



REPLY TO  
ATTENTION OF

**DEPARTMENT OF THE ARMY**  
SOUTH PACIFIC DIVISION, CORPS OF ENGINEERS  
1455 MARKET STREET  
SAN FRANCISCO, CALIFORNIA 94103-1399

*U. Aug '12*

CESPD-PDS-P

MEMORANDUM FOR Commander, Los Angeles District, ATTN: CESPL-PM-C, Mr. Brian Kenny

Subject: Rio Salado Oeste Environmental Restoration Project Phase 1, Phoenix, Arizona, Review Plan

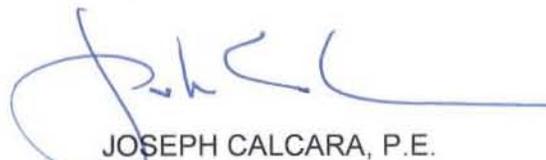
1. The Rio Salado Oeste Environmental Restoration Project Phase I (Including Channel Restoration Grade Control Structure and 31st – 38th Avenue Water Infrastructure), Phoenix, Arizona, Review Plan that is enclosed is in accordance with Engineering Circular (EC) 1165-2-209, Review of Decision Documents, dated 31 Jan 2012. The South Pacific Division, Planning and Policy Division and Los Angeles District Support Team have reviewed the Review Plan that has been submitted. The South Pacific Division approves the Rio Salado Oeste Environmental Restoration Project Phase 1 Review Plan.

2. With MSC approval the Review Plan will be made available for public comment via the internet and the comments received will be incorporated into future revisions of the Review Plans. This project is to restore the Salt River to its natural state and will include habitat restoration, river channel restoration, stormwater outfall wetlands, re-vegetation, sand and gravel mining pit restoration, invasive species management, water supply and distribution, public access facilities, and maintenance road improvements. These features do not use innovative materials or techniques, unique construction sequencing, or a reduced or overlapping design construction schedule. Due to the low complexity and no significant threat to human life the Review Plan does not require independent external peer review.

3. I hereby approve the Review Plan which is subject to change as study circumstances require. This is consistent with study development under the Project Management Business Process. Subsequent revisions to the Review Plan after public comment or during project execution will require new written approval from this office.

4. Point of contact for this action is Kurt Keilman, CESPD-PDS-P, 415-503-6596, [Kurt.Keilman@usace.army.mil](mailto:Kurt.Keilman@usace.army.mil).

***Building Strong From New Mexico All The Way To The Pacific!***

  
JOSEPH CALCARA, P.E.  
Director  
Programs

Encl  
Review Plan

**REVIEW PLAN**  
**RIO SALADO OESTE ENVIRONMENTAL RESTORATION PROJECT PHASE I**  
**(Including Channel Restoration Grade Control Structure and 31<sup>st</sup> – 38<sup>th</sup> Avenue Water**  
**Infrastructure)**  
**Phoenix, Arizona**

**LOS ANGELES DISTRICT**

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Prepared by:

U.S. Army Corps of Engineers  
Los Angeles District

August 9, 2012.



**US Army Corps  
of Engineers** ®  
Los Angeles District

ENLL

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**REVIEW PLAN**  
**RIO SALADO OESTE ENVIRONMENTAL RESTORATION PROJECT PHASE I**  
**(Including Channel Restoration Grade Control Structure and 31<sup>st</sup> – 38<sup>th</sup> Avenue Water**  
**Infrastructure)**  
**Phoenix, Arizona**

**LOS ANGELES DISTRICT**

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<b>1. INTRODUCTION</b> .....	<b>1</b>
a. Purpose .....	1
b. References .....	1
c. Review Requirements .....	1
d. Review Management Organization (RMO) .....	2
<b>2. PROJECT DESCRIPTION</b> .....	<b>2</b>
a. Project Authority .....	2
b. Project Location Description .....	2
c. Value Engineering .....	3
<b>3. WORK PRODUCTS TO BE REVIEWED</b> .....	<b>3</b>
a. Products Features .....	3
b. Products for Review .....	3
c. Authorization & Reference Materials .....	3
<b>4. SCOPE OF REVIEW</b> .....	<b>3</b>
a. District Quality Control .....	3
b. Agency Technical Review .....	3
c. Independent-External-Peer-Review .....	5
<b>5. REVIEW TEAM</b> .....	<b>5</b>
a. Agency Technical Review .....	5
<b>6. PUBLIC COMMENT</b> .....	<b>5</b>
<b>7. REVIEW SCHEDULE</b> .....	<b>6</b>
a. Schedule .....	6
b. ATR Funding .....	6
a. ATR Communication and Documentation .....	6
b. ATR Resolution .....	7
c. ATR Certification .....	7
d. Dispute Resolution .....	7
<b>9. POINTS OF CONTACT</b> .....	<b>8</b>
<b>10. REVIEW PLAN APPROVAL</b> .....	<b>8</b>

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**REVIEW PLAN**  
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**(Including Channel Restoration Grade Control Structure and 31<sup>st</sup> – 38<sup>th</sup> Avenue Water**  
**Infrastructure)**  
**Phoenix, Arizona**

**LOS ANGELES DISTRICT**

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Location Map

Vicinity Map

Appendix A – Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure

Appendix B – 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure

Appendix C – Sample Certification

Appendix D – HDR/CDM Joint Venture Quality Control Plan for Channel Restoration and Grade Control Structure

Appendix E - HDR/CDM Joint Venture Quality Control Plan for Water Supply/Distribution System, between 19<sup>th</sup> Ave and 83<sup>rd</sup> Ave

**REVIEW PLAN**  
**RIO SALADO OESTE ENVIRONMENTAL RESTORATION PROJECT PHASE I**  
**(Including Channel Restoration Grade Control Structure and 31<sup>st</sup> – 38<sup>th</sup> Avenue Water**  
**Infrastructure)**  
**Phoenix, Arizona**

**July 3, 2012**

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**1. INTRODUCTION**

a. Purpose. This Review Plan (RP) defines the scope and level of quality management activities and peer review for the Rio Salado Oeste (RSO) Environmental Restoration Project. The project is divided into two phases; Phase I includes the upstream reach from 19<sup>th</sup> to 51<sup>st</sup> Avenues and Phase II extends from 51<sup>st</sup> Avenue to 83<sup>rd</sup> Avenue. The scope of this Review Plan includes the plans and specifications (P&S) for the first two features of Phase I. The two sets of P&S for PH I include: 1) the Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure, and 2) the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure. This RP will be amended to include the remaining features as the funds are made available.

Five (5) separate plans and specification packages will be required to construct all of Phase I; however, the final two (2) sets of P&S are assumed to be designed during the Construction Phase after execution of the Project Cooperation Agreement (PCA). Therefore, the PED Phase only includes design activities for the first three (3) sets of P&S until the PCA is executed. Phase I of the project will be comprised of Design Documentation Reports (DDR), associated P&S, and an Operation & Maintenance (O&M) Manual.

b. References.

- (1) ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 1999
- (2) ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006
- (3) EC 1105-2-410 Water Resources Policies and Authorities: Review of Decision Documents, 22 Aug 08
- (4) WRDA 2007 H. R. 1495 Public Law 110-114, 8 Nov 2007
- (5) EC 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (6) Army Regulation 15-1, Committee Management, 27 November 1992 (Federal Advisory Committee Act Requirements)
- (7) National Academy of Sciences, Background Information and Confidential Conflict Of Interest Disclosure, BI/COI FORM 3, May 2003

c. Review Requirements. This review plan was developed in accordance with EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision and implementation documents through independent review. This Review Plan describes the scope of review for the current phase of work. All appropriate levels of review (DQC, ATR) are included in this Review Plan, and for the levels not included IEPR, the Review Plan provides documentation of the risk-informed decision not to undertake that level of review. The RP identifies the most important skill sets needed in the reviews, the objective of the review, and the

specific advice sought, thus setting the appropriate scale and scope of review for the individual project.

d. Review Management Organization (RMO). The RMO is responsible for managing the overall peer review effort described in this review plan. The SPD will coordinate and approve the review plan and procure the services of a suitable ATR lead and support the ATR team when appropriate. The SPL will post the approved review plan on its public website.

## 2. PROJECT DESCRIPTION

a. Project Authority. The feasibility report was prepared as an interim response to the following authorities provided by Congress. It presents the findings of a feasibility study of the Rio Salado Oeste, Salt River, Arizona. The Salt River is a significant tributary to the Gila River in the State of Arizona.

- The first authority is given by Section 6 of Public Law 761, dated June 28, 1938, known as the Flood Control Act of 1938, which reads in part as follows:

*“the Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys...at the following localities: ...Gila River and tributaries, Arizona.”*

- The second and most recent authority is provided by a Resolution of the Committee on Public Works and Transportation, U.S. House of Representatives, adopted May 17, 1994 (Docket 2425) (Figure I-2), which states:

*“...the Secretary of the Army is requested to review the reports of the Chief of Engineers on the State of Arizona...in the interest of flood damage reduction, environmental protection and restoration, and related purposes.”*

The Energy and Water Appropriations Act, 2000, Public Law 106-60 appropriated funds for investigations of the civil works project prior to construction. A reconnaissance level review of the Salt River (Rio Salado Oeste) was conducted under that authorization and recommended that there was a Federal interest in proceeding to a second, feasibility phase of the General Investigation. The feasibility report was completed and Chief’s Report signed on December 19, 2006.

b. Project Location Description. The project is located in Maricopa County, Arizona, and is entirely within the City of Phoenix. The project will restore ecosystem functions to an 8-mile reach of the Salt River in Phoenix, Arizona (Maricopa County), between 19<sup>th</sup> Avenue and 83rd Avenue (See Exhibits A-1 and A-2 for a Vicinity and Project Location Map). The recommended plan includes the following measures to support restoration:

- (1) Restoring river channel through grading and terracing and grade control structure,
- (2) Restoring riparian habitat of 1,466 acres,
- (3) Modifying storm water outfalls to harvest available runoff,
- (4) A water supply and distribution system to establish vegetation and provide reclaimed water (8 mgd) to the project,
- (5) Maintenance roads and ramps for safety and river access,

- (6) Invasive species removal and control,
- (7) Grading of existing gravel pit lakes to coincide with the floodplain, and
- (8) A passive recreation plan consisting of approximately sixteen miles of multi-use non-motorized trails, pedestrian bridges, parking lots, comfort stations, and interpretive signs are also included in the recommended plan.

c. Value Engineering (VE). The VE study was conducted in Phoenix Arizona on June 2010. The study was based on the Conceptual Design Documentation Report dated May 2010. Tetrattech conducted the VE study. The VE study was applied to the entire Rio Salado Oeste Project. 31st – 38<sup>th</sup> Avenue Water Infrastructure is one of the design component of the Rio Salado Oeste Project. VE Study recommendation No. 1 applied to 31st – 38<sup>th</sup> Avenue Water Infrastructure. The remaining VE Study recommendations will apply to anticipated future design elements.

Recommendation No. 1 from VE study was incorporated into the Habitat re-evaluation report and design documents. The incorporation of this recommendation is documented in the Habitat re-evaluation report.

### **3. WORK PRODUCTS TO BE REVIEWED**

a. Project Features. This Review Plan is intended to cover the design process and work products for the features described in the attached appendices. This Review Plan will be amended in the future to describe the review for the final construction features of the Rio Salado Oeste Project.

b. Products for Review. Designs for the Rio Salado Oeste, have been, or will be, performed by various AE Contractors. Design products include Design Documentation Reports (DDRs), Plans and Specifications (P&S), and Operation and Maintenance Manuals. All design for this project will be performed by AE Contractors as prescribed by Section 219 of WRDA 1992.

c. Authorization & Reference Materials. Electronic versions of the documents, including Feasibility Studies, VE Studies, a Conceptual Design Document Report, and all relevant information available shall be posted in Adobe Acrobat PDF format for the ATR Reviewers to review.

### **4. SCOPE OF REVIEW**

a. District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan. It is managed in the home district in accordance with the MSC and district Quality Management Plan. DQC activities may be conducted by staff in the home district as long as they are not doing the work involved in the study. SPL will continue to follow the Standard Operating Procedures as outlined in ER 1110-1-2 Quality Management, where the DQC will consist of Quality Checks and Reviews, supervisory reviews, Project Delivery Team (PDT) Reviews, including input from the Local Sponsor, and Biddability, Constructability, Operability, and Environmental (BCOE) Reviews. The Independent Review function will be assumed by the ATR processes.

b. Agency Technical Review. ATR is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with ER 1110-1-12. In order to insure

incorporation of Corps national experience for Flood Risk Management Projects (as updated per post-Katrina investigations), and in addition to the DQC, an ATR will also be performed. Moreover, all provisions and checklists for RSO contained in EC 1165-2-209 will be incorporated into the charge to the ATR team.

(1) ATR Team responsibilities are as follows:

(a) Reviewers shall review project authorization material, design documents, and NEPA documents to confirm that work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Comments on the design documents shall be submitted into Document Review and Checking System (DrChecks).

(b) Reviewers shall pay particular attention to one's discipline but may also comment on other aspects as appropriate. Reviewers that do not have any significant comments pertaining to their assigned discipline shall provide a comment stating this fact.

(c) Grammatical and editorial comments shall not be submitted into DrChecks. Grammatical comments should be submitted to the ATR manager via electronic mail using tracked changes feature in the Word document or as a hard copy mark-up. The ATR manager shall provide these comments to the Study Manager.

(d) Review comments shall contain these principal elements:

- a clear statement of the concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
- the basis for the concern, such as law, policy, or guidance – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- significance for the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs) implementation responsibilities, safety, Federal interest, or public acceptability; and
- specific actions needed to resolve the comment – identify the action(s) that the PDT must take to resolve the concern.

(e) The "Critical" comment flag in DrChecks shall not be used unless the comment is discussed with the ATR manager and/or the Technical Project Leader in advance.

(2) PDT Team responsibilities are as follows:

(a) The team shall review comments provided by the ATR TEAM in DrChecks and provide responses to each comment using "Concur", "Non-Concur", or "For Information Only". *Concur* responses shall state what action was taken and provide revised text from the report if

applicable. *Non-Concur* responses shall state the basis for the disagreement or clarification of the concern and suggest actions to negotiate the closure of the comment.

(b) Team members shall contact the PDT and ATRT managers to discuss any “Non- Concur” responses prior to submission.

c. Independent External Peer Review (Safety Assurance Review).

(1) General. Type I and Type II IEPRs are conducted in accordance with the guidance promulgated in EC 1165-2-209. Type I IEPRs are conducted on project studies. It is of critical importance for those decision documents and supporting work products where there are public safety concerns, significant controversy, a high level of complexity, or significant economic, environmental, and social effects to the nation. However, it is not limited to only those cases, and most studies should undergo Type I IEPR. In accordance with EC 1165-2-209, a Type II IEPR (SAR) shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where potential hazards pose a significant threat to human life. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities.

(2) Decision on Type II IEPR. In accordance with EC 1165-2-209, a Type II IEPR (SAR) is not required for this project. This project is to restore the Salt River to its natural state. This project will include habitat restoration, river channel restoration, stormwater outfall wetlands, re-vegetation, sand and gravel mining pit restoration, invasive species management, water supply and distribution, public access facilities, and maintenance road improvements. These features do not use innovative materials or techniques, unique construction sequencing, or a reduced or overlapping design construction schedule. This low complexity project does not pose a significant threat to human life. Even if the project failed, the risk of loss of life is very small. In the event of a failure, the river would be restricted, but likely still better than existing conditions.

## 5. REVIEW TEAM

a. Agency Technical Review. The ATR is undertaken to “ensure the quality and creditability of the government’s scientific information” in accordance with ER1110-1-12. In order to insure incorporation of the USACE national experience for Flood Risk Management Projects (as updated per post-Katrina investigations), and in addition to the A-E’s ITRs, the ATRs will also be performed. Moreover, all revisions and checklists for Safety Assurance Review (SAR) contained in EC 1165-2-209 will be incorporated into the ATR. The ATR team will be established per ER 1110-1-12 and EC 1165-2-209. The Corps will manage the ATR internally, and it will be conducted by individuals and organizations that are separate and independent from those that accomplished the work, in accordance with policy. The ATR Team Leader will be a Corps of Engineers employee outside the South Pacific Division. The required disciplines are described in the feature appendices.

## 6. PUBLIC COMMENT

To ensure that the peer review approach is responsive to the wide array of stakeholders and customers, both within and outside the Federal Government, SPL will provide an opportunity for public comment by posting the approved RP on its public website, [http://spl.usace.army.mil/review\\_plans](http://spl.usace.army.mil/review_plans), for 30 calendar days. This is not a formal comment period; however, if and when comments are received, the PDT will consider them and decide if revisions to the review plan are necessary. If significant and relevant comments are made, the comments will be provided to the reviewers before they conduct their review.

## **7. REVIEW SCHEDULE**

a. Schedule. Based on SPL's commitment to executing the Rio Salado Oeste Environmental Restoration project schedule for design and construction, milestones for the DQC and ATR processes will be determined and documented as the PED funds are available in the Project Feature appendix. The project is projected for construction in FY13; therefore, the actual dates may have to be adjusted once the period draws closer.

b. ATR Funding. The Los Angeles District will provide labor funding by cross charge labor codes. Funding for travel - if needed- will be provided by way of a government order. The Project Manager will work with the ATR team leader to ensure that adequate funding is available and is commensurate with the level of review needed. The current cost estimate for these reviews is in the range of \$50,000-\$65,000. Any funding shortages will be negotiated on a case by case basis and in advance of a negative charge occurring.

The ATR team leader shall provide organization codes for each team member and a responsible financial point of contact (CEFMS responsible employee) for creation of labor codes. Reviewers shall monitor individual labor code balances and alert the ATR team leader to any possible funding shortages.

## **8. DOCUMENTATION OF REVIEW**

a. ATR Communication and Documentation. The communication and documentation plan for the ATR is as follows:

(1) The team will use the Document Review and Checking System (DrChecks) to document the ATR process. The Technical Project Leader will facilitate the creation of a project portfolio in the system to allow access by all PDT and ATR TEAM members. An electronic version of the documents, appendices, and any significant and relevant public comments shall be made available.

(2) The PDT shall send the ATR team leader one hard copy of the documents for each ATR team member such that the copies are received at least one business day prior to the start of the comment period.

(3) The PDT shall host an ATR kick-off meeting virtually to orient the ATR team during the first week of the comment period. If funds are not available for an on-site meeting, the PDT shall provide a presentation about the project, including photos of the site, for the team.

(4) The Technical Project Leader shall inform the ATR team leader when all responses have been entered into DrChecks and conduct a briefing to summarize comment responses to highlight any areas of disagreement.

(5) A revised electronic version of the documents with comments incorporated shall be made available for use during the back check of the comments.

(6) PDT members shall contact ATR team members or leader as appropriate to seek clarification of a comment's intent or provide clarification of information in the report. Discussions shall occur outside of DrChecks but a summary of discussions may be provided in the system.

(7) Reviewers will be encouraged to contact PDT members directly via email or phone to clarify any confusion. DrChecks shall not be used to post questions needed for clarification.

b. ATR Resolution.

(1) Reviewers shall back check PDT responses to the review comments and either close the comment or attempt to resolve any disagreements. Conference calls shall be used to resolve any conflicting comments and responses.

(2) Reviewers may "agree to disagree" with any comment response and close the comment with a detailed explanation. If reviewer and responder cannot resolve a comment, it should be brought to the attention of the ATR team leader. If the ATR team leader is unable to resolve the issue, the ATR team leader will implement the guidelines as described below in the paragraph on Dispute Resolution.

c. ATR Certification. To fully document the ATR process, a statement of technical review will be prepared for each product reviewed. The ATR documentation will include the text of each ATR comment, the PDT response, a brief summary of the pertinent points in the ensuing discussion, including any vertical coordination, and the agreed upon resolution. Certification by the ATR team leader and the Technical Project Leader will occur once issues raised by the reviewers have been addressed to the review team's satisfaction. Indication of this concurrence will be documented by the signing of a certification statement (Appendix C).

d. Dispute Resolution. The review team leader shall review the products and comments, project delivery team responses, and back check of responses to reviewer's comments to identify any outstanding disagreements between members of the project delivery team and the review team. When resolution is not readily achievable, the RMO should engage the PCX or MSC subject matter experts (SMEs) to help facilitate resolution, and they in turn may choose to engage HQUSACE SMEs. If a specific concern still remains unresolved, the district is to pursue resolution through the policy issue resolution processes described in Appendix H, ER 1105-2-100; ER 1110-1-12, or other applicable guidance. HQUSACE may choose to defer the issue to the policy compliance review process or address it directly. The ATR shall be certified in accordance with ER 1110-1-12 when all ATR concerns are documented as either resolved or deferred by HQUSACE to a separate process.

The ATR team will identify significant issues that they believe are not satisfactorily resolved and will note these concerns in the Technical Review Certification documentation. The ATR team will prepare a Review Report, which includes a summary of each unresolved issue. Review Reports will be considered an integral part of the ATR documentation.

Significant unresolved ATR concerns that are documented by the RMO will be forwarded through the MSC to the HQUSACE RIT, including basic research of Corps guidance and an expression of desired outcome, for further resolution in accordance with the policy issue resolution process described in ER 1110-2-12 or Appendix H, ER 1105-2-100, as appropriate. HQUSACE may choose to defer the issue to the policy compliance review process or address it directly. At this point the ATR documentation for the concern may be closed with a notation that will note these concerns in the Technical Review Certification documentation. The ATR team will prepare a Review Report which includes a summary of each unresolved issue. Review Reports will be considered an integral part of the ATR documentation.

## **9. POINTS OF CONTACT**

Questions about this Review Plan may be directed to the Los Angeles District Project Delivery Team, Design Lead Supervisor, Mr. Stephen H. Vaughn (213) 452-3654, or to the Project Manager for the Rio Salado Oeste, Mr. Brian Kenny at (602) 230-6934. The Chief, Engineering Division is Mr. Richard J. Leifield, PE at (213) 452-3629. Inquiries to the MSC should be directed to Paul Bowers at (415) 503-6556.

## **10. REVIEW PLAN APPROVAL**

In summary, the Los Angeles District proposes to fully comply with all existing guidance, to add ATR, and conduct it in accordance with EC 1165-2-209. Approval of this plan as outlined above will help facilitate the District's completion of the Rio Salado Oeste features within the authorized schedule. In order to ensure the RP is in compliance with the principles of EC 1165-2-209, the RP must be approved by the applicable MSC, in this case the Commander, South Pacific Division (SPD). Once the RP is approved, the District will post it to its district public website and notify SPD. If necessary, any changes to the review plan will be approved by following the process used for initially approving the plan.

The Los Angeles District requests that the South Pacific Division endorse the above recommendations and approve this Review Plan as described in Appendix B of EC 1165-2-609.

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**APPENDIX A**  
**CHANNEL RESTORATION (19<sup>th</sup> to 51<sup>st</sup> Avenue) AND 35<sup>th</sup> AVENUE GRADE CONTROL STRUCTURE**

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**A-1. FEATURE DESCRIPTION**

The Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure include the following major components:

- **Channel Restoration:** The Channel Restoration is proposed to keep more frequent flows confined to certain areas of the river in order to return the stream channel to more natural river morphology. As described in the Feasibility Report, average depth of the Channel Restoration would be approximately 5 feet, with a width varying from 200 to 400 feet. The Channel Restoration is to be graded from existing materials on the site and is not intended to be a hardened channel. The Channel Restoration design will be a 5-year event (20,200 cfs) with occasional flooding to be expected on the adjacent terrace at low depths and velocities.

The current Channel Restoration design has a bottom width ranging from 170 feet to 400 feet in width, with depth ranging from 5 to 20 feet, and 3 horizontal to 1 vertical side slopes. The Channel Restoration thalweg roughly parallels the existing river thalweg between 19<sup>th</sup> Avenue and 35<sup>th</sup> Avenue, most of which is currently in a sump condition due to sand and gravel mining. Consequently, the Channel Restoration between a point approximately 1,300 feet upstream of 35<sup>th</sup> Avenue to approximately 7,500 feet upstream of 35<sup>th</sup> Avenue will not drain except in flows that exceed the thalweg elevation at a point 1,300 feet upstream of 35<sup>th</sup> Avenue. The maximum ponding depth within the Channel Restoration in this reach would be approximately 6 feet. The Channel Restoration between a point approximately 1,300 feet upstream of 35<sup>th</sup> Avenue and 51<sup>st</sup> Avenue would have a constant downstream slope of 0.0015.

The Channel Restoration reach between 35<sup>th</sup> Avenue and 19<sup>th</sup> Avenue would require a cut of 650,000 cubic yards and a fill of 750,000 cubic yards. The reach between 51<sup>st</sup> Avenue and 35<sup>th</sup> Avenue would require a cut of 1,650,000 cubic yards and a fill of 150,000 cubic yards.

The Channel Restoration alignment at 51<sup>st</sup> Avenue follows the existing low flow pattern due to geomorphic conditions. This pattern brings the Channel Restoration close to the south bank at that point. Additional topography has been obtained downstream of 51<sup>st</sup> Avenue to assist the design analysis in ensuring no induced bank erosion in the vicinity of the 51<sup>st</sup> Avenue bridge.

The Channel Restoration will bypass two major gravel pits with a potential for overflow into these pits at flows up to and exceeding the Channel Restoration design discharge. The design is being evaluated to minimize the frequency of overflows and to minimize maintenance needs resulting from overflows.

- **Grade Control Structure:** The grade control structure is proposed to control bed degradation resulting from sand and gravel mining downstream of 35<sup>th</sup> Avenue. This structure will be

constructed of roller-compacted concrete and grouted stone and span the width of the Salt River channel floodway.

## **A-2. WORK PRODUCTS TO BE REVIEWED**

a. Project Features. Design for the Channel Restoration was initiated on March 01, 2010 presuming no major coordination issues for this feature. However, during the 30% review, due to a Real Estate concern, the local sponsor requested to remove one of the gravel pits, located approximately 1,500 feet downstream of 35<sup>th</sup> Avenue (West Pit). In the 30% design, Low Flow Channel (Channel Restoration) enters directly into the upstream end of the West Pit, and exits over the downstream lip of this pit. The RSO project will include a total of approximately 156 acres of emergent wetlands - 28 acres of storm water outfall wetlands, up to 34 acres within the restored channel, and the remaining at the sand and gravel pits. SPL, AE, and the Local Sponsor are coordinating to ensure the new project will provide adequate wetland to meet the requirement of the authorized project.

b. Products for Review. District Quality Control activities for the Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure features have been on-going. Revisions to the (Channel Restoration) alignment and changes will be documented in a DDR. The draft DDR will include all revisions. This Review Plan proposes the DQC and ATR reviews to be conducted on the following draft and final design products:

- Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure Design Documentation Report
- Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure, Plans and Specifications

c. Reference Materials. An electronic version of the following documents will be provided:

- Final Feasibility Study and Environmental Impact Statement, USACE, September 2006
- Final Conceptual Design Document Report July 2010

## **A-3. SCOPE OF REVIEW**

a. District Quality Control. District Quality Control activities for the Channel Restoration plans and specifications will consist of quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, Local Sponsor review, and a BCOE Review as required by the ER 1110-1-12.

b. Agency Technical Review. Agency Technical Review (ATR) will examine the Channel Restoration plans and specifications, focusing on compliance with established policy, principles and procedures using clearly justified and valid assumptions. It includes the verification of assumptions, methods, procedures, and material used in analyses based on the level of complexity of the analysis. The ATR should verify the alternatives evaluated, appropriateness of data used and level of data obtained, functionality of the project, and verify the reasonableness of

the results, including, whether the project meets the customer’s needs consistent with law and existing policy and engineering and scientific principles. The ATR should also determine if the proposed alternative is feasible and will be safe, functional, constructible, and environmentally sustainable within the Federal interest, and whether the concepts and project costs are valid. The final review will confirm whether all relevant engineering and scientific disciplines have been effectively integrated and that the content is sufficiently complete for the current phase of the project. The ATR team should also ensure that the Channel Restoration design satisfies all of the concerns on the design and construction.

**A-4. REVIEW SCHEDULE**

a. ATR Schedule. The ATR process for the Channel Restoration will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

DQC & BCOE Review of DDR and P&S	01 Feb 12– 22 Feb 12
Submittal of Final DDR and P&S Package	23 Apr 12
ATR Review	TBD as funds are available
ATR Complete Back Checking	TBD as funds are available
ATR Certification	TBD as funds are available
BCOE Certification Complete	TBD as funds are available
Advertise Construction Contract	TBD as funds are available
Construction Contract Award	TBD as funds are available

b. ATR Funding. The current cost estimate for the review of the Channel Restoration design materials is in the range of \$50,000 to \$65,000.

**A-5. REVIEW TEAM**

a. District Quality Control. District Quality Control. Reference is made in the RSO PMP that identifies the activities and roles of the DQC team members.

b. Agency Technical Review Team Qualifications. The ATR team for the RSO should be comprised of the following disciplines:

Hydrology and Hydraulics. The reviewer should have extensive knowledge of HEC-RAS modeling including the use of GIS (ARC-INFO) inputs to the model. The reviewer should also have a solid understanding of the geomorphology of alluvial rivers.

Geotechnical Engineering. The team member should have 10 or more years experience in geotechnical engineering. Team member must demonstrate significant experience in the geotechnical aspects of analysis, design, and construction of Ecosystem Restoration Project. Specifically surface and subsurface soil and rock sampling , restoration features, foundations in soils and rock, retaining structures, groundwater investigation, slope stability studies, shallow and deep foundation explorations, slope protection, evaluating QA/QC and record test data, and evaluating earthwork construction and differing site condition claims.

Environmental Specialist. The team member should have a solid background in the habitat types to be found in the arid southwestern United States and understand the factors that influence the reestablishment of native species of plants and animals. The team member also should have 10 or more years experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact statements for complex civil/site work projects.

Structural Engineering. The team member should have 10 or more years experience in structural engineering. Experience needs to include design and evaluations of large complex hydraulic structures associated with flood risk management projects.

Civil Engineering. The team member should have 10 or more years experience with large scale civil/site work projects and be knowledgeable in the art of science Ecosystem Restoration Projects such as design of channels, detention ponds, and site layout.

Landscape Architect. The team member should have 10 or more years experience in the habit types to be found in the southwestern United States and understand the factors that influence the reestablishment of native species of plants.

ATR Team Leader. The ATR Team Leader should have 10 or more years experience with Civil works projects, preferably on environmental restoration projects, also capable of performing ATR Team Lead duties on complex civil works projects.

Discipline/Role	Name	Agency/Office	Phone No.
SPL District Lead include:			
Project Team Leader	Huma Nisar	CESPL-ED-DB	(213) 452-3665
SPL Project Manager	Brian Kenny	CESPL-PM-I	(602) 230-6934
Civil Engineer	Juan Martinez	CESPL-ED-DA	(213) 452-3649
Structural Engineer	Robert Ngo	CESPL-ED-DS	(213) 452-3609
Geotechnical Engineer	Julia Yang	CESPL-ED-DG	(213) 452-3468
Materials Engineer	Francis Omoregie	CESPL-ED-GI	(213) 452-3599
Geologist	Jeff Devine	CESPL-ED-GG	(213) 452-3579
Hydraulic Engineer	Mylene Guron	CESPL-ED-HH	(213) 452-3551
Cost Engineer	Phillip Eng	CESPL-ED-DS	(213) 452-3744
Landscape Architect	Sandra Willis	CESPL-ED-DA	(213) 452-3638
Environmental	Michael Fink	CESPL-PD	(602) 230-6908
Real Estate	Gale, Steven	CESPL-RE-AR	(602) 230-6965
Construction Engineer	Joel Rodriquez	CESPL-CO-AV-AW	(623) 463-5881

ATR Team includes:

ATR Team Leader			
Civil Engineer			
Geotechnical Engineer			
Hydraulic Engineer			
Structural Engineer			
Landscape Architect			
Environmental Specialist			

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**APPENDIX B**  
**31<sup>st</sup> – 38<sup>th</sup> AVENUE WATER INFRASTRUCTURE**

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**B-1. FEATURE DESCRIPTION**

The RSO Project is located in the Salt River corridor between 19<sup>th</sup> Avenue and 83<sup>rd</sup> Avenue, within the city limits of Phoenix, Arizona. The 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure feature includes the design of three major water infrastructure system elements that supply habitat irrigation water to the Rio Salado Oeste Environmental Restoration Project (RSO Project) between approximately 31<sup>st</sup> Avenue and 38<sup>th</sup> Avenue.

The main water supply for the RSO Project will be provided from City of Phoenix (COP)–Water Service Department’s (WSD) 23<sup>rd</sup> Avenue Wastewater Treatment Plant (WWTP). Currently there is a 66 inch effluent line that discharges into the Salt River at an outfall structure located just east of 35<sup>th</sup> Avenue. The 35<sup>th</sup> Avenue Reservoir will supply water to eight (8) habitat areas, totaling 72.6 acres.

a. Basis of Design.

- An average daily continuous flow of 8 mgd is expected be available in the 66 inch effluent disposal line from the 23<sup>rd</sup> Avenue WWTP. The project sponsor (COP) will make available a supplemental source of water supply to meet the 8 mgd requirement.
- The water from the 23<sup>rd</sup> Avenue WWTP is dechlorinated tertiary WWTP class A effluent.
- 35<sup>th</sup> Avenue Reservoir capacity of 3 mg.

b. Conceptual Hydraulic Model. A conceptual level hydraulic model was developed for the water supply and distribution system to more accurately determine pipe and reservoir sizes, and to be used as a basis of design for future phasing of the entire water system. The model was developed in H2ONet with nodes and pipe network. The H2ONet model was simulated using both 5 and 10 day demand schedules.

c. Pump Station and Reservoir Design. The 8 million gallons per day (mgd) pump station will collect and pump tertiary effluent from the COP’s 23<sup>rd</sup> Avenue WWTP 66 inch effluent disposal line to the 35<sup>th</sup> Avenue Reservoir. A gravity-type drop box structure will be used to divert water to the pump station. Two (2) pumps (2 services) will be provided initially to deliver water to the 35<sup>th</sup> Avenue Reservoir. Space will be provided for a third and fourth pump, which will provide the hydraulic flexibility to concurrently deliver water to the future 67<sup>th</sup> Avenue Reservoir.

The 35<sup>th</sup> Avenue Reservoir will store water for irrigation of approximately 72 acres of future riparian habitats and be a public use facility ,which includes trails and recreation areas. The reservoir will have two separate chambers that hold approximately 3.5 million gallons (mg) of total water (1.75 mg each). There will be three (3) different distribution lines to irrigate the habitats assigned to this reservoir. The site will have a 10-foot asphalt paved maintenance road on the perimeter that will also serve as the primary trail when that phase (public facilities) of the project is incorporated.

d. Electrical / Instrumentation and Controls. The pump station and reservoir will have an electronic control system that will include instrumentation and a local programmable logic controller (PLC) to monitor the status of the entire pump station and locally control the pumps. The level of the reservoir will be monitored and displayed at the pump station local control panel through a wireless input/output (I/O) connection between the pump station and the reservoir. Supervisory control and monitoring of the pump station will be accomplished by connecting the pump station's PLC to the COP's existing Supervisory Control and Data Acquisition (SCADA) system through the licensed SCADA radio system. The electrical power system design will incorporate energy efficient electrical components. The electrical design will include new power distribution systems at new facilities, grounding, lighting, and miscellaneous systems. Both the pump station and reservoir electrical system design will require new electric services from Arizona Public Service (APS) to accommodate the electrical loads for the facilities.

## **B-2. WORK PRODUCTS TO BE REVIEWED**

a. Project Features. Design for the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure was initiated on June 29, 2010. The Design Documentation Report (DDR) is an implementation document that provides the technical basis for design of two elements of the RSO project: (1) an update to the conceptual level design of the water supply and distribution system from 19<sup>th</sup> Avenue to 83<sup>rd</sup> Avenue and (2) final design of the water system between approximately 31<sup>st</sup> Avenue and 38<sup>th</sup> Avenue. The DDR presents the project design requirements, criteria, guidance, assumptions, analysis, calculation, and coordination related to the design.

b. Products for Review. District Quality Control activities for the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure features have been on-going. Any revisions and changes will be documented in a DDR. The 30%, 60%, and 90% DDRs include all revisions. This Review Plan proposes the DQC and ATR reviews will be conducted on the following final design products:

- 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure Design Documentation Report
- 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure Plans & Specifications

c. Reference Materials. An electronic version of the following documents will be provided:

- Final Feasibility Study and Environmental Impact Statement, USACE, September 2006
- Final CDDR, July 2010

## **B-3. SCOPE OF REVIEW**

a. District Quality Control. District Quality Control activities for the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure plans and specifications will consist of quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, Local Sponsor review, and a BCOE Review as required by the ER 1110-1-12.

b. Agency Technical Review. Agency Technical Review (ATR) will examine the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure plans and specifications, focusing on compliance with established policy, principles and procedures using clearly justified and valid assumptions. It includes the verification of

assumptions, methods, procedures, and material used in analyses based on the level of complexity of the analysis. The ATR should verify the alternatives evaluated, appropriateness of data used and level of data obtained, functionality of the project, and verify the reasonableness of the results including whether the project meets the customer’s needs consistent with law and existing policy and engineering and scientific principles. The ATR should also determine if the proposed alternative is feasible and will be safe, functional, constructible, and environmentally sustainable within the Federal interest, and whether the concepts and project costs are valid. The final review will confirm whether all relevant engineering and scientific disciplines have been effectively integrated and that the content is sufficiently complete for the current phase of the project. The ATR team should also ensure that the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure design satisfies all of the concerns on the design and construction.

**B-4. REVIEW SCHEDULE**

a. ATR Schedule. The ATR process for the infrastructure facilities will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

DQC & BCOE Review of DDR and P&S	14 Nov 11– 05 Dec 11
Submittal of Final DDR and P&S Package	21 Feb 12
ATR Review	TBD as funds are available
ATR Complete Back Checking	TBD as funds are available
ATR Certification	TBD as funds are available
BCOE Certification Complete	TBD as funds are available
Advertise Construction Contract	TBD as funds are available
Construction Contract Award	TBD as funds are available

b. ATR Funding. The current cost estimate for the review of the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure design materials is in the range of \$65,000 to \$80,000.

**B-5. REVIEW TEAM**

a. District Quality Control. District Quality Control. Reference is made in the RSO QMP that identifies the activities and roles of the DQC team members.

b. Agency Technical Review Team Qualifications. The ATR team for the RSO should be comprised of the following disciplines:

Hydrology and Hydraulics. The team member should be a registered professional with 10 or more years experience in planning, hydrologic and hydraulic analysis, modeling and design of water distribution systems, pumping stations, and treatment facilities.

Geotechnical Engineering. The team member should have 10 or more years experience in geotechnical engineering. Team member must demonstrate significant experience in the geotechnical aspects of analysis, design, and construction of Ecosystem Restoration Project. Specifically surface and subsurface soil and rock sampling , restoration features, foundations in soils and rock, retaining

structures, groundwater investigation, slope stability studies, shallow and deep foundation explorations, slope protection, evaluating QA/QC and record test data, and evaluating earthwork construction and differing site condition claims.

Mechanical Engineering. The team member should have 10 or more years experience in mechanical engineering. Experience needs to include engineering and design of water distributions system project features such as pump stations, related systems and components.

Electrical Engineering. The team member should have 10 or more years experience in electrical engineering. Experience needs to include engineering and design of water distributions system project features such as pump stations, related systems and components.

Structural Engineering. The team member should have 10 or more years experience in structural engineering. Experience needs to include design and evaluations of large complex hydraulic structures associated with flood risk management projects. Practical knowledge of construction methods and techniques as it relates to structural portions of projects is encouraged.

Civil Engineering. The team member should have 10 or more years experience with large scale civil/site work projects and be knowledgeable in the art of science Ecosystem Restoration Projects such as design of channels, detention ponds, and site layout.

Environmental Engineer. The team member should have 10 or more years experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact statements for complex civil/site work projects.

ATR Team Leader. The ATR Team Leader should have 10 or more years experience with large civil works environmental restoration projects and/or water infrastructure projects, including the pump station design, and be capable of performing ATR Team Leader duties on complex civil works projects such as the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure.

Following is the SPL Review Team Roster:

Discipline/Role	Name	Agency/Office	Phone No.
SPL District Lead include:			
Project Team Leader	Huma Nisar	CESPL-ED-DB	(213) 452-3665
SPL Project Manager	Brian Kenny	CESPL-PM-I	(602) 230-6934
Civil Engineer	Juan Martinez	CESPL-ED-DA	(213) 452-3649
Structural Engineer	Robert Ngo	CESPL-ED-DS	(213) 452-3609
Geotechnical Engineer	Julia Yang	CESPL-ED-DG	(213) 452-3468
Materials Engineer	Francis Omoregie	CESPL-ED-GI	(213) 452-3599
Geologist	Jeff Devine	CESPL-ED-GG	(213) 452-3579
Hydraulic Engineer	Mylene Guron	CESPL-ED-HH	(213) 452-3551
Cost Engineer	Phillip Eng	CESPL-ED-DS	(213) 452-3744
Landscape Architect	Sandra Willis	CESPL-ED-DA	(213) 452-3638
Mechanical Engineer	Alton Pitre	CESPL-CO-AN	(602) 640-2018 x 236

Electrical Engineer	Mehrdad Hugh	CESPL-CO-AN	(602) 230-6861
Environmental	Michael Fink	CESPL-PD	(602) 230-6908
Real Estate	Gale, Steven	CESPL-RE-AR	(602) 230-6965
Construction Engineer	Joel Rodriquez	CESPL-CO-AV-AW	(623) 463-5881

ATR Team includes:

ATR Team Leader			
Civil Engineer			
Structural Engineer			
Geotechnical Engineer			
Materials Engineer			
Geologist			
Hydraulic Engineer			
Landscape Architect			
Mechanical Engineer			
Electrical Engineer			
Environmental			

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**APPENDIX C  
SAMPLE CERTIFICATION**

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**COMPLETION OF AGENCY TECHNICAL REVIEW**

The Agency Technical Review (ATR) has been completed for the Design Documentation Report and Plans and Specifications for the \_\_\_\_\_, Rio Salado Oeste, Arizona.

The ATR was conducted as defined in the project's Review Plan 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, alternatives evaluated, 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. 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 DrChecks.

\_\_\_\_\_  
NAME  
ATR Team Leader

\_\_\_\_\_  
Date

\_\_\_\_\_  
NAME  
Project Manager

\_\_\_\_\_  
Date

\_\_\_\_\_  
Nate Snorteland  
Review Management Office Representative

\_\_\_\_\_  
Date

**CERTIFICATION OF AGENCY TECHNICAL REVIEW**

Significant concerns and the explanation of the resolution are as follows:

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

\_\_\_\_\_  
NAME  
Chief, Engineering Division

\_\_\_\_\_  
Date



**Legend**

 Rio Salado Oeste Project



Source: ADOT and ALRIS 2009

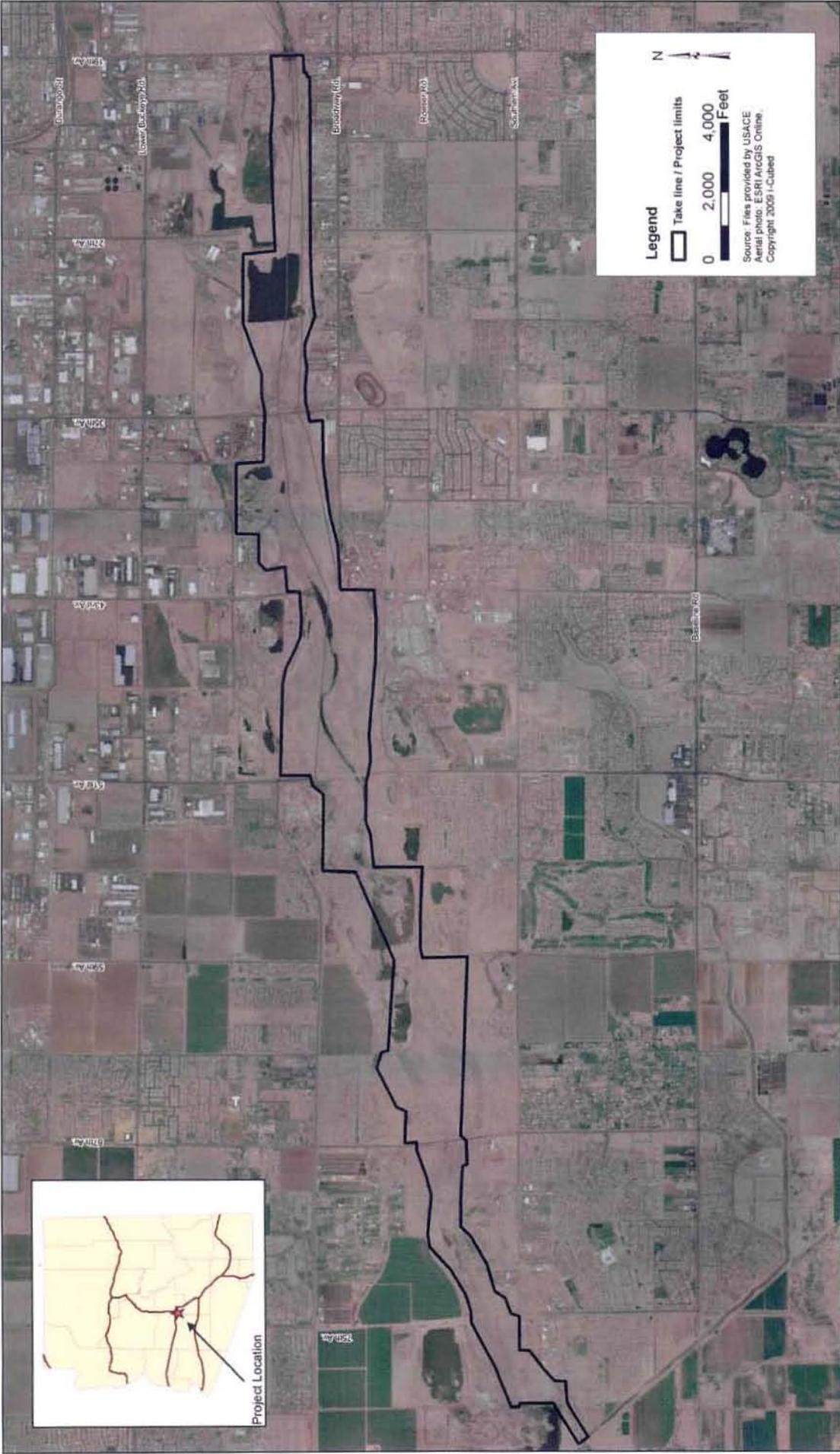
**RIO SALADO OESTE**  
VICINITY MAP

DATE	12/15/09
EXHIBIT	A-1



**City of Phoenix**





DATE 12/15/09  
EXHIBIT A-2

**RIO SALADO OESTE  
PROJECT LOCATION MAP**





**REVIEW PLAN**  
**RIO SALADO OESTE ENVIRONMENTAL RESTORATION PROJECT PHASE I**  
**(Including Channel Restoration Grade Control Structure and 31<sup>st</sup> – 38<sup>th</sup> Avenue Water**  
**Infrastructure)**  
**Phoenix, Arizona**

**LOS ANGELES DISTRICT**

---

Prepared by:

U.S. Army Corps of Engineers  
Los Angeles District

August 9, 2012



**US Army Corps**  
**of Engineers** ®  
Los Angeles District

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**REVIEW PLAN**  
**RIO SALADO OESTE ENVIRONMENTAL RESTORATION PROJECT PHASE I**  
**(Including Channel Restoration Grade Control Structure and 31<sup>st</sup> – 38<sup>th</sup> Avenue Water**  
**Infrastructure)**  
**Phoenix, Arizona**

**LOS ANGELES DISTRICT**

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<b>1. INTRODUCTION.....</b>	<b>1</b>
a. Purpose .....	1
b. References .....	1
c. Review Requirements .....	1
d. Review Management Organization (RMO) .....	2
<b>2. PROJECT DESCRIPTION .....</b>	<b>2</b>
a. Project Authority.....	2
b. Project Location Description .....	2
c. Value Engineering.....	3
<b>3. WORK PRODUCTS TO BE REVIEWED.....</b>	<b>3</b>
a. Products Features .....	3
b. Products for Review .....	3
c. Authorization & Reference Materials .....	3
<b>4. SCOPE OF REVIEW .....</b>	<b>3</b>
a. District Quality Control.....	3
b. Agency Technical Review .....	3
c. Independent-External-Peer-Review .....	5
<b>5. REVIEW TEAM .....</b>	<b>5</b>
a. Agency Technical Review .....	5
<b>6. PUBLIC COMMENT .....</b>	<b>5</b>
<b>7. REVIEW SCHEDULE .....</b>	<b>6</b>
a. Schedule.....	6
b. ATR Funding.....	6
a. ATR Communication and Documentation.....	6
b. ATR Resolution .....	7
c. ATR Certification .....	7
d. Dispute Resolution.....	7
<b>9. POINTS OF CONTACT .....</b>	<b>8</b>
<b>10. REVIEW PLAN APPROVAL .....</b>	<b>8</b>

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**REVIEW PLAN**  
**RIO SALADO OESTE ENVIRONMENTAL RESTORATION PROJECT PHASE I**  
**(Including Channel Restoration Grade Control Structure and 31<sup>st</sup> – 38<sup>th</sup> Avenue Water**  
**Infrastructure)**  
**Phoenix, