



**US Army Corps
of Engineers**

Los Angeles District

Geotechnical Branch

Dam and Levee Safety Section

**NATIONAL FLOOD INSURANCE PROGRAM, LEVEE SYSTEM
EVALUATION REPORT (NLSE) FOR TRES RIOS NORTH LEVEE,
MARICOPA COUNTY, ARIZONA**



Center: Tres Rios North Levee looking downstream.

Lower Left: Downstream end of interior drainage outlet flap gates.

Upper Right: Near upstream end on levee crest looking upstream.

by
US Army Corps of Engineers
Los Angeles District, Geotechnical Branch
915 Wilshire Boulevard, Los Angeles CA 90017
November 2012



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REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

November 16, 2012

Office of the Chief
Engineering Division

Mr. Timothy S. Phillips
Chief Engineer and General Manager
Flood Control District of Maricopa County
2801 West Durango Street
Phoenix, Arizona 85009

Dear Mr. Phillips,

I am pleased to submit to you the Los Angeles District's final National Flood Insurance Program (NFIP) Levee System Evaluation Report (NLSER) for the Tres Rios North Levee Phase 1A and Phase 1B. This report concludes that the Tres Rios North Levee Phase 1A and Phase 1B have met all of the requirements established by USACE for determining that the levee system can be reasonably expected to exclude the 1% annual chance exceedance flood, also referred to as the base flood, from the leveed area. This NLSER documents the NFIP levee system evaluation requirements, assumptions made, and analyses conducted to make this NFIP levee system evaluation finding and that they are consistent with requirements outlined in Title 44 of the Code of Federal Regulations, Section 65.10 (44 CFR 65.10), *Mapping Areas Protected by Levee Systems*.

Under the National Flood Insurance Program, a NFIP levee system evaluation is a prerequisite for receiving levee accreditation from the Department of Homeland Security, Federal Emergency Management Agency (FEMA). If the levee is in accordance with NFIP levee system evaluation requirements and thus accredited, FEMA will not show the area located behind the levee as a Special Flood Hazard Area, an area that would be subject to flooding by the base flood. The area instead will be designated as a shaded Zone X or moderate risk zone. The purchase of flood insurance and elevation of structures is not federally mandated in a moderate risk zone; however, it is encouraged.

This NFIP levee system evaluation expires on November 16, 2022. After this time, USACE will no longer consider the Tres Rios North Levee Phase 1A and Phase 1B to be in accordance with NFIP levee system evaluation requirements and the Flood Control District of Maricopa County and FEMA will be notified. At any time prior to this date, it is at the Los Angeles District's discretion to revoke the positive finding for NFIP levee system evaluation should the District decide that Tres Rios North Levee Phase 1A and Phase 1B is no longer in accordance with NFIP levee system evaluation requirements, which may include reasons such as inadequate operation and maintenance, excessive settlement/subsidence, or change in hydraulic conditions. USACE will notify the Flood Control District of Maricopa County and FEMA Region IX should this situation occur. It will be the responsibility of the local community or other entity that desires to retain

accreditation of this levee system to pursue a reevaluation. At that time, it is recommended that the USACE be contacted to discuss potential next steps.

This NFIP levee system evaluation does not assure that Tres Rios North Levee Phase 1A and Phase 1B will exclude floodwater from all future flood events. Even with a levee in place that meets NFIP levee system evaluation requirements, a possibility of flooding that overtops or otherwise fails the levee still exists. Flood risk management measures to reduce the consequences of this possibility are strongly advised, such as elevating structures, maintaining a current flood warning system and evacuation plan, and wisely managing floodplain development.

This report has been prepared for your use to obtain accreditation with FEMA. A copy of the NLSER has been transmitted to FEMA Region IX. Electronic copies also have been sent to the NFIP Coordinator for the County of Maricopa, and the State of Arizona.

For any questions regarding this report, please contact Jody L. Fisher, P.E., USACE Los Angeles District Levee Safety Program Manager at (213) 452-3576. For questions about accreditation or the NFIP, please contact Mr. Bob Bezak, FEMA Region IX Coordinator for Arizona, at (510) 627-7274.

Sincerely,



Richard J. Leiffield, P.E.
Levee Safety Officer
Chief, Engineering Division
Los Angeles District
U.S. Army Corps of Engineers

Enclosure

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FIGURES

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Figure 2: Leveed Area Map

Figure 3: Levee Features

Figure 4: Profile of Levee Surveys and 1% AEP Event Water Surface Elevation

Figure 5: Floodplain and Assumed Inundation Extents

APPENDICES

A. Project Agreement Documents

B. Amended Design Documentation Report (DDR) For Flood Control North Levee, Phase 1A & 1B, Maricopa County, Arizona and Tres Rios Environmental Restoration Project Hydraulic Model Acceptance by Hydrology and Hydraulics Branch

C. Construction Report for the Tres Rios Environmental Restoration Project Phases 1A and 1B, North Levee, Maricopa County Arizona prepared by Genterra, Consultants, Inc.

D. As-built Drawings

E. Construction Completion Letters

F. Inspection Information and Checklists.

G. Emergency Action Plan (EAP)

H. Operations & Maintenance Manuals

I. Agency Technical Review Documentation

1.0 PURPOSE AND BACKGROUND

The ultimate purpose of a National Flood Insurance Program (NFIP) Levee System Evaluation (NLSE) is to determine how flood hazard areas behind levees are mapped on Flood Insurance Rate Maps (FIRM). A levee is a man-made structure, usually an earthen embankment or concrete floodwall, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide reasonable assurance of excluding temporary flooding (as defined in 44 CFR 59.1) from the leveed area. According to EC 1110-2-6067, the definition of a leveed area is the lands from which flood water is excluded by the levee system. A levee system consists of a levee or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices to provide reasonable assurance of excluding flood water from an associated separable floodplain (and further defined in 44 CFR 59.1). The resultant maps are used to determine flood insurance rates; federal, state, and local floodplain management requirements; and other floodplain management decisions. If a positive finding (i.e. that the levee system can be reasonably expected to exclude the 1% annual chance exceedance flood) is made in an NFIP levee system evaluation, the Federal Emergency Management Agency (FEMA) will use this information to determine how the floodplain behind the levee system is mapped.

A positive NFIP levee system evaluation determination by the United States Army Corps of Engineers (USACE) is a technical finding that, for the floodplain in question, there is a reasonable assurance (as defined below) that the levee system will exclude the 1% annual chance exceedance flood (or base flood) from the leveed area based on the condition of the system at the time the determination is made. NFIP levee system evaluation only addresses the levee system with regard to the 1% annual chance exceedance flood. If a levee meets NFIP levee system evaluation requirements, it may be 'accredited' by FEMA and the area behind the levee thus mapped on the FIRM in accordance with 44 CFR 65.10. If a levee is not found to meet the requirements of NFIP levee system evaluation, the area behind the levee that is subject to inundation by the base flood could be mapped as a high-risk area (or Special Flood Hazard Area) on the FIRM.

This report is a NLSE Report (NLSE) for the Tres Rios North Levee System described below. The Summary of NFIP levee system evaluation findings (signed and approved by the Levee Safety Officer (LSO) for the Los Angeles District (L.A. District) of USACE), is provided as part of this report and presented as a cover letter for this report.

2.0 AUTHORITY

The Tres Rios North Levee as described below is part of a larger Tres Rios Project between the City of Phoenix, Arizona and USACE. The City of Phoenix has formally requested the US Army Corps of Engineers, L.A. District to perform NFIP levee system evaluation for the Tres Rios North Levee System consisting of Phases 1A and 1B levee system described herein. A copy of the original Project Cooperation Agreement (PCA) and relevant Congressional Authorities outlined for the Tres Rios Project as well as a request letter for the NLSE and associated

documentation is included in this report as Appendix A. Subsequent to the PCA, an Intergovernmental Agreement (IGA) was made between the City of Phoenix, Arizona and the Flood Control District of Maricopa County (FCDMC) making the FCDMC the owner/operator of the Levee and drainage systems. This document is also included in Appendix A.

3.0 SYSTEM DESCRIPTION

3.1 LOCATION AND BACKGROUND

The subject area is located at the confluence of the Salt, Gila, and Aqua Fria Rivers, west of the City of Phoenix, Arizona. Because of the confluence of the three rivers within this close proximity, the project has been identified as "Tres Rios." In Spanish language, Tres Rios means "three rivers". The Tres Rios North Levee (hereon referred to as the levee) is located approximately 9 miles west of the City of Phoenix and approximately 4 miles south of the City of Avondale in the County of Maricopa, Arizona. The location map is presented on Figure 1. Figure 2 presents the leveed area as shown on the National Levee Database. This area should not be confused with a flood plain, but is used in a nation-wide comparison of relative potential consequences behind levees. The leveed area consists of elevations lower than the top of levee, but does not take into account the general direction of overland flow. It represents the "bath tub affect" of a levee and is determined by projecting horizontal lines from the top of the levee to points of equal elevation. The levee is located along the north (right) bank (looking downstream) of the Salt/Gila Rivers. The levee begins at 105th Avenue (Station 224+62.57), continues downstream past Avondale Boulevard (also known as 115th Avenue and 116th Avenue but for consistency is referred within this report as Avondale Boulevard, (Station 153+72.90), and ends at El Mirage Road (approximate Station 0+00). The construction of the Tres Rios North Levee was conducted in two phases (1A and 1B). Phase 1A is located from 105th Ave. downstream to Avondale Boulevard, and Phase 1B is located from Avondale Boulevard downstream to El Mirage Road. The contractor for Phase 1A was TPA-CKY Joint Venture and the work was performed under contract number W912PL-05-0013. The contractor for Phase 1B was ERS-Joint Venture and the work was performed under contract number W912PL-07-0023.

A previously existing levee, the Holly Acres Levee, was located between approximate Station 103+00 and 168+00. This levee was modified in 1983 and had been operated and maintained by the FCDMC. The Holly Acres Levee was incorporated into the Phase 1A and Phase 1B construction of the Tres Rios North Levee.

3.2 LEVEE FEATURES

The Tres Rios North Levee Phase 1A and Phase 1B consists of a newly constructed levee and improvements to the existing Holly Acres Levee. Flood control features include several access ramps, two collector channels, two catch basins, nine guide dikes, two operation and maintenance roads, Reinforced Concrete Box (RCB) and Reinforced Concrete Pipe (RCP) culverts, and four-wire right-of-way fence. In general, the levee is an earthen embankment levee approximately 12,233 feet in length, approximately 20 feet in height, and protected by rip-rap on the riverside slope with toe-down, launchable stone toe material, gabion mattresses, and guide

dikes. Additional details for the levee can be found in a report prepared by the L.A. District of USACE entitled "Tres Rios Environmental Restoration Project, Amended Design Documentation Report (DDR) for Flood Control North Levee Phase 1A & 1B, Maricopa County, Arizona, Final Submittal," dated July 2012 (USACE, 2012). The DDR is included in this report as Appendix B. A construction/embankment report entitled "Construction Report for the Tres Rios Environmental Restoration Project, Phases 1A and 1B, North Levee, Maricopa County, Phoenix, AZ, PGT Joint Venture Contract No. W912PL-11-D-0019, Task Order No. 2" prepared by Genterra Consultants, Inc. and dated September 2012, (Genterra, 2012), included as Appendix C, also provides details for the constructed conditions. The as-built plans for the levee are included as Appendix D. Selected features are depicted on Figure 3. No instrumentation other than survey monuments have been installed in the levee.

3.2.1 Holly Acres Levee Modifications

About 1 mile of the existing Holly Acres Levee required modifications as part of the project, extending from El Mirage Road to Avondale Boulevard. These modifications included increasing the height of the levee, widening of the landside slope, modifying or repairing the existing revetment, and operation and maintenance road modifications.

3.2.2 Access Ramps

Four access ramps, including turnarounds, to provide access for invert/toe to levee crest, were constructed as part of the Phase 1A levee. Two of the ramps are an upstream and downstream pair located at approximate Station 202+50 and provide access to the channel. These riverside ramps are 14 feet wide and consist of a grouted surface along the ramps. Two ramps are located on the landside of the levee at approximately Station 168+00. These two ramps have an Aggregate Base Course (ABC) surface.

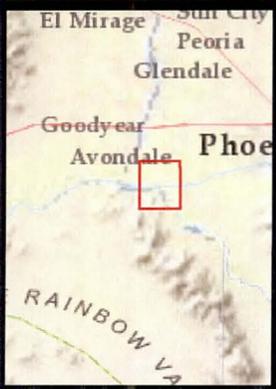
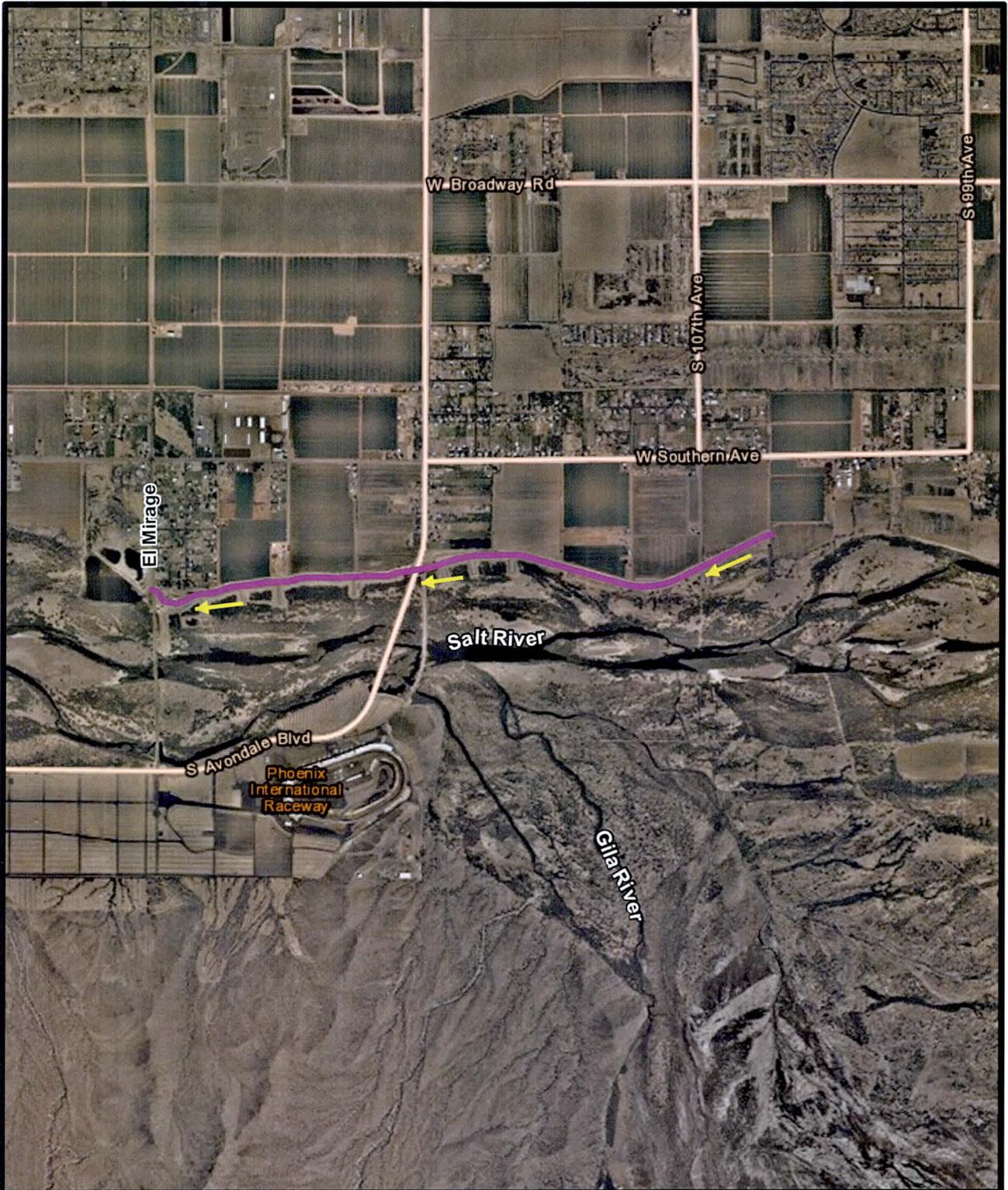
One access ramp including turnarounds, was constructed to provide access to the invert within Phase 1B. This ramp is located downstream of the Avondale Boulevard bridge and is 14 feet wide and consists of a grouted surface along the ramp. One access ramp providing access from the landside is located at approximately Station 4+00 and has a grouted surface and grouted stone above and below the ramp. Another ramp is located on the northern side of the El Mirage Road catch basin described below and provides access to the basin.

3.2.3 Collector Channels

For Phase 1A, a 1.1-mile long reinforced concrete trapezoidal channel extending from 105th Avenue to 113th Avenue drains water on the protected side of the levee to a catch basin upstream of Avondale Boulevard. For Phase 1B, a 1-mile long reinforced concrete trapezoidal channel extending from El Mirage Road to Avondale Boulevard drains water on the protected side of the levee to a catch basin upstream of El Mirage Road. Several concrete culverts located on the Northern channel slope direct irrigation ditch tailwater into the collector channel.

3.2.4 Catch Basins

Two catch basins collect water from the collector channels before it is discharged through the levee into the river channel via RCB culverts described herein. One 15 ac-ft earthen catch basin, for Phase 1A, is located upstream of Avondale Boulevard and a second 8.5 ac-ft. earthen catch basin, for Phase 1B, is located upstream of El Mirage Road.



Legend

- Salt River
- Gila River
- Tres Rios North Levee
- Direction of Flow

0 0.5 1 Miles

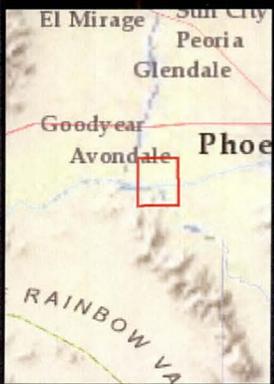
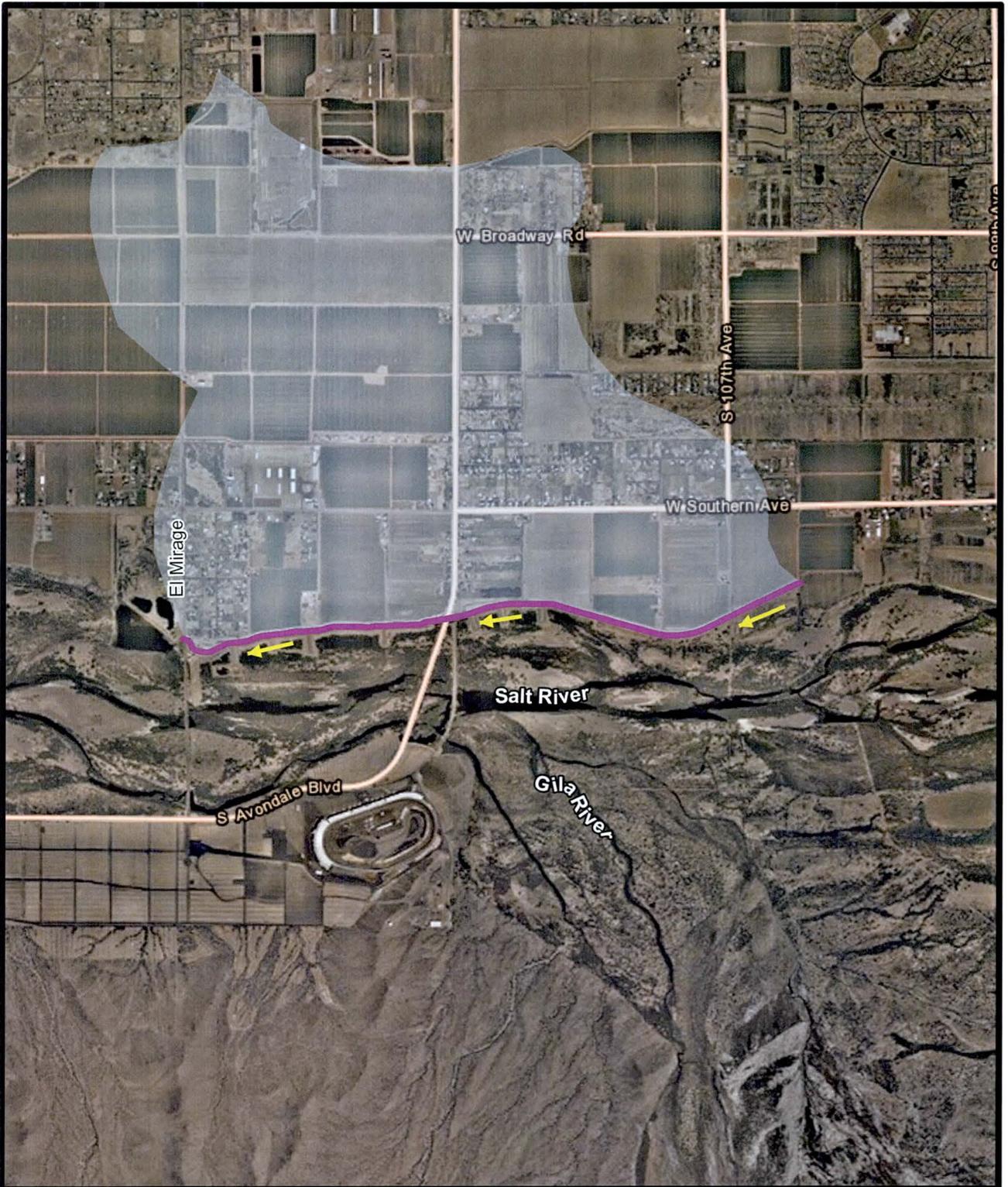
Source: National Levee Database

TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

LOCATION MAP

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

FIGURE 1



Legend

-  Tres Rios Levee
-  Leveed Area
-  Direction of Flow

0 0.5 1 Miles

Source: National Levee Database

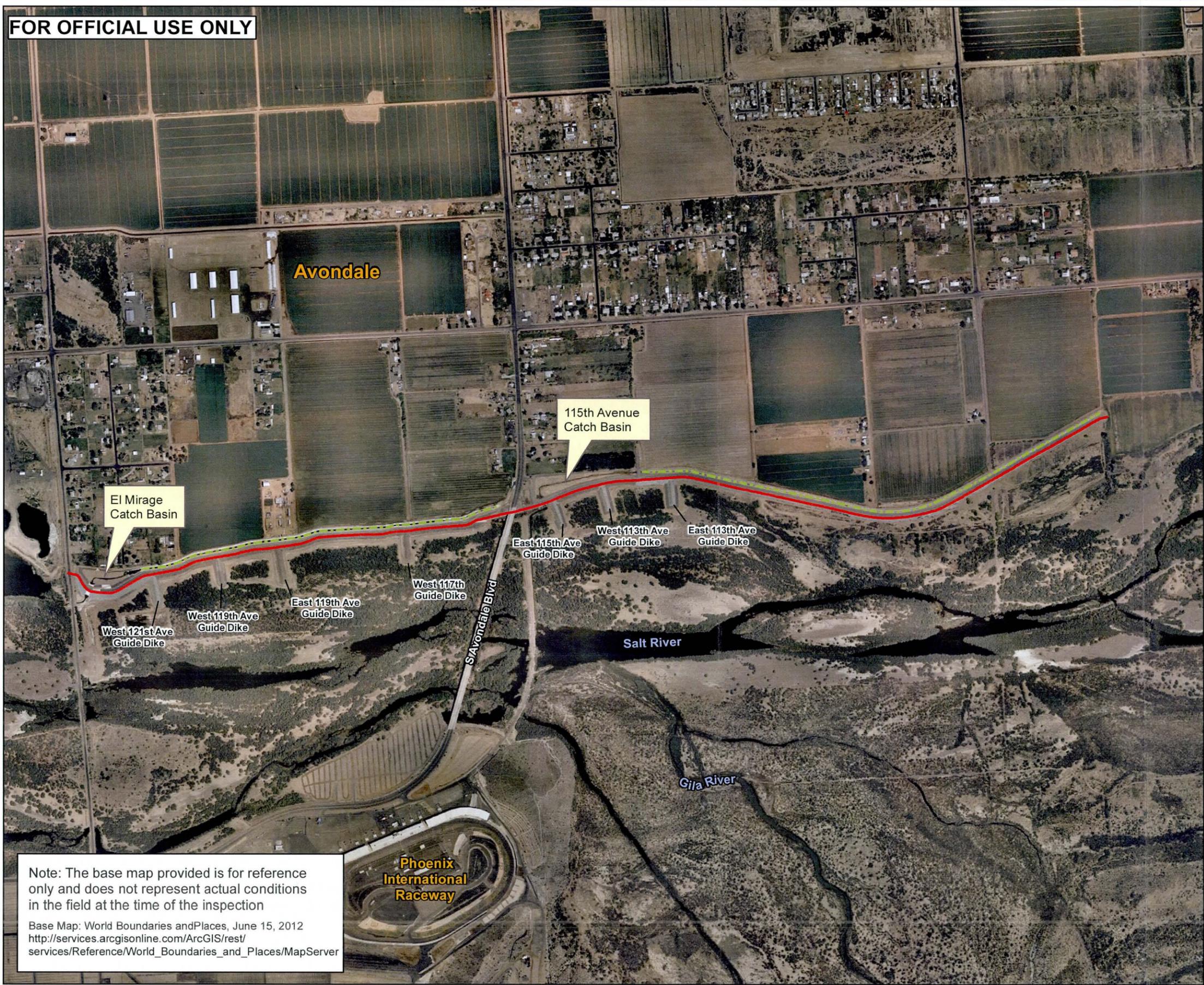
TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

LEVEED AREA

 U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

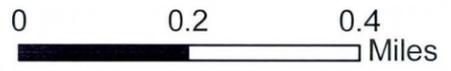
FIGURE 2

FOR OFFICIAL USE ONLY



Legend

-  Levee Centerline
-  Collector Channel



TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

TRES RIOS NORTH
LEVEE SYSTEM



U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

Note: The base map provided is for reference only and does not represent actual conditions in the field at the time of the inspection
Base Map: World Boundaries and Places, June 15, 2012
http://services.arcgisonline.com/ArcGIS/rest/services/Reference/World_Boundaries_and_Places/MapServer

Figure 3

3.2.5 Guide Dikes

Seven compacted earth fill guide dikes were constructed or re-habilitated as part of construction of the Tres Rios North Levee. Three dikes, named 115th Avenue Dike, West 113th Avenue Dike and East 113th Avenue Dike, were constructed for Phase 1A. These dikes are armored by 27-inch thick riprap and the toes are protected by 12-inch thick gabion mattresses. Four dikes, named West 121st Avenue Dike, West 119th Avenue Dike, East 119th Avenue Dike, and West 117th Avenue Dike were constructed or modified as part of Phase 1B construction. Both the West 121st Avenue Dike and the West 119th Avenue Dike were constructed and armored by 27-inch thick riprap and protected by 12-inch thick gabion mattresses. The East 119th Avenue Dike and West 117th Avenue Dike were existing and only the 12-inch thick gabion mattresses were constructed at the toes of these dikes. All seven of the guide dikes are oriented at a 90-degree angle with respect to the levee centerline. The purpose of these guide dikes are discussed in Section 7.

3.2.6 O & M Roads

Two Operation and Maintenance (O&M) Roads are required for each phase. One is located on top of the levee, along the levee crest and the other is situated between the toe of the levee landside slope and the collector channel. These O&M roads consist of 3-inch thick Aggregate Base Course (ABC), 14-foot wide cross section, and turnarounds and other modifications as indicated on the as-built plans.

3.2.7 RCB Culverts

Three Reinforced Concrete Box (RCB) culverts were constructed as part of the Tres Rios North Levee project. One RCB culvert is utilized to cross the collector channel at approximately 113th Avenue at the upstream end of the catch basin upstream of Avondale Boulevard. This RCB consists of a single barrel, 18-feet wide by 4-feet high. The other two RCB culverts are 5 barrels each and are located at the downstream end of the catch basins, at El Mirage Road and 115th Avenue. Each barrel is 5-feet wide by 3-feet high and each has a rectangular flap gate at the outlet. At the inlet, trash racks are installed across the entire RCB inlet width. The purpose of the RCB Culverts is to convey flow from the catch basins through the levee. The flap gates are designed to prevent flow from the riverside to catch basins during high river flows.

3.2.8 Utilities

Several power and telephone lines were removed or relocated as part of the construction of the Tres Rios North Levee. Details regarding the locations of these power and telephone lines can be found in the DDR (USACE, 2012)

3.2.9 Concrete Irrigation Canal Connections

Several existing concrete irrigation canal (CIC) connections, or side drains, were modified during construction of the levee. These drains, typically corrugated metal pipes (CMP), were originally outlet into the river through the Holly Acres Levee or diverted elsewhere. These drains were redirected and, the outlet was reconstructed and replaced with RCP and moved to the collector channel. The existing CMP was sealed by grout/concrete sealing utilizing controlled

low strength material (CLSM)). The as-built plans depict these locations and are summarized in Table 3.2.9 below.

**Table 3.2.9
 CIC Connections**

Approx. Station	Street Association	Original Outlet
<i>Phase 1A</i>		
168+00	Downstream of 113th Ave.	Into river channel or 18-inch diameter CMP at Sta. 162+57
168+75	Upstream of 113th Ave.	Into river channel.
181+50	East 111 th Ave.	Into river channel.
194+00	East 109 th Ave.	Into river channel.
209+50	East 107 th Ave.	Into river channel.
210+00	West 107 th Ave.	Into river channel.
224+00	East 105 th Ave.	Into river channel.
<i>Phase 1B</i>		
~112+00	Upstream of El Mirage	18-inch diameter CMP at ~Sta. 111+95
~114+35	Upstream of El Mirage	18-inch diameter CMP at Sta. 114+35
~115+35	Upstream of El Mirage	18-inch diameter CMP at Sta. 115+15
128+50	West 119 th Ave.	18-inch diameter CMP at Sta. 126+25
141+50	117 th Ave.	18-inch diameter CMP at Sta. 141+45
141+65	117 th Ave.	18-inch diameter CMP at Sta. 141+74

3.2.10 Avondale Boulevard Bridge Crossing

The crossing of Avondale Boulevard is located on the downstream end of Phase 1A and the upstream end of Phase 1B. The crossing was built by the Maricopa County Department of Transportation (MCDOT), is designated as 116th Avenue, and consists of a bridge deck and approach supported on piers and shallow foundations. The levee alignment portion of the crossing is constructed of soil cement with 1.5:1 (horizontal:vertical) riverside slopes. As-built plans for the crossing are included in Appendix D.

3.3 LOCAL OWNERSHIP

The Flood Control District of Maricopa County (FCDMC) is the local owner/operator of the Tres Rios Flood Control North Levee. Operation and Maintenance (O&M) of the project will be performed by FCDMC. The IGA between the City of Phoenix and the FCDMC is included in Appendix A.

4.0 PREVIOUS CERTIFICATION INFORMATION/FIRM OR DFIRM

No previous certifications have been presented.

5.0 OVERALL PERFORMANCE HISTORY

The Tres Rios Flood Control North Levee system components are operating as designed. However, levee construction was completed in 2008 and significant storm event flows which will test the integrity of the levee system have not occurred. In January 2010, a flow in the Salt/Gila River of 17,638 cfs was reported in gage ID 6848. This corresponds to a peak gage height of 6.95 feet, where zero gage height elevation is 927.14 feet mean sea level. This flow was not large enough to affect the levee or any of the attendant features. No instrumentation other than survey monuments have been installed in the levee.

6.0 NFIP LEVEE SYSTEM EVALUATION TEAM MEMBERS

Table 6.1 details the key USACE team members and the role each assumed during the Levee System Evaluation. Personnel with FCDMC were also in attendance during the inspection.

Table 6.1
List of Levee System Evaluation Team Members

Title	Name
Geotechnical/Lead	Chris A. Spitzer, P.E.
Hydrology/Hydraulics	Mylene M. Perry
Structural	James Majors, P.E.
Levee Inspection Tool Operator	Cynthia M. Wong, P.E.

7.0 ENGINEERING STUDIES, INVESTIGATIONS, AND ANALYSES

As part of this NLSER, a review of studies, investigations and analyses for the levee design, construction documentation, and O&M records were performed. In addition, a levee system inspection was performed by the NLSER evaluation team. This section provides summaries of those reviews.

7.1 SITE VISIT SUMMARY AND RECENT INSPECTION

7.1.1 Construction Completion Site Walk Through

A formal site ‘walk through’ was performed following the completion of each phase of construction. Signed Corps completion of construction letters for both Phase 1A and 1B are dated January 22, 2009 and are included in Appendix E.

7.1.2 Recent Inspection

Two inspections of the levee were conducted by FCDMC on March 2, 2011 and May 2, 2011 and are included in Appendix H. A recent USACE inspection was conducted by the team listed in Section 6.0 on April 26 and 27, 2012. This inspection was performed in general accordance with procedures and practices for periodic inspections of levees conducted by the Los Angeles District of USACE. However, as this levee was recently constructed, this did not include a design criteria review. In addition, the inspection was more rigorous than a routine inspection as

the level of detail of observations was increased. The overall rating of the system was determined to be "Minimally Acceptable."

The purpose of this levee system inspection was to identify deficiencies that could pose hazards to human life or property. This assessment of the general condition of the levee system is based on available data and visual inspections at the time of the inspection. Detailed investigation and analysis involving hydrologic design, topographic mapping, subsurface investigations, testing, and detailed computational evaluations is beyond the scope of this levee system inspection format. The inspection is intended to identify the issues to facilitate such future studies and associated repairs as appropriate.

The condition of any levee system depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It is incorrect to assume the present condition of the levee system will continue to represent the condition of the levee system in the future. A reasonable chance that unsafe conditions developing over time can only be avoided through continued inspection, maintenance, repair, and rehabilitation.

The findings and details resulting from the recent inspection (the complete Flood Damage Reduction System Inspection Report) are found in Appendix F. Three items identified during the inspection as being of interest are reiterated here.

1. During the site inspection, a significant amount of flow from irrigation water was observed from irrigation activities on the protected side of the collector channel. This water was observed percolating adjacent to the channel, over the top edge of the collector channel, and sheet flowing along the channel slopes and in the collector channel. Although the collector channel is functioning as intended, continuous flow over time will likely be detrimental to the stability of the channel. FCDMC has issued a letter to the irrigation district requesting that the users maintain irrigation berms to prevent this uncontrolled flow of irrigation water across Flood Control District property. The letter from FCDMC is included in Appendix H.
2. An 18-inch diameter CMP, designed and depicted on the as-built plans without a flapgate, was observed at the downstream end of the levee near El Mirage Road. This pipe may or may not be within FCDMC right-of-way and is likely maintained by the Maricopa Department of Transportation. Note that this CMP was not part of the USACE design and was constructed by local interests. However, during design of the Tres Rios North Levee, the CMP was evaluated. Due to the size and elevation of the inlet of the CMP it was determined that a flapgate was not required as flood flow through the pipe would be limited. Further, if flow was to occur through the CMP towards the landside, water would flow into the catch basin and subsequently into the river. Although at the time of inspection, the pipe was in fair condition, significant debris was observed, further deterioration is anticipated and may cause failure of the pipe. It was recommended that this pipe be reevaluated by the actual operator/maintainer to determine if it is still needed. The FCDMC evaluated this pipe and determined that it is no longer needed and will be back-filled per the original project specifications, as per the other CMPs, and the area adjacent will be re-graded to allow direct drainage into the catch basin. .

3. Video inspection of the two non-Corps built culverts adjacent to Avondale Boulevard has been conducted by the FCDMC and the findings have been presented to USACE. This information has been reviewed by USACE and is included in Appendix F. The culvert west of Avondale Boulevard was given an “acceptable” rating with minor spalling noted and the culvert east of Avondale Boulevard was given a “minimally acceptable” rating due to spalling/exposed rebar and water seepage through cracks. These inspections evaluated the entire length of the pipe.

7.2 HYDROLOGY EVALUATION

7.2.1 Characterization of the Watershed

The general area is characterized by a broad alluvial valley surrounded by steeply sloped mountain ranges that rise several thousand feet above the valley floors. The sub-basin is bounded on the south by the Sierra Estrella, the South Mountains, and the Buckeye Hills; on the west by the White Tanks Mountains; and on the north by the Wickenburg, Hieroglyphic, and New River Mountains (USACE, 2000).

The drainage of the Gila River covers approximately 58,000 square miles and extends from the Continental Divide in southwestern New Mexico to the Colorado River at Yuma, Arizona, including practically all the southern half of the State of Arizona. The Salt River is the largest tributary of the Gila River and drains a total area of approximately 13,700 square miles within the northern and eastern portions of the State of Arizona.

Further discussion of the watershed can be found in the Tres Rios Project Feasibility Study (USACE, 2000).

7.2.2 Flood Frequency Analyses

The development of discharge frequency relationships for each river is discussed in Appendix B (Hydraulic Analysis) of the DDR (USACE, 2012). For continuity, the DDR is included as Appendix B of this report.

Two stream gages which measure runoff are located within the vicinity of the levee. One is on the Salt River at Priest Drive near Phoenix, Arizona, which measures inflow upstream of the levee. The other is located on the Gila River at Estrella Parkway, near Goodyear, Arizona, which measures outflow downstream of the levee.

Numerous other gauging stations are located upstream of the levee and were utilized to develop historical and synthetic flood flows. Discharge –frequency relationships developed for flow in the Salt River are based on a record length of 105 years. Historical information, as available, was used to develop the discharge-frequency relationships for the Gila River.

7.2.3 Discharge Frequency Analysis

The methodologies and assumptions used to determine the discharge-frequency relationships are discussed in Appendix B (Hydraulic Analysis) the DDR (USACE, 2012). Peak discharge-frequency relationships for the Salt and Gila Rivers are presented in Table 7.2.3.

Table 7.2.3
Peak discharge-frequency relationships for the Salt and Gila Rivers

Location	Return Period						
	5-yr	10-yr	20-yr	50-yr	100-yr	200-yr	500-yr
Salt River above Gila River	19,500	49,000	82,000	130,000	162,000	198,000	235,000
Gila River below Salt River	23,500	57,000	92,000	185,000	227,000	243,000	285,000

Notes: Gila River Basin Section 7 Study for Modified Roosevelt Dam Arizona, Hydrologic Evaluation of Water Control Plans, Sal River Project to Gila River at Gillespie Dam, USACE (1996a).
 Discharges are in cubic feet per second (cfs)

7.3 HYDRAULIC EVALUATION

The levee system protects residential property and farmland to the north (right bank). The guide dikes were part of the project to protect movement of the channel to the north bank that would otherwise impact the bank and cause scour along the levee which, if not protected, could result in levee failure and flooding of the protected area. Hydraulic analysis was performed using a one-dimensional numerical model. The details of the hydraulic evaluation are provided in the following subsections.

7.3.1 Computer Model

The Hydrologic Engineering Center River Analysis System (HEC-RAS), Version 4.1 was used for the hydraulic evaluation. In applying the numerical model (HEC-RAS), the flow is in a one-dimensional, uniform, steady state. The one-dimensional assumption is applicable since during high flows most of the flow travels downstream along the channel allowing the model to be analyzed in one direction. The uniform flow statement is reasonable since in most situations flow depth and velocity is gradually changing. Steady flow states that the change in depth is constant as a function of time. The steady state assumption is reasonable for most of the study reach except at specific locations where abrupt changes in the cross sectional flow are present; examples include hydraulic jumps, abrupt channel bends and changes in bed slope.

7.3.2 Cross Sections

The cross sections were set up as part of the PED project (WEST, 2004). The cross-sections were arranged perpendicular to the flow and are spaced between 100 and 800 feet apart, which is appropriate given the hydraulic conditions of the reach. Cross-section descriptions in the HEC-RAS model indicate those cross-sections that incorporated as-built information in the development of the cross-section

geometry. Cross sections where flows from the Salt and Upper Gila rivers overlapped were cut off where a line of separation follows the natural high ground between the two rivers.

Ineffective flow areas were set at the regime bank stations to elevations high enough such that the 5-yr discharge was completely contained within the channel, but low enough to allow the 20-year discharge to flow uncontained. The ineffective flow limits along the north bank were developed based on the 100-year event. A maximum of 4:1 expansion was maintained in developing these areas, where necessary. The ineffective area heights were raised vertically sufficient to contain high flows.

The cross sections from the Upper Gila River reach and junction feature were removed from the original model since previous FEMA mapping excluded the Gila River Indian Community. Cross sections from river Station 199.52 to river Station 200.27 were extended to the south to include the revised floodplain area from the Upper Gila River area. These cross section extensions were also modeled as ineffective flow areas. These areas are not mapped within the final floodplain boundaries because there is no significant flow-connectivity along such areas for any considerable length.

7.3.3 Manning's n-values

The primary factor in the estimation of Manning's roughness coefficients (n-values) was vegetation. Field observations along with hydraulic relationships and values assigned as per methodologies outlined by "Estimated Manning's Roughness Coefficients for Stream Channels and Floodplains in Maricopa County, Arizona" (Thomsen and Hjalmarson, 1991), and USGS "Guide for Selecting Manning's Roughness Coefficients for Natural Channel and Floodplains" (Arcement and Schneider, 1984) were used in the estimation process.

Vertical variation in Manning's roughness coefficients were used at every cross section in the model except immediately upstream and downstream of the Avondale Boulevard Bridge. These two cross sections did not utilize the vertical variation in Manning's roughness coefficients because this bridge was modeled as a multiple opening analysis, and HEC-RAS will not allow vertical variation in Manning's roughness coefficients for a multiple opening analysis.

A Manning's roughness coefficient of 0.15 was used for the 5-yr event, 0.10 for the 20-yr event and 0.07 for events greater than or equal to the 100-yr event. However, based on engineering judgment and field observations the Manning's n-value was decreased from 0.07 to 0.04 for the cottonwood areas.

7.3.4 Bridges

The Avondale Boulevard Bridge and the Bullard Avenue Bridge (located several miles downstream of El Mirage Road) geometries were obtained from the Maricopa County Department of Transportation as-built plans and coded into the hydraulic model. Per guidance contained in the HEC-RAS Reference Manual (USACE, 2010a), the contraction and expansion coefficients were set to 0.1 and 0.3, respectively since no contraction/expansion conditions exist at these bridges. The same coefficient values were also applied to all other cross sections in the model.

Since the bridges are supported by piers that extend into the channel cross section, the highest energy solution between Energy Only (Standard Step) and Momentum appropriate for each bridge was selected for low flow conditions and Energy Only was selected for high flow conditions.

7.3.5 Debris Loading on Bridges

Bridge piers have been shown to trap significant amounts of debris during flood flows. Therefore, two feet of debris were loaded on each side of the pier for the full flow of depth.

7.3.6 Levees and Dikes

Dikes were added at various locations for additional bank protection and to prevent flow from impinging on the levee. Seven dikes are at approximate levee Stations 171+50, 164+00, 158+00, 141+00, 126+50, 119+50, 112+00. The dikes are about 300 feet in length, 10-foot wide at the crest, sloped at 2H:1V, and protected by 27-inch thick riprap with 12-inch thick gabion mattresses at the dike toes.

The levee alignment was coded into the model, which updated the representation of the north levee using as-built information. Additionally, the seven dikes were represented with ground elevations capturing the shape of the dike.

7.3.7 Levee Bank Protection and Toedown

7.3.7.1 Hydraulic Criteria for Bank Protection

A report issued by WEST Consultants, Inc. titled "PED Hydraulic Design of Tres Rios North Levee – 2D Model Analysis, Final Design Report" (WEST, 2004a) was used as a starting point in developing the final bank and toe protection alternative. The purpose of the study was to conduct a two-dimensional (2D) numerical model analysis in order to assess the vulnerability of the north levee bank system with respect to historical and simulated 1% annual exceedance probability (AEP) flood frequency event conditions. Design guidance for stone size protection and revetment toe scour estimation were computed using the procedures outlined in EM 1110-2-1601 (USACE, 1994).

In the process of developing this design alternative, specific criteria was identified that established a reasonable risk for setting design parameters that were based on the information contained in the report as well as known historical data within the project reach. The memorandum titled "Tres Rios Preconstruction Engineering and Design (PED) – Hydraulic Criteria for Bank Protection" (USACE, 2004) outlines the specific criteria used for the final design alternative. This memorandum contains velocity magnitudes and vector information as well as a logic diagram that were used to establish the final design. Graphical results indicate that the recommended bank protection features reduce the lateral impingement forces against the north bank.

After careful consideration of historical flood information in the project area, an examination of the functional performance of existing bank protection features within the project reach, and an assessment of the 2-D model results as presented in the WEST Report, it was determined that much of the original proposed bank protection design and associated toe protection measures as recommended in the Final Report should be incorporated in the final design. However, an exception to the total acceptance of the Final Report's design recommendations was to keep a single dike at 95th Avenue and delete all other proposed dikes and bendaway wiers. The primary purpose for this dike near the 95th Avenue extension is to offset any major catastrophic threat in this localized area of relative high flow velocities immediately adjacent to the high terrace bank. Riprap bank protection was used throughout the face of the north levee.

At the upstream end, the levee is buried by backfill to accommodate the overbank wetlands design, which is part of the other project features of the Tres Rios Environmental Restoration Project.

An estimate of local scour or toe-down depth along the proposed levee was performed so that levee protection could be placed sufficiently low in the streambed to prevent undermining damage from potential degradation (WEST, 2004b). A 105-year long-term period of record hydrograph was simulated using HEC-6T to determine the future river thalweg. Several regime equations were then used to calculate the general scour. The average depths of scour obtained from the equations were added to the magnitude of predicted degradation to arrive at the total required toe-depth. A 30% safety factor was added to account for uncertainty. The resulting toe depth recommended is 10 ft below the existing thalweg, however, the final design used launchable toe stone protection designed to launch to a depth of 15 feet (see section 7.3.7.3).

7.3.7.2 Riprap Calculations

The riprap design guidance outlined in EM 1110-2-1601 (USACE, 1994) was used to determine the minimum required riprap sizes. Velocities from the HEC-RAS and RMA2 numerical models were used for riprap calculations. A specific gravity of 2.65 was assumed for the riprap. The ratio of V_{SS}/V_{AVG} was assumed to be 1.0 where V_{SS} and V_{AVG} are the velocity of the riprap side slope at 20% of the flow depth and the average flow velocity, respectively. A design safety factor of 1.1 was used based on guidance in EM 1110-2-1601 (USACE, 1994).

Both angular and rounded riprap was considered. For rounded riprap, the stability coefficient for incipient failure vertical velocity distribution coefficient, C_S , was adjusted to 0.375 (0.30 for angular rock).

Additional consideration was made for impinging flows. For braided streams having impinged flow, the stone sizing procedures were modified in two areas: the method of velocity estimation and the velocity distribution coefficient, C_V . In this case, the ratio of V_{SS}/V_{avg} was multiplied by 1.5 and C_V was adjusted to 1.25 (1.0 for parallel flow).

Although the results show that a 9-inch layer of riprap would be adequate at most locations, a 15-inch layer of riprap (angular or rounded) was recommended for several reasons: 1) there is not much difference between the angular or rounded rock required thickness; 2) the stone size

requirements using the HEC-2 numerical models are thicker than 9 inches and averages to approximately 15 inches; and 3) theft is not a concern within the populated area.

7.3.7.3 Launchable Toe Stone

Launchable toe stone was used based on economic analysis. The guidelines described in EM 1110-2-1601 (USACE, 1994) were used to determine the volume of launchable toe stone. This concept simply uses toe scour as a substitute for mechanical excavation. This method also has the advantage of providing a "built-in" scour gage, allowing easy monitoring of high-flow scour and the need for additional stone reinforcement by visual inspection of the remaining toe stone. This method of toe protection is useful where water levels prohibit excavation for a toe section or where the cost of extra stone required to produce a launched thickness equal to or greater than 1.5T is exceeded by the cost of excavation required to carry the design thickness T down the slope.

To compute the required launchable stone volume, the following assumptions were used: 1) launch slope = 2 horizontal on 1 vertical (2H:1V); 2) scour depth = existing elevation – maximum scour elevation; 3) thickness after launching = 1.5 times the thickness of the bank revetment T. For a 15 ft scour depth protection, the launchable toe stone height and width would be approximately 8.0 ft.

7.3.8 HEC-RAS Results

The final 1% AEP water surface profile, typical cross sections and supporting pertinent hydraulic data are shown in Exhibit VI through Exhibit VIII in the Hydraulic Appendix of the DDR (USACE, 2012). In addition, a memo with review of the model entitled Tres Rios Environmental Restoration Project Hydraulic Model Acceptance by Hydrology and Hydraulics Branch and presented in Appendix B.

7.3.9 Risk and Uncertainty Analysis

A risk and uncertainty analysis was performed on the levee and documented in Appendix B of the DDR (USACE, 2012). The probability of exceedance and uncertainty analysis of levee containment is accepted by FEMA National Flood Insurance Program (NFIP) levee system evaluation requirements if the levee is shown to have 3 ft of freeboard above the computed water surface elevation for the 1% AEP, plus an additional foot of freeboard at bridges, and an additional 0.5 foot required at the upstream end and tapering to the minimum at the downstream end of the levee (FEMA, 1991; FEMA, 2003). The 3 ft of freeboard required by FEMA can be reduced to 2 ft if there is assurance of 95% or greater of containment of the 1% AEP.

The USACE probability of exceedance and uncertainty analysis procedure used in the HEC Flood Damage Analysis (HEC-FDA) program is used to determine if the levee system has a minimum CNP of 95%, with a minimum of 2 ft of freeboard added to the computed water surface elevation of the 1% AEP (USACE, 1996). The results from the HEC-FDA analysis confirmed that the entire levee evaluation reach has greater than a 95% non-exceedance probability for the 1% AEP with greater than 2 ft of freeboard.

7.3.10 Characterization of the Flood Hazard

Hydraulic modeling of the Tres Rios North Levee indicate that freeboard for the 100-yr event is over 2 feet for Phase 1A and 1B segments. An evaluation of risk and uncertainty using the HEC-FDA program showed that the entire evaluation reach does pass the 100-yr event with greater than or equal to a 95% probability. Refer to the Hydraulic Appendix of the DDR (USACE, 2012) for a detailed discussion on the risk and uncertainty analysis.

The Tres Rios North Levee contains the water to eliminate the 100-yr floodplain associated with the Salt River and Gila River flows.

7.4 SEDIMENT TRANSPORT

Sediment transport modeling is detailed in WEST's report, "PED Hydraulic Design of Tres Rios North Levee, Volume II Pre-Final Project Analysis Final Report" (WEST, 2004b). The computer program (HEC-6T) was used to conduct the numerical sediment transport modeling for without-project, with-levee only and with-project (levee with open-water marshes and ponds). The HEC-6T model simulation was performed for 105-years of record (1889 – 1993 period). Detailed discussion of the sedimentation analysis and results are documented in Exhibit III Appendix B of the DDR (USACE, 2012). For without-project conditions, the results show an overall lowering of the average bed elevations indicating potential for erosion in most areas. The analysis of the with-levee only condition is similar to the without-project conditions. The long-term degradation is approximately 3 feet.

The results for with-project are shown in Figure 5-8 on page 67 of Exhibit III of Appendix B of the DDR (USACE, 2012). In the Salt River area, the addition of ponds immediately upstream of the 116th Avenue Bridge provides additional conveyance on the overbanks resulting in lower velocities within the channel. The results show an increase in the average bed elevations. This deposition results in the depletion of the sediment load as the flow moves downstream. As a result of the upstream deposition, there is erosion in the Lower Gila River as the flows tend to regain equilibrium by scouring to increase the sediment load that was lost due to deposition in the Salt River portion of the model. The location of the ponds will act as a sediment trap and retain nearly all sediment inflows from the Gila River during low flows, which could lead to increased degradation downstream of the confluence.

Following sediment transport analysis, the resulting bed elevations were coded into the HEC-RAS model and rerun, and inundation limits were remapped. Post-sediment transport inundation limits indicate that the lateral extent of inundation decreased in most locations through the study reach. These results are consistent with the overall trend of erosion and slight channel deepening indicated in the sediment transport analysis.

7.5 STRUCTURAL EVALUATION

7.5.1 Drainage Structure Assessment

7.5.1.1 Levee Penetrations

Based on the recent levee inspection conducted in April 2012, the primary drainage structures penetrating the levee are in good condition. The 5-Cell RCB culverts are in good condition, but show sediment accumulation on the inlet/outlet inverts. These concerns are minor and can be addressed by routine Operations & Maintenance. The RCP culverts (near the Avondale Bridge) show erosion at the outlets of up to three feet into the levee. Currently, this is a minor concern, but has the potential to become a major concern. The erosion in this area should be monitored regularly. Also, the inlet grate (for the 30" RCP) shows bearing bar failure/warping and should be replaced. The 18" CMP near El Mirage Road is in fair condition, but is filled with sediment/obstructions that should be cleared. After the obstructions are cleared, a more accurate assessment of the CMP can be made. In addition, the CMP does not have a flap gate. Note that this CMP was not part of the USACE design and was constructed by local interests. All other in-service flap gates are in good working condition.

7.5.1.2 Collector Channel and Side Drains – Concrete Irrigation Canals

The collector channel and side drains are in fair condition. The primary issues with the side drains are erosion at the inlets and obstructions in pipes. The erosion at various side drain inlets initially occur outside of USACE right of way, but then continue toward the collector channel. This can potentially compromise the stability of USACE structures. This should be monitored regularly to see if the conditions worsen. The collector channel also shows signs of erosion at various locations along the north side. The collector channel transition area (~STA 110+60) has severe erosion and should be repaired. Side Drain No. 1 has up to 12" of erosion at the outlet toe and should be regularly monitored. Side drain No. 6 has a cracked concrete collar head and should be repaired. It should be noted that this collar head, and the erosion condition are on the protected side of the collector channel and although may cause degradation of the collector channel, impact on the levee would be minimal.

7.5.1.3 Concrete Compressive Strength

Concrete compressive strength (28-day) for collector channel invert and side slopes were specified at 4000 psi and 3000 psi, respectively. Overall evaluation of CQC/QA reports and data indicate collector channel concrete is in compliance with project specifications and should perform as designed. See Appendix C for a detailed presentation of concrete construction, materials and test data.

Concrete compressive strength (28-day) for structural concrete (RCB) was specified at 4000 psi. Overall evaluation of CQC/QA data indicate structural concrete is in compliance with project specifications and should perform as designed. See Appendix C for a detailed presentation of concrete construction, materials and test data.

