San Joaquin River as the flooding source, and includes a setback levee to limit protection of already developed but not urbanized flood plain within RD 17. It extends the tieback levee at the southern-most end of the RD to minimize probability of flanking during extreme high water events. The alternative covers 113,500 linear feet (21.5 miles) of levee.

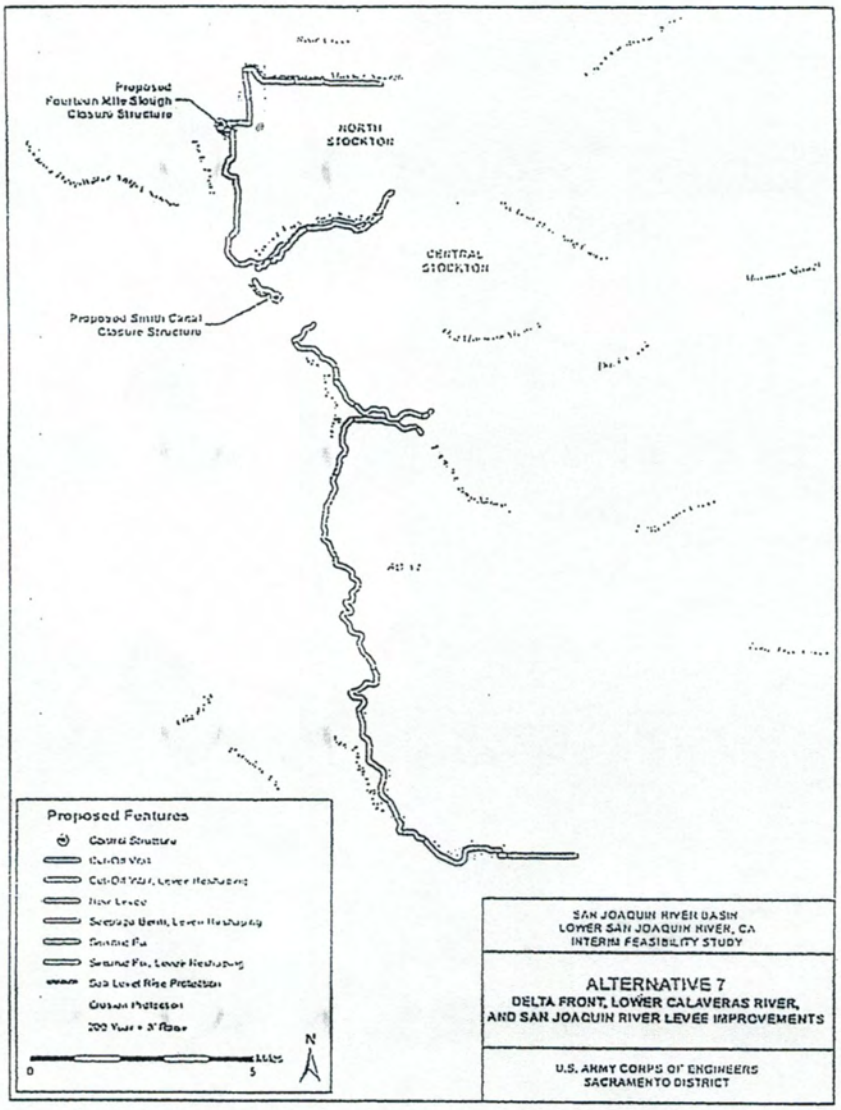

Figure 3-8. Alternative 7.

Central Stockton:

- No Action: This alternative would involve no Federal action within the base flood plain as a result of this study. No additional reductions in flood risk to the area would be realized.

- Improvement of Paradise Cut: This was screened out because the cost exceeded the benefits and because it did not address geotechnical levee failure modes.

- Flood proofing and raising existing structures and infrastructure: This was determined to not be a cost effective alternative.

- Reservoir reoperation: This alternative was screened out due to potential system-wide effects, and because it did not address geotechnical failure modes.

- Reduce geotechnical failure probability and increase height of existing levees: These measures were retained. The geotechnical issues addressed are primarily through- and under-seepage with areas on the Delta Front requiring seismic stabilization.

RD 17:

- No Action: This alternative would involve no Federal action within the base flood plain as a result of this study. No additional reductions in flood risk to the area would be realized.

- Improvement of Paradise Cut: Tl1is was screened out because the cost exceeded the benefits and because it did not address geotechnical levee failure modes.

- Flood proofing and raising existing structures and infrastructure: This was determined to not be a cost effective alternative.

- Reservoir reoperation: This alternative was screened out due to potentialsystem-wide effects, and because it did not address geotechnical failure modes.

- Ring levees: Inclusion of ring levees may be effective in some study areas, but will need to be incrementally cost effective to be a practicable alternative.

- Set-back levees: This was determined to be cost effective for one reach in RD 17 with a length of approximately 3,500 feet.

- Reduce geotechnical failure probability and increase height of existing levees: These measures were retained. The geotechnical issues addressed are primarily through- and under-seepage with areas on the Delta Front requiring

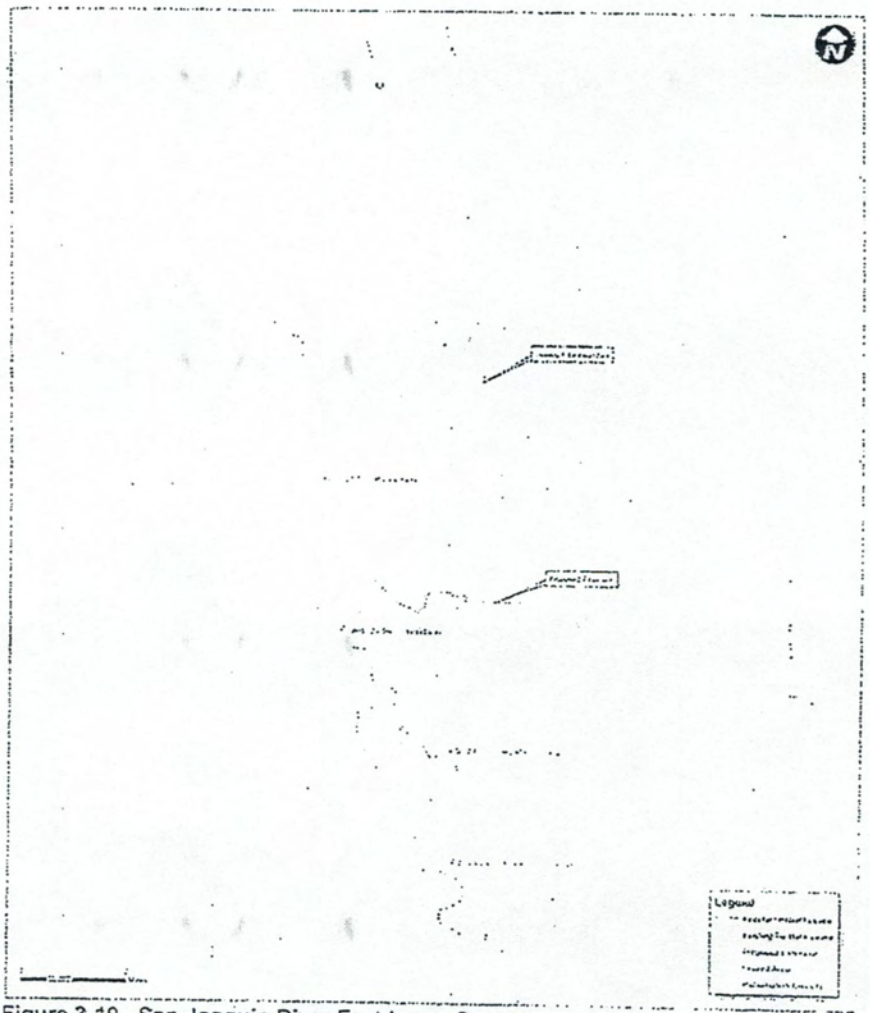

Figure 3-19. San Joaquin River East Levee System.

Figure 3-20. Existing Landuse in Study Area.

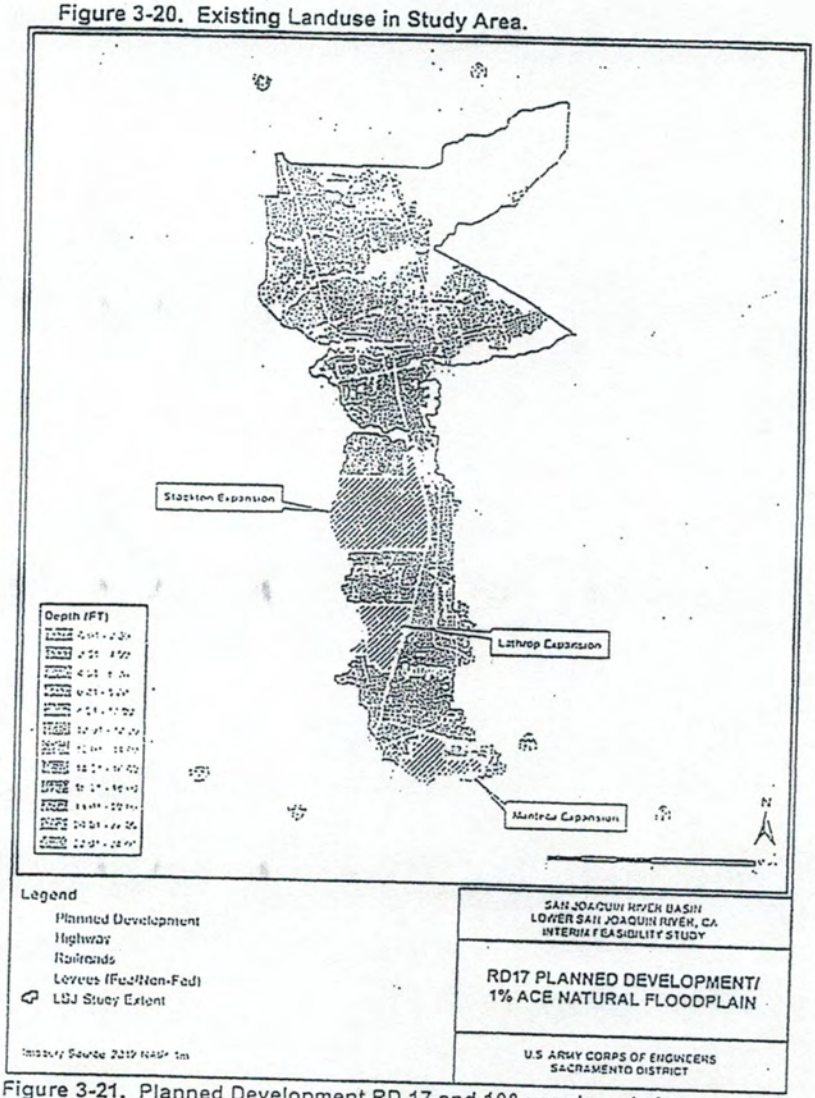

Figure 3-21. Planned Development RD 17 and 100-year Inundation Area.

alternatives for identification of the NED and TSP plans: Alternative 7a, Alternative Sa, and Alternative 9a.

It is understood that RD 17, with funding assistance from the State, is currently pursuing a phased strategy of levee improvements to initially increase the resistance of RD 17's levee system to under seepage and through seepage. Upon completion of that work, RD 17 and the non-Federal sponsors intend to pursue USACE participation in additional studies/improvements necessary to achieve the non-Federal objective of 200-year (0.5 percent ACE) flood risk management in order to meet SB 5 requirements. Consideration of future Federal participation would be subject to demonstration of a Federal interest in such incremental improvements.

3.7 Environmental Considerations and Mitigation

All appropriate environmental resources were analyzed during development of the proposed alternatives to fully comply with NEPA and CEQA. Most impacts to resources as a result of implementation of a proposed project can be mitigated, but there are challenges related to impacts to riparian habitats within the study area.

3.7.1 Regional Context

Riparian habitats are substantially reduced from their historical extents throughout the Central Valley. Only about 2-5 percent of the historic riparian habitat still exists (RHJV 2004). This is true along the San Joaquin River as well. Establishment of the FRM system, with levees set immediately adjacent to the main rivers and tributaries contributed to this decline and continues to result in conflicts between ecosystem health and sustainability and maintenance of the FRM system. Upstream of the proposed project area, considerable Federal and state investment has been made to improve the riparian corridor as part of the San Joaquin River Restoration Program and the Federal and state refuge systems.

In general, riparian communities are among the richest community types, in terms of structural and biotic diversity, of any plant community found in California. Riparian vegetation provides important ecological functions, including: wildlife hijbitat; migratory corridors for wildlife; pollution filtration and waterway shading, thereby improving water quality; provides connectivity between waterways and nearby uplands; and biomass (nutrients, insects, large woody debris, etc.) to adjacent waterways. Riparian forests and woodlands – even remnant patches – are important to resident and migratory fish, birds, and other wildlife.

3.7.2 Study Area

The riparian corridor in the study area is severely constrained by the proximity of the flood management levees to the rivers, tributaries and sloughs. Throughout most of the corridor vegetation is highly altered and fragmented. Nevertheless, this vegetation is all that remains as habitat to resident and migratory fish and wildlife in the proposed

Based on the information presented above, Alternative ?a is identified as the NED plan and is selected as the TSP.

3.10 THE TENTATIVELY SELECTED PLAN

The TSP is Alternative 7a, North and Central Stockton – Delta Front, Lower Calaveras River, and San Joaquin River Levee Improvements excluding RD 17 (Figure 3-12). This plan meets the study objectives of reducing flood risk and flood damages. With the TSP in place, the North Stockton impact area improves from an approximate 15% annual chance of flooding in the highest risk areas to less than 1% annual chance of flooding. The Central Stockton impact area improves from a 12% annual chance of flooding in the highest risk areas to an approximate 2% annual chance of flooding. Further information about specific annual exceedance probabilities and the performance of levees for a range of hydrologic events within sub-impact areas can be found in the Economic Appendix. However, this plan will result in no risk reduction for 43,000 people and critical infrastructure within RD 17.

The structural features of Alternative 7a include approximately 23 miles of levee improvements and two closure structures, one at Fourteenmile Slough and the other at Smith Canal. The levee improvements are comprised of a cutoff wall, deep soil mixing (seismic), a new levee, levee geometry improvements, and erosion protection.

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In addition to the structural features, the recommended plan also includes several non-structural features to further reduce the consequences of flooding. These include the following measures: Comprehensive Flood Warning Emergency Evacuation Planning and Flood Plain Management.

Table 3-19 below contains a first cost break-out for the TSP, Alternative 7a, North and Central Stockton – Delta Front, Lower Calaveras River, and San Joaquin River Levee Improvements excluding FD 17. These costs are preliminary and will change during additional analysis.

CHAPTER 4 - DESCRIPTION OF FINAL ALTERNATIVES*

4.1 INTRODUCTION

This chapter provides additional details related to the final array of alternatives identified in Chapter 3. NEPA requires a greater level of detail in order to properly analyze the potential effects of the proposed alternatives on the natural and human environment. Under NEPA, both the proposed project and the project alternatives are each analyzed at the same level. CEQA project alternatives are usually analyzed at a lesser degree than the proposed project, and the primary comparison is as an alternative to the proposed project. The common objective of both CEQA and NEPA is to identify the potential impacts on the human environment that would potentially arise if the preferred alternative is approved – and consider alternatives that could also address the purpose and objectives of the project.

NEPA and CEQA take a slightly different approach to considering alternatives to the proposed project however, both sets of environmental laws have the same overall objective – to inform the decision makers and the public of the environmental effects of a project and ways those effects could be mitigated through measures to avoid, minimize, rectify, reduce or compensate for adverse impacts.

This Chapter is followed by Chapter 5, which includes a discussion of the affected environment and the potential environmental effects of the proposed alternatives that are described below.

4.2 ALTERNATIVES CONSIDERED IN DETAIL

As discussed in Chapter 3, the Feasibility Study screened the alternative plans down to the following final array of alternatives (with options). The difference between the two options for the action alternatives is that option "a" excludes levee work in RD 17, while option "b" includes levee work in RD 17.

- Alternative 1, No Action
- Alternative 7a, North and Central Stockton, Delta Front, and Lower Calaveras River and San Joaquin River Levee Improvements (see Chapter 3, Figure 3-12)
- Alternative 7b, Norih and Central Stockton, Delta Front, Lower Calaveras River, San Joaquin River Levee Improvements, and RD 17 Levee Improvements (see Chapter 3, Figure 3-13)
- Alternative Sa, North and Central Stockton, Delta Front, Lower Calaveras River, San Joaquin River, and Stockton Diverting Canal Levee Improvements (see Chapter 3, Figure 3-14)

4.3.1 Cutoff Walls

Seepage cutoff walls are vertical walls of low hydraulic conductivity material constructed through the embankment and foundation to cut off potential through- and under-seepage. In order to be effective in reducing under-seepage, cutoff walls usually tie into an impervious sub-layer. Prior to construction, the construction site and staging areas would be cleared and grubbed. The levee is typically degraded by one half the levee height to provide a sufficient working surface and prevent hydraulic fracture of the levee. The cutoff walls for the project area would be a minimum of 3-feet in width; the cutoff wall would be constructed from a working surface elevation to a design depth at least 3-feet into an impermeable layer. During construction, bentonite-water slurry is used to keep the trench open and stable prior to backfilling with the permanent wall material. Soil is mixed with bentonite (SB) and then pushed into the trench, displacing the bentonite-water slurry. After a predetermined settlement period, an impervious cap is constructed above the cutoff wall and the levee is reconstructed using suitable material (Type 1 levee fill) to the correct design elevation and current USACE levee design criteria.

The conventional slurry method for SB walls is an open trench method that uses an excavator with a long-stick boom to excavate the slurry trench. The conventional method has a maximum depth of about 70 to 80 feet. Cutoff walls in North and Central Stockton would extend up to 70 feet below the working surface elevation. Some areas in RD 17 would require cutoff walls using Deep Mixing Method and would need to be up to 120 feet below the working surface elevation. The Deep Mixing Method involves blending the existing soil with cementitious material using blade or auger based mixing tools. Figure 4-1 shows a typical plan for a cutoff wall.

THIS DISCUSSION SECTION APPEARS INCOMPLETE BECAUSE IT DOES NOT CONSIDER THE USE OF DRAINS AS OPPOSED TO, OR IN CONJUNCTION WITH, CUT-OFF WALLS TO ENHANCE STRUCTURAL PERFORMANCE DURING HIGH WATER IMPOUNDMENT PERIODS. THE CUT-OFF WALL WOULD TYPICALLY BE MORE COST-EFFECTIVE FROM THE STANDPOINT OF BUILDING AND MAINTAINING THE LEVEES BUT THE CROPS, PARTICULARLY ALMOND TREES, CAN BE FLOODED OUT IN THE ROOT ZONE IN ANY TIME OF HIGH GROUNDWATER BECAUSE THE NATURAL SUBSURFACE DRAINAGE IS LITERALLY CUT-OFF BY A CUT-OFF WALL. THIS ROOT ZONE FLOODING CAN HAPPEN EVEN IF NO ABOVE-GROUND FLOODING OCCURS. BY INSTALLING ONLY A CUTOFF WALL BARRIER UNDER THE PROPOSED LEVEES, THE CURRENT DESIGN EFFECTIVELY GUARANTEES THAT THERE WILL BE MORE PROBLEMS WITH SHALLOW ROOT ZONE FLOODING AND TREE ROOT DROWNING EVEN IF NO FLOODING WOULD HAVE OCCURRED. THIS IS BECAUSE THE MINIMAL NATURAL DRAINAGE WHICH PERIODICALLY RESULTS IN TREE KILLS WILL BE SUBSTANTIALLY WORSENED BY THE CUTOFF BARRIER. A DRAIN SYSTEM IN COMBINATION WITH THE CUTOFF WALL IS ABSOLUTELY ESSENTIAL TO LONG TERM TREE GROWTH BEHIND THE LEVEES.

MY RECOMMENDATION IS TO INSTALL A SUBDRAIN SYSTEM ON THE INSIDE TOE OF THE LEVEE WHICH WOULD MAINTAIN THE GROUNDWATER

LEVEL AT LEAST 5 FEET BELOW THE BOTTOM OF THE ROOT ZONE OF THE ALMOND TREES. THE SYSTEM WOULD INCLUDE A GRAVEL INTERCEPTOR TRENCH TO WITHIN NOMINALLY 3 FEET OF THE ORIGINAL GROUND SURFACE WITH THE GRAVEL ENCAPSULATED IN FILTER FABRIC AND A PERFORATED COLLECTOR PIPE IN THE BASE OF THE GRAVEL. A DEDICATED PUMP WOULD LIFT THE COLLECTED WATER FOR DISPOSAL ELSEWHERE. THE PUMP WOULD ACTIVATE AUTOMATICALLY BY FLOAT CONTROL.

THE WATER SO COLLECTED WOULD REQUIRE DISCHARGE OFF-SITE. BECAUSE THE SHALLOW GROUNDWATER SO COLLECTED IS MORE THAN LIKELY TO CONTAIN CONSTITUENT LEVELS HIGHER THAN THE LARGE FLOOD WATERS, A WAIVER TO ALLOW AUTOMATIC DISCHARGE OF THE COLLECTED GROUNDWATER WOULD NEED TO BE OBTAINED.

4.3.2 Levee Reshaping (also called "Geometric Fix")

This measure would include reshaping the existing levees to restore them to I:JSACE levee design criteria for side slopes and crown width. For the LSJRFS area, the minimum crest width for mainline or major tributary levees is 20 feet; the minimum crest width for minor tributary levees is 12 feet. Existing levees with landside and waterside slopes as steep as 2H:1V (i.e., for every 2 feet of horizontal distance, there is a 1 foot increase in height) may be acceptable if slope performance has been good and if the slope stability analyses determined the factors of safety to be adequate. Newly constructed levees should have 3H:1V waterside and landside slopes.

For new levees constructed in the LSJRFS area, a minimum permanent landside toe clear access easement of 20 feet is required; for existing levees within the LSJRFS area, a minimum permanent landside toe clear access easement of 10 feet is required. For both new and existing levees in the LSJRFS a minimum permanent watersidEj toe vegetation free zone (VFZ) of 15 feet is required unless a variance is approved by USACE.

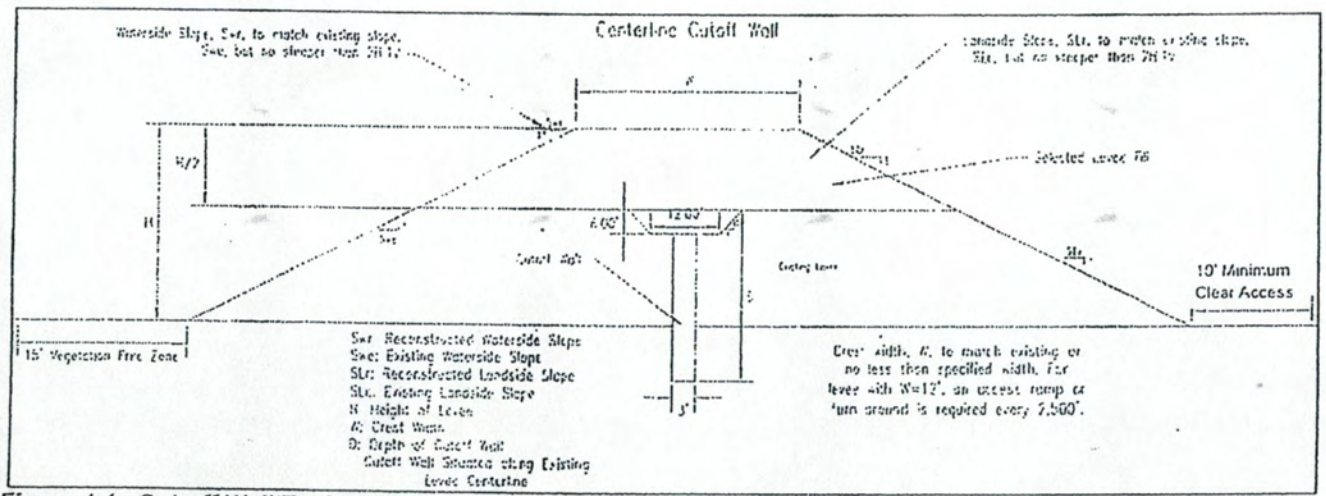


Figure 4-1. Cut-off Wall Typical Plan.
Note that the landside easement (right side) shown would be the minimum easement; landside easements would range from 10 feet to 20 feet from the levee toe.

Prior to construction, the waterside levee crest edge would be cleared and grubbed and the crown and existing landside slope would be stripped to remove at least 2 feet of material. To correct levee geometry, suitable material would be placed along the landside of existing levee slopes where needed to provide the minimum slope, required height, and crest width to meet current USACE levee design criteria, as detailed above. After construction, slopes would be hydroseeded for erosion control.

The additional area added to the landside toe by widening varies from 1 to 30 feet, depending on the existing width of the levee. The slope reshaping typical plan is shown on Figure 4-2. Slope reshaping and levee height fixes may require relocation of landside toe drains and ditches. These toe drains and ditches would be reestablished landward of the improved levee toe and would continue to function as they did before the levee improvements were constructed.

4.3.3 Levee Raise (Levee Height Fix)

This measure describes the construction action that would be taken to repair the levee height in locations where the crown has slumped and to raise the existing levee height to reasonably maximize net benefits. Where SLR was a design consideration, the height could increase up to 5 feet. An increase in levee height may require additional levee footprint area to meet design requirements for minimum levee slope and crown width. Prior to construction, the waterside levee crest edge would be cleared and grubbed and the crown and existing landside slope would be stripped to remove at least 2 feet of material. To construct a levee raise, suitable material would. be placed along the crown and landside of existing levee slopes, where needed, to provide the minimum slopes, required height, and crest width that meet current USACE levee design criteria. The typical plan for a levee raise is shown in Figure 4-2.

4.3.4 Seepage Berm

Seepage berms are proposed to address levee stability, under- and through-seepage which are affecting levee performance and safety. A seepage berm is typically built adjacent to the landside of the levee and consists of layers of sand, gravel, and soil. The purpose of the berm is to control seepage flows and reduce the risk of the levee being undermined during a high-water event. The seepage berm acts as a cap, controlling the seepage flow below the berm surface and allowing the flow to reach an exit location in such a way that the undermining of levee soils is reduced or eliminated, thereby preventing boils and piping.

The seepage berm width could range from 100 to 200 feet from the landside toe of the existing levee with a maximum width of 300 feet. The seepage berms would be approximately 5 feet thick at the toe of the existing levee and would gradually slope downward to about 3 feet thick at the landside edge, with a 3:1 slope to ground level.

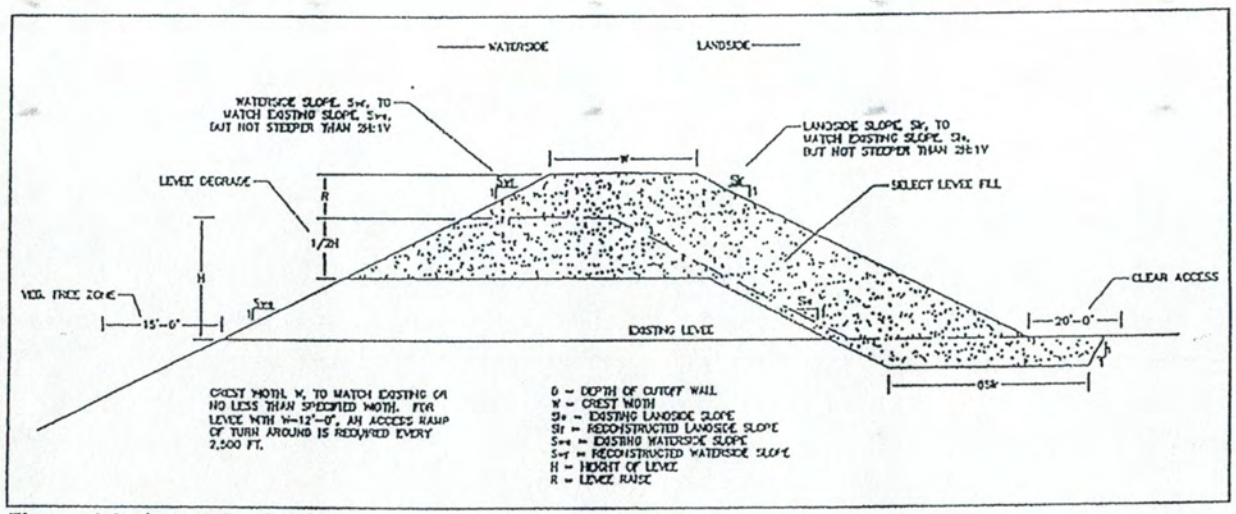


Figure 4-2. Levee Reshaping and Levee Raise Typical Plan.
Note that the landside easement (right side) shown would be the maximum clear access easement; landside easements would range from 10 feet to 20 feet from the levee toe. Half levee degradation is generally not proposed unless a cutoff wall would be installed. Instead, an internal drain may be constructed between the existing levee materials and the new fill.

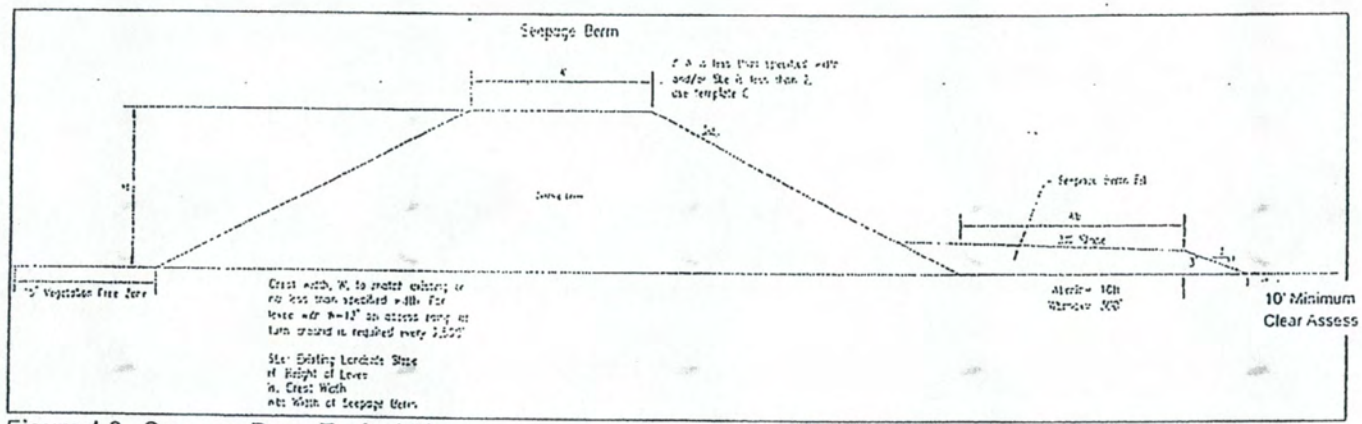


Figure 4-3. Seepage Berm Typical Plan.

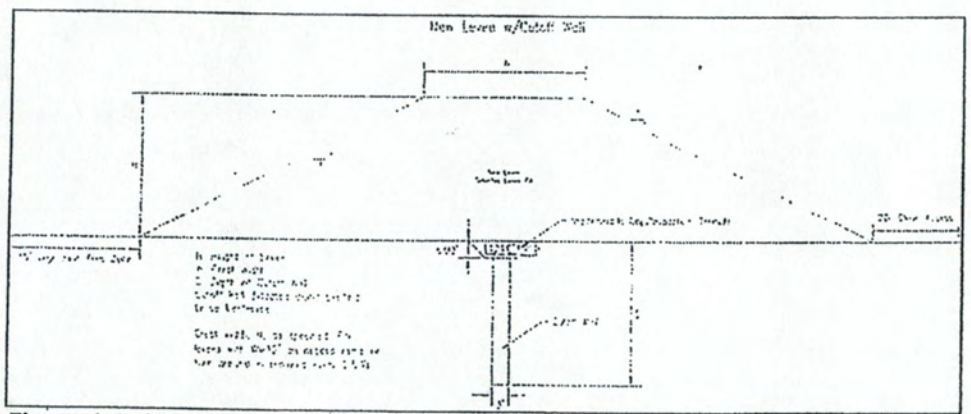


Figure 4-4. New Levee with Cut-off Wall Typical Plan.

Approximately 75,000 tons of quarry stone riprap would be imported by truck and would be placed to a thickness of 2 feet along the landside to prevent wind wave erosion during high water. A sand filter would also be placed prior to the riprap layer to prevent the migration of fines causing gravel instability and decreased erosion protection performance.

4.3.7 Floodwall

This measure consists of construction of about 825 linear feet of sheetpile floodwall from the southern portion of Dad's Point to high ground at Louise Park. Thewall height would be an average of three to four feet above the ground surface. A metal cap may be placed on the top of the sheetpile or the sheetpile maybe encased in concrete. The floodwall would be approximately 12 to 18 inches wide.

4.3.8 New Bridges

This measure would consist of constructing three bridges over Old Mormon Channel to replace low water road crossings that are currently inundated periodically. This measure is included in Alternatives 9a and 9b. The measure would include removing the existing road and grading the area to allow flood flows to move unimpeded from the Stockton Diverting Canal through the Old Mormon Channel, into Mormon Slough and then into the San Joaquin River.

4.3.9 Seismic Remediation

This measure would be implemented to provide seismic stability to the Delta Front levees of North Stockton that are frequently loaded (due to slough water surface elevations that are tidally influenced) and that are also subject to potentially significant deformations due to a seismic event. The seismic (deep soil mixing) remediation measure would involve installation of a grid of drilled soil-cement mixed columns aligned longitudinally with. and transverse to, the alignment of the levee extending beyond the levee prism. This measure would minimize significant deformation of the levee during a seismic event.

The seismic remediation would involve degrading approximately the top half of the levee and placing the degraded material landward as shown in Figure 4-5. Prior to construction, the construction area would be cleared and grubbed. The material obtained from degrading the levee would extend up to 60 feet beyond the existing levee landside and would be compacted such that the material forms an extension to the existing levee. The crest of the levee would then be reconstructed with suitable material to comply with the USACE levee design criteria. A determination may be made during the future design that all of the degraded material may not be necessary to extend

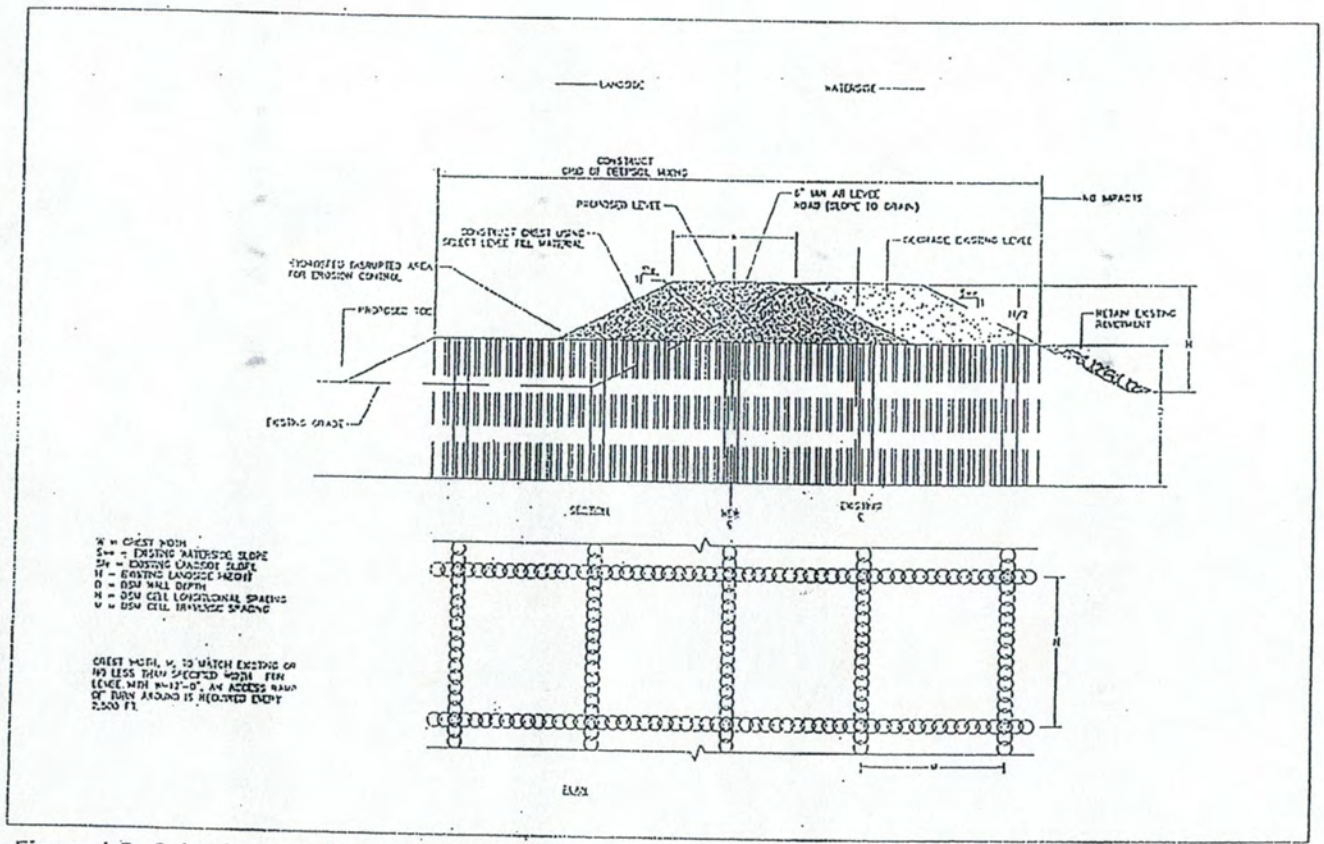


Figure 4-5. Seismic Remediation Typical Plan.

the levee to the proposed toe shown in Figure 4-5. The proposed toe could be located along an imaginary line extending from the landward face of the proposed levee to existing grade. During the current feasibility planning the maximum extent of the reconstruction berm is shown in order to show the maximum impacts which could occur.

Deep soil mixing augers would be used to construct a continuous grouping of cells spaced equally in both the longitudinal and transverse direction to the levee alignment as shown in the plan view in Figure 4-5. The deep soil mixing is a seismic strengthening feature meant to keep the levee from liquefying during seismic activity. After construction is completed, the levee crest would then be topped with a 6-inch aggregate road, and slopes would be hydroseeded for erosion control. This degrading and reconstruction *effort* would occur along 3 miles of Fourteenmile Slough and TenmileSlough.

4.3.10 Closure Structures

This measure would include construction of closure structures at the mouths of backwater sloughs at Smith Canal and Fourteenmile Slough to provide flood risk management along those sloughs. The closure structures would control back-flooding from the San Joaquin River and Delta during high water events. The gates would be operated typically between November 1st to April 30th which covers the rainy season and the period when high tides occur in this area. Specifically, the gates will be operated when the high tide is forecast to reach, or exceed +8.00 ft NAVD88 to prevent high flows from entering the canal/slough. The gate would be closed at the lowest tide prior to the forecasted high tide and remain closed until the high tide begins to recede. The gate would then be opened to allow any accumulated interior drainage behind the gate structure to flow out. This would limit the level and duration of water saturation and reduce the risk of levee damage or failure. Due to the tidal influence of the Delta, high water events could last from a few days to a few weeks, depending on river conditions. During development of the alternatives, Smith Canal and Fourteenmile Slough were identified as appropriate locations for closure structures.

The proposed closure structures would consist of a fixed sheet pile wall structure with an opening gate structure sufficiently large to allow for the safe passage of boats and other watercrafts. Fish and other aquatic organisms would also be able to pass through these gates when they are open. The opening portion of the closure structure would be an automated gate that may open upward or outward. The gate would be approximately 50-feet wide, and would be constructed of stainless steel. The gate would be attached to a concrete foundation using stainless steel anchor bolts. A small building would be built on land directly adjacent to the closure structures to store equiopment required to operate the gate. As needed, a sheet pile floodwall would be constructed adjacent to the control structures to tie the structures into the adjacent levee or high ground areas.

Construction would require dredging or draglining, construction of a temporary cofferdam, in-water excavation, and placement of some structural features in the water.

CHAPTER 5 - AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES*

This chapter describes the affected environment and environmental consequences of each of the alternatives in the final array, mitigation measures for potential impacts, cumulative effects, and other environmental considerations for implementing the LSJR project.

NEPA and CEQA require that the environmental effects of a project be analyzed for significance. Under NEPA, significant impacts are impacts that are considered significant because of their context (location sensitivity) and intensity (magnitude of impact) (40 CFR Section 1508.27). Under CEQA, impacts are assessed for significance based on specific significance criteria consistent with State CEQA Guidelines Appendix G (14 California Code of Regulations 15000 et seq.). For the purposes of CEQA, potential effects are determined by assessing the potential impacts of the proposed action on the existing conditions for each resource. For the purposes of NEPA, potential project effects assessed in relation to the conditions described in the No Action Alternative. For the purpose of this impact analysis, effects are evaluated against existing conditions since these conditions either reasonably represent future conditions in the project area or because using existing conditions will facilitate full evaluation and disclosure of the greatest potential impacts of the proposed project.

The CEQA existing (baseline) environmental conditions assumed in the preparation of this chapter consist of the existing environment as of January 15, 2010, when USACE published the Notice of Intent (NOi) to prepare an EIS in the *Federal Register* and SJAFCA published the Notice of Preparation (NOP) to prepare an EIR with the State Clearinghouse (State Clearinghouse Number (SCH#) 2010012027). Resource conditions were reassessed and updated between fall 2013 and spring 2014. Changes in the existing conditions during that time were not substantial.

The alternatives evaluated in this chapter are described in Chapter 4. They are listed below for ease of reference:

Alternative 1 – No Action

Alternative 7a – North and Central Stockton – Delta Front, Lower Calaveras River, and San Joaquin River Levee Improvements excluding RD 17

Alternative 7b – North and Central Stockton – Delta Front, Lower Calaveras River, and San Joaquin River Levee Improvements including RD 17

Alternative Ba – North and Central Stockton – Delta Front, Lower Calaveras River, San Joaquin River, and Stockton Diveriing Canal Levee Improvements excluding RD 17
Alternative Sb – North and Central Stockton – Delta Front, Lower Calaveras River, San Joaquin River, and Stockton Diverting Canal Levee Improvements including RD 17

Alternative 9a – North and Central Stockton – Delta Front, Lower Calaveras River, San Joaquin River Levee Improvements and Mormon Channel Bypass excluding RD 17

Alternative 9b - North and Central Stockton – Delta Front, Lower Calaveras River, San Joaquin River Levee Improvements and Mormon Channel Bypass including RD 17

This chapter is organized to meet NEPA .requirements for determination of the overall impact of each alternative, but will also meet CEQA requirements for an irnpact-by-irnpact determination of effect. The terms *environmental consequences* , *environmental impacts* , and *environmental effects* are considered synonymous in this analysis.

The structure of each section is described below.

- **Environmental Setting**
    - Regulatory Framework. This section lists the laws, regulations and policies that are considered in the assessment of effects on the resource. These regulatory requirements are more fully described in Chapter 7, Compliance with Applicable Laws, Policies, and Plans.
    - Existing Conditions. This section describes the environmental setting and considers the environmental conditions in the area at the time that the NOP (CEQA) and NOi (NEPA) were published (January 15, 2010). Resource conditions were reassessed and updated between fall 2013 and spring 2014.
- **Environmental Consequences**
    - Assessment Methods. This section describes the methods, models, process, and procedures, data sources, and/or assumptions used to conduct the effect analysis. Where possible, effects are evaluated quantitatively. Where quantification is not possible, effects are evaluated qualitatively.
    - Basis of Significance. This section provides the criteria used in this document to define the level at which an effect would be considered

Potential seismic hazards from a nearby moderate to major earthquake are generally classified as primary and secondary. The primary effect is fault ground rupture, also called surface faulting. Because there are no active faults in the project area and the area is not located within an Alquist-Priolo Earthquake Fault Zone, fault ground rupture is negligible. Common secondary seismic hazards include ground shaking, liquefaction, subsidence, and seiches.

Although located in an area of low seismic risk, Stockton, Manteca, and San Joaquin County require all new development and substantial renovations to comply with current seismic standards for construction. Geotechnical engineering studies are also required for major new buildings or earthworks.

Table 5-2. Maximum Credible Earthquake Magnitudes

Fault	Estimated Distance from Project Site	Fault Class [1]	Maximum Credible Earthquake[2]	Slip Rate (mm/yr)
Greenville Fault Zone, North Section	20 miles	B	6.6	2.0
Greenville Fault Zone, South Section	24 miles	B	6.6	2.0
Calaveras Fault-Northern Segment	34 miles	B	6.8	6
Concord- Green Valley	38 miles	B	6.2	5.0
Hayward Fault - North Segment	45 miles	A	6.4	9

Notes:
1 Faults with an "A" classification are capable of producing large magnitude (M) events (M greater than 7.0), have a high rate of seismic activity (e.g., slip rates greater than 5 millimeters per year), and have well-constrained paleoseismic data (e.g., evidence of displacement within the last 700,000 years). Class B faults are those that lack paleoseismic data necessary to constrain the recurrence intervals of large-scale events. Faults with a "B" classification are capable of producing an event of M 6.5 or greater.
2. The moment magnitude scale is used by seismologists to compare the energy released by earthquakes. Unlike other magnitude scales, it does not saturate at the upper end, meaning that there is no particular value beyond which all earthquakes have about the same magnitude, which makes it a particularly valuable tool for assessing large earthquakes.
Sources: Cao et al., 2003; Jennings 1994; Petersen et al., 1996; data compiled by USACE in 2014

Liquefaction and Settlement

Liquefaction is the liquefying of certain sediments during seismic ground-shaking, resulting in temporary loss of support to overlying sediments and structures. Differential settlement occurs when the layers that liquefy are not of uniform thickness, a common problem when the liquefaction occurs in artificial fills. Poorly consolidated, water-saturated fine sands located within 30 to 50 feet of the surface typically are considered the most susceptible to liquefaction. Dry soils and sediments consisting of finer grained materials are generally not susceptible to liquefaction.

Many of the levees in the project area are constructed over alluvial deposits and may be susceptible to liquefaction or degradation due to a seismic event. The area is unusual in that it contains infrequently water-saturated levees in Central and South Stockton, but also frequently saturated levees in North Stockton and Delta Front. Frequently saturated levees are likely to be sensitive to seepage, leading to breach with seismic-event induced transverse cracking or displacement.

As part of the design effort, USACE conducted liquefaction triggering analyses and identified liquefiable material along several levees in the project area. Static limit equilibrium stability analyses were then conducted for these levees. Based on the analyses, the flood protection ability after a 200-year seismic event was judged to be compromised at several locations. Thus, a large regional earthquake during a major flood event would increase the potential liquefaction, settlement, and levee failure. The greatest susceptibility is along the Delta Front and North Stockton. Details of the liquefaction analyses are included in Appendix B.

5.2.2 Assessment Methods and Basis of Significance

Assessment Methods

The types and extent of potential effects and significance were assessed by reviewing seismic fault and event maps, reviewing seismic studies, discussing seismic aspects with professional staff, and then considering the work proposed under each alternative.

Basis of Significance

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    - rupture a known earthquake fault as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
    - strong seismic ground shaking;
    - seismic-related ground failure, including liquefaction; or
    - landslides.

- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction or collapse.

The project area is not located within or adjacent to an Alquist-Priolo Fault Zone or any known active fault. Therefore, the risk of surface fault rupture is negligible and is not evaluated further. Additionally, the project area is relatively flat, and there would be no adverse impacts related to landslides. Therefore, landslides are not addressed further.

5.2.3 Alternative 1 - No Action

Under the no action alternative, no construction activities would occur. As a result, the existing seismic faults and potential for ground movement would be expected to remain the same. Prior to the implementation of the proposed measures to reduce flood damage to the Stockton, Lathrop and Manteca area, the structural integrity of existing levees, berms, and bridges would continue to be at risk from high magnitude seismic events on active faults to the west. Some of the levees in tidally influenced areas would also continue to be at risk from seismically induced structural instability and/or failure due to liquefaction of soils. The magnitude of the impact of flooding resulting from levee failure would depend on the location of the levee breach, severity of the storm, and river flows at the time of flooding. Predicting these events and providing a determination of significance is not possible based on the information available atthis time. Therefore identification of potential effects is **too speculative for meaningful consideration.**

5.2.4 Alternatives 7a, 7b, *Ba,* 8b, 9a, and 9b

These alternatives would have no effects on known seismic faults or cause ground movement along faults because of the type of proposed work and the nature of seismicity. The work would be limited to borrow sites activities and improvements along surface waterways, while seismic forces are subsurface and regional. In addition, there are no identified active faults in the project area.

Seismic ground shaking is an unavoidable hazard for facilities within and/or near the San Francisco Bay Area. The proposed project could experience at least one earthquake within the life of the project. Design, construction, and maintenance must comply with the regulatory standards of USACE and CVFPB, the latest industry standards and building code requirements for seismic design. The design and construction of the cut-off walls, floodwalls and/or levees would meet or exceed applicable design standards for static and dynamic stability , seismic ground shaking, liquefaction, subsidence, and seepage, minimizing the potential for significant damage. Therefore, the existing geology and seismicity of the area would not affect the proposed project or expose people or structures to potential risk or injury.

Consistent with project objectives, the completed project would provide long-term flood risk management benefits by improving the structure and functioning of the existing levee system. This includes designing the proposed features to avoid or minimize any potential for seismic-related ground failure, such liquefaction, in tidally influence areas in the project area. As a result, none of the alternatives would cause any seismic-related ground failure, and therefore would result in no effects on seismicity.

The Geotechnical Investigation prepared for the proposed project (Appendix C) did not indicate evidence of instability because of landslides, subsidence, or collapse.

Liquefaction analysis indicates some existing levees within the project area are constructed over alluvial deposits that could be susceptible to liquefaction or degradation due to a seismic event. Design recommendations to address this condition are provided in the Geotechnical Investigation and would be implemented. The proposed project would implement standard grading and soil engineering practices to ensure that foundations are adequately supported and do not settle or otherwise fail. This includes excavating the existing soils and replacing it with compacted engineered fill. In addition, all structures associated with the proposed project would be designed in accordance with USACE, and CVFPB standards, and the provisions of the California Building Standards Code. The California Building Standards Code requirements establish minimum structural load requirements for foundations. Because project facilities would be designed, constructed and maintained in accordance with applicable standards risk of failure due to a seismic event would be minimized and this impact is less-than-significant.

5.2.5 Mitigation

There would be no significant effects from seismicity, therefore no mitigation is required.

5.3 SOILS AND MINERAL RESOURCES

This section describes the affected environmental and environmental consequences relating to soils and mineral resources for the LSJR project. The significance of the impacts and mitigation measures to reduce impacts are also discussed.

5.3.1 Environmental

Setting Regulatory

Framework

Federal

- Clean Water Act (CWA) Section 402

State

- California Surface Mining and Reclamation Act of 1975
- National Pollutant Discharge Elimination System (NPDES) Permit
- California Building Standards Code
- California Code of Regulations: Title 23, Division 1, Article 8, Sections 111-137

Regional and Local

- San Joaquin County General Plan 2010

quarrying, and are intended to ensure that mineral resources will be available when their development is necessary or economically feasible (CDC, 2013). However, the MRZ-2 sector between Lathrop and Manteca lies outside the area that would be affected by the alternatives in the Lower San Joaquin River study.

5.3.2 Assessment Methods and Basis of

Significance Basis of Significance

- Result in substantial erosion of soil or loss of topsoil;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or
- Result in the loss of availability of a known mineral resource of economic value to the region and the residents of the state or a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

The project would not involve the use of wastewater disposal systems of any kind, including septic systems, and there would be no impacts. Therefore, this issue is not addressed further in this document.

5.3.3 Alternative 1 - No Action

Under the no action alternative, no construction activities would occur. As a result, the soil types and their characteristics on the alluvial fan in San Joaquin County would be expected to remain the same as deposited over time. Prior to the implementation of the proposed measures to reduce flood damage to the Stockton, Lathrop and Manteca area, water and wind erosion of exposed and recently disturbed soils would continue, and continue to weaken the structure of levees along the San Joaquin River and tributaries. The risk of levee failure and flooding would also continue, resulting in soil scouring and substantial loss< of nearby valuable topsoil in the event of a breach. The eroded soils could be carried by the floodwaters and deposited in developed areas, causing damage to residences, businesses, and infrastructure. This would be considered a potentially significant effect. Implementation of USACE levee vegetation management requirements in not expected to occur under the No Action alternative, therefore removal of waterside and landside vegetation would not occur, reducing potential erosion impacts.

The magnitude of the impact of flooding resulting from levee failure would depend on the location of the levee breach, severity of the storm, and river flows at

time of flooding. In the event of a flood, levee failures could result in soil scouring, erosion, and permanent loss of top soil in localized areas within several hundred feet of a levee breach. Depending on the location and severity of the levee failure and duration of flooding, the location and extent of damage and impacts related to soil erosion could be minor to extensive. Predicting these events and providing a determination of significance is not possible based on the information available at this time. Therefore identification of potential effects is too speculative for meaningful consideration.

The principal mineral resources in San Joaquin County are deposits of sand and gravel aggregate, and many companies are currently mining and processing these deposits as regulated by the State and County. Mining operations would continue to be at risk of disruption, damage, or loss of mineral resources in the event of levee failure and flooding. This disruption could affect the local economy. The substantial soil subsidence in the valley due to over-pumping of groundwater and drainage of lowlands by agricultural and municipal interests would also continue. These would be considered as potentially significant effects.

5.3.4 Alternatives 7a, 7b, *Ba,* 8b, 9a, and 9b

These alternatives would have no effect on the soil types or their characteristics on the alluvial fan. However, they would have short-term effects on soils in the project area during construction. These would include disturbing soils at staging areas; clearing, excavating, and clearing soils during site preparation; excavating, stockpiling, and/or removing soil material at borrow sites; and depositing and shaping soils at the work site. Table 5-3 lists the approximate area of disturbance by alternative. These activities could result in the potential for surface water to carry sediment from onsite erosion into the stormwater and local waterways or increase air-borne dust, resulting in potential effects on existing water quality and air quality. These short-term effects would increase with the increasing extent, type, and amount of work proposed under the alternatives; e.g., 7a would have fewer effects than 9b. The potential effects on water quality and air quality of the alternatives, BMPs, and mitigation measures are discussed in detail under Sections 5.5 and 5.8, respectively.

elements would be supported by a site-specific geotechnical investigation, which would include an evaluation of site soils and recommendations to ensure project elements are appropriately designed and constructed, consistent with the current California Building Code earthwork standards, and USACE and CVFPB standards. With adherence to the current California Building Code and any additional recommendations of the site-specific geotechnical investigation, impacts associated with potential adverse soils conditions would be less-than-significant, and no mitigation is required.

These alternatives would have no short-term or long-term effects on the acquisition, mining, or processing of the mineral resources in the project area. None of the existing sand and gravel mining or processing operations are located at the work sites. Implementation of the project would not reduce or eliminate availability of mineral resources. However, consistent with the project objectives, the completed project would provide long-term flood risk management benefits by improving the structure and functioning of the existing levee system. This would include reducing the potential for loss of soils or mineral resources due to erosion and levee failure. The potential loss of locally or regionally significant mineral resources would be a less-than-significant impact. No mitigation would be required.

To identify potential locations for borrow material, soil maps and land use maps were obtained for a 25-mile radius surrounding the project area. Whenever possible, borrow sites would be obtained from willing sellers and located on land to minimize effects on the environment. Once details of borrow locations have been finalized, coordination with the California Department of Conservation (CDC) State Mining and Geology Board (SMGB) would occur to ensure compliance with the SMARA, as stated in Chapter 4, including any additional permitting, CEQA (as determined by the SMARA lead agency (SMGB), or NEPA required prior to commencing surface mining at the borrow sites. After material is extracted, borrow sites would be returned to their existing use whenever possible.

5.3.5 Mitigation

There would be no significant effects on soils and mineral resources, therefore no mitigation is required.

5.4 HYDROLOGY AND HYDRAULICS

This section describes the affected environmental and environmental consequences relating to hydrology and hydraulics for the LSJR project. The significance of the impacts and mitigation measures to reduce impacts are also discussed.

narrows to approximately 500 feet. However, there is one oxbow reach where the floodway is approximately 2,000 feet wide. Flood stages within this reach are dominated by runoff from the San Joaquin River.

Approximately 1 mile downstream of Paradise Cut on the right bank is Wetherbee Lake and the upstream tieback levee of RD 17. The Wetherbee Lake levee segment along the San Joaquin River was a feature of the San Joaquin Flood Control Project which cut *off* Walthall slough from the San Joaquin River to reduce damages to a resort development along the river. The RD 17 tieback levee is located downstream of Walthall Slough and extends east along the right bank of the slough to high ground. The RD 17 tieback levee is higher than the right bank levee of the San Joaquin River and diverts any floodwaters on the right overbank back into the San Joaquin River. This situation occurred in the flood of January 1997 and is shown on Plate 10. Flood stages within this channel reach are dominated by runoff from t11e San Joaquin River. Flood stages in the right overbank are dominated by runoff from the San Joaquin River and Stanislaus River.

Old River to French Camp Slough. Old River defines the upstream extent of this reach. Old River is a distributary from the San Joaquin River and conveys floodwaters west into the Sacramento-San Joaquin Delta. There is no hydraulic structure to manage the flow split. The flow split is defined by the hydraulic characteristics of Old River and the San Joaquin River downstream of the flow split.

Within this reach the San Joaquin River further transitions to a less sinuous plan form. The main channel varies in width from 200 to 300 feet. The floodway is contained by left and right bank levees that are approximately 10 to 15 feet tall. From Burns Cutoff to approximately 4 miles downstream, the right bank levee is approximately 3 feet taller than the left bank. The floodway width between the levees varies from 300 feet to 400 feet and widens to 1,400 feet at a few meander bends. The waterside levee face forms the channel bank along most of this reach. Flood stages within this reach are dom.inated by runoff from the San Joaquin River.

French Camp Slough to Burns Cutoff. French Camp Slough defines the upstream extent of this reach. French Camp Slough is a tributary to the San Joaquin River. The reach characteristics of French Camp slough are described below. The main channel varies in width from 200 to 300 feet. The floodway is contained by left and right bank levees that are approximately 10 to 15 feet tall. The floodway width between the levees varies from 300 feet to 400 feet. The waterside levee face is next to the channel bank along most of this reach. Flood stages within this reach are dominated by runoff from the San Joaquin River. However, influence of ocean tides is evident in flood stage hydrographs.

Bums Cutoff to Deep Water Ship Channel. Burns Cutoff defines the upstream extent of this reach. Burns cutoff is a secondary channel of the San Joaquin River which conveys water on the west side of Rough and Ready Island. Burns cutoff flows

TERRA LAND GROUP, LLC

December 16, 2014

VIA HAND DELIVERY & U.S. MAIL

Manteca City Council
1001 W. Center Street
Manteca, CA 95337

RE: **Unidentified and/or unresolved impacts relating to 200-year flood protection (Manteca City Council Meeting 12/16/14 Agenda Item B.07.)**

Dear Council Members:

Terra Land Group, LLC ("**TLG**") owns approximately two hundred thirty (230) acres of farm ground ("**Property**") located within the two hundred year ("**200-year**") floodplain and further situated in the southwest corner of the incorporated area of the City of Manteca. The Property is further identified as APNs:

241-330-32 (approx. 203.33 acres)
241-330-33 (approx. 17.10 acres)
241-320-60 (approx. 10.13 acres)

Currently, approximately 31,000 (thirty-one thousand) almond trees are planted on the Property, with access to irrigation water provided by means of 2 (two) deep-water wells specifically located on TLG APN 241-330-032.

Further, TLG is presently involved in negotiations with South San Joaquin Irrigation District ("**SSJID**") to allow TLG to receive SSJID surface water by means of annexation into SSJID.

The costs associated with the annexation into SSJID are significant and are subject to increases on an annual basis.

As of the date of this letter, the costs associated with annexation into SSJID involve:

1) TLG payment of an annexation fee approximating $2,300 (two thousand three hundred dollars) per acre.
2) TLG responsibility to pay all costs involved to construct any and all irrigation water conveyance, storage and delivery infrastructure necessary to distribute water throughout the TLG farm Property.

At this time, TLG is in receipt of a December 8, 2014 Public Works Staff Report recommendation from Phil Govea to the Manteca City Council. (See Exhibit "1")

As I understand it, Senate Bill 5 ("SB5"), as administrated by the United States Army Corps of Engineers and the State of California Department of Integrated Water Management, will significantly limit the ability of urban communities to approve residential, commercial and industrial development projects after July, 2016, unless communities have either:

1) Constructed all improvements needed to provide an Urban Level of Flood Protection for a 200-year storm event (200-year Flood Protection), or
2) Made a finding of adequate progress toward providing 200-year Flood Protection.

Other requirements leading to the completion of SB5 200-year levee flood protection improvements indicate that all such improvements are to be completed by 2025.

Prior to that date, various work products need to be completed to demonstrate that the permitting agency can make a defensible "finding of adequate progress".

Scope of Work Products Involved

1) Development of a master model to simulate a 200-year flood event
2) Significant engineering and geotechnical efforts involving
    a) Identifying deficiencies in the existing levee system
    b) Preparing levee design criteria that meets state and federal standards
    c) Identifying rehabilitation measures to fix any deficiencies found in the existing levee system
    d) Preparing cost estimates for the rehabilitation work
    e) Vetting the analyses and design criteria in a series of workshops with a panel of independent experts, as well as state agencies.
3) Preparation of a financing plan and the initiation of construction on some of the needed improvements by July, 2016, in order to comply with SB5 requirements by supporting a "finding of adequate progress".

With this in mind, I, Martin Harris, representing TLG, attended a 12/9/14 Reclamation District 17 ("RD17") Board meeting.

At that meeting, RD17 representative Dante Nomellini explained to those in attendance that RD17 was working with the City of Manteca to conduct levee improvements that were described as a "seepage repair project" involving bench berms and changes to the levee bank slope on both the leading and tail sides of the levee.

Mr. Nomellini added that the initial levee improvements were of an intermediate nature and were not meant to satisfy final SB5 200-year levee flood protection requirements.

Finally, Mr. Nomellini stated that the City of Manteca's continued participation in an ongoing Regional Feasibility Study was an important component in meeting the adequate progress goals for 200-year levee protection compliance.

I inquired as to whether the levee design slopes currently anticipated to affect the TLG farm Property would be designed in accordance with the levee design map presented on Page 3-32 of the March 2011 Terra Ranch Subdivision Final EIR. (See Exhibit "2")

RD17 representative Chris Nudeck indicated that the levee design would follow the 3:1 (three-to-one) slope indicated on the drawing.

I also brought the RD17 Board's attention to a December 29, 2010, letter from Dante Nomellini which indicated that "excavations for swimming pools and other purposes outside the levee easements are increasingly being recognized as having the potential for affecting under seepage and therefore levee stability".

Further, the 12/29/10 letter goes on to state that "Location of ample open space along the levees coupled with a single loaded street as a buffer from development is highly recommended. The Terra Ranch Plan appears to incorporate the single loaded street and a setback. The setback may have to be increased and excavations as far away as 300 (three hundred) feet may be restricted". (See Exhibit "3")

Chris Nudeck confirmed the need for a setback standard and indicated that the greatest concern would involve uses such as a stormwater pond.

The meeting ended.

<u>Other Historical Meeting Information Supporting This Letter</u>

December 3, 2013, SSJID negotiations begin
On December 3, 2013, TLG began discussions with SSJID to prepare to annex the TLG farm Property into SSJID. (See Exhibit "4")

November 7, 2014: SSJID, Supplemental Annexation Plan:
On 11/7/14, I, Martin Harris, attended an 8:00 a.m. meeting at SSJID to discuss a newly created Supplemental Annexation Plan that may clear a path for TLG to be allowed access to SSJID surface farm irrigation water.

Present at the meeting were: Jeff Shields, SSJID; Bere Lindley, SSJID, Sam Bologna, SSJID, Forest Killingsworth, SSJID, myself (Martin Harris), TLG and Josh Harris, TLG.

In addition, SSJID also presented that the City of Manteca was considering the annexation of the entire developable portion of the Zone 39 Storm Drainage Region into SSJID.

Jeff Shields went on to state that Manteca's participation in the Supplemental Annexation Plan could allow Manteca to:

A. discharge their stormwater utilizing portions of existing stormwater discharge conveyance facilities to access and convey water north to the SSJID French Camp storm drain outlet; and
B. have access to surface water to supplement groundwater well pumping and improve the overall quality of the municipal drinking water serving the Zone 39 area.

Certain advantages were discussed in coordinating the timing of both the City of Manteca and TLG's Supplemental Annexation application submissions for SSJID review, processing and board approval.

I stated to everyone present that TLG was very interested and would return to the TLG offices to evaluate the design and feasibility of the TLG surface water storage and receiving infrastructure required.

The meeting then ended.

At 11:27 a.m. that same day, I received an email from SSJID providing a Term Sheet and Water Service Agreement. (See **Exhibit "5"**)

Total acreage shown on the documents presented indicated two hundred twenty and five tenths (220.5) acres which differed from TLG's past conversations with SSJID for total acres involved. (See **Exhibits "4" and "5"**)

November 13, 2014: SSJID, Supplemental Annexation Plan, continued:
On November 13, 2014, Josh Harris and I met with SSJID staff for the purpose of gaining additional information and identifying the minimum TLG facility requirements necessary to connect with SSJID surface water conveyance facilities currently in place.

Several questions relating to fully understanding information to be submitted by TLG on the SSJID application followed.

Eventually, I raised the question as to how SSJID determined, as specified by SSJID on the rate sheet, that TLG was only looking to annex two hundred twenty and five tenths (220.5) of the approximate two hundred thirty and six tenths (230.6) acres that had been discussed previously.

SSJID responded by presenting a City of Manteca Storm Drainage Zone 39 Subarea Map ("Zone 39 Map") that, to my surprise, clearly showed a significant portion of the RD17 levee relocated to a position substantially south of its current location. (See Exhibit "6")

As shown on the Zone 39 Map, the realignment of the RD17 levee for the portion to be repositioned on the TLG Property, straightens the levee in accordance with the current position of the RD17 levee east of the TLG Property, while interrupting TLG's ability to provide irrigation water to a significant portion of the TLG Property. (See Exhibit "6")

In fact, the resulting segmented portion of TLG Property involved could affect the entire TLG APN 241-320-60 parcel and more.

The meeting then ended.

For some time now, TLG has actively participated in numerous discussions with Manteca City staff and various development interests involved to resolve issues and seek protections relating to any and all environmental impacts that have previously been identified and have the potential to affect the TLG Property.

Further, TLG had formed an opinion that the efforts put forth by the various parties involved were approaching a reasonable conclusion.

For this reason, TLG was disappointed to discover that the portion of the existing RD17 levee separating TR Land Company's APN 241-320-59 and TLG's APN 241-320-60 was apparently being relocated to a southern position that could significantly impact the TLG farm Property.

<u>This makes TLG question:</u>

1) What was the City of Manteca's intent in altering the location of the RD17 levee as shown on the Zone 39 Map presented to TLG by SSJID staff on November 13, 2014? (See Exhibit "6")
2) Why were TLG APNs 241-330-32 and 241-330-33 located south of the Zone 39 reconfigured levee clearly identified by APNs shown on the Zone 39 Map, while TLG APN 241-320-60 is left unidentified on that same Zone 39 Map? (See Exhibit "6")
3) Why does the Zone 39 Map clearly show the TLG's APN 241-320-60 northern jagged edged levee boundary a substantial distance within the total area that the City of Manteca is looking to annex into SSJID as part of the developing area included in its Zone 39 Stormwater Drainage Plan? (See Exhibit "6")
4) What parties will stand to benefit from the new location of the reconfigured levee?
5) What purpose does the Zone 39 Map's bold print "DRY LAND LEVEE" designation have in describing the location of the Zone 39 reconfigured levee placement if not to depict a new location for the Dry Land Levee? (See Exhibit "6")

6) What additional flood related impacts will a levee relocation create?
7) What affect will a levee relocation have on flood water flows and flood water elevation levels impacting neighboring properties?
8) Doesn't the public have a right to know that their property could be subject to unidentified and unanticipated flood impacts?
9) At what point will these potential flood levee impacts be presented to the public?
10) How can TLG justify the costs of annexation into SSJID while significant unidentified impacts remain that may ultimately affect TLG's continued right or ability to farm?
11) At this point, how can any affected property owners address known and/or anticipated impacts affecting their property, when the total list of known impacts is unreliable and continually changes over time?
12) If the information presented to the public does not accurately describe the City of Manteca's intentions relating to a final SB5 levee plan; is it unreasonable for the public to question the costs involved or the validity of any engineering or geotechnical data collected?

In closing, TLG believes that significant and unidentified environmental impacts, with the potential to adversely affect the TLG Property exist.

In addition, TLG believes that certain related impacts may extend to neighboring property owners as well.

These impacts are expected to involve levee related separations to property parcels with impacts that may involve potential flood water elevations, stormwater drainage, continued opportunity to distribute irrigation water, equipment access and the continuing right and/or feasibility to farm.

As a result, TLG requests that the City of Manteca hold public workshops to present a complete levee compliance overview, identifying the City of Manteca's intentions and to allow for public feedback relating to SB5 200-year flood levee requirements.

Thank you for you attention to this very important matter.

Yours Truly,

Martin Harris
Terra Land Group, LLC

MH/jas

Enclosures:

1) Ex. "1": *Manteca City Council Agenda Item No. B.07*
2) Ex. "2": *Page 3-32 of the March 2011 Terra Ranch Subdivision Final EIR*
3) Ex. "3": *December 29, 2010 Nomellini, Grilli & McDaniel PLCs email to Erika Durrer*
4) Ex. "4": *December 3, 2013 Sam Bologna/SSJID email to Martin Harris with Enclosures*
5) Ex. "5": *November 7, 2014 SSJID to TLG Proposed Terms of Supplement to Annexation and Water Service Agreement*
6) Ex. "6": *{Map appears to indicate April 2014} City of Manteca Public Works Department Storm Drainage Zone 39 Subareas Map*

cc:
Manteca City Council
Mark Meissner, City of Manteca Planning Department
Karen McLaughlin, Manteca City Manager
Mark Houghton, City of Manteca Public Works
Jeff Shields, South San Joaquin Irrigation District
Manteca Development Group
TR Land Company
Rosi Cerri Foundation
Reclamation District No. 17
Brian Jones, North Star Engineering Company
Title Company

EXHIBIT "1"

City Council Agenda
December 16, 2014
Consent Calendar
Agenda Item No. B.07

Reviewed by
City Mgr's office: /KLM

Memo to: Manteca City Council

From: Phil Govea, Deputy Director of Public Works

Date: December 8, 2014

Subject: 200-Year Flood Protection Update

Recommendation:

Receive report on 200-year flood protection, and provide direction to staff as appropriate.

Background:

Senate Bill 5 was passed by the California Legislature in 2007, and later amended in 2012 by SB 1278 (SB5). Among its many requirements, SB5 significantly limits the ability of urban communities to approve residential, commercial and industrial development projects after July 2016 unless communities have either: 1) Constructed all improvements needed to provide an Urban Level of Flood Protection for a 200-year storm event (200-year Flood Protection), or 2) Made a finding of adequate progress toward providing 200-year Flood Protection. Since completing all needed improvements by July 2016 is not practical, most communities impacted by SB5 are instead working toward making a "finding of adequate progress," which is what the cities of Lathrop and Manteca have been working toward over the last several months. Ultimately, SB5 requires that all improvements needed to provide 200-year flood protection are completed by July 2025.

Before a permitting agency can make a defensible "finding of adequate progress," various work products need to be completed as described below. The first work product involves developing a computer model to simulate 200-year flood events and, from this information, preparing maps of the effected properties should the levees fail. In February 2014, the cities of Lathrop and Manteca jointly funded an agreement with an engineering firm (Peterson Brustad, Inc. [PBI]) to develop a computer model, to calculate the 200-year water surface profile in the San Joaquin River, and to develop 200-year floodplain maps for the cities of Lathrop

and Manteca and the unincorporated areas of the County that are within Lathrop's or Manteca's General Plan boundaries. The modeling and mapping work was completed, and a presentation was provided to Council at the June 17, 2014 meeting. Figure 1 shows the 200-year floodplain for the cities of Lathrop and Manteca.

The next work products needed to support a finding of adequate progress involve significant engineering and geotechnical efforts, and again, Lathrop and Manteca contracted with PBI to complete the necessary work. Specifically, the work involves :1) Conducting field surveying and reconnaissance to identify deficiencies in the existing levee system, 2) Preparing levee design criteria that meets State and Federal standards, 3) Identifying rehabilitation measures to fix the deficiencies, 4) Preparing cost estimates for the rehabilitation work, and 5) Vetting the analyses and design criteria in a series of workshops with a panel of independent experts, as well as with State agencies. The work on these tasks has progressed far enough that PBI has prepared a preliminary cost estimate of $145 million needed to repair the 20 miles of levees that protect the cities of Lathrop and Manteca. Assuming State funding is available for 50% of the costs, and assuming a 2/3-Lathrop, 1/3-Manteca split on the remaining costs (based on land area located within the 200-year floodplain), the total cost for Manteca is conservatively estimated at $24 million.

In addition to the above work, a financing plan needs to be prepared and construction on some of the needed improvements must be under way by July 2016 in order to make a finding of adequate progress. Regarding a financing plan, staff from the cities of Lathrop and Manteca are soliciting proposals from qualified firms to prepare the plan. Regarding construction, Reclamation District 17 (RD 17) is the local agency responsible for maintaining the levee system in the vicinity of Lathrop, Manteca, Stockton and portions of the San Joaquin County. RD 17 has an existing levee improvement project soon to be in construction, and the plan is to leverage this project as a qualifying construction activity to support a finding of adequate progress. It should be noted that, while RD 17's levee project makes needed improvements to this existing levees, the project by itself does not provide 200-year flood protection for the region. Significant additional work is needed to achieve 200-year flood protection as described later in this report.

As for next steps, staff has a goal of completing the work needed to make findings of adequate progress by February 2016, such that the Lathrop and Manteca City Councils can take action at their February or March 2016 Council meetings.

From July 2016 to July 2025, significant work will then continue toward achieving 200-year flood protection. These work activities will include: implementing a financing plan; designing and preparing construction documents for the levee improvements; obtaining environmental clearance for the improvements; acquiring property; and construction of the improvements.

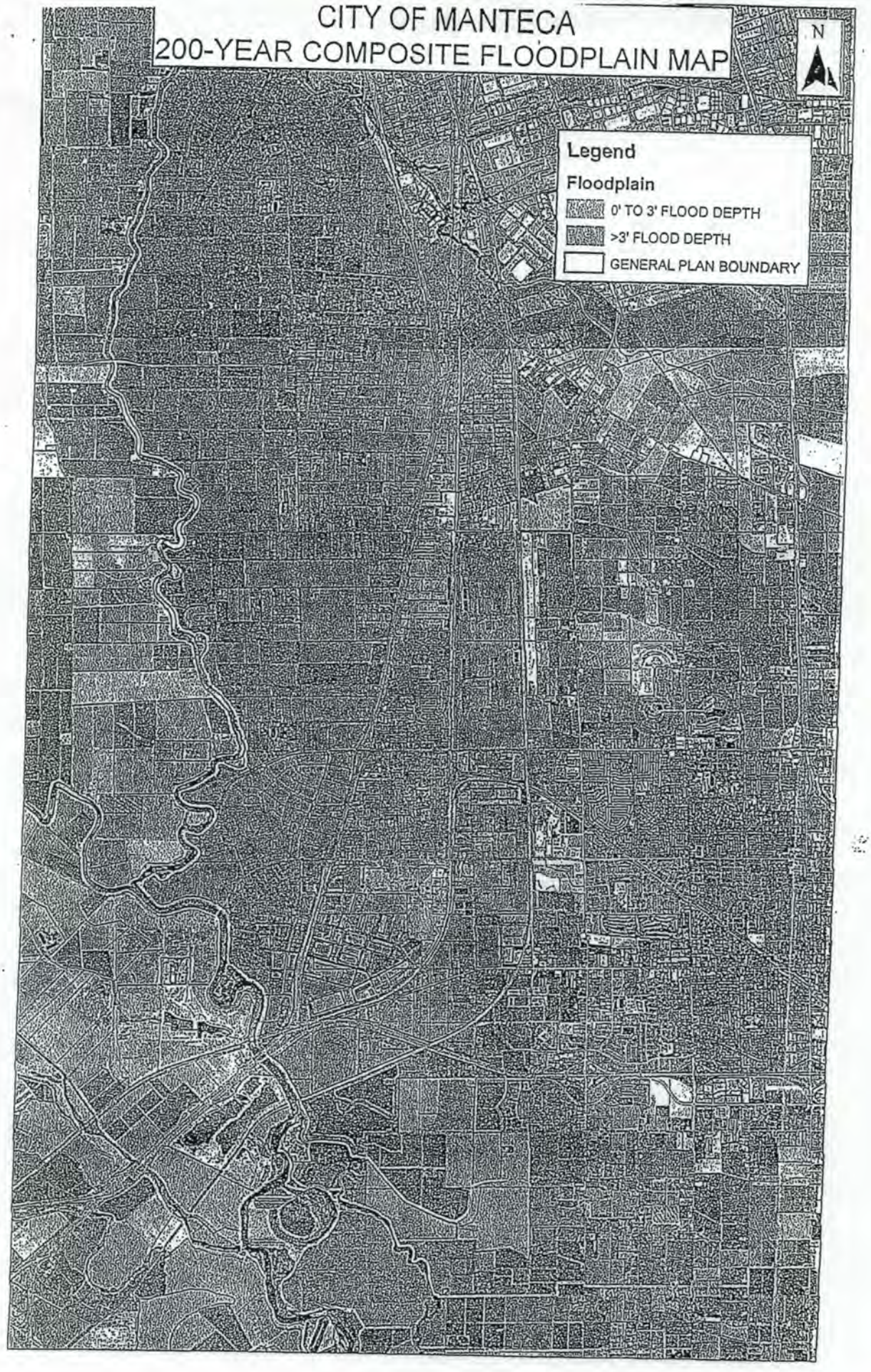
It should also be noted that only Lathrop and Manteca have come forward to fund the SB5 compliance work to date, although the work also benefits Stockton and the unincorporated areas of San Joaquin County.

Fiscal Impact:

The fiscal impact to Manteca of providing 200-year flood protection is estimated at $24 million. Identifying a financing plan to recover these costs is part of the next steps in the process.

Attachment:
Figure 1

CITY OF MANTECA
200-YEAR COMPOSITE FLOODPLAIN MAP

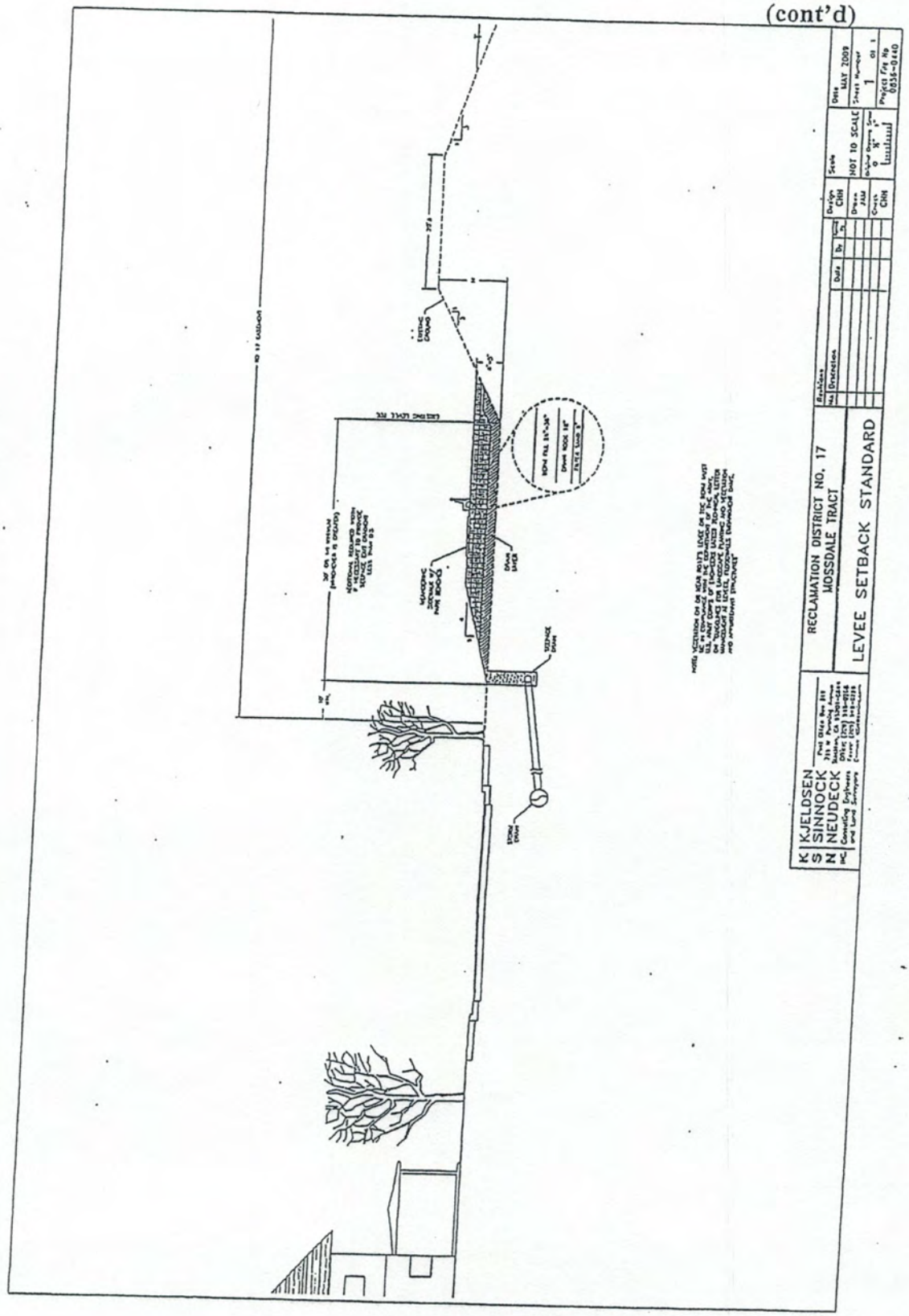


TERRA LAND GROUP, LLC

EXHIBIT "2"

5151 E. ALMONDWOOD DRIVE MANTECA, CA 95337

Letter 7
(cont'd)



TERRA LAND GROUP, LLC

EXHIBIT "3"

5151 E. ALMONDWOOD DRIVE MANTECA, CA 95337

From: Nomellini, Grilli & McDaniel PLCs [mailto:ngmplcs@pacbell.net]
Sent: Wednesday, December 29, 2010 4:48 PM
To: Durrer, Erika
Cc: Chris Neudeck'; Stone, Jim
Subject: Terra Ranch Subdivision DEIR Sch#.2010072054

Letter 7

Erika Durrer: Reclamation District No. 17 submits the following comments. Attached please find copy
7-1 of May 19, 2009 letter from Kjeldsen, Sinnock & Neudeck, Inc to Mark Meissner commenting on the preliminary tentative map for the Trails e project which are relevant to this project as well. Such comments are incorporated herein. Since such comments were submitted the setback required by DWR
7-2 and the USACE has increased from 10ft to 15ft and poswibly 20ft. The RD 17 Levee Setback Standard should be adjusted accordingly. Engineering and O&M requirements are evolving and becoming more rigid. Excavations for swimming pools and other purposes outside the levee easements are increasingly being recognized as having the potential for affecting under seepage and therefore levee stability.
7-3 Location of ample open space along the levees coupled with a single loaded street as a buffer from development is highly recommended. The Terra Ranch plan appears to incorporate the single loaded street and a setback. The setback may have to be increased and excavations as far as 300ft may be restricted. The single loaded street with an adequate setback will add flexibility to accommodate future levee requirements, avoid conflicting encroachments and improve access for patrol and floodlighting.
7-4 Thank you for your consideration. Dante John Nomellini, Secretary and Counsel for Reclamation District No 17

Nomellini, Grilli & McDaniel
Professional Law Corporations
235 East Weber Avenue
Stockton, CA 95202
Mailing address:
P.O. Box 1461
Stockton, CA 95201-1461
Telephone: (209) 465-5883
Facsimile: (209) 465-3956
Email: ngmplcs@pacbell.net

TERRA LAND GROUP, LLC

EXHIBIT "4"

5151 E. ALMONDWOOD DRIVE MANTECA, CA 95337

From: Sam Bologna <sbologna@ssjid.com>
To: Marty Harris (harrismw1@aol.com) <harrismw1@aol.com>
Cc: Sam Bologna <sbologna@ssjid.com>
Subject: Water levels
Date: Tue, Dec 3, 2013 2:55 pm
Attachments: Lateral_W_water_levels.PDF (4327K)

Marty,

Attached are a couple of maps that show the irrigation supply line (Lateral "W"), where you plan to make your connection. The Lateral is a 42" pipeline that will handle 25 CFS flow. The elevations on the maps show where the high water marks are in the systems that are taken from the upstream box, east of Airport way. Unfortunately, we could not find any water surface elevation information at the end of the line. Please let me know if there is anything else you might need.

Sam Bologna

Engineering Department Manager

South San Joaquin Irrigation District

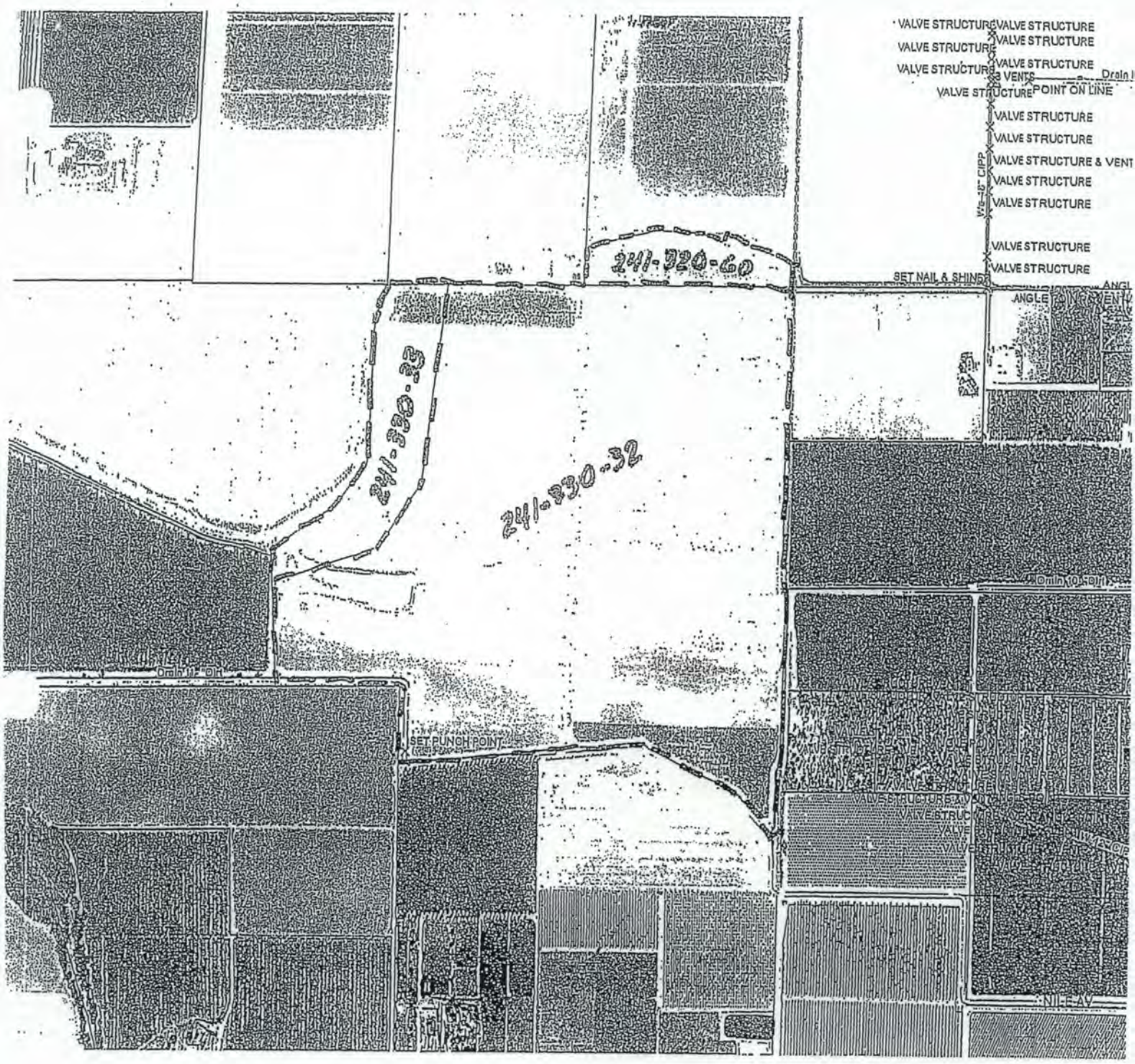
P.O. Box 747

Ripon, Ca. 95366

(209) 249-4617 direct phone

(209) 249-4651 direct fax

(209) 456-1574 cell phone


VALVE STRUCTURE
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3 VENTS
POINT ON LINE
Drain
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241-330-33
241-330-32
SET NAIL & SHINER
ANGLE
SET PUNCH POINT
Drain
Drain

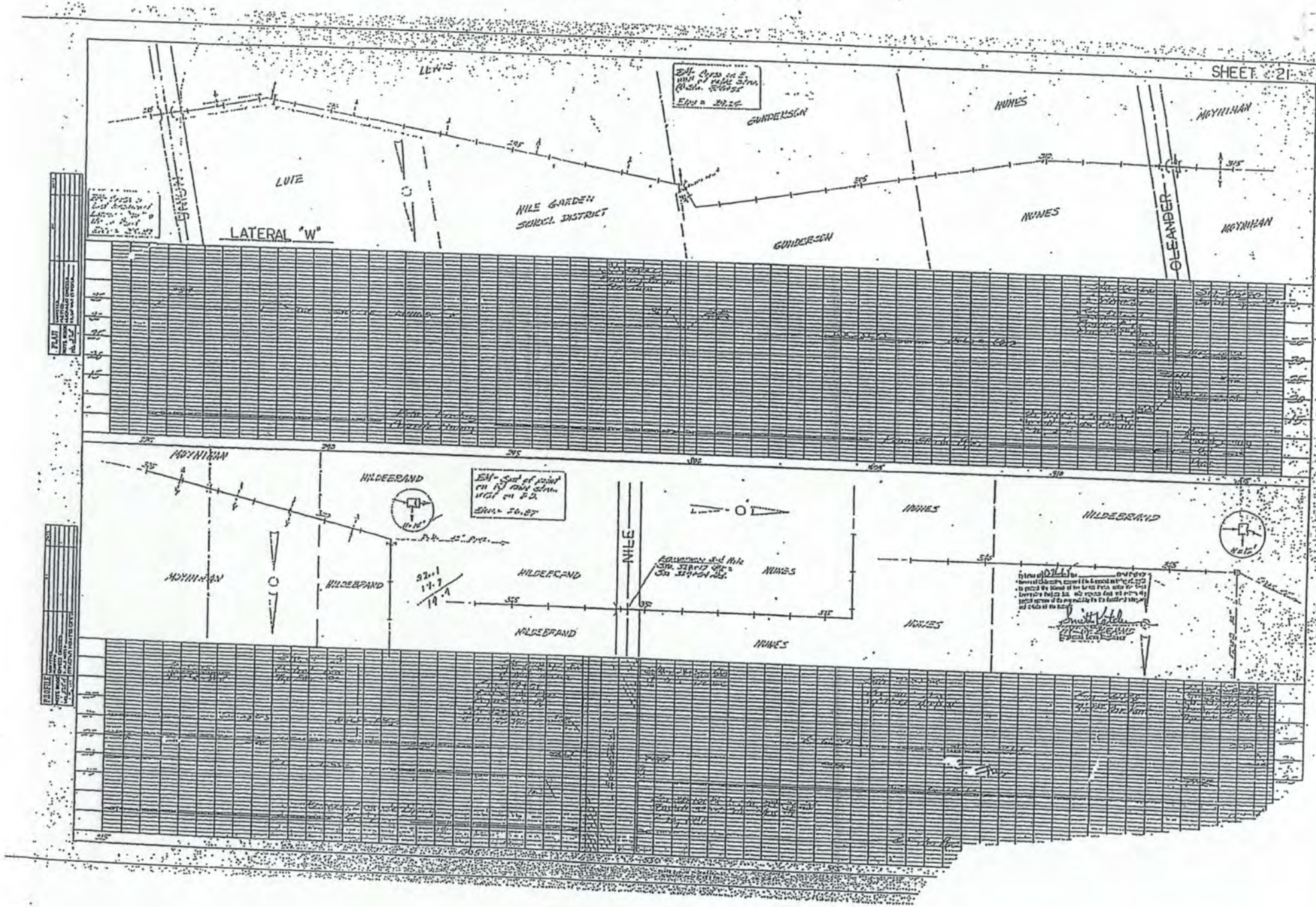
SHEET 21
LEWIS
GUNDERSON
NUNES
MOYNIHAN
LUTE
NILE GARDEN SCHOOL DISTRICT
LATERAL "W"
OLEANDER
HILDEBRAND
NILE

EXHIBIT "5"

Proposed Terms of Supplement to Annexation Agreement

November 7, 2014

1. The supplemental agreement entitles landowner to buy water transferred from the District under the following terms.
2. SSJID and landowner will make all reasonable efforts to complete annexation expeditiously.
3. Regardless of when or whether annexation is approved by LAFCo, SSJID will make water available during the annual irrigation season as soon as:
    a. Landowner has applied to the District for annexation and has paid the portion of the annexation fee required with the application.
    b. The Board has taken such action as is required by CEQA and approved the agreement.
    c. All District and private facilities necessary to provide service to the land are installed and in a condition satisfactory to District.
    d. Other requisite conditions are satisfied (i. e., environmental review), and,
4. All provisions relating to new facilities are identical to provisions in the annexation agreement. So, the cost for installing new District facilities is at landowner's expense.
5. The land will have the same Tier 2 priority for water supply under this supplemental agreement as it will have after annexation.
6. The entitlement fee entitles landowner to the rights granted in the supplemental agreement:
    a. The amount of the entitlement fee is 75% of the annexation fee.
    b. The entitlement fee is due upon Board approval of the supplemental agreement.
    c. The entitlement fee becomes nonrefundable upon board approval of the supplemental agreement.
    d. The payment schedule for the financing plan is coordinated with the annexation payment schedule:
        i. The 25% portion of the annexation fee paid with the annexation application counts toward the entitlement fee. This amount equals 1/3 of the entitlement fee. This leaves an amount equal to 2/3 of the entitlement fee due upon Board approval of this agreement (See examples below). SSJID may agree to a reasonable financing plan for this 2/3 portion of the entitlement fee, including interest on the deferred portion.