Meeting of the Central Valley Flood Protection Board
February 24, 2012

Staff Report – Encroachment Permit
West Sacramento Area Flood Control Agency – The Rivers EIP
Mitigation Plantings and Appurtenances
West Sacramento, Yolo County, CA

1.0 – ITEM

Consider final approval of Permit No. 18313-2-1 amended (formerly numbered 18313-2a), see Attachment -B.

This project was conditionally approved by the Board on December 2, 2011 based on the final submittal of the Mitigation Monitoring and Reporting and Long-Term Management Plan, see Attachment-D.

2.0 – APPLICANT

West Sacramento Area Flood Control Agency (WSAFCA)

3.0 – LOCATION

The project is located in West Sacramento along the right (south) bank of the Sacramento River approximately 1.5 miles upstream from the American River outfall along the Riverbank Road, in Yolo County (see Attachment C). This reach of the levee is maintained by Maintenance Area (MA) 4 and the City of West Sacramento.

4.0 – DESCRIPTION

The City of West Sacramento proposes to mitigate for the loss of riparian vegetation associated with the Rivers levee modification project and the River Walk project mitigation improvements (West Sacramento Bridge District Levee Access Road and River Walk Trail). The two sites will be mitigated at The Rivers EIP site recently permitted by the CVFPB by permit number 18313-2. All recreational improvements and their construction activities will occur above the ordinary high water mark.

The work includes 1-inch to 2-inch irrigation pipes; and a total of 5,132 trees and shrubs.

5.0 – THE RIPARIAN MITIGATION SITE and LONG - TERM MANAGEMENT PLAN

On January 28, 2012 WSAFCA submitted to Board Staff the Long-Term Management Plan for the Riparian Mitigation site with 100 % Plans and Designs.

The scope of work under this Riparian Mitigation will be to:

- Clear & grub the 4.198 acres of mitigation land within the project area.
- Provide erosion control for the mitigation area.
- Prepare the soil.
- Plant approximately 975 trees and 4,157 shrubs.
- Prepare a temporary irrigation system for the establishment period.
- Provide plant maintenance for the establishment period.
- Provide Long-Term Maintenance for the plants.

5.1 - MITIGATION MONITORING AND REPORTING AND LONG-TERM MANAGEMENT PLAN (MMRLMP) PURPOSES

The purpose of the MMRLMP is to ensure that the targeted mitigation requirements are achieved. Remedial measures provide a mechanism for modifying the mitigation program if the tree mitigation site does not achieve the success criterion in Year 5.

5.2 - MITIGATION

The City will be responsible for long-term operation and maintenance of the re-vegetation mitigation features. The City will coordinate long-term maintenance activities with State Maintenance Area 4, as needed.

5.3 - IMPLEMENTATION SCHEDULE

Operation and maintenance will occur as needed in conjunction with other City maintenance activities at the site. As is typical for native restoration plantings of this type, regular operation and maintenance are expected to be relatively minor in scope. At minimum, the Mitigation Site will be checked annually for maintenance activities as follows:

5.3.1 – Post-Plant Establishment Guidelines

It is anticipated that during the first 5 years, a sufficient and healthy plant community will be established and that after this period, no plant replacement will be required. Maintenance and operations activities that will occur in perpetuity are described below.

5.3.2 - Tree Preservation

Trees and other native vegetation installed by this project will be preserved. Only those large trees that interfere with levee maintenance or inspection, interfere with

flood fighting procedures, threaten public safety, or substantially impede the hydraulic capacity of the flood protection project should be removed by the City.

5.3.3 - Elderberry Preservation

Elderberry shrubs occur in the mitigation site. When maintaining the site, no herbicides will be used in the re-vegetation area that are not approved for use near water, and no herbicides will be sprayed on or within 100 feet of elderberry shrub canopies. Weed infestations will be controlled as early as possible to prevent establishment and to minimize weed control efforts and pesticide usage.

5.3.4 - Volunteer Growth

Volunteer seedlings of native species are expected to naturally colonize the mitigation site. Volunteer seedlings will be preserved unless they are competing with installed plants, are establishing too close to the trail, are threatening public safety or the integrity of the levee, or impeding access to the levee for inspections, maintenance, or flood fighting. Restricted planting areas, as identified in the construction documents, are areas of no planting set by USACE policy. Volunteer seedlings of any woody species will be removed from the restricted planting areas on as needed basis by the City.

5.3.5 - Selective Clearing and Pruning

Downed trees and branches, dead limbs, and dead trees provide habitat for numerous wildlife species. However, pruning of planted trees and targeted clearing will be conducted to promote proper structure and canopy development of planted trees, maintain access for site and levee maintenance activities, resolve detriments to the integrity of the levee or flood-fighting capacity, eliminate a risk to public safety, or remove conflicts with firebreaks. Debris from clearing or pruning shall be properly disposed of by either complete burning or complete removal outside the limits of the levee right-of-way.

5.3.6 - Weed Control

Weeds targeted for control on the revegetation site during the long-term operation and maintenance period include invasive nonnative species that can dominate the site and reduce the desired restoration vegetation to below the performance standards. The City will determine which weed species will be targeted for control and implement control in conjunction with other City maintenance activities at the site.

5.3.7 - Rodent Control

Herbicide and bait station application will continue to be conducted by State Maintenance Area 4 as is done presently. Rodent control is not a component of this MMRLMP but is mentioned to satisfy condition h of the USACE letter of concurrence with the CVFPB Encroachment Permit.

5.4 – FUNDING

Long-term operation and maintenance of the riparian mitigation plantings will be funded by the City as part of operating and maintaining public recreational amenities of the site. Typical of other municipal parks, the City will allocate money for operation and maintenance from the General Fund during each annual budget after the 10-year establishment period.

Remedial measures will be developed based on the qualitative and quantitative monitoring results. To develop remedial measures, the City will evaluate why the success criterion was not achieved and determine the most effective remedy. Remedial measures may include, but are not limited to, the actions listed below:

- Replant using the same species if it is determined that plant survival or vigor was influenced by human-related factors, such as vandalism or inadequate irrigation, based on the quantitative and qualitative site observations made during monitoring;
- Replant using alternative species if monitoring results and site conditions indicate that the original plant species is not suited to the tree mitigation site or to a particular location in the tree mitigation site;
- Implement a plant protection program if wildlife damage is affecting plant survival and vigor. If wildlife damage is threatening the successful establishment of woody vegetation, some types of deterrents (e.g., repellents, plant protection cages) might be necessary;
- Implement and/or adjust irrigation applications if the plant material continually exhibits low survivorship or vigor. These conditions also might indicate that the target plant species are not suitable for the tree mitigation site and that alternative species may be required.

5.5 – FINANCING

WSAFCA and the City will finance implementation of the MMRLMP including the implementation of restoration plantings, establishment period maintenance, establishment period monitoring, and annual reporting described in this MMRLMP. The

planting plan is based on the requirement that 975 trees survive and a minimum of 0.99 acre of riparian plantings. The cost to implement this MMRLMP is approximately $700,000. Establishment of the plantings and monitoring and reporting will cost an additional $370,000 over 10 years.

5.6 – THE RIPARIAN MITIGATION SITE QUANTITIES

The River's Project accounts for 89% of the mitigation and The River Walk Project accounts for 11% of the mitigation.

	The Rivers Project	River Walk Project	Sub Total
Trees required	853	122	975
Shrubs			4157
Total			5132

Total planting area = 207,892 SF = 4.77 acres

- All proposed Fremont Cottonwood (*Populus fremontii)* trees shall be no closer than 100 feet from the waterside levee hinge point.
- Seeding will be utilized within the restoration area (all disturbed areas) and made up of 6 different seed types at the rate of 26 lbs per acre.
- There is approximately 3,315 linear feet (scaled from the plans) of irrigation mainline which is 3-inch diameter, class 315, buried 18" with warning tape. Irrigation laterals will vary between 1" to 2" diameter schedule 40 PVC. Irrigation pipe sleeves, when used, will be a minimum of 2 times the diameter of the actual irrigation pipe. There are 160 Bubbler valves through-out the project.
- All electrical lines; irrigation filters; gate vales; control valves; quick coupling valves, and irrigation lines shall be as shown on the approved drawings. Variations from material type, location, and sizes shall be pre-approved and shown on the final As-Built Drawings.

5.7 – PROJECT DESIGN REVIEW

The Flood System Improvements Section staff completed a technical review of the following documents:

- Mitigation Monitoring and Reporting and Long-Term Management Plan for the Rivers Mitigation Site, Dated January 2012, received by Board Staff January 28, 2012

6.0 – AGENCY COMMENTS AND ENDORSEMENTS

The comments and endorsements associated with this project, from all pertinent agencies are shown below:

- The U.S. Army Corps of Engineers 208.10 comment letter has been received for this application. The COE District Engineer has no objection to the project, subject to conditions, and will incorporate the letter into the permit as Exhibit A.
- The Department of Water Resources under Maintenance Area-4 will be the Long Term Maintenance Agency. Their concerns are addressed in the Board's permit.

7.0 – PROPOSED CEQA FINDINGS

No change from initial staff report dated December 2011

8.0 – SECTION 8610.5 CONSIDERATIONS

No change from initial staff report dated December 2011

9.0 – STAFF RECOMMENDATION

Staff recommends that the Board adopt the CEQA findings, approve the revised permit from the December 2, 2011 Board Meeting, adopt the U.S. Army Corps of Engineers 208.10 comment letter and direct staff to file a Notice of Determination with the State Clearinghouse.

10.0 – LIST OF ATTACHMENTS

A. Resolution No. (None required under consent items)

B. Draft Permit No. 18313-2-1modified

Exhibit A – USACE 208.10 Comment Letter

C. Vicinity Map
D. ICF International, Mitigation Monitoring and Reporting and Long-Term Management Plan for The Rivers Mitigation site. Appendix A (Site Construction Documents and specifications) has been omitted per Board's request from the December 2, 2011 Board Meeting.
E. Excerpt from December 2, 2011 Board Meeting Minutes for permit 18313-2-1
F. Item 8A-18313-2-1 Dec. 2, 2011 Staff Report.

Report Completed by:	David R. Williams, P.E.
Design Review:	David R. Williams, P.E.
Environmental Review:	James Herota, E.S. and Andrea Mauro, E.S.
Document Review:	Eric Butler, P.E. – Supervising Engineer
	Len Marino, P.E. – Chief Engineer

DRAFT

STATE OF CALIFORNIA
THE RESOURCES AGENCY

THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 18313-2-1 BD

This Permit is issued to:

West Sacramento Area Flood Control Agency
1420 Merkley Avenue, Suite 4
West Sacramento, California 95691

The City of West Sacramento purpose to mitigate for the loss of riparian vegetation associated with the Rivers Levee Modification Project and the River-Walk Project Mitigation Improvements (West Sacramento Bridge District, LeveeAccess Road and River Walk Trail). The two sites will be mitigated at The Rivers E.I.P. site, recently permitted by the CVFPB by permit number 18313-2. All recreational improvements and there construction activities will occur above the ordinary high water mark.
The work will include a paved 12-ft. wide bicycle/ pedestrian trail; landside embankment ramps; paved 6-ft. wide pedestrian trail; paved landing; 1-inch to 2-inch irrigation pipes; and 5,207 trees and plants. Township is 38d 36m 6.45s N -- 38d 36m 12.01s N and Range is 121d 32m 11.34s W -- 121d 31m 21.59s W. Proposed work is located approximately 200 feet north of River Bank Road between Todhunter Avenue and Fountain Drive in West Sacramento Yolo County).

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

Dated: _____

_____
Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 18313-2-1 BD

THIRTEEN: Within three years from completion of the construction of the work authorized under this permit, the permittee shall provide the Sacramento and San Joaquin Drainage District, acting by and through the Central Valley Flood Protection Board of the State of California, a permanent easement and/or a joint use agreement granting all flood control rights upon, over and across the property that is or will be occupied by the existing or to-be-constructed levee including the area of the cutoff wall and levee raise and realignment fill areas. The easement must include the following: 1)the levee section; 2) an area ten (10) feet in width from the waterside levee toe; the area ten (10) feet in width adjacent to the existing and new landward levee toes, if the areas are not presently encumbered by a Central Valley Flood Protection Board easement. For information regarding existing Central Valley Flood Protection Board Easements, please contact Angelica Aguilar at (916) 653-5782.

FOURTEEN: No construction work within the easement or rights of way, both existing and to be provided under this permit, of flood control features, including levees and seepage berms shall be done during the flood season from November 1 to April 15 without prior approval of the Central Valley Flood Protection Board.

FIFTEEN: All work approved by this permit shall be in accordance with the (100%/90%) submitted drawings and specifications, except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Central

Valley Flood Protection Board.

SIXTEEN: All addendums or other changes made to the submitted drawings or specifications by the permittee after issuance of this permit are subject to submittal and review for approval by the Central Valley Flood Protection Board prior to incorporation into the permitted project. Upon review and approval of any new submitted drawings or specifications the permit shall be revised, if needed, prior to construction related to the proposed changes. The Central Valley Flood Protection Board shall have up to 90 days after receipt of any documents, plans, drawings, and specifications for the review process. The Central Valley Flood Protection Board and/or the Department of Water Resources may extend this review period by written notification.

SEVENTEEN: The permittee is responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

EIGHTEEN: The permittee shall be responsible for repair of any damages to the project levee and other flood control facilities due to construction, operation, or maintenance of the proposed project.

NINETEEN: All proposed recreational features and asphalt pavement on the finished levee and the recreational / pedestrian ramps and roads will be maintained in total by the City of West Sacramento.

TWENTY: The mitigation measures approved by the CEQA lead agency and the permittee are found in its Mitigation and Monitoring Reporting Program (MMRP) adopted by the CEQA lead agency. The permittee shall implement all such mitigation measures.

TWENTY-ONE: The permittee shall provide construction supervision and inspection services acceptable to the Central Valley Flood Protection Board.

TWENTY-TWO: Prior to commencement of excavation, the permittee shall create a photo record, including associated descriptions, of the levee conditions. The photo record shall be certified (signed and stamped) by a licensed land surveyor or professional engineer, registered in the State of California, and submitted to the Central Valley Flood Protection Board within 30 days of beginning the project.

TWENTY-THREE: The permittee shall contact the U.S. Army Corps of Engineers regarding inspection of the project during construction as the proposed work is an alteration to the existing Federal Flood Control Project that will be incorporated into the Sacramento River Flood Control Project, an adopted plan of flood control.

TWENTY-FOUR: FEMA certification of the levee by the Corps of Engineers is being considered, the project proponent should contact the U. S. Army Corps of Engineers regarding inspection of this project during construction for FEMA certification purposes.

TWENTY-FIVE: The stability of the levee shall be maintained at all times during construction.

TWENTY-SIX: Cleared trees and brush shall be completely burned or removed from the floodway, and downed trees or brush shall not remain in the floodway during the flood season from November 1 to April 15.

TWENTY-SEVEN: No material stockpiles, temporary buildings, or equipment shall remain in the floodway during the flood season from November 1 to April 15 without prior CVFPB authorization.

TWENTY-EIGHT: The permittee shall cooperate with the Central Valley Flood Protection Board to ensure that any encroachment that must be relocated, modified or otherwise altered to accommodate construction of the improvements permitted herein are relocated, modified or otherwise altered in a manner that complies with current applicable state and federal standards. If the affected encroachment has an existing Board permit or is subject to some other applicable Board authorization, the permittee shall cooperate with the Board to ensure the permit or other authorization is appropriately amended to reflect the changed condition as shown on as-built drawings for the encroachment and the overall project. If the encroachment does not have a Board permit or other Board authorization, the permittee shall cooperate with the Board to determine whether a Board permit is required. If so, permittee shall cooperate with the Board to ensure that required permit application is made and, if granted, the permit reflects the changed condition as shown on as-built drawings for the encroachment and the overall project.

TWENTY-NINE: During demolition of the project, any and all anticipated or unanticipated conditions encountered which may impact levee integrity or flood control shall be brought to the attention of the Flood Project Inspector immediately and prior to continuation. Any encountered abandoned encroachments shall be completely removed or properly abandoned under the direction of the Department of Water Resources Inspector and the Early Implementation Project (EIP) Construction Supervisor.

THIRTY: The permittee shall be responsible for all damages due to settlement, consolidation, or heave from any construction-induced activities.

THIRTY-ONE: A profile of the levee crown roadway and access ramp that will be utilized for access to and from the borrow area shall be submitted to the Central Valley Flood Protection Board prior to commencement of construction.

THIRTY-TWO: The haul ramps and utilized levee crown roadway shall be maintained in a manner prescribed by the authorized representative of the Department of Water Resources, or any other agency responsible for maintenance.

THIRTY-THREE: Any damage to the levee section, crown, roadway, or access ramps that will be utilized for access for this project shall be promptly repaired to the condition that existed prior to this project.

THIRTY-FOUR: Excavations, of four feet or greater, below the design flood plane and within the levee section or within fifty (50) feet of the projected waterward and landward levee slopes, excluding the cutoff wall trench, shall have side slopes no steeper than 1 horizontal to 1 vertical. Flatter slopes may be required to ensure stability of the excavation.

THIRTY-FIVE: Fluid pressures and flow rates shall be carefully monitored and controlled to minimize the potential for hydrofracturing.

THIRTY-SIX: Fill on the levee slope shall be keyed into the existing levee section with each lift.

THIRTY-SEVEN: Fill material shall be placed only within the area indicated on the approved plans.

THIRTY-EIGHT: All fill material shall be impervious material with a minimum of 30 percent or more passing the No. 200 sieve, a plasticity index of 8 to 30, and a liquid limit of less than 55 and free of lumps or stones exceeding 3 inches in greatest dimension, vegetative matter, or other unsatisfactory material.

THIRTY-NINE: Density tests by a certified soils laboratory will be required to verify compaction of backfill within the floodway and within 10 feet of the levee toes.

FORTY: The fill surface area shall be graded to direct drainage away from the toe of the levee.

FORTY-ONE: Backfill material for excavations within the, existing and to be constructed, levee section and within ten (10) feet of the levee toes shall be placed in 4- to 6-inch layers, moisture conditioned above optimum moisture content, and compacted to a minimum of 95 percent relative compaction as measured by ASTM Method D698.

FORTY-TWO: Any pipe or conduit being reinstalled in the levee section and within fifty (50) feet of both the waterward and landward levee toes shall meet Title 23 standards.

FORTY-THREE: Where appropriate the new and reconstructed levee crown roadway and access ramps shall be surfaced with a minimum of 4 inches of compacted, Class 2, aggregate base (Caltrans Specification 26-1.02A).

FORTY-FOUR: In the event existing revetment on the channel bank or levee slope is disturbed or displaced, it shall be restored to its original condition upon completion of the proposed installation.

FORTY-FIVE: The permittee shall replant or reseed the levee slopes to restore sod, grass, or other non-woody ground covers if damaged during project work.

FORTY-SIX: The landscaping, appurtenances, and maintenance practices shall conform to standards contained in Section 131 of the Central Valley Flood Protection Board's Regulations.

FORTY-SEVEN: As per the approved planting plan (June/July 2011 by ICF International), no Freemont Cottonwood trees shall be planted on the waterside of the levee, any closer than 100 feet from the waterside levee hinge point.

FORTY-EIGHT: All fencing, gates and signs removed during construction of this project shall be replaced in kind and at the original locations. If it is necessary to relocate any fence, gate or sign, the permittee is required to obtain written approval from the Central Valley Flood Protection Board prior to installation at a new location.

FORTY-NINE: All temporary fencing, gates and signs shall be removed upon completion of the

project.

FIFTY: All debris generated by this project shall be disposed of outside the floodway and off the levee section.

FIFTY-ONE: Debris that may accumulate on the permitted encroachment(s) and related facilities shall be cleared off and disposed of outside the floodway after each period of high water with the exception of habitat debris, which may remain.

FIFTY-TWO: The permittee shall maintain the permitted encroachment(s) and the project works within the utilized area in the manner required and as requested by the authorized representative of the Department of Water Resources, or any other agency responsible for maintenance.

FIFTY-THREE: In the event that permitted improvements cause levee or bank erosion injurious to the adopted plan of flood control to occur at or adjacent to the permitted encroachment(s), the permittee shall repair the eroded area and propose measures, to be approved by the Central Valley Flood Protection Board, to prevent further erosion.

FIFTY-FOUR: Any vegetative material, living or dead, that interferes with the successful execution, functioning, maintenance, or operation of the adopted plan of flood control must be removed by the permittee at permittee's expense upon request by the Central Valley Flood Protection Board or Department of Water Resources. If the permittee does not remove such vegetation or trees upon request, the Central Valley Flood Protection Board reserves the right to remove such at the permittee's expense.

FIFTY-FIVE: Thorny plant will be removed from the planting pallet so inspections and maintenance are not impacted.

FIFTY-SIX: The permittee may be required, at permittee's cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted encroachment(s) if removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with any present or future flood control plan or project or if damaged by any cause. If the permittee does not comply, the Central Valley Flood Protection Board may remove the encroachment(s) at the permittee's expense.

FIFTY-SEVEN: The permitted encroachment(s) shall not interfere with operation and maintenance of the current or future flood control project. If the permitted encroachment(s) are determined by any agency responsible for operation or maintenance of the flood control project to interfere, the permittee shall be required, at permittee's cost and expense, to modify or remove the permitted encroachment(s) under direction of the Central Valley Flood Protection Board or Department of Water Resources. If the permittee does not comply, the Central Valley Flood Protection Board may modify or remove the encroachment(s) at the permittee's expense.

FIFTY-EIGHT: According to the permittee, the improvements herein permitted will control flood flows from a storm with a probability of occurrence of 0.005 in any year (200-year protection). Permittee's design assumed that non-urban existing levees upstream of Natomas will not be raised above the current design for the Sacramento River Flood Control Project as shown on the 1957 profile. Permittee's design flow therefore, reflects upstream flood water losses from levee overtopping where the water surface elevation for the permittee's design storm exceeds the top of levee elevation shown

on the 1957 profile. Permittee acknowledges that a Central Valley Flood Protection Plan will be developed, adopted, and regularly updated by the State and the plan and subsequent updates could include improvements that would change the flow and water level associated with permittee's design storm, possibly reducing the level of protection provided by the permitted improvements. Permittee agrees to participate in future modifications to the West Sacramento levees as may be required by the Central Valley Flood Protection Plan and its subsequent updates. Permittee's level of participation shall be equivalent to the level required of other local jurisdictions by the plan. Permittee further agrees that should the Plan include measures that reduce the level of protection provided by the permitted improvements, permittee shall have no basis for a claim of hydraulic impacts.

FIFTY-NINE: Within 120 days of completion of the project, the permittee shall submit to the Central Valley Flood Protection Board a certification report, stamped and signed by a professional civil engineer registered in the State of California, certifying the work was performed and inspected in accordance with the Central Valley Flood Protection Board permit conditions and submitted drawings and specifications.

SIXTY: Within 120 days of completion of the project, the permittee shall submit to the Central Valley Flood Protection Board proposed revision to the U.S. Army Corps of Engineers, Supplement to Standard Operation and Maintenance Manual, West Sacramento River Flood Control Project, and the associated "as-built" drawings for system alterations that are to be incorporated into the federal West Sacramento River Flood Control Project.

SIXTY-ONE: The permittee is responsible for all liability associated with damage to the permitted facilities resulting from flood fight, operation, maintenance, inspection or emergency repair and shall defend, indemnify, and hold the Central Valley Flood Protection Board, the Department of Water Resources, the State of California, and Maintenance Area 4, including their agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "agencies"), safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The agencies expressly reserve the right to supplement or take over their defense, in their sole discretion.

SIXTY-TWO: This permit is not valid until the Central Valley Flood Protection Board has received 33 U.S.C. Section 208.10 approval and letter of permission from the U.S. Army Corps of Engineers (Corps). The permittee shall comply with all conditions set forth in the letter of permission from the Corps, when it is received, which shall be attached to this permit as Exhibit A and incorporated by reference.

SIXTY-THREE: The permittee shall contact the Department of Water Resources by telephone, (916) 574-0609, and submit the enclosed postcard to schedule a preconstruction conference. Failure to do so at least 10 working days prior to start of work may result in delay of the project. The applicant is also required to contact the Early ImplementationProject (EIP) Construction Supervisor by telephone, (916)574-2646 to initiate inspection of the work.

SIXTY-FOUR: The permittee should contact the U.S. Army Corps of Engineers, Sacramento District, Regulatory Branch, 1325 J Street, Sacramento, California 95814, telephone (916) 557-5250, as compliance with Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act may be required.

SIXTY-FIVE: If the permittee or successor does not comply with the conditions of the permit and an enforcement by the Central Valley Flood Protection Board is required, the permittee or successor shall be responsible for bearing all costs associated with the enforcement action, including reasonable attorney's fees.

SIXTY-SIX: If the project, or any portion thereof, is to be abandoned in the future, the permittee or successor shall abandon the project under direction of the Central Valley Flood Protection Board and Department of Water Resources, at the permittee's or successor's cost and expense.

SIXTY-SEVEN: Any additional encroachment(s) in the floodway, on or in the levee section, and within ten (10) feet of the landside levee toe and berm toes, require an approved permit from the Central Valley Flood Protection Board and shall be in compliance with the Central Valley Flood Protection Board's regulations (Title 23 California Code of Regulations).