7.5.2 Corrugated Metal Pipe (CMP) Condition Assessment

One (1) in-service CMP side drain penetrates the levee at approximately Station 103+20. Upon recent construction (2008 completion), all other CMPs were sealed or removed. Currently, a total of nine (9) sealed CMPs penetrate the levee. The condition of the one (1) in-service CMP is fair. However, the CMP has obstructions that do not allow for an accurate assessment and reduce the capacity by approximately 30 percent. In addition, the CMP does not have a flap gate.

7.6 GEOTECHNICAL EVALUATION

7.6.1 Local Geology

The geology of the Tres Rios study area is dominated by valley fills and alluvium associated with the Salt River and Gila River channels. Granite and metamorphic bedrock outcrops are found in the south portion of the Tres Rios project area, in the Sierra Estrella Mountains. The surface materials within the Tres Rios study area are Quaternary age river sediment deposited as alluvium and, to a lesser extent, sheet-wash deposited alluvium and slope deposited colluvium. This alluvium thins in the direction of local mountains.

Sand and gravel, moderately to poorly graded and stratified, compose the bulk of the deposits left by the Salt River. These deposits consist of well-rounded clasts and are locally interbedded with irregular silt, sand, and clay lenses. The fine sediments are derived from overbank flows during flood stage. Prominent terraces of the Salt River sediments are present within the limits of the study area. Colluvium is formed of loose to well-cemented silt, sand, clay, and gravel. The colluvium and alluvial deposits rests upon bedrock consisting of Tertiary granite rocks, as well as the Precambrian metamorphic rocks. Bedrock is relatively deep in the area of the project but outcrops can be found south of the project site in the Sierra Estrella Mountains.

7.6.2 Summary of Geotechnical Exploration

The USACE conducted field exploration/sampling and laboratory testing programs for the Tres Rios project in September 2002, January 2003, and December 2003. URS Corporation (URS) conducted additional field investigations in March 2005. Details regarding these investigations can be found in Appendix C (Geotechnical Appendix) to the DDR (USACE, 2012). For continuity, the DDR is included as Appendix B of this report.

Field exploration programs were performed and soil samples were collected from the proposed levee alignment and existing Holly Acres Levee in September 2002, January 2003, and December 2003 by USACE. Investigations in September 2002 included 15 test trenches ranging in depth from 4 to 12 feet. Investigations in January 2003 included 9 test holes using a 24-inch bucket auger to a maximum depth of 20 feet. Investigations in December 2003 included 4 test trenches. A total of 175 soil samples were collected from 9 boring holes and 5 test trench locations during the investigations.

An additional field exploration program was conducted by URS Corporation in March 2005 for the Tres Rios project. This investigation included 24 borings and 34 test pits. While drilling

borings, soil samples were obtained at about five-foot intervals. Four test pits were dug near or on the levee footprint. Depths explored ranged from 10 to 14 feet. The other test pits were performed outside of the levee footprint in conjunction with other aspects of the Tres Rios Project.

7.6.3 Embankment Erosion Protection

The site is comprised of varying amounts of silt and sand with gravel. Per the DDR (USACE 2012), the foundation strength is adequate to support the levee; however, scour and erosion of the foundation materials was considered to be a potential problem. For this reason, several guide dikes were constructed to divert the river flow away from the levee. The guide dikes were constructed at right angles to the levee and are approximately 300 feet long. Selected dike foundations consist of gabion mattresses installed to reduce the potential for scour of the foundation materials underneath the guide dikes. Performance of these mattresses are generally as intended with minor issues noted and included in Appendix F. In addition, riprap was added to the levee and dike slopes to prevent erosion of the slopes. More detailed information can be found in the DDR. During construction, no significant changes were made to the above describe design and any changes are noted in the Construction Report (Appendix C).

Slope Protection for the levee and guide dikes were determined per EM 1110-2-1601 (USACE 1994). The slopes are protected by a 15-inch thick layer of riprap underlain by a 6-inch layer of gravel. Table 7.6.3 presents the stone gradation for the levee and the guide dikes.

Table 7.6.3

Levee Riverward Slope		Guide Dikes	
Stone Size (inches)	Percent Smaller	Stone Size (inches)	Percent Smaller
15	100	27	100
11	50-100	20	60-100
9	30--50	18	45-70
6	0-15	15	15-45
--	--	11	0-15

More information can be found in the Hydraulic and the Geotechnical DDR Appendices (Appendix B of this report).

7.6.4 Seepage

According to the DDR (USACE, 2012), seepage analysis was performed using the GeoStudio Seep/W model with two scenarios evaluated. The first scenario is a condition with the river at the modeled maximum flood stage (water within 3 feet of top of levee). The second scenario is a condition of 1 foot of water on the backside of the levee resulting from irrigation and/or storm water draining from the neighboring farmland and flowing through the levee into the river. For the analysis, an existing 22 feet high embankment with 8 feet of newly constructed levee, for a total height of 30 feet, was modeled.

7.6.4.1 Soil Parameters Utilized

Hydraulic conductivity values used in the model are discussed in the DDR (USACE, 2012) and are shown in tables 7.6.4-1

Table 7.6.4-1
 Hydraulic Conductivity Test Results

Sample Number	Depth ft	Soil Description	Moisture Content %	Dry Density pcf	Hydraulic Conductivity (K) ft/d
TR03 H-5	6-15	ML	19	112	0.040
TR03 H-8	9-18	SM	18	113	0.016
TR03 T-10	0-10	SM	20	110	0.010

Note: Soil Description is the description given to the sample from lab assistant performing hydraulic conductivity tests.

Parameters used in modeling for both seepage analysis and slope stability as discussed below are summarized in Table 7.6.4-2.

Table 7.6.4-2
 Soil Parameters Used in Analysis

Material	Moist Density (pcf)	Depth (ft)	c' (psf)	ϕ' (degree)	c (psf)	ϕ (degree)	K (fpd)
Embankment	130	0-10	200	35	200	34	0.016
Upper Foundation	136	6-15	120	35	120	34	0.010
Lower Foundation	136	9-18	200	36	200	34	0.040

As discussed in the DDR, the ratio of $K_h/K_v = 4$ was used in the analysis. The equation used to determine the exit gradient (i_e) is as follows: $i_e = \Delta h / \Delta l$, where Δh is the change in head and Δl is the change in length between the last equipotential line and the levee toe. Δh and Δl were obtained directly from the Seep/W modeling outputs.

7.6.4.2 Scenario 1 (River at Flood Stage)

The DDR indicates the 100-year flood will result in a water surface elevation at its full flood stage for less than one day. However, a conservative analysis was performed using steady state conditions. The result of this analysis indicates the levee will not be fully saturated by the floodwater during the maximum flood event and the exit gradient at the toe will be 0.11 with a factor of safety against piping of material is greater than 8.

7.6.4.3 Scenario 2 (Water flow through levee from landward side)

The seepage analysis scenario for water seeping from the landward side through the levee to the river assumed 1 foot of head on the landward side of the levee and no water in the river. Results indicated the volume of through-seepage is low for steady state conditions. The results indicated an insignificant flow rate of less than 1 cubic feet per day per foot. The analysis indicated a gradient of approximately 0.19, creating insignificant uplift pressures. The resulting factor of safety against piping of material is greater than 5.

7.6.4.4 Results

In both scenarios modeled, seepage was not considered to negatively impact the levee and measures to prevent seepage were not recommended. The analysis conducted is still considered applicable and meets current criteria.

7.6.5 Embankment and Foundation Stability

7.6.5.1 General

As indicated in the DDR (USACE, 2012), Station 172+00 was chosen as the critical (tallest slope) section for slope stability analysis. The design at this location consists of constructing the new levee on an existing un-engineered embankment. Slope stability analyses were performed using the computer program, GeoStudio, Slope/W by Geo-Slope International using Spencer's Method of analysis. The program was used to determine the minimum factor of safety for both the riverward and landward levee slopes under differing loading conditions. The results of the analyses are listed below in Table 7.6.5-1. Slope stability analyses were performed for the following loading conditions:

- End of Construction and Long Term. Long-term analysis is for the condition where the soil is drained and effective strengths are used. End of construction conditions are satisfied by the long-term steady state conditions due to the free draining nature of the levee and foundation materials.
- Steady State Seepage due to Irrigation/Storm Water. This analysis has 1 foot of water behind the levee on the landward side due to irrigation and storm water draining from the neighboring farmland and flowing through the levee and into the river.
- 100-Year Storm event. This is the design storm for this report. The water level is modeled to within three feet of the levee crest. The 100-year flood will remain at its full flood stage for less than 1 day; however, a conservative analysis was performed with steady state conditions of 4 days.
- Rapid Drawdown. This case analyzes conditions when the water level adjacent to the slope is lowered rapidly. This case first analyzes steady state conditions at the 100-year storm event to obtain the pore pressures and then lowering of the water very quickly.
- Long-term condition with a 5.8-foot deep crack due to desiccation or saturation of the levee. The analysis was run with the crack dry or free of water. Crack depth was calculated using equation C-36 of EM1110-2-1902 (USACE, 2003) . $d_{crack} = (2c_D)/[\gamma \cdot \tan(45 - \phi_D/2)]$ where c_D and ϕ_D = developed shear strength parameters and γ = unit weight of soil.
- Pseudo-Static (Seismic) considering the anticipated seismic accelerations at the site.

7.6.5.2 Material Strengths

Strength values used in analysis are discussed in detail in the DDR (USACE, 2012) and are summarized in above in Table 7.6.4-2. A review of the construction CQC/QA field density test results for levee embankment indicate the compaction generally satisfied project specifications (95% of maximum density per ASTM D 698) and suggest the embankment strengths assumed for design are appropriate. See Appendix C for a detailed presentation of embankment construction and test data.

7.6.5.3 Analysis Results

As presented in the DDR, (USACE, 2012) results of the slope stability analysis versus the minimum allowable factor of safety per EM 1110-2-1913 (USACE 2000a) are shown in Table 7.6.5-1.

Table 7.6.5-1
 Slope Stability Analysis Results (calculated and allowable)

Case	Minimum Calculated	Minimum Allowable
End of Construction and Long Term (Riverward Slope)	2.7	1.5
End of Construction and Long Term (Landward Slope)	4.0	1.5
Steady State Seepage due to irrigation/storm water (Riverward Slope)	2.5	1.4
100 Year Storm (Landward Slope)	3.3	1.4
100 Year Storm (Riverward Slope)	3.6	1.4
Rapid Drawdown	2.1	1.3
Long Term Condition*(with crack depth 5.8 ft)	2.8	1.5
Pseudo-Static (Seismic)	>1.0 with MDE of 0.04g (Ky=0.52)	1.0

*The levee was modeled with a 5.8 feet deep vertical crack extending from the levee top downward to simulate a condition where the levee loses strength due to cracking caused by desiccation or by saturation of the upper 5.8 feet of the levee.

7.6.5.4 Recommended Slope Configuration

Based on slope stability analysis (using Slope/W) for the levee, and the possible slope protection choices, it was recommended that the steepest design slope shall be no more than 2.25 horizontal to 1 vertical (2.25H:1V) as angular stones were used as riprap. The steepest design slope for the levee with rounded stones as riprap was recommended to be no more than 3H:1V. The as-built levee slope gradient of 3:1 meets these design requirements. The analysis conducted is still considered applicable and meets current criteria.

7.6.6 Settlement

The DDR (USACE, 2012) indicated that estimated settlements following levee construction were to be in the range of 2 inches or less. Following construction, survey of the levee was conducted as part of the National Levee Database work by the Los Angeles District. The details on the survey work are discussed in Section 7.8 below. Based on the results of the survey, settlement detrimental to the functionality of the levee has not occurred.

7.6.7 Seismic Considerations

7.6.7.1 Site Seismicity

As discussed in the DDR (USACE, 2012), the design of the levee systems was based on the OBE and MDE seismic parameters. The Operating Base earthquake (OBE) for the Tres Rios project was determined to be the 144-year return period corresponding to an exceedance probability of 50% in 100 years. The Maximum Credible earthquake (MCE) along with the Maximum Design earthquake (MDE) was determined to be a 950-year return period corresponding to an exceedance probability of 10% in 100 years. The governing fault is the Carefree Fault and is 20 miles north of City of Mesa and approximately 35 miles northeast of the project area. The fault has a length of approximately 7 miles, an average strike of N30°W, and a slip rate of less than 0.2 mm per year (Pearthree, 1998). From the USGS website presenting site specific ground accelerations (USGS, 2008), the maximum moment magnitude produced by the Carefree Fault would be 6.1. The peak horizontal ground motion for the OBE is estimated to be 0.03g. The peak horizontal ground motion associated with the MDE and MCE at the project site was estimated to be 0.04g. The EC1110-2-6067 suggests that seismic evaluation be performed based on the 100-year return period. The design earthquake events for the Tres Rios levee exceed that recommended for the LSER. In addition, the seismic levels of ground shaking are considered to be low.

7.6.7.2 Seismic Deformation

The DDR (USACE, 2012) states that the site has the potential for shallow groundwater conditions. In addition, granular subgrade materials are present, and the results of the subsurface exploration programs indicate the materials are in a loose to medium dense condition. As discussed above, peak horizontal ground acceleration for the OBE and MDE is 0.03g and 0.04g, respectively. Both are below what would generally be considered strong ground motions. Therefore, the potential for liquefaction is considered to be low.

The materials at the site are granular cohesionless materials and are susceptible to seismically induced settlement. However, due to the low ground accelerations the risk of this type of settlement is considered low.

Based on the low probability of liquefaction present at the site, the probability of lateral spreading to occur is considered low.

As discussed in the DDR (USACE, 2012), potential slope displacement following a seismic event was estimated from Bray & Travasarou (2007). The median displacement was estimated to

be less than 1 cm. As such, the potential for slope displacement can be neglected due to its diminutive magnitude. See Appendix B for more details.

7.7 INTERIOR DRAINAGE

7.7.1 Hydrologic Basis for Design of Interior Drainage Features

The hydrologic basis for the interior drainage design is discussed in Exhibit I of the Hydraulics Appendix of the DDR (USACE, 2012). The intent of the analysis (USACE, 2002) was to prevent or minimize induced flooding along the line-of-protection resulting from construction of the north levee. The procedure for analyzing the interior runoff for this phase of the Tres Rios project was based on the same procedure used for the Rio Salado Interior Drainage study (USACE, 1998). The peak discharge and volume relationships in the Rio Salado Interior Drainage study were developed using an 8-drain sample of urbanized drainage areas.

The 8-drain sample method used rainfall-runoff modeling software to estimate N-year peak discharges and maximum 24-hour runoff volumes for 8 side drains arbitrarily selected to provide a wide range of drainage area sizes. A family of frequency curves were generated by regressing the peak discharges for the 24-hour volumes against drainage area, from which the peak discharges for the remaining drains were estimated (USACE, 1998). The relationships for the peak discharges and volumes were developed from side drains in mostly urbanized areas. Should future development occur, the flow rates and volumes will already account for increases in impervious cover and improved drainage systems.

Runoff from the interior area may pond along the levee during high or extended stage in the Salt and Gila Rivers. This condition is typically limited to the winter-late spring months when spill from the upstream Salt River Project reservoirs are most likely to occur. To mitigate for this, provision of sufficient catch-basin (detention basin) volume to store the runoff resulting from 2.00 inches of precipitation in 24-hours (5-year, 24-hour precipitation) was constructed. The flapgates for the gravity drains will be closed, i.e. the 100-year flood event is assumed to be occurring in the mainstem channel.

Existing 1% AEP floodplains as a result of local drainage were not analyzed in this project because no local flooding sources are mapped by FEMA or regulated by FCDMC presently on the landward side of the levee.

7.7.2 Collector Channels

The computer program HEC-RAS was used for hydraulic design of the concrete collector channels. In general, the slopes of the concrete channels follow the existing ground. As much as practicable, the tops of the collector channels match the existing ground, i.e. no freeboard was utilized. A Manning's roughness coefficient of 0.015 was used for the concrete. The expansion and contraction coefficients were 0.3 and 0.1, respectively. The channels are trapezoidal, with 2:1 (Horizontal:Vertical) sideslopes. The minimum channel basewidth is 14 feet in order to maintain the channel. The flow regime of the collector channels is mixed, i.e. subcritical and

supercritical. The boundary condition at the downstream end of the channel assumed a full catch basin and the upstream end of the channel was set to normal depth.

7.7.3 Catch Basins

The catch basins for this phase of the project are located at 115th Avenue and El Mirage Road. The volumes are based on the required volumes determined by the Interior Drainage Hydrology (Exhibit I of the Hydraulics Appendix of the DDR (USACE, 2012)). The depth was limited to approximately 3 to 4 feet below existing ground to minimize the tailwater restrictions caused by the 1% AEP water surface. In other words, the catch basins were kept fairly shallow so they would more likely drain during high flows to the river. The catch basins are graded so that lowflows drain towards the outlets.

7.7.4 Catch Basin Outlets

The catch basin outlets were sized to handle the peak flows determined in the Interior Drainage Hydrology (Exhibit I of the Hydraulics Appendix of the DDR (USACE, 2012)). Modeling using HEC-RAS was used to determine the size and number of reinforced concrete boxes (RCBs) required. The HEC-RAS culvert routine was used to analyze the boxes. Due to their length, the culverts were also analyzed as a covered channel. A Manning's roughness coefficient of 0.015 was used for the concrete. The downstream boundary condition was assumed to be critical depth. Loss coefficients of 1.0 were used to account for flapgates; and inlet and outlet losses, etc., with the exception of an entrance loss coefficient of 0.2 at the 115th Avenue catch basin. The expansion and contraction coefficients were 0.3 and 0.1, respectively. The RCBs are inlet control. The flow regime inside the culverts is subcritical.

7.7.5 Flapgates

Flapgates are needed at the catch basin outlets to prevent river flows from going into the catch basins. The flapgates are rectangular, standard size, and are 5 feet wide by 3 feet high.

7.8 SURVEY

7.8.1 Preconstruction Survey

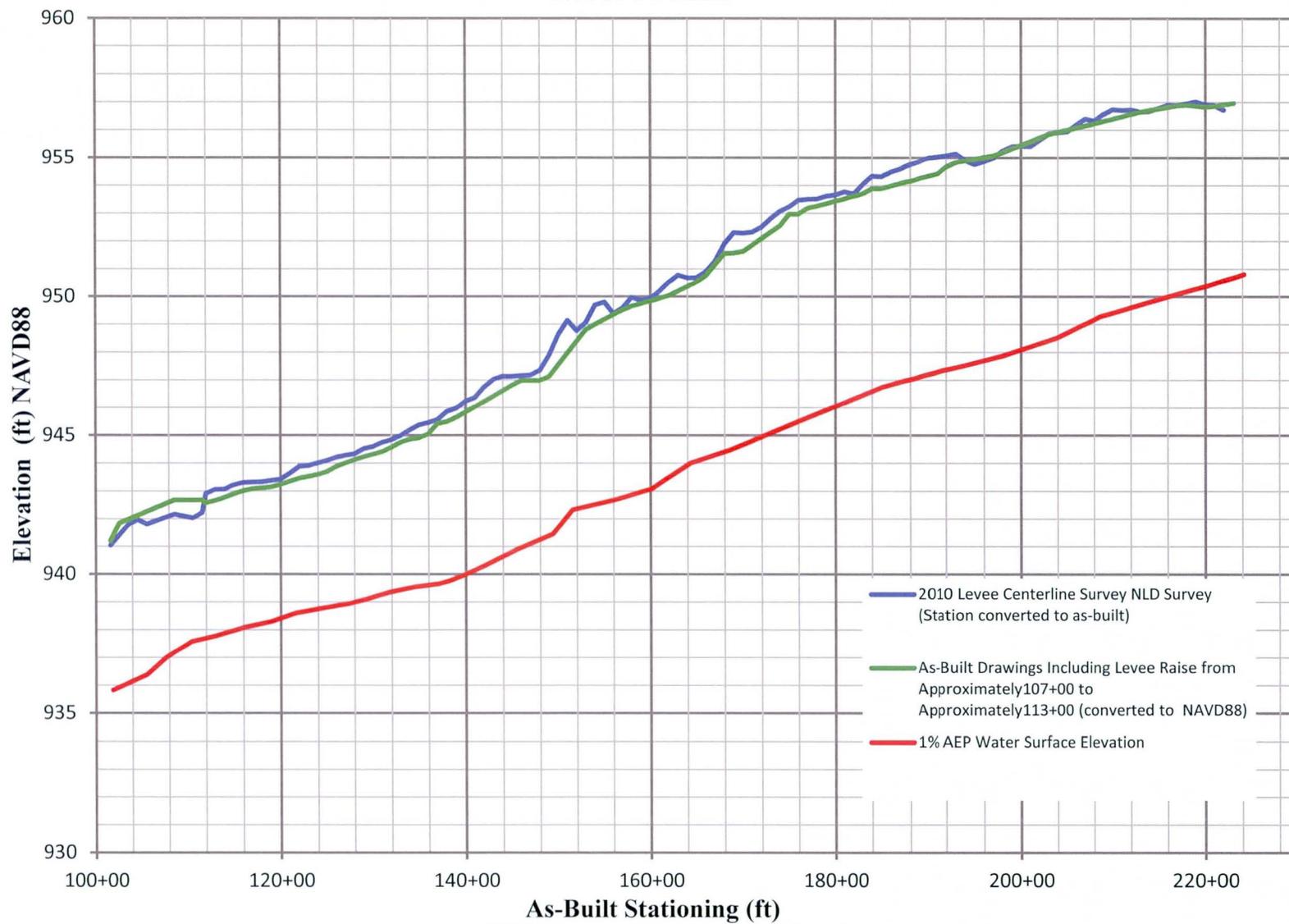
An initial design survey was performed by Towill for mapping of the Tres Rios project in 2001. A construction completion survey was also performed by the construction contractor and a review of the final product by the Corps of Engineer's Survey and Mapping Section for the Los Angeles District determined that the mapping met National Map Accuracy Standards for one foot contour interval mapping. Horizontal coordinates are referenced to the North American Datum of 1983 (NAD83), Arizona Central Zone, epoch 1992. Elevations are referenced to the North American Vertical Datum of 1988 (NAVD 88). National Geodetic Vertical Datum of 1929 elevations on NGS benchmarks with NAVD 88 elevations were determined by holding the datum shift of 2.19 feet at the project benchmark to each NGS benchmark. Mapping was compiled in NGVD 29.

7.8.2 Post Construction Survey

Following construction, a survey was conducted in 2010 as part of the National Levee Database (NLD) efforts by the USACE. This initial survey indicated that the down-stream portion of the levee from Station 107+60 to Station 111+60 was approximately 6 inches lower than required per the design. Additional fill was placed on the levee in late 2011 and early 2012 and a new survey of the raised area was completed by the contractor. The profiles showing the elevations for the NLD survey, the As-Built profile, and the 1% AEP profile for the levee are presented in Figure 4. The green line represents the as-built elevation profile to include the 2012 increase in levee height between approximate stations 107+00 and 113+00. The blue line represents a 2010 Levee centerline Survey for the National Levee Database. This is prior to the levee height increase in 2012.

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**Figure 4 - Tres Rios North Levee
Levee Profiles**



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8.0 SYSTEM EVALUATION

8.1 EMERGENCY RESPONSE PLAN AND STATUS

The Emergency Action Plan (EAP) was prepared by WEST consultants (WEST, 2012). The plan is included in Appendix G. The plan will be reviewed and revised as needed by the FCDMC or their consultant and as new information of changing procedures becomes available.

8.2 SYSTEM CAPACITY EXCEEDANCE PROVISIONS

8.2.1 Potential Breach Locations

The Emergency Action Plan (EAP) was prepared by WEST consultants (WEST, 2012). If the levee were to breach, flow through the interior region would expand to the north and then flow west to the Agua Fria River. Conservative EAP design requires that the 'worst case' breach location be identified and planned for accordingly. Indeed, for long levees, this factor can be a critical design aspect, as noted in 9.j.(2) of EC 1110-2-6067 (USACE, 2010), USACE Process for the NFIP Levee System Evaluation. However, for short levees such as the Tres Rio levee, this may not be as important. For this project, the LA District does not consider breach location modeling to be a critical item and hence it was not included. Thus, all breaches are assumed to result in the same inundated area and the EAP depicts this area. (see Figure 5 below). For further discussion refer to the EAP (Appendix G).

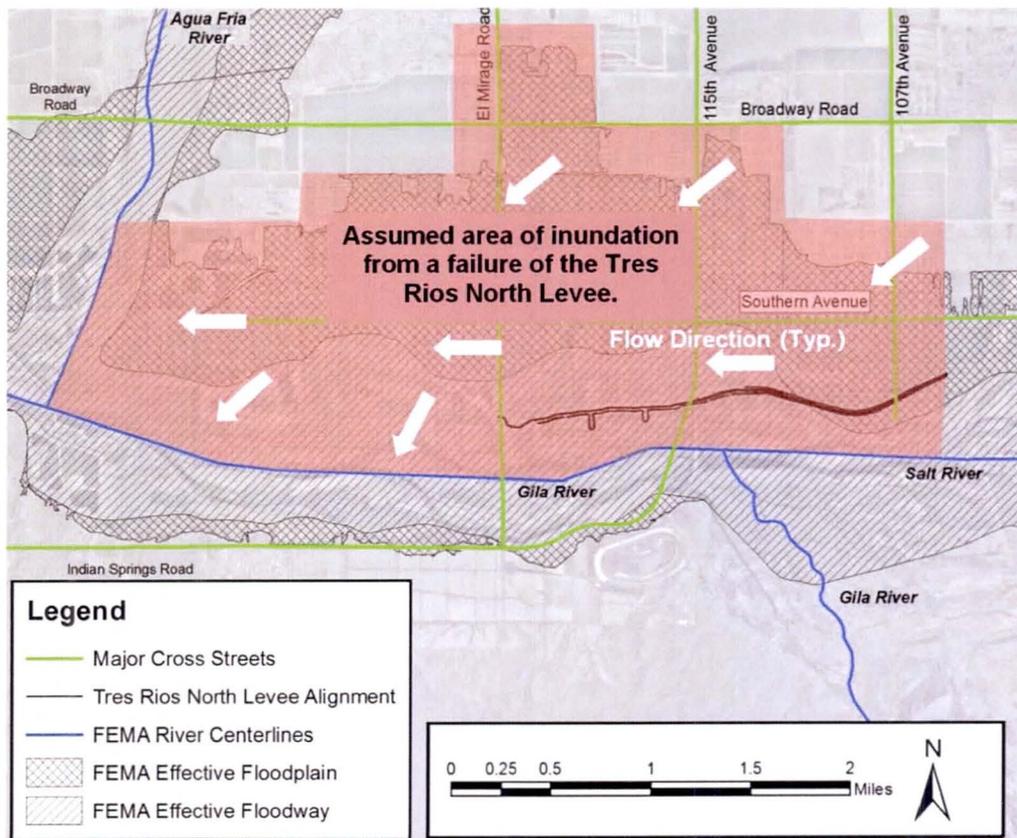


Figure 5: FEMA Floodplain and Assumed Inundation Extents (Figure 7 from WEST, 2012)

8.2.2 Potential or Actual Failure

Levee failure can occur from overtopping due to increased pressure and traction force; from a piping failure through or under the levee embankment; from earthquake, earth fissuring, or other geological causes; and from manmade causes, such as nearby construction activities. If failure occurs during high river flow, even a small local embankment failure can potentially spread, resulting in a dynamic failure with increasing flows as the opening widens.

8.2.3 Residual Risk and Public Safety

No residual risk impact from the levee system exists for the 1% AEP event. An evaluation of risk and uncertainty analysis showed greater than or equal to a 95% probability. Construction of the levee eliminates the 1% AEP floodplain behind the levee.

The EAP (WEST, 2012) provides information and instruction in the case of an emergency. It provides guidance for emergency action planning for future levee projects as well. The EAP provides a comprehensive list of contacts and procedures/responsibilities in case an emergency were to develop.

The Corps of Engineers does not dictate, nor approve any emergency action plan written by a local sponsor. This report only provides it as a reference. Its inclusion herein does not infer anything other than its existence.

8.3 OPERATIONS AND MAINTENANCE (O&M)

Per the agreements presented in Appendix A, FCDMC will perform the operations and maintenance of the Tres Rios North Levee. The O&M Manuals for Phase 1A and Phase 1B, and the standard operating procedures used by FCDMC are included in Appendix H.

8.4 DETERMINATIONS AND CONSIDERATIONS

8.4.1 Positive NFIP Levee System Evaluation Determination

Based on the review of the design documentation, the construction information, and the recent inspection of the Tres Rios North Levee, it is the opinion of the Los Angeles District that the levee as described within this report has met all of the requirements established by USACE for determining that the levee system can be reasonably expected to exclude the 1% annual chance exceedance flood, also referred to as the base flood, from the leveed area. This NLSER documents the NFIP levee system evaluation requirements, assumptions made, and analyses conducted to arrive at the report findings. The study was consistent with requirements outlined in Title 44 of the Code of Federal Regulations, Section 65.10 (44 CFR 65.10), Mapping Areas Protected by Levee Systems.

8.4.2 Future Considerations

As discussed above and in the Construction Embankment Report (Appendix C), several items that do not impact the positive determination for the levee as stated above will need to be addressed in the near future to retain accreditation and eligibility in the Rehabilitation and Inspection (RIP) Program.

The 18-inch diameter CMP as discussed above located upstream of El Mirage Road needs to be evaluated by the FCDMC for purpose, intent, and operability. If the pipe is still needed, it is recommended that the pipe be brought to current standards with a flap gate and reinforced concrete material. If the pipe is not needed it is recommended to be either filled and abandoned or removed and the levee to be reconstructed to Corps standards. Re-grading in that area to allow drainage into the catch basin would also be required.

The potential for seepage at the El Mirage Catch Basin RCB and at several areas where stabilization was required for subgrade were discussed in the Construction Embankment Report (Appendix C). Based on anticipated gradients at the RCB, the nature of the materials used for stabilization, and current observations, seepage is not anticipated. However, continued increased monitoring at these locations, especially during events where flows are present, is recommended. Documentation noting potential through seepage and potential piping during these events will be reviewed on a periodic basis by USACE programs.

The potential for differential settlement was mentioned in the Construction Embankment Report (Appendix C) and may be located in areas where fill was placed against sloping ground or where benching into existing material was needed. Although not anticipated to occur, increased or focused monitoring at these locations for signs of differential settlement is recommended. Signs of differential settlement may include cracking, protection displacement, depressions, rutting, s. Rutting, lippage along slopes, or cracking in concrete structures. Documentation noting potential differential settlement will be reviewed on a periodic basis by USACE programs, however it is the responsibility of FCDMC to visually inspect this area on an annual or more frequent basis, and survey and document if settlement becomes evident.

The potential for erosion and undermining was mentioned in the Construction Embankment Report (Appendix C) and is anticipated at the collector channel, the guide dikes, at the catch basins, the catch basins themselves, and along flowlines through the levee area. The FCDMC has been proactive in notifying the irrigation company adjacent to the levee (as discussed in Section 7.1.2 and is aware that other erosion will need to be monitored and repaired as needed. Documentation noting potential erosion and undermining will be reviewed on a periodic basis by USACE programs, however it is the responsibility of FCDMC to visually inspect this area on a quarterly basis and after significant events, and actively repair and document erosion as it occurs.

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Appendix A
Agreement Docs

110989..

PROJECT COOPERATION AGREEMENT

BETWEEN
THE DEPARTMENT OF THE ARMY
AND
THE CITY OF PHOENIX

FOR THE CONSTRUCTION OF THE
TRES RIOS, ARIZONA,
ECOSYSTEM RESTORATION, FLOOD CONTROL, AND RECREATION
PROJECT FEATURES ON THE NORTH SIDE OF THE GILA AND SALT RIVERS

THIS AGREEMENT is entered into this 14th day of April, 2004, by and between the Department of the Army (hereinafter the "Government"), represented by the Assistant Secretary of the Army (Civil Works), and the City of Phoenix, (hereinafter the "Non-Federal Sponsor"), represented by the Deputy City Manager.

WITNESSETH, THAT:

WHEREAS, construction of the Tres Rios, Arizona Ecosystem Restoration and Flood Control Project at Maricopa County, Arizona (hereinafter the "Authorized Project") was authorized by Section 101 (b)(4) of the Water Resources Development Act of 2000 (WRDA 2000);

WHEREAS, the Government and the Non-Federal Sponsor desire to enter into a Project Cooperation Agreement (hereinafter the "Agreement") for construction of a separable element of the Authorized Project whose features are located on the north side of the Salt River (hereinafter the "Project", as defined in Article I.A. of this Agreement);

WHEREAS, Sponsor is the management agency for the 91st Avenue Wastewater Treatment Plant Sub Regional Operating Group (SROG), which also includes the cities of Glendale, Mesa, Scottsdale, and Tempe, Arizona.

WHEREAS, a separate and subsequent Project Cooperation Agreement is intended to be implemented for the separable element of the Authorized Project whose features are located on the south side of the Salt River on lands that include those owned by the Gila River Indian Community;

WHEREAS, Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended, specifies the cost-sharing requirements applicable to the Project;

WHEREAS, Section 221 of the Flood Control Act of 1970, Public Law 91-611, as amended, and Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended, provide that the Secretary of the Army shall not commence construction of any water resources project, or separable element thereof, until each

non-Federal sponsor has entered into a written agreement to furnish its required cooperation for the project or separable element;

WHEREAS, the Non-Federal Sponsor does not qualify for a reduction of the maximum non-Federal cost share pursuant to the guidelines that implement Section 103(m) of the Water Resources Development Act of 1986, Public Law 99-662, as amended;

WHEREAS, Section 902 of Public Law 99-662 establishes the maximum amount of costs for the Authorized Project and sets forth procedures for adjusting such maximum amount; and

WHEREAS, the Government and Non-Federal Sponsor have the full authority and capability to perform as hereinafter set forth and intend to cooperate in cost-sharing and financing of the construction of the Project in accordance with the terms of this Agreement.

NOW, THEREFORE, the Government and the Non-Federal Sponsor agree as follows:

ARTICLE I -DEFINITIONS AND GENERAL PROVISIONS

For purposes of this Agreement:

A. The term "Project" under this PCA shall mean the ecosystem restoration features, the flood control features, the recreation features, and the environmental education features as defined in this Article and as generally described in the Tres Rios, Arizona, Feasibility Study dated September 2000, and the Report of the Chief of Engineers, dated 12 December, 2000.

B. The term "Ecosystem restoration features" shall mean a pump station and water distribution system to reestablish and support about 775 acres of native vegetation and wildlife habitat within and along approximately an 8 mile reach of the Salt River; a regulating wetland about 290 acres in size to equalize diurnal variations in discharges from the 91st Avenue treatment plant; a 300 million gallon per day pump station to convey flow of water from such treatment plant to the regulating wetland; approximately 128 acres of wetlands along the north bank of the Salt River; a water pipeline in the overbank wetland leading to series of riparian corridors totaling about 38 acres west of El Mirage Road; a series of open water/or marsh areas totaling about 134 acres within the Gila River channel west of El Mirage Road; and selective grading of locations within the Salt and Gila River channels to convey surface water to supply about 69 acres of riparian habitat.

C. The term "flood control features" shall mean approximately 6 miles of flood control levee ranging in height from 4 to 10 feet on the north bank of the Salt River approximately between the regulating wetland and Dysart Road.

D. The term "recreation features" shall mean approximately 11 miles of multi-use trails, parking lots with kiosks, and other features including ramadas, park benches, shaded areas, comfort stations, drinking fountains and informative signage.

E. The term "environmental education features" shall mean an interpretive center that includes displays and supplemental learning materials.

F. The term "total project costs" shall mean all costs incurred by the Non-Federal Sponsor and the Government in accordance with the terms of this Agreement directly related to construction of the Project. Subject to the provisions of this Agreement, the term shall include, but is not necessarily limited to: continuing planning and engineering costs incurred after October 1, 1985; advanced engineering and design costs; pre-construction engineering and design costs; engineering and design costs during construction; the costs of monitoring and adaptive management in accordance with Article II.T. of this agreement; the costs of investigations to identify the existence and extent of hazardous substances in accordance with Article XV.A. of this Agreement; costs of historic preservation activities in accordance with Article XVIII.A. of this Agreement; actual construction costs, supervision and administration costs; costs of participation in the Project Coordination Team in accordance with Article V of this Agreement; costs of contract dispute settlements or awards; the value of lands, easements, rights-of-way, relocations, and suitable borrow and dredged or excavated material disposal areas for which the Government affords credit in accordance with Article IV of this Agreement; and costs of audit in accordance with Article X of this Agreement. The term does not include any costs for operation, maintenance, repair, replacement, or rehabilitation; any costs due to betterments; or any costs of dispute resolution under Article VII of this Agreement.

G. The term "total project ecosystem restoration costs" shall mean that portion of the total project costs that the Government assigns to the ecosystem restoration features

H. The term "total project flood control costs" shall mean that portion of the total project costs that the Government assigns to the flood control features.

I. The term "total project recreation costs" shall mean that portion of the total project costs that the Government assigns to the recreation features.

J. The term "total project environmental education facilities costs" shall mean that portion of the total project costs that the Government assigns to the environmental education features.

K. The term "financial obligation for construction" shall mean a financial obligation of the Government, other than an obligation pertaining to the provision of lands, easements, rights-of-way, relocations, and borrow and dredged or excavated material disposal areas, that results or would result in a cost that is or would be included in total project costs.

L. The term "non-Federal proportionate share" shall mean the ratio of the Non-Federal Sponsor's total cash contribution required in accordance with Articles II.D.1.,II.D.3,

II.E.2, II.F.2 and II.G.2 of this Agreement to total financial obligations for construction, as projected by the Government.

M. The term "period of construction" shall mean the time from the date the Government first notifies the Non-Federal Sponsor in writing, in accordance with Article VI.B. of this Agreement, of the scheduled date for issuance of the solicitation for the first construction contract to the date that the U.S. Army Engineer for the Los Angeles District (hereinafter the "District Engineer") notifies the Non-Federal Sponsor in writing of the Government's determination that, except for monitoring and adaptive management, construction of the Project is complete.

N. The term "highway" shall mean any public highway, roadway, street, or way, including any bridge thereof.

O. The term "relocation" shall mean providing a functionally equivalent facility to the owner of an existing utility, cemetery, highway or other public facility, when such action is authorized in accordance with applicable legal principles of just compensation or as otherwise provided in the authorizing legislation for the Project or any report referenced therein. Providing a functionally equivalent facility may take the form of alteration, lowering, raising, or replacement and attendant removal of the affected facility or part thereof.

P. The term "fiscal year" shall mean one fiscal year of the Government. The Government fiscal year begins on October 1 and ends on September 30.

Q. The term "functional portion of the Project" shall mean a portion of the Project that is suitable for tender to the Non-Federal Sponsor to operate and maintain in advance of completion of the entire Project. For a portion of the Project to be suitable for tender, the District Engineer must notify the Non-Federal Sponsor in writing of the Government's determination that the portion of the Project is complete and can function independently and for a useful purpose, although the balance of the Project is not complete.

R. The term "betterment" shall mean a change in the design and construction of an element of the Project resulting from the application of standards that the Government determines exceed those that the Government would otherwise apply for accomplishing the design and construction of that element.

S. The term "monitoring" shall mean monitoring of the ecosystem restoration features during the first five years following construction of the ecosystem restoration features, in order to assure that the ecosystem restoration features function properly. This term shall include, but is not necessarily limited to, monitoring the success of vegetation and habitat establishment in the ecosystem restoration features area; monitoring the restored aquatic resources associated with the ecosystem restoration features; monitoring wildlife resources associated with the restored habitats; and monitoring and early identification of the establishment of wildlife that has the potential to become a hazard to aviation safety.

T. The term "adaptive management" shall mean changes made to the ecosystem restoration features that are based on monitoring results and deemed necessary to attain the objectives of the ecosystem restoration features following their construction. The term shall include, but is not necessarily limited to, adjustments due to unforeseen circumstances and changes to structures or their operations or management methods.

U. The term "costs of water" shall mean all costs incurred by the Non-Federal Sponsor, in accordance with Article II.K. of this Agreement, to acquire, secure and maintain the quantity of water that the Government determines is necessary for the construction, operation, and maintenance of the Project. As of the effective date of this Agreement, the Cost of Water that is estimated to be continually necessary for construction, operation and maintenance of the Project is estimated to be \$1,356,600 annually, at October 2003 price level.

ARTICLE II - OBLIGATIONS OF THE GOVERNMENT AND THE NON-FEDERAL SPONSOR

A. The Government, subject to receiving funds appropriated by the Congress of the United States (hereinafter, the "Congress") and using those funds and funds provided by the Non-Federal Sponsor, shall expeditiously construct the Project, applying those procedures usually applied to Federal projects, pursuant to Federal laws, regulations, and policies.

1. The Government shall afford the Non-Federal Sponsor the opportunity to review and comment on the solicitations for all contracts, including relevant plans and specifications, prior to the Government's issuance of such solicitations. The Government shall not issue the solicitation for the first construction contract until the Non-Federal Sponsor has confirmed in writing its willingness to proceed with the Project. To the extent possible, the Government shall afford the Non-Federal Sponsor the opportunity to review and comment on all contract modifications, including change orders, prior to the issuance to the contractor of a Notice to Proceed. In any instance where providing the Non-Federal Sponsor with notification of a contract modification or change order is not possible prior to issuance of the Notice to Proceed, the Government shall provide such notification in writing at the earliest date possible. To the extent possible, the Government also shall afford the Non-Federal Sponsor the opportunity to review and comment on all contract claims prior to resolution thereof. The Government shall consider in good faith the comments of the Non-Federal Sponsor, but the contents of solicitations, award of contracts, execution of contract modifications, issuance of change orders, resolution of contract claims, and performance of all work on the Project (whether the work is performed under contract or by Government personnel), shall be exclusively within the control of the Government.

2. Throughout the period of construction, the District Engineer shall furnish the Non-Federal Sponsor with a copy of the Government's Written Notice of Acceptance of Completed Work for each contract for the Project.

3. As of the effective date of this Agreement, \$6,198,810.05 of Federal funds have been made available for the Authorized Project of which \$6,198,810.05 is available for the Project. The Government makes no commitment to budget for additional Federal funds for the Authorized Project. Notwithstanding any other provision of this Agreement, the Government's financial participation in the Authorized Project, including the Project, is limited to this amount together with any additional funds that the Congress may appropriate for the Authorized Project. In the event that the Congress does not appropriate Federal funds for the Authorized Project sufficient to meet the Federal share of the costs of work on the Project and other elements of the Authorized Project in the then-current or upcoming fiscal year, the Government shall notify the Non-Federal Sponsor of the insufficiency of funds and the parties, within the Federal and non-Federal funds available for the Project, shall suspend construction or terminate this Agreement in accordance with Article XIV.B. of this Agreement. To provide for this eventuality, the Government may reserve a percentage of total Federal funds available for the Project and an equal percentage of the total funds contributed by the Non-Federal Sponsor in accordance with Articles II.D., IIE. and IIF. of this Agreement, as applicable, and a percentage of the total funds contributed by the Non-Federal Sponsor in accordance with Article II.G. of this Agreement, as applicable, as a contingency to pay costs of termination, including any costs of resolution of contract claims and contract modifications.

B. The Non-Federal Sponsor may request the Government to accomplish betterments. Such requests shall be in writing and shall describe the betterments requested to be accomplished. If the Government in its sole discretion elects to accomplish the requested betterments or any portion thereof, it shall so notify the Non-Federal Sponsor in a writing that sets forth any applicable terms and conditions, which must be consistent with this Agreement. In the event of conflict between such a writing and this Agreement, this Agreement shall control. The Non-Federal Sponsor shall be solely responsible for all costs due to the requested betterments and shall pay all such costs in accordance with Article VI.C. of this Agreement.

C. When the District Engineer determines that, except for monitoring and adaptive management, the entire Project is complete or that a portion of the Project has become a functional portion of the Project, the District Engineer shall so notify the Non-Federal Sponsor in writing and furnish the Non-Federal Sponsor with an Operation, Maintenance, Repair, Replacement, and Rehabilitation Manual (hereinafter the "OMRR&R Manual") and with copies of all of the Government's Written Notices of Acceptance of Completed Work for all contracts for the Project or the functional portion of the Project that have not been provided previously. Upon such notification, the Non-Federal Sponsor shall operate, maintain, repair, replace, and rehabilitate the entire Project or the functional portion of the Project in accordance with Article VIII of this Agreement. Further, on the date of such notice, the monitoring and adaptive management period described in paragraph T.1. of this Article shall begin for the entire Project, or functional portion of the Project pertaining to the ecosystem restoration features, as applicable. The monitoring and adaptive management of the ecosystem restoration features shall be performed concurrently with the Non-Federal

Sponsor's responsibilities for operation, maintenance, repair, replacement, and rehabilitation of the ecosystem restoration features in accordance with Article VIII of this Agreement.

D. The Non-Federal Sponsor shall contribute a minimum of 35 percent, but not to exceed 50 percent, of total project flood control costs in accordance with the provisions of this paragraph.

1. The Non-Federal Sponsor shall provide a cash contribution equal to 5 percent of total project flood control costs in accordance with Article VI.B. of this Agreement.

2. In accordance with Article III of this Agreement, the Non-Federal Sponsor shall provide all lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas that the Government determines the Non-Federal Sponsor must provide for the construction, operation, and maintenance of the flood control features, and shall perform or ensure performance of all relocations that the Government determines to be necessary for the construction, operation, and maintenance of the flood control features.

3. If the Government projects that the value of the Non-Federal Sponsor's contributions under paragraphs D.1. and D.2. of this Article and Articles V, X, and XV.A. of this Agreement will be less than 35 percent of total project flood control costs, the Non-Federal Sponsor shall provide an additional cash contribution, in accordance with Article VI.B. of this Agreement, in the amount necessary to make the Non-Federal Sponsor's total contribution equal to 35 percent of total project flood control costs.

4. If the Government determines that the value of the Non-Federal Sponsor's contributions provided under paragraph D.2. of this Article and Articles V, X, and XV.A. of this Agreement has exceeded 45 percent of total project flood control costs, the Government, subject to the availability of funds, shall reimburse the Non-Federal Sponsor for any such value in excess of 45 percent of total project flood control costs. After such a determination, the Government, in its sole discretion, may provide any remaining lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas and perform any remaining relocations on behalf of the Non-Federal Sponsor that are required for the flood control features.

E. The Non-Federal Sponsor shall contribute 35 percent of total project ecosystem restoration costs in accordance with the provisions of this paragraph.

1. In accordance with Article III of this Agreement, the Non-Federal Sponsor shall provide all lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas that the Government determines the Non-Federal Sponsor must provide for the construction, operation, and maintenance of the ecosystem restoration features, and shall perform or ensure performance of all relocations that the Government determines to be necessary for the construction, operation, and maintenance of the ecosystem restoration features.

2. If the Government projects that the value of the Non-Federal Sponsor's contributions under paragraphs E.1. of this Article and Articles V, X, and XV.A. of this Agreement will be less than 35 percent of total project ecosystem restoration costs, the Non-Federal Sponsor shall provide an additional cash contribution, in accordance with Article VI.B. of this Agreement, in the amount necessary to make the Non-Federal Sponsor's total contribution equal to 35 percent of total project ecosystem restoration costs.

3. If the Government determines that the value of the Non-Federal Sponsor's contributions provided under paragraph E.1. of this Article and Articles V, X, and XV.A. of this Agreement has exceeded 35 percent of total project ecosystem restoration costs, the Government, subject to the availability of funds, shall reimburse the Non-Federal Sponsor for any such value in excess of 35 percent of total project ecosystem restoration costs. After such a determination, the Government, in its sole discretion, may provide any remaining lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas and perform any remaining relocations on behalf of the Non-Federal Sponsor that are required for the ecosystem restoration features.

F. The Non-Federal Sponsor shall contribute 50 percent of total project recreation costs in accordance with the provisions of this paragraph.

1. In accordance with Article III of this Agreement, the Non-Federal Sponsor shall provide all lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas that the Government determines the Non-Federal Sponsor must provide for the construction, operation, and maintenance of the recreation features, and shall perform or ensure performance of all relocations that the Government determines to be necessary for the construction, operation, and maintenance of the recreation features.

2. If the Government projects that the value of the Non-Federal Sponsor's contributions under paragraphs F.1. of this Article and Articles V, X, and XV.A. of this Agreement will be less than 50 percent of total project recreation costs, the Non-Federal Sponsor shall provide an additional cash contribution, in accordance with Article VI.B. of this Agreement, in the amount necessary to make the Non-Federal Sponsor's total contribution equal to 50 percent of total project recreation costs.

3. If the Government determines that the value of the Non-Federal Sponsor's contributions provided under paragraph F.1 of this Article and Articles V, X, and XV.A. of this Agreement has exceeded 50 percent of total project recreation costs, the Government, subject to the availability of funds, shall reimburse the Non-Federal Sponsor for any such value in excess of 50 percent of total project recreation costs. After such a determination, the Government, in its sole discretion, may provide any remaining lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas and perform any remaining relocations on behalf of the Non-Federal Sponsor that are required for the recreation features.

G. The Non-Federal Sponsor shall contribute 100 percent of total project environmental education facilities costs in accordance with the provisions of this paragraph.

1. In accordance with Article III of this Agreement, the Non-Federal Sponsor shall provide all lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas that the Government determines the Non-Federal Sponsor must provide for the construction, operation, and maintenance of the environmental education features, and shall perform or ensure performance of all relocations that the Government determines to be necessary for the construction, operation, and maintenance of the environmental education features.

2. In addition to the contributions of the Non-Federal Sponsor under paragraph G.1. of this Article, the Non-Federal Sponsor shall provide a cash contribution equal to 100 percent of the total project environmental education facilities costs in accordance with Article VI.B. of this Agreement.

H. The Non-Federal Sponsor may request the Government to provide lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas or perform relocations on behalf of the Non-Federal Sponsor. Such requests shall be in writing and shall describe the services requested to be performed. If in its sole discretion the Government elects to perform the requested services or any portion thereof, it shall so notify the Non-Federal Sponsor in a writing that sets forth any applicable terms and conditions, which must be consistent with this Agreement. In the event of conflict between such a writing and this Agreement, this Agreement shall control. The Non-Federal Sponsor shall be solely responsible for all costs of the requested services and shall pay all such costs in accordance with Article VI.C. of this Agreement. Notwithstanding the provision of lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas or performance of relocations by the Government, the Non-Federal Sponsor shall be responsible, as between the Government and the Non-Federal Sponsor, for the costs of cleanup and response in accordance with Article XV.C. of this Agreement.

I. The Government shall perform a final accounting in accordance with Article VI.D. of this Agreement to determine the contributions provided by the Non-Federal Sponsor in accordance with paragraphs B., D., E., F., G., and H. of this Article and Articles V, X, and XV.A. of this Agreement and to determine whether the Non-Federal Sponsor has met its obligations under paragraphs B., D., E., F., and G. of this Article.

J. The Non-Federal Sponsor shall not use Federal funds to meet the Non-Federal Sponsor's share of total project costs under this Agreement unless the Federal granting agency verifies in writing that the expenditure of such funds is expressly authorized by statute.

K. The Non-Federal Sponsor shall, for so long as the Project remains authorized, acquire, secure, provide, and maintain the quantity of water for such periods that the Government determines is necessary for the construction, operation, and maintenance of the Project, at no cost to the Government.

L. The Non-Federal Sponsor shall prevent obstructions of or encroachments on Project lands, easements, and rights-of-way (including prescribing and enforcing regulations to prevent such obstructions or encroachments) which might reduce the environmental restoration or level of flood protection it affords, or hinder its operation and maintenance, or interfere with the proper functioning of the Project.

M. The Non-Federal Sponsor shall prevent future recreation features or facilities, or the use thereof, from significantly impacting or interfering with the intended functions of the ecosystem restoration and flood control features of the Project.

N. The Non-Federal Sponsor shall provide and maintain necessary access roads, parking areas, and other public use facilities, open and available to all on equal terms.

O. The Non-Federal Sponsor shall participate in and comply with applicable Federal floodplain management and flood insurance programs.

P. Not less than once each year, the Non-Federal Sponsor shall inform affected interests of the limitations of the protection afforded by the Project.

Q. The Non-Federal Sponsor shall publicize flood plain information in the area concerned and shall provide this information to zoning and other regulatory agencies for their use in preventing unwise future development in the flood plain and in adopting such regulations as may be necessary to prevent unwise future development and to ensure compatibility with protection levels provided by the Project.

R. The Non-Federal Sponsor shall comply with Section 402 of the Water Resources Development Act of 1986, as amended (33 U.S.C. 701b-12), which requires a Non-Federal interest to have prepared within one year after the date of signing this Agreement, a floodplain management plan. The plan shall be designed to reduce the impacts of future flood events in the project area, including but not limited to, addressing those measures to be undertaken by Non-Federal interests to preserve the level of flood protection provided by this Project. As required by Section 402, as amended, the Non-Federal interest shall implement such plan not later than one year after completion of construction of the Project. The Non-Federal Sponsor shall provide an information copy of the plan to the Government upon its preparation.

S. The costs of identification, survey and evaluation of historic properties and the costs of mitigation and data recovery activities associated with historic preservation shall be shared in accordance with the provisions of Article XVIII of this Agreement.

T. During the monitoring and adaptive management period, the Government shall perform monitoring and, if necessary, adaptive management of the ecosystem restoration features in accordance with the provisions of this paragraph.

1. The monitoring and adaptive management period shall be a period of five years beginning on the date of the District Engineer's notice to the Non-Federal Sponsor

in accordance with Article II.C. of this Agreement that the entire Project, or a functional portion of the Project pertaining to the ecosystem restoration features, is complete. If the District Engineer's notice addresses only a functional portion of the Project pertaining to the ecosystem restoration features, the monitoring and adaptive management period for that functional portion shall be a period of five years beginning on the date of such notice. Any monitoring or adaptive management required or performed after such five year period shall be the responsibility of the Non-Federal Sponsor at no cost to the Government.

2. Monitoring results shall be compared to success criteria identified for the ecosystem restoration features to determine if adaptive management measures are necessary. The total costs of monitoring shall not exceed one percent of the total cost of the ecosystem restoration features of the Project.

