

# PLAN TO MINIMIZE IMPACTS TO ADJACENT LANDOWNERS

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For the Bedford Wash and Temescal Wash Flood  
Protection Corridor Restoration Project

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## Introduction

The Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act of March 2000 (Proposition 13) created the Flood Protection Corridor Program. The Program is authorized to fund projects providing nonstructural approaches to flood management, including the acquisition and restoration of wildlife habitat and agricultural land preservation. Proposition 13 requires the Department of Water Resources to ensure prior to acquiring any interest in land for the Flood Protection Corridor Program (California Water Code Section 79041) that a plan to minimize the impacts on adjacent landowners is prepared and approved. The plan must include an evaluation of the impact on floodwaters, the structural integrity of affected levees, diversion facilities, customary agricultural husbandry practices and timber extraction operations, and an evaluation with regard to the maintenance required for any facilities that are proposed to be constructed or altered.

Agreement 4600003310 for the Bedford Wash and Temescal Wash Flood Protection Corridor Restoration Project (FPCRP) in Temescal Canyon, requires that the Riverside-Corona Resource Conservation District (RCRCD) prepare a “Plan to Minimize Impacts to Adjacent Landowners” (herein Plan) prior to disbursement of property acquisition funds under this Agreement. A Plan is also required prior to implementing any changes in topography or vegetation including earthmoving or planting or cessation of maintenance of vegetation that could affect the flow of floodwaters or surface storm water runoff on the properties acquired or to be modified as part of the Scope of Work of the original agreement. The Plan shall be subject to State approval (Section 79041, Division 26, Chapter 5, Article 2.5), and it shall comply with all applicable requirements of all applicable federal, State and local laws, rules and regulations. The Plan submitted here is an update of the one submitted in May 2004 as a part of the Approved Scope of Work for the Agreement 4600003310 (herein FPCRP Agreement).

The improvements to the embankment of Temescal Wash as part of the FPCRP were covered in the initial “Plan to Minimize Impacts to Adjacent Landowners” submitted as part of the initial Scope of Work for the FPCRP. In association with the improvements, the original Plan stated that Temescal Canyon Properties-8, LLC (herein TCP-8, LLC) submitted a request for FEMA to prepare a Conditional Letter of Map Revision (CLOMR). Since that submission on May 15, 2004, two corrected models for the CLOMR were provided to FEMA. The corrected models are cited in the present Plan. In addition, four amendments have been made to the FPCRP Agreement. The Plan developed in this current document focuses on three project components of the FPCRP Agreement as amended July 24, 2012 (Amendment 4). The project areas are shown on maps in Attachment A for these three main project components:

- Bank stabilization and restoration project with a Slope Conservation Easement.
- Acquisition of a 15-acre Bedford Confluence Parcel (increased from 5 acres).
- Potential purchase of up to a 0.72-acre Buffer Conservation Easement.

Public notice for the entire project was provided in 2003. A total of 11 area residents, landowners, public agency representatives and project participants attended the August 27, 2003 meeting.

## **Department of Water Resources' Interest in Providing Funds to Implement the Bedford Wash and Temescal Wash Flood Protection Corridor Restoration Project**

Bedford Wash and especially Temescal Wash are major local drainages located within designated FEMA 100-year Flood Plain (see maps, Attachment B). Temescal Wash is a relatively major drainage basin of 60,000 acres at the point that it crosses the project area. The project seeks to establish a permanent location for Bedford Wash which at the time flowed over Temescal Canyon Road from a crude unlined channel at a location 500 feet south of its original location, onto a confluence with Temescal Wash. Temescal Wash meanders through the eastern portion of a 543-acre area utilized for silica mining for more than 60 years. Much of that area outside the Wash has been reclaimed through redevelopment. The natural banks of Temescal Wash had been encroached upon by past mining operations resulting in steep, manmade banks composed of rejected material (fine sand, silts, and clay) from the silica mining. The banks were highly erosive and subject to failure. The wash consistently reclaimed its natural banks resulting in debris and heavy siltation which impacted downstream areas including the Santa Ana River. The FPCRP reshaped the banks of Temescal Wash in a collaboration between the Riverside-Corona Resource Conservation District (RCRCD) and a local land-owner, Temescal Canyon Properties-8, LLC. As per the Scope of Work, the full project was set up to:

- 1.) Set aside acreage within Bedford Wash for the future construction of a de-sedimentation and transitory storage basin and to ensure that a portion of the Wash will be utilized as an important wildlife linkage between Temescal Wash and the Cleveland National Forest,*
- 2.) Stabilize the conditions described within Temescal Wash through the implementation of flood proofing structures required to provide the wash stability, reliability, and separation from the surrounding activities utilizing a variety of methods including laying the slopes back and armoring the critical bank locations with a combination of pervious riprap containing holes for vegetation, and vegetation alone or in combination with slope stabilizing fabric such as geonetting, and*
- 3.) Improve conditions to support wildlife habitat functions through improved water quality and channel flow and bank and slope planting along stabilized areas of the Wash.*

Of the major goals, 1) above, has yet to be achieved. The RCRCD is in the process of acquiring a 15-acre parcel (Bedford Confluence Parcel) to satisfy this important portion of the FPCRP. The bank stabilization and habitat restoration portion of the project under 2) and 3) are nearly complete. In addition, the RCRCD is negotiating with the property owners to establish further improvements including a native grass buffer along the edge of the golf course adjacent to the top edge of the restored embankments to protect the slope areas from runoff and erosion from broken irrigation lines and sprinklers. The benefits of these three FPCRP components are described below.

## **Bank Stabilization and Restoration Project:**

This major portion of the FPCRP involved reshaping the existing banks along Temescal Wash from artificial unconsolidated fill into stabilized compacted earthen slopes of 1.5 to 1 or flatter aspects, restoring the habitat with native plants, and placing a Slope Conservation Easement over the improved slopes and embankments. The slopes were armored using several methods combined with planting native plants to enhance slope stability and habitat for wildlife. A full armor slope protection system using High Performance-HPTRM geotextile material (identified as RM-2-Pyramat) was installed in critical locations at the toe of the slopes where potential downcutting, erosion or lateral movement of the stream gradient would occur. Some of the RM-2 stabilized banks occurred adjacent to an existing conservation easement held by the RCRCDC and all RM-2 areas were adjacent to portions of Temescal Wash where high water velocities and potential bank erosion required heightened protection. A more conventional slope stabilization system (identified as RM-1-Landlok CS2 brand) was installed on the upper slope areas, usually above the high water mark, in locations less prone to critical erosion but prone to erosion from stormwater and irrigation runoff from the adjacent golf course property. Both the RM-1 and RM-2 areas were revegetated using native plant palettes appropriate to the elevation and position above the main channel. The revegetation palettes utilized plant species native to the local plant communities. In all, about 5 acres of restructured and stabilized banks were hydroseeded and/or planted with native grasses, trees, shrubs and cuttings to reinforce the banks and improve the anchoring of the bio-engineered RM-1/RM-2 materials.

## **Bedford Confluence Parcel:**

The RCRCDC plans to purchase the 15-acre Bedford Confluence Parcel with existing DWR grant funds. The acreage will serve as a flood easement conveyance for the purposes of: 1.) Protecting the floodplain area from inappropriate or incompatible development; 2.) Preserving the channel/floodplain location which historically functioned as part of a regionally significant east-west wildlife corridor; 3.) Encouraging and promoting wildlife habitat; 4.) Preserve the location for the future restoration of the floodplain/wash as significant habitat and a functioning wildlife linkage between Temescal Wash and the Cleveland National Forest; 5.) Allow future flood management projects, as needed and as approved by DWR and Riverside County Flood and Water Conservation District, on the westerly five acres of the parcel for sediment capture to manage sedimentation, water quality, and habitat of downstream reaches; 6.) Promoting transitory water storage; and 7.) Establishing a permanent location for Bedford Wash.

## **Buffer Conservation Easement with Native Grass Buffer:**

The golf course construction crew installed the sprinklers and irrigation main lines too close to the slopes. A number of areas of the restored slopes have been subjected to erosive waters from high-pressure irrigation leaks at the edge of the golf course. This portion of the project would move sprinklers and irrigation lines away from the edge of the slopes and install a deep-rooted, approximately 4 to 5 foot wide native bunch grass buffer at the edge of the golf course adjacent to the most vulnerable slopes. An approximately 0.72 Buffer Conservation Easement would be placed over these protective improvements. The narrow, linear (mostly 5 feet to 8 feet wide) easement would be along the edge of the golf course immediately adjacent to the existing Slope Conservation Easement. These improvements are expected to decrease erosion from above,

improve the structural integrity of the upper slopes, and decrease sedimentation of the channel below.

## Evaluation of the Impact of the Project on Floodwaters

### Bank Stabilization and Restoration Project:

Based on the initial scope of work for the bank stabilization and improvement plans for Temescal Wash, located within the Special Flood Hazard Area, an application for a Conditional Letter of Map Revision (CLOMR) for Tract Number 31530 of Temescal Canyon Wash was prepared by MV Consulting Engineers, INC. for Temescal Canyon Properties-8, LLC in March 2004. The application was processed through the Federal Emergency Management Agency (FEMA) and a request for supplemental information was made by FEMA. A Supplemental Report for the CLOMR was submitted in July 2004.

### *Project CLOMR:*

All the projects described in the CLOMR request were established to mitigate erosion and sedimentation within the Temescal Wash through bank stabilization (part of which was the bioengineering part of the FPCRP) and to implement a Mitigation, Monitoring, and Management plan for the restoration of an additional 12.8 acres of riparian vegetation after removing stands of *Arundo* (a separate but adjacent project to the FPCRP). The 12.8-acre restoration project involved weeding invasive species and planting native riparian vegetation within degraded portions of the channel of Temescal Wash adjacent to the banks stabilized by the FPCRP project. Separating the effects of the FPCRP-funded portion of the project from other stabilization and restoration work would have been nearly impossible and irrelevant to a CLOMR. A corrected hydrological model involving all improvements was run in July 2004. The study concluded that the proposed bank stabilization and restoration would have no floodwater impacts on the adjacent properties. The revised hydraulic models included a Duplicate Effective Model, a Pre Project Conditions Model, and a Post Project Conditions Model.

The resulting CLOMR 04-09-1005R prepared by FEMA November 4, 2004 stated that the data submitted to prepare the effective FIRM and Flood Boundary and Floodway Map (FBFM) for the community met the minimum floodplain management criteria of the National Flood Insurance Program (NFIP). Based on the grading plans, maps, and hydraulic data submitted, a revision to Flood Insurance Rate Map (FIRM) and FLOODWAY was warranted. FEMA stated that upon completion of the project, the community “may submit the data listed below and request that we make a final determination on revising the effective FIRM, FBFM, and FIS report”. The list included:

- Detailed application and certification forms.
- If as-build conditions differ from preliminary plans, submit:
  - Form 2, Riverine Hydrology & Hydraulics Form
  - Form 3, “Riverine Structures Form”
- Topographic map showing the revised floodplain and floodway boundaries.
- Payment of fees.

- Hydraulic analyses based on as built conditions.
- As built plans, certified by a registered professional engineer, of all proposed project elements.
- As built plans with engineering stamp.
- Community acknowledgement of the map revision request.

### ***Project LOMR:***

One Letter of Map Revision (LOMR 07-09-0879P) was linked to this CLOMR. In addition to the embankment improvements and restoration, the LOMR considered the construction of three bridges that were not a part of the FPCRP or the original CLOMR request and modeling. The supplemental data provided to FEMA incorporated these bridges in the as-built plan. One of the three bridges was adjacent to bank stabilization work and restoration done as part of the FPCRP. The other two bridges were nearby.

We found no LOMR resulting from only the bank stabilization and restoration projects. It made more sense for the applicant and FEMA to focus on a comprehensive model based on all improvements and as-built changes. By examining the studies associated with the CLOMR and the LOMR it appears that bridge structures and channel restoration included in the final model had a larger effect on the floodway and water surface elevations than just the slope reconstruction project. The effects of the slope reconstruction and restoration can be considered beneficial and can only have positive effect on upstream and downstream landowners.

### ***The Hydrological Model:***

The July 2004 supplemental hydrological study associated with CLOMR 04-09-1005R updated the results reported in the original Plan to Minimize Impacts to Adjacent Landowners. The July submittal for the CLOMR did not incorporate the three bridges that were eventually incorporated into the as-built plan. The July 2004 letter and data were submitted by Massoud Vatankhahi, P.E. for TCP-8, LLC. For the analysis, more cross sections from up and downstream of the project reach were added. These included survey points 608+73 and 610+13 at the upstream and 521+21, 521+01, 520+81, 517+76, 512+26 and 503+76 at the downstream end of the project area. Floodplain/floodway analyses were done for the revised reach for both pre-project and post-project condition models. Based on model results topographic work maps were submitted that delineated the floodplain and floodway boundaries for pre and post project conditions, and how they tie into the effective floodway boundary. Also included were a modified 100-year flood profile for the revised reach, revised floodway data indicating limits of the revision, revised floodway boundary delineation on FEMA Floodway Map, and electronic files of the models used for the revision. The revised duplicate effective model indicated that the BFEs are within 0.1 foot of the effective BFEs in the HEC-2 model. Sediment transport was not considered because the project included work to armor areas that were susceptible to erosion using a combination of RIP-RAP and equal protection materials (e.g., RM-1 and RM-2 techniques for bioengineering). Due to lower elevations of minimum channel elevations the floodplain elevations are lower than the effective model of November 20, 1996, except the reach between approximately 550 feet upstream of cross section "O" and cross section "P" within the proposed project. Mr. Vatankhahi stated that the floodway analysis of Temescal Wash will show that in the post-

project condition, the floodway will be contained in the channel and will have no impacts on adjacent properties.

The data from the HEC-2 model prepared by Schaarf and Wheeler Consulting Engineers used Army Corps of Engineers’ HEC-2 model in the original study. This model was incorporated into the Army Corps Engineers Hydrological Engineering Center for river analysis (HEC-RAS) model and was selected as the Duplicate Effective Model. The pre proposed model was developed based on the cross sections as shown on the floodplain map using the recently flown aerial topography. The cross sections taken from FIS were also used to develop a more current model of the river channel. The proposed model was developed based on proposed site grading conditions. The results of the pre-proposed models were analyzed and were presented in the supplemental report.

Evidently, after the official CLOMR of 11/4/04, the as built models and maps were submitted as requested. Revised data for the hydraulic models were dated April 19, 2007. The resulting LOMR 07-09-0879P states, “a hydraulic analysis was performed to incorporate updated topographic information and the effects of installation of three bridges across Temescal Wash from approximately 100 feet upstream to approximately 8,900 feet upstream of Cajalco Road. This has resulted in a revised delineation of the regulatory floodway, increases and decreases in SFHA width, and increased and decreased BFEs for Temescal Wash”. Table 1, below shows the existing and modified BFEs for two locations along the affected lengths of Temescal Wash.

**TABLE 1. Effective Model vs. Corrected Effective Model Comparison**

<b>Station</b>	<b>Effective BFE (feet)*</b>	<b>Revised BFE (feet)*</b>
Approximately 500 feet upstream (south) of Cajalco Road.	802	803
Approximately 8,700 feet upstream of Cajalco Road	868	869

\*National Geodetic Vertical Datum, rounded to nearest whole foot.

This notice of changes was published in the *Federal Register* and in the local newspaper, the *Press Enterprise*, 06/14/2007 and 06/21/2007.

The LOMR included a detailed table of flooding source, floodway, and base flood water surface elevations for 26 cross sections (A-Z) based on the revised data of April 19, 2007. These data are included in Attachment B. Increases in water surface elevation occurred for 16 of the 24 cross sections, and ranged from 0.1 to 0.9 feet with the highest elevations (0.6 feet to 0.9 feet) at cross sections I, J, K, between Joseph Canyon and Cajalco Road (downstream of Cajalco Road, likely due to two other projects) and N, O, and P (upstream and south of Cajalco Road). Two other construction projects nearby that were not part of the FPCRP were issued LOMRs (see below).

### ***Slope Conservation Easement:***

There is a Slope Conservation Easement in place as an instrument to protect the improved embankments. The dedication of a Slope Conservation Easement over the improved slopes and embankments will allow long-term management and protection of the improved slopes. The easement will benefit adjacent property owners because it will ensure against unwanted erosion of the slopes and sedimentation of Temescal Wash during flood stage. No other effects on flood waters are expected to occur.

### **Bedford Confluence Parcel:**

A 15-acre Bedford Confluence Parcel is to be purchased with funding from the revised FPCRP Agreement per Amendment. A portion of this area is within the boundary of the LOMR described above. The 15-acre parcel includes an area for a 5-acre transitory storage and de-sedimentation area, a permanent location for the confluence of Bedford Wash and Temescal Wash, and contiguous areas along the main channel of Temescal Wash, including the channel adjacent to the northernmost slopes improved as a part of the original Scope of Work for the FPCRP. A conservation easement will be placed over the entire 15-acre parcel, with at least five acres of the westerly portion of the Bedford Wash segment of the parcel designated for future use as a sediment collection and transitory storage area for flood waters and the remainder of the parcel managed to convey flood waters, as wildlife habitat, and as a wildlife corridor. Title over the 5-acre transitory storage area of the Bedford Wash portion of the parcel may, in the future be passed on to the Riverside County Flood Control and Water Conservation District (RCFCWCD) if RCFCWCD requests it. The adjacent Bedford Wash/Temescal Wash confluence and Temescal Wash portion of the parcel will be placed under conservation and may undergo habitat enhancement and restoration work to decrease erosion potential, improve wildlife habitat, and improve native ecosystem function and values. Any restoration and enhancement within the 15-acre parcel is expected to decrease erosion, scour, and sedimentation while increasing the habitat value of the area.

The purchase and management of the Bedford Confluence Parcel, the management of the easterly 5 acres as a transitory flood storage and de-sedimentation area, and the management of the downstream 10 acres for transitory flood storage and wildlife habitat is not expected to have any impacts on floodwaters other than beneficial effects, including, but not limited to damping of peak flows, capture of sediments, and decreased downstream erosion. The upstream areas are already channelized with concrete and riprap. There is no reason to prepare a CLOMR request for the purchase of the 15-acre Bedford Confluence Parcel. Preservation of the area is not expected to generate changes in floodway or surface water elevations. Much of the parcel is covered by native riparian vegetation, including the western 5-acres. The western edge of the parcel is within the apron of a channelized portion of Bedford Wash. The apron of the channel spreads flows over the western portion of the parcel. The riprap floor of the apron became filled with sediments during January 2011 storms. Subsequently, the sediments become colonized naturally with native plants. Some weeding of invasive plants, such as Arundo and castor bean has occurred over the apron and on several adjacent acres within the parcel. The resulting vegetation will help to control erosion, capture sediments, and provide rich habitat for wildlife.

There are other projects outside the FCPRP that have had potential effects on floodwaters within the Bedford Parcel in recent years, including the channelization that created the rip rap apron on the western edge of the parcel. In a search of FEMA records, three LOMRs in addition to LOMR 04-09-1005R were within the same FIRM panels occupied by portions of the FPCR. One LOMR was for a bridge and channelization of a portion of Bedford Wash in the vicinity of Temescal Canyon Road, westerly of the confluence with Temescal Wash. A portion of that project includes the apron mentioned above. Two additional LOMRs were located that have affected reaches of Temescal or Bedford Wash within the boundaries of the 15-acre Bedford Confluence Parcel. All these LOMRs resulted in the most recent changes to FLOODWAY and FIRM maps in the vicinity of the FPCR.

***Other CLOMR/LOMRs for Nearby Projects:***

The following bridge projects that resulted in LOMRs were not a part of the Scope of Work for the FPCR, but land within the FPCR was affected by the changes. CLOMR 04-09-0847R was submitted by FEMA in July 30, 2004 to the Riverside County Board of Supervisors regarding a corrected hydrological model that incorporated the effects of updated topographic information, construction of a bridge at Cajalco Road, channelization from approximately 800 feet downstream of Cajalco Road to approximately 200 feet upstream of the confluence with Joseph Canyon, and grading from just downstream of Cajalco Road to approximately 200 feet downstream of the confluence with Joseph Canyon. The changes in the model were reflected in a revision of the Flood Boundary and Floodway Map for the area along Temescal Wash from just north of Joseph Canyon upstream and southerly of the confluence between Bedford Wash and Temescal Wash. The updated model resulted in a revised delineation of the regulatory floodway. (The CLOMR and data were provided to TCP-8, LLC for consideration regarding CLOMR 04-09-1005R).

FEMA submitted a Letter of Map Revision (LOMR 06-09-BD43P) for flood plain management dated Dec. 21, 2006. The information was to be published in the Federal Register and a notice in the Press Enterprise 1/11/07 and 1/18/07, prior to the submission of the final models for LOMR 07-09-0879P. The new FIRM and FLOODWAY maps were subsequently approved.

The corrected hydrological model resulted in changes in delineation of the Base Flood Elevations (BFEs) and the need to revise the FIRM for the community. The revised data resulted in elevation changes of less than a foot in four of five locations, and no difference in one other.

**TABLE 2. Effective Model vs. Corrected Effective Model Comparison**

<b>Station</b>	<b>Existing BFE (feet)*</b>	<b>Modified BFE (feet)*</b>	<b>ΔH (ft.)</b>
Approximately 6,100 feet downstream (north) of Cajalco Rd.	773	774	1
Approximately 650 feet upstream (south) of Cajalco Road	803	804	1

\*National Geodetic Vertical Datum, rounded to nearest whole foot.

LOMR 07-09-1194P was submitted by FEMA October 19, 2007 to the Mayor of the City of Corona regarding map revisions resulting from the construction of a bridge over Bedford Wash at Temescal Canyon Road, channelization of a portion of the wash, and fill. A hydraulic analysis was performed to incorporate updated topographic information along Bedford Canyon Wash from confluence with Temescal Wash to approximately 1,300 feet upstream of Temescal Canyon Road and resulted in an increase in SFHA width, a decrease in SFHA width, establishment of floodway and establishment of BFEs for Bedford Canyon Wash. Table 4 shows existing and modified BFEs for selected locations along the lengths of the flooding source.

**TABLE 3. Elevations Based on Corrected Model Associated with Flooding of Bedford Wash**

Station	Existing BFE (feet)*	Modified BFE (feet)*	Lat/Long Coordinates
Just upstream of confluence with Temescal Wash.	*0	*802	33° 49' 30.10"/ 117° 30' 25.90" -
Approximately 650 feet upstream (south) of Cajalco Road	*0	*882	33° 49' 14.31"/ 117° 30' 54.86" -

\*Elevation in feet (NGVD).

### Buffer Conservation Easement with Native Grass Buffer:

The potential placement of a linear Buffer Conservation Easement planted with native bunch grasses along the edge of the existing golf course adjacent to the tops of the improved slopes of the Slope Conservation Easement will have no adverse effect on flood waters. The Buffer is expected to help hold the slopes during floods or excessive runoff from above. The District plans to move irrigation lines and sprinklers that are currently immediately adjacent to the top of the slopes. The irrigation system has had numerous breaks that have eroded large sections of the improved slopes, causing sedimentation of the streambed and setbacks in the restoration process. Once the irrigation lines are moved, a native bunch grass buffer will be planted along the edge of the Buffer Easement next to the Slope Conservation Easement. The deep-rooted bunch grasses are expected to provide enhanced aesthetics and increase slope stability at the top of the slopes bordering the existing golf course. Moving the irrigation lines will result substantially decrease the opportunity for broken sprinklers to erode the slopes. The buffer will also decrease the spread of invasive species from the golf course into the Slope Conservation Easement.

### Structural Integrity of Affected Levees and Diversion Facilities

Conditions that existed at the start of this FPCRP Agreement included impacts to adjacent up and downstream landowners, such as mass wasting and scour along banks, heavy sedimentation and disruptions and the restricted flow of floodwaters due to the rough and highly variable channel

banks. These problems and any potential negative effects on any up and downstream levees and diversion facilities have been greatly reduced as a result of the channel and bank improvements implemented by this project. The reshaping/re-contouring of existing banks within the project has resulted in greater capacity to pass flood flows. The reinforced banks held up to high flows in January 2010. The new and more uniform channel geometry significantly reduces the downstream sedimentation and flooding that had been impacting adjacent lands as well as habitat and flows as far downstream as the Santa Ana River and upstream to Dawson Canyon and perhaps as far as Corona Lake.

Adjacent landowners will additionally benefit from the purchase of the 15-acre Bedford Confluence Parcel for storage and passage of flood waters. The dedication of the 5-acre desiltation/transitory storage area at the end of Bedford Wash adjacent to its confluence with Temescal Wash, and the additional 10 acres for transitory flood storage, wildlife habitat, and as a wildlife corridor will help to maintain any levees up and downstream of the project area. The increase from 5 to 15 acres allows incorporation of the entire confluence area which will allow a higher capacity for sediment capture of flood water storage than before. There are no levees, structures, diversions, grading, or other plans for the 15-acre parcel that could influence the elevation of flood waters or affect levees.

The stabilization and restoration work undertaken within Temescal Wash is critical to the success of the future desiltation/transitory storage area and the integrity of the Temescal Wash at its confluence with Bedford Wash. This area will further reduce the amount of sediment downstream of the Temescal Wash as well as the peak runoffs. Aside from the channel improvements undertaken by the Scope of Work and the future transitory storage and de-sedimentation area discussed, no other levees or diversion facilities are impacted by the project.

The proposed Buffer Conservation Easement is a 0.72 acre, narrow, linear (mostly 5 feet to 8 feet wide) easement along the edge of the golf course adjacent to the Slope Conservation Easement. If anything, the improvements within this easement will improve the integrity of the adjacent, improved slopes. There would be no levees or diversions associated with the Buffer Conservation Easement.

## **Impact on Customary Agricultural Husbandry Practices and Timber Extraction Operations**

Land uses adjacent to the entire project area do not include agricultural or timber extraction uses. Hence the project does not impact customary agricultural husbandry practices or timber extraction operations.

## Evaluation of Maintenance Required for Proposed Facilities

### Bank Stabilization and Restoration Project:

A Slope Conservation Easement was created in favor of the RCRCDD for all the embankments and slopes that received bioengineering improvements and funding as part of the Scope of Work for the FPCRP Agreement. The improved banks require ongoing weeding maintenance and repair of erosion damage caused by storm water runoff, irrigation leaks, and trespassing golfers and golf ball collectors. The long-term maintenance responsibilities and funding are detailed in the Conservation Easement Deed for the improved slopes. In the agreement, RCRCDD arranges for maintenance and conducts the monitoring and reporting, in perpetuity. The current and all successor property owners are required to fund the annual maintenance of the Slope Conservation Easement and the RCRCDD is to submit a budget to the property owner annually. In addition, the RCRCDD has a separate easement agreement with the property owner for a 13.1-acre portion of the Temescal Wash immediately adjacent to a large portion of the project. There is a non-wasting endowment in favor of the RCRCDD for the long-term maintenance and management the 13.10 acre easement. The project will not require maintenance activities by adjacent landowners other than the property owner. As part of the Conservation Easement Agreement, the edges of the adjacent golf course (same owner) must be maintained so as to prevent invasion of non-native invasive species into the Conservation Easement. In addition, the owner must pay for the repair of washouts caused by problems their gold course irrigation system and water detention facilities.

### Bedford Confluence Parcel:

Long-term maintenance for the 15-acre Bedford Confluence Parcel and the Bedford Wash Flood Easement and Set-Aside is being worked out as part of the Conservation Easement Deed for the Bedford Confluence Parcel. Periodic weeding of invasive species and removal of incoming flood debris that collect within the western 5-acres of the parcel will be an ongoing maintenance requirement. Flood waters carry rhizomes of *Arundo donax* and seeds of other weed species into the 5-acre detention area. A non-wasting endowment will be set up to fund maintenance costs. The maintenance endowment will be partially funded by a line item within the budget for the FPCRP as 20% of the acquisition cost. The details are in the Scope of Work for the FPCRP. For all acreage in the deed held in favor of the RCRCDD, the RCRCDD will arrange for the maintenance of the Bedford Confluence Parcel and all monitoring and reporting will be carried out by the District. Restoration and enhancement of portions of the 15 acres will be achieved as funding permits. Additional maintenance activities for adjacent landowner properties are not necessitated by the project.

### Buffer Conservation Easement:

Establishment of a Buffer Conservation Easement with an approximately 5-ft wide native, bunchgrass buffer is expected to result in a decrease in the long-term maintenance needs within the adjacent Slope Conservation Easement and the edge of the golf course. Long-term maintenance of the approximately 0.72-acre BCE is to be provided primarily by the RCRCDD. The Conservation Easement Deed for the Buffer Conservation Easement will direct that a non-

wasting endowment be set up to help fund maintenance costs. We expect the agreement will include some assistance from the golf course crew toward maintenance. For example, all fence repairs of a split rail fence between the buffer and the improved slopes will be the responsibility of the golf course maintenance crew. The crew may also provide some assistance with occasional mowing of the native grass buffer when requested by the RCRC. The RCRC will manage the buffer irrigation system and weeding. The maintenance endowment will be partially funded by a line item within the budget for the FPCR as 20% of the acquisition cost. The golf course is currently responsible for maintenance of a denuded buffer alongside the top edge of the slopes but turf irrigation leaks and growth of Bermuda grass have been ongoing problems. The golf course has not been able to keep up with the level of maintenance needed to prevent large washouts and encroachment of Bermuda grass into the Slope Conservation Easement. Additional maintenance activities for adjacent landowner properties are not necessitated by the project.

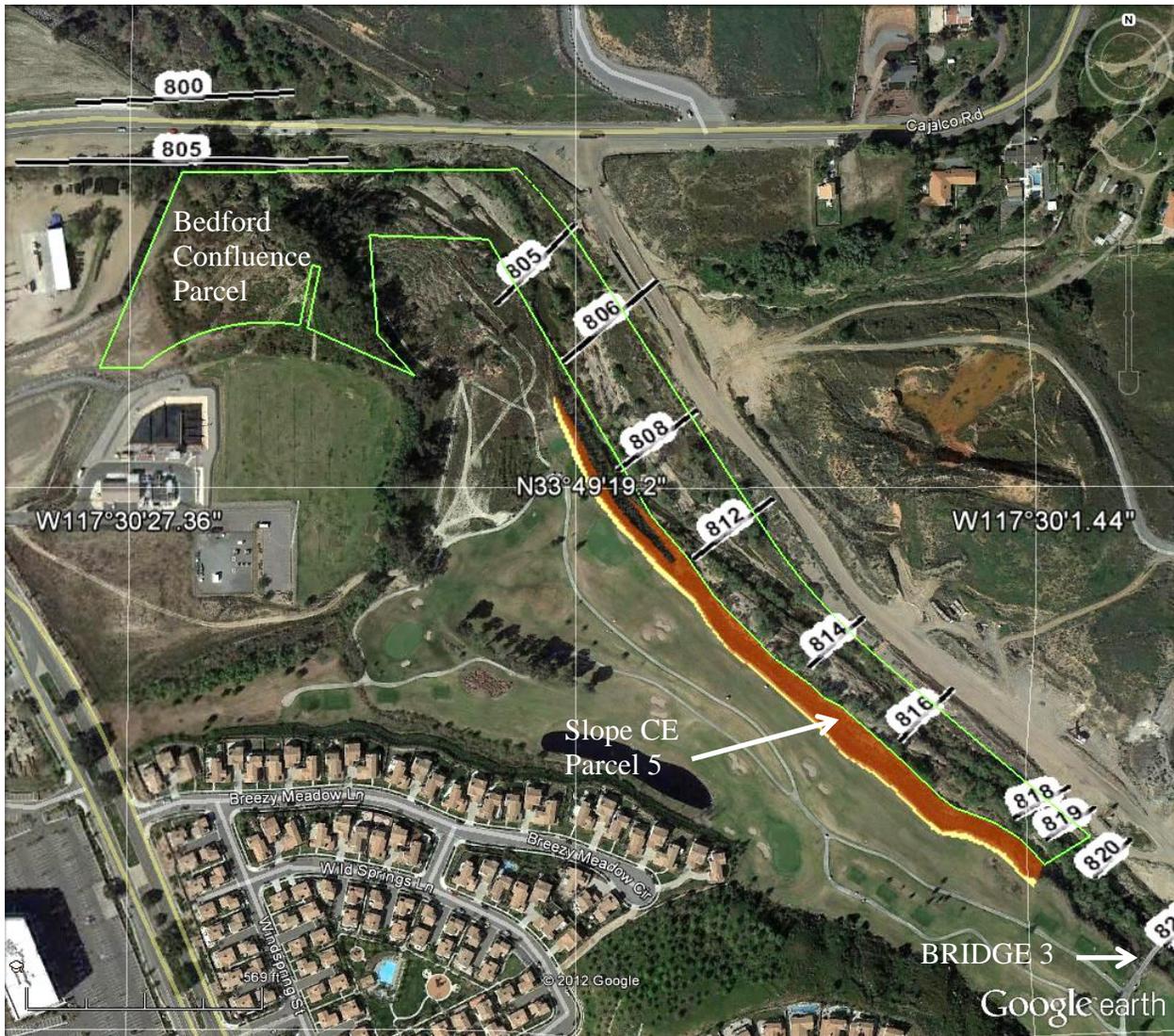
## Conclusions

In summary, the bank stabilization and restoration project, the acquisition of the 15-acre Bedford Confluence Parcel, and the proposed Buffer Conservation Easement will not have significant adverse impacts to existing adjoining property owners or to their land use practices. All of acquisitions and improvements are likely to have only beneficial effects on adjacent landowners. Areas within the FEMA 100- year floodplain and floodways that are upstream of the project are primarily within conservation easements. In addition, the acquisition of the 15-acre Bedford Confluence parcel places much of the FEMA flood plain and floodway areas immediately downstream of the slope improvement project within a conservation easement. This prevents that vulnerable land from undergoing future fill and development of structures. No fill or structures within the Temescal Wash or Bedford Wash were conducted or planned as a part of this project. The small increase in flood water elevation in the hydraulic models was due to the incorporation of OTHER Temescal Canyon Property-8, LLC projects including the installation of three bridges with supports within the stream channel and to an increase in the volume of riparian vegetation as a result of the restoration within the adjacent 13.1-acre Temescal Wash Conservation Easement that was set aside and restored as mitigation for the Dos Lagos Project.

# Attachment A: Maps of FPCRP Components

## Bedford Confluence Parcel and Slope Conservation Easement, Northern Section

The 15-acre Bedford Confluence Parcel is a shape file from the plat map and legal description of the parcel obtained May 14, 2012. In addition, the northernmost parcel number 5 of the DWR Slope Easement is shown in red and parcel number 4 of the proposed Buffer Conservation Easement is shown in yellow (also based on legal descriptions). None of these parcels overlap. The aerial map is from 3/9/2011, Google Earth. The Base Flood Elevations (feet) are from the 2008 FEMA National Flood Hazard Layer (NFHL) for Google Earth. The bridge at the bottom of the map is one of three bridges included in LOMR 07-09-0879P.



## Slope Conservation Easement, Southern Section

The Slope Conservation Easement (CE) parcels 1-4, are in red. The yellow strips are parcels 1-3 of the proposed Buffer Conservation Easement and they are immediately adjacent to the Slope CE. The Base Flood Elevations (feet) are from the 2008 FEMA National Flood Hazard Layer (NFHL) for Google Earth. The bridges are the three included in LOMR 07-09-0879P.



## Map of Proposed Buffer Conservation Easement

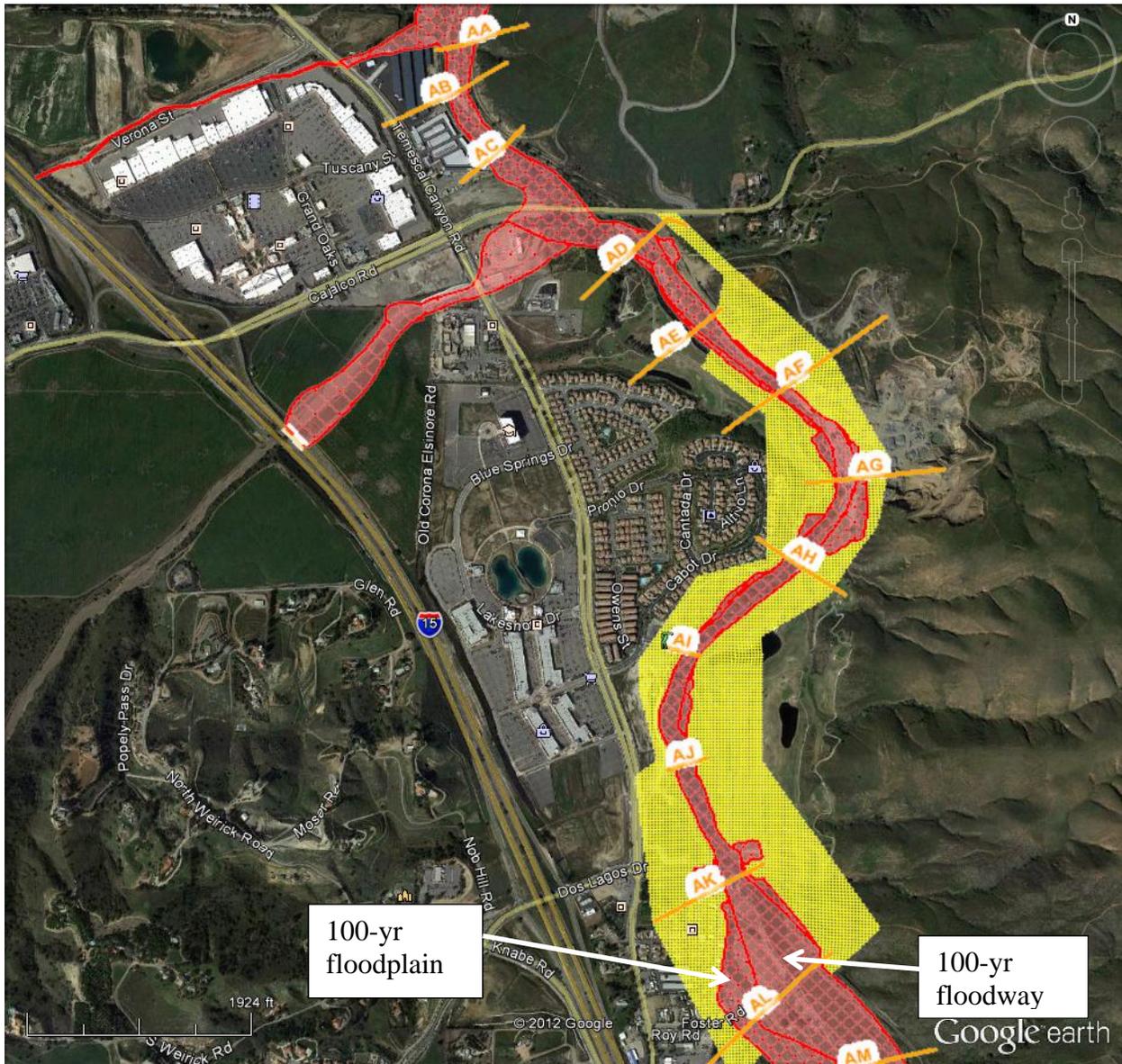
The four parcels that would make up the Buffer Conservation Easement are shown in yellow. All are adjacent to the Slope CE. The shape files were provided with the legal descriptions and plat maps of June 11, 2012. The three bridges are those included as part of the Dos Lagos Project cited in LOMR 07-09-0879P. The aerial photograph is from ESRI.



## Attachment B: FEMA Maps and Hydraulic Data

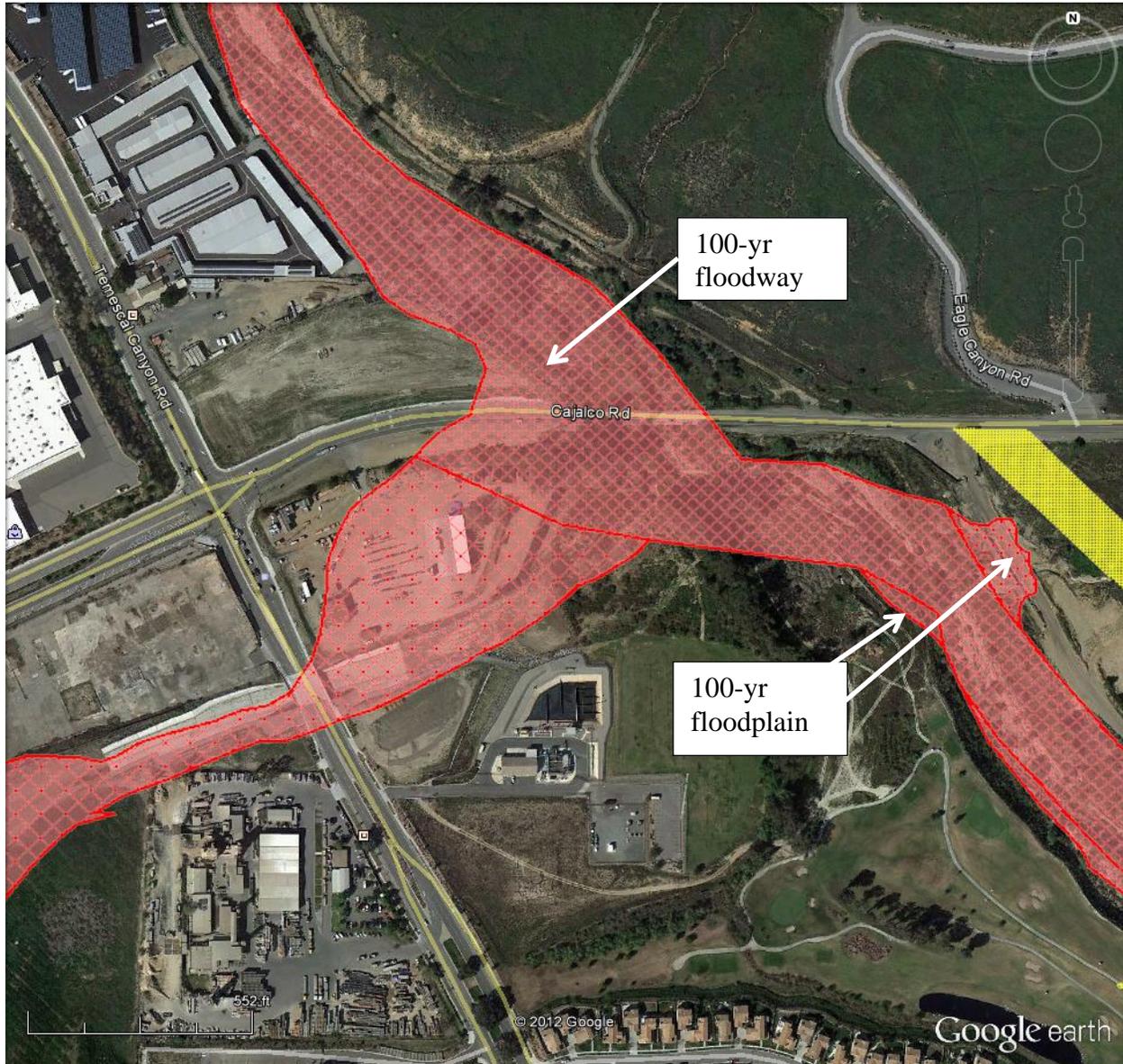
### Current FEMA Flood Zones and Cross Sections from National Flood Hazard Layer (NFHL) for Google Earth

NFHL map (updated in 2008) for area of Temescal Wash from Joseph Canyon Wash (north) to Lee Lake Water Conservation District Conservation Easement (south end), south of Dos Lagos Road. See Attachment A, close-up maps, for Base Flood Elevations. The yellow area has no flood information available from FEMA.



## Close Up of Confluence of Bedford Wash and Temescal Wash with Current FEMA, NFHL for Google Earth

NFHL map layers for the 100-year floodway and floodplain (updated in 2008) for area of Bedford Wash and Temescal Wash in the vicinity of the confluence.



## Table of Hydraulic Analysis Results for Base Flood Water Surface Elevations by Cross Section for Temescal Wash LOMR 04-09-1005R

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
		DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY WITH FLOODWAY	INCREASE
Temescal Wash		REVISED DATA PER LOMR DATED APRIL 19, 2007						
A	36,325	99	4,388	5.6	685.4	685.6	0.2	
B	38,166	541	4,245	5.7	696.1	696.1	0.0	
C	40,116	279	1,725	14.1	705.3	705.3	0.0	
D	41,116	470	3,725	6.6	714.9	715.0	0.1	
E	43,051	425	2,948	8.3	734.5	734.5	0.0	
F	45,016	371	3,445	7.1	747.0	747.0	0.0	
G	46,166	599	4,652	5.2	753.6	753.6	0.0	
H	47,916	580	3,816	6.4	764.6	764.6	0.0	
I	49,916	231	2,345	10.4	783.8	784.5	0.7	
J	50,376	185	2,612	8.7	789.9	790.5	0.6	
K	51,226	274	4,004	6.1	795.0	795.9	0.9	
L	52,626	260	2,297	10.6	802.7	802.7	0.0	
M	53,676	200	2,073	11.8	809.6	809.9	0.3	
N	54,676	110	1,318	18.5	815.2	815.8	0.6	
O	55,576	194	1,699	14.4	829.2	829.8	0.6	
P	56,276	159	2,084	11.7	835.1	835.7	0.6	
Q	57,550	111	1,345	18.1	842.4	842.6	0.2	
R	58,573	160	1,994	9.7	848.9	849.3	0.4	
S	59,723	190	1,680	11.6	857.0	857.3	0.3	
T	61,013	790	3,031	6.4	870.3	870.5	0.2	
U	62,073	480	2,424	8.0	876.6	876.6	0.0	
V	63,173	269	2,260	8.6	882.2	882.3	0.1	
W	64,323	537	5,331	3.6	884.6	884.9	0.3	
X	65,323	286	1,476	13.1	888.5	888.5	0.0	
Y	66,473	743	2,731	7.1	899.7	899.7	0.0	
Z	67,548	465	2,564	7.6	907.5	907.5	0.0	

REVISED TO REFLECT LOMR EFFECTIVE MAY 31 2007

1 Feet above confluence with Santa Ana River

REVISOR DATA

FEDERAL EMERGENCY MANAGEMENT AGENCY  
**RIVERSIDE COUNTY, CA**  
 (UNINCORPORATED AREAS)

FLOODWAY DATA  
**TEMESCAL WASH**