SIXTY-EIGHT: By acceptance of this permit, the permittee (West Sacramento Area Flood Control Agency) acknowledges the authority of the Central Valley Flood Protection Board to regulate all future encroachments along this levee reach, including those that may encroach upon alterations approved by this permit to incorporation into the federal West Sacramento River Flood Control Project by the U.S. Army Corps of Engineers.

SIXTY-NINE: The applicant must adopt a resolution within 18 months from the date of issuance of this permit, that complies with Board Resolution No. 11-15, regarding the Board's Joint Powers Agreement (JPA) Policy, and the resolution must be to the satisfaction of the Board.

SEVENTY: Prior to construction, the applicant, West Sacramento Area Flood Control Agency (WSAFCA), shall have obtained legal possession of all property where work to be performed under this permit is located.

SEVENTY-ONE: Survey markers are to be installed to delineate easement boundaries and a GIS shapefile of the boundaries is to be provided to DWR within 120 days of construction completion.

SEVENTY-TWO: WSAFCA or the City of West Sacramento must enter into an agreement with DWR Sacramento Maintenance Yard for use of power and water throughout the project including vegetation irrigation following construction.

SEVENTY-THREE: City of West Sacramento will provide a letter to DWR assuring perpetual maintenance of vegetation within the project boundaries.

SEVENTY-FOUR: A copy of this permit shall be included as an attachment to any Long-Term Management Plan for the permitted project area.

SEVENTY-FIVE: This permit shall run with the land and all conditions are binding on permitee's successors and assigns.

SEVENTY-SIX: The permittee shall operate and maintain the permitted encroachment(s) and the project works within the utilized area in the manner required and as requested by the authorized representative of the City of West Sacramento, Department of Water Resources, or any other agency responsible for maintenance. Maintenance may include actions to preserve the integrity of the flood

control system under emergency conditions. Items in the Mitigation Monitoring and Reporting and Long Term Management Plan dated January 2012 will apply. These actions will be taken at the sole expense of the permittee.

DEPARTMENT OF THE ARMY
U.S. Army Engineer District, Sacramento
Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

REPLY TO
ATTENTION OF

Flood Protection and Navigation Section (18313-2-1)

DEC 1 2010

Mr. Jay Punia, Executive Officer
Central Valley Flood Protection Board
3310 El Camino Avenue, Room 151
Sacramento, California 95821

Dear Mr. Punia:

We have reviewed a permit application by the West Sacramento Area Flood Control Agency (application number 18313-2-1). These plans include planting 900 trees on the waterside upper plateau of the right bank levee of the Sacramento River. Work also includes site preparation and irrigation. The project is located on the right bank floodway of the Sacramento River, about 1.5 miles upstream of the American River confluence in West Sacramento at, 38.6028°N 121.5304°W NAD83, in Yolo County, California.

The District Engineer has no objection to approval of this application by your Board from a flood control standpoint, subject to the following conditions:

a. That the proposed work shall not be performed during the flood season of November 1 to April 15, unless otherwise approved in writing by your Board.

b. That an operation and maintenance plan shall be developed and provided to the Central Valley Flood Protection Board for approval prior to planting (with a copy to the USACE Sacramento District, Flood Protection and Navigation Section). The plan shall ensure that the proposed plantings will not grow uncontrolled and will not impact the existing hydraulic conditions of the Flood Risk Reduction Project.

c. That all buildup of debris or underbrush shall be removed from the plantings prior to the beginning of the flood season, November 1, and after each high water event.

d. That the proposed work shall not interfere with the integrity or hydraulic capacity of the flood damage reduction project; easement access; or maintenance, inspection, and flood fighting procedures.

e. That in the event trees and brush are cleared, they shall be properly disposed of by either complete burning or complete removal outside the limits of the project right-of-way.

f. That the proposed work shall not change the streamflow velocity in such a way that might cause damage to the existing waterside levee slope or reduce the channel flow velocity.

g. That the plants and irrigation lines shall be located at least 15 feet from the waterside levee toe.

h. That an effective rodent control program shall be in place to address rodent activity in the area of the proposed project.

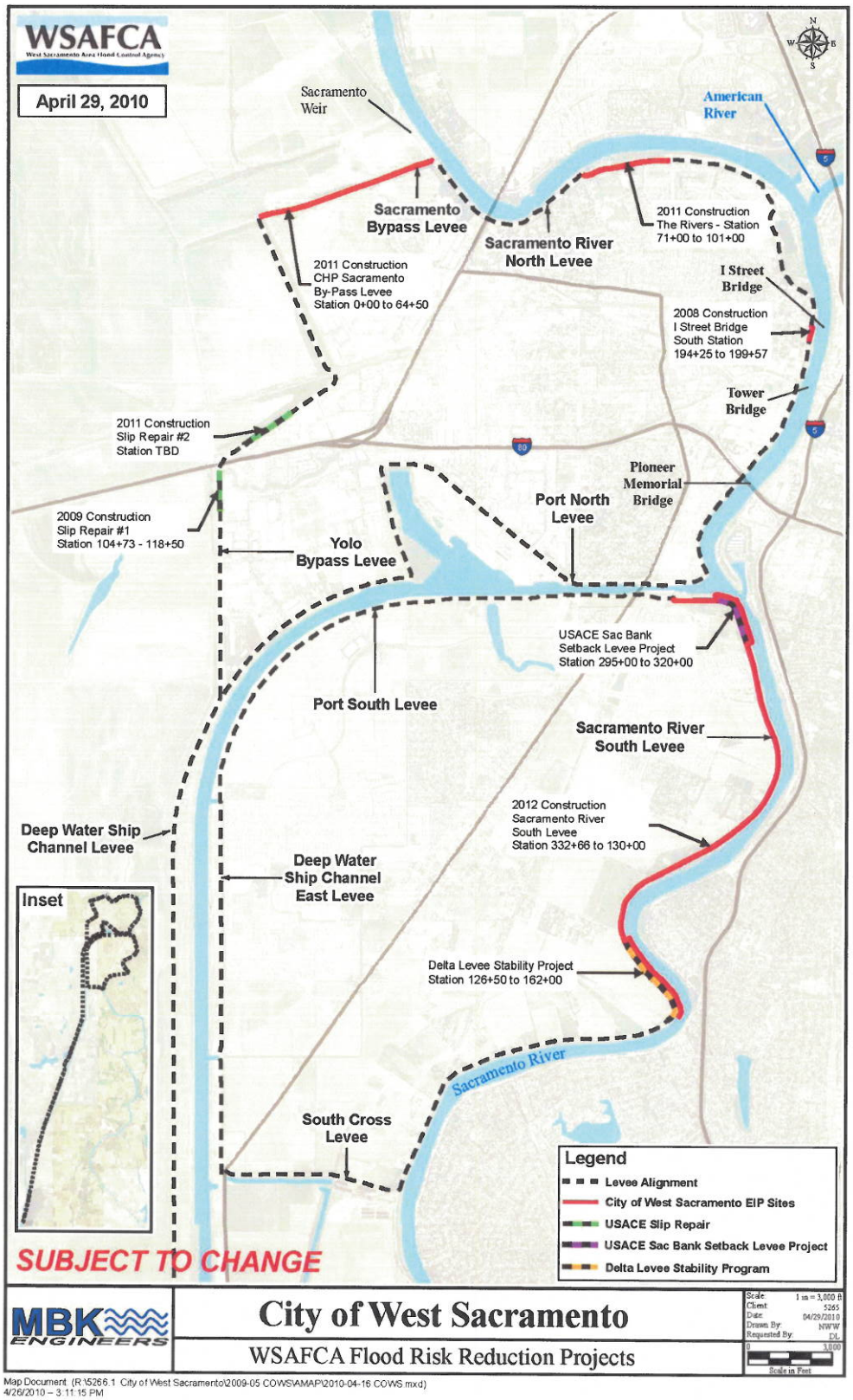
A Section 10 and/or Section 404 permit may be required. Please advise the applicant to contact the U.S. Army Corps of Engineers, Sacramento District, Regulatory Division, 650 Capitol Mall, Suite 5-200, Sacramento, California 95814, telephone (916) 557-5250.

A copy of this letter is being furnished to Mr. Don Rasmussen, Chief, Flood Project Integrity and Inspection Branch, 3310 El Camino Avenue, Suite LL30, Sacramento, California 95821.

Sincerely,

For Rick L. Poeppelman, P.E.
Chief, Engineering Division

PLATE 1: WSLIP Construction Phasing Map



MITIGATION MONITORING AND REPORTING AND LONG-TERM MANAGEMENT PLAN FOR THE RIVERS MITIGATION SITE

A PLAN SUPPORTING THE MITIGATION REQUIREMENTS FOR THE RIVERS EARLY IMPLEMENTATION PROJECT (STREAMBED ALTERATION AGREEMENT NO. 1600-201-0061-R2) AND THE BRIDGE DISTRICT LEVEE ACCESS AND RIVER WALK TRAIL PROJECT (STREAMBED ALTERATION AGREEMENT NO. 1600-2010-0136-R2)

PREPARED FOR:

West Sacramento Flood Control Agency
110 West Capitol Avenue
West Sacramento, CA 95691
Contact: Dave Shpak
(916) 617-4540

PREPARED BY:

ICF International
630 K Street, Suite 400
Sacramento, CA 95814
Contact: Kristin Lantz
(916) 737-3000

January 2012

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ICF International. 2012. *Mitigation Monitoring and Reporting and Long-Term Management Plan for The Rivers Mitigation Site*. January. (ICF 00587.11.) Sacramento, CA. Prepared for West Sacramento Flood Control Agency, West Sacramento, CA.

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List of Tables and Figures

Acronyms and Abbreviations

Agencies	California Department of Fish and Game and U.S. Army Corps of Engineers
City	City of West Sacramento
CNDDB	California Natural Diversity Database
Construction Plan Set	West Sacramento Levee Improvement Program The Rivers Riparian Mitigation Site construction plan set
CVFCB	Central Valley Flood Control Board
DBH	diameter at breast height
DFG	California Department of Fish and Game
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
IS/MND	Initial Study/Mitigated Negative Declaration
Mitigation Site	The Rivers Mitigation Site
MMRLMP	Mitigation Monitoring and Reporting and Long-Term Management Plan
NMFS	National Marine Fisheries Service
RD	Reclamation District
River Walk Trail Project	Bridge District Levee Access and River Walk Trail Project
Rivers EIP	The Rivers Early Implementation Project
SRA	shaded riverine aquatic
TP4	Treepot 4
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WSAFCA	West Sacramento Flood Control Agency
WSLIP	West Sacramento Levee Improvement Program

Mitigation Monitoring and Reporting and Long-Term Management Plan for The Rivers Mitigation Site

Introduction

The City of West Sacramento (City) developed and constructed the Bridge District Levee Access and River Walk Trail Project (River Walk Trail Project) and the West Sacramento Flood Control Agency (WSAFCA) developed and constructed The Rivers Early Implementation Project (Rivers EIP) as part of the West Sacramento Levee Improvement Program (WSLIP) in fall 2011. These projects are both located along the west bank of the Sacramento River Levee in the city in eastern Yolo County, California (Figure 1). Riparian habitat and City protected–tree impacts resulting from these projects will be mitigated at The Rivers Mitigation Site (Mitigation Site), located on site at The Rivers EIP.

The purpose of this document is to describe the proposed Mitigation Monitoring and Reporting and Long-Term Management Plan (MMRLMP) for the Mitigation Site. The MMRLMP specifically describes revegetation that will be implemented, plant establishment, monitoring and reporting, and long-term management activities at the Mitigation Site implemented to address riparian and City protected–tree impacts associated with the construction of The Rivers EIP and the River Walk Trail Project.

The mitigation and monitoring requirements associated with the River Walk Trail Project are described in the *Revegetation and Monitoring Guidelines Associated with the California Department of Fish and Game and City of West Sacramento Requirements for the West Sacramento Bridge District Levee Access Road and River Walk Trail Project* (ICF International 2010); thus, the mitigation and monitoring requirements described in this MMRLMP focus primarily on those associated with The Rivers EIP. The mitigation and monitoring requirements in this MMRLMP are more stringent than the River Walk Trail Revegetation and Monitoring Guidelines and will supersede the River Walk Trail Revegetation and Monitoring Guidelines requirements. Additionally, planting at the Mitigation Site will be contiguous and will not designate specific areas as mitigation for specific projects; therefore, only one approach to monitoring and reporting will be used.

Project Description

The Rivers

The Rivers EIP area is approximately 3,035 feet long and is located on the Sacramento River North Levee, just north of the confluence of the Sacramento and American Rivers, including part of The Rivers residential development. Implementation of The Rivers EIP would alleviate through- and under-seepage concerns on this portion of levee, as well as address stability and geometry issues. Treatments for these deficiencies are the combination of a slurry cutoff wall, constructed through the center of the levee, and slope flattening. The project also includes construction of approximately 1,250 linear feet of a pedestrian trail and paved bike trail on the levee crown.

Site Characteristics

The Rivers EIP site contains two vegetation communities that could provide or enhance habitat for wildlife species, including special-status terrestrial wildlife species and special-status fish; Great Valley valley oak riparian forest and nonnative annual grassland. Both of these vegetation communities are identified in California Department of Fish and Game's (DFG's) List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database (CNDDB) (California Department of Fish and Game 2003).

Great Valley Valley Oak Riparian Forest

The Great Valley valley oak riparian forest occurs in a narrow corridor along the Sacramento River and has an overstory of mature, well-established trees). Valley oak (*Quercus lobata*) is the dominant species, but Fremont cottonwood (*Populus fremontii* ssp*. fremontii*), box elder (*Acer negundo* var. *californicum*), and interior live oak (*Quercus wislizeni*) also are present. The shrub layer was predominantly Himalayan blackberry (*Rubus armeniacus*) and poison-oak (*Toxicodendron diversilobum*). Scattered elderberry (*Sambucus mexicana*) shrubs occur within and along the southern edge of the riparian forest. Riparian forest is identified as a sensitive natural community by the CNDDB (2009).

Nonnative Annual Grassland

The majority of remaining vegetated portions of the study area consists of nonnative annual grassland. Indications of past and ongoing disturbance are evident (e.g., dirt trails, transient camps). Species commonly observed in the nonnative grassland were wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), soft chess, rattail fescue (*Vulpia myuros* var*. myuros*), foxtail barley (*Hordeum murinum* spp*. leporinum*), and Italian ryegrass (*Lolium multiflorum*). Forb species observed in nonnative annual grasslands in the study area were Mediterranean mustard (*Hirschfeldia incana*), big heronbill (*Erodium botrys*), prickly lettuce (*Lactuca serriola*), horseweed (*Conyza canadensis*), and wild radish (*Raphanus* spp.). Patches of nonnative annual grassland are interspersed with bare ground, and the density of vegetation ranges from sparse (less than 5% cover) to highly dense (90–100% cover). The annual grasslands in the study area contain a relatively large proportion of ruderal species, likely as a result of the substantial degree of disturbance from human activities.

Habitat Value

Great Valley valley oak riparian forest provides important habitat for wildlife species. Overstory trees may be used for nesting and roosting by raptors and also provide suitable habitat for other birds, such as herons, egrets, and numerous songbirds. Riparian habitat provides important nesting and foraging cover for resident, migratory, and wintering songbirds and hibernacula and nesting habitat for western pond turtles. In addition, riparian vegetation provides habitat for several species of mammals, along with shaded riverine aquatic (SRA) overhead and instream cover.

The abundance and diversity of wildlife species are relatively low in the nonnative annual grassland habitat in the study area; however, the proximity of the nonnative annual grassland to the riparian forest habitat increases its value to wildlife, especially for foraging.

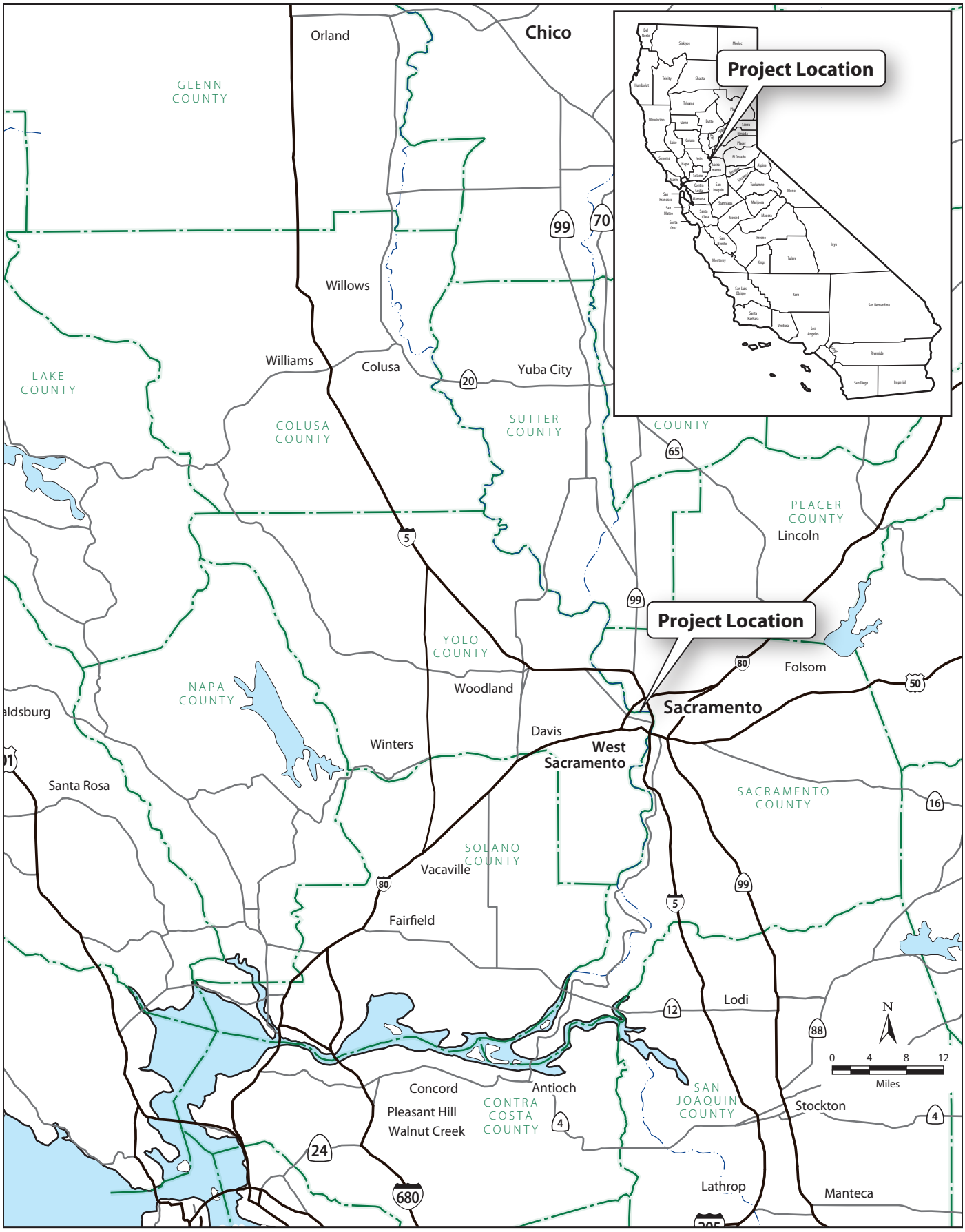

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Figure 1
Regional Location

Project Impacts

Impacts on Riparian Habitat and City-Protected Trees at The Rivers Early Implementation Project Site

Construction activities associated with The Rivers EIP would result in the loss of 0.9 acre (37 trees with a cumulative diameter at breast height [DBH] of 1,007 inches) of Great Valley valley oak riparian forest. These effects result from the riparian habitat being located within the project levee improvement construction footprint (i.e., the construction zone).

Within the 0.9 acre of Great Valley valley oak riparian habitat, 26 trees (having a cumulative DBH of 853 inches) of the 37 trees meet the definition of a heritage or landmark tree protected under the City's Tree Preservation Ordinance. A *heritage tree* is defined as any living tree with a trunk circumference of 75 inches (diameter of 24 inches) or more, or any living native oak (any species of the genus *Quercus*) with a trunk circumference of 50 inches (diameter of 16 inches) or more, both measured 4.5 feet above ground level. The circumference of multi-trunk trees is based on the sum of the circumference of each trunk. A *landmark tree* is defined as a tree or stand of trees that is especially prominent, stately, or of historical significance as designated by the City Council. Trees that are too small in diameter to meet the size threshold of either a heritage or landmark tree but are located within the public right-of-way (typically 12.5 feet from the curb) also are protected by the ordinance.

Mitigation Requirements

This section describes the mitigation requirements for both The Rivers EIP and River Walk Trail Project that are satisfied at the Mitigation Site.

The Rivers Early Implementation Project

Riparian Habitat Mitigation

The Rivers EIP's Environmental Impact Statement/Environmental Impact Report (EIS/EIR) (ICF International 2011) included a mitigation measure to compensate for the loss of riparian habitat. Mitigation Measure VEG-MM-1 requires compensation to be provided at a minimum acreage ratio of 1:1 for the loss of riparian habitat. A total of 0.9 acre of riparian vegetation is required to be planted at the Mitigation Site to compensate for the permanent loss of 0.9 acre of Great Valley valley oak riparian forest habitat due to The Rivers EIP.

City Protected–Tree Mitigation

The Rivers EIP's EIS/EIR included a mitigation measure to compensate for the loss of City protected–tree resources. Mitigation Measure VEG-MM-4 requires City protected–tree replacement compensation at a ratio of 1:1 (i.e., 1-inch diameter of replacement plant for every 1-inch diameter of tree removed). Because of the overall size of the project and beneficial habitat value, the City has agreed to allow the replacement trees to come from a smaller container size (less than 1-inch diameter). A total of 853 DBH inches of heritage or landmark trees lost is required to be replaced with 853 trees.

River Walk Trail Project

Riparian Habitat Mitigation

The River Walk Trail Project's Initial Study/Mitigated Negative Declaration (IS/MND) included a mitigation measure to compensate for the loss of riparian habitat. Mitigation Measure BIO-5 and the Streambed Alteration Agreement issued by DFG require that compensation be provided at a minimum acreage of 2:1 (i.e., 2 acres restored/created/enhanced or credits purchased for every 1 acre removed) for the loss of riparian habitat. A total of 0.9 acre of riparian vegetation is required to be planted at the Mitigation Site to compensate for the permanent loss of 0.045 acre of Great Valley cottonwood riparian forest habitat as a result of the River Walk Trail Project.

City Protected–Tree Mitigation

The River Walk Trail Project's IS/MND states that the provisions of the City's Tree Preservation Ordinance require that City protected–tree replacement be compensated at a ratio of 1:1 (i.e., 1-inch diameter of replacement plant for every 1-inch diameter of tree removed). A total of 122 DBH inches of heritage or landmark tress lost is required to be replaced with 122 trees.

Summary

To compensate for riparian habitat and protected tree losses resulting from The Rivers EIP and the River Walk Trail Project, a total of 0.99 acre of riparian habitat, which includes totals of 975 replacement trees, is required to be planted at the Mitigation Site.

Mitigation Implementation Plan

Responsible Party

The City will be responsible for implementation and long-term maintenance of the Mitigation Site as well as the 5-year monitoring and reporting. WSAFCA will have secondary responsibility in funding the maintenance and monitoring of the Mitigation Site and will serve as the regulatory intermediary between the City and the permitting agencies.

Mitigation Site Selection

The Mitigation Site is located within and adjacent to The Rivers EIP site and approximately 2 miles upstream of the River Walk Trail Project (Figure 2).

Mitigation site selection focused on a site close to the impact area. Sites considered needed to provide the necessary site resources (e.g., soil texture, proximity to water or groundwater) to support riparian vegetation. Onsite mitigation for The Rivers Trail Walk Project was not feasible, because the U.S. Army Corps of Engineers (USACE) policies forbid all woody vegetation on the crown, slopes, and within 15 feet of the waterside and landside levee toes (U.S. Army Corps of Engineers 2009).

The Mitigation Site currently supports a moderate stand of riparian vegetation. Canopy gaps will be filled with understory shrubs and overstory trees to provide a more contiguous and diverse

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Figure 2
The Rivers EIP and River Walk Trail Project Sites

vegetative structure. Additional trees and shrubs will be planted to the south of existing vegetation in unvegetated areas, further expanding the existing riparian corridor.

Implementation Schedule

Both projects have been constructed. Mitigation planting will occur in the late fall of 2012.

Riparian Planting Plan

As stated above, the riparian habitat and protected-tree mitigation required to mitigate impacts of The Rivers EIP and River Walk Trail Project consists of the creation of 0.99 acres of riparian habitat through the planting of 975 trees. To provide adequate spacing between the required trees and allow understory planting of shrubs to provide greater habitat diversity, additional acreage above the 0.99 acres required will be planted. Additionally, some plant mortality is expected; therefore, additional trees will be planted to account for the loss and provide added resiliency to the planting over time.

The Mitigation Site planting plan consists of three habitat zones and one landscaping zone totaling 4.338 acres: Riparian habitat zone (1.593 acres), Oak Woodland habitat zone (1.647 acres), Shrub Infill habitat zone (0.435 acre), and Trail Side landscaping zone (1.098 acres). Within these zones, 1,050 trees (45 24-gallon containers and 1,005 TP4 size containers) will be planted. The TP4 size containers will be used in lieu of 15-gallon containers. The three habitat zones will be planted with native species that occur naturally on site or in local riparian corridors. The Trail Side landscaping zone will be planted with a mixture of native species that occur naturally on site or in local riparian corridors and native species commonly used in landscape settings to provide interest to trail users. All trees in the Trail Side landscaping zone are intended for mitigation purposes. Refer to Appendix A for detailed construction drawings, including site preparation, planting, and irrigation.

The riparian mitigation will increase the current habitat value and function of the Mitigation Site and replicate and/or exceed the conditions present at the Mitigation Site.

Container Plants

All plant material will be container stock of varying sizes. The City will obtain the container plant material from a plant nursery experienced with the propagation of native species. The plants will be planted by a qualified landscape contractor during construction of the project. All plants will be planted in fall/winter to minimize planting shock and allow optimal establishment.

All herbaceous material to be planted in the habitat zones will be planted in clusters of three or five as Treeband container size, which has a soil/root volume of 20 cubic inches. All large shrubs to be planted in the habitat zones will be planted individually as 1-gallon or TP4 container size, which both have a soil/root volume of 180 cubic inches and are 7 and 14 inches long, respectively. All trees to be planted in the habitat zones will be planted individually as TP4 container size. All herbaceous plants and shrubs in the landscape zone will be planted individually as 1-gallon container size. All trees to be planted in the landscape zone will be planted individually as TP4 or 24-inch box container size. All plants in the habitat zones will be laid out randomly based on average plant spacing provided in the “West Sacramento Levee Improvement Program The Rivers Riparian Mitigation Site” construction plan set (Construction Plan Set) (Appendix A). Plant locations will be flagged by the contractor prior to planting for approval by the City landscape construction inspector.

All plants in the landscape zone will be planted according to the layout provided in the Construction Plan Set.

Treeband, TP4, and 1-gallon container plants will be placed in a planting hole that is twice the width of, and one and one half times deeper than, the container. Planting holes will be hand-excavated or augered. All planting holes within the dripline of existing trees will be hand-excavated. The planting hole sides will be scarified to allow roots to more easily penetrate the surrounding soil. Soil removed when the planting hole is created will be used as backfill.

Before planting, the container plant's root mass will be inspected, and any matted, dead, diseased, encircling, or twisted roots will be pruned. Inspection and pruning will be done quickly because exposure to the air results in loss of root hairs. Care will be taken not to prune excessively, to avoid excessive loss of root mass.

Container plants will be placed in the planting hole so that the root collar is slightly above the desired final grade with the top of the first major root barely visible at the surface. Fertilizer will not be applied during container plant installation. As soil is backfilled, it will be worked around the roots so that the roots are not compressed into a tight mass, but spread out and supported by the new soil beneath them. After each 3 to 4 inches of soil have been placed in the hole, the soil will be tamped around the roots with foot or hand pressure, with care taken not to damage the roots.

Container plants will be watered immediately after planting and will be inspected after initial watering to ensure that they have not settled. Any container plants that have settled will be adjusted so the appropriate root collar is exposed aboveground.

Irrigation

All plant material will be irrigated by a direct root watering system. The root watering system consists of a bubbler that emits 0.25 gallons of water per minute, encased in a perforated tube that allows water to soak into the surrounding soil. The 24-inch box trees will have three root watering systems equally spaced around the rootball at each tree. All other plants, regardless of size, will have one root watering system at each plant. Irrigation will be controlled by an automatic controller scheduled to provide appropriate, seasonally adjusted volumes of water to each plant. Irrigation distribution lines will be buried 18 inches for pressurized pipe and 12 inches for non-pressurized pipe. All irrigation lines will be installed outside of the levee prism buffer limit. All irrigation lines installed within the canopy of existing trees will be hand-trenched to minimize disturbance to roots.

Establishment Maintenance Guidelines

To ensure that the mitigation plantings meet the prescribed survival and growth criteria, plants will be monitored and maintained as needed. City staff members or their landscape contractor will provide the following maintenance for the mitigation plantings.

Plant Watering

Irrigation will be seasonally adjusted to provide the appropriate volume of water to each plant. Irrigation will be applied to all plants for a period of 3 years. Following Year 3, irrigation will be applied to all 24-inch box trees and where needed for the remaining plants for an additional 2 years. The 24-inch box trees will be irrigated for an additional 5 years (for a total of 10 years) to properly establish the root systems.

Tree Pruning

All trees within the Trail Side planting zone will be pruned, as needed, for proper structure, canopy development, and vertical clearance for safety reasons. The trees will be pruned for initial structure during the contractor maintenance period followed by a recurring 3- to 4-year pruning cycle, depending on growth rates until established. All pruning will be performed in accordance with the American National Standards Institute's pruning standards by an International Society of Arboriculture certified professional.

Weed Control

Weeds will be removed from the immediate area around each plant as well as within the planting basin as needed. Any noxious weeds observed in the Mitigation Site will be eradicated through mechanical and/or chemical applications.

Rodent Control

Herbicide and bait station application will continue to be conducted by State Maintenance Area 4 as is done presently. Rodent control is not a component of this MMRLMP but is mentioned to satisfy condition h of the USACE letter of concurrence with the Central Valley Flood Control Board (CVFCB) Encroachment Permit.

Replacement Planting

The plantings will be inspected during the performance monitoring visits to determine whether replacement plantings will be necessary to meet the success criterion discussed below.

Required replacement plantings, based on the results of the annual vegetation monitoring surveys, will be provided, installed, and maintained by the City during each year of the maintenance period. The annual monitoring reports will identify the causes of plant mortality and any remedial measures that may be required. For example, if a particular species has a high mortality rate, a determination will be made regarding the cause of plant mortality and whether replacement by another species is warranted.

Replacement will include planting enough plants that the total number of living plants meets or exceeds the success criterion. Replacement plants will be installed according to the original plant installation methods.

Monitoring Program

This section describes the mitigation, monitoring, and reporting for the mitigation plantings, including the success criterion, monitoring schedule, monitoring methods, remedial measures, and reporting/documentation requirements.

Although plant survival is the only information necessary to verify compliance with the stated mitigation criterion, other factors will be monitored annually to provide information to the City during plant establishment. Annual monitoring reports will provide timely summaries of important growth information, allowing project managers to address any irrigation needs, weed control activities, or other factors that affect tree health and productivity.

The mitigation plantings will be monitored for a 5-year period after the initial mitigation planting. The City has agreed to monitor the plantings and submit monitoring reports for the specified time period; however, the monitoring could be shortened, following consultation with and approval by DFG and USACE (Agencies), if monitoring results indicate that the site has achieved or is likely to achieve the success criterion. The planting areas will be evaluated based on both quantitative and qualitative criteria. Annual monitoring reports will provide the Agencies with information to determine whether the planted area is progressing toward project success.

Monitoring Schedule

The first monitoring report will be submitted 1 year after the plantings are installed (fall 2013). The mitigation site will be monitored annually during Years 1 through 5 in August or September. Monitoring results from Years 1 and 2 will be used to determine whether the mitigation site is likely to meet the success criterion. Year 5 monitoring results will be used to determine whether the tree mitigation site has met the success criterion. If the planting area achieves the success criterion in Year 5, no further monitoring will be required; however, long-term operation and maintenance activities will be required in perpetuity. If the planting areas do not achieve the success criterion, remedial actions, as discussed under Remedial Measures, below, will be implemented, as necessary.

Success Criterion

Successful mitigation of City protected–tree removal will be achieved by the end of the 5-year monitoring period if there is 93% survival of the 1,050 trees planted (975 trees must survive). Successful mitigation of riparian habitat loss will be achieved by the end of the 5-year monitoring period if the City protected–tree criterion is met, in addition to 50% survival of the remaining planted species in the habitat zones. Of all plants in the landscaping zone, only trees are intended for mitigation purposes. All other plants in the landscaping zone will not be monitored or counted toward mitigation success.

If at any time the native plantings fail to meet the prescribed survival criterion, remedial measures such as replanting will be implemented, and monitoring of the newly planted vegetation will continue for an additional 5-year period or less if the site has achieved or is likely to achieve the success criterion.

Monitoring Methods

The mitigation sites will be monitored annually by a qualified biologist, ecologist, arborist, or landscape architect according to the monitoring schedule stated above and in compliance with applicable Agency protocols.

Survival

Survival rates will be determined based on the total number of plants originally planted. Plants will be recorded as dead if there is no viable aboveground growth visible. For example, if all the leaves on a tree are brown, but an examination of the stems and branches shows viable stem vigor, the plant will be considered alive, although it will be given a poor vigor rating.

Plant Vigor

The determination of vigor will account for the following conditions.

- Disease symptoms.
- Low-density foliage.
- Atypical leaf color.
- Stem and foliar vigor (e.g., signs of desiccation, leaf curl).
- Browsing or other wildlife-related damage.
- Vandalism.

A vigor rating of *good*, *fair*, or *poor* (values of 3.0, 2.0, and 1.0, respectively) will be assigned to each plant. Dead plants will not be assigned a vigor rating. The ratings are defined below.

- **Good (3.0):** a seedling with less than 25% of its aboveground growth exhibiting one or more of the factors listed above.
- **Fair (2.0):** a seedling with 25%–75% of its aboveground growth exhibiting one or more of the factors listed above.
- **Poor (1.0):** a seedling with more than 75% of its aboveground growth exhibiting one or more of the factors listed above.
- **Dead:** a seedling that is no longer visible or that does not appear capable of growth.

If the average plant vigor score for a given species is less than 1.0, the field monitor will evaluate the reasons the particular species received a low rating and determine whether remedial measures are required. If necessary, corrective action will be taken.

Plant Height

Tree height will be measured to the nearest 0.5 foot using a stadia rod or visual estimation. No quantitative criteria have been established for plant height. Instead, plant height will be recorded annually to determine trends in plant growth during the monitoring period.

Annual Reports

Annual reports describing the results of the performance monitoring will be submitted to the Agencies by November 30 of each monitoring year to allow time to implement any necessary corrective measures identified in the report. Annual reports will quantify conditions at the tree mitigation site to demonstrate progress toward meeting the success criteria. Each monitoring report will include these components.

- A summary of the project location and description.
- A summary of the monitoring methods.
- A list of the City personnel, or their contractor, who prepared the content of the annual report and/or participated in monitoring activities that year.
- A summary and analysis of the monitoring results, including an evaluation of site conditions in the context of the success criteria.

- A discussion of the monitoring results.
- Management recommendations, including discussion of areas with inadequate performance and recommendations for remedial action.
- A discussion of any modifications made to the monitoring methods.
- A discussion of the previous year's maintenance efforts, including, but not limited to, replacement planting and weed control.
- Photodocumentation of the mitigation sites.

Remedial Measures

The purpose of the MMRLMP is to ensure that the targeted mitigation requirements are achieved. Remedial measures provide a mechanism for modifying the mitigation program if the tree mitigation site does not achieve the success criterion in Year 5.

The City will seek approval from the Agencies for the most suitable remedial measures based on site conditions. Remedial actions must be approved by the Agencies prior to implementation. Remedial measures will be developed based on the qualitative and quantitative monitoring results. To develop remedial measures, the City will evaluate why the success criterion was not achieved and determine the most effective remedy. Remedial measures may include, but are not limited to, the actions listed below.

- Replant plants using the same species if it is determined that plant survival or vigor was influenced by human-related factors, such as vandalism or inadequate irrigation, based on the quantitative and qualitative site observations made during monitoring.
- Replant plants using alternative species if monitoring results and site conditions indicate that the original plant species is not suited to the tree mitigation site or to a particular location in the tree mitigation site.
- Implement a plant protection program if wildlife damage is affecting plant survival and vigor. If wildlife damage is threatening the successful establishment of woody vegetation, some types of deterrents (e.g., repellents, plant protection cages) might be necessary.
- Implement and/or adjust irrigation applications if the plant material continually exhibits low survivorship or vigor. These conditions also might indicate that the target plant species are not suitable for the tree mitigation site and that alternative species may be required.

Financing

WSAFCA and the City will finance implementation of the MMRLMP. A cost estimate is provided below for implementation of restoration plantings, establishment period maintenance, establishment period monitoring, and annual reporting described in this MMRLMP.

Cost Estimate

The riparian planting plan is based on the requirement that 975 trees survive and a minimum of 0.99 acre of riparian plantings. The cost to implement this MMRLMP is approximately $700,000. Establishment of the plantings and monitoring and reporting will cost an additional $370,000 over

10 years. Table 1 provides a breakdown of associated costs, including those for site preparation, vegetation planting, general maintenance activities such as weeding and pruning during the establishment period, and monitoring and reporting.

Table 1. Riparian Mitigation Cost Estimate

Implementation Phase				
Item/Description	**Quantity**	**Units**	**Unit Cost**	**Total Item Cost**
Mobilization and Demobilization	1	Lump Sum	$4,500	$4,500
Clearing and Grubbing	4.5	Acre	$8,500	$38,250
Soil Preparation	4.5	Acre	$2,000	$9,000
Erosion Control	4.5	Acre	$2,000	$9,000
Protection Fence Installation	5700	Linear Feet	$5	$28,500
Electrical Point of Connection	1	Lump Sum	$3,000	$3,000
Irrigation Point of Connection	1	Lump Sum	$1,000	$1,000
Irrigation Controller, Pull Boxes, Enclosure	1	Lump Sum	$25,000	$25,000
Irrigation Controller Valves and Wiring	48	Each	$325	$15,600
Irrigation Quick Coupling Valves	20	Each	$200	$4,000
Irrigation Gate Valves	8	Each	$275	$2,200
Irrigation Mainline	3500	Linear Feet	$9	$31,500
Irrigation dws 18" Bubblers (with Lateral Pipe)	135	Each	$64	$8,640
Irrigation dws 10" Bubblers (with Lateral Pipe)	5162	Each	$50	$258,100
Container Plant—24" Box Tree and Tree Stakes	45	Each	$750	$33,750
Container Plant—Treepot 4	1155	Each	$29	$33,495
Container Plant—1 Gallon	1948	Each	$22	$42,856
Container Plant—Tree Band	2059	Each	$16	$32,944
Bark Mulch	200	Cubic Yard	$24	$4,800
Soil Amendment	50	Cubic Yard	$24	$1,200
Tree Shelters and Stakes	1005	Each	$2.50	$2,513
Seeding	4.5	Acre	$3,000	$13,500
Informational Sign	4	Each	$600	$2,400
Additional Sign Panels (Material Only)	8	Each	$100	$800
Maintenance (180 Days)	4.5	Acre	$6,000	$27,000
Subtotal				**$633,548**
10% Contingency				$63,355
Total Cost				**$696,902**

Plant Establishment Phase				
Item/Description	**Quantity**	**Units**	**Unit Cost**	**Total Item Cost**
Year 1—6 months (contractor maintains for first half of year)				
Irrigation System Operation and Maintenance	0.5	Year	$25,000	$12,500
Water Cost (1050 ccf/yr @ $1.50/ccf)[3]	1	Year	$1,575	$1,575
Electrical Cost (3100 watts/day @ $0.13/kwh)[3]	1	Year	$146	$146
Weed Management[4]	0.5	Year	$25,000	$12,500

Plant Establishment Phase				
Item/Description	**Quantity**	**Units**	**Unit Cost**	**Total Item Cost**
Plant Replacement[5]	0.5	Year	$14,500	$7,250
Years 2 and 3				
Irrigation System Operation and Maintenance	2	Year	$12,500	$25,000
Water Cost (840 ccf/yr @ $1.50/ccf)	2	Year	$1,260	$2,520
Electrical Cost (3100 watts/day @ $0.13/kwh)	2	Year	$146	$292
Weed Management	2	Year	$12,500	$25,000
Plant Replacement	2	Year	$7,250	$14,500
Tree Pruning	1	Year	$1,500	$1,500
Years 4 and 5				
Irrigation System Operation and Maintenance	2	Year	$6,000	$12,000
Water Cost (525 ccf/yr @ $1.75/ccf)	2	Year	$920	$1,840
Electrical Cost (3100 watts/day @ $0.15/kwh)	2	Year	$170	$340
Weed Management	2	Year	$6,000	$12,000
Plant Replacement	2	Year	$3,625	$7,250
Years 6–10 (24" Box Trees Only)				
Irrigation System Operation and Maintenance	5	Year	$3,000	$15,000
Water Cost (22 ccf/yr @ $1.75/ccf)	5	Year	$40	$200
Electrical Cost (3100 watts/day @ $0.15/kwh)	5	Year	$170	$850
Weed Management	5	Year	$3,000	$15,000
Plant Replacement	5	Year	$750	$3,750
Tree Pruning	2	Year	$1,500	$3,000
Monitoring and Reporting (First 5 Years Only)				
Monitoring Surveys[7]	5	Year	$15,000	$75,000
Report Preparation[7]	5	Year	$15,000	$75,000
Agency Coordination	5	Year	$2,500	$12,500
Subtotal				**$337,583**
10% Contingency				$33,758
Total Cost				**$371,341**
Total Mitigation Planting Cost				**$1,068,244**

Notes:
[1] Rivers mitigation accounts for 88% of the total.
[2] River Walk mitigations accounts for 12% of the total.
[3] Cost is for the entire year.
[4] Assumes one application at $5,000/acre.
[5] Assumes 10% plant replacement.
[6] Assumes 128 trees pruned on a 3- to 4-year cycle.
[7] Assumes 100 hrs at $150/hr.

Long-Term Operation and Maintenance

This section addresses specific site operation and maintenance activities during the post–5-year mitigation and monitoring period. The long-term operation and maintenance plan associated with this MMRLMP serves to satisfy condition b of the CVFCB Encroachment Permit (No. 18313-2-1), stating that "an operation and maintenance plan shall be developed and provided to the CVFPB for approval prior to planting" and conditions b, c, and e of the USACE letter of concurrence with the CVFPB Encroachment Permit.

Responsible Party

The City will be responsible for long-term operation and maintenance of the revegetation mitigation features. The City will coordinate long-term maintenance activities with State Maintenance Area 4, as needed.

Implementation Schedule

Operation and maintenance will occur as needed in conjunction with other City maintenance activities at the site. As is typical for native restoration plantings of this type, regular operation and maintenance are expected to be relatively minor in scope. At minimum, the Mitigation Site will be checked annually for maintenance activities listed below.

Post–Plant Establishment Guidelines

It is anticipated that during the first 5 years, a sufficient and healthy plant community will be established and that after this period, no plant replacement will be required. Maintenance and operations activities that will occur in perpetuity are described below.

Tree Preservation

Trees and other native vegetation installed by this project will be preserved. Only those large trees that interfere with levee maintenance or inspection, interfere with flood fighting procedures, threaten public safety, or substantially impede the hydraulic capacity of the flood protection project should be removed by the City. If a tree is removed, each tree would be replaced as required by the City Tree Preservation Ordinance. Restoration trees or brush removed from the site shall be properly disposed of by either complete burning or complete removal outside the limits of the levee right-of-way.

Elderberry Preservation

Elderberry shrubs occur in the mitigation site. When maintaining the site, no herbicides will be used in the revegetation area that are not approved for use near water, and no herbicides will be sprayed on or within 100 feet of elderberry shrub canopies. Weed infestations will be controlled as early as possible to prevent establishment and to minimize weed control efforts and pesticide usage.

Volunteer Growth

Volunteer seedlings of native species are expected to naturally colonize the mitigation site. Volunteer seedlings will be preserved unless they are competing with installed plants, are

establishing too close to the trail, are threatening public safety or the integrity of the levee, or impeding access to the levee for inspections, maintenance, or flood fighting. Restricted planting areas, as identified in the construction documents, are areas of no planting set by USACE policy. Volunteer seedlings of any woody species will be removed from the restricted planting areas on as-needed basis by the City.

Selective Clearing and Pruning

Downed trees and branches, dead limbs, and dead trees provide habitat for numerous wildlife species. However, pruning of planted trees and targeted clearing will be conducted to promote proper structure and canopy development of planted trees, maintain access for site and levee maintenance activities, resolve detriments to the integrity of the levee or flood-fighting capacity, eliminate a risk to public safety, or remove conflicts with firebreaks. Debris from clearing or pruning shall be properly disposed of by either complete burning or complete removal outside the limits of the levee right-of-way.

Weed Control

Weeds targeted for control on the revegetation site during the long-term operation and maintenance period include invasive nonnative species that can dominate the site and reduce the desired restoration vegetation to below the performance standards. The City will determine which weed species will be targeted for control and implement control in conjunction with other City maintenance activities at the site.

Rodent Control

Herbicide and bait station application will continue to be conducted by State Maintenance Area 4 as is done presently. Rodent control is not a component of this MMRLMP but is mentioned to satisfy condition h of the USACE letter of concurrence with the CVFPB Encroachment Permit.

Funding

Long-term operation and maintenance of the riparian mitigation plantings will be funded by the City as part of operating and maintaining public recreational amenities of the site. Typical of other municipal parks, the City will allocate money for operation and maintenance from the General Fund during each annual budget after the 10-year establishment period.

Public Use

The public's impact on the Mitigation Site will continue to be potentially disruptive to the vegetation. The City will ensure that recreational activities do not affect the plants. If public use becomes destructive, the City will take corrective measures to replace plants and to ensure their survival.

Printed References

California Department of Fish and Game 2003. *The Vegetation Classification and Mapping Program; List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database*. September 2003 edition. Wildlife and Habitat Data Analysis Branch. Sacramento, CA.

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ICF International. 2010. *Revegetation and Monitoring Guidelines Associated with the California Department of Fish and Game and City of West Sacramento Requirements for the West Sacramento Bridge District Levee Access Road and River Walk Trail Project*. September. (ICF 00548.09.) Sacramento, CA. Prepared for the City of West Sacramento.

ICF International. 2011. *West Sacramento Levee Improvements Program CHP Academy and The Rivers Early Implementation Projects 408 Permission Environmental Impact Statement/Environmental Impact Report*. Final. February. (ICF 00875.07.) Sacramento, CA. Prepared for: U.S. Army Corps of Engineers and West Sacramento Area Flood Control Agency, Sacramento, CA.

U.S. Army Corps of Engineers, 2009. *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures.* April 10. ETL 1110-2-571. Washington, D.C. Available: <http://140.194.76.129/publications/eng-tech-ltrs/>. Accessed: July 2009.

ATTACHMENT-E

18313-2-1

MEETING

STATE OF CALIFORNIA

THE RESOURCES AGENCY

CENTRAL VALLEY FLOOD PROTECTION BOARD

OPEN SESSION

THE RESOURCES BUILDING

1416 NINTH STREET

AUDITORIUM

SACRAMENTO, CALIFORNIA

FRIDAY, DECEMBER 2, 2011

8:37 A.M.

JAMES F. PETERS, CSR, RPR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 10063

APPEARANCES

BOARD MEMBERS

Mr. Benjamin Carter, President

Ms. Teri Rie, Vice-President

Mr. Butch Hodgkins, Secretary

Mr. John Brown

Mr. John Moffatt

Ms. Emma Suarez

Mr. Mike Villines

STAFF

Mr. Jay Punia, Executive Officer

Mr. Len Marino, Chief Engineer

Mr. Eric Butler, Supervising Engineer

Mr. Curt Taras, Supervising Engineer

Mr. David Williams, Senior Engineer

Ms. Angeles Caliso, Staff Engineer

Ms. Amber Woertink, Staff Assistant

Mr. Jim Andrews, Legal Counsel

Ms. Deborah Smith, Legal Counsel

DEPARTMENT OF WATER RESOURCES

Mr. Jeremy Arrich, Chief, Central Valley Flood Planning Office

Ms. Robin Brewer, Staff Counsel

Mr. Jeremy Goldberg, Staff Counsel

APPEARANCES CONTINUED

Mr. Arthur Hinojosa, Chief, Hydrology & Flood Operations

Mr. Paul Marshall, Assistant Chief, Division of Flood Management

Mr. Ward Tabor, Assistant Chief Counsel

Mr. Dan Wheeldon, Chief, Floodplain Evaluation Branch

Mr. Christopher Williams, Staff Engineer

Mr. Kent Zenobia, Chief, Project Delivery Branch

ALSO PRESENT

Mr. Lee Bass, United States Army Corps of Engineers

Mr. Paul Brunner, Three Rivers Levee Improvement Authority

Mr. Keith Coolidge, Delta Stewardship Council

Mr. Steve Fordice, Reclamation District 784

Mr. Kevin Heeney, CTA Engineers & Surveying

Mr. Michael King

Ms. Susan LaGrand

Mr. Derek Larsen, MBK Engineers

Ms. Carol Miller

Mr. Brandon Muncy, United States Army Corps of Engineers

Ms. Meegan Nagy, United States Army Corps of Engineers

Mr. Scott Shapiro, Downey Brand

Mr. Dave Shpak, City of West Sacramento

Mr. Max Steinheimer, Downey Brand

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PROCEEDINGS

PRESIDENT CARTER: Good morning, ladies and gentlemen. Welcome to the Central Valley Flood Protection Board meeting for December 2nd, 2011.

Before we call the roll, I just want to make one announcement. You all may see a gentleman wandering around the auditorium this morning with a camera. He is doing some filming and taking some pictures of the Board in action. And those will be a part of a documentary that's going to be used during the Board's centennial celebration, which you all are invited to, in January. So if you see him wandering around, just smile; and like us, look intelligent.

Thanks very much.

Mr. Punia, could you please call the roll.

EXECUTIVE OFFICER PUNIA: Good morning. Jay Punia.

Except Board Member Butch Hodgkins and Teri Rie, the rest of the Board members are present. And we are expecting Board Member Teri Rie and Butch Hodgkins to join us too.

PRESIDENT CARTER: Thank you.

At this time we'll move to Item 2, Approval of the Minutes for September 23rd and the August 12th Site Visit.

Brown?

BOARD MEMBER BROWN: Aye.

EXECUTIVE OFFICER PUNIA: Board Vice-President Teri Rie?

VICE-PRESIDENT RIE: Aye.

EXECUTIVE OFFICER PUNIA: Board President Ben Carter?

PRESIDENT CARTER: Aye.

Motion carries unanimously.

Thank you, Mr. Wheeldon.

DWR FLOODPLAIN EVALUATION BRANCH CHIEF WHEELDON: Thank you.

PRESIDENT CARTER: Moving back to Item 8A.

So I'll call the hearing to order for Permit No. 18313-2-1 - this is the West Sacramento Area Flood Control Agency - to consider approval of said permit to plant mitigation plantings for "The Rivers" and "Riverwalk" project along the Sacramento River in Yolo County.

Good afternoon, Mr. Williams.

SENIOR ENGINEER WILLIAMS: Good afternoon, Mr. Carter.

So we will follow -- this hearing we'll follow the same process as all of our others.

Does anybody need a review of that process?

Okay. Please proceed.

(Thereupon an overhead presentation was Presented as follows.)

SENIOR ENGINEER WILLIAMS: Good afternoon, President Carter, members of the Board. Dave Williams, Chief of the Levee Improvement Section.

This is Application No. 18353-1. 18313-2-1 It is a second permit request based off of a 408 permit that was granted last June.

So, anyway, this portion of that 408 project is under 208.10 with the Corps or 408 minor modification of the levee. And the work that will go on under this proposed permit is vegetative mitigation planting and irrigation works on the Sacramento River at the river's development in West Sacramento.

The mitigation work is based off of the initial 408 application, which is 18313-2, and a previous application, which was a 208 application on the Riverwalk. There was plants that came out of those two projects. And this is the mitigation for those plantings.

In the consultant's report, the plantings are going to be made up of 1,129 trees planted on the river site location. Eighty-nine percent of those trees are ~~for~~ from "The rivers" project and 122 of those trees were ~~for~~ from the "Riverwalk" project.

In addition to trees that will be planted,

there's also 231 small shrubs and 3,914 -- excuse me -- 3,914 small shrubs and 231 large shrubs.

The trees are going to be planted 100 feet waterside of the top of the newly proposed and being-constructed levee. And that from the top of the levee 500 feet out is the low bank of the Sacramento River on the south side.

So that the trees will be planted in this area of 100 feet waterside of the levee to 500 feet of the waterside of the levee.

On top of that the waterside slope of the levee is so flat that it pretty much carries out several feet under the levee itself to the Sacramento River on about a 40-to-1 slope. Which means that the actual levee prism, which is typically a 3-to-1 waterside slope, a 3-to-1 landside slope and a 20-foot top width, comes well under where the plantings are going. As a matter of fact, a hundred feet out from the top of the levee on the waterside the plantings will be 23 feet above the top of the projected waterside levee prism.

The hydraulics in this area are very, very complicated, in that there could be 40 or 50 different scenarios in what we look at.

We have the American River over on the downstream side of the Sacramento River that's coming into the

Sacramento River, and on low flows at American River converges with the Sacramento River and runs downstream.

Then about 6,000 feet upstream of our site we have the Sacramento Bypass. And that is closed until the river stage meets an elevation of 29 feet down at the I Street Bridge, where at that time the ~~we're~~ weir would be open and water from the Sacramento River will drain into the Sac Bypass and into the Yolo Bypass.

Further upstream we have further complications in that we have the Fremont ~~we're~~ weir. When the water reaches such a stage that the Fremont Weir starts to overtop, just before that point we have about 500,000 cfs that is running down the Sacramento River. Then when it starts to spill over the Fremont Weir into the Yolo Bypass, we have about 400 cfs running into the Yolo Bypass and only a hundred thousand 100,000 cfs running down the Sacramento River.

And then when the stage reaches 29 feet at the I Street Bridge, the weir at the Sacramento Bypass is opened and water flows out to the left on your screen into the Yolo Bypass. And what it starts to do at that point in time is it starts to create an effect where we actually have water coming out of the American River into the Sacramento River running back upstream and out the Sacramento Weir to the Yolo Bypass.

So given all of that, the West Sac's engineer

looked at the worst case being that when the water reaches that point on the Sac Bypass, that is the worst case for this river's development and the hydraulics.

When that happens, the water surface profile showed that there was no problem with raising water surface elevation because of these tree plantings and having the levee in place.

Currently, the levee work under 408 project is coming to an end. We're getting in the next couple of weeks into a position where we're going to be doing a job walk and finalizing everything except this mitigation work and the irrigation work.

So it's very critical here in the next couple of weeks that we proceed with allowing this 208 project to be done by West SAFCA for the end of December, early January.

With that, there are operation and maintenance requirements for those trees and plants. MA4, which is the Department of Water Resources, has certain operation and maintenance responsibilities on the 408 site, for the levee, for the newly constructed cutoff wall, for some trails. But West Sacramento will be responsible under the first five years for O&M responsibilities on the mitigation plantings. And then after that they will be responsible in perpetuity for tree trimming and any other type of maintenance.

I have our environmentalist, James Herota, here today, who can go through the environmental requirements of the operation and maintenance of those trees, if you so desire. But I'd like to go right into the staff recommendations at this time.

Staff recommends that the Board adopt the CEQA findings, approve Permit No. 18313-2 - we do have the Corps approval and Letter of Permission - and to direct staff to file a Notice of Determination with the Clearinghouse.

At this time I can have James Herota come up and talk a little bit more about the environmental considerations and/or the operation and maintenance of those trees and plants.

PRESIDENT CARTER: I don't think that will be necessary.

Does the applicant wish to address the Board on any of this?

Anything to add to the staff report?

MR. LARSEN: Derek Larsen with MBK Engineers. Thank you, Mr. Carter and Board.

The mitigation plantings for this project mitigate for the river's levee improvement project in addition to a portion of work that was completed on our Riverwalk trail in the bridge district for West

Sacramento.

The plantings, as have been shown by David, are essentially in an effective flow area. It is a very large waterside berm. There's really no better type of scenario to have plantings without having any type of hydraulic impact and the system is a very good location. And we're supportive of it, West SAFCA is supportive of it. And we're just we're appreciate of your time in hearing it. And thank you very much.

PRESIDENT CARTER: Okay. Thank you.

Questions?

BOARD MEMBER BROWN: I'd like to hear why -- Ms. Rie, she had something specific in mind maybe, to find out what her concerns are to change this up a little bit.

VICE-PRESIDENT RIE: Thank you.

When we have approved other mitigation plantings in the river for other projects in the past, we typically require a long-term management plan. And I didn't see any requirements in this permit for a long-term management plan. Did they submit one? Did you require one?

SENIOR ENGINEER WILLIAMS: According to my environmentalist, they are in the environmental documents. And in our permit, we have a condition that an operation and maintenance plan shall be developed and provided to the Central Valley Flood Protection Board for approval

prior to planting.

VICE-PRESIDENT RIE: I apologize. I must have missed that.

Do you know which condition that is?

SENIOR ENGINEER WILLIAMS: That is a condition for the Corps permit. This is in the letter from the Corps dated December 1st, 2011.

VICE-PRESIDENT RIE: Okay. I --

SENIOR ENGINEER WILLIAMS: So our permit relates to this Corps letter.

VICE-PRESIDENT RIE: I apologize. I don't have a copy of that letter.

SENIOR ENGINEER WILLIAMS: And you don't have a copy because we just got it.

VICE-PRESIDENT RIE: Oh, good.

Do you want to go through the letter and tell us what it says.

SENIOR ENGINEER WILLIAMS: "The District Engineer has no objection to approval of this application by your board from a flood control standpoint subject to the following conditions:" There's conditions A through H.

"A" is that the work won't be performed during the flood season of November 1st through April 15th.

"B" is that an operation and maintenance plan shall be developed and provided to the Central Valley

Flood Protection Board for approval prior to planting, with a copy to the Corps.

"C" is that all buildup of debris or underbrush shall be removed from the plantings prior to the beginning of the flood season (November 1st) and after each high water event.

"D" - that the proposed work shall not interfere with the integrity or hydraulic capacity of the flood damage reduction project, easement access or maintenance inspection, and flood fighting procedures.

"E" - that in the event trees and brush are cleared, they shall be properly disposed of by either burning or completely removal outside the project right-of-way.

"F" - that the proposed work shall not change the stream flow velocities in such a way that might cause damage to the existing waterside levee slope or reduce the channel flow velocity.

"G" - that the plants and irrigation lines shall be located at least 15 feet from the waterside levee toe - which they are.

"H" - that an effective rodent control program shall be in place to address rodent activity in the area of the proposed project.

That's it.

VICE-PRESIDENT RIE: And do we have a condition in the permit that requires them to comply with all the conditions of the Corps letter?

SENIOR ENGINEER WILLIAMS: Yes, we do.

VICE-PRESIDENT RIE: Do you know which condition that is?

PRESIDENT CARTER: Condition 62.

VICE-PRESIDENT RIE: Okay. Yeah, I'm good with that. That was my issue.

SENIOR ENGINEER WILLIAMS: Yeah, that's right. Condition 62.

BOARD MEMBER SUAREZ: So where does it capture that once they prepare the plan, it comes back to the Board for approval?

SENIOR ENGINEER WILLIAMS: They need to get us that. And I've talked to Mike Bessette, who's one of the heads of West SAFCA. And he will be getting that shortly -- in to us shortly.

BOARD MEMBER SUAREZ: I thought you said earlier that once they did that, it would come back to the Board for approval. Is that --

SENIOR ENGINEER WILLIAMS: That's correct.

BOARD MEMBER SUAREZ: Where does it say that in the permit?

SENIOR ENGINEER WILLIAMS: In the Corps's letter.

BOARD MEMBER SUAREZ: But it's not in the permit?

SENIOR ENGINEER WILLIAMS: Which is an attachment to the permit.

BOARD MEMBER SUAREZ: The Corps letter says that it comes back to the Board for approval?

PRESIDENT CARTER: I don't believe it does.

BOARD MEMBER MOFFATT: I thought I heard him say in sub B that they have to come up with a maintenance plan subject to approval by the Central Valley Flood Protection Board.

SUPERVISING ENGINEER BUTLER: Excuse me, Dave. Let me jump in here. This is Eric Butler. I have it in front of me.

It specifically says that an O&M plan shall be developed and provided to the Board for approval - it does say "for approval" - prior to planting. So it doesn't just say that they have to have a plan. But it specifically calls out that you must approve it.

BOARD MEMBER SUAREZ: But that's not in our permit?

SUPERVISING ENGINEER BUTLER: But our permit references all Corps conditions by our condition that Mr. Carter just referenced, 60 something, whatever it was.

SENIOR ENGINEER WILLIAMS: Sixty-two.

VICE-PRESIDENT RIE: You know, usually when we

have these type of permits, we consider the long-term management plan with the permit, and we look at it to see if, you know, it complies with the issues that we're concerned about. And this particular one it wasn't included. And --

BOARD MEMBER SUAREZ: So --

VICE-PRESIDENT RIE: -- I know we have done that with other applicants.

BOARD MEMBER SUAREZ: It's a conditional permit?

PRESIDENT CARTER: Good catch.

BOARD MEMBER SUAREZ: It's a conditional permit then?

SENIOR ENGINEER WILLIAMS: No. I understand from our environmentalist that it is in the environmental documents that this is happening.

BOARD MEMBER SUAREZ: But that's neither here nor there. I mean the question is, how does this Board get to enforce the requirement that a plan be in place before you can proceed, a plan that we have reviewed and approved?

SENIOR ENGINEER WILLIAMS:

Because it's in the permit via the Corps letter.

EXECUTIVE OFFICER PUNIA: We have to come back to the Board next month.

BOARD MEMBER SUAREZ: So the question is, that the permit is conditioned upon, so it's a conditional

permit?

EXECUTIVE OFFICER PUNIA: That's correct.

SENIOR ENGINEER WILLIAMS: Yes.

PRESIDENT CARTER: And it would be cleaner if -- since it's been the Board's practice, to just go ahead and have that in the permit rather than have it as part of the Corps letter, which is part of -- which is the condition of the permit.

I mean it's something that we're concerned with as much as the Corps is. So our permits of this kind of nature ought to have that as part of the conditions, as a general rule.

VICE-PRESIDENT RIE: It should be standard condition.

BOARD MEMBER SUAREZ: I can make a suggestion, a motion, to --

PRESIDENT CARTER: Please.

BOARD MEMBER SUAREZ: -- to approve the resolution and the planting -- authorize the planting, but include -- amend the permit and include a specific permit term that addresses the vegetation management plan having to come back to the Board for approval and that work doesn't commence until that happens.

SUPERVISING ENGINEER BUTLER: Okay.

SENIOR ENGINEER WILLIAMS: James, do you have

something to add on that?

SUPERVISING ENGINEER BUTLER: That's absolutely fair.

PRESIDENT CARTER: Okay. Is there a second for that motion?

VICE-PRESIDENT RIE: I'll second that.

PRESIDENT CARTER: Okay. Mr. Hodgkins, did you have a comment?

SECRETARY HODGKINS: I have a question.

This is compensatory mitigation, is that correct?

And so after you get through the establishment period, then the responsibility for maintenance of the channel in this area is going to fall to the maintenance area, is that correct?

SENIOR ENGINEER WILLIAMS: Well, the plantings will fall to West SAFCA. They will be on the hook, they'll be responsible.

SECRETARY HODGKINS: Here's what I'd like to think about in the way of a condition. And it's a condition that fundamentally says, if at any point in time it's necessary for flood control maintenance or hydraulics to thin or remove some of the vegetation, that West SAFCA is responsible for permitting, conducting, and financing that maintenance. Because it seems to me if it's compensatory mitigation, you know, you could end up in

3-to-1, 5-to-1 mitigation for having to go in here and do maintenance.

And that's a permit condition that I think we generally need to think about putting in permits where we're involved with mitigation. And that also covers -- if at some point it becomes apparent that there are hydraulic impacts, you're responsible for coming in and thinning or doing whatever's necessary to restore the hydraulics. I would also like us to think about whether that's not a condition that should be in all these permits.

SENIOR ENGINEER WILLIAMS: And that is in our permit.

SECRETARY HODGKINS: It is?

SENIOR ENGINEER WILLIAMS: Yes.

SECRETARY HODGKINS: I looked quickly but not thoroughly.

PRESIDENT CARTER: Does the motioner accept the suggestion of Mr. Hodgkins that if there is maintenance required, that is the responsibility, both operationally and financially, of West SAFCA?

BOARD MEMBER SUAREZ: I do.

PRESIDENT CARTER: The seconder?

VICE-PRESIDENT RIE: Sure.

PRESIDENT CARTER: Okay. Very good.

Any other questions, comments?

SENIOR ENGINEER WILLIAMS: One thing, is it's in our permit, 54 and 57.

PRESIDENT CARTER: Okay. So just for everyone's edification, 54 says, "Any vegetative material, living or dead, that interferes with the successful execution, functioning, maintenance, or operation of the adopted plan of flood control must be removed by the permittee at the permittee's expense upon request by the Central Valley Flood Protection Board or Department of Water Resources. If the permittee does not remove such vegetation, the Board reserves the right to remove it at the permittee's expense." That's 54.

And 57, "Permitted encroachment(s) shall not interfere with the O&M of the current or future flood control project." And if they do, "the permittee shall be required, at permittee's cost and expense, to modify or remove the permitted encroachment(s) under the direction of the Board or DWR."

SECRETARY HODGKINS: I actually think that does it. We might word it a little differently in the future, but I don't have any suggestions at this point.

PRESIDENT CARTER: Any other questions or comments?

VICE-PRESIDENT RIE: I just wanted to clarify

when the Board would be approving the long-term management plan. And when do they plan on planting?

Derek MR. LARSEN: It's our goal to establish a mitigation as soon as we can. In all likelihood, that would probably be, at the earliest, in the April time frame, given that we are at the 90 percent level. So we kept it at 90 percent because we wanted to submit the 100 percent after getting your feedback, staff feedback, feedback from the Corps. So that way when we submit our hundred percent, we know that it will be everything that makes the Corps happy, Central Valley Flood Protection Board happy, and DWR happy with the final plans and specs. At that time we'll include language with respect to how we will O&M these facilities and maintain these facilities that will include the plans. So that's how we plan to submit it for the staff's review and consideration in the future.

As for a long-term management plan, like maybe what you've seen in some larger projects, this project is much smaller and the resource agencies did not require a long-term management plan for the mitigation in this instance because of the scale.

VICE-PRESIDENT RIE: Well, I think that's what we're asking you to do. And we've asked for it on smaller projects than yours.

The Board wants to know what your long-term management plan is of the vegetation. I don't know what you were talking about, plans and specs.

MR. LARSEN: The plans and specifications for the construction that we'll provide the contractor for construction and bidding of the project. In that has construction documentation reports. And in the construction documentation reports we'll deal with the long-term O&M. And so we understand that the Board would like to see that, and we're happy to submit that to you for your staff's review and, finally, for Board approval.

VICE-PRESIDENT RIE: Just to be clear what we're asking for is a long-term management plan of the vegetation that you're planting. We're not asking you to come back to our Board with plans and specifications for construction.

MR. LARSEN: Understood. That will go to the staff.

VICE-PRESIDENT RIE: And I understand that you want to plant in April. So when will you be submitting the long-term vegetation management plan to Board staff?

And for Board staff, when would you anticipate bringing that back before the Board?

MR. LARSEN: I'm going to let Dave Shpak answer that from the City of West Sacramento. He's been taking

the lead on the development of the plans and specifications.

MR. SHPAK: Thanks, Derek.

And for the record, Dave Shpak with the West Sacramento Area Flood control Agency.

At this point what we would shoot for a target is to bring the long-term O&M plan for the plantings back to this Board in February.

VICE-PRESIDENT RIE: Okay.

MR. SHPAK: We believe we can turn the materials around to make the time flame -- the staff time frame for your consideration at that point.

VICE-PRESIDENT RIE: Okay. Great.

MR. SHPAK: Thank you for your consideration.

PRESIDENT CARTER: Thank you.

Just so you know, that our concern is that in the long run these plantings will be managed, there's both a plan and dollars behind the plan to ensure that in 20 years we don't have a problem out there as far as public safety, channel capacity, so forth. So that's the reason we're asking for it.

Very good.

Mr. Punia, did you want to --

EXECUTIVE OFFICER PUNIA: And the staff will make sure that in the future if we are bringing these

mitigation projects, that we have a long-term plan. So we will make note of that.

VICE-PRESIDENT RIE: Yeah, I think that needs to be a standard condition in all of these type of permits.

PRESIDENT CARTER: Okay. Any other questions, comments?

Okay. So we have a motion to approve the Permit -- conditionally approve the Permit No. 18313-2-1 for the mitigation plantings for "The Rivers" and "Riverwalk" projects, with -- I'm sorry, I've got a Perry moment here.

(Laughter.)

SECRETARY HODGKINS: There's no need to add my condition.

PRESIDENT CARTER: No, there isn't.

But, Ms. Suarez, you had --

BOARD MEMBER SUAREZ: Well, that the permit actually reflects a requirement that the long-term management plan has to come back to the Board for approval.

PRESIDENT CARTER: For approval, that's right.

Okay.

BOARD MEMBER SUAREZ: And that the permit is conditioned on that.

VICE-PRESIDENT RIE: Prior to construction.

BOARD MEMBER SUAREZ: Right.

PRESIDENT CARTER: All right. Any other questions, comments?

Mr. Punia, would you call the roll.

EXECUTIVE OFFICER PUNIA: Board Member Mike Villines?

BOARD MEMBER VILLINES: Aye.

EXECUTIVE OFFICER PUNIA: Board Member Emma Suarez?

BOARD MEMBER SUAREZ: Aye.

EXECUTIVE OFFICER PUNIA: Board Member Butch Hodgkins?

SECRETARY HODGKINS: Aye.

EXECUTIVE OFFICER PUNIA: Board Member John Moffatt?

BOARD MEMBER MOFFATT: Aye.

EXECUTIVE OFFICER PUNIA: Board Member John Brown?

BOARD MEMBER BROWN: Aye.

EXECUTIVE OFFICER PUNIA: Board Vice-President Teri Rie?

VICE-PRESIDENT RIE: Aye.

EXECUTIVE OFFICER PUNIA: Board President Ben Carter?

PRESIDENT CARTER: Aye.

Motion carries unanimously.

Thank you very much. Gentlemen, thank you very much for your patience. Look forward to seeing you in February.

We're on the home stretch, ladies and gentlemen.

We have -- if I'm not mistaken, since we jumped around so much, we have 11 and 12 to take care of.

Board Comments and Task Leader Reports.

Any -- Mr. Moffatt, do you have anything you'd like to share with the Board?

BOARD MEMBER MOFFATT: No, other than to say thank you. And unless a miracle occurs, this is my last board meeting. And so I just wanted to say thank you very much. It's been a great year. I've really enjoyed it and really enjoyed working with all of you and the staff, and learned a lot. And you've got a monumental task in front of you with the Central Valley Flood Protection Plan, and I wish you luck.

I'm sure our paths will cross at some point here in the future. But I just want to say thank you. It's been fun. I've really enjoyed it.

PRESIDENT CARTER: Well, thank you for your year of service and value added to the Board.

Mr. Brown.

BOARD MEMBER BROWN: John, you've been a great

Meeting of the Central Valley Flood Protection Board
December 2, 2011

Staff Report – Encroachment Permit
West Sacramento Area Flood Control Agency – The Rivers EIP
Mitigation Plantings and Appurtenances
West Sacramento, Yolo County, CA

1.0 – ITEM

Consider approval of Permit No. 18313-2-1 (formerly numbered 18313-2a), see Attachment B.

2.0 – APPLICANT

West Sacramento Area Flood Control Agency (WSAFCA)

3.0 – LOCATION

The project is located in West Sacramento along the right (south) bank of the Sacramento River approximately 1.5 miles upstream from the American River outfall along the Riverbank Road, in Yolo County (see Attachment C). This reach of the levee is maintained by Maintenance Area (MA) 4.

4.0 – DESCRIPTION

The City of West Sacramento purposes to mitigate for the loss of riparian vegetation associated with the Rivers levee modification project and the River Walk project mitigation improvements (West Sacramento Bridge District Levee Access Road and River Walk Trail). The two sites will be mitigated at The Rivers EIP site recently permitted by the CVFPB by permit number 18313-2. All recreational improvements and their construction activities will occur above the ordinary high water mark.

The work will include a paved 12-ft. wide bicycle/ pedestrian trail; landside embankment ramps; paved 6-ft wide pedestrian trail; paved landing; 1-inch to 2-inch irrigation pipes; and 1,360 trees and plants.

5.0 – PROJECT ANALYSIS

The following project analyses have been made based on the review of the available technical information provided by the applicant and the applicants engineer MBK Engineers.

The newly constructed levee, cutoff wall, construction and utility relocations was designed and constructed in accordance with United States Army Corps of Engineers (USACE), Department of Water Resources (DWR) Interim Levee Design Criteria (ILDC), and Central Valley Flood Protection Board (Board) standards and was permitted under Board Permit 18313-2. The levee modification has a cutoff wall for under-seepage. The construction will be completed in this single construction season and includes all of the above improvements as well as the recreational features, tree mitigation and utility improvements provided in this proposed permit application.

5.1 – Background

The West Sacramento Basin is bounded by the Sacramento bypass on the north, the Sacramento River on the east, the Yolo Bypass and Sacramento Deep Water Ship Channel (DWSC) on the west and the South Cross Levee on the south. The West Sacramento Basin is divided into the north and south basins. The levee system that protects these basins is a part of the Sacramento River Flood Control Project (SRFCP) and includes over 50 miles of levees in Reclamation District (RD) 900, RD 537, Maintenance Area 4, and DWSC. Its primary purpose is to prevent Sacramento River and Yolo Bypass flood flows from entering the City. The Rivers site is part of the Sacramento River North West Levee and is referred to as “The Rivers” EIP site.

The West Sacramento flood protection system was originally constructed by the U.S. Army Corps of Engineers as a part of the Sacramento River Flood Control Project. The non-federal sponsor of the flood control system is the Central Valley Flood Protection Board, however, the project is maintained and operated by the California Department of Water Resources (DWR), RD 900 and RD 537.

The West Sacramento Area Flood Control Agency (WSAFCA) and the City of West Sacramento City Council defined a policy of achieving a minimum 200-year flood protection for the City by adopting Ordinance 07-11 at a City Council Meeting on May 2, 2007. The City of West Sacramento, through a team of consultants lead by HDR Engineering, has evaluated the levee system and found it to be inadequate for protecting the City from a 200-year flood event.

The City’s overall levee improvement program includes identification of candidate sites for the State Flood Control System Program, Early Implementation Projects (EIP). These are projects that are to be built in advance of publication of the State Plan of Flood Control scheduled for 2012. EIP sites are assumed to conform to the eventual requirements defined by the State Plan of Flood Control. The Rivers EIP site was identified for improvement as part of the EIP program.

Land use in the proposed project area is primarily residential with a school and parks nearby. There is also a large riparian strip of land adjacent to the Sacramento River. The impacts to private landowners will be compensated, and public lands will be used where possible for outfall location, and valuable riparian habitat will be avoided as well.

Maintenance Area (MA) 4 has endorsed this project and construction has been initiated on one other phase of the WSAFCA to the south of the proposed project. The River's Project (permit No. 18313-2BD) and the CHP Police Academy Levee (permit No. 18313-1BD) along the south bank of the Sacramento Bypass was the next phase of improvements scheduled for the WSAFCA. The third project approved and constructed was permit number 18336. This initial Early Implementation Project was to construct a 600 foot long seepage cutoff wall on the right (west) bank of the Sacramento River south of the "I" Street Bridge (also known as the River Walk).

5.2 – Hydraulic Analysis

The design hydraulic study for this project was prepared by MBK Engineering dated October 11, 2011 utilizing a UNET Model and a higher flow rate. Originally the site was modeled on March 8, 2011 for the levee construction anticipating that the Sacramento Weir would be open, reducing the flow.

The COE had issue with the flow rate used and the proposed worst case scenario. The issue is that the O&M manual for unit 124 (attached) states that this section of the system is designed to handle 107,000 cfs. The O&M manual does not capture the fact that in the portion of the system being analyzed has an authorized design flow of 18,000 cfs. The project is located in the portion of the system where the Sacramento Rivers flows toward the Sacramento Bypass during large flood events.

MBK's analysis shows that for the 200-year Design WSE that the proposed plantings have no hydraulic impacts. MBK makes the necessary assumptions that forces 107,000 cfs through this portion of the system to satisfy the comments from the COE. The fact is that MBK's professional opinion is that the assumptions that would have to made are unlikely to ever occur. The analysis will essentially have to show that almost no flow is coming from the American River while the Sacramento River is experiencing a 100-year event.

The USACOE requested a Hydraulic Impact Analysis with a flow of 107,000 cfs for this project on or about October 14, 2011. The USACOE noted that the O&M Manual (Supplement to Standard Operation and Maintenance Manual, Sacramento River Flood Control Project, Unit No. 124, Sacramento District, Corps of Engineers. June 1953) for this reach states that the project design flood in this reach is 107,000 cfs. The O&M Manual states:

"*the project design flood for the Sacramento River is 107,000 cubic feet per second and the project design flood for the American River is 180,000 cubic feet per second within*

the limits of this levee unit. In the event of high water as reflected on the U.S. Weather Bureau gauge at the "I" Street Bridge, the Sacramento Weir is opened in order to control the flood stage in the river to 29.0 insofar as possible. With the Sacramento Weir in operation, flows in that portion of the Sacramento River from Sacramento Weir to the American River may vary from 107,000 cubic feet per second in a downstream direction to as much as 80,000 cubic feet per second in an upstream direction."

The scenario developed that resulted in a maximum flow of 107,000 cfs in the Project reach was as follows, and is referred to in shorthand as "100-yr/<2-yr":

- 100-year Sacramento River at latitude of Sacramento centering hydrology for all but American River,
- American River: 2-year Sacramento River at latitude of Sacramento centering hydrology reduced by 30%,
- No influence from the Sacramento Weir.

The 200-year event was produced utilizing 110,500 cfs and is referred to as "200-yr/2-yr".

The expanded hydraulic impact analysis presented by the consultant based on the proposed fill locations and mitigation plantings will have no hydraulic impacts. The minor fill and mitigation plantings are in an ineffective flow area.

SUMMARY: Maximum Water Surface Elevation Impact

Location	Design Condition			200-yr/2-yr		
River Mile	W/out	With	Impact (ft.)	W/out	With	Impact (ft.)
63.44 [1]	34.03	34.03	0	35.12	35.13	+0.01
62.25 [2]	34.06	34.06	0	35.61	35.61	0.00
62.15	34.06	34.06	0	35.57	35.56	-0.01
62.00	34.07	34.07	0	35.48	35.48	0.00
61.75	34.07	34.07	0	35.32	35.31	-0.01
61.65	34.08	34.08	0	35.29	35.27	-0.02
61.50 [3]	34.08	34.08	0	35.12	35.12	0.00
60.60 [4]	34.10	34.10	0	35.74	35.74	0.00

[1] Sacramento River below Sacramento Weir
[2] Upstream end of the Project
[3] Downstream end of the Project
[4] Sacramento River at the American River

Velocity Range (Ft/Sec.)	With-out Project	With Project

For 100-yr/2-yr = 107,300 cfs	4.52 to 5.29	4.53 to 5.28
For 200-yr/2-yr = 110,500 cfs	4.63 to 5.36	4.64 to 5.43

5.3– Geotechnical Summary

This geotechnical review has been made based upon the documentations provided by WSAFCA for the improvement of the Rivers Site (from STA 71+00 to STA 101+50) along the Sacramento River, Yolo County, California. In particular, the review is based on the data presented in the geotechnical data and Design Document Report, and partially on the Technical Memorandum Analysis Summary and Recommendations.

The proposed levee re-configuration varies in re-compacted height from 10 to 15 feet. Top widths are 20 feet wide at the crest with 12 feet of 3 inch A.C. on 9 inches of AB. Landside slopes are designed to be 3:1 and waterside slopes vary from 3:1 to ~10:1. The soil cement bentonite (SCB) cut-off wall will be positioned along the centerline of the reconstructed levee and consist of a clay cap and 95 percent compacted soil benched and keyed into the existing levee.

Models for analysis of the Rivers Site levee were selected at station 87+50, 97+50 and 114+00. The model cross sections were developed at each location using available topographic data provided by HDR Engineering. The stratigraphy and soil property parameters for the models were selected using available subsurface data gathered from the exploration locations and presented in the Technical Memorandum provided by West Sacramento and dated September 9, 2009. The subsurface data includes borings and cone penetration tests (CPTs) performed by URS in 2006, CPTs performed by DWR in 2006 and 2007, and borings and CPTs performed by Kleinfelder in 1988,1989, 1992, 2007, and 2009.

Based on the general subsurface conditions, cross sections at stations 87+50, 97+50, and 114+00 were analyzed for seepage and slope stability as provided in the Rivers Site Technical Memorandum by DWR and Kleinfelder.

The geotechnical analyses conducted were seepage analysis, slope stability analysis, settlement analysis, seismic analysis, and cutoff wall trench stability analysis during construction. The seepage and slope stability analyses were conducted based on both USACE and DWR Interim Levee Design (ILDC - 2009) criteria. A deterministic 200-year water surface elevation by MBK Engineers, were used in the models. The analyses were generally in agreement with the standard of practice in the Sacramento area, and as per required regulatory guidelines.

5.4 – The Riparian Mitigation Site

ICF International (a sub-consultant to WSAFCA for tree plantings) provided

90 % Plans and Design Submittal for Riparian Mitigation which were presented to Board Staff in June 2011 after ACOE approval at Washington D.C. for the bulk of the project development. It is intended by the USACOE and WSAFCA to permit the vegetative work under the ACOE 208.10 process and this proposed permit.

WSAFCA's rationale is that the major civil work will be constructed first under an initial construction contract followed by the site vegetative plantings at the latter part of the contract which is typical in these types of projects. Therefore, it is WSAFCA's intent to hire a separate qualified Landscape Contractor to do this final mitigation work at a savings for the contract. WSAFCA did not want to risk delays in construction for the levee improvements due to the approval of the mitigation features.

The scope of work under this Riparian Mitigation will be to:

- Clear & grub the 4.77 acres of mitigation land within the project area.
- Provide erosion control for the mitigation area.
- Prepare the soil.
- Plant approximately 1,360 trees and plants as shown on the planting plan.
- Prepare a temporary irrigation system for the establishment period.
- Provide plant maintenance for the establishment period.

5.5 – The Riparian Mitigation Site Quantities

The River's Project accounts for 89% of the mitigation and The River Walk Project accounts for 11% of the mitigation.

	The Rivers Project	River Walk Project	Sub Total
Trees required	1,007	122	1,129
Large Shrubs required			231
Small shrubs required			3,914
Total plants			**5,274**

Total planting area = 207,892 SF = 4.77 acres

All proposed Fremont Cottonwood (*Populus fremontii)* trees shall be no closer than 100 feet from the waterside levee hinge point as shown on the approved drawings dated June 2011.

Seeding will be utilized within the restoration area (all disturbed areas) as shown on the 18 drawings dated June 2011 and made up of 7 different seed types at the rate of 30 lbs per acre.

There is approximately 3,315 linear feet (scaled from the plans) of irrigation mainline which is 3-inch diameter, class 315, buried 18" with warning tape. Irrigation laterals will vary between 1" to 2" diameter schedule 40 pvc. Irrigation pipe sleeves, when used, will be a minimum of 2 times the diameter of the actual irrigation pipe. There are 160 Bubbler valves through-out the project.

All electrical lines; irrigation filters; gate vales; control valves; quick coupling valves, and irrigation lines shall be as shown on the approved drawings. Variations from material type, location, and sizes shall be pre-approved and shown on the final As-Built Drawings.

5.6 – Project Design Review

The Flood System Improvements Section staff completed a technical review of the following documents:

- 90% Plans and Specifications for the Rivers Site, Station 71+50 to 101+00.
- Permit Application, submitted by WSAFCA dated May 2011.
- 90% Project Specification dated June 2011, by ICF International.
- H&H UNET Model (MBK ftp web site) July 27, 2011

  ftp://ftp.mbkengineers.com/Outgoing/Larsen/WSAFCA/CVFPB/18313-2a (The Rivers-Mitigation Features)
- Subsequent e-mails between the Corps of Engineers and MBK Engineers; revised hydraulics. October 11 thru 14, 2011.
- Hydrology / Hydraulic Technical Memorandum, dated March 8, 2011 – MBK Engineers;

This technical review concluded that the designs for the Rivers Site are in accordance with Board, USACE standards, and DWR Interim Levee Design Criteria (ILDC Version 4).

5.7 – Staff Comments

The project has little effect on the Flood Control System and is an improvement. The mitigation effort provides beneficial effect on both flora and fauna while address the needs of recreation for the public.

6.0 – AGENCY COMMENTS AND ENDORSEMENTS:

The comments and endorsements associated with this project, from all pertinent agencies are shown below:

- The U.S. Army Corps of Engineers 208.10 comment letter has not yet been received for this application. Staff expects to receive a letter indicating that the District Engineer has no objection to the project, subject to conditions, and will incorporate the letter into the permit as Exhibit A.
- The Department of Water Resources under Maintenance Area-4 will be the Long Term Maintenance Agency. Their concerns are addressed in the Board's permit.

7.0 – PROPOSED CEQA FINDINGS:

Board staff has prepared the following CEQA findings:

The Board, acting as a responsible agency under CEQA, has independently reviewed the Draft Environmental Impact Statement/Draft Environmental Impact Report (DEIS/DEIR) (SCH No. 2007102130, May 2009) and Final Environmental Impact Statement/Final Environmental Impact Report (FEIS/FEIR, December 2010) for the West Sacramento Levee Improvements Program – CHP Academy and The Rivers Early Implementation Projects submitted by the West Sacramento Areas Flood Control Agency. The West Sacramento Areas Flood Control Agency, as the lead agency, determined that the project would have a significant effect on the environment and adopted Resolution 11-03-01 (which includes Findings, Facts in Support of Findings, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Plan) on March 10, 2011 and subsequently filed a Notice of Determination on March 11, 2011 with the Yolo County Clerk. These documents, including project design and WSAFCA resolutions, may be viewed or downloaded from the Central Valley Flood Protection Board website at http://www.cvfpb.ca.gov/meetings/2011/12-02-2011.cfm under a link for this agenda item. The documents are also available for review in hard copy at the Board and City of West Sacramento offices.

7.1 – Impacts that can be Mitigated

The significant impacts and the mitigation measures to reduce them to less than significant are adopted in WSAFCA Resolution 11-03-01 dated March 11, 2011 (which includes Findings, Facts in Support of Findings, Statement of Overriding Considerations, and Mitigation Monitoring and Reporting Plan). Based on its independent review of the DEIS/DEIR and FEIS/FEIR and the WSAFCA Resolution 11-03-01, the Board finds that for each of the significant impacts described, changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effects as identified in the DEIS/DEIR and FEIS/FEIR. Moreover, such changes or alterations are within the responsibility and

jurisdiction of the WSAFCA and such changes have been adopted by that agency. The following are the significant impacts and the mitigation measures to reduce them to less than significant:

- Flood Control and Geomorphic Conditions – The project proponent will coordinate with owners and operators, prepare drainage studies as needed, and remediate effects of the alteration of existing drainage patterns through project design.

- Water Quality and Groundwater Resources – The project proponent will implement a Stormwater Pollution Prevention Plan (SWPPP), Bentonite Slurry Spill Contingency Plan (BSSCP), and a Spill Prevention, Control, and Countermeasures Plan (SPCCP) to mitigate for effects on groundwater or drinking water quality resulting from construction and operation.

- Transportation and Navigation – The effects of temporary road closures or restricted access to parking on the levee crown or roads that run adjacent to levee will be mitigated by implementing the environmental commitments of a Traffic Control Plan, coordination to ensure minimal overlap in disturbances to traffic during construction, and notification of construction area closure.

- Noise and Vibration – Implementation of noise-reducing construction practices and employ measures to prevent exposure of buildings and structures to excessive groundborne vibration.

- Biological Resources – The project proponent will install protective barrier fencing around sensitive wetland/riparian habitats, comply with the City of West Sacramento Tree Preservation Ordinance, conduct mandatory Contractor/Worker Awareness Training for construction personnel, retain a Biological Monitor during construction, and conduct Pre-Construction Surveys for listed species and nesting migratory birds to minimize the effects on their respective habitats. Compensation plans for the loss of woody riparian habitat and wildlife will be completed post construction.

- Visual Resources – The proposed Revegetation Plan will minimize the changes to the existing visual character or quality of the site and its surroundings as a result of construction, operations, and maintenance.

- Utilities and Public Services – The project proponent will verify utility locations, coordinate with utility providers, prepare a Response Plan and conduct worker training to minimize damage of public utility infrastructure and disruption of service during construction.

- Hazards and Hazardous Materials – To minimize effects of exposure to hazardous materials encountered at the project site, the project proponent will implement measures to maintain surface water quality and groundwater quality,

provisions for dewatering, and complete Phase I and Phase II (if necessary) Environmental Site Assessment Investigations. The project proponent will notify Washington Unified School District and applicable schools located within 0.25 Mile of project construction activities to minimize the effects of emissions or handling of hazardous materials substances, or waste, within 0.25 mile of an existing or proposed school.

- Geologic and Soils Resources – The project proponent will implement the corrective actions identified as part of a project-specific Geotechnical Report to minimize the effects of expansive soils.

7.2 – Significant Unavoidable Adverse Impacts of the Project

The following impacts of the proposed project remain significant following adoption and implementation of the mitigation measures described in the FEIS/FEIR:

- Effects on Residents - Construction-related socioeconomic effects on residents will potentially disrupt day to day activities that, even though temporary, may still cause substantial inconvenience.

- Result in a New Source of Light or Glare - During construction, residents across the Sacramento River and the landside of the levee would temporarily experience a new source of light or glare that would affect their viewshed.

- Change in the Significance of an Archaeological Resource - Project proponent will implement Inadvertent Discovery Procedures of the WSLIP Program Historic Properties Management Plan.

- Disturbance of Native American and Historic-Period Human Remains - Project proponent will implement Human Remains Discovery Procedures of the WSLIP Program Historic Properties Management Plan.

- Cumulative Effects on Air Quality - Project proponent will implement measures to reduce exhaust emissions, and a fugitive dust control plan.

The Board finds that the specific economic, legal, social, technological or other benefits of the project outweigh the unavoidable adverse environmental effects, which are thus considered to be “acceptable.”

7.3 – Statement of Overriding Considerations

WSAFCA adopted Resolution 11-03-01 which included the Statement of Overriding Considerations. The Board concurs with this Statement.

The Board has independently considered the significant and unavoidable environmental impacts of the proposed project. The Board has also considered the benefits of the

project, including achieving 200-year flood protection, incremental levee improvements that will bring the levees protecting the city of West Sacramento up to current Federal standards, and providing recreation opportunities that are compatible with flood improvement actions that also meet the city's recreation and open space goals. The Board finds that economic, legal, social, technological, or other benefits of the proposed project outweigh the unavoidable adverse environmental effects of the project, and the adverse environmental effects are considered acceptable when these benefits of the project are considered.

The documents and other materials which constitute the record of the Central Valley Flood Protection Board's proceedings in this matter are in the custody of Jay Punia, Executive Officer, Central Valley Flood Protection Board, 3310 El Camino Ave., Rm. 151, Sacramento, California 95821.

8.0 – SECTION 8610.5 CONSIDERATIONS

1. Evidence that the Board admits into its record from any party, State or local public agency, or nongovernmental organization with expertise in flood or flood plain management:

   The Board will make its decision based on the evidence in the permit application and attachments, this staff report, and any other evidence presented by any individual or group.

2. The best available science that related to the scientific issues presented by the executive officer, legal counsel, the Department or other parties that raise credible scientific issues.

   The accepted industry standards for the work proposed under this permit as regulated by Title 23 have been applied to the review of this permit.

3. Effects of the decision on the entire State Plan of Flood Control:

   This project has no negative impacts on the State Plan of Flood Control. Both hydraulic and structural impacts from the project construction are negligible.

4. Effects of reasonable projected future events, including, but not limited to, changes in hydrology, climate, and development within the applicable watershed:

   Climate change issues have not been taken into account in the hydraulic analysis for this project; however, it is assumed to be inland past the point tidal influence raises in WSE, and due to the excessive amount of freeboard in the channel at this location, the project would have an ample factor of safety built into it. Climate change WSE raises are only estimated from 6-inches to 1-foot of impact and would be well within the freeboard of this project in the event that tidal influences did reach

further inland than expected. There are no other foreseeable projected future events that would impact this project.

9.0 – STAFF RECOMMENDATION

Staff recommends that the Board adopt the CEQA findings, approve the permit conditioned upon receipt and review of a favorable U.S. Army Corps of Engineers 208.10 comment letter and direct staff to file a Notice of Determination with the State Clearinghouse.

10.0 – LIST OF ATTACHMENTS

A. Resolution No. (None required under consent items)

B. Draft Permit No. 18313-2-1

Exhibit A – USACE 208.10 Comment Letter

C. Location Map

D. Vicinity Map

E. Drawing cover sheet

F. Planting Plan

G. Irrigation Plan

H. Water surface Profile

I. Photos

J. Supplement to Standard O&M Manual, Unit 124, COE

Report Completed by:	David R. Williams, P.E.
Design Review:	David R. Williams, P.E.
Enviromental Review:	James Herota, E.S. and Andrea Mauro, E.S.
Document Review:	Eric Butler, P.E. – Supervising Engineer
	Len Marino, P.E. – Chief Engineer

DRAFT

STATE OF CALIFORNIA
THE RESOURCES AGENCY

THE CENTRAL VALLEY FLOOD PROTECTION BOARD

PERMIT NO. 18313-2-1 BD

This Permit is issued to:

West Sacramento Area Flood Control Agency
1420 Merkley Avenue, Suite 4
West Sacramento, California 95691

The City of West Sacramento purpose to mitigate for the loss of riparian vegetation associated with the Rivers Levee Modification Project and the River-Walk Project Mitigation Improvements (West Sacramento Bridge District, LeveeAccess Road and River Walk Trail). The two sites will be mitigated at The Rivers E.I.P. site, recently permitted by the CVFPB by permit number 18313-2. All recreational improvements and there construction activities will occur above the ordinary high water mark.
The work will include a paved 12-ft. wide bicycle/ pedestrian trail; landside embankment ramps; paved 6-ft. wide pedestrian trail; paved landing; 1-inch to 2-inch irrigation pipes; and 5,274 trees and plants. Township is 38d 36m 6.45s N -- 38d 36m 12.01s N and Range is 121d 32m 11.34s W -- 121d 31m 21.59s W. Proposed work is located approximately 200 feet north of River Bank Road between Todhunter Avenue and Fountain Drive in West Sacramento Yolo County).

NOTE: Special Conditions have been incorporated herein which may place limitations on and/or require modification of your proposed project as described above.

(SEAL)

Dated: _____

_____
Executive Officer

GENERAL CONDITIONS:

ONE: This permit is issued under the provisions of Sections 8700 – 8723 of the Water Code.

TWO: Only work described in the subject application is authorized hereby.

THREE: This permit does not grant a right to use or construct works on land owned by the Sacramento and San Joaquin Drainage District or on any other land.

FOUR: The approved work shall be accomplished under the direction and supervision of the State Department of Water Resources, and the permittee shall conform to all requirements of the Department and The Central Valley Flood Protection Board.

FIVE: Unless the work herein contemplated shall have been commenced within one year after issuance of this permit, the Board reserves the right to change any conditions in this permit as may be consistent with current flood control standards and policies of The Central Valley Flood Protection Board.

SIX: This permit shall remain in effect until revoked. In the event any conditions in this permit are not complied with, it may be revoked on 15 days' notice.

SEVEN: It is understood and agreed to by the permittee that the start of any work under this permit shall constitute an acceptance of the conditions in this permit and an agreement to perform work in accordance therewith.

EIGHT: This permit does not establish any precedent with respect to any other application received by The Central Valley Flood Protection Board.

NINE: The permittee shall, when required by law, secure the written order or consent from all other public agencies having jurisdiction.

TEN: The permittee is responsible for all personal liability and property damage which may arise out of failure on the permittee's part to perform the obligations under this permit. If any claim of liability is made against the State of California, or any departments thereof, the United States of America, a local district or other maintaining agencies and the officers, agents or employees thereof, the permittee shall defend and shall hold each of them harmless from each claim.

ELEVEN: The permittee shall exercise reasonable care to operate and maintain any work authorized herein to preclude injury to or damage to any works necessary to any plan of flood control adopted by the Board or the Legislature, or interfere with the successful execution, functioning or operation of any plan of flood control adopted by the Board or the Legislature.

TWELVE: Should any of the work not conform to the conditions of this permit, the permittee, upon order of The Central Valley Flood Protection Board, shall in the manner prescribed by the Board be responsible for the cost and expense to remove, alter, relocate, or reconstruct all or any part of the work herein approved.

SPECIAL CONDITIONS FOR PERMIT NO. 18313-2-1 BD

THIRTEEN: Within three years from completion of the construction of the work authorized under this permit, the permittee shall provide the Sacramento and San Joaquin Drainage District, acting by and through the Central Valley Flood Protection Board of the State of California, a permanent easement and/or a joint use agreement granting all flood control rights upon, over and across the property that is or will be occupied by the existing or to-be-constructed levee including the area of the cutoff wall and levee raise and realignment fill areas. The easement must include the following: 1)the levee section; 2) an area ten (10) feet in width from the waterside levee toe; the area ten (10) feet in width adjacent to the existing and new landward levee toes, if the areas are not presently encumbered by a Central Valley Flood Protection Board easement. For information regarding existing Central Valley Flood Protection Board Easements, please contact Angelica Aguilar at (916) 653-5782.

FOURTEEN: No construction work within the easement or rights of way, both existing and to be provided under this permit, of flood control features, including levees and seepage berms shall be done during the flood season from November 1 to April 15 without prior approval of the Central Valley Flood Protection Board.

FIFTEEN: All work approved by this permit shall be in accordance with the (100%/90%) submitted drawings and specifications, except as modified by special permit conditions herein. No further work, other than that approved by this permit, shall be done in the area without prior approval of the Central Valley Flood Protection Board.

SIXTEEN: All addendums or other changes made to the submitted drawings or specifications by the permittee after issuance of this permit are subject to submittal and review for approval by the Central Valley Flood Protection Board prior to incorporation into the permitted project. Upon review and approval of any new submitted drawings or specifications the permit shall be revised, if needed, prior to construction related to the proposed changes. The Central Valley Flood Protection Board shall have up to 90 days after receipt of any documents, plans, drawings, and specifications for the review process. The Central Valley Flood Protection Board and/or the Department of Water Resources may extend this review period by written notification.

SEVENTEEN: The permittee is responsible for all liability associated with construction, operation, and maintenance of the permitted facilities and shall defend, indemnify, and hold the Central Valley Flood Protection Board and the State of California; including its agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "State"), safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The State expressly reserves the right to supplement or take over its defense, in its sole discretion.

EIGHTEEN: The permittee shall be responsible for repair of any damages to the project levee and other flood control facilities due to construction, operation, or maintenance of the proposed project.

NINETEEN: All proposed recreational features and asphalt pavement on the finished levee and the recreational / pedestrian ramps and roads will be maintained in total by the City of West Sacramento.

TWENTY: The mitigation measures approved by the CEQA lead agency and the permittee are found in its Mitigation and Monitoring Reporting Program (MMRP) adopted by the CEQA lead agency. The permittee shall implement all such mitigation measures.

TWENTY-ONE: The permittee shall provide construction supervision and inspection services acceptable to the Central Valley Flood Protection Board.

TWENTY-TWO: Prior to commencement of excavation, the permittee shall create a photo record, including associated descriptions, of the levee conditions. The photo record shall be certified (signed and stamped) by a licensed land surveyor or professional engineer, registered in the State of California, and submitted to the Central Valley Flood Protection Board within 30 days of beginning the project.

TWENTY-THREE: The permittee shall contact the U.S. Army Corps of Engineers regarding inspection of the project during construction as the proposed work is an alteration to the existing Federal Flood Control Project that will be incorporated into the Sacramento River Flood Control Project, an adopted plan of flood control.

TWENTY-FOUR: FEMA certification of the levee by the Corps of Engineers is being considered, the project proponent should contact the U. S. Army Corps of Engineers regarding inspection of this project during construction for FEMA certification purposes.

TWENTY-FIVE: The stability of the levee shall be maintained at all times during construction.

TWENTY-SIX: Cleared trees and brush shall be completely burned or removed from the floodway, and downed trees or brush shall not remain in the floodway during the flood season from November 1 to April 15.

TWENTY-SEVEN: No material stockpiles, temporary buildings, or equipment shall remain in the floodway during the flood season from November 1 to April 15 without prior CVFPB authorization.

TWENTY-EIGHT: The permittee shall cooperate with the Central Valley Flood Protection Board to ensure that any encroachment that must be relocated, modified or otherwise altered to accommodate construction of the improvements permitted herein are relocated, modified or otherwise altered in a manner that complies with current applicable state and federal standards. If the affected encroachment has an existing Board permit or is subject to some other applicable Board authorization, the permittee shall cooperate with the Board to ensure the permit or other authorization is appropriately amended to reflect the changed condition as shown on as-built drawings for the encroachment and the overall project. If the encroachment does not have a Board permit or other Board authorization, the permittee shall cooperate with the Board to determine whether a Board permit is required. If so, permittee shall cooperate with the Board to ensure that required permit application is made and, if granted, the permit reflects the changed condition as shown on as-built drawings for the encroachment and the overall project.

TWENTY-NINE: During demolition of the project, any and all anticipated or unanticipated conditions encountered which may impact levee integrity or flood control shall be brought to the attention of the Flood Project Inspector immediately and prior to continuation. Any encountered abandoned encroachments shall be completely removed or properly abandoned under the direction of the Department of Water Resources Inspector and the Early Implementation Project (EIP) Construction Supervisor.

THIRTY: The permittee shall be responsible for all damages due to settlement, consolidation, or heave from any construction-induced activities.

THIRTY-ONE: A profile of the levee crown roadway and access ramp that will be utilized for access to and from the borrow area shall be submitted to the Central Valley Flood Protection Board prior to commencement of construction.

THIRTY-TWO: The haul ramps and utilized levee crown roadway shall be maintained in a manner prescribed by the authorized representative of the Department of Water Resources, or any other agency responsible for maintenance.

THIRTY-THREE: Any damage to the levee section, crown, roadway, or access ramps that will be utilized for access for this project shall be promptly repaired to the condition that existed prior to this project.

THIRTY-FOUR: Excavations, of four feet or greater, below the design flood plane and within the levee section or within fifty (50) feet of the projected waterward and landward levee slopes, excluding the cutoff wall trench, shall have side slopes no steeper than 1 horizontal to 1 vertical. Flatter slopes may be required to ensure stability of the excavation.

THIRTY-FIVE: Fluid pressures and flow rates shall be carefully monitored and controlled to minimize

the potential for hydrofracturing.

THIRTY-SIX: Fill on the levee slope shall be keyed into the existing levee section with each lift.

THIRTY-SEVEN: Fill material shall be placed only within the area indicated on the approved plans.

THIRTY-EIGHT: All fill material shall be impervious material with a minimum of 30 percent or more passing the No. 200 sieve, a plasticity index of 8 to 30, and a liquid limit of less than 55 and free of lumps or stones exceeding 3 inches in greatest dimension, vegetative matter, or other unsatisfactory material.

THIRTY-NINE: Density tests by a certified soils laboratory will be required to verify compaction of backfill within the floodway and within 10 feet of the levee toes.

FORTY: The fill surface area shall be graded to direct drainage away from the toe of the levee.

FORTY-ONE: Backfill material for excavations within the, existing and to be constructed, levee section and within ten (10) feet of the levee toes shall be placed in 4- to 6-inch layers, moisture conditioned above optimum moisture content, and compacted to a minimum of 95 percent relative compaction as measured by ASTM Method D698.

FORTY-TWO: Any pipe or conduit being reinstalled in the levee section and within fifty (50) feet of both the waterward and landward levee toes shall meet Title 23 standards.

FORTY-THREE: Where appropriate the new and reconstructed levee crown roadway and access ramps shall be surfaced with a minimum of 4 inches of compacted, Class 2, aggregate base (Caltrans Specification 26-1.02A).

FORTY-FOUR: In the event existing revetment on the channel bank or levee slope is disturbed or displaced, it shall be restored to its original condition upon completion of the proposed installation.

FORTY-FIVE: The permittee shall replant or reseed the levee slopes to restore sod, grass, or other non-woody ground covers if damaged during project work.

FORTY-SIX: The landscaping, appurtenances, and maintenance practices shall conform to standards contained in Section 131 of the Central Valley Flood Protection Board's Regulations.

FORTY-SEVEN: As per the approved planting plan (June/July 2011 by ICF International), no Freemont Cottonwood trees shall be planted on the waterside of the levee, any closer than 100 feet from the waterside levee hinge point.

FORTY-EIGHT: All fencing, gates and signs removed during construction of this project shall be replaced in kind and at the original locations. If it is necessary to relocate any fence, gate or sign, the permittee is required to obtain written approval from the Central Valley Flood Protection Board prior to installation at a new location.

FORTY-NINE: All temporary fencing, gates and signs shall be removed upon completion of the project.

FIFTY: All debris generated by this project shall be disposed of outside the floodway and off the levee section.

FIFTY-ONE: Debris that may accumulate on the permitted encroachment(s) and related facilities shall be cleared off and disposed of outside the floodway after each period of high water with the exception of habitat debris, which may remain.

FIFTY-TWO: The permittee shall maintain the permitted encroachment(s) and the project works within the utilized area in the manner required and as requested by the authorized representative of the Department of Water Resources, or any other agency responsible for maintenance.

FIFTY-THREE: In the event that permitted improvements cause levee or bank erosion injurious to the adopted plan of flood control to occur at or adjacent to the permitted encroachment(s), the permittee shall repair the eroded area and propose measures, to be approved by the Central Valley Flood Protection Board, to prevent further erosion.

FIFTY-FOUR: Any vegetative material, living or dead, that interferes with the successful execution, functioning, maintenance, or operation of the adopted plan of flood control must be removed by the permittee at permittee's expense upon request by the Central Valley Flood Protection Board or Department of Water Resources. If the permittee does not remove such vegetation or trees upon request, the Central Valley Flood Protection Board reserves the right to remove such at the permittee's expense.

FIFTY-FIVE: Thorny plant will be removed from the planting pallet so inspections and maintenance are not impacted.

FIFTY-SIX: The permittee may be required, at permittee's cost and expense, to remove, alter, relocate, or reconstruct all or any part of the permitted encroachment(s) if removal, alteration, relocation, or reconstruction is necessary as part of or in conjunction with any present or future flood control plan or project or if damaged by any cause. If the permittee does not comply, the Central Valley Flood Protection Board may remove the encroachment(s) at the permittee's expense.

FIFTY-SEVEN: The permitted encroachment(s) shall not interfere with operation and maintenance of the current or future flood control project. If the permitted encroachment(s) are determined by any agency responsible for operation or maintenance of the flood control project to interfere, the permittee shall be required, at permittee's cost and expense, to modify or remove the permitted encroachment(s) under direction of the Central Valley Flood Protection Board or Department of Water Resources. If the permittee does not comply, the Central Valley Flood Protection Board may modify or remove the encroachment(s) at the permittee's expense.

FIFTY-EIGHT: According to the permittee, the improvements herein permitted will control flood flows from a storm with a probability of occurrence of 0.005 in any year (200-year protection). Permittee's design assumed that non-urban existing levees upstream of Natomas will not be raised above the current design for the Sacramento River Flood Control Project as shown on the 1957 profile. Permittee's design flow therefore, reflects upstream flood water losses from levee overtopping where the water surface elevation for the permittee's design storm exceeds the top of levee elevation shown on the 1957 profile. Permittee acknowledges that a Central Valley Flood Protection Plan will be

developed, adopted, and regularly updated by the State and the plan and subsequent updates could include improvements that would change the flow and water level associated with permittee's design storm, possibly reducing the level of protection provided by the permitted improvements. Permittee agrees to participate in future modifications to the West Sacramento levees as may be required by the Central Valley Flood Protection Plan and its subsequent updates. Permittee's level of participation shall be equivalent to the level required of other local jurisdictions by the plan. Permittee further agrees that should the Plan include measures that reduce the level of protection provided by the permitted improvements, permittee shall have no basis for a claim of hydraulic impacts.

FIFTY-NINE: Within 120 days of completion of the project, the permittee shall submit to the Central Valley Flood Protection Board a certification report, stamped and signed by a professional civil engineer registered in the State of California, certifying the work was performed and inspected in accordance with the Central Valley Flood Protection Board permit conditions and submitted drawings and specifications.

SIXTY: Within 120 days of completion of the project, the permittee shall submit to the Central Valley Flood Protection Board proposed revision to the U.S. Army Corps of Engineers, Supplement to Standard Operation and Maintenance Manual, West Sacramento River Flood Control Project, and the associated "as-built" drawings for system alterations that are to be incorporated into the federal West Sacramento River Flood Control Project.

SIXTY-ONE: The permittee is responsible for all liability associated with damage to the permitted facilities resulting from flood fight, operation, maintenance, inspection or emergency repair and shall defend, indemnify, and hold the Central Valley Flood Protection Board, the Department of Water Resources, the State of California, and Maintenance Area 4, including their agencies, departments, boards, commissions, and their respective officers, agents, employees, successors and assigns (collectively, the "agencies"), safe and harmless, of and from all claims and damages arising from the project undertaken pursuant to this permit, all to the extent allowed by law. The agencies expressly reserve the right to supplement or take over their defense, in their sole discretion.

SIXTY-TWO: This permit is not valid until the Central Valley Flood Protection Board has received 33 U.S.C. Section 208.10 approval and letter of permission from the U.S. Army Corps of Engineers (Corps). The permittee shall comply with all conditions set forth in the letter of permission from the Corps, when it is received, which shall be attached to this permit as Exhibit A and incorporated by reference.

SIXTY-THREE: The permittee shall contact the Department of Water Resources by telephone, (916) 574-0609, and submit the enclosed postcard to schedule a preconstruction conference. Failure to do so at least 10 working days prior to start of work may result in delay of the project. The applicant is also required to contact the Early ImplementationProject (EIP) Construction Supervisor by telephone, (916)574-2646 to initiate inspection of the work.

SIXTY-FOUR: The permittee should contact the U.S. Army Corps of Engineers, Sacramento District, Regulatory Branch, 1325 J Street, Sacramento, California 95814, telephone (916) 557-5250, as compliance with Section 10 of the Rivers and Harbors Act and/or Section 404 of the Clean Water Act may be required.

SIXTY-FIVE: If the permittee or successor does not comply with the conditions of the permit and an

enforcement by the Central Valley Flood Protection Board is required, the permittee or successor shall be responsible for bearing all costs associated with the enforcement action, including reasonable attorney's fees.

SIXTY-SIX: If the project, or any portion thereof, is to be abandoned in the future, the permittee or successor shall abandon the project under direction of the Central Valley Flood Protection Board and Department of Water Resources, at the permittee's or successor's cost and expense.

SIXTY-SEVEN: Any additional encroachment(s) in the floodway, on or in the levee section, and within ten (10) feet of the landside levee toe and berm toes, require an approved permit from the Central Valley Flood Protection Board and shall be in compliance with the Central Valley Flood Protection Board's regulations (Title 23 California Code of Regulations).

SIXTY-EIGHT: By acceptance of this permit, the permittee (West Sacramento Area Flood Control Agency) acknowledges the authority of the Central Valley Flood Protection Board to regulate all future encroachments along this levee reach, including those that may encroach upon alterations approved by this permit to incorporation into the federal West Sacramento River Flood Control Project by the U.S. Army Corps of Engineers.

SIXTY-NINE: The applicant must adopt a resolution within 18 months from the date of issuance of this permit, that complies with Board Resolution No. 11-15, regarding the Board's Joint Powers Agreement (JPA) Policy, and the resolution must be to the satisfaction of the Board.

SEVENTY: Prior to construction, the applicant, West Sacramento Area Flood Control Agency (WSAFCA), shall have obtained legal possession of all property where work to be performed under this permit is located.

SEVENTY-ONE: Survey markers are to be installed to delineate easement boundaries and a GIS shapefile of the boundaries is to be provided to DWR within 120 days of construction completion.

SEVENTY-TWO: WSAFCA or the City of West Sacramento must enter into an agreement with DWR Sacramento Maintenance Yard for use of power and water throughout the project including vegetation irrigation following construction.

SEVENTY-THREE: City of West Sacramento will provide a letter to DWR assuring perpetual maintenance of vegetation within the project boundaries.

SEVENTY-FOUR: A copy of this permit shall be included as an attachment to any Long-Term Management Plan for the permitted project area.

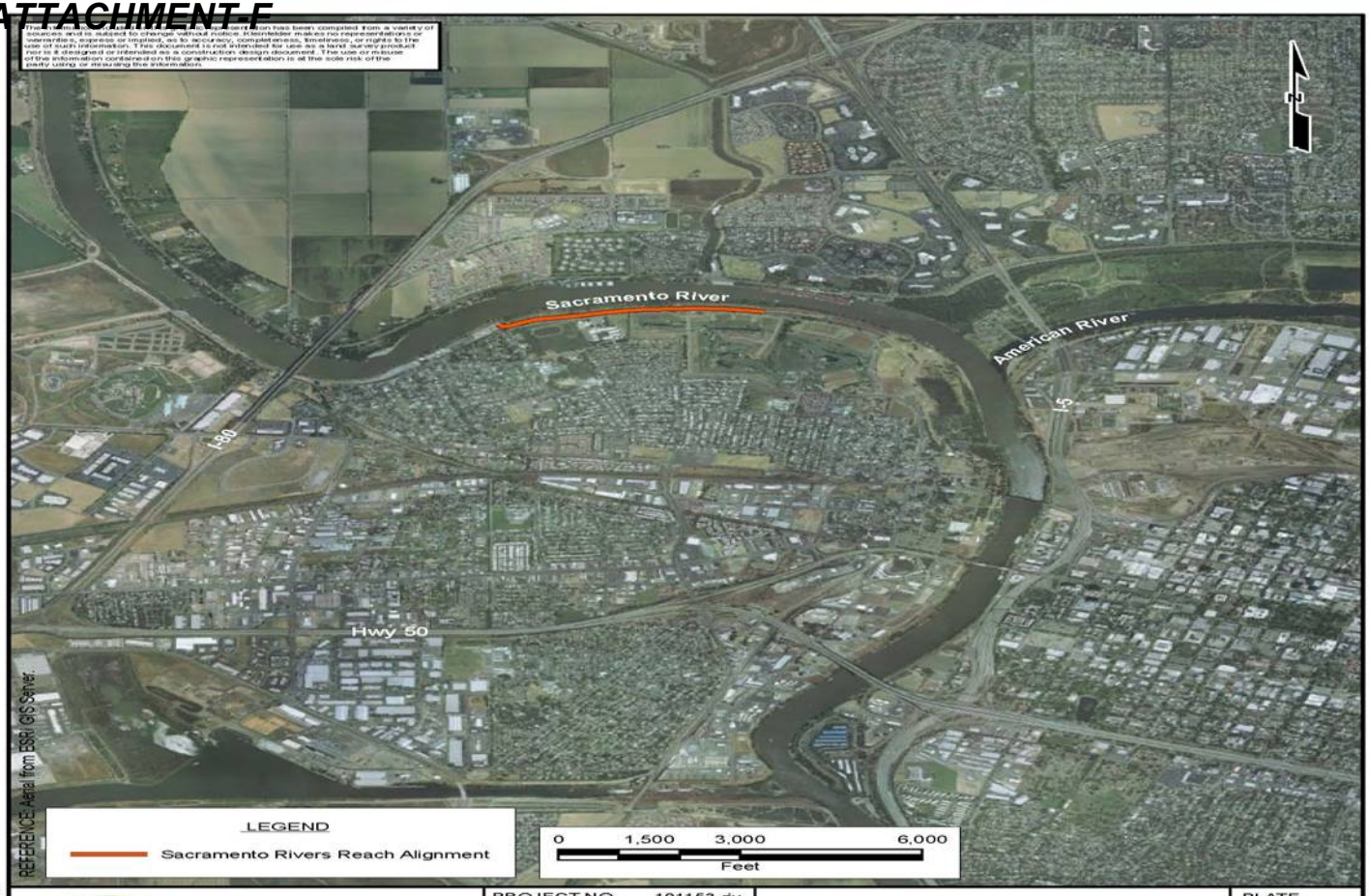
SEVENTY-FIVE: This permit shall run with the land and all conditions are binding on permitee's successors and assigns.

ATTACHMENT B, Exhibit –A

USACOE

208.10 Letter of Permission

ATTACHMENT F



KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

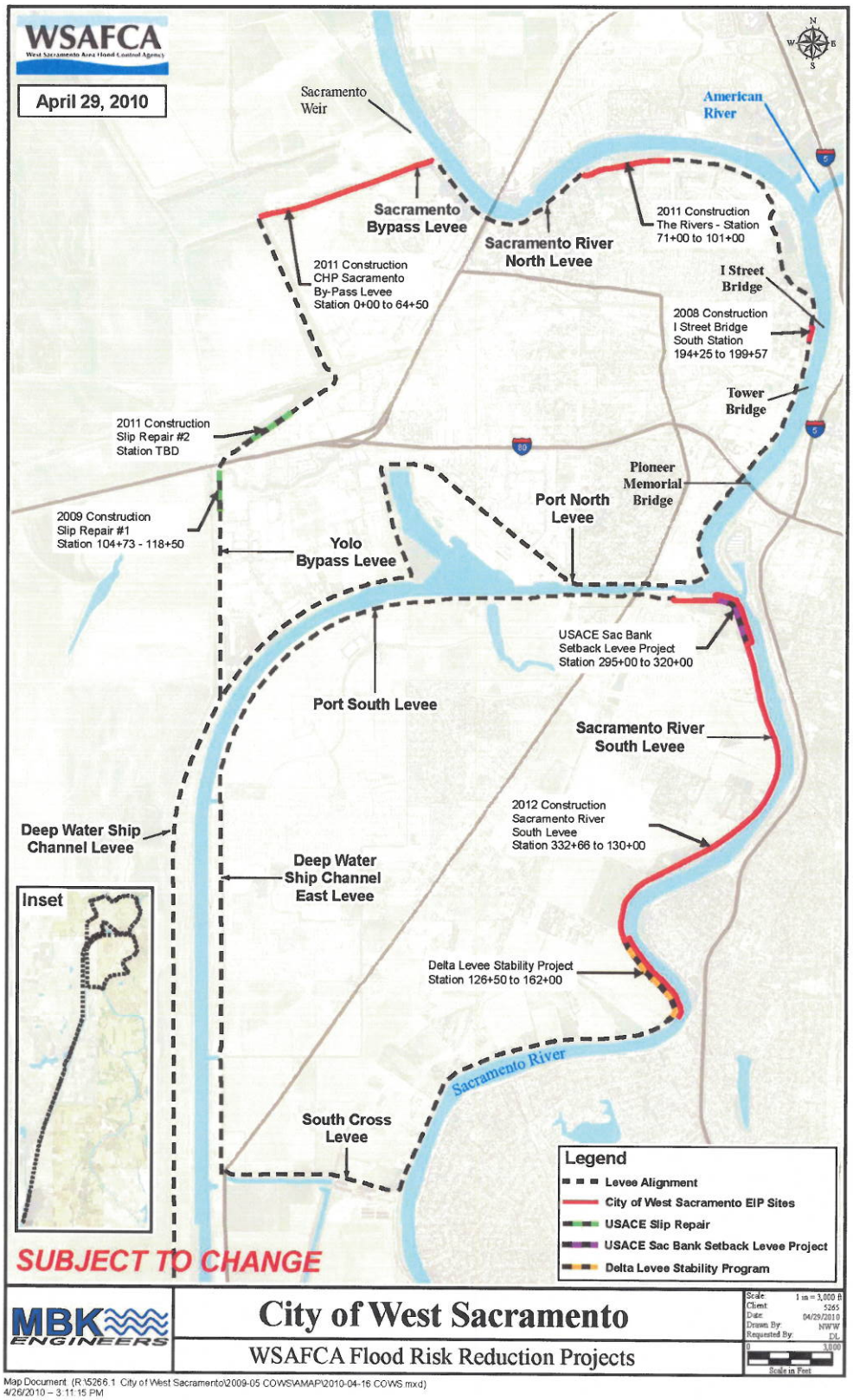
PROJECT NO.	101153-riv
DRAWN:	6/22/09
DRAWN BY:	D. Anderson
CHECKED BY:	B. Anderson
FILE NAME:	101153 BOD Riv SLM.mxd

SITE LOCATION MAP

DRAFT GEOTECHNICAL BASIS OF DESIGN REPORT
THE RIVERS SITE, SRWNL STA 70+00 TO STA 115+00
WEST SACRAMENTO LEVEE IMPROVEMENT PROGRAM
WEST SACRAMENTO, CALIFORNIA

PLATE
1-1

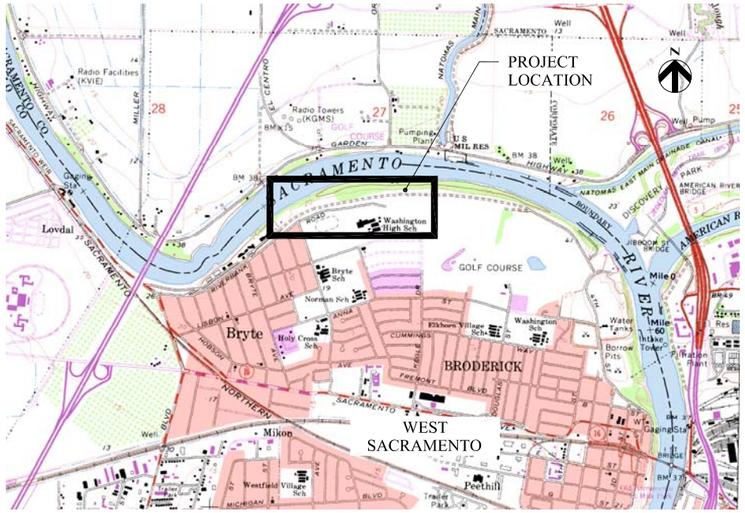
PLATE 1: WSLIP Construction Phasing Map



Map Document (R:\5266.1 City of West Sacramento\2009-05 COWS\AMAP\2010-04-16 COWS.mxd)
4/26/2010 – 3:11:15 PM

WEST SACRAMENTO LEVEE IMPROVEMENT PROGRAM
THE RIVERS RIPARIAN MITIGATION SITE

SACRAMENTO RIVER NORTH WEST LEVEE:
LEVEE MILE 0.73 TO 1.29
(STA 71+50 TO STA 101+00)



VICINITY MAP
NTS

WSAFCA
WEST SACRAMENTO AREA FLOOD CONTROL AGENCY

JUNE 2011
90% SUBMITTAL

CALIFORNIA STATE LOCATION MAP
NTS

SHEET INDEX

MITIGATION QUANTITIES

	RIVERS	RIVER WALK	TOTAL PROJECT
TREES REQUIRED	1007	122	1129
TOTAL TREES AND LARGE SHRUBS BEING PLANTED	–	–	1360
PLANTING AREA (SF)	–	–	207,892

* RIVERS ACCOUNTS FOR 89% OF THE MITIGATION,
RIVER WALK ACCOUNTS FOR 11% OF THE MITIGATION

SUBMITTED BY

MICHAEL VECCHIO RCE 74245 DATE

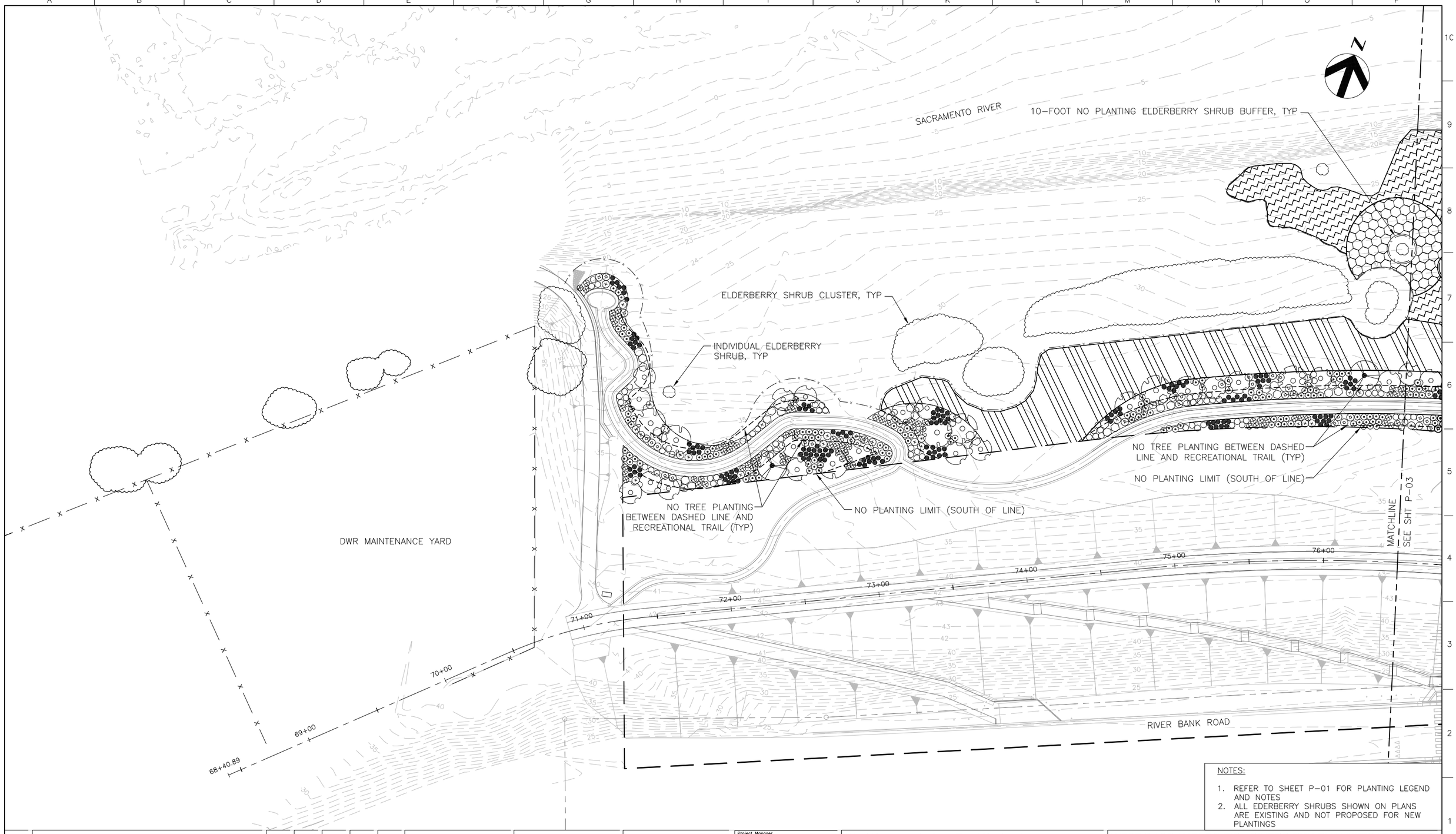
KRISTIN LANTZ RLA 5400 DATE

SUBMITTED BY

MICHAEL W. BESSETTE DATE
CITY OF WEST SACRAMENTO RCE 53088

KEN RUZICH DATE
WSAFCA, GENERAL MANAGER

ATTACHMENT-F



NOTES:

1. REFER TO SHEET P-01 FOR PLANTING LEGEND AND NOTES
2. ALL EDERBERRY SHRUBS SHOWN ON PLANS ARE EXISTING AND NOT PROPOSED FOR NEW PLANTINGS

Issue No.	Description	Date	Drwn.	Chkd.	Resp. Engr.	Proj. Mgr.

HORIZONTAL DATUM IS THE CALIFORNIA COORDINATE SYSTEM, ZONE 2 (NAD 83)

VERTICAL DATUM IS NAVD 88

EL NAVD 88 = EL NGVD 29+2.6'

ICF INTERNATIONAL

BAR LENGTH ON ORGINAL DRAWING EQUALS ONE INCH. ADJUST SCALE ACCORDINGLY.

Project Manager	M. VECCHIO
Designed	K. LANTZ
Designed	
Checked	H. OAKES
Drawn	K. LANTZ

West Sacramento Area Flood Control Agency
Levee Improvement Program
Early Implementation Project
The Rivers Phase 1 Site

PRELIMINARY

THESE PLANS ARE NOT ISSUED FOR BID OR CONSTRUCTION. THEY ARE ISSUED FOR REVIEW AND COMMENT ONLY.

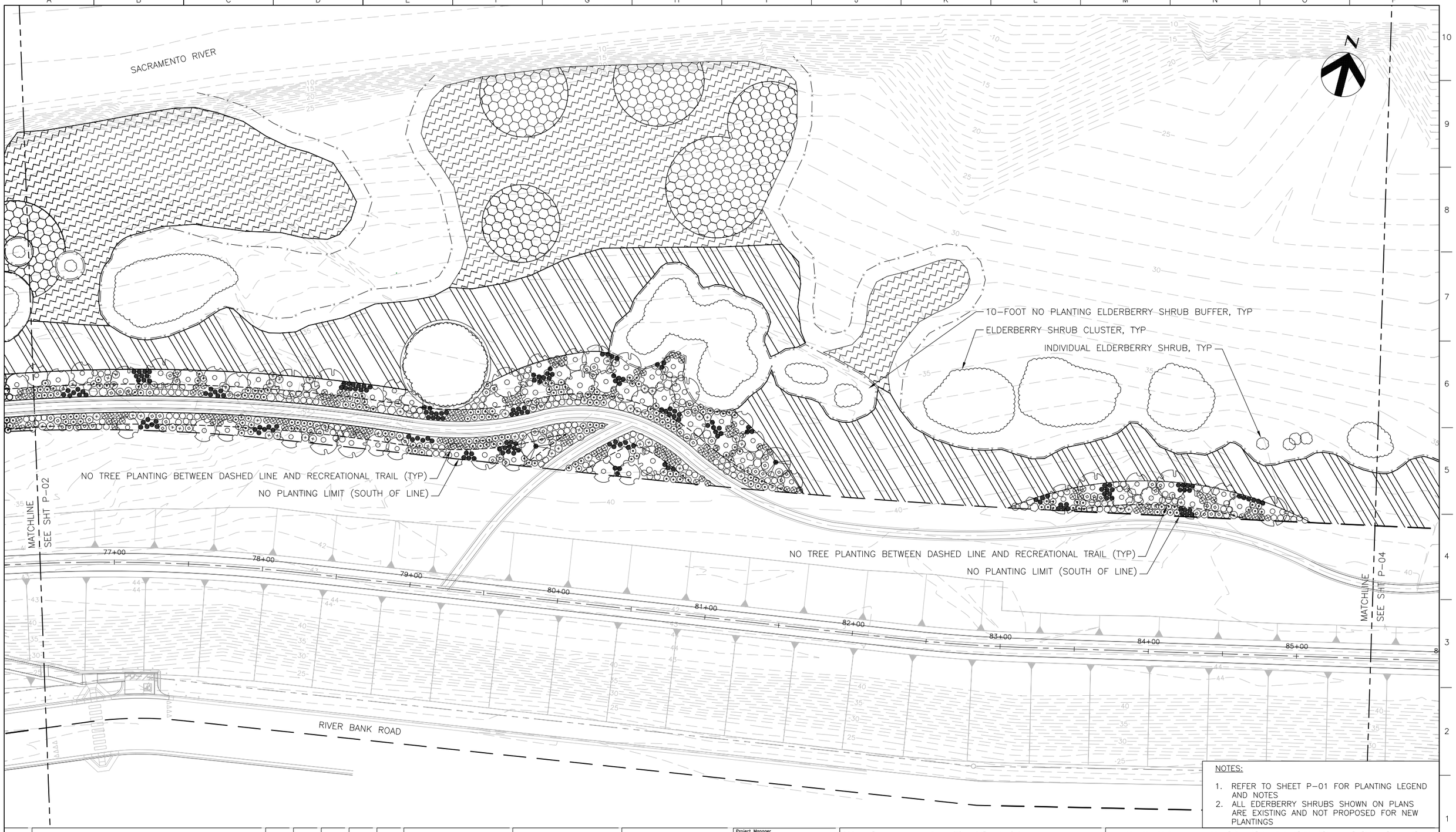
WEST SACRAMENTO EIP - RIVERS RIPARIAN MITIGATION SITE

PLANTING PLAN

STATION 70+90 TO 76+50

Date	Project No.	Drawing No.	Issue
JUNE 2011	007436-101209-141	P-02	X
Scale: 1" = 30'	File Name: P-2.dwg		

ATTACHMENT-F



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HORIZONTAL DATUM IS THE CALIFORNIA COORDINATE SYSTEM, ZONE 2 (NAD 83)

VERTICAL DATUM IS NAVD 88

EL NAVD 88 = EL NGVD 29+2.6'

ICF INTERNATIONAL

BAR LENGTH ON ORIGINAL DRAWING EQUALS ONE INCH. ADJUST SCALE ACCORDINGLY.

Project Manager	M. VECCHIO
Designed	K. LANTZ
Designed	
Checked	H. OAKES
Drawn	K. LANTZ

West Sacramento Area Flood Control Agency
Levee Improvement Program
Early Implementation Project
The Rivers Phase 1 Site

PRELIMINARY

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WEST SACRAMENTO EIP - RIVERS RIPARIAN MITIGATION SITE

PLANTING PLAN

STATION 76+50 TO 85+50

Date	Project No.	Drawing No.	Issue
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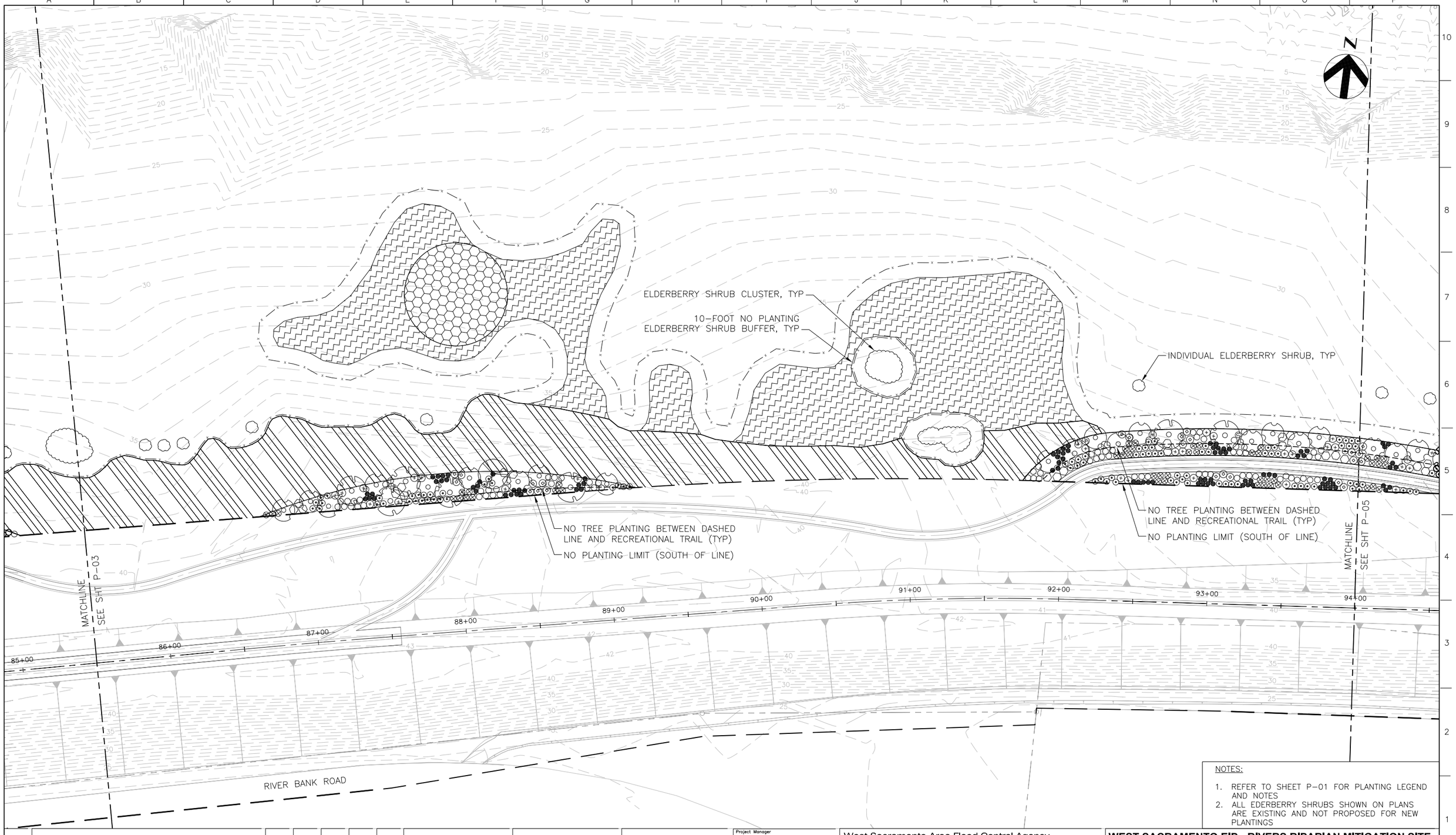
ATTACHMENT-F



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Issue No.	Description	Date	Drwn.	Chkd.	Resp. Engr.	Proj. Mgr.

HORIZONTAL DATUM IS THE CALIFORNIA COORDINATE SYSTEM, ZONE 2 (NAD 83)

VERTICAL DATUM IS NAVD 88

EL NAVD 88 = EL NGVD 29+2.6'

ICF INTERNATIONAL

BAR LENGTH ON ORIGINAL DRAWING EQUALS ONE INCH. ADJUST SCALE ACCORDINGLY.

Project Manager	M. VECCHIO
Designed	K. LANTZ
Designed	
Checked	H. OAKES
Drawn	K. LANTZ

West Sacramento Area Flood Control Agency
Levee Improvement Program
Early Implementation Project
The Rivers Phase 1 Site

PRELIMINARY

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WEST SACRAMENTO EIP - RIVERS RIPARIAN MITIGATION SITE

PLANTING PLAN

STATION 85+50 TO 94+00

Date	Project No.	Drawing No.	Issue
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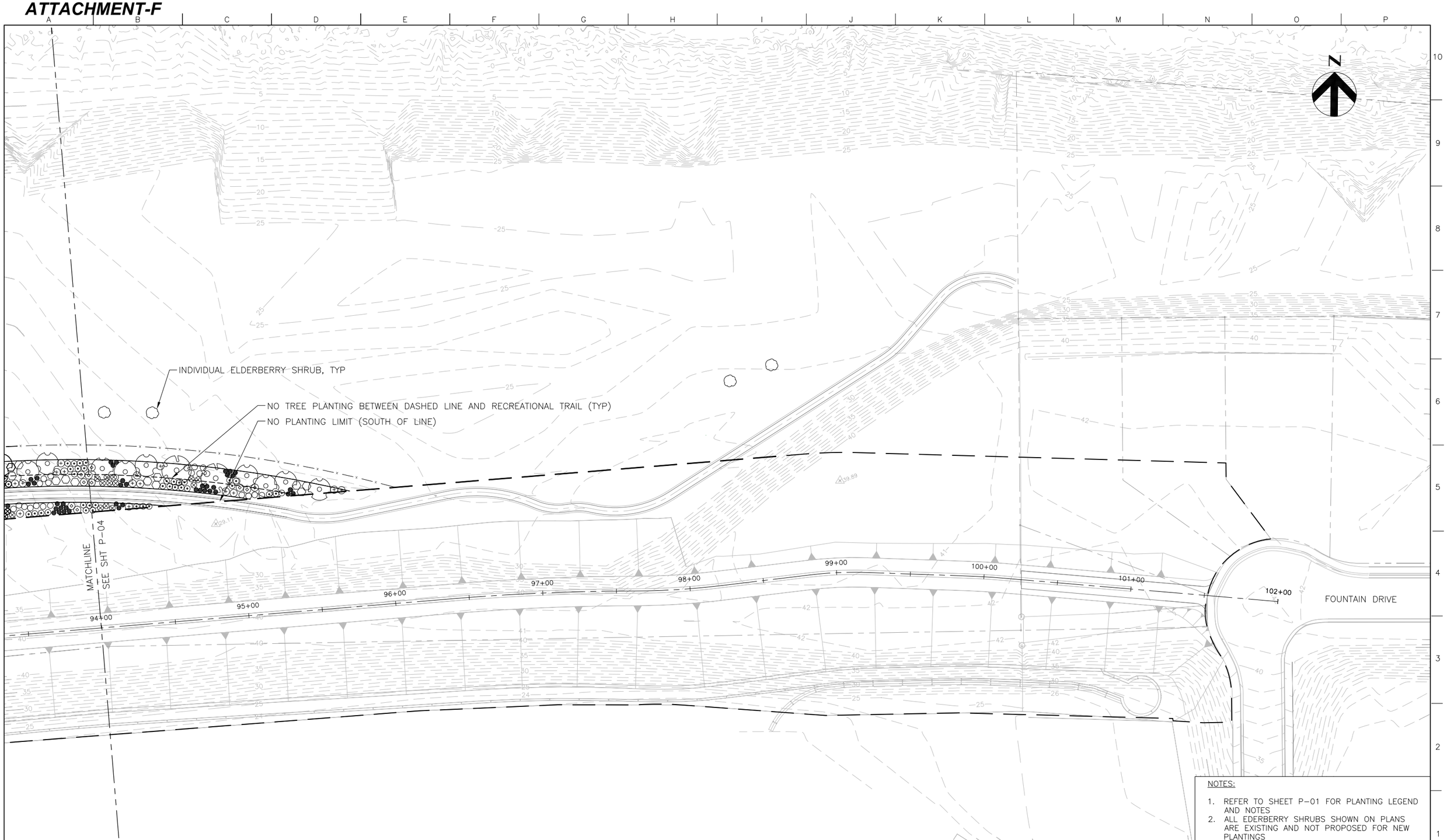
ATTACHMENT-F



NOTES:

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2. ALL EDERBERRY SHRUBS SHOWN ON PLANS ARE EXISTING AND NOT PROPOSED FOR NEW PLANTINGS

Issue No.	Description	Date	Drwn.	Chkd.	Resp. Engr.	Proj. Mgr.

HORIZONTAL DATUM IS THE CALIFORNIA COORDINATE SYSTEM, ZONE 2 (NAD 83)

VERTICAL DATUM IS NAVD 88

EL NAVD 88 = EL NGVD 29+2.6'

ICF INTERNATIONAL

BAR LENGTH ON ORIGINAL DRAWING EQUALS ONE INCH. ADJUST SCALE ACCORDINGLY.

Project Manager	M. VECCHIO
Designed	K. LANTZ
Designed	
Checked	H. OAKES
Drawn	K. LANTZ

West Sacramento Area Flood Control Agency
Levee Improvement Program
Early Implementation Project
The Rivers Phase 1 Site

PRELIMINARY

THESE PLANS ARE NOT ISSUED FOR BID OR CONSTRUCTION. THEY ARE ISSUED FOR REVIEW AND COMMENT ONLY.

WEST SACRAMENTO EIP - RIVERS RIPARIAN MITIGATION SITE

PLANTING PLAN

STATION 94+00 TO 101+50

Date	Project No.	Drawing No.	Issue
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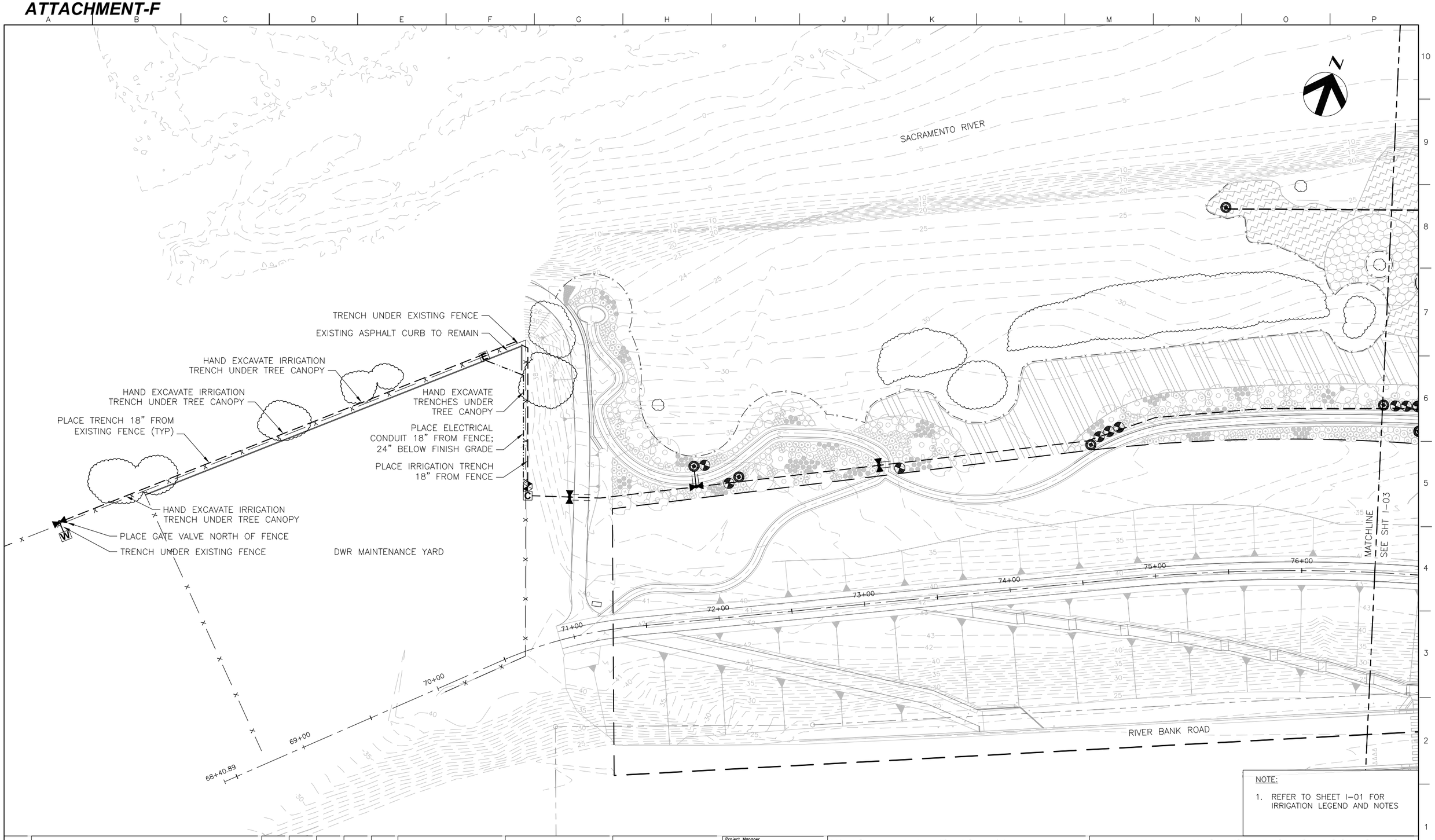
Scale: 1" = 30'	File Name: P-5.dwg		

ATTACHMENT-F



NOTE:

1. REFER TO SHEET I-01 FOR IRRIGATION LEGEND AND NOTES

Issue No.	Description	Date	Drwn.	Chkd.	Resp. Engr.	Proj. Mgr.

HORIZONTAL DATUM IS THE CALIFORNIA COORDINATE SYSTEM, ZONE 2 (NAD 83)

VERTICAL DATUM IS NAVD 88

EL NAVD 88 = EL NGVD 29+2.6'

ICF INTERNATIONAL

BAR LENGTH ON ORIGINAL DRAWING EQUALS ONE INCH. ADJUST SCALE ACCORDINGLY.

Project Manager	M. VECCHIO
Designed	K. LANTZ
Designed	
Checked	H. OAKES
Drawn	K. LANTZ

West Sacramento Area Flood Control Agency
Levee Improvement Program
Early Implementation Project
The Rivers Phase 1 Site

PRELIMINARY

THESE PLANS ARE NOT ISSUED FOR BID OR CONSTRUCTION. THEY ARE ISSUED FOR REVIEW AND COMMENT ONLY.

WEST SACRAMENTO EIP - RIVERS RIPARIAN MITIGATION SITE

IRRIGATION PLAN

STATION 70+90 TO 76+50

Date	Project No.	Drawing No.	Issue
JUNE 2011	007436-101209-141	I-02	X
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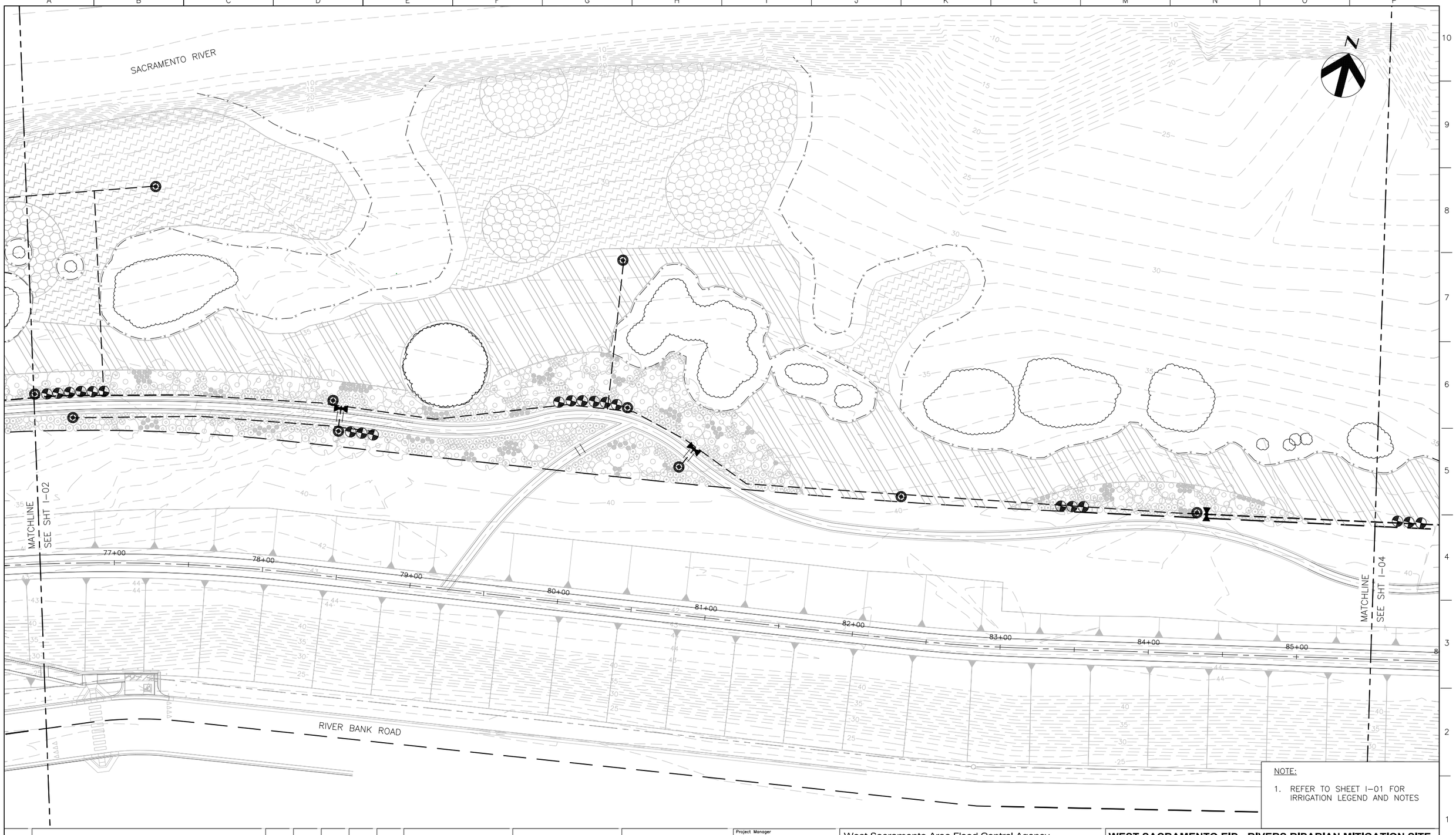
ATTACHMENT-F



NOTE:

1. REFER TO SHEET I–01 FOR IRRIGATION LEGEND AND NOTES

Issue No.	Description	Date	Drwn.	Chkd.	Resp. Engr.	Proj. Mgr.

HORIZONTAL DATUM IS THE CALIFORNIA COORDINATE SYSTEM, ZONE 2 (NAD 83)

VERTICAL DATUM IS NAVD 88

EL NAVD 88 =
EL NGVD 29+2.6'

ICF INTERNATIONAL

BAR LENGTH ON ORIGINAL DRAWING EQUALS ONE INCH. ADJUST SCALE ACCORDINGLY.

Project Manager	M. VECCHIO
Designed	K. LANTZ
Designed	
Checked	H. OAKES
Drawn	K. LANTZ

West Sacramento Area Flood Control Agency
Levee Improvement Program
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The Rivers Phase 1 Site

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WEST SACRAMENTO EIP - RIVERS RIPARIAN MITIGATION SITE

IRRIGATION PLAN

STATION 76+50 TO 85+50

Date	Project No.	Drawing No.	Issue
JUNE 2011	007436–101209–141	I-03	X
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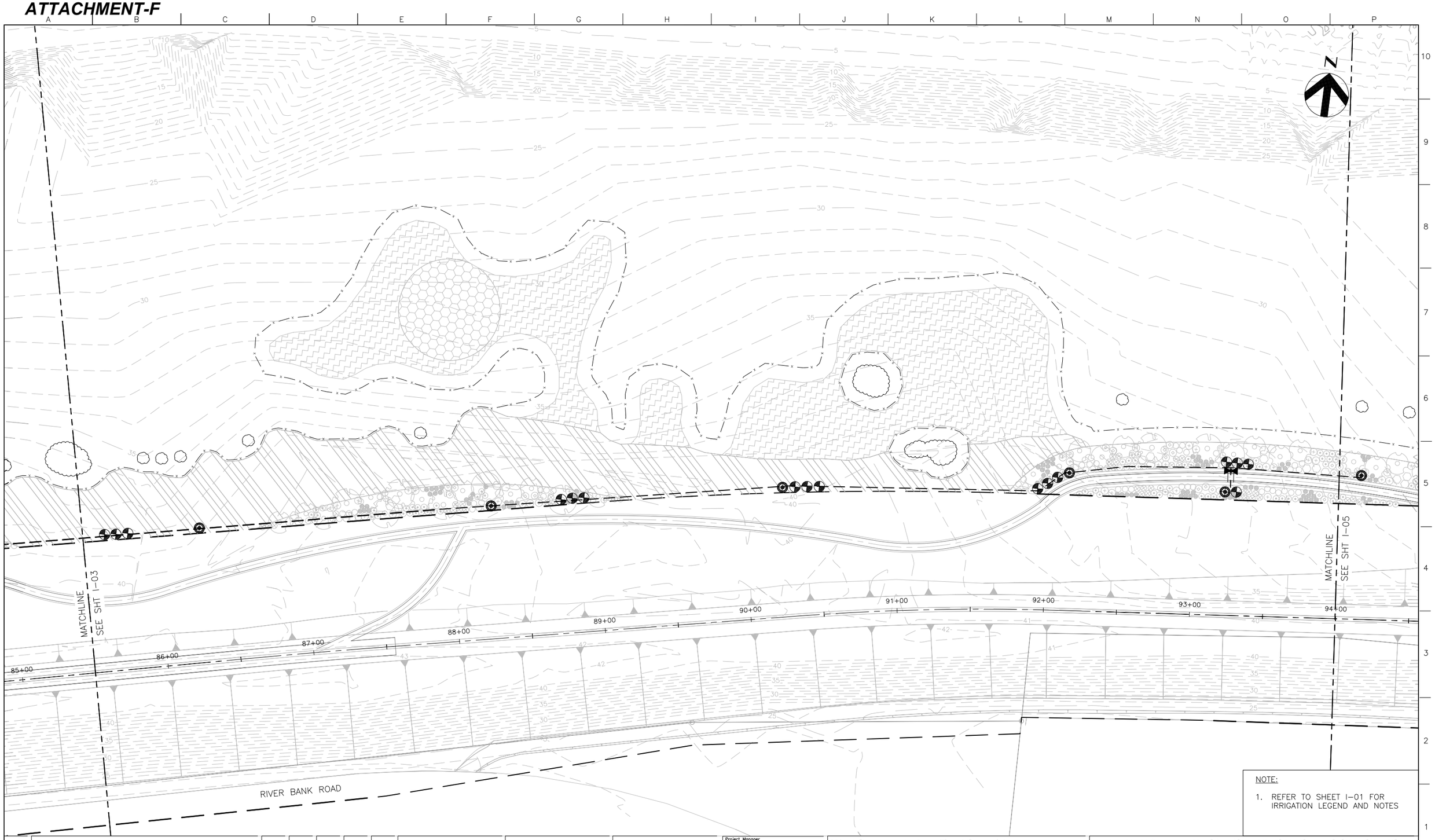

NOTE:

1. REFER TO SHEET I-01 FOR IRRIGATION LEGEND AND NOTES

Issue No.	Description	Date	Drwn.	Chkd.	Resp. Engr.	Proj. Mgr.

HORIZONTAL DATUM IS THE CALIFORNIA COORDINATE SYSTEM, ZONE 2 (NAD 83)

VERTICAL DATUM IS NAVD 88

EL NAVD 88 = EL NGVD 29+2.6'

ICF INTERNATIONAL

BAR LENGTH ON ORIGINAL DRAWING EQUALS ONE INCH. ADJUST SCALE ACCORDINGLY.

Project Manager	M. VECCHIO
Designed	K. LANTZ
Designed	
Checked	H. OAKES
Drawn	K. LANTZ

West Sacramento Area Flood Control Agency
Levee Improvement Program
Early Implementation Project
The Rivers Phase 1 Site

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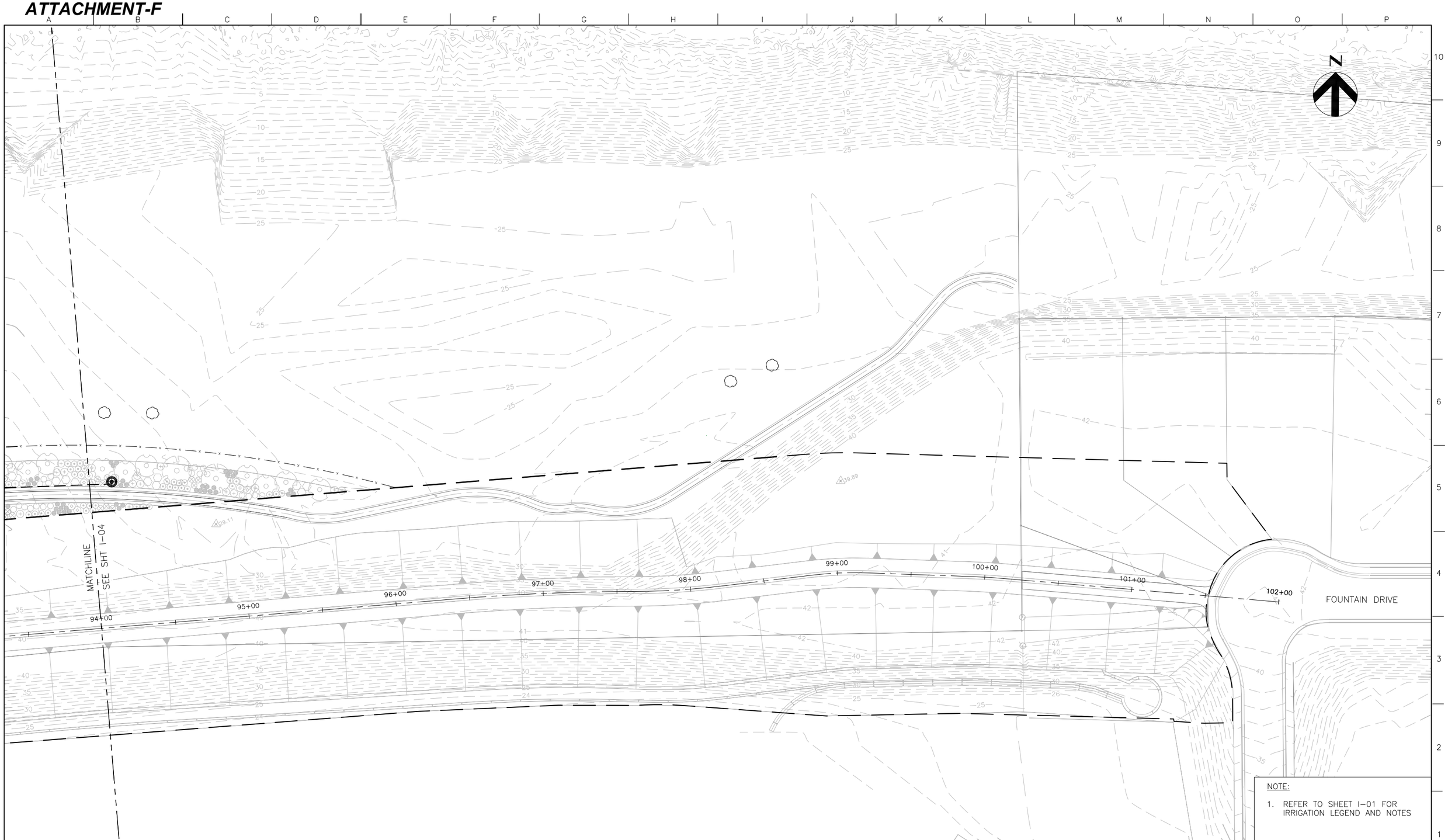
WEST SACRAMENTO EIP - RIVERS RIPARIAN MITIGATION SITE

IRRIGATION PLAN

STATION 85+50 TO 94+00

Date	Project No.	Drawing No.	Issue
JUNE 2011	007436-101209-141	I-04	X
Scale: 1" = 30'	File Name: I-4.dwg		

ATTACHMENT-F



NOTE:

1. REFER TO SHEET I-01 FOR IRRIGATION LEGEND AND NOTES

Issue No.	Description	Date	Drwn.	Chkd.	Resp. Engr.	Proj. Mgr.

HORIZONTAL DATUM IS THE CALIFORNIA COORDINATE SYSTEM, ZONE 2 (NAD 83)

VERTICAL DATUM IS NAVD 88

EL NAVD 88 = EL NGVD 29+2.6'

ICF INTERNATIONAL

BAR LENGTH ON ORIGINAL DRAWING EQUALS ONE INCH. ADJUST SCALE ACCORDINGLY.

Project Manager	M. VECCHIO
Designed	K. LANTZ
Designed	
Checked	H. OAKES
Drawn	K. LANTZ

West Sacramento Area Flood Control Agency
Levee Improvement Program
Early Implementation Project
The Rivers Phase 1 Site

PRELIMINARY

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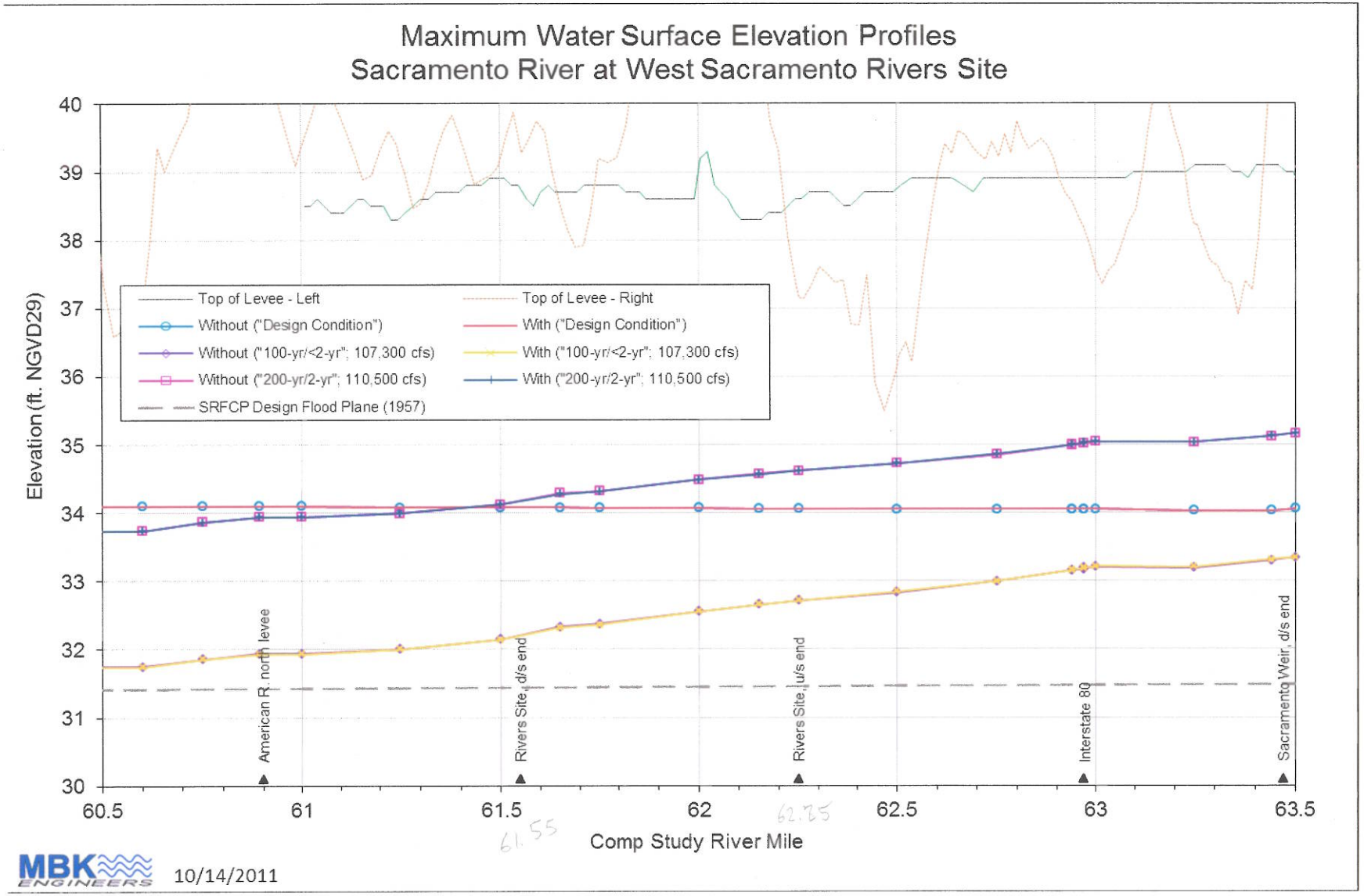
WEST SACRAMENTO EIP - RIVERS RIPARIAN MITIGATION SITE

IRRIGATION PLAN

STATION 94+00 TO 101+50

Date	Project No.	Drawing No.	Issue
JUNE 2011	007436-101209-141	I-05	X
Scale: 1" = 30'	File Name: I-5.dwg		

ATTACHMENT-F



MBK ENGINEERS 10/14/2011

ATTACHMENT-F

ATTACHMENT-F

Norton

Book G

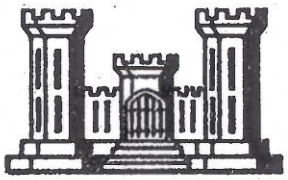
0051

SUPPLEMENT TO STANDARD OPERATION AND MAINTENANCE MANUAL

SACRAMENTO RIVER FLOOD CONTROL PROJECT

UNIT NO. 124

NORTH LEVEE OF AMERICAN RIVER FROM NATOMAS EAST CANAL TO THE SACRAMENTO RIVER AND EAST LEVEE OF THE SACRAMENTO RIVER FROM NATOMAS CROSS CANAL TO AMERICAN RIVER



SACRAMENTO DISTRICT

CORPS OF ENGINEERS

U. S. ARMY

SACRAMENTO, CALIFORNIA

Ltr of trans 3/26/84 - 221.04

FILE COPY

Rec'd 2.

ATTACHMENT-F

SPKGE 15 March 1954

SUBJECT: Operation and Maintenance Manuals

MEMORANDUM TO: CHIEF, CONSTRUCTION-OPERATIONS DIVISION

A Supplement to the Standard Operation and Maintenance Manual for the Sacramento River Flood Control Project, Unit No. 12½, entitled, "North Levee of the American River from Natomas East Canal to the Sacramento River and East Levee of the Sacramento River from Natomas Cross Canal to the American River," is submitted herewith.

F. KOCHIS
Chief, Engineering Division

1 Incl
1. O & M Manual

cc: Levees

Copies furnished: —

State Reclamation Board 2 copies
" Water Resources 2 "
Division Engineer 2 "

ATTACHMENT-F

CORPS OF ENGINEERS
U. S. ARMY

SUPPLEMENT TO STANDARD OPERATION AND MAINTENANCE MANUAL SACRAMENTO RIVER FLOOD CONTROL PROJECT

UNIT NO. 124
NORTH LEVEE OF THE AMERICAN RIVER FROM NATOMAS EAST CANAL TO THE SACRAMENTO RIVER AND EAST LEVEE OF THE SACRAMENTO RIVER FROM NATOMAS CROSS CANAL TO AMERICAN RIVER

Prepared by the Sacramento District
Corps of Engineers, U. S. Army
Sacramento, California, dated June 1953

ATTACHMENT-F

SUPPLEMENT TO STANDARD
OPERATION AND MAINTENANCE MANUAL
SACRAMENTO RIVER FLOOD CONTROL PROJECT

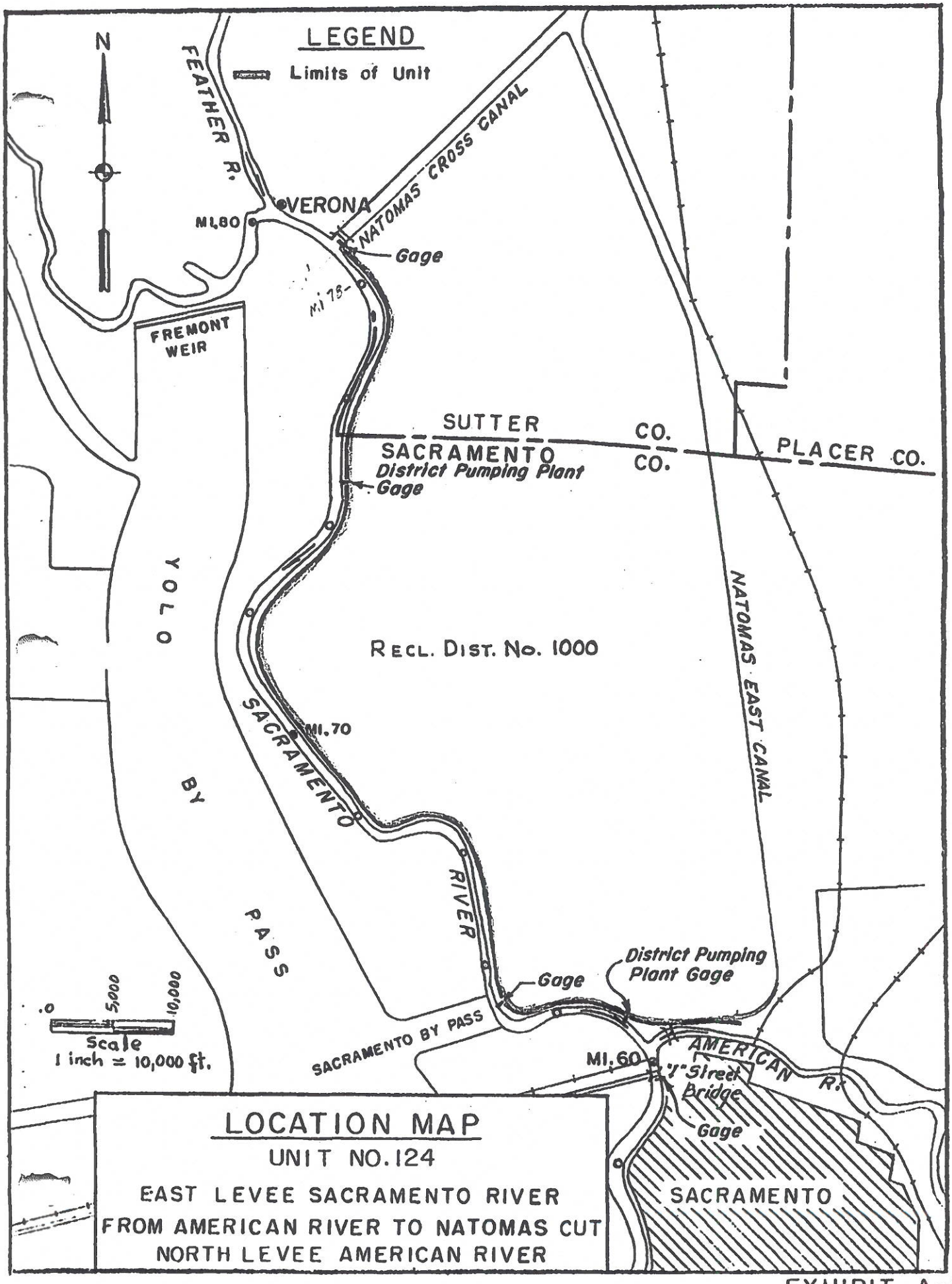
UNIT NO. 124
NORTH LEVEE OF THE AMERICAN RIVER
FROM
NATOMAS EAST CANAL TO THE SACRAMENTO RIVER
AND
EAST LEVEE OF THE SACRAMENTO RIVER
FROM
NATOMAS CROSS CANAL TO AMERICAN RIVER

SECTION I - INTRODUCTION

1-01. Location. - The improvement covered by this manual is that part of the Sacramento River Flood Control Project which includes the North levee of the American River from Natomas Canal to the Sacramento River and the East levee of the Sacramento River from Natomas Cross Canal to the mouth of the American River. The levees of this unit form a portion of the boundary of Reclamation District No. 1000 and are located in Sacramento and Sutter Counties, California. The location of the completed unit covered by this manual is shown on Exhibit A-1 and is in the general vicinity of the Town of Verona and the City of Sacramento.

1-02. Protection provided. - The levees of this unit provide direct protection to agricultural lands against high water of the Sacramento River and the American River. The grade of the adopted flood plane profile along the main channel of the Sacramento River varies from elevation 41.0 at Natomas Cross Canal to elevation 34.7 at the mouth of the American River. The grade of the adopted flood plane profile in the American River varies from elevation 36.0 at Natomas East Canal to elevation 34.7 at the junction with the Sacramento River. Allowance for freeboard along both levees is in excess of 3 feet. The project design flood for the Sacramento River is 107,000 cubic feet per second and the project design flood for the American River is 180,000 cubic feet per second within the limits of this levee unit. In the event of high water as reflected on the U. S. Weather Bureau gage at the "I" Street Bridge, the Sacramento Weir is opened in order to control the flood stage in the river to 29.0 insofar as possible. With the Sacramento Weir in operation, flows in that portion of the Sacramento River from Sacramanto Weir to the American River may vary from 107,000 cubic feet per second in a downstream direction to as much as 80,000 cubic feet per second in an upstream direction.

ATTACHMENT-F



LOCATION MAP

UNIT NO. 124

EAST LEVEE SACRAMENTO RIVER
FROM AMERICAN RIVER TO NATOMAS CUT
NORTH LEVEE AMERICAN RIVER

EXHIBIT A-1