3. Adaptive management shall be undertaken if the Government, after consultation with the Non-Federal Sponsor, determines adjustments or changes are necessary to attain the objectives of the ecosystem restoration features. The total cost of adaptive management shall not exceed one percent of the total cost of the ecosystem restoration features of the Project.

ARTICLE III -LANDS, RELOCATIONS, DISPOSAL AREAS, AND PUBLIC LAW 91-646 COMPLIANCE

A. The Government, after consultation with the Non-Federal Sponsor, shall determine the lands, easements, and rights-of-way required for the construction, operation, and maintenance of the Project, including those required for relocations, borrow materials, and dredged or excavated material disposal. The Government in a timely manner shall provide the Non-Federal Sponsor with general written descriptions, including maps as appropriate, of the lands, easements, and rights-of-way that the Government determines the Non-Federal Sponsor must provide, in detail sufficient to enable the Non-Federal Sponsor to fulfill its obligations under this paragraph, and shall provide the Non-Federal Sponsor with a written notice to proceed with acquisition of such lands, easements, and rights-of-way. In such general written descriptions, the Government shall delineate which of such lands, easements, and rights-of-way are required for the flood control features, the ecosystem restoration features, the recreation features, and the environmental education features. Prior to the end of the period of construction, the Non-Federal Sponsor shall acquire all lands, easements, and rights-of-way set forth in such descriptions. Furthermore, prior to issuance of the solicitation for each construction contract, the Non-Federal Sponsor shall provide the Government with authorization for entry to all lands, easements, and rights-of-way the Government determines the Non-Federal Sponsor must provide for that contract. For so long as the Project remains authorized, the Non-Federal Sponsor shall ensure that lands, easements, and rights-of-way that the Government determines to be required for the operation and maintenance of the Project and that were provided by the Non-Federal Sponsor are retained in public ownership for uses compatible with the authorized purposes of the Project.

share of total project flood control costs, total project environmental restoration costs, total project recreation costs, or total project environmental education facilities costs.

E. The Non-Federal Sponsor shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended by Title IV of the Surface Transportation and Uniform Relocation Assistance Act of 1987 (Public Law 100-17), and the Uniform Regulations contained in 49 C.F.R. Part 24, in acquiring lands, easements, and rights-of-way required for the construction, operation, and maintenance of the Project, including those necessary for relocations, borrow materials, and dredged or excavated material disposal, and shall inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

ARTICLE IV - CREDIT FOR VALUE OF LANDS, RELOCATIONS, AND DISPOSAL AREAS

A. The Non-Federal Sponsor shall receive credit toward its share of total project costs for the value of the lands, easements, rights-of-way, and suitable borrow and dredged or excavated material disposal areas that the Non-Federal Sponsor must provide pursuant to Article III of this Agreement for the flood control features, ecosystem restoration features and recreation features, and for the value of the relocations that the Non-Federal Sponsor must perform or for which it must ensure performance pursuant to Article III of this Agreement for the flood control features, ecosystem restoration features and recreation features. However, the Non-Federal Sponsor shall not receive credit for the value of separable lands, easements, rights-of-way, relocations, or borrow and dredged or excavated material disposal areas that the Non-Federal Sponsor must provide or perform pursuant to Article III of this Agreement for the environmental education features. Further, the Non-Federal Sponsor shall not receive credit for the value of any lands, easements, rights-of-way, relocations, or borrow and dredged or excavated material disposal areas that have been provided previously as an item of cooperation for another Federal project. The Non-Federal Sponsor also shall not receive credit for the value of lands, easements, rights-of-way, relocations, or borrow and dredged or excavated material disposal areas to the extent that such items are provided using Federal funds unless the Federal granting agency verifies in writing that such credit is expressly authorized by statute.

B. For the sole purpose of affording credit in accordance with this Agreement, the value of lands, easements, and rights-of-way, including those necessary for relocations, borrow materials, and dredged or excavated material disposal, shall be the fair market value of the real property interests, plus certain incidental costs of acquiring those interests, as determined in accordance with the provisions of this paragraph.

1. Date of Valuation. The fair market value of lands, easements, or rights-of-way owned by the Non-Federal Sponsor on the effective date of this Agreement shall be the fair market value of such real property interests as of the date the Non-Federal Sponsor provides the Government with authorization for entry thereto. The fair market value of

lands, easements, or rights-of-way acquired by the Non-Federal Sponsor after the effective date of this Agreement shall be the fair market value of such real property interests at the time the interests are acquired.

2. General Valuation Procedure. Except as provided in paragraph B.3. of this Article, the fair market value of lands, easements, or rights-of-way shall be determined in accordance with paragraph B.2.a. of this Article, unless thereafter a different amount is determined to represent fair market value in accordance with paragraph B.2.b. of this Article.

a. The Non-Federal Sponsor shall obtain, for each real property interest, an appraisal that is prepared by a qualified appraiser who is acceptable to the Non-Federal Sponsor and the Government. The appraisal must be prepared in accordance with the applicable rules of just compensation, as specified by the Government. The fair market value shall be the amount set forth in the Non-Federal Sponsor's appraisal, if such appraisal is approved by the Government. In the event the Government does not approve the Non-Federal Sponsor's appraisal, the Non-Federal Sponsor may obtain a second appraisal, and the fair market value shall be the amount set forth in the Non-Federal Sponsor's second appraisal, if such appraisal is approved by the Government. In the event the Government does not approve the Non-Federal Sponsor's second appraisal, or the Non-Federal Sponsor chooses not to obtain a second appraisal, the Government shall obtain an appraisal, and the fair market value shall be the amount set forth in the Government's appraisal, if such appraisal is approved by the Non-Federal Sponsor. In the event the Non-Federal Sponsor does not approve the Government's appraisal, the Government, after consultation with the Non-Federal Sponsor, shall consider the Government's and the Non-Federal Sponsor's appraisals and determine an amount based thereon, which shall be deemed to be the fair market value.

b. Where the amount paid or proposed to be paid by the Non-Federal Sponsor for the real property interest exceeds the amount determined pursuant to paragraph B.2.a. of this Article, the Government, at the request of the Non-Federal Sponsor, shall consider all factors relevant to determining fair market value and, in its sole discretion, after consultation with the Non-Federal Sponsor, may approve in writing an amount greater than the amount determined pursuant to paragraph B.2.a. of this Article, but not to exceed the amount actually paid or proposed to be paid. If the Government approves such an amount, the fair market value shall be the lesser of the approved amount or the amount paid by the Non-Federal Sponsor, but no less than the amount determined pursuant to paragraph B.2.a. of this Article.

3. Eminent Domain Valuation Procedure. For lands, easements, or rights-of-way acquired by eminent domain proceedings instituted after the effective date of this Agreement, the Non-Federal Sponsor shall, prior to instituting such proceedings, submit to the Government notification in writing of its intent to institute such proceedings and an appraisal of the specific real property interests to be acquired in such proceedings. The Government shall have 60 days after receipt of such a notice and appraisal within which to review the appraisal, if not previously approved by the Government in writing.

a. If the Government previously has approved the appraisal in writing, or if the Government provides written approval of, or takes no action on, the appraisal within such 60-day period, the Non-Federal Sponsor shall use the amount set forth in such appraisal as the estimate of just compensation for the purpose of instituting the eminent domain proceeding.

b. If the Government provides written disapproval of the appraisal, including the reasons for disapproval, within such 60-day period, the Government and the Non-Federal Sponsor shall consult in good faith to promptly resolve the issues or areas of disagreement that are identified in the Government's written disapproval. If, after such good faith consultation, the Government and the Non-Federal Sponsor agree as to an appropriate amount, then the Non-Federal Sponsor shall use that amount as the estimate of just compensation for the purpose of instituting the eminent domain proceeding. If, after such good faith consultation, the Government and the Non-Federal Sponsor cannot agree as to an appropriate amount, then the Non-Federal Sponsor may use the amount set forth in its appraisal as the estimate of just compensation for the purpose of instituting the eminent domain proceeding.

c. For lands, easements, or rights-of-way acquired by eminent domain proceedings instituted in accordance with sub-paragraph B.3. of this Article, fair market value shall be either the amount of the court award for the real property interests taken, to the extent the Government determined such interests are required for the construction, operation, and maintenance of the Project, or the amount of any stipulated settlement or portion thereof that the Government approves in writing.

4. Incidental Costs. For lands, easements, or rights-of-way acquired by the Non-Federal Sponsor within a five-year period preceding the effective date of this Agreement, or at any time after the effective date of this Agreement, the value of the interest shall include the documented incidental costs of acquiring the interest, as determined by the Government, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of costs. Such incidental costs shall include, but not necessarily be limited to, closing and title costs, appraisal costs, survey costs, attorney's fees, plat maps, and mapping costs, as well as the actual amounts expended for payment of any Public Law 91-646 relocation assistance benefits provided in accordance with Article III.E. of this Agreement.

C. After consultation with the Non-Federal Sponsor, the Government shall determine the value of relocations in accordance with the provisions of this paragraph.

1. For a relocation other than a highway, the value shall be only that portion of relocation costs that the Government determines is necessary to provide a functionally equivalent facility, reduced by depreciation, as applicable, and by the salvage value of any removed items.

2. For a relocation of a highway, the value shall be only that portion of relocation costs that would be necessary to accomplish the relocation in accordance with the design standard that the State of Arizona would apply under similar conditions of geography and traffic load, reduced by the salvage value of any removed items.

3. Relocation costs shall include, but not necessarily be limited to, actual costs of performing the relocation; planning, engineering and design costs; supervision and administration costs; and documented incidental costs associated with performance of the relocation, but shall not include any costs due to betterments, as determined by the Government, nor any additional cost of using new material when suitable used material is available. Relocation costs shall be subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of costs.

4. Any credit afforded for the value of relocations performed within the Project boundaries is subject to satisfactory compliance with applicable Federal labor laws covering non-Federal construction, including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)). Crediting may be withheld, in whole or in part, as a result of the Non-Federal Sponsor's failure to comply with its obligations under these laws.

D. The value of the improvements made to lands, easements, and rights-of-way for the proper disposal of dredged or excavated material shall be the costs of the improvements, as determined by the Government, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of costs. Such costs shall include, but not necessarily be limited to, actual costs of providing the improvements; planning, engineering and design costs; supervision and administration costs; and documented incidental costs associated with providing the improvements, but shall not include any costs due to betterments, as determined by the Government.

ARTICLE V -PROJECT COORDINATION TEAM

A. To provide for consistent and effective communication, the Non-Federal Sponsor and the Government, not later than 30 days after the effective date of this Agreement, shall appoint named senior representatives to a Project Coordination Team. Thereafter, the Project Coordination Team shall meet regularly until the end of the period of construction. The Government's Project Manager and a counterpart named by the Non-Federal Sponsor shall co-chair the Project Coordination Team.

B. The Government's Project Manager and the Non-Federal Sponsor's counterpart shall keep the Project Coordination Team informed of the progress of construction and of significant pending issues and actions, and shall seek the views of the Project Coordination Team on matters that the Project Coordination Team generally oversees.

C. Until the end of the period of construction, the Project Coordination Team shall generally oversee the Project, including issues related to design; plans and specifications; scheduling; real property and relocation requirements; real property acquisition; contract awards and modifications; contract costs; the application of and compliance with 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)) for relocations; the Government's cost projections; final inspection of the entire Project or functional portions of the Project; preparation of the proposed OMRR&R Manual; performance of monitoring and adaptive management; anticipated requirements and needed capabilities for performance of operation, maintenance, repair, replacement, and rehabilitation of the Project; requirements of the monitoring; implementation of any adaptive management changes; and other related matters. This oversight shall be consistent with a project management plan developed by the Government after consultation with the Non-Federal Sponsor.

D. The Project Coordination Team may make recommendations that it deems warranted to the District Engineer on matters that the Project Coordination Team generally oversees, including suggestions to avoid potential sources of dispute. The Government in good faith shall consider the recommendations of the Project Coordination Team. The Government, having the legal authority and responsibility for construction of the Project, has the discretion to accept, reject, or modify the Project Coordination Team's recommendations.

E. The costs of participation in the Project Coordination Team shall be included in total project costs and cost shared in accordance with the provisions of this Agreement. However, the Non-Federal Sponsor shall not receive credit for the costs of participation in the Project Coordination Team that pertain to the environmental education features.

ARTICLE VI -METHOD OF PAYMENT

A. The Government shall maintain current records of contributions provided by the parties and current projections of total project costs and costs due to betterments. By July 1st of each year and at least quarterly thereafter, the Government shall provide the Non-Federal Sponsor with a report setting forth all contributions provided to date and the current projections of total project costs, of total costs due to betterments, of the maximum amount of total project costs determined in accordance with Article XIX of this Agreement, of the components of total project costs, of each party's share of total project costs, of the Non-Federal Sponsor's total cash contributions required in accordance with Articles II.B., II.D., II.E., II.F., II.G., and II.H. of this Agreement, of the non-Federal proportionate share, and of the funds the Government projects to be required from the Non-Federal Sponsor for the upcoming fiscal year. On the effective date of this Agreement, total project costs for Phases I-III are projected to be \$90,810,000 (at October 2003 price levels), and the Non-Federal Sponsor's cash contribution required under Article II.D. of this Agreement is projected to be

\$15,749,000 with an estimated \$18,290,000 in LERRDS, (at October 2003 price levels). Such amounts are estimates subject to adjustment by the Government and are not to be construed as the total financial responsibilities of the Government and the Non-Federal Sponsor.

B. The Non-Federal Sponsor shall provide the cash contribution required under Articles II.D.1., II.D.3., II.E.2., II.F.2., and II.G.2. of this Agreement in accordance with the provisions of this paragraph.

1. Not less than 30 calendar days prior to the scheduled date for issuance of the solicitation for the first construction contract, the Government shall notify the Non-Federal Sponsor in writing of such scheduled date and the funds the Government determines to be required from the Non-Federal Sponsor to meet the non-Federal proportionate share of projected financial obligations for construction through the first fiscal year of construction, including the non-Federal proportionate share of financial obligations for construction incurred prior to the commencement of the period of construction. Not later than such scheduled date, the Non-Federal Sponsor shall provide the Government with the full amount of the required funds by delivering a check payable to "FAO, USAED, Los Angeles" to the District Engineer or verifying to the satisfaction of the Government that the Non-Federal Sponsor has deposited the required funds in an escrow or other account acceptable to the Government, with interest accruing to the Non-Federal Sponsor or presenting the Government with an irrevocable letter of credit acceptable to the Government for the required funds or providing an Electronic Funds Transfer in accordance with procedures established by the Government.

2. For the second and subsequent fiscal years of construction, the Government shall notify the Non-Federal Sponsor in writing, no later than 60 calendar days prior to the beginning of that fiscal year, of the funds the Government determines to be required from the Non-Federal Sponsor to meet the non-Federal proportionate share of projected financial obligations for construction for that fiscal year. No later than 30 calendar days prior to the beginning of the fiscal year, the Non-Federal Sponsor shall make the full amount of the required funds for that fiscal year available to the Government through any of the payment mechanisms specified in Article VI.B.1. of this Agreement.

3. The Government shall draw from the funds provided by the Non-Federal Sponsor such sums as the Government deems necessary to cover: (a) the non-Federal proportionate share of financial obligations for construction incurred prior to the commencement of the period of construction; and (b) the non-Federal proportionate share of financial obligations for construction as they are incurred during the period of construction.

4. If at any time during the period of construction the Government determines that additional funds will be needed from the Non-Federal Sponsor to cover the non-Federal proportionate share of projected financial obligations for construction for the current fiscal year, the Government shall notify the Non-Federal Sponsor in writing of the additional funds required, and provide an explanation of why additional funds are required, and the Non-Federal Sponsor, no later than 90 calendar days from receipt of such notice,

shall make the additional required funds available through any of the payment mechanisms specified in Article VI.B.1. of this Agreement.

C. In advance of the Government incurring any financial obligation associated with additional work under Article II.B. or II.H. of this Agreement, the Non-Federal Sponsor shall provide the Government with the full amount of the funds required to pay for such additional work through any of the payment mechanisms specified in Article VI.B.1. of this Agreement. The Government shall draw from the funds provided by the Non-Federal Sponsor such sums as the Government deems necessary to cover the Government's financial obligations for such additional work as they are incurred. In the event the Government determines that the Non-Federal Sponsor must provide additional funds to meet its cash contribution, the Government shall notify the Non-Federal Sponsor in writing of the additional funds required and provide an explanation of why additional funds are required. Within 90 calendar days thereafter, the Non-Federal Sponsor shall provide the Government with the full amount of the additional required funds through any of the payment mechanisms specified in Article VI.B.1. of this Agreement

D. Upon completion of the Project or termination of this Agreement, and upon resolution of all relevant claims and appeals, the Government shall conduct a final accounting and furnish the Non-Federal Sponsor with the results of the final accounting. The final accounting shall determine total project costs, each party's contribution provided thereto, and each party's required share thereof. The final accounting also shall determine costs due to betterments and the Non-Federal Sponsor's cash contribution provided pursuant to Article II.B. of this Agreement.

1. In the event the final accounting shows that the total contribution provided by the Non-Federal Sponsor is less than its required share of total project costs plus costs due to any betterments provided in accordance with Article II.B. of this Agreement, the Non-Federal Sponsor shall, no later than 90 calendar days after receipt of written notice, make a cash payment to the Government of whatever sum is required to meet the Non-Federal Sponsor's required share of total project costs plus costs due to any betterments provided in accordance with Article II.B. of this Agreement by delivering a check payable to "FAO, USAED, Los Angeles" to the District Engineer or providing an Electronic Funds Transfer in accordance with procedures established by the Government.

2. In the event the final accounting shows that the total contribution provided by the Non-Federal Sponsor exceeds its required share of total project costs plus costs due to any betterments provided in accordance with Article II.B. of this Agreement, the Government shall, subject to the availability of funds, refund the excess to the Non-Federal Sponsor no later than 90 calendar days after the final accounting is complete. In the event existing funds are not available to refund the excess to the Non-Federal Sponsor, the Government shall seek such appropriations in the next possible budget cycle as are necessary to make the refund in the succeeding fiscal year.

ARTICLE VII -DISPUTE RESOLUTION

As a condition precedent to a party bringing any suit for breach of this Agreement, that party must first notify the other party in writing of the nature of the purported breach and seek in good faith to resolve the dispute through negotiation. If the parties cannot resolve the dispute through negotiation, they may agree to a mutually acceptable method of non-binding alternative dispute resolution with a qualified third party acceptable to both parties. The parties shall each pay 50 percent of any costs for the services provided by such a third party as such costs are incurred. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

ARTICLE VIII - OPERATION, MAINTENANCE, REPAIR, REPLACEMENT, AND REHABILITATION (OMRR&R)

A. Upon notification in accordance with Article II.C. of this Agreement and for so long as the Project remains authorized, the Non-Federal Sponsor shall operate, maintain, repair, replace, and rehabilitate the entire Project or the functional portion of the Project, at no cost to the Government, in a manner compatible with the Project's authorized purposes and in accordance with applicable Federal and State laws as provided in Article XI of this Agreement and specific directions prescribed by the Government in the OMRR&R Manual and any subsequent amendments thereto.

B. The Non-Federal Sponsor hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon property that the Non-Federal Sponsor owns or controls for access to the Project for the purpose of inspection and, if necessary, for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the Project. If an inspection shows that the Non-Federal Sponsor for any reason is failing to perform its obligations under this Agreement, the Government shall send a written notice describing the non-performance to the Non-Federal Sponsor. If, after 90 calendar days from receipt of notice, the Non-Federal Sponsor continues to fail to perform, then the Government shall have the right to enter, at reasonable times and in a reasonable manner, upon property that the Non-Federal Sponsor owns or controls for access to the Project for the purpose of completing, operating, maintaining, repairing, replacing, or rehabilitating the Project. No completion, operation, maintenance, repair, replacement, or rehabilitation by the Government shall operate to relieve the Non-Federal Sponsor of responsibility to meet the Non-Federal Sponsor's obligations as set forth in this Agreement, or to preclude the Government from pursuing any other remedy at law or equity to ensure faithful performance pursuant to this Agreement.

ARTICLE IX -INDEMNIFICATION

The Non-Federal Sponsor shall hold and save the Government free from all damages arising from the construction, operation, maintenance, repair, replacement, and

rehabilitation of the Project and any Project-related betterments, except for damages due to the fault or negligence of the Government or its contractors.

ARTICLE X -MAINTENANCE OF RECORDS AND AUDIT

A. Not later than 60 calendar days after the effective date of this Agreement, the Government and the Non-Federal Sponsor shall develop procedures for keeping books, records, documents, and other evidence pertaining to costs and expenses incurred pursuant to this Agreement. These procedures shall incorporate, and apply as appropriate, the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 C.F.R. Section 33.20. The Government and the Non-Federal Sponsor shall maintain such books, records, documents, and other evidence in accordance with these procedures and for a minimum of three years after the period of construction and resolution of all relevant claims arising therefrom. To the extent permitted under applicable Federal laws and regulations, the Government and the Non-Federal Sponsor shall each allow the other to inspect such books, documents, records, and other evidence.

B. Pursuant to 32 C.F.R. Section 33.26, the Non-Federal Sponsor is responsible for complying with the Single Audit Act Amendments of 1996, 31 U.S.C. Sections 7501-7507, as implemented by Office of Management and Budget (OMB) Circular No. A-133 and Department of Defense Directive 7600.10. Upon request of the Non-Federal Sponsor and to the extent permitted under applicable Federal laws and regulations, the Government shall provide to the Non-Federal Sponsor and independent auditors any information necessary to enable an audit of the Non-Federal Sponsor's activities under this Agreement. The costs of any non-Federal audits performed in accordance with this paragraph shall be allocated in accordance with the provisions of OMB Circulars A-87 and A-133, and such costs as are allocated to the Project shall be included in total project costs and cost shared in accordance with the provisions of this Agreement. However, the Non-Federal Sponsor shall not receive credit for such allocated costs of non-Federal audits that pertain to the environmental education features.

C. In accordance with 31 U.S.C. Section 7503, the Government may conduct audits in addition to any audit that the Non-Federal Sponsor is required to conduct under the Single Audit Act Amendments of 1996. Any such Government audits shall be conducted in accordance with Government Auditing Standards and the cost principles in OMB Circular No. A-87 and other applicable cost principles and regulations. The costs of Government audits performed in accordance with this paragraph shall be included in total project costs and cost shared in accordance with the provisions of this Agreement.

ARTICLE XI -FEDERAL AND STATE LAWS

In the exercise of their respective rights and obligations under this Agreement, the Non-Federal Sponsor and the Government agree to comply with all applicable Federal

and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*) and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)).

ARTICLE XII -RELATIONSHIP OF PARTIES

A. In the exercise of their respective rights and obligations under this Agreement, the Government and the Non-Federal Sponsor each act in an independent capacity, and neither is to be considered the officer, agent, or employee of the other.

B. In the exercise of its rights and obligations under this Agreement, neither party shall provide, without the consent of the other party, any contractor with a release that waives or purports to waive any rights such other party may have to seek relief or redress against such contractor either pursuant to any cause of action that such other party may have or for violation of any law.

ARTICLE XIII -OFFICIALS NOT TO BENEFIT

No member of or delegate to the Congress, nor any resident commissioner, shall be admitted to any share or part of this Agreement, or to any benefit that may arise therefrom.

ARTICLE XIV -TERMINATION OR SUSPENSION

A. If at any time the Non-Federal Sponsor fails to fulfill its obligations under Article II.B., II.D., II.E., II.F., II.G., VI, or XVIII.C. of this Agreement, the Assistant Secretary of the Army (Civil Works) shall terminate this Agreement or suspend future performance under this Agreement unless he determines that continuation of work on the Project is in the interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with the Project.

B. If the Government fails to receive annual appropriations in amounts sufficient to meet Project expenditures for the then-current or upcoming fiscal year, the Government shall so notify the Non-Federal Sponsor in writing, and 60 calendar days thereafter either party may elect without penalty to terminate this Agreement or to suspend future performance under this Agreement. In the event that either party elects to suspend future performance under this Agreement pursuant to this paragraph, such suspension shall remain

in effect until such time as the Government receives sufficient appropriations or until either the Government or the Non-Federal Sponsor elects to terminate this Agreement.

C. In the event that either party elects to terminate this Agreement pursuant to this Article or Article XV of this Agreement, both parties shall conclude their activities relating to the Project and proceed to a final accounting in accordance with Article VI.D. of this Agreement.

D. Any termination of this Agreement or suspension of future performance under this Agreement in accordance with this Article or Article XV of this Agreement shall not relieve the parties of liability for any obligation previously incurred. Any delinquent payment shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13-week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3-month period if the period of delinquency exceeds 3 months.

B. The Government, after consultation with the Non-Federal Sponsor, shall determine the improvements required on lands, easements, and rights-of-way to enable the proper disposal of dredged or excavated material associated with the construction, operation, and maintenance of the Project. Such improvements may include, but are not necessarily limited to, retaining dikes, wasteweirs, bulkheads, embankments, monitoring features, stilling basins, and de-watering pumps and pipes. The Government in a timely manner shall provide the Non-Federal Sponsor with general written descriptions of such improvements in detail sufficient to enable the Non-Federal Sponsor to fulfill its obligations under this paragraph, and shall provide the Non-Federal Sponsor with a written notice to proceed with construction of such improvements. In such general written descriptions, the Government shall delineate which of such improvements are required for the flood control features, the environmental restoration features, the recreation features, and the environmental education features. Prior to the end of the period of construction, the Non-Federal Sponsor shall provide all improvements set forth in such descriptions. Furthermore, prior to issuance of the solicitation for each Government construction contract, the Non-Federal Sponsor shall prepare plans and specifications for all improvements the Government determines to be required for the proper disposal of dredged or excavated material under that contract, submit such plans and specifications to the Government for approval, and provide such improvements in accordance with the approved plans and specifications.

C. The Government, after consultation with the Non-Federal Sponsor, shall determine the relocations necessary for the construction, operation, and maintenance of the Project, including those necessary to enable the removal of borrow materials and the proper disposal of dredged or excavated material. The Government in a timely manner shall provide the Non-Federal Sponsor with general written descriptions, including maps as appropriate, of such relocations in detail sufficient to enable the Non-Federal Sponsor to fulfill its obligations under this paragraph, and shall provide the Non-Federal Sponsor with a written notice to proceed with such relocations. In such general written descriptions, the Government shall delineate which of such relocations are necessary for the flood control features, the environmental restoration features, the recreation features, and the environmental education features. Prior to the end of the period of construction, the Non-Federal Sponsor shall perform or ensure the performance of all relocations as set forth in such descriptions. Furthermore, prior to issuance of the solicitation for each Government construction contract, the Non-Federal Sponsor shall prepare or ensure the preparation of plans and specifications for, and perform or ensure the performance of, all relocations the Government determines to be necessary for that contract.

D. The Non-Federal Sponsor in a timely manner shall provide the Government with such documents as are sufficient to enable the Government to determine the value of any contribution provided pursuant to paragraphs A., B., or C. of this Article. Upon receipt of such documents the Government, in accordance with Article IV of this Agreement and in a timely manner, shall determine the value of such contribution; include such value in total project costs; assign that value to total project flood control costs, total project environmental restoration costs, total project recreation costs, or total project environmental education facilities cost; and afford credit for such value toward the Non-Federal Sponsor's

ARTICLE XV - HAZARDOUS SUBSTANCES

A. After execution of this Agreement and upon direction by the District Engineer, the Non-Federal Sponsor shall perform, or cause to be performed, any investigations for hazardous substances that the Government or the Non-Federal Sponsor determines to be necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (hereinafter "CERCLA"), 42 U.S.C. Sections 9601-9675, that may exist in, on, or under lands, easements, and rights-of-way that the Government determines, pursuant to Article III of this Agreement, to be required for the construction, operation, and maintenance of the Project. However, for lands that the Government determines to be subject to the navigation servitude, only the Government shall perform such investigations unless the District Engineer provides the Non-Federal Sponsor with prior specific written direction, in which case the Non-Federal Sponsor shall perform such investigations in accordance with such written direction. All actual costs incurred by the Non-Federal Sponsor for such investigations for hazardous substances shall be included in total project costs and cost shared in accordance with the provisions of this Agreement, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of costs. However, the Non-Federal Sponsor shall not receive credit for costs incurred by the Non-Federal Sponsor for such investigations for hazardous substances that pertain to the environmental education features.

B. In the event it is discovered through any investigation for hazardous substances or other means that hazardous substances regulated under CERCLA exist in, on, or under any lands, easements, or rights-of-way that the Government determines, pursuant to Article III of this Agreement, to be required for the construction, operation, and maintenance of the Project, the Non-Federal Sponsor and the Government shall provide prompt written notice to each other, and the Non-Federal Sponsor shall not proceed with the acquisition of the real property interests until both parties agree that the Non-Federal Sponsor should proceed.

C. The Government and the Non-Federal Sponsor shall determine whether to initiate construction of the Project, or, if already in construction, whether to continue with work on the Project, suspend future performance under this Agreement, or terminate this Agreement for the convenience of the Government, in any case where hazardous substances regulated under CERCLA are found to exist in, on, or under any lands, easements, or rights-of-way that the Government determines, pursuant to Article III of this Agreement, to be required for the construction, operation, and maintenance of the Project. Should the Government and the Non-Federal Sponsor determine to initiate or continue with construction after considering any liability that may arise under CERCLA, the Non-Federal Sponsor shall be responsible, as between the Government and the Non-Federal Sponsor, for the costs of clean-up and response, to include the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of total project costs. In the event the Non-Federal Sponsor fails to provide any funds necessary to pay for clean up and response costs or to otherwise discharge the Non-Federal Sponsor's responsibilities under this paragraph upon direction by the

Government, the Government may, in its sole discretion, either terminate this Agreement for the convenience of the Government, suspend future performance under this Agreement, or continue work on the Project.

D. The Non-Federal Sponsor and the Government shall consult with each other in accordance with Article V of this Agreement in an effort to ensure that responsible parties bear any necessary clean up and response costs as defined in CERCLA. Any decision made pursuant to paragraph C. of this Article shall not relieve any third party from any liability that may arise under CERCLA.

E. As between the Government and the Non-Federal Sponsor, the Non-Federal Sponsor shall be considered the operator of the Project for purposes of CERCLA liability. To the maximum extent practicable, the Non-Federal Sponsor shall operate, maintain, repair, replace, and rehabilitate the Project in a manner that will not cause liability to arise under CERCLA.

ARTICLE XVI -NOTICES

A. Any notice, request, demand, or other communication required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and either delivered personally, by telegram or mailed by first-class, registered, or certified mail, as follows:

If to the Non-Federal Sponsor:

Deputy City Manager
City of Phoenix
200 West Washington Street, Room 1200
Phoenix, AZ 85003-1611

If to the Government:

Deputy District Engineer
Department of the Army
Corps of Engineers
Los Angeles District
ATTN: CESPL-PM-C
P.O. Box 532711
Los Angeles, California 90053-2325

B. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

C. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at the earlier of such time as it is actually received or seven calendar days after it is mailed.

ARTICLE XVII -CONFIDENTIALITY

To the extent permitted by the laws governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

ARTICLE XVIII - HISTORIC PRESERVATION

A. The costs of identification, survey and evaluation of historic properties shall be included in total project costs and cost shared in accordance with the provisions of this Agreement.

B. As specified in Section 7(a) of Public Law 93-291 (16 U.S.C. Section 469c(a)), the costs of mitigation and data recovery activities associated with historic preservation shall be borne entirely by the Government and shall not be included in total project costs, up to the statutory limit of one percent of the total amount authorized to be appropriated for the Project.

C. The Government shall not incur costs for mitigation and data recovery that exceed the statutory one percent limit specified in paragraph B. of this Article unless and until the Assistant Secretary of the Army (Civil Works) has waived that limit in accordance with Section 208(3) of Public Law 96-515 (16 U.S.C. Section 469c-2(3)). Any costs of mitigation and data recovery attributable to the flood control features, or the ecosystem restoration features, that exceed the one percent limit shall not be included in total project costs but shall be cost shared between the Non-Federal Sponsor and the Government consistent with the minimum non-Federal cost sharing requirements for the underlying flood control purpose, or the non-Federal cost sharing requirements for the underlying ecosystem restoration purpose, as follows: 35 percent borne by the Non-Federal Sponsor, and 65 percent borne by the Government. Any costs of mitigation and data recovery attributable to the recreation features that exceed the one percent limit shall not be included in total project costs but shall be cost shared between the Non-Federal Sponsor and the Government consistent with the non-Federal cost sharing requirements for the underlying recreation purpose, as follows: 50 percent borne by the Non-Federal Sponsor, and 50 percent borne by the Government.

ARTICLE XIX -SECTION 902 PROJECT COST LIMITS

The Non-Federal Sponsor has reviewed the provisions set forth in Section 902 of Public Law 99-662, as amended, and understands that Section 902 establishes the maximum amount of total project costs for the Authorized Project. Notwithstanding any other provision of this Agreement, the Government shall not make a new Project financial obligation, make a Project expenditure, or afford credit toward total project costs for the value of any contribution provided by the Non-Federal Sponsor, if such obligation, expenditure, or credit would result in total project costs exceeding this maximum amount, unless otherwise authorized by law. On the effective date of this Agreement, this maximum

amount is estimated to be \$133,086,000, as calculated in accordance with ER 1105-2-100 using October 1, 2003 price levels and allowances for projected future inflation. The Government shall adjust this maximum amount in accordance with Section 902 of Public Law 99-662, as amended.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the Assistant Secretary of the Army (Civil Works).

DEPARTMENT OF THE ARMY

CITY OF PHOENIX
A municipal corporation
Frank Fairbanks, City Manager

BY: John Paul Woodley
John Paul Woodley
Assistant Secretary of the Army
(Civil Works)

BY: Andrea Tevlin
Andrea Tevlin
Deputy City Manager

By Memorandum, dated
March 8, 2004, delegated to:
Richard G. Thompson
Colonel, US Army
District Engineer

ATTEST: Vicky Miel
Vicky Miel, City Clerk

DATE: 14 May 2004

DATE: APR 19 2004

CERTIFICATE OF AUTHORITY

I, William Bock, do hereby certify that I am the principal legal officer of the City of Phoenix, that the City of Phoenix is a legally constituted public body with full authority and legal capability to perform the terms of the Agreement between the Department of the Army and the City of Phoenix in connection with the Tres Rios, Arizona Project, and to pay damages in accordance with the terms of this Agreement, if necessary, in the event of the failure to perform, as required by Section 221 of Public Law 91-611 (42 U.S.C. Section 1962d-5b), and that the persons who have executed this Agreement on behalf of the City of Phoenix have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification this

16 day of APRIL 2004.

William Bock
WFB

William F. Bock
City of Phoenix
Chief Counsel

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Andrea Tevlin

Andrea Tevlin
Deputy City Manager
City of Phoenix, Arizona

DATE: April 19, 2004

APPROVED BY CITY COUNCIL:

DATE: April 14, 2004 - Item No. 71



City of Phoenix
WATER SERVICES DEPARTMENT
TREATMENT PLANT ENGINEERING DIVISION

November 1, 2010

Gwen Meyer
Project Manager
U.S. Army Corp of Engineers, Los Angeles District
3636 N. Central Ave., Suite 900
Phoenix, Arizona 85012-1939

RE: Tres Rios Environmental Restoration Project
Phase I – LOMR

Dear Gwen,

The City, as the local sponsor, formally requests that the Corps provide all supporting technical information and documentation, including FEMA forms sealed by a registered engineer, needed for the Flood Control District of Maricopa County (FCDMC) to apply for the LOMR.

If you have any questions, please contact me at 602.534.9205.

Sincerely,

A handwritten signature in blue ink, appearing to read "Robert F. Upham".

Robert F. Upham, PE
Civil Engineer III
Wastewater Engineering



OFFICIAL RECORDS OF
MARICOPA COUNTY RECORDER
HELEN PURCELL
2005-0616351 05/10/05 16:32
8 OF 12

HENSLEYE

CLERK OF THE BOARD
BASKET PICK UP

ounty

INTERGOVERNMENTAL AGREEMENT

for the

Design, Rights-of-Way Acquisition, Construction, and Operation and Maintenance

of the

TRES RIOS PROJECT FLOOD CONTROL FEATURES

between the

Flood Control District of Maricopa County

and the

City of Phoenix

IGA FCD 2004A017

Agenda Item: C-69-05-101-2-00

This Agreement is entered into by and between the Flood Control District of Maricopa County, a municipal corporation and political subdivision of the State of Arizona, acting by and through its Board of Directors hereinafter called DISTRICT; and the City of Phoenix, a municipal corporation, acting by and through its City Manager, hereinafter called CITY.

This Agreement shall become effective as of the date it has been executed by all parties.

DATE FILED WITH MARICOPA COUNTY RECORDER May 10, 2005

STATUTORY AUTHORIZATION

1. The DISTRICT is empowered by Arizona Revised Statutes §48-3603, as revised, to enter into this Agreement and has authorized the undersigned to execute this Agreement on behalf of the DISTRICT.
2. The CITY is empowered by Arizona Revised Statutes §11-951 and Article II, Chapter II, and Section 2 of the Phoenix City Charter to enter into this Agreement, and has authorized the undersigned to execute this Agreement on behalf of the CITY.

BACKGROUND

3. The Tres Rios Project is a joint project between the U. S. Army Corps of Engineers (CORPS) and the City of Phoenix (CITY), with the CITY acting as the local sponsor. The CORPS has completed a feasibility study for the Tres Rios Project with the CITY, and is presently underway with the design for the Tres Rios Project.
4. The Tres Rios Project is located along the Salt and Gila Rivers from approximately 83rd Avenue downstream to the Agua Fria River, and will provide flood control as well as river and habitat restoration. The DISTRICT and the CITY desire to implement cooperatively the flood control and drainage features of the Tres Rios Project consisting primarily of a flood control levee along the north bank of the Salt and Gila Rivers, beginning west of 91st Avenue and extending downstream to near the confluence with the Agua Fria River, and related interior drainage features near the levee, hereinafter referred to as the PROJECT, as shown in Exhibit "A".
5. The DISTRICT and the CITY wish to formally establish the DISTRICT's role in the PROJECT, including but not limited to cooperation with the CITY in identifying and providing usage of necessary rights-of-way for the PROJECT, at no cost to the PROJECT, DISTRICT owned rights of way along the Holly Acres Levee and in the rivers, and DISTRICT operation and maintenance of the completed PROJECT features that function solely for flood control purposes. The DISTRICT will also cost-share in the flood control features of the PROJECT.
6. The CORPS is the lead agency for design and construction and is funding approximately 65% of the PROJECT costs. Under an agreement between the CORPS and CITY, the CITY is tasked with, among other things, rights-of-way acquisition, utility conflict resolution, operations and maintenance of the completed PROJECT and funding 35% of the PROJECT costs. The DISTRICT's cost sharing and rights of way would be credited as part of the CITY's obligations.

PURPOSE OF THE AGREEMENT

7. The purpose of this Agreement is to identify and define the responsibilities of the DISTRICT and the CITY (collectively identified as PROJECT PARTNERS) for rights-of-way acquisition, construction, and operation and maintenance for the PROJECT.

TERMS OF AGREEMENT

8. The DISTRICT shall:
 - 8.1 Recommend, review and, if accepted by the DISTRICT reviewers, approve levee and other flood control features design criteria, and provide technical support to the CORPS as they proceed with the hydraulic design
 - 8.2 Review draft Design Documentation Reports (DDR) and provide comments.
 - 8.3 Review and provide comments on draft technical documents and reports prepared by the CORPS and others in support of the PROJECT.
 - 8.4 Review and provide comments on all construction plans and specifications at 30%, 60%, 90% and 100% completion.

- 8.5 Maintain the "River" computer based model after it is updated by the CORPS at the end of the five-year monitoring period. Model hydraulics may be adjusted for future changed conditions as determined by the DISTRICT.
- 8.6 Perform Local Sponsor Federal Emergency Management Agency (FEMA) Letter of Map Revision (LOMR) – Conditional Letter of Map Revision (CLOMR) responsibilities. The CITY will request that the CORPS provide all supporting technical information and documentation, including FEMA forms sealed by a registered engineer, needed for the DISTRICT to apply for the CLOMR and LOMR. If the CORPS does not provide all supporting information and documentation, the DISTRICT has no obligation under this Agreement to perform these responsibilities.
- 8.7 Upon completion and written acceptance of the PROJECT by the CITY and the DISTRICT, and upon release of the PROJECT from the CORPS to the CITY, the DISTRICT will operate and maintain the PROJECT features that function solely for flood control purposes including the levee and the interior drainage facilities, including but not limited to (a) collector channel(s) and basins during and after the five-year monitoring period. If the PROJECT flood control features are incorporated into Tres Rios Recreational and Outreach Facilities, the DISTRICT will not maintain those features. The initial period of the DISTRICT's operation and maintenance shall be for fifty years, which may be extended if agreed to in writing by the Chief Engineer and General Manager of the DISTRICT and the City manager of the CITY.
- 8.8 For the Tres Rios Recreational and Outreach Features and Facilities, the DISTRICT will provide the following:
- 8.8.1 Review and provide comments on draft DDR's
 - 8.8.2 Review and provide comments on plans and specifications
- 8.9 For Tres Rios Habitat and Species Restoration Features, the DISTRICT will provide the following:
- 8.9.1 Participate in special habitat workshops and technical committee meetings.
 - 8.9.2 Review and comment on draft DDR's.
 - 8.9.3 Review and comment on in-stream vegetation affecting river hydraulics.
 - 8.9.4 Review and provide comments on plans and specifications at the intervals provided by the CORPS, but no less than at the 30%, 60%, 90% and 100% levels of completion.
 - 8.9.5 Review and provide comments on adaptive management studies and reports as needed.
 - 8.9.6 Review and provide comments on Operations and Maintenance plans prepared by the CORPS.
- 8.10 The DISTRICT will be responsible for the following for Tres Rios Project rights-of-way:
- 8.10.1 Provide easements to the CITY for DISTRICT owned rights-of-way for the Holly Acres Levee necessary for the CORPS' reconstruction and modification of the existing structure.
 - 8.10.2 Convey easements to the CITY, for other DISTRICT owned rights-of-way in the rivers necessary for construction of the Habitat and Species Restoration Features, prior to the CITY issuing authorization of entry to the CORPS for construction of those features.
 - 8.10.3 The DISTRICT will provide to the CITY a construction easement for DISTRICT rights-of-way in the rivers, as requested and required by the CITY for the PROJECT. This easement right will not include warranting or defending this right should it be determined that any of these rights-of-way are within Gila River Indian Community (GRIC) jurisdiction.

- 8.10.4 The DISTRICT will provide review comments and have the opportunity to approve any rights-of-way easements or fee acquisition in the PROJECT area upon which the DISTRICT will assume operation and maintenance responsibility. The DISTRICT will not assume operation and maintenance responsibility on any property on which the DISTRICT does not believe the CITY has appropriate land rights or federal permits nor shall the DISTRICT have the obligation to acquire additional land rights or federal permits.
 - 8.10.5 The DISTRICT will cooperate with the CITY for the use of DISTRICT owned rights-of-way for a potential vegetation nursery to be managed by others.
 - 8.10.6 In accordance with property rights granted or held by the DISTRICT, the DISTRICT will have rights-of-way use permitting authority over any features that it maintains. If the rights-of-way are on GRIC property, the CITY and DISTRICT will request that the DISTRICT be given special review authority.
 - 8.10.7 The DISTRICT will be provided by the CITY at no cost, fee ownership over all rights-of-way for the PROJECT features that it maintains, with exception of any features on DISTRICT owned or GRIC property.
 - 8.10.8 The DISTRICT will provide rights-of-way owned or controlled by the DISTRICT needed by the CITY for the PROJECT, at no cost, to the Tres Rios Project by issuing easements as requested by the CITY for the PROJECT. The DISTRICT can mine mineral resources on its property prior to the start of CORPS construction in the lines and grades of the Tres Rios Project and any revenues generated from this activity shall be the DISTRICT's.
 - 8.10.9 In accordance with the property rights granted to or held by the DISTRICT, upon completion and written acceptance of the PROJECT by the CITY and the DISTRICT, and upon release of the PROJECT from the CORPS to the CITY, the DISTRICT will be the licensing/permitting authority for any future modifications, construction, or uses within the PROJECT rights-of-way that the DISTRICT operates and maintains. The CITY will be given the opportunity to review and approve the modifications prior to construction of such future modifications within the limits of the PROJECT.
 - 8.11 The DISTRICT will contribute \$2,000,000 cash to the local 35% cost-share of the PROJECT. The DISTRICT may participate in cost-sharing of a south bank levee, if required because of a raised 100-year water surface elevation due to the north bank levee.
 - 8.11.1 The DISTRICT will contribute \$1,000,000 to the CITY upon approval and recordation of this Agreement, and within thirty (30) days of receipt of an invoice from the CITY.
 - 8.11.2 The DISTRICT will contribute \$1,000,000 to the CITY upon the Notice to Proceed by the CORPS of Phase 1B construction of the PROJECT flood control features, and within thirty (30) days of receipt of an invoice from the CITY.
 - 8.12 The DISTRICT shall monitor construction and provide comments and concerns to the CORPS through the CITY, for resolution and/or incorporation into the PROJECT.
 - 8.13 The DISTRICT will acquire and periodically renew the 404 Permit required for the DISTRICT to operate and maintain the PROJECT flood control features.
9. The CITY shall:
- 9.1 Review the draft DDR's and provide comments to the CORPS and DISTRICT.

- 9.2 Review and provide comments on draft technical documents and reports prepared by the CORPS in support of the PROJECT.
- 9.3 Review and provide comments on all construction plans and specifications at 30%, 60%, 90% and 100% completion.
- 9.4 Provide the DISTRICT's review comments as described in subparagraphs 8.3 and 8.4 to the CORPS for resolution and/or incorporation into the design of the PROJECT.
- 9.5 Assist the DISTRICT in acquiring and periodically renewing the 404 Permit required for the DISTRICT to operate and maintain the PROJECT flood control features.
- 9.6 For Tres Rios Recreational and Outreach Features and Facilities, the CITY will provide the following:
 - 9.6.1 Review and provide comments on draft DDR's.
 - 9.6.2 Review and provide comments on plans and specifications.
 - 9.6.3 Assist the CORPS in developing an Operation and Maintenance plan for recreation and education features.
 - 9.6.4 Operate and Maintain recreation and education features.
- 9.7 For the Tres Rios Habitat and Species Restoration Features, the CITY will provide the following:
 - 9.7.1 Provide design oversight to the CORPS during design of habitat restoration features.
 - 9.7.2 Review and provide comments on draft DDR's.
 - 9.7.3 Review and provide comments on plans and specifications at intervals provided by CORPS, but no less than at the 30%, 60%, 90% and 100% levels of completion.
 - 9.7.4 Assist the CORPS in reviewing the monitoring data collected and preparation of annual reports.
 - 9.7.5 Provide for continued operation and maintenance of habitat and restoration features for the Tres Rios Project, during and after the 5-year Adaptive Management period.
- 9.8 The CITY will be responsible for PROJECT rights-of-way acquisition as provided in the PROJECT Cooperation Agreement between CORPS and CITY, except as indicated in paragraph 8.10. The CITY will convey to the DISTRICT at no cost, fee ownership of lands needed for the operation and maintenance of the PROJECT flood control features, and not owned by the DISTRICT, at the completion of the PROJECT construction.
- 9.9 The CITY will take the lead for PROJECT public involvement activities, with assistance from the DISTRICT.
- 9.10 The CITY will provide to the CORPS DISTRICT comments and concerns regarding construction of the PROJECT, for resolution and/or incorporation into the PROJECT.
- 9.11 In accordance with the property rights granted or held by the CITY, the CITY will be the licensing/permitting authority for any future modifications, construction, or uses within the PROJECT rights-of-way with the exception of the portion(s) of the PROJECT operated and maintained by the DISTRICT. The DISTRICT will be given the opportunity to review and approve the modifications prior to construction of such future modifications.
- 9.12 As provided in the Agreements between the CORPS and the CITY, and notwithstanding other sources of funding obtained by the CITY, the CITY will fund all of the 35% local sponsor cost-

share for PROJECT costs, with the exception of the DISTRICT's contribution of \$2,000,000 cash and the market value of lands, easements, and rights-of-way provided by the DISTRICT toward the CITY's local 35% cost-share of the PROJECT. The value of DISTRICT provided rights-of-way may also be credited to the CITY's local 35% project cost-share.

- 9.12.1 The CITY will invoice the DISTRICT for \$1,000,000 upon approval and recordation of this Agreement.
 - 9.12.2 The CITY will invoice the DISTRICT for \$1,000,000 upon the Notice to Proceed by the CORPS of Phase 1B construction of the PROJECT flood control features.
10. The PROJECT PARTNERS shall provide any and all permits and/or licenses within their authority required for the PROJECT at no cost to the PROJECT.
 11. The PROJECT PARTNERS may, with mutual written agreement of all parties, delegate responsibilities to another party. Any delegation, however, shall not relieve the delegating party of its original responsibilities as defined herein.
 12. Each of the PROJECT PARTNERS to this Agreement shall take appropriate actions within their authority to ensure that only agricultural drainage, irrigation delivery, storm water, or waste water is discharged into the PROJECT, and that such discharges into the PROJECT comply at the point of discharge with any applicable requirements of the Clean Water Act, and the Arizona Pollutant Discharge Elimination System (AZPDES), or any other applicable discharge requirements, including any permit requirements.
 13. Each of the PROJECT PARTNERS to this Agreement (indemnitor) shall, to the extent permissible by law, indemnify, defend, and save harmless the other (indemnitees) including agents, officers, directors, governors, and employees thereof, from and against any loss or expense incurred as a result of any claim or suit of any nature whatsoever, which arises out of indemnitor's negligent or wrongful acts or omissions pursuant to this Agreement. Such indemnification obligation shall encompass any personal injury, death or property damages resulting from the indemnitor's negligent or wrongful acts or omissions, as well as reasonable attorney's fees, court costs, and other expenses relating to the defense against claims or litigation incurred by the indemnitee.
 14. Each PROJECT PARTNER to this Agreement will pay for, and not seek reimbursement from each other for, its own personnel and administrative costs associated with this PROJECT including, but not limited to, the following unless specifically identified otherwise in this Agreement: design, rights-of-way acquisition, inspection, public involvement, permitting, management and administration, and operation and maintenance. The CITY will submit the market value of lands addressed in this agreement to the CORPS as part of the local cost share for the PROJECT, and provide a copy of the market valuation and request for credit to the DISTRICT.
 15. This Agreement shall expire fifty (50) years from the date of recording with the Maricopa County Recorder or upon exceeding the life of the PROJECT, whichever is the first to occur, and after all funding obligations and reimbursements have been satisfied in accordance with this Agreement. However, by mutual written agreement of all parties, this Agreement may be amended or terminated.
 16. This Agreement is subject to cancellation by any party pursuant to the provisions of Arizona Revised Statutes §38-511.

17. Attached to this Agreement or contained herein are the written determinations by the appropriate attorneys for the parties to this Agreement that these agencies are authorized under the laws of the State of Arizona to enter into this Agreement and that it is in proper form.
18. If legislation is enacted after the effective date of this Agreement, which changes the relationship, or structure of one or more parties to this Agreement, the parties agree that this Agreement shall be renegotiated at the written request of either party.
19. All notices or demands upon any of the PROJECT PARTNERS to this Agreement shall be in writing and shall be delivered in person or sent by mail addressed as follows:

Flood Control District of Maricopa County
Attn: Chief Engineer and General Manager
2801 West Durango Street
Phoenix, Arizona 85009-6399

City of Phoenix
Attn: Water Services Director
200 West Washington Street, 12th Floor
Phoenix, Arizona 85003-1611

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
A Municipal Corporation

Recommended by:

TSR 4/25/05

Timothy S. Phillips, P.E. Date
Acting Chief Engineer and General Manager

Approved and Accepted:

By: May W Wilson
Chairman, Board of Directors Date

Attest:

By: Janice Carroll 5/4/05
Clerk of the Board Date

The foregoing Intergovernmental Agreement IGA FCD 2004A017 has been reviewed pursuant to Arizona Revised Statutes §11-952, as amended, by the undersigned General Counsel, who has determined that it is in proper form and within the powers and authority granted to the Flood Control District of Maricopa County under the laws of the State of Arizona.

Julie M. Semmon 3/10/05
General Counsel Date

CITY OF PHOENIX

CITY OF PHOENIX
A Municipal Corporation
Frank Fairbanks, City Manager

Cal PK
dr

By: Andrea Tevlin 4/18/05
Andrea Tevlin Date
Deputy City Manager



Attest:

By: Vicky Miel 4-21-05
City Clerk Date

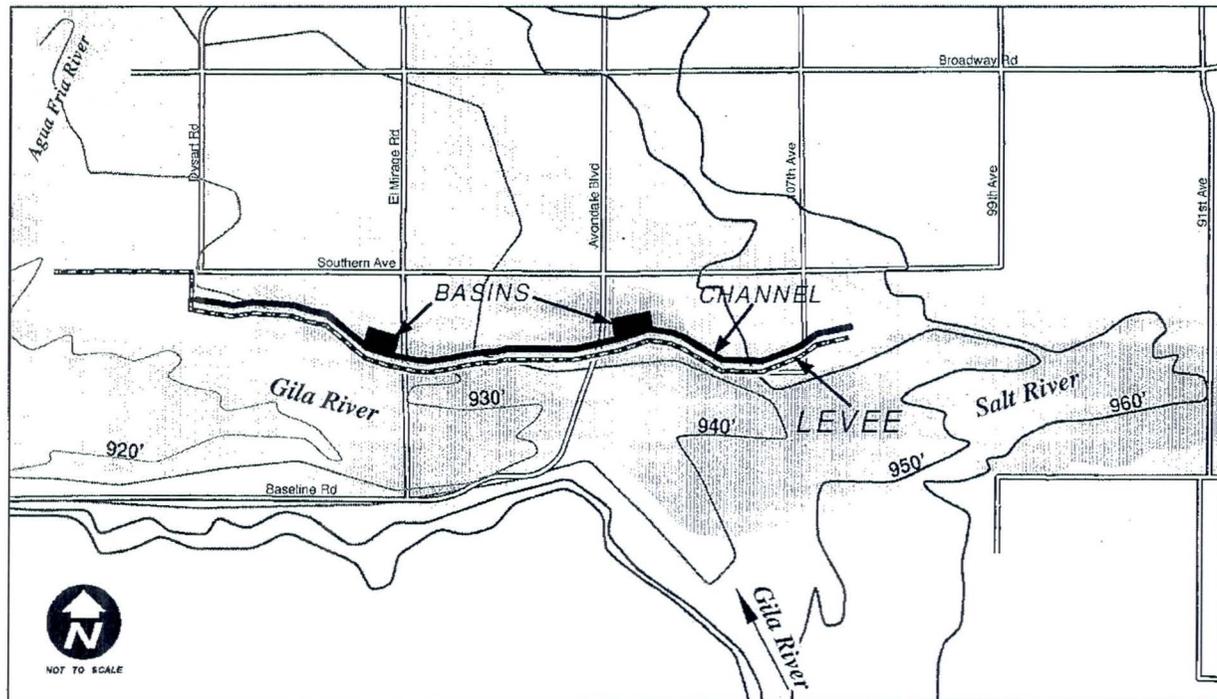
The foregoing Intergovernmental Agreement IGA FCD 2004A017 has been reviewed pursuant to Arizona Revised Statutes §11-952, as amended, by the undersigned attorney who has determined that it is in proper form and within the power and authority granted to the City of Phoenix under the laws of the State of Arizona.

ACTING Jesse W Sears 4/21/05
City Attorney Date

APPROVED BY CITY COUNCIL:

DATE: March 30, 2005 - Item No. 79

IGA FCD 2004A017
TRES RIOS PROJECT FLOOD CONTROL FEATURES
EXHIBIT "A"





Appendix B

**Amended Tres Rios North Levee Phase 1A & 1B Design Documentation Report
(DDR)**

(In separate 3-ring binders)



Appendix C

Tres Rios North Levee Final Construction Report

(In a separate 3-ring binder)



Appendix D1

Tres Rios North Levee Phase 1A Updated As-Built Drawings

(In a separate 3-ring binder)



Appendix D2

Tres Rios North Levee Phase 1B Updated As-Built Drawings

(El Mirage Road to 115th Ave)

(In a separate 3-ring binder)



Appendix D3

Avondale Bridge As-Built Drawings

(In a separate 3-ring binder)



Appendix E

Completion of Construction Letters



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY

LOS ANGELES DISTRICT CORPS OF ENGINEERS
P. O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

January 22, 2009

Civil Works Branch

Mr. Robert Upham, P.E.
Tres Rios Project Manager
200 West Washington Street
8th Floor
Phoenix, Arizona 85003-1611

Dear Mr. Upham:

We are pleased to provide you with notification of the completion of the construction phase for the Tres Rios Flood Control North Levee, Phase 1A (115th Avenue to 105th Avenue). A final inspection was conducted on December 17, 2008, to inspect the physical completion of the levee and the completion of all work required by the contract scope of work, plans and specifications and any modifications, including the completion of all punch list items. The inspection confirmed the completion of all contract requirements and punch list items by the contractor.

Based on the results of this final inspection and pursuant to Article VIII of the Tres Rios Project Cooperation Agreement, the Non-Federal Sponsor shall assume the Operation, Maintenance, Repair, Replacement, and Rehabilitation requirements for this phase of the project. The Beneficial Occupancy Date for the Levee Phase 1A has been established at December 17, 2008. Please return a copy of this letter acknowledging receipt.

Should you have any questions, please feel free to contact me at (213) 452-3971, or your staff may contact my Project Manager Mr. Mike Ternak, at (602) 640-2000, Ext. 272.

Sincerely,

Kenneth L. Moore
for: Brian M. Moore
Deputy District Engineer
for Project Management



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY

LOS ANGELES DISTRICT CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

January 22, 2009

Civil Works Branch

Mr. Robert Upham, P.E.
Tres Rios Project Manager
200 West Washington Street
8th Floor
Phoenix, Arizona 85003-1611

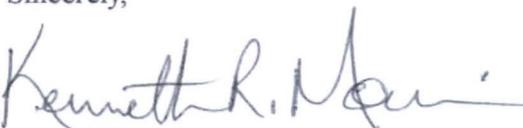
Dear Mr. Upham:

We are pleased to provide you with notification of the completion of the construction phase for the Tres Rios Flood Control North Levee, Phase 1A (115th Avenue to 105th Avenue). A final inspection was conducted on December 17, 2008, to inspect the physical completion of the levee and the completion of all work required by the contract scope of work, plans and specifications and any modifications, including the completion of all punch list items. The inspection confirmed the completion of all contract requirements and punch list items by the contractor.

Based on the results of this final inspection and pursuant to Article VIII of the Tres Rios Project Cooperation Agreement, the Non-Federal Sponsor shall assume the Operation, Maintenance, Repair, Replacement, and Rehabilitation requirements for this phase of the project. The Beneficial Occupancy Date for the Levee Phase 1A has been established at December 17, 2008. Please return a copy of this letter acknowledging receipt.

Should you have any questions, please feel free to contact me at (213) 452-3971, or your staff may contact my Project Manager Mr. Mike Ternak, at (602) 640-2000, Ext. 272.

Sincerely,


for: Brian M. Moore
Deputy District Engineer
for Project Management

Receipt Acknowledge: _____ Date: _____
Mr. Robert Upham

for: MOORE ^{KRM}
PM 1/25/09

MORRIS ^{KRM}
PM 1/25/09

^{M 1/25/09}
WEIFIELD
PM-C



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY

LOS ANGELES DISTRICT CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

January 22, 2009

Civil Works Branch

Mr. Robert Upham, P.E.
Tres Rios Project Manager
200 West Washington Street
8th Floor
Phoenix, Arizona 85003-1611

Dear Mr. Upham:

We are pleased to provide you with notification of the completion of the construction phase for the Tres Rios Flood Control North Levee, Phase 1B (El mirage Road to 115th Avenue). A final inspection was conducted on November 12, 2008, to inspect the physical completion of the levee and the completion of all work required by the contract scope of work, plans and specifications and any modifications, including the completion of all punch list items. The inspection confirmed the completion of all contract requirements and punch list items by the contractor.

Based on the results of this final inspection and pursuant to Article VIII of the Tres Rios Project Cooperation Agreement, the Non-Federal Sponsor shall assume the Operation, Maintenance, Repair, Replacement, and Rehabilitation requirements for this phase of the project. The Beneficial Occupancy Date for the Levee Phase 1B has been established at November 13, 2008. Please return a copy of this letter acknowledging receipt.

Should you have any questions, feel free to contact me at (213) 452-3971, or your staff may contact my Project Manager Mr. Mike Ternak, Project Manager at (602) 640-2000, Ext. 272.

Sincerely,

for: Brian M. Moore
Deputy District Engineer
for Project Management



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY

LOS ANGELES DISTRICT CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

January 22, 2009

Civil Works Branch

Mr. Robert Upham, P.E.
Tres Rios Project Manager
200 West Washington Street
8th Floor
Phoenix, Arizona 85003-1611

Dear Mr. Upham:

We are pleased to provide you with notification of the completion of the construction phase for the Tres Rios Flood Control North Levee, Phase 1B (El mirage Road to 115th Avenue). A final inspection was conducted on November 12, 2008, to inspect the physical completion of the levee and the completion of all work required by the contract scope of work, plans and specifications and any modifications, including the completion of all punch list items. The inspection confirmed the completion of all contract requirements and punch list items by the contractor.

Based on the results of this final inspection and pursuant to Article VIII of the Tres Rios Project Cooperation Agreement, the Non-Federal Sponsor shall assume the Operation, Maintenance, Repair, Replacement, and Rehabilitation requirements for this phase of the project. The Beneficial Occupancy Date for the Levee Phase 1B has been established at November 13, 2008. Please return a copy of this letter acknowledging receipt.

Should you have any questions, feel free to contact me at (213) 452-3971, or your staff may contact my Project Manager Mr. Mike Ternak, Project Manager at (602) 640-2000, Ext. 272.

Sincerely,

for: Brian M. Moore
Deputy District Engineer
for Project Management

Receipt Acknowledge: _____ Date: _____
Mr. Robert Upham

MOORE ^{KRM}
PM 1/25/09

MORRIS ^{KRM}
PM 1/25/09

[Signature] 1/23/09
LEIFIELD
PM-C



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY

LOS ANGELES DISTRICT CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

January 22, 2009

Civil Works Branch

Mr. Robert Upham, P.E.
Tres Rios Project Manager
200 West Washington Street
8th Floor
Phoenix, Arizona 85003-1611

Dear Mr. Upham:

We are pleased to provide you with notification of the completion of the construction phase for the Tres Rios Flood Control North Levee, Phase 1B (El mirage Road to 115th Avenue). A final inspection was conducted on November 12, 2008, to inspect the physical completion of the levee and the completion of all work required by the contract scope of work, plans and specifications and any modifications, including the completion of all punch list items. The inspection confirmed the completion of all contract requirements and punch list items by the contractor.

Based on the results of this final inspection and pursuant to Article VIII of the Tres Rios Project Cooperation Agreement, the Non-Federal Sponsor shall assume the Operation, Maintenance, Repair, Replacement, and Rehabilitation requirements for this phase of the project. The Beneficial Occupancy Date for the Levee Phase 1B has been established at November 13, 2008. Please return a copy of this letter acknowledging receipt.

Should you have any questions, feel free to contact me at (213) 452-3971, or your staff may contact my Project Manager Mr. Mike Ternak, Project Manager at (602) 640-2000, Ext. 272.

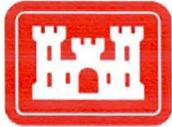
Sincerely,


for: Brian M. Moore
Deputy District Engineer
for Project Management



Appendix F1

Inspection Information



**US Army Corps
of Engineers®**

Flood Damage Reduction Segment / System Inspection Report

Name of Segment / System: Tres Rios North Levee System

Public Sponsor(s): Flood Control District of Maricopa County

Public Sponsor Representatives Present During Inspection: Frank Brown, Charles Klenner, Mike Ramirez

Sponsor Phone: Don Rerrick, Project Manager (602) 506-4878

Sponsor Email: djr@mail.maricopa.gov

Corps of Engineers Inspectors: Chris Spitzer (Lead, Geotech), Jimmy Majors (Structural), Mylene Perry (HH),
Cynthia Wong (LIS Operator) Inspection Start Date: 4/26/2012

Inspection End Date: 4/27/2012

Inspection Report Prepared By: Cynthia Wong Date Report Prepared: 7/3/2012

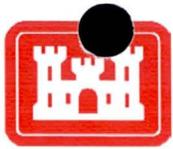
Internal Technical Review (for Periodic Inspections) By: Refer to Appendix I (Agency Review Documentation) Date of ITR: 7/10/2012

Final Approved By: Richard J. Leifield, P.E. (Reference Positive NFIP LSER Transmittal Letter) Date Approved: Reference
Transmittal Letter

Type of Inspection:	<input checked="" type="checkbox"/> Initial Eligibility Inspection <input type="checkbox"/> Continuing Eligibility Inspection (Routine) <input checked="" type="checkbox"/> Continuing Eligibility Inspection (Periodic)	Overall Segment / System Rating:	<input type="checkbox"/> Acceptable <input checked="" type="checkbox"/> Minimally Acceptable <input type="checkbox"/> Unacceptable
Contents of Report:	<input checked="" type="checkbox"/> Instructions <input type="checkbox"/> Initial Eligibility Inspection <input checked="" type="checkbox"/> General Items for All Flood Control Works <input checked="" type="checkbox"/> Levee Embankment <input type="checkbox"/> Concrete Floodwalls <input type="checkbox"/> Sheet Pile and Concrete I-walls <input checked="" type="checkbox"/> Interior Drainage System <input type="checkbox"/> Pump Stations	<p>Note: In addition to the report contents indicated here, a plan view drawing of the system, with stationing, should be included with this report to reference locations of items rated less than acceptable. Photos of general system condition and any noted deficiencies should also be attached.</p> <p>Note: This inspection rating represents the Corps evaluation of operations and maintenance of the flood damage reduction system and may be used in conjunction with other information for a levee certification determination for National Flood Insurance Program (NFIP) purposes if applicable. An Acceptable Corps inspection rating, alone, does not equate to a certifiable levee for the NFIP. It is recommended for levee systems currently accredited by the Federal Emergency Management Agency (FEMA) for NFIP</p>	

FDR System Channels

purposes receiving a Corps Minimally Acceptable or Unacceptable rating be evaluated by the levee owner to determine the potential impacts to the certification for FEMA.



**US Army Corps
of Engineers®**

Flood Damage Reduction Segment / System Public Sponsor Pre-Inspection Form

The following information is to be provided by the levee district sponsor prior to an inspection. This information will be used to help evaluate the organizational capability of the levee district to manage the levee segment / system maintenance program.

1. Levee segment / system and district: (name of the segment / system and levee district) Tres Rios North Levee System / Flood Control District of Maricopa County
2. Reporting period: (month/day/year to month/day/year) Not applicable (this is the first periodic inspection)
3. Summary of maintenance required by last inspection report: Not applicable
4. Summary of maintenance performed this reporting period: Not applicable
5. Summary of maintenance planned next reporting period: Not applicable
6. Summary of changes to segment / system since last inspection: Not applicable
7. Problems/ issues requiring the assistance of the US Army Corps of Engineers: Not provided by local sponsor

General Instructions for the Inspection of Flood Damage Reduction Segments / Systems

A. Purpose of USACE Inspections:

The primary purpose of these inspections is to prevent loss of life and catastrophic damages; preserve the value of Federal investments, and to encourage non-Federal sponsors to bear responsibility for their own protection. Inspections should assure that Flood Damage Reduction structures and facilities are continually maintained and operated as necessary to obtain the maximum benefits. Inspections are also conducted to determine eligibility for Rehabilitation Assistance under authority of PL 84-99 for Federal and non-Federal systems. (ER 1130-2-530, ER 500-1-1)

B. Types of Inspections:

The Corps conducts several types of inspections of Flood Damage Reduction systems, as outlined below:

Initial Eligibility Inspections	Continuing Eligibility Inspections	
	Routine Inspections	Periodic Inspections
IEIs are conducted to determine whether a non-Federally constructed Flood Damage Reduction system meets the minimum criteria and standards set forth by the Corps for initial inclusion into the Rehabilitation and Inspection Program.	RIs are intended to verify proper maintenance, owner preparedness, and component operation.	PIs are intended to verify proper maintenance and component operation and to evaluate operational adequacy, structural stability, and safety of the system. Periodic Inspections evaluate the system's original design criteria vs. current design criteria to determine potential performance impacts, evaluate the current conditions, and compare the design loads and design analysis used against current design standards. This is to be done to identify components and features for the sponsor that need to be monitored more closely over time or corrected as needed. (Periodic Inspections are used as the basis of risk assessments.)

C. Inspection Boundaries:

Inspections should be conducted so as to rate each Flood Damage Reduction "Segment" of the system. The overall system rating will be the lowest segment rating in the system.

Project	System	Segment
A flood damage reduction project is made up of one or more flood damage reduction systems which were under the same authorization.	A flood damage reduction system is made up of one or more flood damage reduction segments which collectively provide flood damage reduction to a defined area. Failure of one segment within a system constitutes failure of the entire system. Failure of one system does not affect another system.	A flood damage reduction segment is defined as a discrete portion of a flood damage reduction system that is operated and maintained by a single entity. A flood damage reduction segment can be made up of one or more features (levee, floodwall, pump stations, etc).

D. Land Use Definitions:

The following three definitions are intended for use in determining minimum required inspection intervals and initial requirements for inclusion into the Rehabilitation and Inspection Program. Inspections should be considered for all systems that would result in significant environmental or economic impact upon failure regardless of specific land use.

Agricultural	Rural	Urban
Protected population in the range of zero to 5 households per square mile protected.	Protected population in the range of 6 to 20 households per square mile protected.	Greater than 20 households per square mile; major industrial areas with significant infrastructure investment. Some protected urban areas have no permanent population but may be industrial areas with high value infrastructure with no overnight population.

E. Use of the Inspection Report Template:

The report template is intended for use in all Army Corps of Engineers inspections of levee and floodwall systems and flood damage reduction channels. The section of the template labeled "Initial Eligibility" only needs to be completed during Initial Eligibility Inspections of Non-Federally constructed Flood Damage Reduction Systems. The section labeled "General Items" needs to be completed with every inspection, along with all other sections that correspond to features in the system. The section labeled "Public Sponsor Pre-Inspection Report" is intended for completion before the inspection, if possible.

F. Individual Item / Component Ratings:

Assessment of individual components rated during the inspection should be based on the criteria provided in the inspection report template, though inspectors may incorporate additional items into the report based on the characteristics of the system. The assessment of individual components should be based on the following definitions.

Acceptable Item	Minimally Acceptable Item	Unacceptable Item
The inspected item is in satisfactory condition, with no deficiencies, and will function as intended during the next flood event.	The inspected item has one or more minor deficiencies that need to be corrected. The minor deficiency or deficiencies will not seriously impair the functioning of the item as intended during the next flood event.	The inspected item has one or more serious deficiencies that need to be corrected. The serious deficiency or deficiencies will seriously impair the functioning of the item as intended during the next flood event.

G. Overall Segment / System Ratings:

Determination of the overall system rating is based on the definitions below. Note that an Unacceptable System Rating may be either based on an engineering determination that concluded that noted deficiencies would prevent the system from functioning as intended during the next flood event, or based on the sponsor's demonstrated lack of commitment or inability to correct serious deficiencies in a timely manner.

Acceptable System	Minimally Acceptable System	Unacceptable System
All items or components are rated as Acceptable.	One or more items are rated as Minimally Acceptable or one or more items are rated as Unacceptable and an engineering determination concludes that the Unacceptable items would not prevent the segment / system from performing as intended during the next flood event.	One or more items are rated as Unacceptable and would prevent the segment / system from performing as intended, or a serious deficiency noted in past inspections (which had previously resulted in a minimally acceptable system rating) has not been corrected within the established timeframe, not to exceed two years.

H. Eligibility for PL84-99 Rehabilitation Assistance:

Inspected systems that are not operated and maintained by the Federal government may be Active in the Corps' Rehabilitation and Inspection Program (RIP) and eligible for rehabilitation assistance from the Corps as defined below:

If the Overall System Rating is Acceptable	If the Overall System Rating is Minimally Acceptable	If the Overall System Rating is Unacceptable
The system is active in the RIP and eligible for PL84-99 rehabilitation assistance.	The system is Active in the RIP during the time that it takes to make needed corrections. Active systems are eligible for rehabilitation assistance. However, if the sponsor does not present USACE with proof that serious deficiencies (which had previously resulted in a minimally acceptable system rating) were corrected within the established timeframe, then the system will become Inactive in the RIP.	The system is Inactive in the RIP, and the status will remain Inactive until the sponsor presents USACE with proof that all items rated Unacceptable have been corrected. Inactive systems are ineligible for rehabilitation assistance.

I. Reporting:

After the inspection, the Corps is responsible for assembling an inspection report (or a summary report if it was a Periodic Inspection) including the following information:

- a. All sections of the report template used during the inspection, including the cover and pre-inspection materials. (Supplemental data collected, and any sections of the template that weren't used during the inspection do not need to be included with the report.)
- b. Photos of the general system condition and noted deficiencies.
- c. A plan view drawing of the system, with stationing, to reference locations of items rated less than acceptable.
- d. The relative importance of the identified maintenance issues should be specified in the transmittal letter.
- e. If the Overall System Rating is Minimally Acceptable, the report needs to establish a timeframe for correction of serious deficiencies noted (not to exceed two years) and indicate that if these items are not corrected within the required timeframe, the system will be rated as Unacceptable and made Inactive in the Rehabilitation Inspection Program.

J. Notification:

Reports are to be disseminated as follows within 30 days of the inspection date.

If the Overall System Rating is Acceptable	If the Overall System Rating is Minimally Acceptable	If the Overall System Rating is Unacceptable
Reports need to be provided to the local sponsor and the county emergency management agency.	Reports need to be provided to the local sponsor, state emergency management agency, county emergency management agency, and to the FEMA region.	Reports need to be provided to the local sponsor, state emergency management agency, county emergency management agency, FEMA region, and to the Congressional delegation within 30 days of the inspection.

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Operations and Maintenance Manuals	A	A	Levee Owner's Manual, O&M Manuals, and/or manufacturer's operating instructions are present.	
		M	Sponsor manuals are lost or missing or out of date; however, sponsor will obtain manuals prior to next scheduled inspection.	
		U	Sponsor has not obtained lost or missing manuals identified during previous inspection.	
2. Emergency Supplies and Equipment (A or M only)	A	A	The sponsor maintains a stockpile of sandbags, shovels, and other flood fight supplies which will adequately supply all needs for the initial days of a flood fight. Sponsor determines required quantity of supplies after consulting with inspector.	
		M	The sponsor does not maintain an adequate supply of flood fighting materials as part of their preparedness activities.	
3. Flood Preparedness and Training (A or M only)	A	A	Sponsor has a written system-specific flood response plan and a solid understanding of how to operate, maintain, and staff the FDR system during a flood. Sponsor maintains a list of emergency contact information for appropriate personnel and other emergency response agencies.	
		M	The sponsor maintains a good working knowledge of flood response activities, but documentation of system-specific emergency procedures and emergency contact personnel is insufficient or out of date.	

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Unwanted Vegetation Growth ¹	M	A	The levee has little or no unwanted vegetation (trees, bush, or undesirable weeds), except for vegetation that is properly contained and/or situated on overbuilt sections, such that the mandatory 3-foot root-free zone is preserved around the levee profile. The levee has been recently mowed. The vegetation-free zone extends 15 feet from both the landside and riverside toes of the levee to the centerline of the tree. If the levee access easement doesn't extend to the described limits, then the vegetation-free zone must be maintained to the easement limits. Reference EM 1110-2-301 or Corps policy for regional vegetation variance.	TR10_2012_a_0024: Station_1 154+00: Sage brush and vegetation.: Remove non-compliant vegetation. (M)
		M	Minimal vegetation growth (brush, weeds, or trees 2 inches in diameter or smaller) is present within the zones described above. This vegetation must be removed but does not currently threaten the operation or integrity of the levee.	
		U	Significant vegetation growth (brush, weeds, or any trees greater than 2 inches in diameter) is present within the zones described above and must to be removed to reestablish or ascertain levee integrity.	
2. Sod Cover	NA	A	There is good coverage of sod over the levee.	
		M	Approximately 25% of the sod cover is missing or damaged over a significant portion or over significant portions of the levee embankment. This may be the result of over-grazing or feeding on the levee, unauthorized vehicular traffic, chemical or insect problems, or burning during inappropriate seasons.	
		U	Over 50% of the sod cover is missing or damaged over a significant portion or portions of the levee embankment.	
		N/A	Surface protection is provided by other means.	
3. Encroachments	M	A	No trash, debris, unauthorized farming activity, structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the levee.	TR10_2012_a_0009: Station_1 183+00: Riverside toe of slope fill 4x4 access ramp on as-builts.: None. (A) TR10_2012_a_0012: Station_1 169+00: Grouted stone riprap around upstream drain and downstream end drain two-24 in dia RCP.: Restore riprap to as-built conditions or permit modification. (M) TR10_2012_a_0013: Station_1 164+00: K-rail/jersey barrier on gabion blanket.: Remove K-rail/jersey barrier or provide permit. (M) TR10_2012_a_0019: Station_1 155+00: Station_2 152+00: Soil cement portion of levee constructed in conjunction w/ bridge. As builts provided by County.: None. (M) TR10_2012_a_0023: Station_1 154+00: 30 in dia RCP not shown on as-builts. As-builts provided by County.: Permit. (M) TR10_2012_a_0033: Station_1 148+00: Concrete at toe. Riprap in corner appears to be disturbed by maintenance.: Restore riprap to as-built condition. (M)
		M	Trash, debris, unauthorized farming activity, structures, excavations, or other obstructions present, or inappropriate activities noted that should be corrected but will not inhibit operations and maintenance or emergency operations. Encroachments have not been reviewed by the Corps.	
		U	Unauthorized encroachments or inappropriate activities noted are likely to inhibit operations and maintenance, emergency operations, or negatively impact the integrity of the levee.	

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
				TR10_2012_a_0048: Station_1 105+00: 24 in RCP and power pole guide wire not shown on as-builts.: USACE working on as-builts at time of report preparation. (M)
4. Closure Structures (Stop Log, Earthen Closures, Gates, or Sandbag Closures) (A or U only)	NA	A	Closure structure in good repair. Placing equipment, stoplogs, and other materials are readily available at all times. Components are clearly marked and installation instructions/ procedures readily available. Trial erections have been accomplished in accordance with the O&M Manual.	
		U	Any of the following issues is cause for this rating: Closure structure in poor condition. Parts missing or corroded. Placing equipment may not be available within the anticipated warning time. The storage vaults cannot be opened during the time of inspection. Components of closure are not clearly marked and installation instructions/ procedures are not readily available. Trial erections have not been accomplished in accordance with the O&M Manual.	
		N/A	There are no closure structures along this component of the FDR segment / system.	
5. Slope Stability	A	A	No slides, sloughs, tension cracking, slope depressions, or bulges are present.	
		M	Minor slope stability problems that do not pose an immediate threat to the levee embankment.	
		U	Major slope stability problems (ex. deep seated sliding) identified that must be repaired to reestablish the integrity of the levee embankment.	
6. Erosion/ Bank Caving	M	A	No erosion or bank caving is observed on the landward or riverward sides of the levee that might endanger its stability.	TR10_2012_a_0005: Station_1 202+00: Gravel mulch displaced for length of approx 50 ft.: Replace gravel mulch. (M) TR10_2012_a_0015: Station_1 161+00: Erosion gullies at top of slope on riverside.: Repair erosion gullies. (M) TR10_2012_a_0025: Station_1 155+00: Erosion at outlet and no protection extending 3 ft at metal gate inlet.: Repair erosion and provide protection for the metal gate inlet. (M) TR10_2012_a_0027: Station_1 156+00: Gravel mulch on access ramp is misplaced or rutted as a result of traffic.: Restore gravel mulch to as-built condition. (M) TR10_2012_a_0030: Station_1 149+00: Gravel mulch displacement adjacent to ramp appears to be caused by vehicle.: Restore gravel mulch to as-built condition. (M) TR10_2012_a_0032: Station_1 149+00: Gravel mulch rutting at top of slope.: Restore gravel mulch to as-built condition. (M) TR10_2012_a_0036: Station_1 135+00: 3 ft long x 1 ft wide x 3 in deep erosion on RS top of slope.: Repair erosion. (M)
		M	There are areas where minor erosion is occurring or has occurred on or near the levee embankment, but levee integrity is not threatened.	
		U	Erosion or caving is occurring or has occurred that threatens the stability and integrity of the levee. The erosion or caving has progressed into the levee section or into the extended footprint of the levee foundation and has compromised the levee foundation stability.	
7. Settlement ²	A	A	No observed depressions in crown. Records exist and indicate no unexplained historical changes.	

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
		M	Minor irregularities that do not threaten integrity of levee. Records are incomplete or inclusive.	
		U	Obvious variations in elevation over significant reaches. No records exist or records indicate that design elevation is compromised.	
8. Depressions/ Rutting	A	A	There are scattered, shallow ruts, pot holes, or other depressions on the levee that are unrelated to levee settlement. The levee crown, embankments, and access road crowns are well established and drain properly without any ponded water.	
		M	There are some infrequent minor depressions less than 6 inches deep in the levee crown, embankment, or access roads that will pond water.	
		U	There are depressions greater than 6 inches deep that will pond water.	
9. Cracking	A	A	Minor longitudinal, transverse, or desiccation cracks with no vertical movement along the crack. No cracks extend continuously through the levee crest.	
		M	Longitudinal and/or transverse cracks up to 6 inches in depth with no vertical movement along the crack. No cracks extend continuously through the levee crest. Longitudinal cracks are no longer than the height of the levee.	
		U	Cracks exceed 6 inches in depth. Longitudinal cracks are longer than the height of the levee and/or exhibit vertical movement along the crack. Transverse cracks extend through the entire levee width.	
10. Animal Control	M	A	Continuous animal burrow control program in place that includes the elimination of active burrowing and the filling in of existing burrows.	TR10_2012_a_0003: Station_1 203+00: Animal burrows in placed material on riverside. Per County, animal burrow control program is current in progress.: Fix animal burrows. (M) TR10_2012_a_0016: Station_1 160+00: Animal burrows on riverside slope at mid-height of slope. Per County, animal burrow control program is current in progress.: Fix animal burrows. (M) TR10_2012_a_0039: Station_1 129+00: Debris/soil from possible animal burrows. Per County, animal burrow control program is current in progress.: Fix animal burrows. (M) TR10_2012_a_0044: Station_1 110+00: Minor animal burrow from end of concrete to top of ramp on north side of basin. Per County, animal burrow control program is current in progress.: Fix animal burrows. (A)
		M	The existing animal burrow control program needs to be improved. Several burrows are present which may lead to seepage or slope stability problems, and they require immediate attention.	
		U	Animal burrow control program is not effective or is nonexistent. Significant maintenance is required to fill existing burrows, and the levee will not provide reliable flood protection until this maintenance is complete.	

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
11. Culverts/ Discharge Pipes ³ (This item includes both concrete and corrugated metal pipes.)	M	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	See "Culverts/Discharge Pipes" on the Interior Drainage Systems checklist for details.
		M	There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	
		U	Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.	
		N/A	There are no discharge pipes/ culverts.	
12. Riprap Revetments & Bank Protection	M	A	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	TR10_2012_a_0014: Station_1 161+00: Section approx 30 ft long w/ riprap change.: Restore riprap to as-built condition or provide permit. (M)
		M	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	TR10_2012_a_0017: Station_1 160+00: Station_2 155+00: 200 ft length of up to 2 ft of revetment missing at top of RS slope.: Restore revetment to as-built conditions. (M)
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	TR10_2012_a_0034: Station_1 136+00: Minor displacement of riprap approx 8-10 ft deep bedding not exposed but a hollow.: Restore riprap to as-built condition. (M)
		N/A	There is no riprap protecting this feature of the segment / system, or riprap is discussed in another section.	TR10_2012_a_0040: Station_1 119+00: Displaced riprap or covered.: Restore riprap to as-built condition. (M) TR10_2012_a_0041: Station_1 116+00: Vehicular displaced riprap and mounded riprap at toe. Possible vandalism.: Restore riprap to as-built condition. (M)
13. Revetments other	M	A	Existing revetment protection is properly maintained, undamaged, and clearly visible.	TR10_2012_a_0010: Station_1 172+00: Gabion basket torn

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
than Riprap		M	Minor revetment displacement or deterioration that does not pose an immediate threat to the integrity of the levee. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	on top. 15 ft long by 5 ft wide.: Repair gabion basket. (M) TR10_2012_a_0035: Station_1 136+00: Approx 300 ft long of newer mattress lower than prior and corrosion noted on prior gabion wire.: Monitor new mattress condition and corrosion on gabion wire. (M) TR10_2012_a_0037: Station_1 133+00: Minor riprap displacement of revetment due to vehicle traffic.: Restore riprap to as-built condition. (M)
		U	Significant revetment displacement, deterioration, or exposure of bedding observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Revetment protection is hidden by dense brush and trees.	
		N/A	There are no such revetments protecting this feature of the segment / system.	
14. Underseepage Relief Wells/ Toe Drainage Systems	NA	A	Toe drainage systems and pressure relief wells necessary for maintaining FDR segment / system stability during high water functioned properly during the last flood event and no sediment is observed in horizontal system (if applicable). Nothing is observed which would indicate that the drainage systems won't function properly during the next flood, and maintenance records indicate regular cleaning. Wells have been pumped tested within the past 5 years and documentation is provided.	
		M	Toe drainage systems or pressure relief wells are damaged and may become clogged if they are not repaired. Maintenance records are incomplete or indicate irregular cleaning and pump testing.	
		U	Toe drainage systems or pressure relief wells necessary for maintaining FDR segment / system stability during flood events have fallen into disrepair or have become clogged. No maintenance records. No documentation of the required pump testing.	
		N/A	There are no relief wells/ toe drainage systems along this component of the FDR segment / system.	
15. Seepage	A	A	No evidence or history of unrepaired seepage, saturated areas, or boils.	
		M	Evidence or history of minor unrepaired seepage or small saturated areas at or beyond the landside toe but not on the landward slope of levee. No evidence of soil transport.	
		U	Evidence or history of active seepage, extensive saturated areas, or boils.	

¹ If there is significant growth on the levee that inhibits the inspection of animal burrows or other items, the inspection should be ended until this item is corrected.

² Detailed survey elevations are normally required during Periodic Inspections, and whenever there are obvious visual settlements.

³ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.



Inspect ID: TR10_2012_a_0012 **Title:** USACE_CESPL_TR10_2012_a_0012_1.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks:
Grouted stone riprap around upstream drain and downstream end drain two-24 in dia
RCP. ; Station_1: 169+00



Inspect ID: TR10_2012_a_0012 **Title:** USACE_CESPL_TR10_2012_a_0012_2.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks:
Grouted stone riprap around upstream drain and downstream end drain two-24 in dia
RCP. ; Station_1: 169+00



Inspect ID: TR10_2012_a_0012 **Title:** USACE_CESPL_TR10_2012_a_0012_3.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: Grouted stone riprap around upstream drain and downstream end drain two-24 in dia RCP. ; Station_1: 169+00



Inspect ID: TR10_2012_a_0013 **Title:** USACE_CESPL_TR10_2012_a_0013_1.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: K-rail/jersey barrier on gabion blanket.; Station_1: 164+00



Inspect ID: TR10_2012_a_0019 **Title:** USACE_CESPL_TR10_2012_a_0019_1.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: Soil cement portion of levee constructed in conjunction w/ bridge. As built provided by County.; Station_1: 155+00; Station_2: 152+00



Inspect ID: TR10_2012_a_0019 **Title:** USACE_CESPL_TR10_2012_a_0019_2.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: Soil cement portion of levee constructed in conjunction w/ bridge. As built provided by County.; Station_1: 155+00; Station_2: 152+00



Inspect ID: TR10_2012_a_0019 **Title:** USACE_CESPL_TR10_2012_a_0019_3.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: Soil cement portion of levee constructed in conjunction w/ bridge. As built provided by County.; Station_1: 155+00; Station_2: 152+00



Inspect ID: TR10_2012_a_0023 **Title:** USACE_CESPL_TR10_2012_a_0023_1.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: 30 in dia RCP not shown on as-builts. As-builts provided by County.; Station_1: 154+00



Inspect ID: TR10_2012_a_0023 **Title:** USACE_CESPL_TR10_2012_a_0023_2.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: 30 in dia RCP not shown on as-builts. As-builts provided by County.; Station_1: 154+00



Inspect ID: TR10_2012_a_0033 **Title:** USACE_CESPL_TR10_2012_a_0033_1.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: Concrete at toe. Riprap in corner appears to be disturbed by maintenance.; Station_1: 148+00



Inspect ID: TR10_2012_a_0033 **Title:** USACE_CESPL_TR10_2012_a_0033_2.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: Concrete at toe. Riprap in corner appears to be disturbed by maintenance.; **Station_1:** 148+00



Inspect ID: TR10_2012_a_0048 **Title:** USACE_CESPL_TR10_2012_a_0048_1.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: 24 in RCP and power pole guide wire not shown on as-builts.; **Station_1:** 105+00



Inspect ID: TR10_2012_a_0048 **Title:** USACE_CESPL_TR10_2012_a_0048_2.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: 24 in RCP and power pole guide wire not shown on as-builts.; Station_1: 105+00



Inspect ID: TR10_2012_a_0048 **Title:** USACE_CESPL_TR10_2012_a_0048_3.jpg
Rated Item: 3. Encroachments **Caption:** Rating: Minimally Acceptable; Remarks: 24 in RCP and power pole guide wire not shown on as-builts.; Station_1: 105+00



Inspect ID: TR10_2012_a_0005 **Title:** USACE_CESPL_TR10_2012_a_0005_1.jpg
Rated Item: 6. Erosion/ Bank Caving **Caption:** Rating: Minimally Acceptable;
Remarks: Gravel mulch displaced for length of approx 50 ft.; Station_1: 202+00



Inspect ID: TR10_2012_a_0015 **Title:** USACE_CESPL_TR10_2012_a_0015_1.jpg
Rated Item: 6. Erosion/ Bank Caving **Caption:** Rating: Minimally Acceptable;
Remarks: Erosion gullies at top of slope on riverside.; Station_1: 161+00



Inspect ID: TR10_2012_a_0025 **Title:** USACE_CESPL_TR10_2012_a_0025_1.jpg
Rated Item: 6. Erosion/ Bank Caving **Caption:** Rating: Minimally Acceptable;
Remarks: Erosion at outlet and no protection extending 3 ft at metal gate inlet.; **Station_1:** 155+00



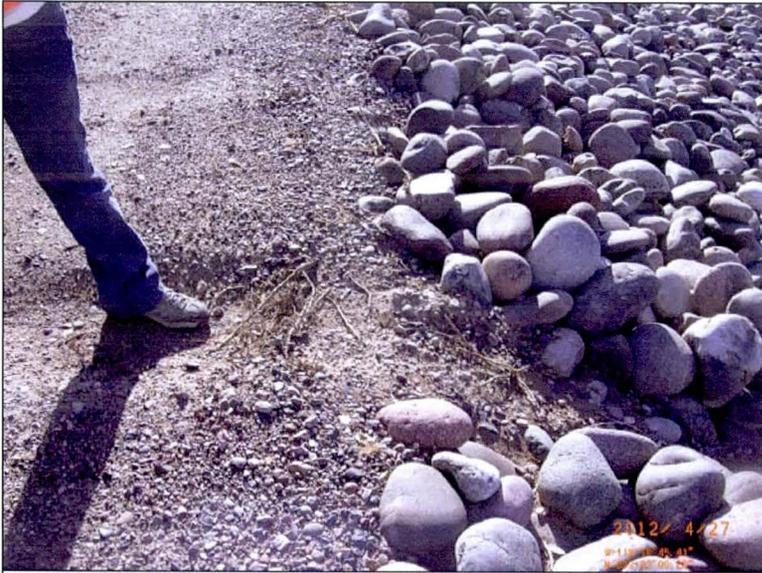
Inspect ID: TR10_2012_a_0027 **Title:** USACE_CESPL_TR10_2012_a_0027_1.jpg
Rated Item: 6. Erosion/ Bank Caving **Caption:** Rating: Minimally Acceptable;
Remarks: Gravel mulch on access ramp is misplaced or rutted as a result of traffic.;
Station_1: 156+00



Inspect ID: TR10_2012_a_0030 **Title:** USACE_CESPL_TR10_2012_a_0030_1.jpg
Rated Item: 6. Erosion/ Bank Caving **Caption:** Rating: Minimally Acceptable;
Remarks: Gravel mulch displacement adjacent to ramp appears to be caused by vehicle.;
Station_1: 149+00



Inspect ID: TR10_2012_a_0032 **Title:** USACE_CESPL_TR10_2012_a_0032_1.jpg
Rated Item: 6. Erosion/ Bank Caving **Caption:** Rating: Minimally Acceptable;
Remarks: Gravel mulch rutting at top of slope.; **Station_1:** 149+00



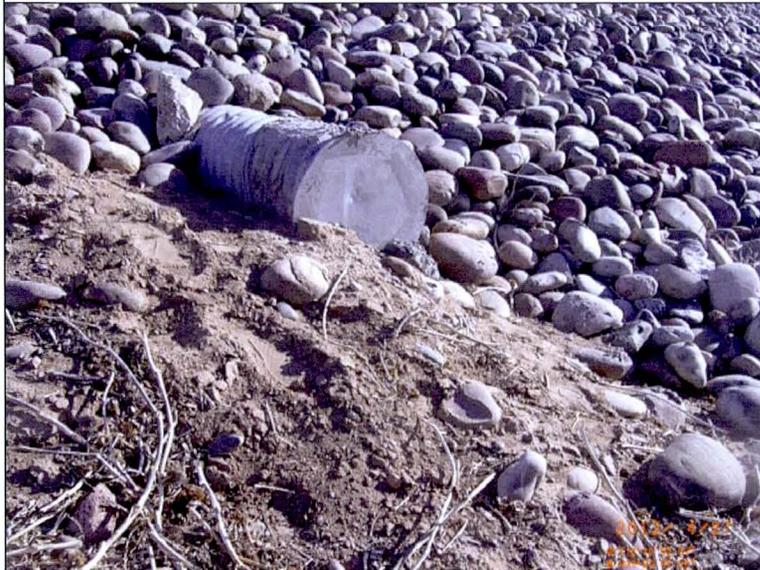
Inspect ID: TR10_2012_a_0036 **Title:** USACE_CESPL_TR10_2012_a_0036_1.jpg
Rated Item: 6. Erosion/ Bank Caving **Caption:** Rating: Minimally Acceptable;
Remarks: 3 ft long x 1 ft wide x 3 in deep erosion on RS top of slope.; Station_1: 135+00



Inspect ID: TR10_2012_a_0003 **Title:** USACE_CESPL_TR10_2012_a_0003_1.jpg
Rated Item: 10. Animal Control **Caption:** Rating: Minimally Acceptable; **Remarks:** Animal burrows in placed material on riverside. Per County, animal burrow control program is current in progress.; Station_1: 203+00



Inspect ID: TR10_2012_a_0016 **Title:** USACE_CESPL_TR10_2012_a_0016_1.jpg
Rated Item: 10. Animal Control **Caption:** Rating: Minimally Acceptable; Remarks:
Animal burrows on riverside slope at mid-height of slope. Per County, animal burrow
control program is current in progress.; Station_1: 160+00



Inspect ID: TR10_2012_a_0039 **Title:** USACE_CESPL_TR10_2012_a_0039_1.jpg
Rated Item: 10. Animal Control **Caption:** Rating: Minimally Acceptable; Remarks:
Debris/soil from possible animal burrows. Per County, animal burrow control program is
current in progress.; Station_1: 129+00



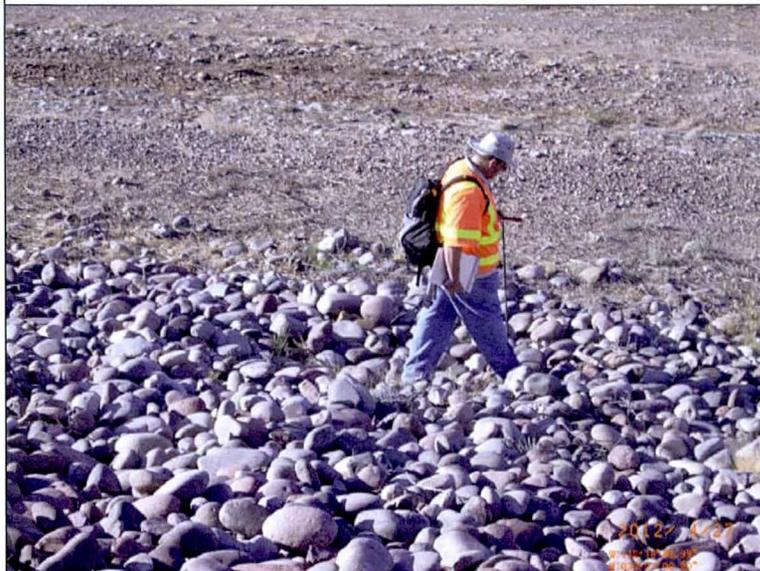
Inspect ID: TR10_2012_a_0044 **Title:** USACE_CESPL_TR10_2012_a_0044_1.jpg
Rated Item: 10. Animal Control **Caption:** Rating: Acceptable; Remarks: Minor animal burrow from end of concrete to top of ramp on north side of basin. Per County, animal burrow control program is current in progress.; Station_1: 110+00



Inspect ID: TR10_2012_a_0014 **Title:** USACE_CESPL_TR10_2012_a_0014_1.jpg
Rated Item: 12. Riprap Revetments & Bank Protection **Caption:** Rating: Minimally Acceptable; Remarks: Section approx 30 ft long w/ riprap change.; Station_1: 161+00



Inspect ID: TR10_2012_a_0017 **Title:** USACE_CESPL_TR10_2012_a_0017_1.jpg
Rated Item: 12. Riprap Revetments & Bank Protection **Caption:** Rating: Minimally Acceptable; Remarks: 200 ft length of up to 2 ft of revetment missing at top of RS slope.; Station_1: 160+00; Station_2: 155+00



Inspect ID: TR10_2012_a_0034 **Title:** USACE_CESPL_TR10_2012_a_0034_1.jpg
Rated Item: 12. Riprap Revetments & Bank Protection **Caption:** Rating: Minimally Acceptable; Remarks: Minor displacement of riprap approx 8-10 ft deep bedding not exposed but a hollow.; Station_1: 136+00



Inspect ID: TR10_2012_a_0040 **Title:** USACE_CESPL_TR10_2012_a_0040_1.jpg
Rated Item: 12. Riprap Revetments & Bank Protection **Caption:** Rating: Minimally Acceptable; Remarks: Displaced riprap or covered.; Station_1: 119+00



Inspect ID: TR10_2012_a_0041 **Title:** USACE_CESPL_TR10_2012_a_0041_1.jpg
Rated Item: 12. Riprap Revetments & Bank Protection **Caption:** Rating: Minimally Acceptable; Remarks: Vehicular displaced riprap and mounded riprap at toe. Possible vandalism.; Station_1: 116+00



Inspect ID: TR10_2012_a_0010 **Title:** USACE_CESPL_TR10_2012_a_0010_1.jpg
Rated Item: 13. Revetments other than Riprap **Caption:** Rating: Minimally Acceptable;
Remarks: Gabion basket torn on top. 15 ft long by 5 ft wide.; Station_1: 172+00



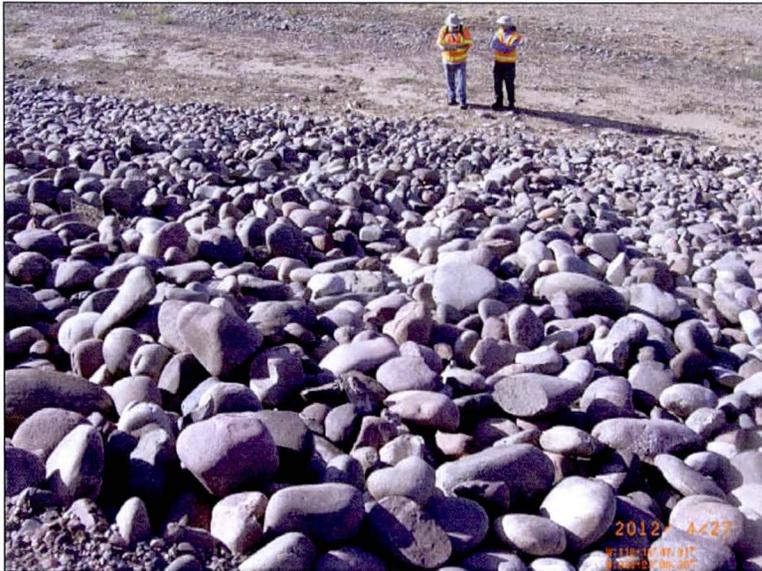
Inspect ID: TR10_2012_a_0035 **Title:** USACE_CESPL_TR10_2012_a_0035_1.jpg
Rated Item: 13. Revetments other than Riprap **Caption:** Rating: Minimally Acceptable;
Remarks: Approx 300 ft long of newer mattress lower than prior and corrosion noted on prior gabion wire.; Station_1: 136+00



Inspect ID: TR10_2012_a_0035 **Title:** USACE_CESPL_TR10_2012_a_0035_2.jpg
Rated Item: 13. Revetments other than Riprap **Caption:** Rating: Minimally Acceptable;
Remarks: Approx 300 ft long of newer mattress lower than prior and corrosion noted on prior gabion wire.; Station_1: 136+00



Inspect ID: TR10_2012_a_0035 **Title:** USACE_CESPL_TR10_2012_a_0035_3.jpg
Rated Item: 13. Revetments other than Riprap **Caption:** Rating: Minimally Acceptable;
Remarks: Approx 300 ft long of newer mattress lower than prior and corrosion noted on prior gabion wire.; Station_1: 136+00



Inspect ID: TR10_2012_a_0037 **Title:** USACE_CESPL_TR10_2012_a_0037_1.jpg
Rated Item: 13. Revetments other than Riprap **Caption:** Rating: Minimally Acceptable;
Remarks: Minor riprap displacement of revetment due to vehicle traffic.; Station_1:
133+00

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
1. Vegetation and Obstructions	M	A	No obstructions, vegetation, debris, or sediment accumulation noted within interior drainage channels or blocking the culverts, inlets, or discharge areas. Concrete joints and weep holes are free of grass and weeds.	TR10_2012_a_0011: Station_1 170+00: Sediment under bridge. Inlet of side drain blocked. Downstream end of culvert. Informed County of sediment build up while in field and County personnel stated that removal was scheduled.: Remove sediment. (M) TR10_2012_a_0020: Station_1 157+00: Sediment build-up on invert slab.: Remove sediment. (M) TR10_2012_a_0031: Station_1 149+00: Erosion at inlet channel. Vegetation could block inlet.: Repair erosion. (M) TR10_2012_a_0049: Station_1 104+00: 4 in debris in invert slab. No hand rail - safety issue!: Remove obstructions and recommend installation of hand rail for safety. (M) TR10_2012_a_0050: Station_1 104+00: Debris on invert slab. No hand rail - safety issue!: Remove debris and recommend installation of hand rail for safety. (M) TR10_2012_a_0052: Station_1 103+00: 18 in dia CMP. 10% obstruction.: Remove debris and restore condition of CMP. (M)
		M	Obstructions, vegetation, debris, or sediment are minor and have not impaired channel flow capacity or blocked more than 10% of any culvert openings, but should be removed. A limited volume of grass and weeds may be present in concrete channel joints and weep holes.	
		U	Obstructions, vegetation, debris, or sediment have impaired the channel flow capacity or blocked more than 10% of a culvert opening. Sediment and debris removal required to re-establish flow capacity.	
2. Encroachments	A	A	No trash, debris, unauthorized structures, excavations, or other obstructions present within the easement area. Encroachments have been previously reviewed by the Corps, and it was determined that they do not diminish proper functioning of the interior drainage system.	
		M	Trash, debris, unauthorized structures, excavations, or other obstructions present, or inappropriate activities noted that should be corrected but will not inhibit operations and maintenance or emergency operations. Encroachments have not been reviewed by the Corps.	
		U	Unauthorized encroachments or inappropriate activities noted are likely to inhibit operations and maintenance, emergency operations, or negatively impact the integrity of this component of the interior drainage system.	
3. Ponding Areas	NA	A	No trash, debris, structures, or other obstructions present within the ponding areas. Sediment deposits do not exceed 10% of capacity.	
		M	Trash, debris, excavations, structures, or other obstructions present, or inappropriate activities that will not inhibit operations and maintenance. Sediment deposits do not exceed 30% of capacity.	
		U	Trash, debris, excavations, structures, or other obstructions, or other encroachments or activities noted that will inhibit operations, maintenance, or emergency work. Sediment deposits exceeds 30% of capacity.	
		N/A	There are no ponding areas associated with the interior drainage system.	
4. Fencing and Gates ¹	M	A	Fencing is in good condition and provides protection against falling or unauthorized access. Gates open and close freely, locks are in place, and there is little corrosion on metal parts.	TR10_2012_a_0021: Station_1 157+00: Corrosion on railing.: Maintain railing to prevent further corrosion. It was

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
		M	Fencing or gates are damaged or corroded but appear to be maintainable. Locks may be missing or damaged.	noted by the inspection team that rails were not present on top of RCB walls. Although it understood that the rails were not part of the design, the team felt that it was a safety concern and recommen (M)
		U	Fencing and gates are damaged or corroded to the point that replacement is required, or potentially dangerous features are not secured.	
		N/A	There are no features noted that require safety fencing.	
5. Concrete Surfaces (Such as gate wells, outfalls, intakes, or culverts)	M	A	Negligible spalling, scaling or cracking. If the concrete surface is weathered or holds moisture, it is still satisfactory but should be seal coated to prevent freeze/ thaw damage.	TR10_2012_a_0007: Station_1 196+00: Minor spalling on channel wall. Small vegetation in channel along crack: Repair spalling and remove vegetation. (M) TR10_2012_a_0046: Station_1 106+00: Cracking along ramp (longitudinal) and minor cracking in grouted stone (transverse).: Monitor and repair crack. (M)
		M	Spalling, scaling, and open cracking present, but the immediate integrity or performance of the structure is not threatened. Reinforcing steel may be exposed. Repairs/ sealing is necessary to prevent additional damage during periods of thawing and freezing.	
		U	Surface deterioration or deep cracks present that may result in an unreliable structure. Any surface deterioration that exposes the sheet piling or lies adjacent to monolith joints may indicate underlying reinforcement corrosion and is unacceptable.	
		N/A	There are no concrete items in the interior drainage system.	
6. Tilting, Sliding or Settlement of Concrete and Sheet Pile Structures ² (Such as gate wells, outfalls, intakes, or culverts)	NA	A	There are no significant areas of tilting, sliding, or settlement that would endanger the integrity of the structure.	
		M	There are areas of tilting, sliding, or settlement (either active or inactive) that need to be repaired. The maximum offset, either laterally or vertically, does not exceed 2 inches unless the movement can be shown to be no longer actively occurring. The integrity of the structure is not in danger.	
		U	There are areas of tilting, sliding, or settlement (either active or inactive) that threaten the structure's integrity and performance. Any movement that has resulted in failure of the waterstop (possibly identified by daylight visible through the joint) is unacceptable. Differential movement of greater than 2 inches between any two adjacent monoliths, either laterally or vertically, is unacceptable unless it can be shown that the movement is no longer active. Also, if the floodwall is of l-wall construction, then any visible or measurable tilting of the wall toward the protected side that has created an open horizontal crack on the riverside base of a monolith is unacceptable.	
		N/A	There are no concrete items in the interior drainage system.	
7. Foundation of Concrete Structures ³ (Such as culverts, inlet and discharge structures, or gatewells.)	M	A	No active erosion, scouring, or bank caving that might endanger the structure's stability.	TR10_2012_a_0002: Station_1 210+00: Landside drainage channel inlet eroded 107th Ave side drain.: Repair erosion. (M) TR10_2012_a_0004: Station_1 202+00: Erosion at landside channel onprotected side. Erosion from irrigation run-off.: Repair erosion. (M) TR10_2012_a_0006: Station_1 196+00: Erosion at inlet to drain/channel. 109th Ave drain possible animal burrows
		M	There are areas where the ground is eroding towards the base of the structure. Efforts need to be taken to slow and repair this erosion, but it is not judged to be close enough to the structure or to be progressing rapidly enough to affect structural stability before the next inspection. The rate of erosion is such that the structure is expected to remain stabile until the next inspection.	
		U	Erosion or bank caving observed that may lead to structural instabilities before the next inspection.	

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
		N/A	There are no concrete items in the interior drainage system.	adjacent to drain.: Repair erosion and fix animal burrows. (M) TR10_2012_a_0008: Station_1 193+00: Erosion on landside and near channel on landside. Typical start of erosion on landside of channel possible result of over irrigation.: Repair erosion. (A) TR10_2012_a_0029: Station_1 150+00: Seepage and boil associated with over irrigation on protected side of landside channel.: Repair and monitor. (M) TR10_2012_a_0042: Station_1 111+00: 1 ft deep erosion gully on backside of grouted stone.: Repair erosion. (M) TR10_2012_a_0043: Station_1 111+00: 6 in deep erosion or burrow on DS end of concrete channel at top of grouted stone.: Repair erosion. (M) TR10_2012_a_0045: Station_1 110+00: Grouted stone in basin is undercut and cracking at termination approx 1 ft deep pool.: Repair grouted stone. (M) TR10_2012_a_0047: Station_1 106+00: 6 inches of undercutting at grouted stone from drain outfall.: Repair. (M)
8. Monolith Joints	A	A	The joint material is in good condition. The exterior joint sealant is intact and cracking/desiccation is minimal. Joint filler material and/or waterstop is not visible at any point.	
		M	The joint material has appreciable deterioration to the point where joint filler material and/or waterstop is visible in some locations. This needs to be repaired or replaced to prevent spalling and cracking during freeze/ thaw cycles, and to ensure water tightness of the joint.	
		U	The joint material is severely deteriorated or the concrete adjacent to the monolith joints has spalled and cracked, damaging the waterstop; in either case damage has occurred to the point where it is apparent that the joint is no longer watertight and will not provide the intended level of protection during a flood.	
		N/A	There are no monolith joints in the interior drainage system.	
9. Culverts/ Discharge Pipes ^d	M	A	There are no breaks, holes, cracks in the discharge pipes/ culverts that would result in significant water leakage. The pipe shape is still essentially circular. All joints appear to be closed and the soil tight. Corrugated metal pipes, if present, are in good condition with 100% of the original coating still in place (either asphalt or galvanizing) or have been relined with appropriate material, which is still in good condition. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.	TR10_2012_a_0018: Station_1 157+00: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. 115th Ave. No blockage to inlet or outlet.: None. (A) TR10_2012_a_0022: Station_1 154+00: 30 in dia RCP, flap gate w/ min debris. Video inspection performed by County Sub-contractor. Recommendations made within inspection report.: NA (M)

Rated Item	Rating	Rating Guidelines	Location/Remarks/Recommendations
		<p>M There are a small number of corrosion pinholes or cracks that could leak water and need to be repaired, but the entire length of pipe is still structurally sound and is not in danger of collapsing. Pipe shape may be ovalized in some locations but does not appear to be approaching a curvature reversal. A limited number of joints may have opened and soil loss may be beginning. Any open joints should be repaired prior to the next inspection. Corrugated metal pipes, if present, may be showing corrosion and pinholes but there are no areas with total section loss. Condition of pipes has been verified using television camera video taping or visual inspection methods within the past five years, and the report for every pipe is available for review by the inspector.</p> <p>U Culvert has deterioration and/or has significant leakage; it is in danger of collapsing or as already begun to collapse. Corrugated metal pipes have suffered 100% section loss in the invert. HOWEVER: Even if pipes appear to be in good condition, as judged by an external visual inspection, an Unacceptable Rating will be assigned if the condition of pipes has not been verified using television camera video taping or visual inspection methods within the past five years, and reports for all pipes are not available for review by the inspector.</p> <p>N/A There are no discharge pipes/ culverts.</p>	<p>TR10_2012_a_0028: Station_1 152+00: 18 in dia CMP shown on as-builts. Video inspection performed by County Sub-contractor. Recommendations made within inspection report.: NA (M)</p> <p>TR10_2012_a_0038: Station_1 129+00: Concrete side drain #6. Longitudinal cracking along collar.: Repair crack or replace collar. (M)</p> <p>TR10_2012_a_0051: Station_1 104+00: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. Based gate and inlets appear in good condition.: No action. (M)</p> <p>TR10_2012_a_0053: Station_1 103+00: 18 in dia CMP. No video inspection. No flap gate per plan. If deemed critical, overall rating of item would be rated U.: Provide information regarding the interior condition of the pipe. (M)</p>
10. Sluice / Slide Gates ⁵	NA	<p>A Gates open and close freely to a tight seal or minor leakage. Gate operators are in good working condition and are properly maintained. Sill is free of sediment and other obstructions. Gates and lifters have been maintained and are free of corrosion. Documentation provided during the inspection.</p> <p>M Gates and/or operators have been damaged or have minor corrosion, and open and close with resistance or binding. Leakage quantity is controllable, but maintenance is required. Sill is free of sediment and other obstructions.</p> <p>U Gates do not open or close and/or operators do not function. Gate, stem, lifter and/or guides may be damaged or have major corrosion.</p> <p>N/A There are no sluice/ slide gates.</p>	
11. Flap Gates/ Flap Valves/ Pinch Valves ¹	A	<p>A Gates/ valves open and close easily with minimal leakage, have no corrosion damage, and have been exercised and lubricated as required.</p> <p>M Gates/ valves will not fully open or close because of obstructions that can be easily removed, or have minor corrosion damage that requires maintenance.</p> <p>U Gates/ valves are missing, have been damaged, or have deteriorated to the point that they need to be replaced.</p> <p>N/A There are no flap gates.</p>	
12. Trash Racks	A	<p>A Trash racks are fastened in place and properly maintained.</p>	

Rated Item	Rating	Rating Guidelines		Location/Remarks/Recommendations
(non-mechanical)		M	Trash racks are in place but are unfastened or have bent bars that allow debris to enter into the pipe or pump station, bars are corroded to the point that up to 10% of the sectional area may be lost. Repair or replacement is required.	
		U	Trash racks are missing or damaged to the extent that they are no longer functional and must be replaced. (For example, more than 10% of the sectional area may be lost.)	
		N/A	There are no trash racks, or they are covered in the pump stations section of the report.	
13. Other Metallic Items	M	A	All metal parts are protected from corrosion damage and show no rust, damage, or deterioration that would cause a safety concern.	TR10_2012_a_0026: Station_1 155+00: Metal gate at inlet to be repaired by County.: None. (M)
		M	Corrosion seen on metallic parts appears to be maintainable.	
		U	Metallic parts are severely corroded and require replacement to prevent failure, equipment damage, or safety issues.	
		N/A	There are no other significant metallic items.	
14. Riprap Revetments of Inlet/ Discharge Areas	NA	A	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	
		M	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	
		N/A	There is no riprap protecting this feature of the segment / system, or riprap is discussed in another section.	
15. Revetments other than Riprap	NA	A	No riprap displacement or stone degradation that could pose an immediate threat to the integrity of channel bank. Riprap intact with no woody vegetation present.	
		M	Minor riprap displacement or stone degradation that could pose an immediate threat to the integrity of the channel bank. Unwanted vegetation must be cleared or sprayed with an appropriate herbicide.	
		U	Significant riprap displacement, exposure of bedding, or stone degradation observed. Scour activity is undercutting banks, eroding embankments, or impairing channel flows by causing turbulence or shoaling. Rock protection is hidden by dense brush, trees, or grasses.	
		N/A	There are no such revetments protecting this feature of the segment / system.	

¹ Proper operation of this item must be demonstrated during the inspection.

² The sponsor should be monitoring any observed movement to verify whether the movement is active or inactive.

³ Inspectors must have as-built drawings available during the inspection so that the lateral distance to the heel and toe of the floodwalls can be determined in the field.

⁴ The decision on whether or not USACE inspectors should enter a pipe to perform a detailed inspection must be made at the USACE District level. This decision should be made in conjunction with the District Safety Office, as pipes may be considered confined spaces. This decision should consider the age of the pipe, the diameter of the pipe, the apparent condition of the pipe, and the length of the pipe. If a pipe is entered for the purposes of inspection, the inspector should record observations with a video camera in order that the condition of the entire pipe, including all joints, can later be assessed. Additionally, the video record provides a baseline to which future inspections can be compared.

⁵ Proper operation of the gates (full open and closed) must be demonstrated during the inspection if no documentation is available. Be aware of both manual and electrical operators.



Inspect ID: TR10_2012_a_0011 **Title:** USACE_CESPL_TR10_2012_a_0011_1.jpg
Rated Item: 1. Vegetation and Obstructions **Caption:** Rating: Minimally Acceptable;
Remarks: Sediment under bridge. Inlet of side drain blocked. Downstream end of culvert. Informed County of sediment build up while in field and County personnel stated that removal was scheduled.; Station_1: 170+00



Inspect ID: TR10_2012_a_0011 **Title:** USACE_CESPL_TR10_2012_a_0011_2.jpg
Rated Item: 1. Vegetation and Obstructions **Caption:** Rating: Minimally Acceptable;
Remarks: Sediment under bridge. Inlet of side drain blocked. Downstream end of culvert. Informed County of sediment build up while in field and County personnel stated that removal was scheduled.; Station_1: 170+00



Inspect ID: TR10_2012_a_0020 **Title:** USACE_CESPL_TR10_2012_a_0020_1.jpg
Rated Item: 1. Vegetation and Obstructions **Caption:** Rating: Minimally Acceptable;
Remarks: Sediment build-up on invert slab.; Station_1: 157+00



Inspect ID: TR10_2012_a_0031 **Title:** USACE_CESPL_TR10_2012_a_0031_1.jpg
Rated Item: 1. Vegetation and Obstructions **Caption:** Rating: Minimally Acceptable;
Remarks: Erosion at inlet channel. Vegetation could block inlet.; Station_1: 149+00



Inspect ID: TR10_2012_a_0049 **Title:** USACE_CESPL_TR10_2012_a_0049_1.jpg
Rated Item: 1. Vegetation and Obstructions **Caption:** Rating: Minimally Acceptable;
Remarks: 4 in debris in invert slab. No hand rail - safety issue!; Station_1: 104+00



Inspect ID: TR10_2012_a_0049 **Title:** USACE_CESPL_TR10_2012_a_0049_2.jpg
Rated Item: 1. Vegetation and Obstructions **Caption:** Rating: Minimally Acceptable;
Remarks: 4 in debris in invert slab. No hand rail - safety issue!; Station_1: 104+00



Inspect ID: TR10_2012_a_0050 **Title:** USACE_CESPL_TR10_2012_a_0050_1.jpg
Rated Item: 1. Vegetation and Obstructions **Caption:** Rating: Minimally Acceptable;
Remarks: Debris on invert slab. No hand rail - safety issue!; Station_1: 104+00



Inspect ID: TR10_2012_a_0052 **Title:** USACE_CESPL_TR10_2012_a_0052_1.jpg
Rated Item: 1. Vegetation and Obstructions **Caption:** Rating: Minimally Acceptable;
Remarks: 18 in dia CMP. 10% obstruction.; Station_1: 103+00



Inspect ID: TR10_2012_a_0052 **Title:** USACE_CESPL_TR10_2012_a_0052_2.jpg
Rated Item: 1. Vegetation and Obstructions **Caption:** Rating: Minimally Acceptable;
Remarks: 18 in dia CMP. 10% obstruction.; Station_1: 103+00



Inspect ID: TR10_2012_a_0021 **Title:** USACE_CESPL_TR10_2012_a_0021_1.jpg
Rated Item: 4. Fencing and Gates **Caption:** Rating: Minimally Acceptable; **Remarks:**
Corrosion on railing.; Station_1: 157+00



Inspect ID: TR10_2012_a_0021 **Title:** USACE_CESPL_TR10_2012_a_0021_2.jpg
Rated Item: 4. Fencing and Gates **Caption:** Rating: Minimally Acceptable; Remarks: Corrosion on railing.; Station_1: 157+00



Inspect ID: TR10_2012_a_0007 **Title:** USACE_CESPL_TR10_2012_a_0007_1.jpg
Rated Item: 5. Concrete Surfaces (Such as gate wells, outfalls, intakes, or culverts)
Caption: Rating: Minimally Acceptable; Remarks: Minor spalling on channel wall. Small vegetation in channel along crack; Station_1: 196+00



Inspect ID: TR10_2012_a_0007 **Title:** USACE_CESPL_TR10_2012_a_0007_2.jpg
Rated Item: 5. Concrete Surfaces (Such as gate wells, outfalls, intakes, or culverts)
Caption: Rating: Minimally Acceptable; Remarks: Minor spalling on channel wall. Small vegetation in channel along crack; Station_1: 196+00



Inspect ID: TR10_2012_a_0007 **Title:** USACE_CESPL_TR10_2012_a_0007_3.jpg
Rated Item: 5. Concrete Surfaces (Such as gate wells, outfalls, intakes, or culverts)
Caption: Rating: Minimally Acceptable; Remarks: Minor spalling on channel wall. Small vegetation in channel along crack; Station_1: 196+00



Inspect ID: TR10_2012_a_0046 **Title:** USACE_CESPL_TR10_2012_a_0046_1.jpg
Rated Item: 5. Concrete Surfaces (Such as gate wells, outfalls, intakes, or culverts)
Caption: Rating: Minimally Acceptable; Remarks: Cracking along ramp (longitudinal) and minor cracking in grouted stone (transverse).; Station_1: 106+00



Inspect ID: TR10_2012_a_0046 **Title:** USACE_CESPL_TR10_2012_a_0046_2.jpg
Rated Item: 5. Concrete Surfaces (Such as gate wells, outfalls, intakes, or culverts)
Caption: Rating: Minimally Acceptable; Remarks: Cracking along ramp (longitudinal) and minor cracking in grouted stone (transverse).; Station_1: 106+00



Inspect ID: TR10_2012_a_0046 **Title:** USACE_CESPL_TR10_2012_a_0046_3.jpg
Rated Item: 5. Concrete Surfaces (Such as gate wells, outfalls, intakes, or culverts)
Caption: Rating: Minimally Acceptable; Remarks: Cracking along ramp (longitudinal) and minor cracking in grouted stone (transverse).; Station_1: 106+00



Inspect ID: TR10_2012_a_0002 **Title:** USACE_CESPL_TR10_2012_a_0002_2.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: Landside drainage channel inlet eroded 107th Ave side drain.; Station_1: 210+00



Inspect ID: TR10_2012_a_0004 **Title:** USACE_CESPL_TR10_2012_a_0004_1.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: Erosion at landside channel onprotected side. Erosion from irrigation run-off.; Station_1: 202+00



Inspect ID: TR10_2012_a_0004 **Title:** USACE_CESPL_TR10_2012_a_0004_2.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: Erosion at landside channel onprotected side. Erosion from irrigation run-off.; Station_1: 202+00



Inspect ID: TR10_2012_a_0006 **Title:** USACE_CESPL_TR10_2012_a_0006_1.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: Erosion at inlet to drain/channel. 109th Ave drain possible animal burrows adjacent to drain.; Station_1: 196+00



Inspect ID: TR10_2012_a_0006 **Title:** USACE_CESPL_TR10_2012_a_0006_2.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: Erosion at inlet to drain/channel. 109th Ave drain possible animal burrows adjacent to drain.; Station_1: 196+00



Inspect ID: TR10_2012_a_0006 **Title:** USACE_CESPL_TR10_2012_a_0006_3.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: Erosion at inlet to drain/channel. 109th Ave drain possible animal burrows adjacent to drain.; Station_1: 196+00



Inspect ID: TR10_2012_a_0006 **Title:** USACE_CESPL_TR10_2012_a_0006_4.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: Erosion at inlet to drain/channel. 109th Ave drain possible animal burrows adjacent to drain.; Station_1: 196+00



Inspect ID: TR10_2012_a_0008 **Title:** USACE_CESPL_TR10_2012_a_0008_1.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Acceptable; Remarks: Erosion on landside and near channel on landside. Typical start of erosion on landside of channel possible result of over irrigation.; Station_1: 193+00



Inspect ID: TR10_2012_a_0008 **Title:** USACE_CESPL_TR10_2012_a_0008_2.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Acceptable; Remarks: Erosion on landside and near channel on landside. Typical start of erosion on landside of channel possible result of over irrigation.; Station_1: 193+00



Inspect ID: TR10_2012_a_0029 **Title:** USACE_CESPL_TR10_2012_a_0029_1.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: Seepage and boil associated with over irrigation on protected side of landside channel.; Station_1: 150+00



Inspect ID: TR10_2012_a_0029 **Title:** USACE_CESPL_TR10_2012_a_0029_2.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: Seepage and boil associated with over irrigation on protected side of landside channel.; Station_1: 150+00



Inspect ID: TR10_2012_a_0042 **Title:** USACE_CESPL_TR10_2012_a_0042_1.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: 1 ft deep erosion gully on backside of grouted stone.; Station_1: 111+00



Inspect ID: TR10_2012_a_0042 **Title:** USACE_CESPL_TR10_2012_a_0042_2.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: 1 ft deep erosion gully on backside of grouted stone.; Station_1: 111+00



Inspect ID: TR10_2012_a_0042 **Title:** USACE_CESPL_TR10_2012_a_0042_3.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: 1 ft deep erosion gully on backside of grouted stone.; Station_1: 111+00



Inspect ID: TR10_2012_a_0043 **Title:** USACE_CESPL_TR10_2012_a_0043_1.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: 6 in deep erosion or burrow on DS end of concrete channel at top of grouted stone.; Station_1: 111+00



Inspect ID: TR10_2012_a_0045 **Title:** USACE_CESPL_TR10_2012_a_0045_1.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: Grouted stone in basin is undercut and cracking at termination approx 1 ft deep pool.; Station_1: 110+00



Inspect ID: TR10_2012_a_0047 **Title:** USACE_CESPL_TR10_2012_a_0047_1.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: 6 inches of undercutting at grouted stone from drain outfall.; Station_1: 106+00



Inspect ID: TR10_2012_a_0047 **Title:** USACE_CESPL_TR10_2012_a_0047_2.jpg
Rated Item: 7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.) **Caption:** Rating: Minimally Acceptable; Remarks: 6 inches of undercutting at grouted stone from drain outfall.; Station_1: 106+00



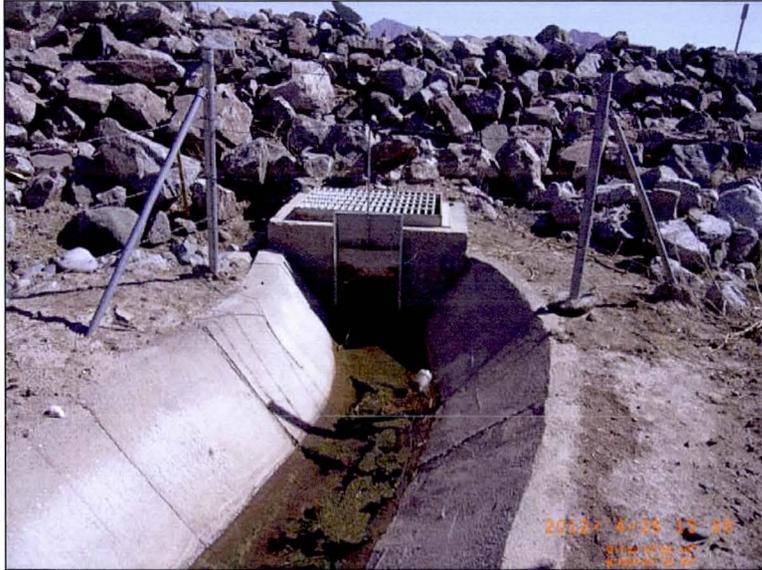
Inspect ID: TR10_2012_a_0018 **Title:** USACE_CESPL_TR10_2012_a_0018_1.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Acceptable; Remarks: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. 115th Ave. No blockage to inlet or outlet.; Station_1: 157+00



Inspect ID: TR10_2012_a_0018 **Title:** USACE_CESPL_TR10_2012_a_0018_2.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Acceptable; Remarks: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. 115th Ave. No blockage to inlet or outlet.; Station_1: 157+00



Inspect ID: TR10_2012_a_0022 **Title:** USACE_CESPL_TR10_2012_a_0022_1.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable; Remarks: 30 in dia RCP, flap gate w/ min debris. Video inspection performed by County Sub-contractor. Recommendations made within inspection report.; Station_1: 154+00



Inspect ID: TR10_2012_a_0028 **Title:** USACE_CESPL_TR10_2012_a_0028_1.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 18 in dia CMP shown on as-builts. Video inspection performed by County Sub-contractor. Recommendations made within inspection report. ; Station_1: 152+00



Inspect ID: TR10_2012_a_0028 **Title:** USACE_CESPL_TR10_2012_a_0028_2.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 18 in dia CMP shown on as-builts. Video inspection performed by County Sub-contractor. Recommendations made within inspection report. ; Station_1: 152+00



Inspect ID: TR10_2012_a_0038 **Title:** USACE_CESPL_TR10_2012_a_0038_1.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: Concrete side drain #6. Longitudinal cracking along collar.; Station_1: 129+00



Inspect ID: TR10_2012_a_0038 **Title:** USACE_CESPL_TR10_2012_a_0038_2.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: Concrete side drain #6. Longitudinal cracking along collar.; Station_1: 129+00



Inspect ID: TR10_2012_a_0051 **Title:** USACE_CESPL_TR10_2012_a_0051_1.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. Based gate and inlets appear in good condition.; Station_1: 104+00



Inspect ID: TR10_2012_a_0051 **Title:** USACE_CESPL_TR10_2012_a_0051_2.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. Based gate and inlets appear in good condition.; Station_1: 104+00



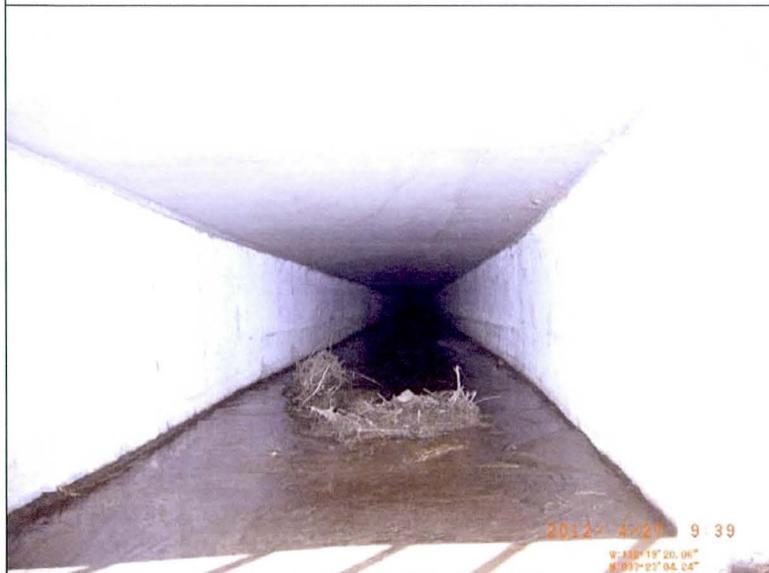
Inspect ID: TR10_2012_a_0051 **Title:** USACE_CESPL_TR10_2012_a_0051_3.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. Based gate and inlets appear in good condition.; Station_1: 104+00



Inspect ID: TR10_2012_a_0051 **Title:** USACE_CESPL_TR10_2012_a_0051_4.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. Based gate and inlets appear in good condition.; Station_1: 104+00



Inspect ID: TR10_2012_a_0051 **Title:** USACE_CESPL_TR10_2012_a_0051_5.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. Based gate and inlets appear in good condition.; Station_1: 104+00



Inspect ID: TR10_2012_a_0051 **Title:** USACE_CESPL_TR10_2012_a_0051_6.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. Based gate and inlets appear in good condition.; Station_1: 104+00



Inspect ID: TR10_2012_a_0051 **Title:** USACE_CESPL_TR10_2012_a_0051_7.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. Based gate and inlets appear in good condition.; Station_1: 104+00



Inspect ID: TR10_2012_a_0051 **Title:** USACE_CESPL_TR10_2012_a_0051_8.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 5-celled 3 ft x 5 ft RCB with flap gate and trash rack. Based gate and inlets appear in good condition.; Station_1: 104+00



Inspect ID: TR10_2012_a_0053 **Title:** USACE_CESPL_TR10_2012_a_0053_1.jpg
Rated Item: 9. Culverts/ Discharge Pipes **Caption:** Rating: Minimally Acceptable;
Remarks: 18 in dia CMP. No video inspection. No flap gate per plan. If deemed critical, overall rating of item would be rated U.; Station_1: 103+00



Inspect ID: TR10_2012_a_0026 **Title:** USACE_CESPL_TR10_2012_a_0026_1.jpg
Rated Item: 13. Other Metallic Items **Caption:** Rating: Minimally Acceptable;
Remarks: Metal gate at inlet to be repaired by County.; Station_1: 155+00



Inspect ID: TR10_2012_a_0026 **Title:** USACE_CESPL_TR10_2012_a_0026_2.jpg
Rated Item: 13. Other Metallic Items **Caption:** Rating: Minimally Acceptable;
Remarks: Metal gate at inlet to be repaired by County.; Station_1: 155+00

Flood Damage Reduction Segment / System Supplemental Data Sheet

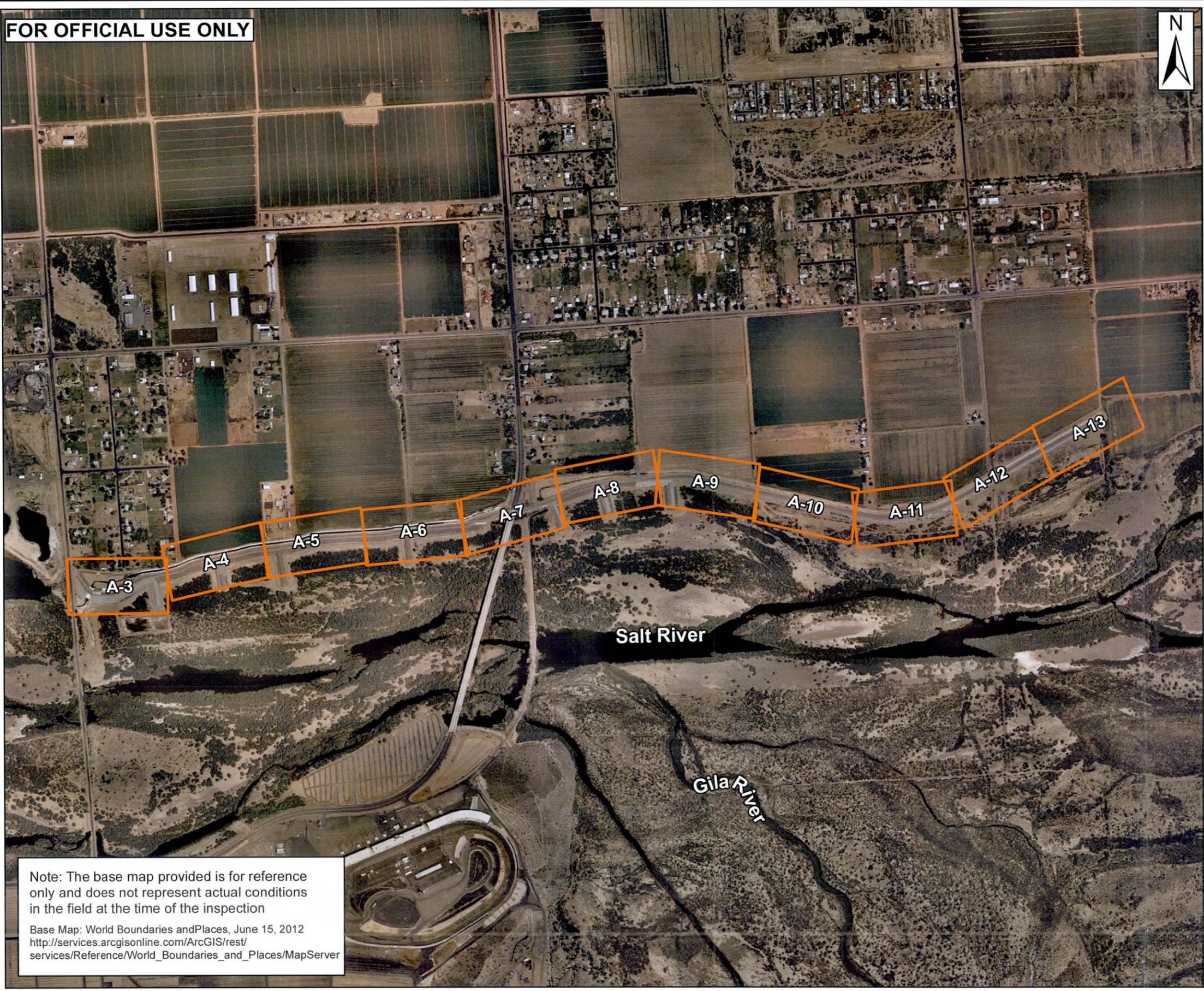
This form is intended for the Corps' internal use and may not need to be updated with every inspection.

Name of Segment / System: Tres Rios North Levee System			
Sponsor: Flood Control District of Maricopa County			
Location: Community of Avondale, Southwest of City of Phoenix, Maricopa County, Arizona			
River Basin: Salt River and Gila River			
Project Description: Flood Control Levee on Right (North) Bank of			
Authority that Project was Constructed Under: PCA between USACE and City of Phoenix, Arizona (see NLSER report for details)			
Date of Construction:			
Approximate Annual Maintenance Costs:			
Construction:	<input checked="" type="checkbox"/> Federally Constructed <input type="checkbox"/> Non-Federally Constructed		
Maintenance:	<input type="checkbox"/> Federally Maintained <input checked="" type="checkbox"/> Non-Federally Maintained		
National Flood Insurance Program:			
a.	Is the project currently NFIP? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
b.	If in the NFIP, Date of Certification (per 44 CFR 65.10):		
Datum Information:			
a.	Datum used for the design and construction of this project is: National Geodetic Vertical Datum of 1929. The project benchmark is NGSBM H 395		
b.	Current recommended datum for this project is:		
c.	Has the Project been converted to the current recommended datum? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Levee Embankment Data:	Protected Features (For use in preparing estimates and PIRs):		
a.	Levee Designed Gage Function Reading/Station: Not Applicable	a.	Total acres protected: Not available
b.	Level of Protection Provided: 1% AEP Flood	b.	Total agriculture production acres protected: Not available
c.	Average Height of Levee: Varies	c.	Towns: Not available
d.	Average Crown Width: 14 feet	d.	Businesses: Not available
e.	Average Side Slope: For levee: typical 2.5H:1V on riverside, 3H:1V on	e.	Residences: Not available
		f.	Roads: Not available
		g.	Utilities: Not available
		h.	Barns: Not available
		i.	Machine Sheds: Not available
		j.	Outbuildings: Not available
		k.	Irrigation Systems: Not available
		l.	Grain Bins: Not available
		m.	Other Facilities: Not available



Appendix F2
Inspection Maps

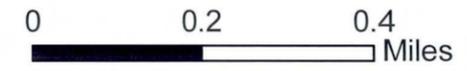
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Sheet Name Refers to the Figures on the Following Pages for Example:

A-3

=
Figure A-3



TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

Results of Field Inspection
Sheet Index

 U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

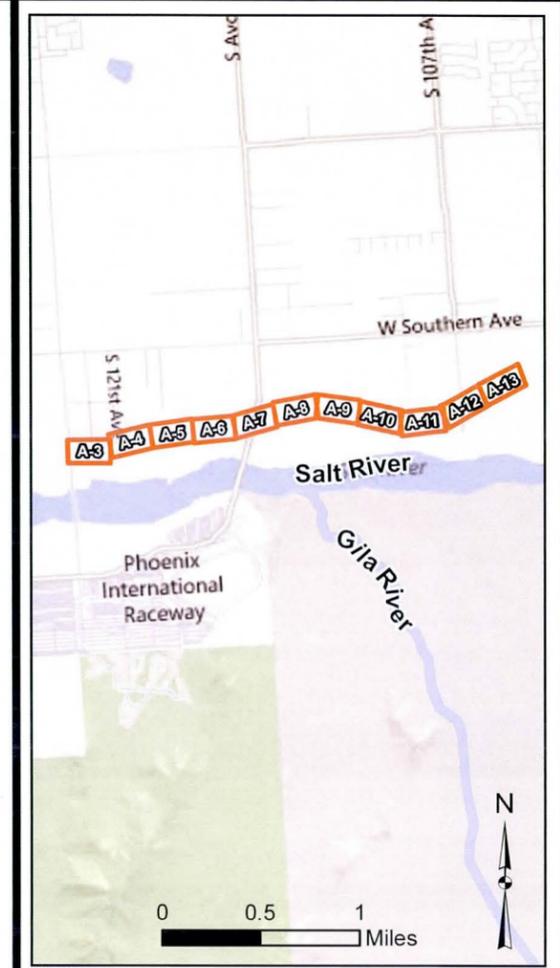
Note: The base map provided is for reference only and does not represent actual conditions in the field at the time of the inspection
Base Map: World Boundaries and Places, June 15, 2012
http://services.arcgisonline.com/ArcGIS/rest/services/Reference/World_Boundaries_and_Places/MapServer

Figure A-1

Deficiency Code	Inspection Finding
General Items	
G1	1. Operations and Maintenance Manuals
G2	2. Emergency Supplies and Equipment (A or M only)
G3	3. Flood Preparedness and Training (A or M only)
Levee Embankments	
L1	1. Unwanted Vegetation Growth
L2	2. Sod Cover
L3	3. Encroachments
L4	4. Closure Structures (Stop Log, Earthen Closures, Gates, or Sandbag Closures) (A or U only)
L5	5. Slope Stability
L6	6. Erosion / Bank Caving
L7	7. Settlement
L8	8. Depressions / Rutting
L9	9. Cracking
L10	10. Animal Control
L11	11. Culverts / Discharge Pipes (This item includes both concrete and corrugated metal pipes.)
L12	12. Riprap Revetments & Bank Protection
L13	13. Revetments other than Riprap
L14	14. Underseepage Relief Wells / Toe Drainage Systems
L15	15. Seepage
Floodwalls	
F1	1. Unwanted Vegetation Growth
F2	2. Encroachments
F3	3. Closure Structures (Stop Log Closures and Gates) (A or U only)
F4	4. Concrete Surfaces
F5	5. Tilting, Sliding or Settlement of Concrete Structures
F6	6. Foundation of Concrete Structures
F7	7. Monolith Joints
F8	8. Underseepage Relief Wells / Toe Drainage Systems
F9	9. Seepage
Interior Drainage System	
I1	1. Vegetation and Obstructions
I2	2. Encroachments
I3	3. Ponding Areas
I4	4. Fencing and Gates
I5	5. Concrete Surfaces (Such as gate wells, outfalls, intakes, or culverts)
I6	6. Tilting, Sliding or Settlement of Concrete and Sheet Pile Structures (Such as gate wells, outfalls, intakes, or culverts)
I7	7. Foundation of Concrete Structures (Such as culverts, inlet and discharge structures, or gatewells.)
I8	8. Monolith Joints
I9	9. Culverts / Discharge Pipes
I10	10. Sluice / Slide Gates
I11	11. Flap Gates / Flap Valves / Pinch Valves
I12	12. Trash Racks (non-mechanical)
I13	13. Other Metallic Items
I14	14. Riprap Revetments of Inlet / Discharge Areas
I15	15. Revetments other than Riprap

Deficiency Code	Inspection Finding
Pump Stations	
P1	1. Pump Stations Operating, Maintenance, Training, & Inspection Records
P2	2. Pump Station Operations and Maintenance Equipment Manuals
P3	3. Safety Compliance
P4	4. Communications (A or M only)
P5	5. Plant Building
P6	6. Fencing and Gates
P7	7. Pumps
P8	8. Motors, Engines, Fans, Gear Reducers, Back Stop Devices, etc.
P9	9. Sumps / Wet well
P10	10. Mechanical Operating Trash Rakes
P11	11. Non-Mechanical Trash Racks
P12	12. Fuel System for Pump Engines
P13	13. Power Source
P14	14. Electrical Systems
P15	15. Megger Testing on Pump Motors and Critical Power Cables
P16	16. Enclosures, Panels, Conduit and Ducts
P17	17. Intake and Discharge Pipelines
P18	18. Sluice / Slide Gates
P19	19. Flap Gates / Flap Valves / Pinch Valves
P20	20. Cranes
P21	21. Other Metallic Items (Equipment, Ladders, Platform Anchors, etc)
Flood Damage Reduction Channels	
C1	1. Vegetation and Obstructions
C2	2. Shoaling (sediment deposition)
C3	3. Encroachments
C4	4. Erosion
C5	5. Concrete Surfaces
C6	6. Tilting, Sliding or Settlement of Concrete Structures
C7	7. Foundation of Concrete Structures
C8	8. Slab and Monolith Joints
C9	9. Flap Gates / Flap Valves / Pinch Valves
C10	10. Riprap Revetments & Banks
C11	11. Revetments other than Riprap

Pipe Type
 CMP = corrugated metal pipe
 RCP = reinforced concrete pipe
 RCB = reinforced concrete box



Deficiency Codes for Use With Results of Field Inspection Maps

TRES RIOS (AZ) LEVEE SYSTEM EVALUATION REPORT 2012

Results of Field Inspection Deficiency Codes

FOR OFFICIAL USE ONLY



Figure A-2

FOR OFFICIAL USE ONLY

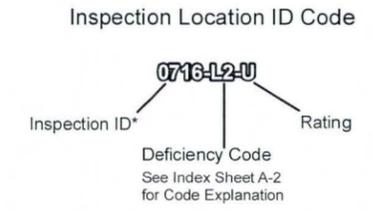


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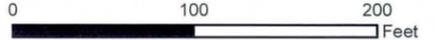
- Point Inspection**
- A - Acceptable
 - M - Minimally Acceptable
 - U - Unacceptable

- Linear Inspection**
- A - Acceptable
 - M - Minimally Acceptable
 - U - Unacceptable

- 325+00** Project Station
- 12" RCP** Pipe Dia & Type
- - - Parcel Data



* Last Four Digits of Inspection ID
e.g. USACE_CESPL_TR10_2012_a_0001



TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

**Results of Field Inspection
Tres Rios**

Station 103+00 to 113+00

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

Figure A-3

FOR OFFICIAL USE ONLY



Legend

Point Inspection

- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

Linear Inspection

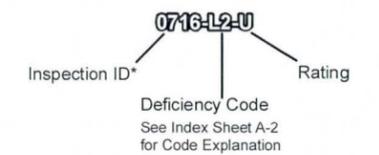
- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

325+00 Project Station

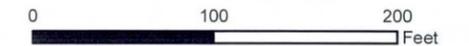
12" RCP Pipe Dia & Type

Parcel Data

Inspection Location ID Code



* Last Four Digits of Inspection ID
e.g. USACE_CESPL_TR10_2012_a_0001



TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

Results of Field Inspection
Tres Rios

Station 113+00 to 124+00



U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

Figure A-4



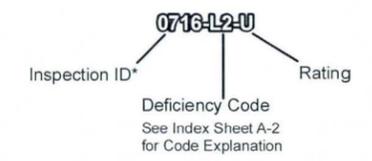
Legend

- Point Inspection**
- A - Acceptable
 - M - Minimally Acceptable
 - U - Unacceptable

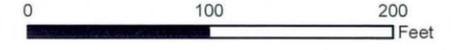
- Linear Inspection**
- A - Acceptable
 - M - Minimally Acceptable
 - U - Unacceptable

- 325+00** Project Station
- 12" RCP** Pipe Dia & Type
- - - - - Parcel Data

Inspection Location ID Code



* Last Four Digits of Inspection ID
e.g. USACE_CESPL_TR10_2012_a_0001



TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

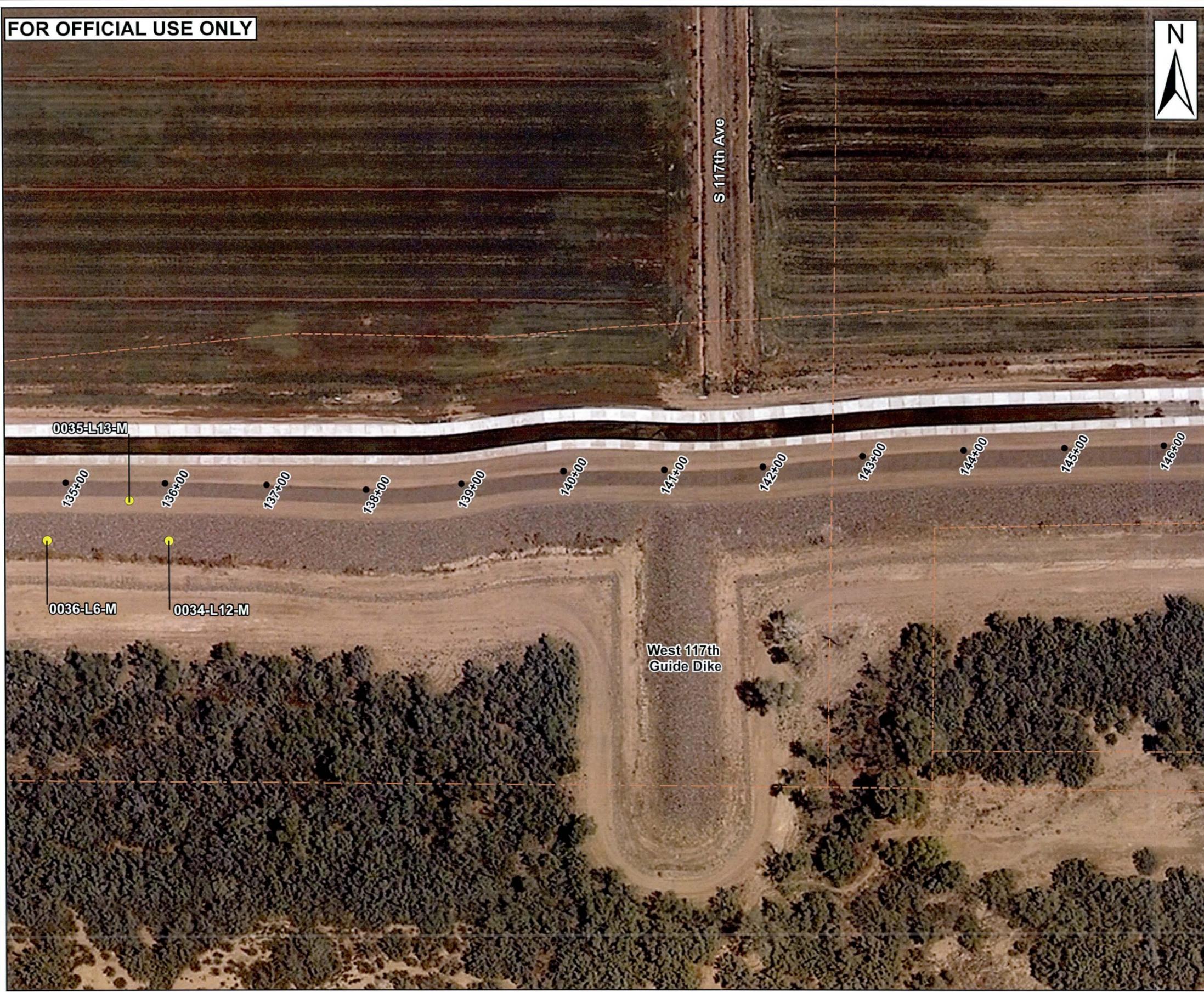
**Results of Field Inspection
Tres Rios**

Station 124+00 to 135+00



Figure A-5

FOR OFFICIAL USE ONLY

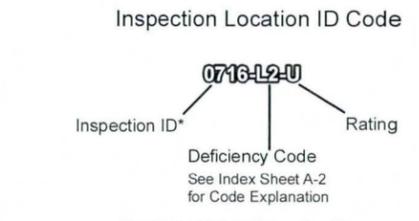


Legend

- Point Inspection
- A - Acceptable
 - M - Minimally Acceptable
 - U - Unacceptable

- Linear Inspection
- A - Acceptable
 - M - Minimally Acceptable
 - U - Unacceptable

- 325+00** Project Station
- 12" RCP** Pipe Dia & Type
- - - - Parcel Data



* Last Four Digits of Inspection ID
e.g. USACE_CESPL_TR10_2012_a_0001

0 100 200 Feet

TRES RIOS (AZ) LEVEE SYSTEM EVALUATION REPORT 2012

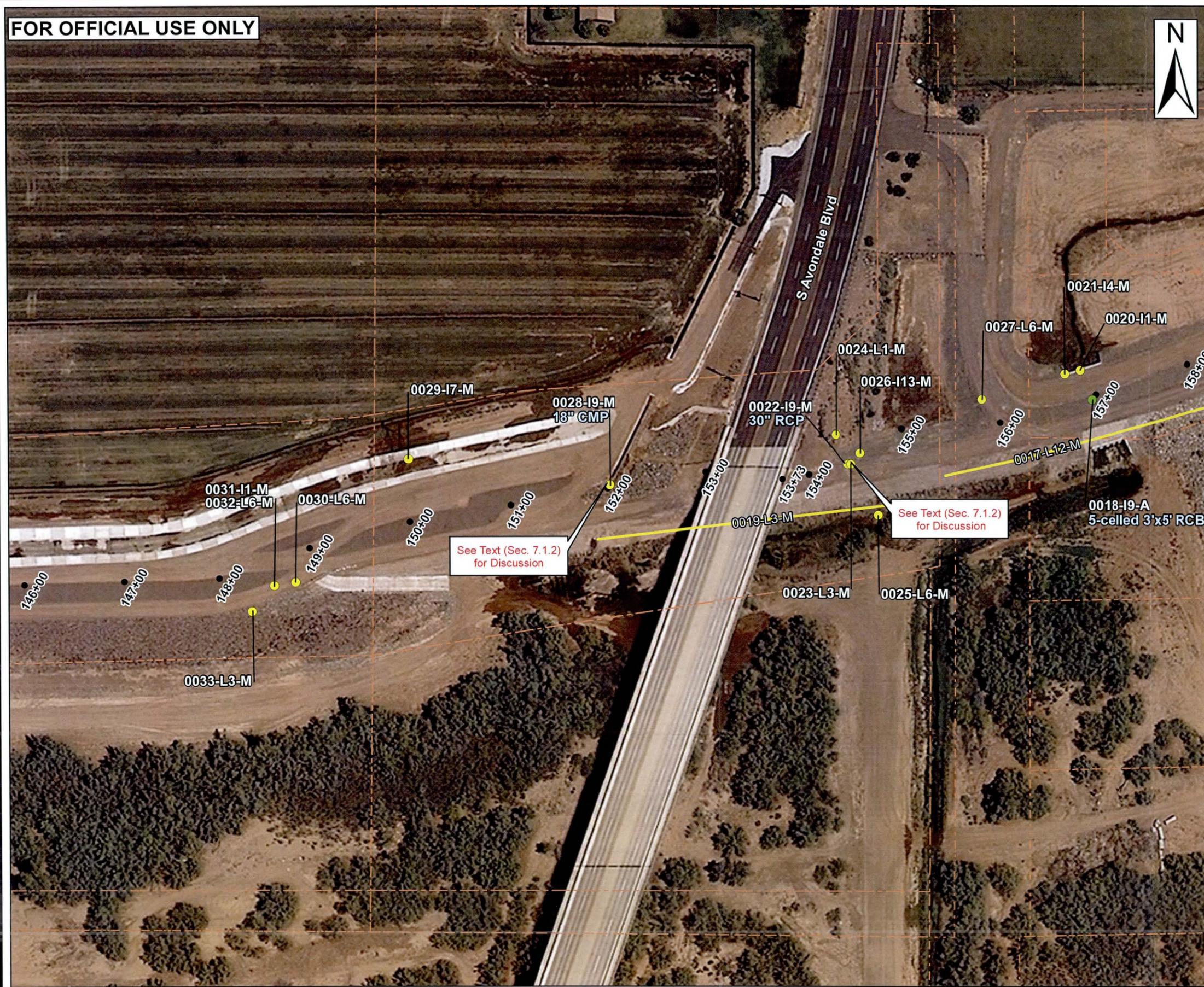
Results of Field Inspection Tres Rios

Station 135+00 to 146+00



Figure A-6

FOR OFFICIAL USE ONLY



Legend

Point Inspection

- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

Linear Inspection

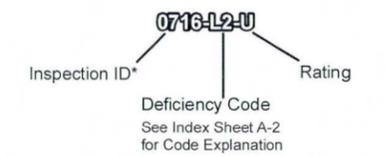
- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

325+00 Project Station

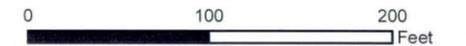
12" RCP Pipe Dia & Type

- - - - Parcel Data

Inspection Location ID Code



* Last Four Digits of Inspection ID
e.g. USACE_CESPL_TR10_2012_a_0001



TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

**Results of Field Inspection
Tres Rios**

Station 146+00 to 158+00



U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

Figure A-7

FOR OFFICIAL USE ONLY



Legend

Point Inspection

- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

Linear Inspection

- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

325+00 Project Station

12" RGP Pipe Dia & Type

- - - - Parcel Data

Inspection Location ID Code

0716-L2-U

Inspection ID* Rating

Deficiency Code
See Index Sheet A-2
for Code Explanation

* Last Four Digits of Inspection ID
e.g. USACE_CESPL_TR10_2012_a_0001

0 100 200
Feet

TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

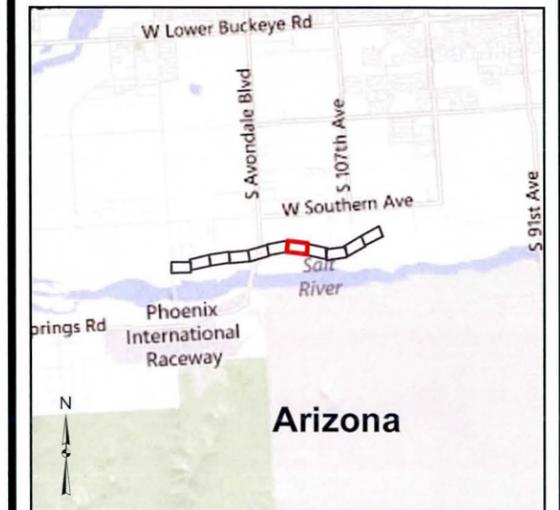
**Results of Field Inspection
Tres Rios**

Station 158+00 to 169+00

U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

Figure A-8

FOR OFFICIAL USE ONLY



Legend

Point Inspection

- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

Linear Inspection

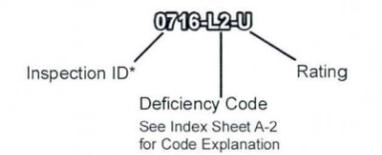
- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

325+00 Project Station

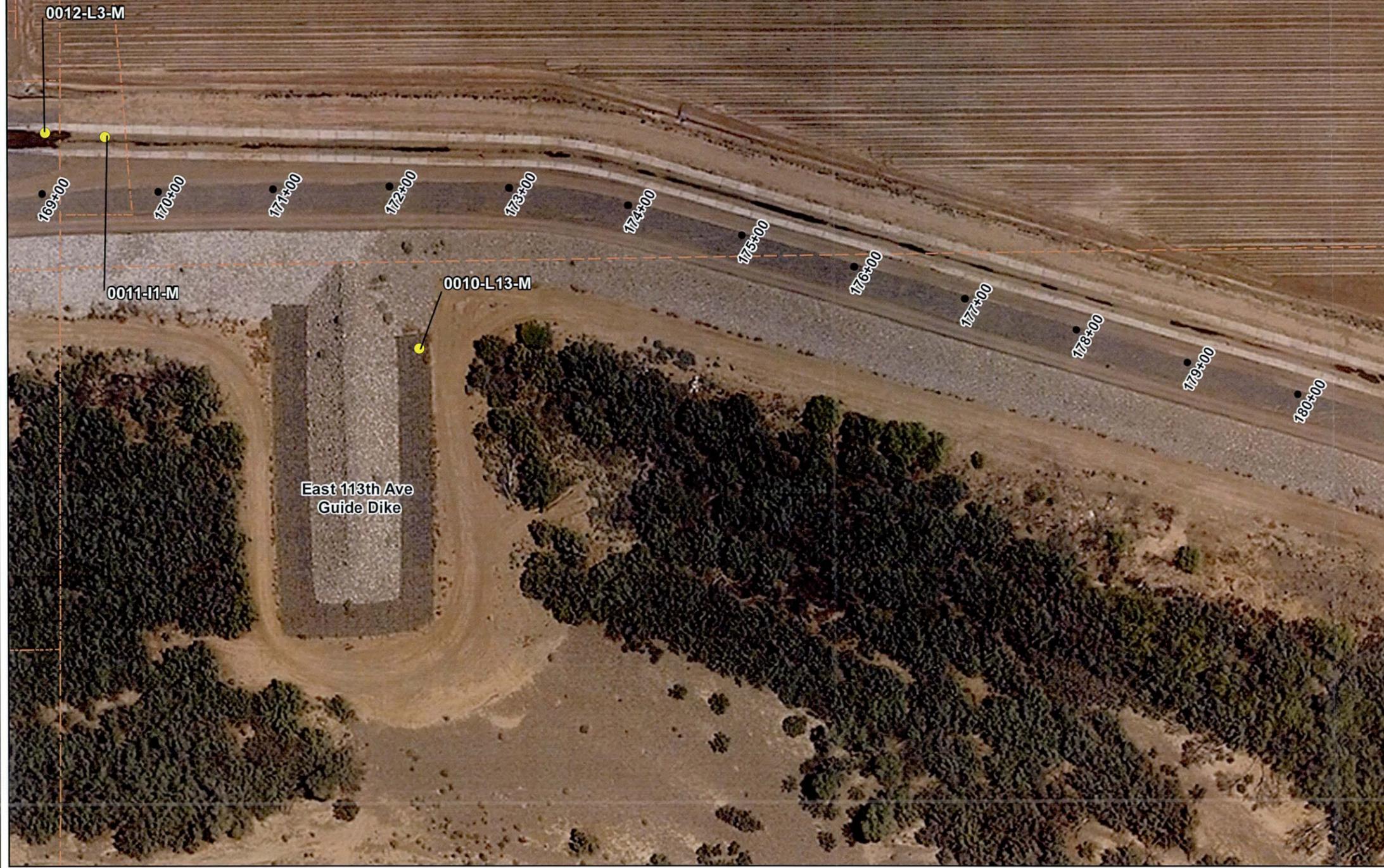
12" RGP Pipe Dia & Type

Parcel Data

Inspection Location ID Code



* Last Four Digits of Inspection ID
e.g. USACE_CESPL_TR10_2012_a_0001



TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

Results of Field Inspection
Tres Rios

Station 169+00 to 180+00



U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

Figure A-9

FOR OFFICIAL USE ONLY



Legend

- Point Inspection
- A - Acceptable
 - M - Minimally Acceptable
 - U - Unacceptable

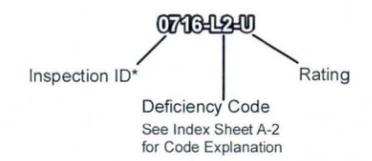
- Linear Inspection
- A - Acceptable
 - M - Minimally Acceptable
 - U - Unacceptable

325+00 Project Station

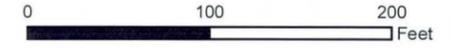
12" RCP Pipe Dia & Type

Parcel Data

Inspection Location ID Code



* Last Four Digits of Inspection ID
e.g. USACE_CESPL_TR10_2012_a_0001



TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

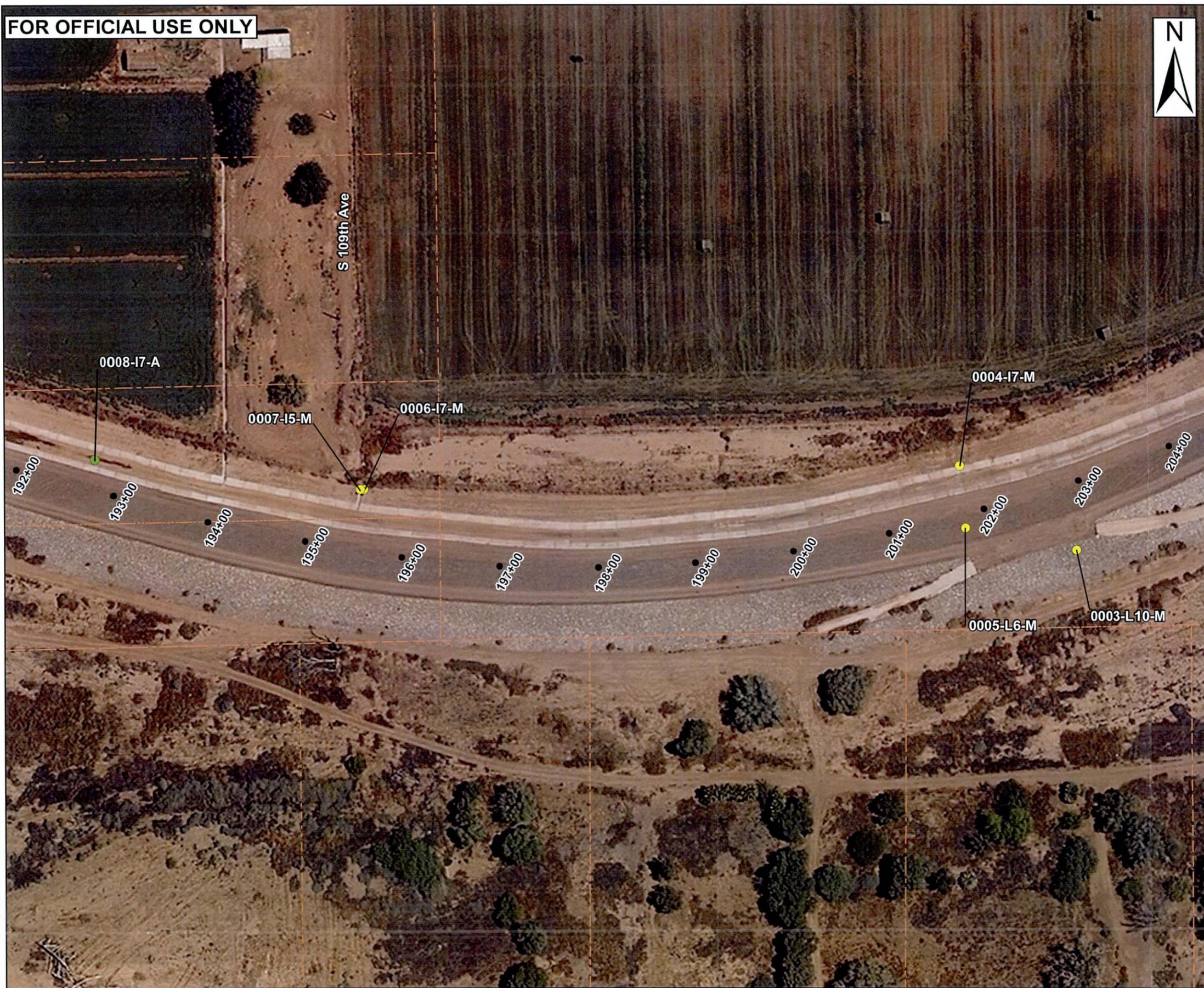
Results of Field Inspection
Tres Rios

Station 180+00 to 192+00



Figure A-10

FOR OFFICIAL USE ONLY



Legend

Point Inspection

- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

Linear Inspection

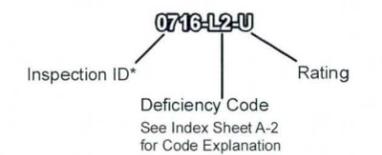
- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

325+00 Project Station

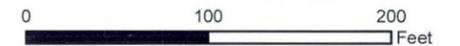
12" RGP Pipe Dia & Type

Parcel Data

Inspection Location ID Code



* Last Four Digits of Inspection ID
e.g. USACE_CESPL_TR10_2012_a_0001



TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

Results of Field Inspection
Tres Rios

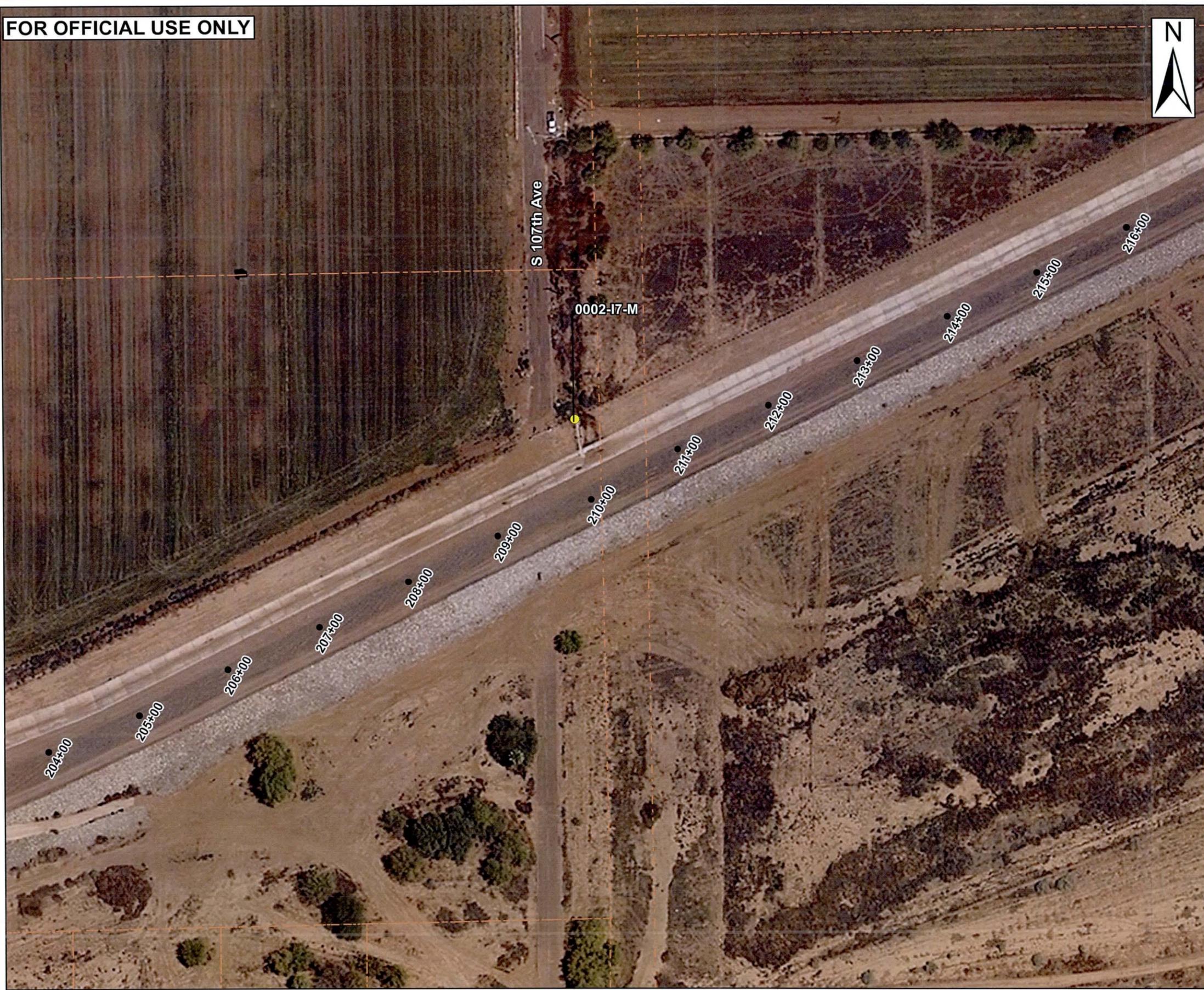
Station 192+00 to 204+00



U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

Figure A-11

FOR OFFICIAL USE ONLY



Legend

Point Inspection

- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

Linear Inspection

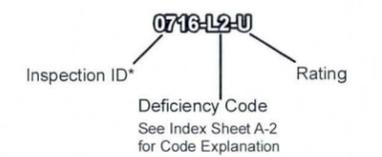
- A - Acceptable
- M - Minimally Acceptable
- U - Unacceptable

325+00 Project Station

12" RGP Pipe Dia & Type

Parcel Data

Inspection Location ID Code



* Last Four Digits of Inspection ID
e.g. USACE_CESPL_TR10_2012_a_0001



TRES RIOS (AZ) LEVEE SYSTEM
EVALUATION REPORT 2012

Results of Field Inspection
Tres Rios

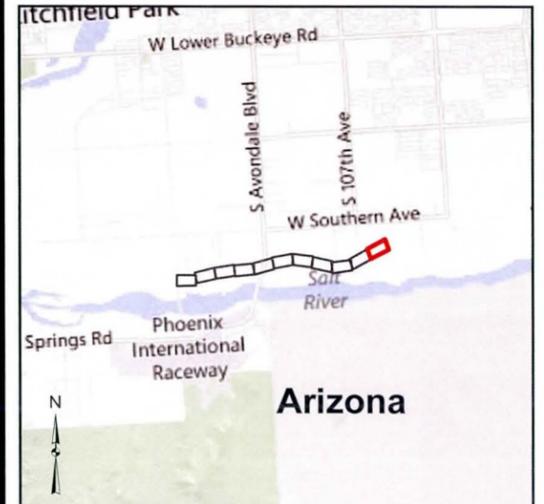
Station 204+00 to 216+00



U.S. ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

Figure A-12

FOR OFFICIAL USE ONLY



Legend

- Point Inspection
- A - Acceptable
 - M - Minimally Acceptable
 - U - Unacceptable

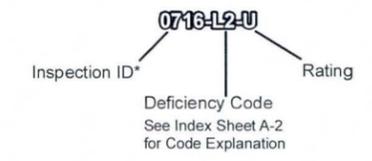
- Linear Inspection
- A - Acceptable
 - M - Minimally Acceptable
 - U - Unacceptable

325+00 Project Station

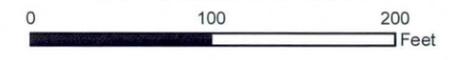
12" RCP Pipe Dia & Type

Parcel Data

Inspection Location ID Code



* Last Four Digits of Inspection ID e.g. USACE_CESPL_TR10_2012_a_0001



TRES RIOS (AZ) LEVEE SYSTEM EVALUATION REPORT 2012

Results of Field Inspection Tres Rios

Station 216+00 to 225+00



Figure A-13



Appendix F3
Video Inspection

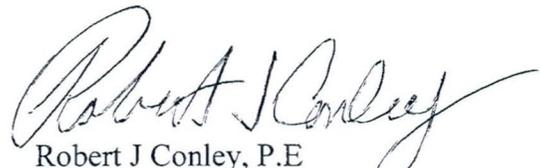
MEMORANDUM FOR RECORD

SUBJECT: Tres Rios - Video inspection

Mr. Patel of the Structural Design Section has reviewed the video inspection report submitted by Flood Control District of Maricopa County dated June 2012.

West of 115th Ave- Based on the report submitted by the county and the criteria in levee inspection check list, the overall rating for the RCP would be "Acceptable". The reason for the rating was the inspection report did not indicate any visible water seepage or loss of soils through the joints and the pipe is still structurally sound. However the inspection did find spalling at two locations, but the joints do appear to be closed/ water tight.

East of 115th Ave- Based on the report submitted by the county and the criteria in levee inspection check list, the overall rating for the RCP would be "Minimally Acceptable". The reason is due to spalling/exposed rebar and water seepage through cracks. However it should be noted that entire length of pipe still structurally sound and there is no evidence of soil loss through the joints.



Robert J Conley, P.E
Structural Engineering Section

Tres Rios Outlet Pipe Video Inspection Report



Prepared By

Flood Control District of Maricopa County

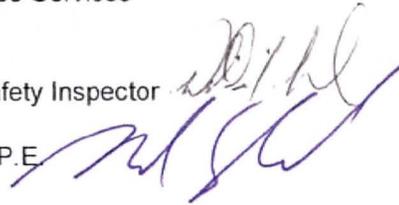
June 2012



**Tres Rios Levee
Outlet Pipe
Video Inspection Report
May 2012**

Contractor: ProPipe Professional Pipe Services
Video Date: May 30, 2012

Inspected By: William Leal, Dam Safety Inspector
Reviewed By: Dan Lawrence, P.E.
Approved By: Michael Greenslade, P.E.
Review Date: June 28, 2012



Structure Description:

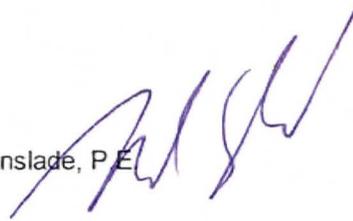
ProPipe Professional Pipe Services was contracted to conduct a video inspections of 2 RGRCP storm drain pipes located in Avondale, Arizona through a soil cement levee on the north bank of the Gila River. The storm drains penetrate the soil cement levee on the east and west sides of the 116th Avenue bridge crossing of the Gila River.

The pipe inspected on the west side of 116th Avenue bridge and is a 450-mm (18-inch) diameter by 17.0-m (55.8-ft) long reinforced concrete pipe. The pipe inspected on the east side of 116th Avenue bridge a 760-mm (30-inch) diameter by 21-m (69-ft) long reinforced concrete pipe.

The Record Drawings for the 116th Avenue Bridge Over Gila River (Project No. 68832) dated 08-10-1999 are recorded in Metric Units. The inspection log by ProPipe shows the travel distance in english units while the pipe stationing obtained from the Record Drawings are in metric units. Therefore, both units of measurement are presented in this assessment report.

Tres F. Levee
Pipe Assessment KSU Rating

Assessment by Dan Lawrence, P.E. and Michael D. Greenslade, P.E.
Date: 28 June 2012



Using four aspects and condition descriptions adapted from a 1989 ASDSO paper, "Evaluation of the Condition of Principal Spillway Conduits," a review of the videotape inspection of the storm drains as well as the other information provided by the dam safety inspector for major defects was completed. A KSU rating for the condition of the storm drains was then assigned. Attached is the crack log for each pipe section. ProPipe has it's own rating system. Their rating sheets and scores are also attached.

West side of 116th Avenue bridge - 18 inch diameter RGRCP

ProPipe started this video inspection at the upstream end of the pipe. However, after 3 feet into the pipe they ran into rock debris that blocked the travel of the camera. They then went to the downstream end and finished the inspection going from downstream to upstream.

There were two joints that had some minor spalling near the top of the pipe. Joints were within tolerance.

As mentioned there was rock debris in the pipe near the upstream end. There were no cracks noted.

KSU Ratings: Cracks: 9, Corrosion: 9, Lining: 8, Joints: 9

Overall KSU rating = 8

ProPipe Rating = No defects

East side of 116th Avenue bridge - 30 inch diameter RGRCP

ProPipe completed this inspection from the downstream end to the upstream end.

This pipe has several longitudinal cracks in the lining. There were 13 cracks approximately 1/8 inch wide and 5 cracks that were 1/4 inch wide.

One crack extended within 3 pipe sections (approximately 12 ft long). It fluctuates from hairline to 1/4 inch wide. Another 1/8 inch wide crack also extends 12 feet long. An additional crack hairline to 1/8th inch wide is 25 feet long.

The reinforcement was exposed in one location.

Joints were within tolerance. There was no corrosion.

KSU Ratings: Cracks: 5, Corrosion: 9, Lining: 6, Joints: 9

Overall KSU Rating = 5

ProPipe Rating = 12 defects with a grade of 2 and 1 defect with a grade of 5 (See attached Grading PACP System for definition of Grades.)

Note: The ProPipe rating sheet references 16 grade 2 defects and 2 grade 5 defects. The difference is due to the ProPipe video inspection extended beyond the the pipe segment which is not part of this assessment.

Kansas State University (KSU) Rating System						
Rating	ERL	TTNI	Cracks	Corrosion	Lining	Joints
9	100	25	None; new condition	None; new condition	No loss; new condition	Watertight; gaps well within tolerance
8	90	20	If any they're hairline & of no structural concern	Very little	Slight evidence of abrasion, scouring cracking or spalling	No evidence of seepage at any joint; gaps within tolerance
7	75	15	Minor & free of leaks or evidence of leakage	Minor, no obvious loss of material evident	Minor evidence of abrasion, scouring, cracking or spalling	One or more show signs of minor leakage; gaps within tolerance
6	50	10	Less than 1/8" & show only minor evidence of leakage	Some deterioration of material evident	Some loss to the point that underlying material is exposed at several locations	One or more have signs of leakage and/or deterioration; gaps within tolerance
5	35	5	Less than 1/4" & show evidence of leakage	Significant deterioration at one or more locations evident	Missing on parts of the conduit throughout the length	One or more show evidence of leakage and/or deterioration; gap equals tolerance
4	20	3	Large enough to show considerable evidence of leakage	Deterioration to point of concern for long-term structural integrity of conduit	Loss so substantial that there is concern for the durability of the underlying material	One or more is leaking and /or significantly deteriorated; gap exceeds tolerance
3	10	2	Openings large enough to affect the integrity of the embankment	Corroded to the point of leakage expected at one or more locations	No longer effective throughout the conduit	Leak large enough to affect embankment; gap well beyond tolerance
2	5	1	Embankment is being affected by allowing erosion of the embankment	Corroded so much that leaks are evident	Completely missing	Embankment exposed at one or more joints; alignment of sections affected
1	2	0	Flow occurring outside the conduit as well as inside	Corrosion so substantial that structural integrity of conduit is in question	Not Applicable	Water flowing through joints as freely as in the conduit; ends no longer line up
0	0	0	Conduit no longer main path of flow because of losses through cracks	So much material lost to corrosion that conduit is no longer capable of supporting the fill	Not Applicable	Not Applicable

ERL- Estimated Remaining Life of pipe

TTNI- Time To Next Inspection

Tolerance- Allowable maximum distance for extensibility for the particular type of joint for welded steel and concrete conduits

Definitions

Circumferential: Cracks that span either the entire diameter are circumferential, but cracks that do not span the entire diameter are referenced from a starting and ending point such as 3 o'clock to 9 o'clock (or 3 - 12); and cracks referenced as 12 - 12 are spanning the entire diameter.

Spiral Circumferential: Cracks that span the diameter but do not connect, these may also span the diameter of the pipe more than one time. The starting and ending points are defined as (example) 12 o'clock - 6 o'clock (or 12 - 6).

Longitudinal: Cracks that follow the length of the pipe

Hairline: Crack width typically less than an 1/8-inch. Cracks 1/8-inch or greater are called out to their estimated width measurement.

Joint #- Joints are numbered in the crack log in order that they appear in the video, starting at either the inlet or outlet ends; however, in some cases the entire length of the conduit could not be video inspected either because the cable was not as long as the outlet pipe or the pipe may have been blocked by debris in both cases the camera would have to resume video from the opposite end of the pipe and continue traveling in the other direction as noted in the crack log.

Pipe Station: is the actual pipe station number given in the as built and should be considered the most accurate portrayal of where any anomaly is inside the pipe.

Feet into Pipe: Distance traveled inside the outlet pipe from the beginning of the pipe (either outlet or inlet ends).

Note: It should be noted in some instances cracks were found during the review process that were not spotted during the actual video inspection. In these cases we found it difficult to get a good visual of the crack and could not accurately describe the dimensions of the crack. In some instances it was difficult to determine whether or not a crack actually existed because of the camera's rotation speed. In this case it was referred to as a question, example: If it appeared as though a circumferential crack was shown but very hard to tell; in the description box you will read: Circumferential hairline crack?

Tres Levee
 Outlet Pipe Inspection
 (West of 116th Ave)
 May 2012

Pipe Station	Joint	Ft. in Pipe	M. in Pipe	Description	Photo
4+357	0	0	0.000	Start from upstream inlet	
4+356	1	3.05	0.930	Rock Debris in Pipe	X
4+356		3.06	0.933	Rock Debris Blocking Pipe - Video inspection will restart at the downstream outlet and travel to rock location in pipe.	

Direction of camera travel: **Upstream to Downstream**

Pipe Station	Joint	Ft. in Pipe	M. in Pipe	Description	Photo
4+340	0	0	0.000	Start from Downstream outlet - Will travel to rock located in pipe	
4+342	1	5.1	1.554	Joint Within Tolerance	
4+344	2	14.02	4.273	Joint - Spalling - 1 o'clock	X
4+345	3	16.06	4.895	Joint - Spalling- 12 o'clock	X
4+347	4	22.06	6.724	Joint Within Tolerance	
4+347		22.07	6.727	Minor sediment accumulation on bottom pipe	X
4+349	5	30.05	9.159	Joint Within Tolerance	
4+352	6	38.06	11.601	Joint Within Tolerance	
4+354	7	46.06	14.039	Joint Within Tolerance	
4+354		46.07	14.042	Rock Debris Blocking Pipe - End of Video Inspection	

Direction of camera travel: **Downstream to Upstream**

Note: The camera started at the inlet structure and traveled approximately 3-ft before encountering a rock thus ending the inspection on that specific run. The camera then started on the outlet end and traveled upstream toward the inlet knowing it would encounter the rock inside the pipe. Approximately 50-ft of the 55-ft of pipe was inspected, the loss of 5-ft was due to the rock and minor distance lost from camera placement.

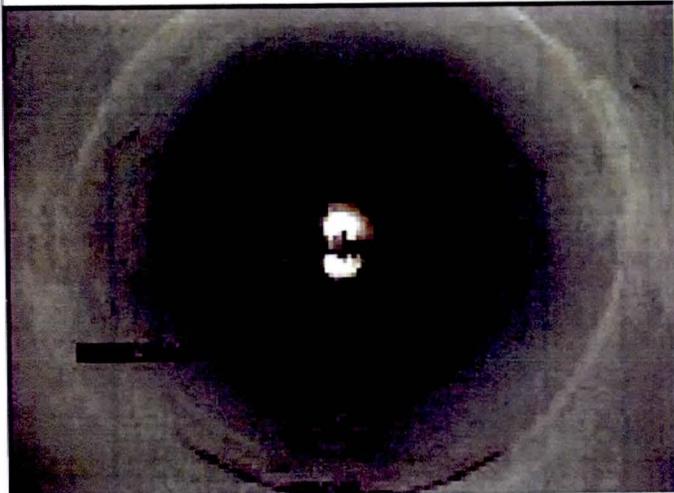
Tres Levee
Outlet Pipe Inspection
(West of 115th Ave)
May 2012



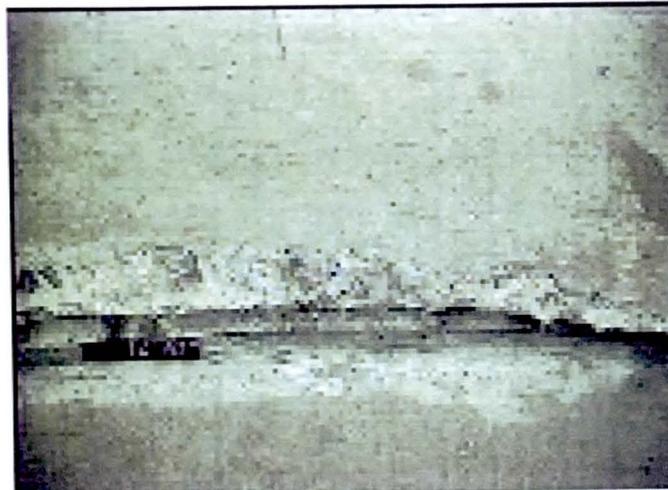
3.06 ft. - Rock Debris Blocking Pipe



3.05 ft.- Pipe Entrance



5.10 ft. - General Photo

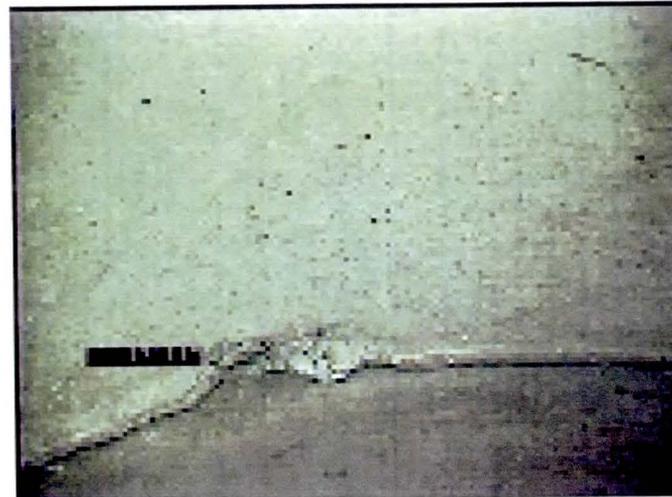


14.02 ft. - 8" Spalling, 1 o'clock

Tres F. Levee
Outlet Pipe Inspection
(West of 115th Ave)
May 2012



22.00 ft - General Photo



16.06 ft. - 3" Spalling 12 o'clock



22.07 ft. - Minor sediment/rock debris

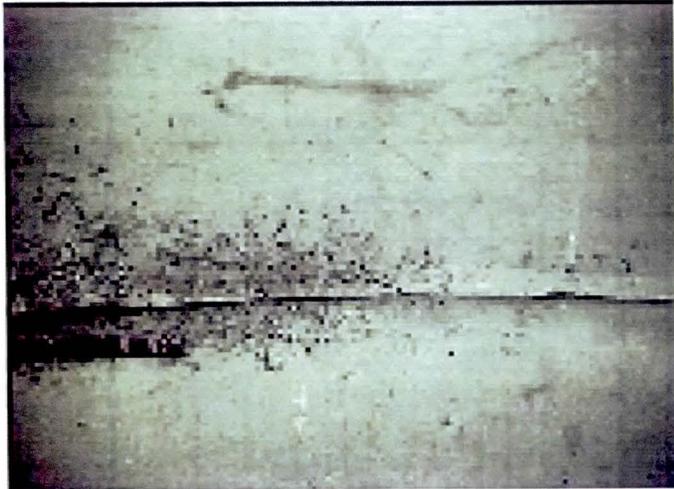
Tres Levee
 Outlet Pipe Inspection
 (East of 116th Ave)
 May 2012

Pipe Station	Joint	Ft. in Pipe	M. in Pipe	Description	Photo
4+373		0.00	0.000	Starting Point (Outlet)	
4+375	1	5.02	1.530	Joint within Tolerance	X
4+375		5.03	1.533	Longitudinal Crack, 5 o'clock, 1/8-inch	
4+377	2	14.00	4.267	Joint - Rebar Exposed, 1 - 2 o'clock	X
4+377		14.02	4.273	Longitudinal Crack, 6 o'clock, 1/8-inch, Starts	
4+378		15.10	4.602	Longitudinal Crack, 6 o'clock, 1/8-inch, Ends	
4+379		20.08	6.120	Longitudinal Crack, 6 o'clock, 1/4-inch, Starts (Ends at 31.04)	
4+379	3	21.03	6.410	Joint - Longitudinal Crack, 6 o'clock, 1/4-inch, Continues	X
4+379		21.05	6.416	Longitudinal Crack, 12 o'clock, 1/8-inch, Starts	
4+381		26.05	7.940	Longitudinal Cracks, 6 o'clock, 1/4-inch, and 12 o'clock, 1/8-inch, Continue	X
4+381		27.15	8.275	Longitudinal Crack, 7 o'clock, 1/4-inch	
4+382	4	29.02	8.845	Joint - Longitudinal Crack, 7 o'clock, 1/4-inch	
4+382		29.09	8.867	Longitudinal Crack, 12 o'clock, 1/8-inch	
4+382		31.04	9.461	Longitudinal Crack, 5 o'clock, 1/8-inch, Ends (Crack started at 20.08- varied in width from hairline up to 1/4")	
4+383		33.10	10.089	Longitudinal Crack, 12 o'clock, 1/8-inch, Ends	
4+384		36.13	11.012	Longitudinal Crack, 5 o'clock, 1/8-inch	
4+384	5	37.05	11.293	Joint within Tolerance	
4+384		36.13	11.012	Longitudinal Crack, 12 o'clock, 1/8-inch (Ends at 61.01)	
4+387	6	45.02	13.722	Joint - Longitudinal Crack, 12 o'clock, 1/8-inch, Continues	
4+388		49.01	14.938	Longitudinal Crack, 12 o'clock, 1/8-inch, Continues	
4+389	7	53.04	16.167	Joint - Longitudinal Crack, 12 - 1 o'clock, 1/8-inch	
4+389		53.05	16.170	Longitudinal Crack, 6 o'clock, 1/8-inch	
4+390		57.11	17.407	Longitudinal Crack, 12 o'clock, 1/8-inch	X
4+392	8	61.01	18.596	Joint - Longitudinal Crack, 12 o'clock, 1/8-inch, Ends (Started at 36.13- mostly hairline cracking)	
4+393		64.07	19.529	Longitudinal Crack, 6 o'clock, 1/8-inch	
4+393		65.05	19.827	Access Gate - End of Video Inspection (Inlet)	

Direction of camera travel: **Downstream to Upstream**

Note: The camera travel distance is approximate due to exact placement of camera inside the pipe and slight loss of distance when traveling inside the pipe (small side to side turns).

Tres Levee
Outlet Pipe Inspection
(East of 115th Ave)
May 2012



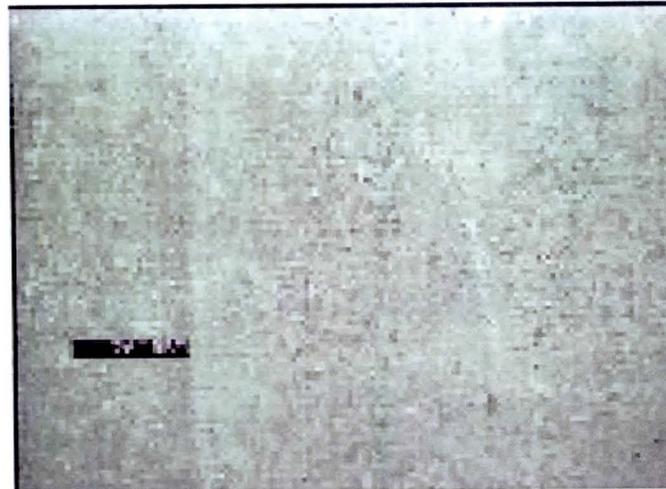
5.02 ft. - General Photo



14.00 ft. Rebar Exposed



21.03 ft. - Longitudinal Cracking

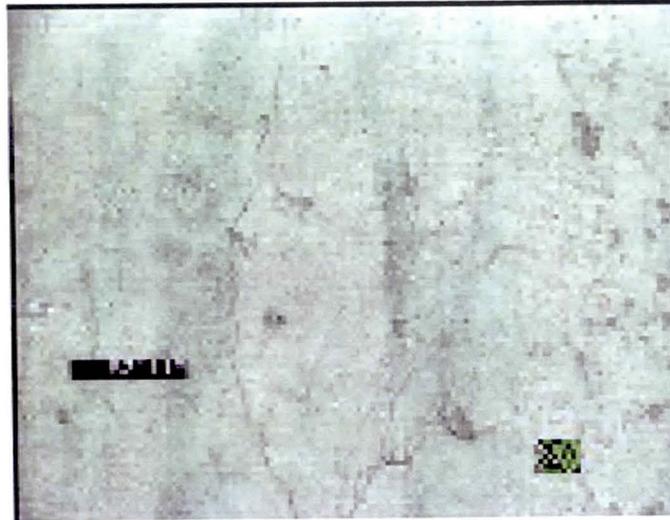


22.00 ft. - General Photo

Tres Levee
Outlet Pipe Inspection
(East of 115th Ave)
May 2012



26.05 ft. Longitudinal Cracking



57.11 ft. - Longitudinal Cracking



ProPipe Professional Pipe Services
 4940 W Wainwright St
 Phoenix, AZ 85043
 Phone: 602-861-3944
 Fax: 602-861-1423



PACP Sewer Report

Surveyor's name: **JEREMIAH**
 Surveyor's certificate No: **U-511-12771**
 System owner:
 Survey Customer: **BILL LEAL**
 Drainage area:
 Sheet number: **1**

Work order:
 Pipeline segment ref: **NORTH-SOUTH**
 Start date/time: **2012/05/30 07:18**
 Location (street name and number): **WEST PIPE**
 Locality: **AVONDALE**

Further location details:
 Upstream manhole No: **NORTH**
 Rim to invert:
 Grade to invert:
 Rim to grade:

Downstream manhole No: **SOUTH**
 Rim to invert:
 Grade to invert:
 Rim to grade:
 Use of sewer:
 Direction: **D**
 Flow control:
 Height: **18**

Width: Shape: **C** Material: **RCP** Ln. method: Pipe joint length: Total length: **3.5** Length surveyed: **3.5** Year laid: Year rehabilitated: Media label: **1**

Purpose: Sewer category: Pre-cleaning: **N** Date cleaned: Weather: Location code: Additional info:

Grade	Amount of Structural Defects	Structural			Amount of O&M Defects	O&M Segment Grade	O&M			Overall Pipe	
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating			O&M Pipe Rating	O&M Quick Rating	O&M Pipe Rating Index	Overall Pipe Rating	Overall Pipe Rating Index
1	0	0			0	0					
2	0	0			0	0					
3	0	0	0	0000	0	0	4	4100	4	4	4
4	0	0			1	4					
5	0	0			0	0					



Surveyor's name: JEREMIAH System owner: Start date/time: 2012/05/30 Upstream manhole No: NORTH Pipeline segment ref: NORTH-SOUTH Sheet number: 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value		%	Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						1st	2nd			At/From	to				
0.0	59	AEP											CF		NORTH
0.0	224	MWL						5							
3.5	423	DSZ						25		6		TRES RIOS-NORTH-S OUTH DSZ at 3.526411 ft (0).jpg	O&M	4	LOOSE ROCK UP TO 8-INCH DIAM
3.5	548	MSA													UNABLE TO CONTINUE



PACP Sewer Report

Surveyor's name: JEREMIAH	Surveyor's certificate No: U-511-12771	System owner:	Survey Customer BILL LEAL	Drainage area:	Sheet number: 1
Work order:	Pipeline segment ref: NORTH-SOUTH2	Start date/time: 2012/05/30 07:55	Location (street name and number): WEST PIPE	Locality: AVONDALE	
Further location details:			Upstream manhole No: NORTH	Rim to invert:	Grade to invert: Rim to grade:
Downstream manhole No: SOUTH		Rim to invert:	Grade to invert:	Rim to grade:	Use of sewer: Direction: Flow control: Height: U U 18
Width:	Shape: C	Material: RCP	Ln. method:	Pipe joint length:	Total length: 46.6
				Pipe joint length:	Length surveyed: 46.6
Purpose:	Sewer category:	Pre-cleaning N	Date cleaned:	Weather:	Location code:
					Additional info:

Grade	Amount of Structural Defects	Structural			Amount of O&M Defects	O&M Segment Grade	O&M			Overall Pipe	
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating			O&M Pipe Rating	O&M Quick Rating	O&M Pipe Rating Index	Overall Pipe Rating	Overall Pipe Rating Index
1	0	0			0	0					
2	0	0			5	10					
3	0	0	0	0000	0	0	10	2500	2	10	2
4	0	0			0	0					
5	0	0			0	0					



Surveyor's name:
 JEREMIAH

System owner:

Start date/time:
 2012/05/30

Upstream manhole No:
 NORTH

Pipeline segment ref:
 NORTH-SOUTH2

Sheet number:
 2

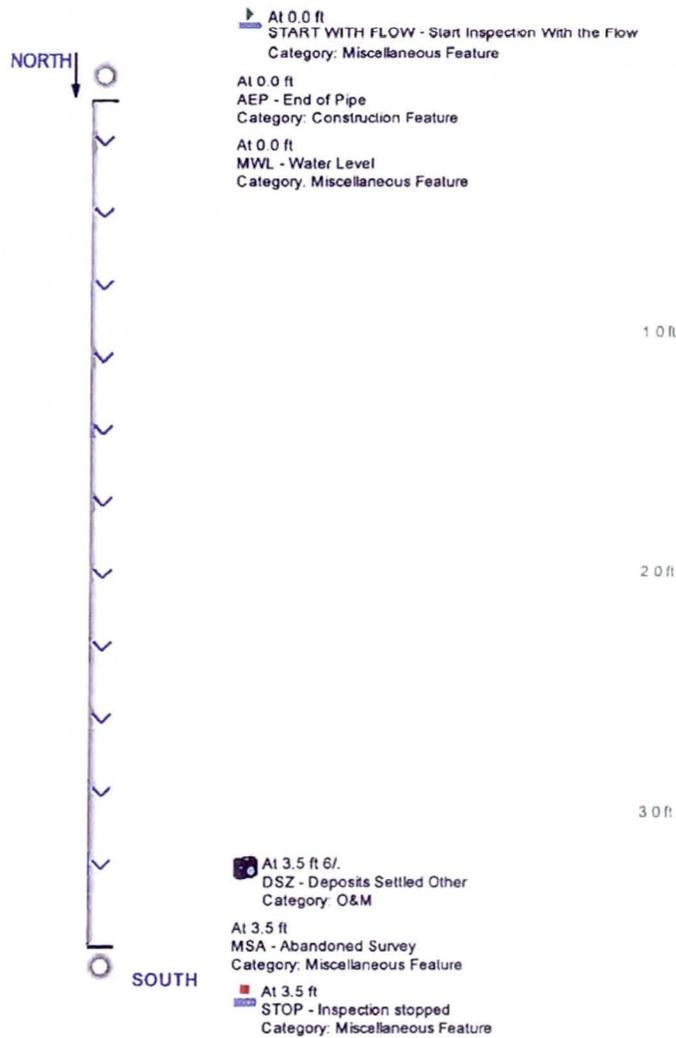
Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value		%	Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						Inches (mm)				At/From	to				
0.0	2	AEP											CF		SOUTH END
0.0	19	MWL						5							
14.2	601	MGO													JOINT
22.4	582	MGO													JOINT
22.5	463	DSGV		S1				5		6		TRES RIOS-NORTH-S OUTH DSGV at 22.49278 ft (U).jpg	O&M	2	RUCKS ON THE BOTTOM OF PIPE
30.4	746	MGO													JOINT
38.5	839	MGO													JOINT
46.5	960	MGO													JOINT
46.6	1009	MSA													UNABLE TO CONTINUE RUCKS ON THE BOTTOM OF PIPE
46.6	463	DSGV		F1				5		6		TRES RIOS-NORTH-S OUTH DSGV at 22.49278 ft (U).jpg	O&M	2	RUCKS ON THE BOTTOM OF PIPE



Main Inspection with Pipe-Run Graph

Project Name:	Pipeline segment ref:	Locality:	Location (street name and number):
TRES RIOS	NORTH-SOUTH	AVONDALE	WEST PIPE
Start date/time:	Width:	Height:	Material:
5/30/2012		18	RCP
Direction:	Length surveyed:	Weather:	Media label:
Downstream	3.5		1

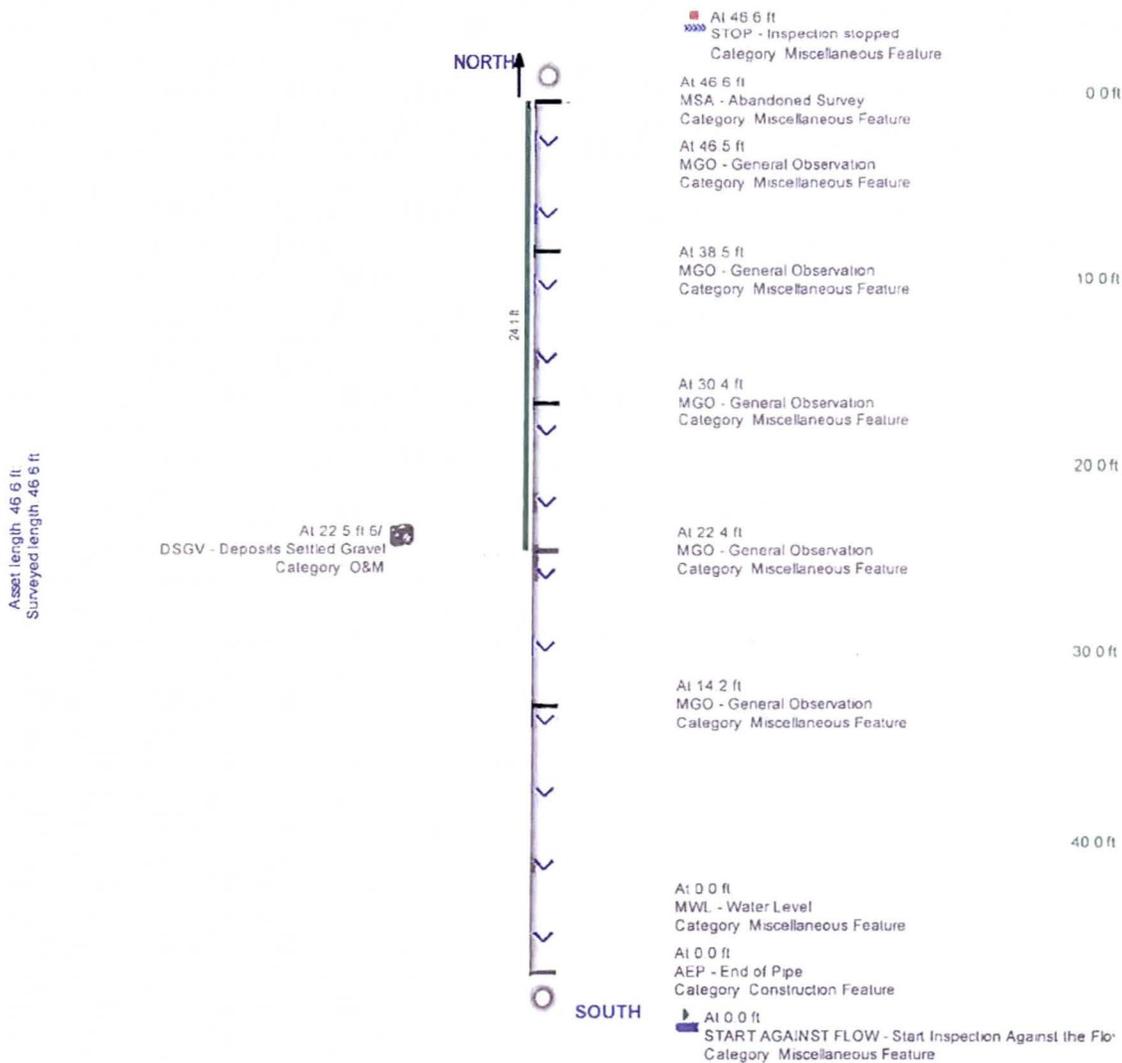
Asset length: 3.5 ft
 Surveyed length: 3.5 ft





Main Inspection with Pipe-Run Graph

Project Name:	Pipeline segment ref:	Locality:	Location (street name and number):
TRES RIOS	NORTH-SOUTH2	AVONDALE	WEST PIPE
Start date/time:	Width:	Height:	Material:
5/30/2012		18	RCP
Direction:	Length surveyed:	Weather:	Media label:
UPSTREAM	46.6		1







PACP Sewer Report

Surveyor's name: JEREMIAH	Surveyor's certificate No: U-511-12771	System owner:	Survey Customer BILL LEAL	Drainage area:	Sheet number: 1				
Work order:	Pipeline segment ref: NORTH-SOUTH3	Start date/time: 2012/05/30 08:56	Location (street name and number): EAST PIPE	Locality: AVONDALE					
Further location details:			Upstream manhole No: NORTH	Rim to invert:	Grade to invert:	Rim to grade:			
Downstream manhole No: SOUTH	Rim to invert:	Grade to invert:	Rim to grade:	Use of sewer:	Direction: U	Flow control:	Height: 30		
Width:	Shape: C	Material: RCP	Ln. method:	Pipe joint length:	Total length: 185.6	Length surveyed: 185.6	Year laid:	Year rehabilitated:	Media label: 1
Purpose:	Sewer category:	Pre-cleaning N	Date cleaned:	Weather:	Location code:	Additional info:			

Grade	Amount of Structural Defects	Structural			Amount of O&M Defects	O&M Segment Grade	O&M			Overall Pipe	
		Structural Segment Grade	Structural Pipe Rating	Structural Quick Rating			O&M Pipe Rating	O&M Quick Rating	O&M Pipe Rating Index	Overall Pipe Rating	Overall Pipe Rating Index
1	0	0			0	0					
2	16	32			3	6					
3	0	0	42	522B	0	0	6	2300	2	48	2.285714
4	0	0			0	0					
5	2	10			0	0					



Surveyor's name:
 JEREMIAH

System owner:

Start date/time:
 2012/05/30

Upstream manhole No:
 NORTH

Pipeline segment ref:
 NORTH-SOUTH3

Sheet number:
 2

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	Value			Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks	
					S/M/L	Inches (mm)			%	At/From					to
						1st	2nd								
0.0	1	AEP										CF		SOUTH END	
0.0	19	MWL					5								
5.2	151	MGO												JOINT	
12.7	227	SRC						2		TRES RIOS-NORTH-S OUTH SRC at 12.67602 ft (U).jpg	S	5		REBAR SHOWING	
13.0	359	MGO												JOINT	
14.2	422	CL						6		TRES RIOS-NORTH-S OUTH CL at 14.20095 ft (U).jpg	S	2		AT JOINT	
20.8	628	CL		S1				6		TRES RIOS-NORTH-S OUTH CL at 20.77723 ft (U).jpg	S	2		JOINT	
21.3	688	CL		S2				12		TRES RIOS-NORTH-S OUTH CL at 21.25377 ft (U).jpg	S	2		JOINT	
29.2	1027	MGO												JOINT	
30.9	688	CL		F2				12		TRES RIOS-NORTH-S OUTH CL at 21.25377 ft (U).jpg	S	2		JOINT	
31.3	628	CL		F1				6		TRES RIOS-NORTH-S OUTH CL at 20.77723 ft (U).jpg	S	2		JOINT	
37.5	1189	MGO												JOINT	



Surveyor's name:
 JEREMIAH

System owner:

Start date/time:
 2012/05/30

Upstream manhole No:
 NORTH

Pipeline segment ref:
 NORTH-SOUTH3

Sheet number:
 3

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	S/M/L	Value		Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
						Inches (mm)	%		At/From	to				
45.2	1259	CL							12		TRES RIOS-NORTH-S OUTH CL at 45.17618 ft (U).jpg	S	2	AT JOINT
45.2	1299	CL							1		TRES RIOS-NORTH-S OUTH CL at 45.17618 ft (U).jpg	S	2	AT JOINT
45.2	1331	MGO												JOINT
49.1	1454	CL							9		TRES RIOS-NORTH-S OUTH CL at 49.08383 ft (U).jpg	S	2	
53.4	1582	CL							12		TRES RIOS-NORTH-S OUTH CL at 53.37271 ft (U).jpg	S	2	AT JOINT
53.4	1602	MGO												JOINT
57.9	1699	CL		S3					12		TRES RIOS-NORTH-S OUTH CL at 57.94751 ft (U).jpg	S	2	
61.1	1803	MGO												JOINT
61.1	1699	CL		F3					12		TRES RIOS-NORTH-S OUTH CL at 57.94751 ft (U).jpg	S	2	
64.6	1880	CL		S4					6		TRES RIOS-NORTH-S OUTH CL at 64.61909 ft (U).jpg	S	2	
65.3	1968	MGO									TRES RIOS-NORTH-S OUTH MGO at 65.28625 ft (U).jpg			ACCESS GRATING



Surveyor's name:
 JEREMIAH

System owner:

Start date/time:
 2012/05/30

Upstream manhole No:
 NORTH

Pipeline segment ref:
 NORTH-SOUTH3

Sheet number:
 4

Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	Value			Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
					S/M/L	Inches (mm)			At/From	to				
						1st	2nd							
69.1	1880	CL		F4				6		TRES RIOS-NORTH-S OUTH CL at 64.61909 ft (U).jpg	S	2		
69.2	2040	MGO											JOINT	
69.2	2050	CL						12		TRES RIOS-NORTH-S OUTH CL at 69.1939 ft (U).jpg	S	2	AT JOINT	
73.8	2139	CL						9		TRES RIOS-NORTH-S OUTH CL at 73.76871 ft (U).jpg	S	2		
77.3	2196	MGO											JOINT	
85.4	2300	MGO											JOINT	
94.0	2427	MGO											JOINT	
101.1	2506	MGO											JOINT	
109.3	2595	MGO											JOINT	
109.4	2630	CL						7		TRES RIOS-NORTH-S OUTH CL at 109.4141 ft (U).jpg	S	2		
117.2	2732	MGO											JOINT	
125.4	2859	MGO											JOINT	
133.4	2925	MGO											JOINT	
141.2	3128	CL						11		TRES RIOS-NORTH-S OUTH CL at 141.1517 ft (U).jpg	S	2		

Not Part of this Assessment



Surveyor's name:
 JEREMIAH

System owner:

Start date/time:
 2012/05/30

Upstream manhole No:
 NORTH

Pipeline segment ref:
 NORTH-SOUTH3

Sheet number:
 5

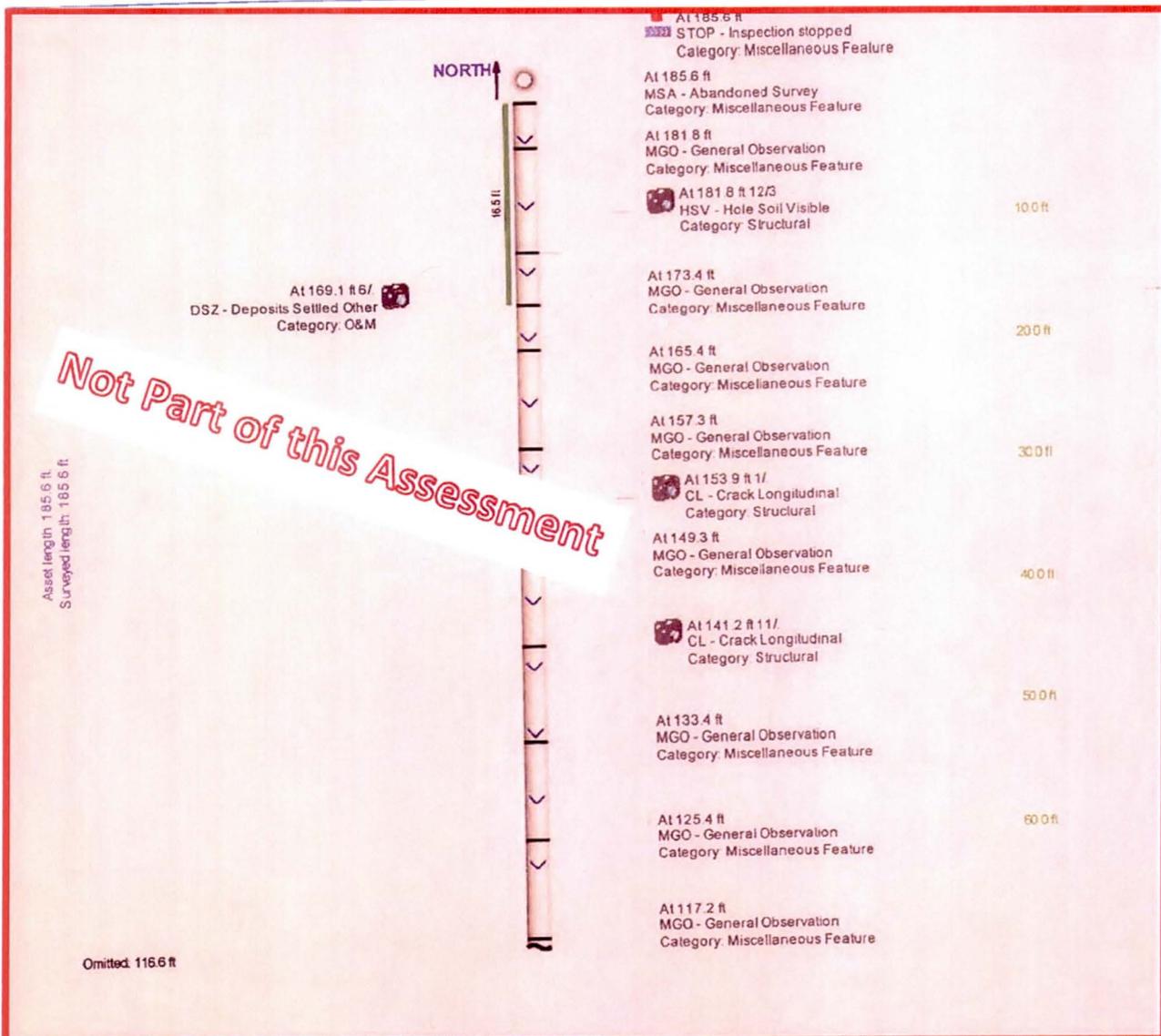
Distance (Feet) (Meters)	Video Ref.	Group/ Descriptor	Modifier/ Severity	Continuous Defect	Value		Joint	Circumferential Location		Image Ref.	Family	Rating	Remarks
					S/M/L	%		At/From	to				
					1st Inches (mm)	2nd							
149.3	3246	MGO											JOINT
153.9	3339	CL						1		TRES RIOS-NORTH-S OUTH CL at 153.9231 ft (U).jpg	S	2	
157.3	3428	MGO											JOINT
165.4	3501	MGO											JOINT
169.1	3568	DSZ		S5				6		TRES RIOS-NORTH-S OUTH DSZ at 169.0771 ft (U).jpg	O&M	2	ROCKS
173.4	3715	MGO											JOINT
181.8	3849	HSV						12	3	TRES RIOS-NORTH-S OUTH HSV at 181.8484 ft (U).jpg	S	5	
181.8	3914	MGO											JOINT
185.6	4041	MSA											UNABLE TO CONTINUE DUE TO ROCKS IN LINE
185.6	3568	DSZ		F5				6		TRES RIOS-NORTH-S OUTH DSZ at 169.0771 ft (U).jpg	O&M	2	ROCKS

Not Part of this Assessment



Main Inspection with Pipe-Run Graph

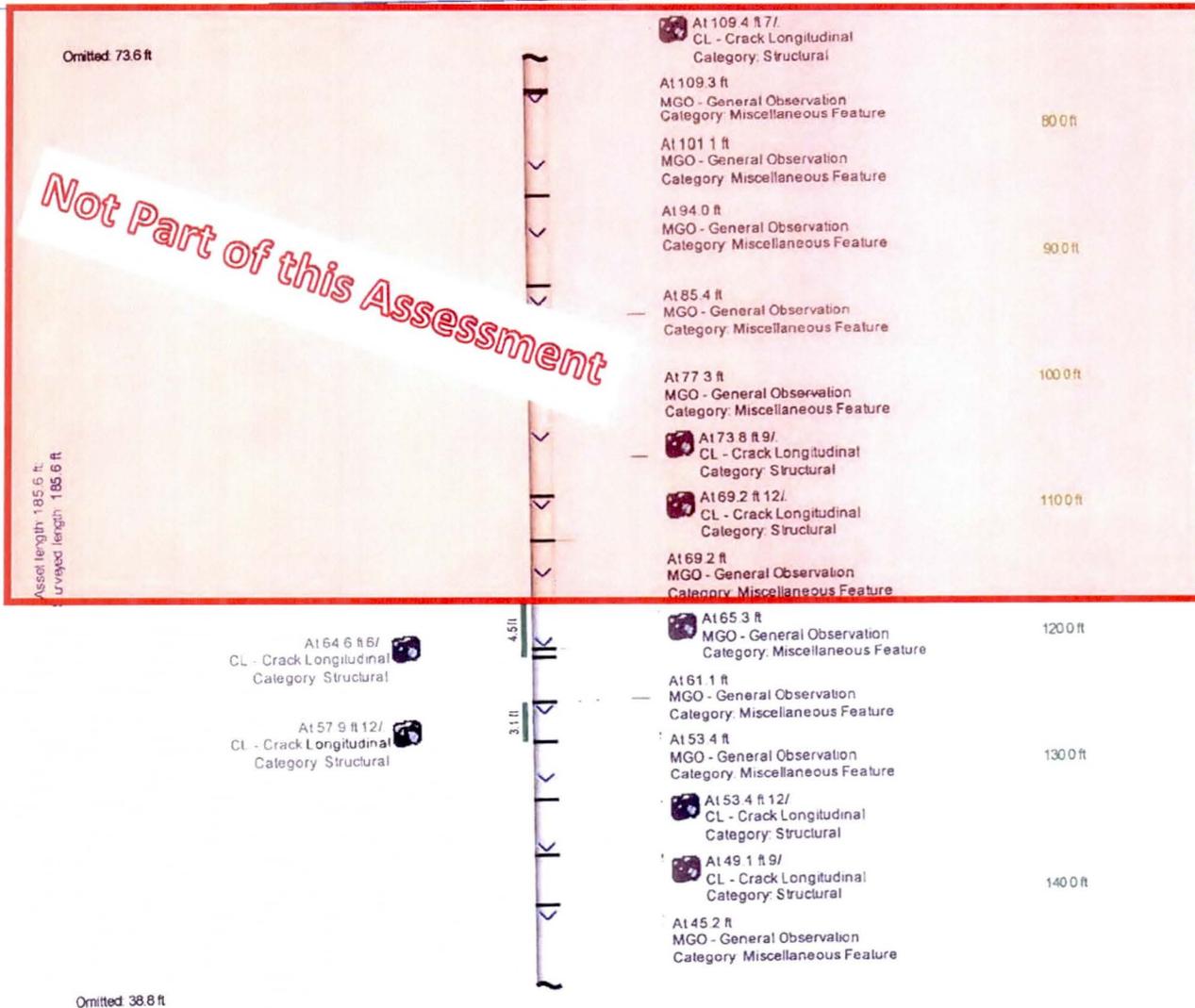
Project Name:	Pipeline segment ref:	Locality:	Location (street name and number):
TRES RIOS	NORTH-SOUTH3	AVONDALE	EAST PIPE
Start date/time:	Width:	Height:	Material:
5/30/2012		30	RCP
Direction:	Length surveyed:	Weather:	Media label:
UPSTREAM	185.6		1





602-861-3944

Project Name:	Pipeline segment ref:	Locality:	Location (street name and number):
TRES RIOS	NORTH-SOUTH3	AVONDALE	EAST PIPE
Start date/time:	Width:	Height:	Material:
5/30/2012		30	RCP
Direction:	Length surveyed:	Weather:	Media label:
UPSTREAM	185.6		1





602-861-3944

Project Name: TRES RIOS	Pipeline segment ref: NORTH-SOUTH3	Locality: AVONDALE	Location (street name and number): EAST PIPE
Start date/time: 5/30/2012	Width: 30	Height: RCP	Location code:
Direction: UPSTREAM	Length surveyed: 185.6	Weather:	Media label: 1

Omitted: 139.2 ft

Assest length: 185.6 ft.
 Surveyed length: 185.6 ft

- At 21 3 ft 12/
CL - Crack Longitudinal
Category Structural
- At 20 8 ft 6/
CL - Crack Longitudinal
Category Structural



- At 45 2 ft 1/
CL - Crack Longitudinal
Category Structural 140 0 ft
- At 45 2 ft 12/
CL - Crack Longitudinal
Category Structural
- At 37 5 ft
MGO - General Observation
Category Miscellaneous Feature 150 0 ft
- At 29 2 ft
MGO - General Observation
Category Miscellaneous Feature 160 0 ft
- At 14 2 ft 6/
CL - Crack Longitudinal
Category Structural
- At 13 0 ft
MGO - General Observation
Category Miscellaneous Feature 170 0 ft
- At 12 7 ft 2/
SRC - Surface Reinforcement Corroded
Category Structural
- At 5 2 ft
MGO - General Observation
Category Miscellaneous Feature 180 0 ft
- At 0 0 ft
MWL - Water Level
Category Miscellaneous Feature
- At 0 0 ft
AEP - End of Pipe
Category Construction Feature
- At 0 0 ft
START AGAINST FLOW - Start Inspection Against the Fl
Category Miscellaneous Feature



PACP Grading System

Index Scores for Pipe Condition

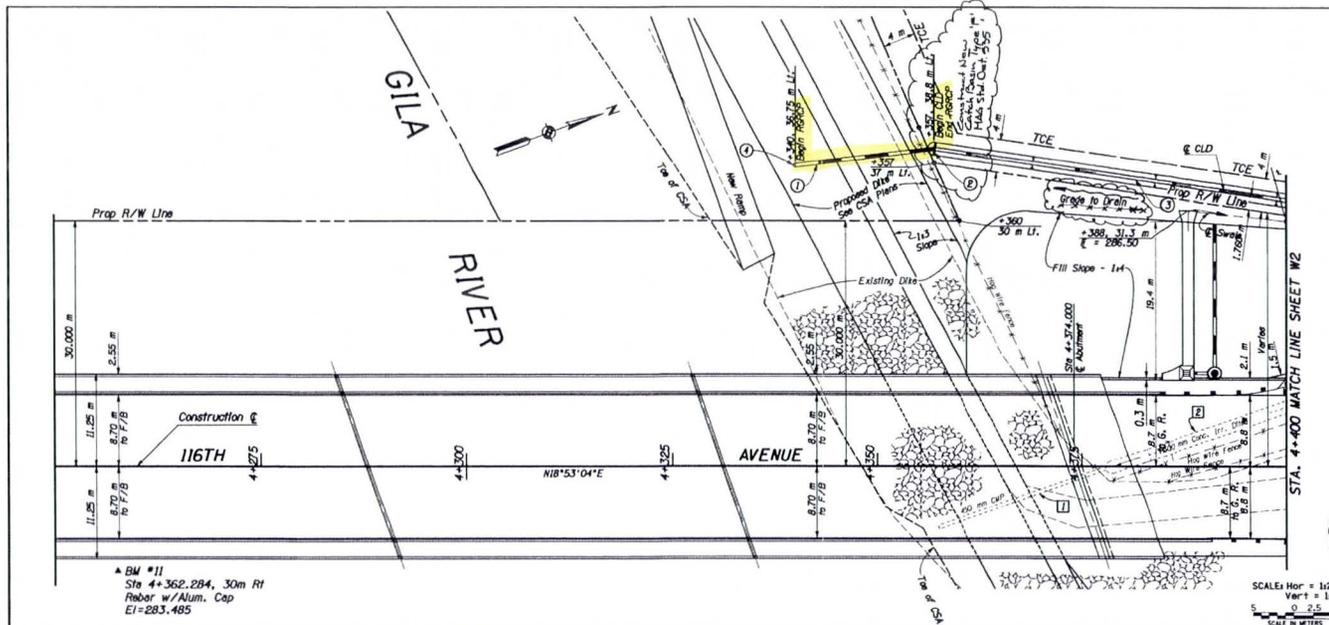
- 5: Immediate attention needed
- 4: Poor; will become Grade 5 in near future
- 3: Fair; moderate
- 2: Good; has not begun to deteriorate
- 1: Excellent; minor defects

Likelihood of Failure as per Defect Grade (from NASSCO)

- 5: Pipe has failed or will likely fail within 5 years
- 4: Pipe will probably fail in 5-10 years
- 3: Pipe may fail in 10-20 years
- 2: Pipe unlikely to fail for at least 20 years
- 1: Failure unlikely in foreseeable future

WHAT DEFINES FAILURE?





▲ BM #11
Sta 4+362.284, 30m Rt
Rebar w/Alum. Cap
EI=283.485

SCALEs Hor = 1:250
Vert = 1:25
0 2.5 5
SCALE IN METERS

F.W.H.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	RECORD DRAWING
9	AZ.	STP-141-008P	29	68	

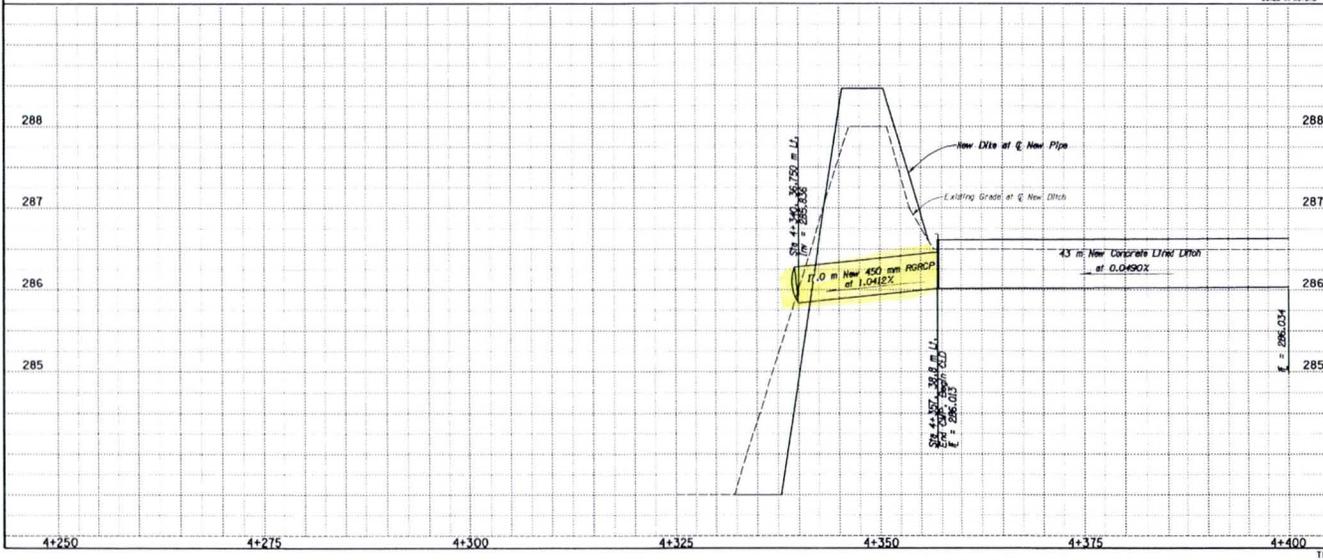
- REMOVAL/RELOCATE
- 1 Sta. 4+357 to Sta. 4+378, Rt. Remove 450 mm x 22 m Pipe Fill & Compact Void - LSR
- 2 Sta. 4+378, Rt. to Sta. 4+400, Lt. Remove 23 m Concrete Ditch Fill & Compact Void - LSR

LSR - Part of Lump Sum Removal Item

- CONSTRUCTION
- 1 Sta. 4+340, 36.750 m Lt. to Sta. 4+357, 38.8 m Lt. Install New 450 mm x 17 m RGRCP, Slope = 1.0412X
- 2 Sta. 4+357, 38.8 m Lt. Install Pull-up Type Irrigation Gate, See Detail A, Sheet P23. Taper 4" Concrete Curb, 1" Max. Steel Deck - 50.0
- 3 Sta. 4+357, 38.8 m Lt. to Sta. 4+400, 32.7 m Lt. Install 43 m New Concrete Lined Ditch, See Detail D, Sheet P23.
- 4 Sta. 4+340, 36.750 m Lt. Install New 0.457 m diameter Flap Gate with Setting Collar, See Detail B, Sheet P23.

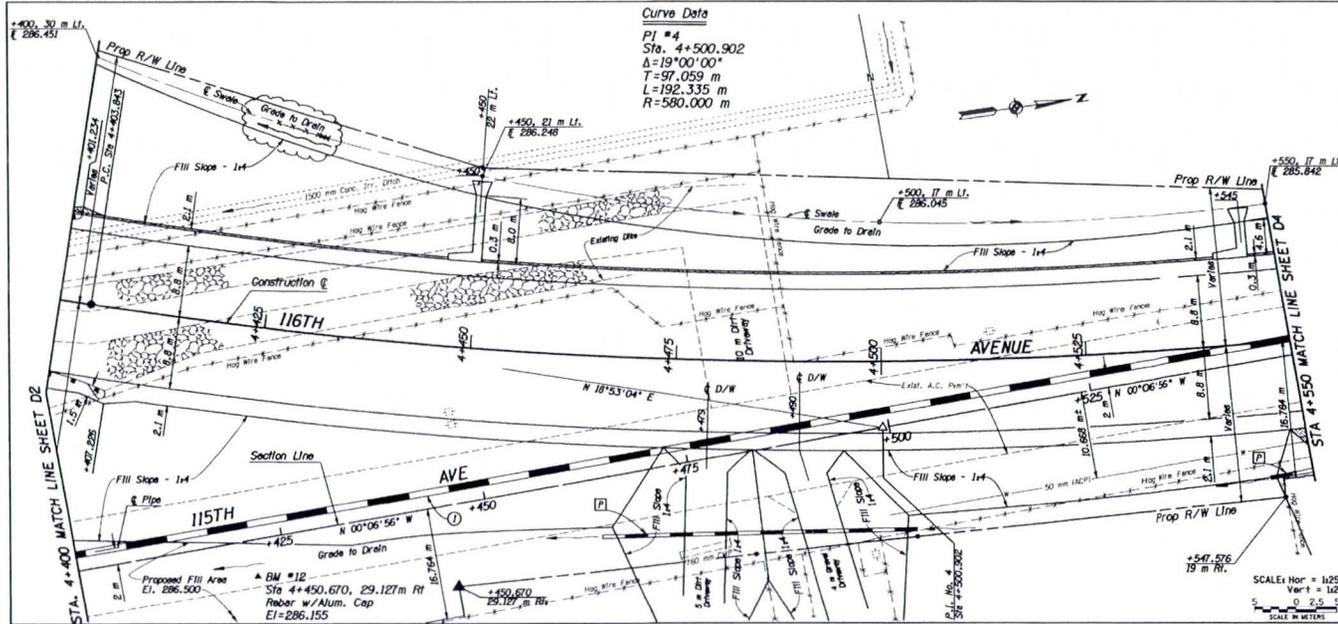
RECORD DRAWING

RECORD DRAWING NOTATIONS
These record drawings reflect certain dimensions, details, specifications, and part revisions prepared by others or obtained from other record drawings which have not been independently verified by Engineer. As a result, Engineer is not responsible for the accuracy, appropriateness or completeness of such information depicted in these record drawings.
BENTON & BOWLES, INC.
DATE: 8-10-97



REVISION	BY	DATE
MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION ENGINEERING DIVISION		
116TH AVENUE BRIDGE OVER GILA RIVER PROJECT NO. 68832		
DESIGNED BY	T. LAVALETTE	2/96
DRAWN BY	J. GILMORE	7/96
CHECKED BY	J. S. PEGANY	7/96
IRRIGATION PLAN		SHEET OF
STA 4+250 TO STA 4+400		WI 4

TRACS NO. 5534501C



Curve Data
 PI # 4
 Sta. 4+500.902
 $\Delta = 19^{\circ}00'00''$
 $T = 97.059$ m
 $L = 192.335$ m
 $R = 580.000$ m

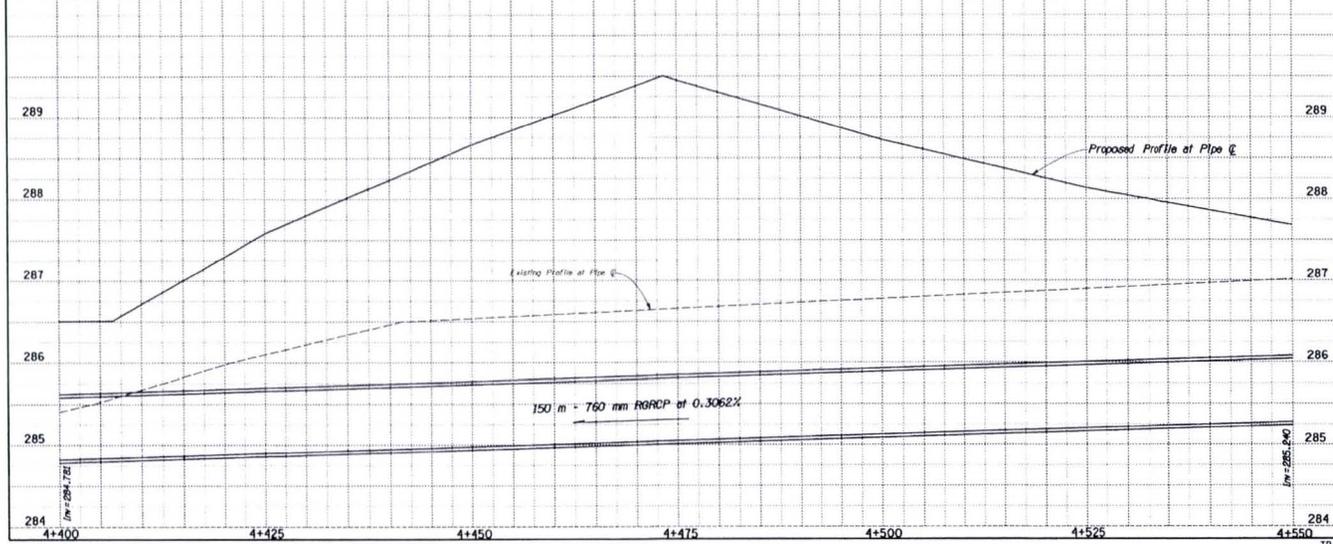
F.W.H.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	RECORD DRAWING
9	AZ.	STP-144-004P	27	68	

RECORD DRAWING

RECORD DRAWING NOTATIONS
 These record drawings reflect certain dimensions, checks, specifications, and plan revisions prepared by others or obtained from other record drawings which have not been independently verified by Engineer. As a result, Engineer is not responsible for the accuracy, completeness or compliance of such information depicted in these record drawings.

ENGINEERING ALLIANCE, INC.
 DATE: 2/15/96

- ① Sta. 4+400 to Sta. 4+550, 2 m L.I. (Section Line Staffing)
 Install 760 mm x 150 m RORCP



[P] For Driveway Culvert, See Sheet P15.	
REVISION	BY DATE

MARICOPA COUNTY
 DEPARTMENT OF TRANSPORTATION
 ENGINEERING DIVISION

116TH AVENUE BRIDGE
 OVER GILA RIVER
 PROJECT NO. 68832

DESIGNED	ROBERT MEYERS	DATE	2/96
DRAWN	J. GILMORE		7/96
CHECKED	J. S. PEGANY		7/96

ENGINEERING ALLIANCE, INC.
 27 E. BERING ROAD, SUITE 2000, PHOENIX, AZ 85016

STORM DRAIN PLAN AND PROFILE
 STA 4+400 TO STA 4+550

SHEET OF 4
 D3 4

TRACS NO. 5534501C



Appendix G

Tres Rios EAP

- **Appendix G**

**Emergency Action Plan
intentionally omitted,**

please see Frank Brown

- **for the latest updated
information.**





Appendix H

O and M Plan

(In a separate 3-ring binder)



Appendix I

ATR Comments and Responses

Agency Technical Review of
Tres Rios Levee System Evaluation Report (LSER)
Tres Rios Environmental Restoration, Arizona, Project
November 2012

For Los Angeles District
U.S. Army Corps of Engineers

Agency Technical Review of Tres Rios Levee System Evaluation Report

1.0 General

The purpose of the Agency Technical Review (ATR) is to ensure that the system meets the minimum requirements for 1% risk reduction, operation, and maintenance based on EC 1110-2-6067 guidance for the National Flood Insurance Program (NFIP) Levee System Evaluation, dated 30 July 2009.

2.0 Project Description

The Tres Rios North Levee is located along the north (right) bank (looking downstream) of the Salt/Gila Rivers in the Phoenix Arizona area. The levee begins at 105th Avenue and ends at El Mirage Road. The project sponsor is City of Phoenix and Maricopa County Flood Control District.

Construction of the Tres Rios Flood Control North Levees began in 2007 and was completed in 2009. The levee consists of compacted earth-fill with side slope riprap protection and toe-down launching stone and gabion mattresses. In addition, several rock guide dikes (each approximately 270 feet long) were constructed perpendicular to the levees to divert flows away from the levees and provide additional protection for the levees. Interior drainage reinforced concrete channels were designed and constructed behind the levees to convey storm water and excess irrigation runoff into the Salt River. Detention basins were built to capture flows from the interior drainage channels and temporarily detain them before they can be discharged into the river via five-cell reinforced concrete box culverts (RCB).

3.0 References

An ATR team evaluated the features, assumptions, and criteria, of the various projects in accordance with the applicable provisions set forth in the engineering publications provided below.

- (1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy dated 31 Jan 2010.
- (2) EC 1110-2-6067 Engineering and Design USACE Process for the National Flood Insurance Program (NFIP) Levee System Evaluation, dated 30 July 2009.
- (3) Code of Federal Regulations 44CFR 65.10.
- (4) Tres Rios Environmental Restoration Project Review Plan, June 2011.
- (5) ER 1110-1-12, Engineering and Design, Quality Management, dated 30 September 2006.

4.0 Documents Requiring ATR

The ATR team reviewed the Tres Rios LSER. This document relies on three other documents: 1. Tres Rios Design Documentation Report, 2. Tres Rios As-Builts, and 3. Tres Rios Embankment Construction Report.

5.0 ATR Process

Because of the short time frame enforced to write and finalize this report, a concurrent DQC and ATR were performed. Specific work items included, but are not limited to the following:

Agency Technical Review
 Tres Rios Levee System Evaluation Report
 November 2012

- Review of the Levee System Evaluation Report
- Review of Design Criteria and Assumptions.
- Entering and resolving all review comments resulting from reviews via Dr Checks.
- ATR certification is required upon completion of the review.

6.0 Objectives

The primary objectives of the review are to ensure that:

- a) The projects meet the Government's scope, intent, and quality objectives, and are suitable for use by FEMA in the development of NFIP in their revised Flood Insurance Studies.
- b) All assumptions and criteria used are valid.
- c) The features are safe, functional, and in-place.
- d) Appropriate methods of analysis were used.
- e) The source, amount, and level of data detail used in the analysis are appropriate for the complexity of the associated projects.
- f) The projects comply with accepted practice and design criteria used by the COE.
- g) All relevant engineering and scientific disciplines have been effectively integrated.
- h) Project documentation is appropriate and adequate.

7.0 Team Membership

All team members have a minimum of 7 years experience within their discipline and are professionals as appropriate in their field. Ms. Kristie Hartfeil, of CENWP-EC-DC has been selected as the ATR Team leader and is a Professional Engineer (PE).

District Quality Review Team within Los Angeles District

Name	Role	Section	Phone Number
Van Crisostomo	DQC HH Section Ch	HH	213 452-3558
Paul Beaver	DQC LSER & Geotech	Geotech	213 452-3588
Douglas Dahncke	DQC Geotech Section Ch	Geotech	213 452-3597
Robert Conley	DQC Structures Section Ch	Structures	213 452-3691
Jody Fischer	DQC LSPM	Dam & Levee	213 452-3576

Agency Technical Review Team outside of LA District but within SPD

Name	Role	District	Phone Number
William Trujillo	LSPM Review	SPA LSPM	(505) 342-3487

Scott Stonestreet	HH	SPK	(916) 557-7719
Derek Morley & Kevin Hazleton	Geotech	SPK	(916) 557-5316
Hana Dodini	Structures	SPK	(916) 557-5340

8.0 Comments

The ATR Team in the formal review of the documents used the DrChecks review tool. The majority of the comments addressed grammatical, style, or clarification issues that resolved quickly within the document and closed out in Dr Checks.

There were many LSER DrChecks comments that addressed issues with the DDR and previous DQC comments on the DDR. The LSER DR Checks comments were closed upon the understanding that the DDR was not being reviewed. The DDR is currently in draft form. The LSER comments were closed with the understanding that the LSER Dr Checks issues did not impact the substance or conclusions for the LSER.

There were many LSER Dr Checks comments on the As-Builts and again these comments were closed upon the understanding that the As-Builts were not being reviewed. The LSER comments were closed with the understanding that the LSER Dr Checks issues on the As-Builts did not impact the substance or conclusions for the LSER.

There were many LSER Dr Checks comments on the Tres Rios Emergency Action Plan and Operations and Maintenance manuals. The LSER comments were closed with the understanding that the LSER Dr Checks comments on the EAP and O & M Plan did not impact the substance or conclusions for the LSER.

There were a few hydraulic modeling comments in the LSER Dr Checks. All of those comments were satisfactorily addressed and then closed. There were also a few geotechnical comments and those were also addressed and closed.

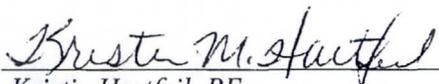
There are no remaining Dr Checks comments on the LSER and the ATR team found it to be a satisfactory document.

9.0 Schedule

The ATR review was completed between August and October 2012 with the majority of the review completed in September 2012.

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the Tres Rios Levee System Evaluation Report (LSER). The ATR was conducted as defined in the project's Review Plan to comply with the requirement EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions, methods, procedures, and materials used in analyses; alternatives evaluated; the appropriateness of data used and level obtained; and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The ATR also assessed the District Quality Control (DQC) documentation and made the determination that the DQC activities employed appear to be appropriate and effective. All comments resulting from the ATR have been resolved and the comments have been closed in Dr Checks.



Kristie Hartfeil, PE
ATR Team Leader
CENWP-EC-DG

14 NOV 12
Date



Jody Fischer
LSER Coordinator
CESPL-ED-GL

16 NOV 2012
Date

MARKUTEN.ROD.E.
1229085340

(Name)
Review Management Office Representative
SPD

Digitally signed by MARKUTEN.ROD.E.1229085340
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=USA, cn=MARKUTEN.ROD.E.1229085340
Date: 2012.11.16 16:51:39 -08'00'

Date

CERTIFICATION OF AGENCY TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:
(Describe the major technical concerns and their resolution)
As noted above, all concerns resulting from the ATR of the project have been fully resolved.

LEIFIELD.RICHARD
J.1231256543

Richard J. Leifield P.E.
Chief Engineering Division
CESPL-ED

Digitally signed by LEIFIELD.RICHARD.J.1231256543
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI,
ou=USA, cn=LEIFIELD.RICHARD.J.1231256543
Date: 2012.11.16 17:22:43 -08'00'

Date



**Addendum to Agency Technical Review of Tres Rios Levee System Evaluation Report
14 November 2012
Van Crisostomo, CESPL-ED-HH**

The purpose of this addendum is to document South Pacific Division's concerns regarding risk issues assumed by a positive NLSER evaluation, recognizing that the ultimate decision to approve the NLSER package rests with the District.

1. The ATR Hydraulics reviewer noted:

"Even with the final water surface elevations from the revised model, I am not convinced either Southern Avenue or El Mirage would not be overtopped. It appears the WSEs are very close to overtopping and the increased WSEs with encroachment to the floodway should not be disregarded."

a. It appears that there was another change to the hydraulic model by WEST consulting (as conveyed by WEST e-mail to SPL Hydraulics on Oct 25, 2012), based on Baker Engineering review of the latest hydraulic runs. Was SPL Hydraulics able to perform DQC on the newer hydraulic runs prior to re-sending to the ATR Hydraulics reviewer? The critical water surface elevation that the ATR reviewer was originally looking at was 935.82 feet NGVD 1929. The low point in the road is 935.60 ft NGVD 1929, so this 'natural ground' would be overtopped by .22 feet of water during this design flow event. The "new" model was based on the Baker comments on the latest WEST modeling, so now this results in the water surface elevation to be 935.60 feet NGVD 1929, which is the same elevation as the low point in the 'natural ground' of El Mirage Road (i.e., there is no factor of safety).

SPL HH Response: DQC was performed on the "new" model since it was part of the Technical Data Notebook submittal to FEMA. Concur that the water surface elevation is the same as the low point in the natural ground of El Mirage Road (935.6 ft NGVD 1929).

b. The ATR reviewer indicated some confusion with the vertical datums changes. As such, this continues to be a concern, as future reviews of Plans & Specifications by others will likely not present the convenience of calling WEST engineers for clarification (as was done by SPL for the ATR reviewer). Rather, the person looking at the levee may be relying on the P&S sheets. We recommend adding a large caveat to each P&S page to indicate the 'correction' needed for complying with current USACE standards (NAVD 1988), so that future users will have ready access for their design needs.

SPL HH Response: Concur. The datum conversion from NGVD 1929 to NAVD 1988 will be included in the DDR and P&S. The conversion is $NGVD29 = NAVD88 - 2.10$ ft.

2. The ATR Hydraulics reviewer agrees with how their comment 4 was answered but left open questions with SPL responses 1, 2, and 3.

" Tamara and I have signed the certification letter and concur with the approval of the hydraulic modeling as stated in number 4 in your email.



Numbers 1-3 I will yield to your office's judgment and understanding of the situation."

a. The design elevation being different for the El Mirage Road roadway and the adjacent end of the North Levee is not clear. Property owners to the east of El Mirage Road will see a top of levee that is higher than the adjacent road, and would wonder if the levee is too high or the road is too low.

SPL HH Response: The elevation of El Mirage Road at the levee intersection is 939.66 ft (NGVD 1929); the elevation of the levee at this location is 940.15 ft (NGVD 1929). Therefore, there should be minimal (6-inch) discernible difference in elevation between the two. With vegetation removal in the near future (Phase 3c), it would be expected that the water surface will decrease by approximately 2 ft at this location.

b. Basing a factor of safety (i.e., a noted drop in water surface elevation of 1-2 feet?) on future desired vegetation removal implies that the levee system should not be certified until that vegetation removal is done. Many outside factors might result in this removal being delayed or perhaps not being accomplished. Also, have test runs verified this anticipated drop?

SPL HH Response: The implied drop in water surface was mentioned for information only, i.e. that the water surface will eventually lower in the future. It is not being used as a factor of safety. The current water surface elevation is 935.6 ft NGVD 1929, which is the same elevation as the low point in the road. Note that vegetation clearing (Phases 3a-3b) from the upstream end of the project to El Mirage Road have already been completed and hydraulic modeling has shown that the water surface dropped up to 2 ft for the design (100-yr) flood event. This is the same type of vegetation clearing expected downstream (Phase 3c) in the near future.

3. It is not clear that El Mirage Road was inspected for adequacy to hold back floodwaters, should the design water surface match the low point in the road of 395.60. Reference has been made to Baker Engineering performing an evaluation, perhaps to FEMA standards, but this evaluation should be confirmed with FEMA and documented (in lieu of our own USACE inspection), as opposed to the consultants Baker or WEST, as this seems to be a critical life safety assumption.

SPL HH Response: The road is considered "natural ground" and therefore not considered as a levee. At the location of the low spot (approximately 500 ft south of Southern Avenue), the floodwaters would not be adjacent to the road since there is local "high" ground between the road and the floodwaters.



Comment Report: All Comments
 Project: Tres Rios North Levee
 Review: Draft Tres Rios Levee System Evaluation Report
 Displaying 207 comments for the criteria specified in this report.

Id	Discipline	Section/Figure	Page Number	Line Number
4713839	General	n/a'	n/a	n/a

See attached for report comments.

(Attachment: [TresRios_NLSER_7-2012_DD_Review.docx](#))

Submitted By: [Douglas Dahncke](#) (213 452-3597). Submitted On: 09-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Open Comment

See attached comments.

Submitted By: [Douglas Dahncke](#) (213 452-3597) Submitted On: 19-Aug-12
 (Attachment: [TresRios_NLSER_for_Backcheck_8-7-12_DD_Comments.pdf](#))

2-0 Evaluation Concurred

Changes to be incorporated as appropriate and as discussed.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 22-Aug-12

2-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Douglas Dahncke](#) (213 452-3597) Submitted On: 20-Sep-12
 Current Comment Status: **Comment Closed**

4739076	Hydraulics	n/a'	Table of Contents (TOC)	n/a
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For Section 8.0 System Evaluation, the word "Ystem" in the TOC is misspelled.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739081	Hydraulics	n/a'	Table of Contents (TOC)	n/a
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This part of the report should have page numbers/letters. Please add.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

1-2 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739089	Hydraulics	n/a'	Table of Contents (TOC)	n/a
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The word "Appendicies" is misspelled. Please correct.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739091	Hydraulics	n/a'	Table of Contents (TOC)	n/a
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For Appendix B, please add the word "Design" in front of the word "Documentation".

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred
Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment
Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12
Current Comment Status: **Comment Closed**

4739094	Hydraulics	n/a'	Positive NFIP LSER Transmittal n/a Letter
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Please add a blank line between the greeting and the next line of text.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred
Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment
Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12
Current Comment Status: **Comment Closed**

4739110	Hydraulics	n/a'	Positive NFIP LSER Transmittal n/a Letter
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Please be consistent throughout the entire document with how you refer to the LA District. Sometimes it is reports as USACE, LA District. Other times it is LACOE. Sometimes it is just USACE. Other times it is Los Angeles District. Please adopt a format when referring to the LACOE and apply this format throughout the entire document.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739140	Hydraulics	n/a'	Positive NFIP LSER Transmittal n/a Letter
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There are several grammatical errors in the transmittal letter. Please see the attached tracked PDF for recommendations towards improving.

(Attachment: [PositiveNFIP_LSERTransmittalLetter.pdf](#))

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739143	Hydraulics	n/a'	Positive NFIP LSER Transmittal n/a Letter
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Please consider addressing the agency (District) within the text rather than "you" as in Mr. Phillips (see tracked PDF from previous comment).

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739147 Hydraulics n/a' Positive NFIP
LSER Transmittal n/a
Letter

Suggest adding Bob Bezek's title in the letter body per the guidance document instructions.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739165 Hydraulics n/a' LSER main body
text n/a

There are numerous grammatical errors throughout the document and the attached tracked pdf has suggestions for improving it. Main comments included consistency in present and past tense within sentences, hyphenation, singularity/plurailty, salutation, etc. Please address.

(Attachment: [TresRios_NLSER_7_20_2012_rph.pdf](#))

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

Revised 23-Jul-12.

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739178 Hydraulics 3.1 2 n/a

You state that the TRNL is 9 miles west of the City of Phoenix. I am not sure that distance is correct. Please check.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739183	Hydraulics	3.1	2	n/a
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The TRNL is also located near Avondale. Suggest adding a description of the location of the TRNL with respect to Avondale.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739191	Hydraulics	3.1	2	n/a
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What is the definition of "leveed area"? From Figure 2, it appears to be the area protected by the levee, but it is not clear.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739201 Hydraulics 3.2 2 n/a

There are too many "r" letters in the name "Genterra" (third sentence from the bottom of the first paragraph in Section 3.2),

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739224 Hydraulics 3.2.1 2 n/a

The first sentence "About 1 mile of the existing Holly Acres Levee is required for modifications. . ." is confusing. Was the 1 mile referring to the actual length of the Holly Acres levee or the length that was modified? Also, there is no indication of what "modification" means in this case (i.e., part of the new TRNL is actually the modified and improved Holly Acres levee). Please clarify.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739231 Hydraulics Figure 1 3 n/a

The legend title falls over the aerial photograph (it does not appear to lie within the legend box). Please label this as Figure 1 to keep in context with the text.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Figure edits have been made and an additional figure has been added. These updated version of the figures will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739236 Hydraulics Figure 1 3 n/a

Suggest adding outlines of Avondale and Phoenix to this figure as well as identifying the Phoenix International Raceway (as it is a large feature).

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Figure edits have been made and an additional figure has been added. These updated version of the figures will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739241 Hydraulics Figure 1 3 n/a

The levee is labeled "Tres Rios" which is confusing because there is a yellow arrow right next to it. The yellow arrow gives the impression that the river name is "Tres Rios". Also, suggest changing the label from "Tres Rios" to "Tres Rios North Levee" to avoid confusion.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Figure edits have been made and an additional figure has been added. These updated version of the figures will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739248 Hydraulics Figure 2 4 n/a

The "leveed area" shown is greater than the effects of the levee on flood protection. To be in conformance with the study results, please consider: West of El Mirage Rd. the area should not extend north of Broadway Rd.; it should not extend north of Broadway Rd. east of 118th avenue (the floodplain shown in this area is not from the Gila River - it is from a different flooding source). Also, please label this Figure 2 to keep in context with the foregoing text.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

The following clarification has been added to the text: Figure 2 presents the Leveed Area as shown on the National Levee Database. This area should not be confused with a flood plain, but is used in a nation-wide comparison of relative potential consequences behind levees. The leveed area consists of elevations lower than the top of levee, but does not take into account the general direction of overland flow. It represents the "bath tub affect" of a levee and is determined by projecting horizontal lines from the top of the levee to points of equal elevation.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739255 Hydraulics 3.2.3 5 n/a

It would be useful to see a map of the collector channel system.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Figure edits have been made and an additional figure has been added. These updated version of the figures will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

2-0 Evaluation Concurred

Figure edits have been made and an additional figure has been added. These updated version of the figures will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

Backcheck not conducted

Current Comment Status: **Comment Closed**

4739256	Hydraulics	3.2.4	5	n/a
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It would be useful to see a map showing the location of the dentention basins.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Figure edits have been made and an additional figure has been added. These updated version of the figures will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739265	Hydraulics	3.2.5	5	n/a
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It is unclear what the East 119th Avenue Dike and West 117th Avenue Dikes are. Are these the old dikes from the Holly Acres levee? If so, explicitly state that. Since you are naming the individual dikes, it would be useful to have a map showing the dikes with their names.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Figure edits have been made and an additional figure has been added. These updated version of the figures will be provided to the reviewer directly. Changes have also been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

2-0 Evaluation Concurred

Figure edits have been made and an additional figure has been added. These updated version of the figures will be provided to the reviewer directly. Changes have also been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

Backcheck not conducted

3-0 Evaluation Concurred

Figure edits have been made and an additional figure has been added. These updated version of the figures will be provided to the reviewer directly. Changes have also been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

Backcheck not conducted

Current Comment Status: **Comment Closed**

4739269	Hydraulics	Table 3.2.9	6	n/a
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What does "which was sealed" mean? Perhaps explain what this means in the text.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

"Which was sealed" means that the CMP is still penetrating the levee; however, it is capped on both ends and filled with grout (plugged). The land side end of the CMP is buried and the river side is exposed. The text has been modified to remove the item from the table and clarify in the text.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739282	Hydraulics	7.1.2	8	n/a
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There is a discussion about "sheer flow". This should be "sheet flow".

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Correction and clarification of sheet flow have been made in the text. An updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 03-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739295	Hydraulics	7.1.2	8	n/a
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The location of the potential for erosion along the collector channel from sheet flow should be defined by station limits. Please address

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

The specific locations where erosion was observed are noted in Appendix F. Based on what was observed, the potential for erosion resulting from irrigation water and sheet flow, however, are along the entire length of the collector channel.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739319	Hydraulics	7.1.2	8	n/a
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The paragraph that begins with "This levee system inspection is based on observations of field conditions" seems out of place in this location. This paragraph is a description of issues with inspections in general and not the inspection of April 2012. Perhaps this paragraph would fit better under the main section (Section 7.1) instead of subsection 7.1.2.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Non-concurred

This paragraph address' the levee system periodic inspection not the final construction completion walk through.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739471	Structural	Appendix D	n/a	n/a
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(Document Reference: DDR)

Changes resulting from structural DQC team review comments that were concurred with have not been made in the final DDR. Update DDR with changes resulting from the comments that were concurred with.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Open Comment

Since the DDR hasn't incorporated the DQC comments, it is not final. The LSER should at least make it clear that the DDR is a Draft.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

1-2 Backcheck Recommendation Close Comment

I looked over the Amended final DDR and noticed that most of the original DQC comments were addressed. However, some references to ACI 318M still remain on page 6 of 31 in also D(see DQC comment 4333555). There is still no explanation of the section called "Shear Design Options: CORTCUL Program (X0024)" (see DQC comment 4333569).

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 14-Sep-12

Current Comment Status: **Comment Closed**

4739478	Structural	Appendix D, section 1.d.2)	4	n/a
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(Document Reference: DDR)

Section 1.d.2) states that reinforcing steel will conform to ASTM A615, Grade 420. This is inconsistent with sheet S-1 on both Phase 1A and Phase 1B as-builts, which calls for ASTM A615, Grade 60. Change 420 to 60.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739486	Structural	Appendix D	23, 29	n/a
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(Document Reference: DDR)

Microstation sketches on pages 23 and 29, which correspond to steel areas entered into CORTCUL, do not match up with the reinforcement spacings indicated on the as-builts(see S-3 and S-5 on Phase 1A as-builts).

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739497	Hydraulics	7.1.2	8	n/a
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It would be useful to define the purpose of the letter issued by the FCDMC to the irrigation district.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

The text has been modified to address this comment. An updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739507 Hydraulics 7.1.2 8 n/a

It would be useful if you stated that a flap gate is not required (and why it is not required) on the 18-inch CMP penetrating the levee on the downstream end.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation For Information Only

Text added to section, "This CMP was not part of the USACE design and constructed by local interests."

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739515 Structural Appendix D 6 n/a

(Document Reference: **DDR**)

Add reference to where the values for drained unit weight, soil bearing, and angle of internal friction are taken from.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

Revised 23-Jul-12.

1-0 Evaluation Non-concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body.

Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739531 Structural Appendix D 6 n/a

(Document Reference: DDR)

Is H = 2 ft for soil cover a constant or just one of multiple values investigated for H?

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Non-concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body.

Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739578 Hydraulics 7.2.2 9 n/a

The way that this section is written, it sounds like a detailed flood frequency analysis was performed for this project. However, the hydrology was taken from the Section 7 USACE report. I assume that the text reflects what was done in the Section 7 report. Suggest explicitly stating that the hydrology was taken from the Section 7 first and then go through the description of the flood frequency analysis.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739582 Hydraulics 7.2.3 9 n/a

The way that this section is written, it sounds like the discharge frequency analysis was performed for this project. However, the discharges were taken from the Section 7 USACE report. Suggest explicitly stating that the hydrology was taken from the Section 7 first and then go through the description of the discharge frequency analysis. You can also look for a description of this section in the TDN prepared by WEST.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739584	Hydraulics	7.3	10	n/a
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WEST is an acronym and should be in all caps.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739589	Structural	Appendix D	8	n/a
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(Document Reference: DDR)

0.5 seems like a high value for maximum reinforcement ratio. Explain the choice of this value in the DDR text.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Non-concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body.

Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739598	Hydraulics	7.3 and 7.3.1	10	n/a
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The introduction paragraph for Section 7.3 is confusing because it discusses the 2D modeling that was done that really was not a big part of the hydraulic analysis used for the levee analysis. Suggest discussing more of the 1D modeling aspects in this section and minimizing (or even removing) the 2D aspects. In addition, 7.3.1 states that the computer model used is HEC-RAS, which is a 1D model and 1D model is not even discussed in 7.3. If 7.3 retains a description of the 2D modeling, the model used (most likely RMA2) should be added to 7.3.1..

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739607	Hydraulics	7.3.2	10	n/a
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The first paragraph in this section is incorrect. Both statements in this paragraph are incorrect. Refer to the TDN prepared by WEST for an accurate description of the cross-sections.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised to include some information from the TDN.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739613 Hydraulics 7.3.4 11 n/a

The expansion and contraction coefficients were not adjusted as described in the text. Because there is very little contraction through the Avondale Bridge, the expansion and contraction coefficients were not changed from their default values. See the TDN prepared by WEST for details.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739614 Hydraulics 7.3.4 11 n/a

The Yarnell equation was not used for modeling low flows through the bridge. Should there be a discussion on modeling approach for high flows?

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739623 Hydraulics 7.3.6 12 n/a

This is the first time that HNTB is mentioned so it is unclear what their role in the project is.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Reference to HNTB deleted.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739631	Hydraulics	7.3.6	12	n/a
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The last paragraph in Section 7.3.6 lists details on how the HNTB model was changed into the final model for the project. The details are probably not needed in the report. Suggest removing this paragraph.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Paragraph deleted.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739650	Hydraulics	7.3.7.1	12	n/a
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Who created the memo described in this section?

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739665	Hydraulics	7.3.7.1	12	n/a
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The discussion about the proposed dikes in the last paragraph of this section is confusing. Is this discussing replacing the old Holly Acres dikes with a single dike? It is unclear. This is also the first mention of bendway weirs. I don't believe that the old Holly Acre dikes were bendway weirs and there are no bendway weirs on the TRNL, so it is unclear why they are mentioned in this paragraph. What does it mean to combine the proposed dikes into a single dike? It would be useful to define what "ultimate scour depth" is. The verb tense in the last sentence suggests that the riprap design has not been done yet (i.e., riprap protection would be used).

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739666	Hydraulics	7.3.7.1	12	n/a
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Who wrote the "Final Report" mentioned in this section? Is this WEST's PED report or is this another report?

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739669	Hydraulics	7.3.7.1	12	n/a
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You might want to mention that the most upstream end of the levee is buried by backfill - this is in the terrace area, I believe.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739679	Structural	Appendix D	9 and 24	n/a
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(Document Reference: DDR)

Reinforcement cover values input into CORTCUL need to match reinforcement cover shown on the as-builts.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

Revised 23-Jul-12.

1-0 Evaluation Non-concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739689	Hydraulics	7.4	14	n/a
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In the first paragraph, there is mention of Exhibit III - of what, the DDR? Please clarify.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739692 Hydraulics 7.4 14 n/a

A reference is needed for the first sentence of Section 7.4. Where did the sediment transport analysis come from? WEST's PED report or some other report?

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739704 Hydraulics 7.4 14 n/a

The last paragraph (Toe Down Depth) appears to be out of place here. It discusses toe down design and probably fits better in Section 7.3.7. In addition, the last sentence does not reflect what was done in the field. While the recommendation was to toe down 10 feet below the thalweg, that was not done in the field. 15-inch riprap blankets were used instead as described in Section 7.3.7. Maybe add a discussion of why the recommend toe down depth was not used in this case.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Last paragraph moved to section 7.3.7. Text for doe down depth was also revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739705 Structural Appendix D 9 n/a

(Document Reference: DDR)

Add reference in text to where values for elevation at top of layer, saturated unit weight, and moist unit weight come from.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Non-concurred

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Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739709	Structural	Appendix D	15	n/a
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(Document Reference: DDR)

Explain the choice of 11 foot soil cover and other differences between case 1 and case 2 in the DDR text.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

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Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739714 Structural Appendix D 24 n/a

(Document Reference: DDR)

Explain the choice of 4 foot soil cover for the 113th Avenue RC Box culvert in the DDR text.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739717 Structural Appendix D 24 n/a

(Document Reference: DDR)

Add reference in text to where 10 feet elevation at top of layer comes from.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739734	Structural	Appendix D	30	n/a
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(Document Reference: DDR)

Replace Mu with phi*Mn.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

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Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739753	Structural	Appendix D	30	n/a
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(Document Reference: DDR)

Slab thickness on this page and in the corresponding Microstation drawing on p. 29 is 16 inches, but is shown as 20 inches on sheet S-5 of the as-builts for Phase 1A.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body.

Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739755	Structural	Appendix D	31	n/a
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(Document Reference: DDR)

Explain what Lns, Lnw, ds, and dw are in the DDR text.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body.

Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739760	Structural	Appendix D	31	n/a
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(Document Reference: DDR)

Explain in the DDR text what U of I 440 is.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body.

Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when

appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739772	Structural	Appendix D	n/a	n/a
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(Document Reference: DDR)

Where are the calculations for the trapezoidal channel sections, transition structure, and gabion mattresses?

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

This comment is being closed with the understanding that the DDR was not included for review. However, the DDR still needs to be revised to incorporate this comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 13-Aug-12

Current Comment Status: **Comment Closed**

4739784	Structural	3.2.10	7	n/a
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Change "consists bridge deck" to "consists of bridge deck."

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739793	Structural	7.5.2	15	n/a
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In the section's last sentence, explain and/or show how the standards and requirements have been met with reference to calculations or other documentation. Also, there are no stability calculations in Appendix D of the DDR to show that the requirements of EM 1110-2-2100 have been met.

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Upon further consideration, this section should be removed from the report as it does not pertain to the inspection and evaluation of the levee. Technical design considerations should not be addressed in this report, but are available for reference in the DDR.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739799	Structural	7.5.3	15	n/a
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Change "approximate Station 103+20" to "approximately Station 103+20".

Submitted By: [Hana Dodini](#) ((916) 557-5340). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Hana Dodini](#) ((916) 557-5340) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739852	Hydraulics	7.5.1.1	15	n/a
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How do you know the primary drainage structures are in good condition? Were these inspected in April? If so, please indicate.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised to indicate that the condition is based on the recent periodic inspection conducted in April.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739855	Hydraulics	7.5.1.1	15	n/a
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Please clarify why a flap gate is not needed on the CMP.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation For Information Only

Text added to section, "This CMP was not part of the USACE design and constructed by local interests."

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739856	Hydraulics	7.5.1.2	15	n/a
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Who is responsible for repairing side drain no. 6?

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation For Information Only

O&M responsibility has been turned over to FCDMC.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739857 Hydraulics 7.5.1.1 15 n/a

Suggest adding word "regular" or "routine" in front of the word Operations

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739859 Hydraulics 7.5.1.2 15 n/a

Are there going to be repairs performed before the final draft LSER? If not, will the description of severe erosion affect project approval or levee certification? Please clarify.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739860 Hydraulics 7.6.1 16 n/a

The word Estrella is misspelled. Please correct.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739866 Hydraulics 7.6.3 17 n/a

Begin new sentence ahead of "are" with word "Slopes" as first word (see tracked pdf).

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739868 Hydraulics 7.6.4.2 18 n/a

Perhaps it is better to use the word "modeled" instead of maximum when describing the flood event considered for design.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739869 Hydraulics 7.6.4.2 and 7.6.4.3 18 n/a

Is an exit gradient of 0.11 and 0.19 acceptable?

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739874	Hydraulics	Table 7.6.5-1	19	n/a
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The top of the table should be moved to join the rest of it - no orphans please.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739875	Hydraulics	7.6.5.1	19	n/a
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Should there be any text associated with the last bullet item (Pseudo-Static)? It seems odd that there is text follow every other bullet item but this last one.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text has been modified and changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739885	Hydraulics	7.6.5.4	20	n/a
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Verb choice and use of the word "if" makes it sound like the levee is still in design. For example, the slope should be 2.25:1 if angular stones are used. It has been designed so you should know if there are angular stones or not.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739887	Hydraulics	7.6.7.2	21	n/a
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A reference is needed for the USGS website mention in the first line on page 21.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739889	Hydraulics	7.7.3	22	n/a
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Please be consistent when describing catch basins by always referring to them this way.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739893 Hydraulics 7.7.4 22 n/a

Suggest stating the coefficients used for the culvert inlet and outlet losses here.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739897 Hydraulics 7.7.6 23 n/a

Please add the as-built plans sheet numbers for the channel as reference.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation For Information Only

The stormdrain channel section was deleted since the stormdrain channel is around the treatment plant and not next to the levee.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739903 Hydraulics 7.8.2 24 n/a

Immediately after "...National Levee Database.." please add "(NLD)" since the acronym is used shortly.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739911	Hydraulics	Figure 3	25	n/a
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Please clarify in the legend (and/or the text) what the differences are between the NLD survey (blue line) and the as-built drawings line (green line).

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Figure edits have been made and the following is stated in the text: The green line represents the as-built elevation profile to include the 2012 increase in levee height between approximate stations 107+00 and 113+00. The blue line represents a 2010 Levee centerline Survey for the National Levee Database. This is prior to the levee height increase in 2012.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4739914	Hydraulics	8.0	26	n/a
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Please check the spelling of the word "System" in the section title.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

Changes have been made to the text and an updated version of the text will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4740160	Hydraulics	n/a'	Appendix E Construction Completion Letters	n/a
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It looks like Bob Upham of the City of Phoenix still needs to sign these.

Submitted By: [Brian Wahlin](#) (480-345-2155). Submitted On: 23-Jul-12

1-0 Evaluation Concurred

The letter referenced is part of an Appendix and is intended for reference only. Please confirm that these are needed for FEMA submittal.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Brian Wahlin](#) (480-345-2155) Submitted On: 10-Aug-12

Current Comment Status: **Comment Closed**

4743506	Civil	n/a'	Sheet	Index to Contract Drawings
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(Document Reference: As-builts Phase 1A)

Under Concrete Irrigation Canal Connections, Sheet No. SD-21 has been deleted, does not exist in this plan set. Correct the Index of Drawings.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

Revised 25-Jul-12.

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 07-Aug-12

Current Comment Status: **Comment Closed**

4743520 Civil n/a' Sheet Index to Contract Drawings

(Document Reference: As-builts Phase 1A)

Under Geotechnical-Plans and Logs of Exploration. Sheet Nos. G-4, G-5, G-6, G-9 and G-10 have been deleted from this as-built set of drawings. Correct the Index of Drawings.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

Revised 25-Jul-12.

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743543 Civil n/a' Sheet 6-Key Map n/a
Sheet 1

(Document Reference: As-Builts Phase 1A)

See note near between Sta 158+00 and Sta 159+00 for GD-23. Index of Contract Drawings shows GD-23 as West 113th Ave Dike Plan, Profile, and Sections not East 115th. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

Revised 25-Jul-12.

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743548	Civil	n/a'	Sheet 6-Key Map Sheet 1	n/a
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(Document Reference: As-Builts Phase 1A)

See note near Sta 164+00 for GD-22. Index of Contract Drawings shows GD-22 as East 113th Ave Dike Plan, Profile, and Sections not West 113th. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

Revised 25-Jul-12.

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743561	Civil	n/a'	Sheet 6	n/a
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(Document Reference: As-Builts Phase 1A)

See note near Sta 172+00 for GD-21. Index of Contract Drawings shows GD-21 as 95th Ave Dike Plan, Profile, and Sections not East 113th. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743571	Civil	n/a'	Sheet 6	n/a
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(Document Reference: As-Builts Phase 1A)

General Comment. The plates are actually different in the separate O&M Manual for Phase 1A. Plates 27 & 28 of O&M Manual are for collector channel and basin. The plates referenced in this note are for this plan set only and not for the separate COE O&M Manual. Just wanted to point out possible confusion to someone unfamiliar with this project.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743578	Civil	n/a'	Sheet 7- Key Map Sheet 2	n/a
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(Document Reference: As-Builts Phase 1A)

See note for SD-21 near Sta 42+00. Index of Contract Drawings shows SD-21 as West 107th Ave CIC Sidedrain Plan, Profile, and Sections not East 107th. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743582	Civil	n/a'	Sheet 7- Key Map Sheet 2	n/a
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(Document Reference: **As-Builts Phase 1A**)

See note near Sta 55+00 for SD-21. Index of Contract Drawings shows SD-21 as West 107th Ave CIC Sidedrain Plan, Profile, and Sections not East 105th. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743603	Civil	n/a'	Sheet 7- Key Map Sheet 2	n/a
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(Document Reference: **As-Builts Phase 1A**)

General Comment. Check O&M Manual for Phase 1A. Plates 27 & 28 of O&M Manual are for collector channel and basin. Possible confusion with Plates from COE O&M Manual and this plan set. Maybe a note stating that the plates referenced in this plan set are not to be confused with the O&M drawings in the separate document.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743609	Civil	n/a'	Sheet 7- Key Map Sheet 2	n/a
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(Document Reference: As-Builts Phase 1A)

Small Plan near bottom right corner. Index of Contract Drawings does not show GD-20 for Guide Dikes. GD-20 not shown in as-built plan set. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743622	Civil	n/a'	Sheet 6- Key Map Sheet 1	n/a
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(Document Reference: As-Builts Phase 1A)

See note near Sta 38+00. Index of Contract Drawings shows SD-20 as E107th Ave CIC, Sidedrain Plan, Profile, and Sections not West 107th. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743635	Civil	n/a'	C-1	n/a
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(Document Reference: As-Builts Phase 1A)

Clarify location of Specification Sections 02380 and 02381 to verify information for 15" riprap and 6" bedding material salvage.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743642	Civil	n/a'	C-2	n/a
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(Document Reference: As-Builts Phase 1A)

Index of Contract Drawings shows GD-22 as East 113th Ave Dike Plan, Profile, and Sections not West 113th. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743648	Civil	n/a'	C-2	n/a
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(Document Reference: As-Builts Phase 1A)

See Note for Install 12" Gabion Mattress. Cannot read note as it is covered by spot elevation, assume Note 3. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743657	Civil	n/a'	C-3	n/a
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(Document Reference: As-Builts Phase 1A)

See Note between Sta 71+00 and Sta 72+00. Index of Contract Drawings shows GD-21 as 95th Ave Dike Plan, Profile, and Sections not East 113th. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743659	Civil	n/a'	C-4	n/a
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(Document Reference: As-Builts Phase 1A)

Reclaimed water pipe inlet (Phase 1B) arrow does not point to any feature and reclaimed water pipe inlet is not shown on the plans. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743665	Civil	n/a'	C-4	n/a
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(Document Reference: As-Builts Phase 1A)

General Comment. Check O&M Manual for Phase 1A. Plates 26, 27 & 28 of O&M Manual are for collector channel and basin. This may be confusing since the LACOE O&M Manual also has O&M drawings included for each phase of construction including Plates 27 & 28. Clarify to make sure O&M drawings refer to this as-built set only.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743671	Civil	Cross Section 169+00	CX-11	n/a
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(Document Reference: As-Builts Phase 1A)

Verify location and accessibility for Specification Section for Compacted Fill Levee.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743672 Civil Cross Section 170+00 CX-11 n/a

(Document Reference: As-Builts Phase 1A)

Verify location and accessibility for Specification Section for geotextile fabric.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743680 Civil Section A-A Typ AR-20 n/a

(Document Reference: As-Builts Phase 1A)

Verify location and accessibility for Specification Section for 3" ABC roadway.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743686 Civil X-Section Sta 0+35 to 0+80 CCTX-12 n/a

(Document Reference: As-Builts Phase 1A)

Verify location and accessibility for Specification Section for Compacted Backfill.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743696	Civil	X-Section Sta 0+35 to 0+80	CB-13	n/a
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(Document Reference: As-Builts Phase 1A)

See Note-15" Grouted Stone Slope. Verify location and accessibility of Spec Section for Grouted Stone.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743706	Civil	n/a'	CB-13	n/a
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(Document Reference: As-Builts Phase 1A)

See Construction Note 2. Verify location and accessibility of Spec Section for Hydroseed.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743755	Civil	Section A-A	RCB-16	n/a
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(Document Reference: As-Builts Phase 1A)

Clarify if weep holes were considered in the design of the concrete structures to relieve uplift pressures. I could not find any mention or justification for deletion of weepholes in channel walls or concrete structures.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743762	Civil	Section B-B	RCB-16	n/a
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(Document Reference: As-Builts Phase 1A)

Verify and provide location and accessibility of Spec Sections for Concrete Fills (lean concrete, soil cement, flowable fill).

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743768	Civil	Detail X Typ	RCB-16	n/a
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(Document Reference: As-Builts Phase 1A)

Verify and provide location and accessibility of Spec Sections for Structural Compacted Earth Fill. Clarify if Structural Compacted Fill requirements are different than Compacted Fill requirements.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743771	Civil	n/a'	SD-21	n/a
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(Document Reference: As-Builts Phase 1A)

Deleted this sheet, does not exist. Correct the Index of Contract Drawings to reflect the deletion. Clarify why it is shown if the sheet is deleted in its entirety.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743779	Civil	n/a'	G-4, G-5, G-6, G-9, G-10	n/a
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(Document Reference: As-Builts Phase 1A)

General Comment. All these sheets were deleted from this as-built plan set. Correct the Index of Contract Drawings to reflect the deletion. Clarify why these sheets are still shown if they are deleted in their entirety.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743793 Civil n/a' S-1 n/a
(Document Reference: As-Builts Phase 1A)

General Comment. Clarify if weepholes were considered in the structural design for concrete structures and channels. This sheet would be ideal for providing a weep hole detail and wall vertical drain system. I did not find any discussion or justification for elimination of weepholes.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743801 Civil n/a' S-1 General Structural
Note 10

(Document Reference: As-Builts Phase 1A)

Note 10 calls out structural compressive strengths of 4,000 and 3,000 psi @ 28 days. Verify location and accessibility of Spec Sections for concrete with smaller compressive strength values (<3,000 psi, soil cement, flowable fill, lean concrete).

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743815 Civil n/a' Sheet 2-Index to
Contract Drawings n/a

(Document Reference: As-Builts Phase 1B)

Sheet DIVC-40 is listed in the Index to Contract Drawings but is not shown in this as-built set of drawings but is referenced in other drawings. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743823 Civil n/a' Sheet 6-Key Map n/a

(Document Reference: As-Builts Phase 1B)

General Comment. Coordinate since LA COE O&M Manual also has attached drawings. Add note or clarify that O&M drawings pertain only to this plan set of drawings. Do not want confusion or conflict with drawings included in the SPL O&M Manual.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743828 Civil n/a' Sheet 6-Key Map n/a

(Document Reference: As-Builts Phase 1B)

See Note-Construct RCB Culvert, Inlet & Outlet Structure (Sheet ERCB-20). Also add reference to structural plan, profile, section sheets for RCB S-2, S-3, S-4.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743833 Civil n/a' Sheet 6-Key Map n/a

(Document Reference: As-Builts Phase 1B)

See Note-Construct Diversion Channel (Shts DICV-40 & DIVC-41). Sheet DIVC-40 is not included in this Index of drawings. Correct this reference or provide DIVC-40 drawing in this as-built plan set.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743839 Civil n/a' Sheet 6-Key Map n/a

(Document Reference: **As-Builts Phase 1B**)

See Note-Construct El Mirage Road Collector Channel (Sht EMCC-27 Thru EMCT-35). Index To Contract Drawings does not list a EMCT-35 in the contents. Correct Index and/or this plate and add EMCT-35 if necessary.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743846 Civil n/a' Sheet 10 n/a

(Document Reference: **As-Builts Phase 1B**)

See West 119th Ave Guide Dike (Exist Dike) located above the drawing scale. Clarify if this should be the West 117th Ave Dike instead. This sheet shows (2) West 119th Guide Dikes. See Sheet 6.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743850	Civil	n/a'	Sheet 10	n/a
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(Document Reference: As-Builts Phase 1B)

General Comment. The title of this sheet does not match the title listed in the Index to Contract Drawings. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743856	Civil	n/a'	CL-1	n/a
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(Document Reference: As-Builts Phase 1B)

See Note-See sheet EMDB-SD for Details and also Levee Profile Along Centerline. In Index to Contract Drawings I do not see a Sheet EMDB-SD listed. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

Revised 25-Jul-12.

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743865	Civil	n/a'	Sheet CL-1	n/a
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(Document Reference: As-Built Phase 1B)

See Note-Basin Invert Access Ramp (Shet EIMDB-1). In Index to Contract Drawings I do not see a Sheet EIMDB-1 listed but I do see an ELMDB-1. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

Revised 25-Jul-12.

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743871	Civil	Section A-A	CL-5	n/a
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(Document Reference: As-Built Phase 1B)

Verify location and accessibility of Spec Section for 6" Grouted ABC Access Ramp. This is first indication of grouted ABC.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743876	Civil	Section A-A	CL-5	n/a
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(Document Reference: As-Built Phase 1B)

Verify location and accessibility of Spec Section for Soil Cement slope protection. Clarify if soil cement be used to repair damaged existing soil cement sections, if so a spec is needed.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743877	Civil	n/a'	CL-5	n/a
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(Document Reference: As-Built Phase 1B)

Construction Note 5. Verify location and accessibility of Spec Sections 02380 and 02381 for riprap and bedding.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743878 Civil n/a' CL-5 n/a

(Document Reference: As-Built Phase 1B)

See Construction Note #3. Verify location and accessibility for Spec Section 02371 for spiral ties for gabion mattress.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743883 Civil n/a' EEM-13 n/a

(Document Reference: As-Built Phase 1B)

See Note 3. Verify location and accessibility for Spec Section for Grouted Stone.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743890	Civil	Lower Ramp Center Line Profile	W115-15	n/a
---------	-------	--------------------------------------	---------	-----

(Document Reference: As-Built Phase 1B)

Verify location and accessibility of Spec Section for asphalt wearing course on Landing Area. This is the first indication of asphalt wearing surface. Spec Section for Tack Coat or Prime Coat is probably needed also.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743897	Civil	West 115th Avenue Dryside Access Ramp Plan	W115-15	n/a
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(Document Reference: As-Built Phase 1B)

Clarify on what sheet(s) are cut sections A-A, B-B, C-C and D-D shown. Provide reference to sheet W115-15A for these additional sections. Only Section E-E cut shown on this sheet.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743906	Civil	RCB Control Line Profile	ERCB-20	n/a
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(Document Reference: As-Built Phase 1B)

See RCB Control Line Profile and Typical Detail for turned down edge shown to the right. The Typical Detail is labeled as Detail "X" Typ and should be labeled as Detail "Y" Typ. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743913	Civil	RCB Plan	ERCB-20	n/a
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(Document Reference: As-Built Phase 1B)

See Note-Detention Basin (sht EIMDB-1). Index to Contract Drawings does not list a Sheet EIMDB-1 but does list a ELMDB-1. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743918	Civil	RCB Plan	ERCB-20	n/a
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(Document Reference: As-Built Phase 1B)

See Note-POB Diversion Channel (sht DIVC-1). Index to Contract Drawings does not list a Sheet DIVC-1 but does list a DIVC-41. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743921	Civil	RCB Plan	ERCB-20	n/a
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(Document Reference: As-Built Phase 1B)

See Diversion Channel (see DIVC-40). Sheet DIVC-40 is not included in this as-built set of drawings. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743924	Civil	RCB Plan	ERCB-20	n/a
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(Document Reference: As-Built Phase 1B)

See Note-Diversion Channel O&M Roads (sht DIVC-40). Sheet DIVC-40 is not included in this set of as-built drawings. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743930	Civil	Plan	O&MR-21	n/a
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(Document Reference: As-Built Phase 1B)

See Note-Basin Invert Access Ramps (sht EIMDB-1). Sheet EIMDB-1 is not listed in Index to Contract Drawings but ELMDB-1 is listed. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743932	Civil	Plan	O&MR-21	n/a
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(Document Reference: As-Built Phase 1B)

See Note-El Mirage Road Detention Basin (sht EIMDB-1). Sheet EIMDB-1 is not listed in Index to Contract Drawings but ELMDB-1 is listed. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743955	Civil	n/a'	O&MR-22	n/a
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(Document Reference: As-Built Phase 1B)

This set of as-builts has two O&MR-22 Sheets. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743966	Civil	n/a'	EMCT-34	n/a
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(Document Reference: As-Built Phase 1B)

See Collector Channel Typical Section Sta 7+60 to Sta 41+50. Sheets CMCC-26 and CMCC-28 called out in Invert Elevation See Profile are not listed in the Index To Contract Drawings but EMCC-26 and EMCC-28 are listed. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743971 Civil El Mirage Road RCB Center Line S-2 n/a
Profile

(Document Reference: As-Built Phase 1B)

Se Note-Cutoff Wall/Turndown for Inlet Structure (see S-4). Sheet S-4 is not included in this As-built set. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743975 Civil n/a' ELMDB-1 n/a

(Document Reference: As-Built Phase 1B)

General Comment. This sheet is shown twice in this as-built set of drawings and is out of sequence. It is included immediately after Sheet S-4. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743979 Civil Plan ELMDB-1 n/a

(Document Reference: As-Built Phase 1B)

See Note-Diversion Channel (Sht DIVC-40). DIVC-40 is not included in this As-built set of drawings. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4743993 Civil Plan EIMDB-2 n/a

(Document Reference: As-Built Phase 1B)

See Notes-Turn-Around Landing Area (Sht EIMDB-1) and Basin Invert Access Ramp (Sht EIMDB-1). Sheet EIMDB-1 is not listed in Index to Contract Drawings but ELMDB-1 is listed. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744022 Civil General, Para. 9 II-vi n/a

(Document Reference: Appendix H O&M Plan)

Third sentence states, Levee height varies from about 3 ft at the upstream end (105th Ave) to about 5 ft at Avondale Boulevard. DDR states between 5 ft and 9.3 feet for levee height. Coordinate and correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744030 Civil Emergency
Operations, Para. II-vii n/a
14

(Document Reference: Appendix H O&M Plan)

POC's. Coordinate the information shown here for the POC's with the EAP Emergency contact information.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744035	Civil	Pertinent Data	App VI-2	n/a
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(Document Reference: [Appendix H O&M Plan](#))

Pertinent data shows 0-7 feet levee height. DDR states between 5 ft and 9.3 feet for levee height. Coordinate and correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744052	Civil	Project Performance, Para. 9	II-vi	n/a
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(Document Reference: [Appendix H O&M Plan](#))

This paragraph states, The levee height ranges from 5 ft at 115th Avenue to 20 ft at El Mirage Road. The Pertinent Data in the DDR states levee height is 0.10 feet to 9.3 feet. Coordinate and correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744058	Civil	Emergency Ops, Para. 14	II-viii	n/a
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(Document Reference: Appendix H O&M Plan)

POC's. Coordinate POC Emergency information with EAP.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744068	Civil	Project Area and Vicinity Map	Plate 1 Phase 1B Drawings	n/a
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(Document Reference: Appendix H O&M Plan)

This text note calls out Phase IC control line. Since Phase IC is no longer needed clarify if an amendment should be provided and the drawing revised accordingly by supplemental note.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however the removal of Phase IC will be addressed in the amended DDR. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 07-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744083	Civil	Pertinent Data Phase 1B	VI-2	n/a
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(Document Reference: [Appendix H O&M Plan](#))

Pertinent Data states that existing Holly Acres Levee Height is 5-8 feet whereas in previous Pertinent Data Phase 1A data, 0-7 feet maximum is mentioned. Coordinate and correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744098	Civil	Pertinent Data Phase 1B	VI-2	n/a
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(Document Reference: [Appendix H O&M Plan](#))

Pertinent Data states height of new levee is 5-20 feet. DDR states 0-9.3 feet. Coordinate and correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744114	Civil	n/a'	Table of Contents (cont.)	n/a
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(Document Reference: Appendix B - TRL Final DDR)

TABLE OF CONTENTS (continued), page vii. Appendix C, change to read, "GEOTECHNICAL DESIGN DOCUMENTATION REPORT to match the title in the appendix.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body.

Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744119	Civil	n/a'	Table of Contents (cont.)	n/a
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(Document Reference: Appendix B - TRL Final DDR)

TABLE OF CONTENTS (continued), page vii. Appendix D, change to read, "STRUCTURAL ANALYSIS to match the title in the appendix.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body.

Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744124	Civil	Pertinent Data	7	n/a
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(Document Reference: [Appendix B - TRL Final DDR](#))

PERTINENT DATA, page 7. Under the description of the Channels/Detention Basin it states, Depth: 2 feet 3 feet. Clarify if it varies from 2-3 feet or 3 feet is the maximum depth.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. The DDR comments will be relayed to the appropriate responsible party for future incorporation if/when appropriate. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744129	Civil	Surveying and Mapping, Para. 1.9	11	n/a
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(Document Reference: [Appendix B - TRL Final DDR](#))

Surveying and Mapping, Page 11, para. 1.9. This paragraph states that the mapping datum is NAD 1983 and NGVD 1929. Revise to include NAVD 88 since the USACE is currently establishing NAVD 88 survey elevations as the baseline for all existing and future levees to be consistent throughout the country.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744132	Civil	Coordination with Others, Para. 1.11 11 a	n/a
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(Document Reference: Appendix B - TRL Final DDR)

Telephone number is incomplete for Mr. Don J. Rerick – Project Manager, Flood Control District of Maricopa County. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744136	Civil	Flood Control North Levee, Para. 15 3.1e	n/a
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(Document Reference: Appendix B - TRL Final DDR)

Flood Control North Levee, Page 15, para. 3.1e. This paragraph describes a flood wall and 4 stop log access points. Clarify if this is the same floodwall for Phase IC. If so and the floodwall is no longer needed, the DDR can be edited with justification as to why the floodwall and stop log access points are no longer needed.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744210	Civil	Access Ramps, Para. 4.3	16	n/a
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(Document Reference: Appendix B - TRL Final DDR)

At least one plate on the as-builts shows grouted 3" ABC one section. Verify if this is correct and if the DDR needs to be revised to reflect 3" grouted ABC for the surfacing.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744240 Civil Detention Basins, 17 n/a
Para. 4.5

(Document Reference: Appendix B - TRL Final DDR)

Include Phase 1A plates 28-30 as reference for the Catch Basins.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

Revised 25-Jul-12.

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744261 Civil n/a' 17 O&M Roads,
Para.4.7

(Document Reference: Appendix B - TRL Final DDR)

At least one plate on the as-builts shows a 3" grouted ABC surface. Verify if this is correct and clarify if the DDR needs to be revised to reflect a 3" grouted ABC surface.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744277	Civil	Proposed Construction, Para. 1.1	1	Appendix C- Geotechnical Design Documentation Report
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(Document Reference: [Appendix B - TRL Final DDR](#))

This paragraph states two concrete lined catch basin (one at El Mirage Road and one directly south of South 109th Avenue);... Verify that the detention basin bottom is also concrete lined. Sheet CB-13 of Phase 1A states that the entire bottom of the basin area will be hydroseeded. Coordinate and delete "concrete lined catch basin" in text. Verify for Phase 1B catch basin.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744281	Civil	General Comment	1	Appendix C- Geotechnical Design Documentation Report
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(Document Reference: [Appendix B - TRL Final DDR](#))

There are many references to Appendices within Appendices. Appendix C- Geotechnical Design Documentation Report with its individual appendices for soil testing, bore logs, etc is included under APPENDIX B-TRL FINAL DDR. This may be confusing but has to be dealt with carefully.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744290	Civil	Groundwater Condition, Para. 5.4	12	Appendix C- Geotechnical Design Documentation Report
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(Document Reference: Appendix B - TRL Final DDR)

Water table elevation depends on season/time of year since precipitation has an influence on water table elevation. Revise sentence to reflect variable water table elevations for different times of the year.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744302

Civil

Slope Protection,
Para. 6.4 16

Appendix C-
Geotechnical
Design
Documentation
Report

(Document Reference: Appendix B - TRL Final DDR)

In first sentence it states that riverward slope of the levee shall consist of 15" thick layer of rounded stone riprap, however, second paragraph states riprap should be "blocky" in shape. CEI photos show rounded riprap with no theft threat. Coordinate DDR writeup with rounded riprap justification.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744311

Civil

Seismic Slope
Displacement, 18
Para 6.6.4

Appendix C-
Geotechnical
Design
Documentation
Report

(Document Reference: Appendix B - TRL Final DDR)

Appendix G not listed in Geotech Table of Contents and not included in this Appendix C-Geotechnical Design Documentation Report. Correct.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744318	Civil	Conventional Concrete Mix Design Criteria, Para 7.6.2	22	Appendix C- Geotechnical Design Documentation Report
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(Document Reference: Appendix B - TRL Final DDR)

Second to last sentence states, "All mixes for exposure to flowing water will be designed with maximum water cement ratio not exceeding 0.45. Clarify w/c ratio for soil cement, lean concrete, concrete slope paving, etc that is not considered structural concrete (these will have lower compressive strengths).

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744323	Civil	References	F-2	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

Clarify the location of the USCOE -LA OMRR&R Manual document and if it is accessible. Clarify if it can be included as an appendix or attachment to the NLSER or DDR.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744326	Civil	Pertinent Project Data	iv	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

Show drainage area (sq miles) for El Mirage Avenue Detention Basin in the table.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744329	Civil	Purpose of Plan, para. 1.3	3	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

Change to read, "Section 6: Emergency Tasks" to match title in Section 6.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744331	Civil	Purpose of Plan, para. 1.3 (3)	3	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

Change to read, "APPENDIX E: EAP Development Notes" to match title in Appendix E.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744345	Civil	Construction History, Para. 1.4.2	4	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

Rewrite this paragraph to explain why the Holly Acres Levee was revised twice. The second time was in order to meet the 1% annual chance flood event at the Gila River and Salt River confluence.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744366	Civil	Potential Refuge/Staging, Para. 2.6	12	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

EAP should show emergency evacuation routes, hospital routes, shelters, resource staging areas (material and equipment), EOC, etc.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744370	Civil	Emergency Response Monitoring, Para. 3	13	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

Clarify who does the FCDMC hydrologist contact after the alarm is activated. Provide sequence of notification events and clarify how will the public be informed: radio alerts, sirens, tv broadcasts, reverse 911 calls, door-to-door contact, etc.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744374	Civil	Flood Control District of Maricopa County, Para. 5.1.1 (2)	16	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

Installed Observations points A & B on Figure 9 only show Lat and Long coordinates. Show top of levee elevations or elevation gage markings for each observation point.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744376	Civil	Flood Control District of Maricopa County, Para. 5.1.2 (1)	16	n/a
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(Document Reference: [Appendix G-Tres Rios EAP](#))

Changes or modifications to the completed levee will be coordinated thru the LA Corps District under the Section Minor 408 or Major 408 Permit process depending on the complexity of the change or modification.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744378	Civil	Flood Control District of Maricopa County, Para. 5.1.3	16	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

Determine or assign what agency/Sponsor will lead the annual mock emergency response exercises and what agency will prepare the incident report the flood emergency. Clarify if the agency responsible be the Maricopa County Department of Emergency Management (MCDEM) or FCDFMC.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744381	Civil	Fail Inspection, Para. 5.1.1.2 (3)	19	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

Clarify what type of repairs may be necessary (sand bags, impervious liner, sand boils, etc) and if the resources (equipment and material) are at secure, nearby stockpiled or stored staging areas for use and are experienced personnel available. Recommend annual or bi-annual floodfighting field exercises.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744382	Civil	Fail Inspection, Para. 5.2.2.2	23	n/a
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(Document Reference: [Appendix G-Tres Rios EAP](#))

There is no B.1 Tier 1 contact, however, Mr. Peter Weaver is listed under B.1. Clarify if Mr. Weaver Director is the levee engineer.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER and was not prepared by or under control of the LA District. The Emergency Action Plan is a local sponsor developed and implemented document and therefore cannot be modified by the Corps. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. However, these EAP comments have been relayed to Don Rerick of the Flood Control District of Maricopa County, as the County is the owner of the EAP Document, for revision or incorporation if they so choose. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744385 Civil Fail Inspection,
Para. 6.2.3.2 (3) 24 n/a

(Document Reference: Appendix G-Tres Rios EAP)

Subsection 2.6 does not have resource stockpiling locations or equipment locations. Describe the locations of material and equipment.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744386 Civil Pass Inspection,
Para. 6.2.4.1 24 n/a

(Document Reference: Appendix G-Tres Rios EAP)

Correct Error! Reference source error.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744392	Civil	Maricopa County Board of Supervisors, Para. 6.2.8	31	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

POC, Title, phone, email address information should be provided in the B.1 and B.2 Emergency contact lists-Appendix B. This person is responsible for declaring an emergency.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744394 Civil List of
Deficiencies, Para. A-1 n/a
A.2

(Document Reference: Appendix G-Tres Rios EAP)

TRNL deficiencies are identified in Flood Damage Reductions Segment/System Inspection Report dated July 3, 2012 with the inspection conducted on April 26, 2012.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744398 Civil FCDMC
Emergency B-1 n/a
Contacts, Para.
B.1

(Document Reference: Appendix G-Tres Rios EAP)

Clarify if Mr. Weaver is also the Levee Engineer. Need work and mobile phone numbers.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744400	Civil	FCDMC Emergency Contacts, Para. B.1	B-1	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

Provide location, POC for availability of RED book.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

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Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744404	Civil	Tier 1 Emergency Contacts, B.2	B-2	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

General Comment. Provide name, work, mobile, fax numbers and email address for POC's that are blank.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER and was not prepared by or under control of the LA District. The Emergency Action Plan is a local sponsor developed and implemented document and therefore cannot be modified by the Corps. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. However, these EAP comments have been relayed to Don Rerick of the Flood Control District of Maricopa County, as the County is the owner of the EAP Document, for revision or incorporation if they so choose. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744408	Civil	Appendix C: FCDMC Distribution List	C-1	n/a
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(Document Reference: Appendix G-Tres Rios EAP)

For levee related issues, also recommend adding Ms. Jody L. Fischer, Levee Safety Program Manager, Los Angeles District Office, 915 Wilshire Blvd, CESPL-ED-GL Los Angeles, CA 90017 Ph. (213) 452-3576 jody.l.fischer@usace.army.mil

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER and was not prepared by or under control of the LA District. The Emergency Action Plan is a local sponsor developed and implemented document and therefore cannot be modified by the Corps. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. Therefore no revisions to the LSER are needed. However, these EAP comments have been relayed to Don Rerick of the Flood Control District of Maricopa County, as the County is the owner of the EAP Document, for revision or incorporation if they so choose. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744417	Civil	General, Para. 1.0, 3.0 and 11	3, 4, and 6	n/a
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(Document Reference: Tres Rios LSER Review Plan)

Tres Rios was constructed prior to the distribution of the current EC 1110-2-6067, USACE Process for the National Flood Insurance Program (NFIP) Levee System Evaluation, 31 August 2010, which Expires 31 August 2012 this year. Clarify if the EC, dated 30 July 2009 will be used instead of the most current EC.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

Text has been revised for clarity.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744428	Civil	Positive NFIP Levee System Evaluation Report Letter	n/a	n/a
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(Document Reference: Tres Rios NLSER 7-2012)

Second page. Change to read, This NFIP levee system evaluation does not assure that Tres Rios North Levee Phase 1A and Phase 1B will exclude flood water from all future flood events exceeding the 1% frequency or higher floods.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred
Change made as noted.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 07-Aug-12

1-1 Backcheck Recommendation Close Comment
Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12
Current Comment Status: **Comment Closed**

4744442	Civil	General Comment	n/a	n/a
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(Document Reference: Tres Rios NLSER 7-2012)

Fill in the blanks or XXX'd out areas in the text.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred
The referenced place holders will be updated when the references become available.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment
Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12
Current Comment Status: **Comment Closed**

4744444	Civil	General Comment	n/a	n/a
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(Document Reference: Tres Rios NLSER 7-2012)

Fill in the Figure numbers 1 and 2 for the Location Map and the Leveed Area, respectively.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

Figure edits have been made and an additional figure has been added. These updated version of the figures will be provided to the reviewer directly.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744449	Civil	NFIP Levee System Eval Team Members, Para. 6.0	7	n/a
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(Document Reference: Tres Rios NLSER 7-2012)

Table, Ms. Cyjthia M. Wong, P.E. title is listed as Levee Safety. Clarify what capacity for Levee Safety: LSO, Geotechnical Engr, ICW, etc.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

The text will be modified to read "Levee Inspection Tool Operator".

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744465	Civil	Site Visit Summary & Recent Inspection, Para. 7.1.2	8	n/a
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(Document Reference: Tres Rios NLSER 7-2012)

Second sentence states in part, "...practices for periodic inspections of levees...USACE. Clarify if an actual Levee Periodic Inspection was conducted since this is a recent levee. The Flood Damage Reduction Segment/System Inspection Report is marked as a routine or Continuing Eligibility Inspection. A Levee PI is more complex than a routine inspection.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

The text has been modified and includes the following text at the end of the paragraph: However, as this levee is recently constructed, this inspection was not rigorous as a periodic inspection as design criteria review was not conducted. In addition, the inspection was more rigorous than a routine inspection as the level of detail of observations was increased.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4744487	Civil	CMP, para 7.5.3	15	n/a
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(Document Reference: Tres Rios NLSER 7-2012)

This paragraph states that CMP's were sealed or removed. Clarify what procedure was used to seal the CMP's (flowable fill, bentonite, lean concrete, etc) and if only the ends were sealed or if the entire length was sealed. These CMP's are still penetrations through the levee and may impact piping, settlement, voids, etc.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

CMP's per the specifications were sealed with controled low strength material (CLSM) which is specified as follows: CLSM shall have cementitious materials content of 40 to 60 lbs of cement and approximately 250 lbs of flyash per cubic yard. The CLSM shall be non-segregating and shall have high flowability as described in ACI 229. It shall be flowable and capable of filling the voids as indicated on the drawings. The CLSM may contain coarse aggregates to a 3/4-inch nominal maximum coarse aggregate size. The precise mix proportions are the responsibility of the contractor and will be prepared to meet the placing requirements specified. The CLSM was to be "fully injected inside the CMP and as directed."

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 22-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 22-Aug-12

Current Comment Status: **Comment Closed**

4744499	Civil	Appendices	n/a	n/a
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(Document Reference: Tres Rios NLSER 7-2012)

Appendix H- Change to read, "Operations & Maintenance Manuals." The O&M Manuals for each respective Phase 1A or 1B will have its own set of plans with the manual.

Submitted By: [William Trujillo](#) (505-342-3487). Submitted On: 25-Jul-12

1-0 Evaluation Concurred

This comment refers to an appendix document that is not included for review in the review plan for the Tres Rios LSER. In addition it does not impact the substance or conclusions of the Levee System Evaluation Report body. No revisions to the LSER are needed, however we will encourage the appropriate responsible party of the as-built/O&M document to make this proposed correction prior to finalization of the LSER. Please close this comment.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [William Trujillo](#) (505-342-3487) Submitted On: 08-Aug-12

Current Comment Status: **Comment Closed**

4745961	Civil	3.2.7	n/a	n/a
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RCB Culverts - verify the size and number of RCBs stated in the paragraph.

Submitted By: [Van Crisostomo](#) ((213) 452-3558). Submitted On: 26-Jul-12

1-0 Evaluation For Information Only

The size and number of RCBs stated are per as-builts and DDR.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Van Crisostomo](#) ((213) 452-3558) Submitted On: 15-Aug-12

Current Comment Status: **Comment Closed**

4745963	Civil	3.2.4	n/a	n/a
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Detention Basins - Verify size of detention basins, should be 15 ac-ft for both.

Submitted By: [Van Crisostomo](#) ((213) 452-3558). Submitted On: 26-Jul-12

1-0 Evaluation For Information Only

The size of the detention basins stated in the report are per as-builts and DDR.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Van Crisostomo](#) ((213) 452-3558) Submitted On: 15-Aug-12

Current Comment Status: **Comment Closed**

4745967	Hydraulics	7.3.3	n/a	n/a
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Last sentence should read "However, based on engineering judgment and field observations..."

Submitted By: [Van Crisostomo](#) ((213) 452-3558). Submitted On: 26-Jul-12

1-0 Evaluation Concurred

Text revised.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 02-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Van Crisostomo](#) ((213) 452-3558) Submitted On: 15-Aug-12

Current Comment Status: **Comment Closed**

4745968	Geotechnical	7.6.3	n/a	n/a
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Verify length of guidedikes - 300 ft instead of 200 ft?

Submitted By: [Van Crisostomo](#) ((213) 452-3558). Submitted On: 26-Jul-12

1-0 Evaluation Concurred

Typo to be corrected to read 300 feet.

Submitted By: [Chris Spitzer](#) (213-452-3562) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Closed without comment.

Submitted By: [Van Crisostomo](#) ((213) 452-3558) Submitted On: 15-Aug-12

Current Comment Status: **Comment Closed**

4762010	Hydraulics	7.3	10	line 5
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"...confirmed this assumptions movement to the north bank." What does this mean? Recommend that this discussion be expanded very slightly to give the reader a clearer idea of the purpose and significance of the subject 2-D modeling.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719). Submitted On: 06-Aug-12

1-0 Evaluation Concurred

Sentence was revised for clarity. However, reference to 2D medeling is summarized in Section 7.3.7.1.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Comment closed.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719) Submitted On: 05-Sep-12

Current Comment Status: **Comment Closed**

4762025	Hydraulics	7.3.2	10	n/a
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The report should explicitly state the source and quality of the geometry used for the HEC-RAS cross sections. If the preconstruction survey discussed in Section 7.8.1 is the source, then please state so. If the geometric data was from somewhere else, then state that.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719). Submitted On: 06-Aug-12

1-0 Evaluation Concurred

Text has been revised to reference PED report.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Comment closed.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719) Submitted On: 05-Sep-12

Current Comment Status: **Comment Closed**

4762035	Hydraulics	7.3.3	11	3th para, 1st line
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"A vertical distribution of 0.15 for the 5-year event,..." Not sure what this means. Suggest this sentence/paragraph be re-written for clarity.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719). Submitted On: 06-Aug-12

1-0 Evaluation Concurred

Text revised for clarity.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 07-Aug-12

1-1 Backcheck Recommendation Close Comment

Comment closed.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719) Submitted On: 05-Sep-12

Current Comment Status: **Comment Closed**

4762041 Hydraulics 7.3.4 Bridges 11 1st para

What expansion/contraction coefficients were used at cross sections which aren't located near bridges? For example, were they set to zero? Please state the values used in the discussion.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719). Submitted On: 06-Aug-12

1-0 Evaluation Concurred

Text revised to include coefficients at all other cross sections.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Comment closed.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719) Submitted On: 05-Sep-12

Current Comment Status: **Comment Closed**

4762139 Hydraulics 7. Interior Drainage 21 n/a

The discussion is not clear with regards to the assumptions for the assumed tailwater condition present in the mainstem channel (a.k.a. the exterior). In looking at Nick Adelmeyer's hydrology write-up (i.e., Exhibit I, to Appendix B in the DDR), he was concerned with thunderstorm-based interior runoff and also stated that there would be no tailwater in the mainstem for this type of event. He also addressed general storm runoff and noted that the contemporaneous WSEL in the mainstem could pose problems to interior runoff for this type of event. What scenario(s) was used to design the gravity drains for this project? What condition controlled? Please modify document to clearly state this assumption.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719). Submitted On: 06-Aug-12

1-0 Evaluation Concurred

Runoff from the interior area may pond along the levee during high or extended stage in the Salt and Gila Rivers. This condition is typically limited to the winter-late spring months when spills from the upstream Salt River Project reservoirs are most likely to occur. To mitigate for this, provision of sufficient catch-basin (detention basin) volume to store the runoff resulting from 2.00 inches of precipitation in 24-hours (5-year, 24-hour precipitation) was constructed. The flapgates for the gravity drains will be closed, i.e. the 100-year flood event is assumed to be occurring in the mainstem channel. The document will be modified to clarify assumptions stated above.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Thanks. The response was very helpful. Comment closed.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719) Submitted On: 05-Sep-12

Current Comment Status: **Comment Closed**

4762210	Hydraulics	8.2.3 Residual Risk and Public Safety	27	n/a
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The document states "No residual risk impact from the levee system exists." Really? Is this true for a 200-, 500-, or 1000-yr event? Perhaps from a FEMA perspective, you are referring to a 100-yr event. I recommend the text to be modified to say "No residual risk impact from the levee system exists for the 1-percent AEP event." Or something to that extent.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719). Submitted On: 06-Aug-12

1-0 Evaluation Concurred

Text revised as suggested.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Comment closed.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719) Submitted On: 05-Sep-12

Current Comment Status: **Comment Closed**

4762280	Hydraulics	n/a'	n/a	n/a
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Attached to this comment are my editorial mark-ups (3 pages). Please consider making these changes to the documentation as you see fit.

(Attachment: [TresRios_NLSER_7-2012_ss_editorial.pdf](#))

Submitted By: [Scott Stonestreet](#) ((916) 557-7719). Submitted On: 06-Aug-12

1-0 Evaluation Concurred

Text revised as suggested.

Submitted By: [Mylene Guron](#) (213-452-3551) Submitted On: 06-Aug-12

1-1 Backcheck Recommendation Close Comment

Comment closed.

Submitted By: [Scott Stonestreet](#) ((916) 557-7719) Submitted On: 05-Sep-12

Current Comment Status: **Comment Closed**

Spitzer, Chris SPL

From: Morley, Derek S SPK
Sent: Wednesday, September 19, 2012 6:51 PM
To: Wong, Cynthia M SPL
Cc: Hartfeil, Kristie M NWP; Fischer, Jody L SPL; Spitzer, Chris SPL
Subject: Tres Rios ATR

Cynthia,

I am the geotechnical ATR reviewer for the Tres Rios LSER, as well as reviewing the related construction report. I have had various questions during my review, which Chris Spitzer has adeptly responded to, explaining to me the various things I felt like I needed to know and making real-time refinements to the documents to address any concerns I had.

At this point I need to document that I have completed my review and I am satisfied that all of my questions/concerns were addressed. Unfortunately, I cannot do so in DrCHECKS, because when I log in to it and go to the Tres Rios LSER project page, it states "You are not assigned to this review", though I think the actual issue is that the review period listed in DrCHECKS has expired.

Since I am indeed satisfied with the document, and have completed my backcheck this afternoon, I have only one comment that I wish to/need to document:

"I have reviewed the LSER, as well as the associated construction report. All review questions have been answered by Mr. Chris Spitzer, the geotechnical lead for this project effort, and I have back-checked the revised documents." With that, I wish to close the comment.

Will this email suffice? Or can you enter this comment and its closure into DrCHECKS if that is needed? If it must be entered by me personally, please let me know as soon as the system is updated to allow me to do so.

Feel free to email or call me any time with questions.

Derek S. Morley, PE
Chief, Soil Design Section B
USACE Sacramento District
1325 J Street • Sacramento CA 95814
derek.s.morley@usace.army.mil
916•201•5519

Spitzer, Chris SPL

From: Hartfeil, Kristie M NWP
Sent: Monday, September 24, 2012 8:58 AM
To: Spitzer, Chris SPL
Cc: Fischer, Jody L SPL; Dahncke, Douglas SPL; Fairbank, Timothy SPL
Subject: RE: Tres Rios Comments (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

We have reviewed the responses and they have addressed our NWP comments adequately. Our comments can be considered closed. This email will provide the documentation for the closed out comments. Please let me know if you have any questions.

Kristie Hartfeil, P.E.
Geotechnical, Civil, and Environmental Section
Portland District, US Army Corps of Engineers
503-808-4861

-----Original Message-----

From: Spitzer, Chris SPL
Sent: Tuesday, September 18, 2012 12:48 PM
To: Hartfeil, Kristie M NWP
Cc: Fischer, Jody L SPL; Dahncke, Douglas SPL; Fairbank, Timothy SPL
Subject: Tres Rios Comments (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hello Kristie,
Per Jody's voicemail to you this morning, attached are the responses to your previous comments. Please let us know if you have any issues and if any other additional response is needed. Also please keep us apprised of any info regarding Derek's work.
Thanks,
Chris

Chris A. Spitzer, P.E.
Soils Design and Materials Section
U.S. Army Corps of Engineers
Los Angeles District
"Building Strong and Taking Care of People"
915 Wilshire Boulevard 13-238
Los Angeles, California 90017
Office (213) 452-3562

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

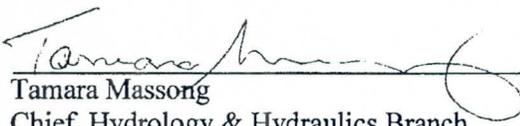
COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the hydraulic modeling for Phase 1 of the Tres Rios Environmental Restoration Project. The ATR was conducted to comply with the requirements of EC 1165-2-209. During the ATR, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions, methods, procedures, and material used in analyses, the appropriateness of data used and level obtained, and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing US Army Corps of Engineers policy.



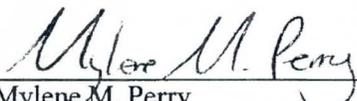
Vince Vigil, P.E., CFM
Hydraulic Engineer
CESPA-PM-LH

30 - October 2012
Date



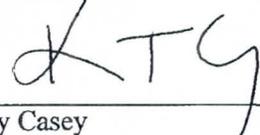
Tamara Massong
Chief, Hydrology & Hydraulics Branch
CESPA-PM-LH

30 Oct 12
Date



Mylene M. Perry
Work Leader/Project Engineer
CESPL-ED-HH

31 OCT 12
Date



Kerry Casey
Chief, Hydraulics Section
CESPL-ED-HH

31 OCT 2012
Date



Van Crisostomo, P.E.
Chief, Hydrology & Hydraulics Branch
CESPL-ED-HH

31 Oct 12
Date

Perry, Mylene M SPL

From: Crisostomo, Van G SPL
Sent: Tuesday, October 30, 2012 3:58 PM
To: Fischer, Jody L SPL; Spitzer, Chris SPL; Perry, Mylene M SPL
Cc: Vermeeren, Rene A SPL; Ly, Cuong SPL; Casey, Kerry T SPL
Subject: Fw: Tres Rios ATR (UNCLASSIFIED)
Attachments: TresRios_HH_ATRCertification.pdf

Mylene,
Please printout and circulate for signatures.
Van

----- Original Message -----
From: Vigil, Vincent SPA
Sent: Tuesday, October 30, 2012 05:44 PM
To: Crisostomo, Van G SPL
Cc: Massong, Tamara M SPA
Subject: RE: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Tamara and I have signed the certification letter and concur with the approval of the hydraulic modeling as stated in number 4 in your email. Numbers 1-3 I will yield to your office's judgment and understanding of the situation.

Vince Vigil P.E., CFM
Hydraulic Engineer, Hydrology and Hydraulics Section
U.S. Army Corps of Engineers - Albuquerque District
(505) 343-6289

-----Original Message-----
From: Crisostomo, Van G SPL
Sent: Tuesday, October 30, 2012 8:09 AM
To: Vigil, Vincent SPA
Cc: Spitzer, Chris SPL; Massong, Tamara M SPA; Perry, Mylene M SPL; Vermeeren, Rene A SPL; Ly, Cuong SPL; Casey, Kerry T SPL
Subject: RE: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Vince,

We appreciate your comments and quick turnaround for this review. However, we still believe that the HEC-RAS models are adequate and do not need additional freeboard at El Mirage for the following reasons:

1. The area in question is in a non-conveyance area, i.e. it is outside the main channel flow and should not have wave action during the design flood.
2. The overall project is not complete yet. When Phase 3c, i.e. channel vegetation clearing is completed, the overall water surface should see a decrease on the order of 1-2 ft in the vicinity of El Mirage Road (based on

Feasibility Study).

3. The locals know that any increase in water surface (encroachment, or otherwise) would negate the ability for the upstream levee to convey the design flood based on the risk and uncertainty analysis. In other words, it would behoove the locals to not allow any increase in water surface in this area.

4. Finally, these models have been approved by FEMA (through Baker, see attached). Since FEMA has approved the floodplain mapping, they agree with utilizing the natural rise in ground elevations to contain flooding without requiring a freeboard analysis and certification of the roadway embankment.

Please let us know if you concur or non-concur with these responses to your comments and/or if you'd like to discuss.

Thanks,
Van

-----Original Message-----

From: Vigil, Vincent SPA
Sent: Friday, October 26, 2012 11:16 AM
To: Perry, Mylene M SPL; Massong, Tamara M SPA
Cc: Crisostomo, Van G SPL; Spitzer, Chris SPL
Subject: RE: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

I have reviewed the revised model, compared it to the previous model and I believe the changes are acceptable. Even with the final water surface elevations from the revised model, I am not convinced either Southern Avenue or El Mirage would not be overtopped. It appears the WSEs are very close to overtopping and the increased WSEs with encroachment to the floodway should not be disregarded.

I tried calling Mylene to discuss, but since I am leaving early today I will have to take care of signing the certification letter when I return on Monday.

I revised my signature block, added Tamara's signature block and added comments regarding the potential overtopping issue. Take a look at what I wrote and let me know if this is an acceptable solution then I can sign Monday when I return, or if we need to discuss further you can call me first thing on Monday.

Vince Vigil P.E., CFM
Hydraulic Engineer, Hydrology and Hydraulics Section
U.S. Army Corps of Engineers - Albuquerque District
(505) 343-6289

-----Original Message-----

From: Perry, Mylene M SPL
Sent: Thursday, October 25, 2012 5:18 PM
To: Vigil, Vincent SPA; Massong, Tamara M SPA
Cc: Crisostomo, Van G SPL; Spitzer, Chris SPL
Subject: RE: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Vince,

You are correct. The 2008 topography was in NGVD88 and covered approx. 100' upstream of El Mirage Road to downstream of the project. This portion was converted to NGVD29 to match the NGVD29 topo upstream of El Mirage Road and to the upstream end of the project.

Also, there were some minor changes to the model following review by FEMA last month. The attached is the latest version of the RAS model. At Cross-section 198.27 the FP elevation is 935.6' and FW elevation is 935.99. See email from WEST Consultants regarding the floodway encroachment.

I have also attached the Certification sheet.

If you have additional questions please let me know.

Thanks,
Mylene M. Perry
USACE, Los Angeles District
Hydraulics Section
(213) 452-3551

-----Original Message-----

From: Vigil, Vincent SPA
Sent: Thursday, October 25, 2012 1:01 PM
To: Perry, Mylene M SPL; Massong, Tamara M SPA
Cc: Crisostomo, Van G SPL; Spitzer, Chris SPL
Subject: RE: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

I would like to confirm my understanding of the issue with the vertical datum. According to the memos I was provided, the RAS model was previously referencing the NGVD29 datum when 2008 mapping from WEST Consulting was added to the model. According to Paragraph 5 in the Memorandum dated 24 August 2011, the 2008 topography from WEST Consulting had already been converted to the NGVD29 datum to match the previous model and was "then utilized to update the geometry of the HEC-RAS model, and the hydraulic calculations were recomputed in HEC-RAS based on this geometry."

If both the RAS model and the maps you provided are referenced to NGVD29 datum, the base flood elevation at Cross-section 198.27 (just downstream of El Mirage Road) is 935.82 feet which could overtop El Mirage Road and/or Southern Avenue in places. You should also consider that by defining a floodway and allowing encroachment into the floodplain these base flood elevations could increase up to one foot.

If I am not understanding the datum issue or seeing the right elevations let me know.

Vince Vigil P.E., CFM
Hydraulic Engineer, Hydrology and Hydraulics Section
U.S. Army Corps of Engineers - Albuquerque District
(505) 343-6289

P.S. I just wanted to point out that all the plates/figures I've seen reference the NAVD29 datum. That should either be NGVD29 or NAVD88.

-----Original Message-----

From: Perry, Mylene M SPL
Sent: Thursday, October 25, 2012 10:34 AM
To: Vigil, Vincent SPA; Massong, Tamara M SPA
Cc: Crisostomo, Van G SPL; Spitzer, Chris SPL
Subject: RE: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Thanks Vince,

I'm creating the certification letter now.

Mylene M. Perry
USACE, Los Angeles District
Hydraulics Section
(213) 452-3551

-----Original Message-----

From: Vigil, Vincent SPA
Sent: Thursday, October 25, 2012 8:32 AM
To: Perry, Mylene M SPL; Massong, Tamara M SPA
Cc: Crisostomo, Van G SPL; Spitzer, Chris SPL
Subject: RE: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Just finishing up, everything looks good so far, I should be done today. Is there a certification letter I should sign?

Vince Vigil P.E., CFM
Hydraulic Engineer, Hydrology and Hydraulics Section
U.S. Army Corps of Engineers - Albuquerque District
(505) 343-6289

-----Original Message-----

From: Perry, Mylene M SPL
Sent: Thursday, October 25, 2012 9:23 AM
To: Massong, Tamara M SPA; Vigil, Vincent SPA
Cc: Crisostomo, Van G SPL; Spitzer, Chris SPL
Subject: RE: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi Tamara/Vince,

When could we expect your backcheck to be completed by?

Mylene M. Perry
USACE, Los Angeles District
Hydraulics Section
(213) 452-3551

-----Original Message-----
From: Massong, Tamara M SPA
Sent: Thursday, October 18, 2012 9:15 AM
To: Perry, Mylene M SPL; Vigil, Vincent SPA
Cc: Crisostomo, Van G SPL; Spitzer, Chris SPL
Subject: RE: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi Mylene,
Vince will be back in the office on Monday, and will start his backcheck on this. :-)

Tamara

-----Original Message-----
From: Perry, Mylene M SPL
Sent: Thursday, October 18, 2012 9:37 AM
To: Massong, Tamara M SPA; Vigil, Vincent SPA
Cc: Crisostomo, Van G SPL; Spitzer, Chris SPL
Subject: RE: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Tamara/Vince - Please see highlighted responses.

Thanks,
Mylene M. Perry
USACE, Los Angeles District
Hydraulics Section
(213) 452-3551

-----Original Message-----
From: Crisostomo, Van G SPL
Sent: Tuesday, October 16, 2012 12:28 PM
To: Spitzer, Chris SPL; Perry, Mylene M SPL
Cc: Massong, Tamara M SPA; Vigil, Vincent SPA
Subject: FW: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Chris/Mylene -- See SPA's ATR Comments.

Tamara/Vince - Thanks for the quick review, we'll get on these right away.

Van

-----Original Message-----

From: Massong, Tamara M SPA
Sent: Tuesday, October 16, 2012 11:20 AM
To: Crisostomo, Van G SPL
Cc: Vigil, Vincent SPA
Subject: FW: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Hi Van,
Here are our comments. Sorry that they are late, Vince wanted me to look them over, and I was out of the office yesterday.

The project engineer called and left me a message, but I missed his last name...could you please forward these on to him?

Tamara

-----Original Message-----

From: Vigil, Vincent SPA
Sent: Friday, October 12, 2012 5:25 PM
To: Massong, Tamara M SPA
Subject: Tres Rios ATR (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Tamara,
I am sending the ATR comments to you to look over before sending forward. If everything looks good you can forward it, but if you see anything that I should fix before sending can you send it to my personal email and I'll fix it next week and send it back to you.
My email is; vigilvince@comcast.net

Vince Vigil P.E., CFM
Hydraulic Engineer, Hydrology and Hydraulics Section
U.S. Army Corps of Engineers - Albuquerque District
(505) 343-6289

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE

Classification: UNCLASSIFIED
Caveats: NONE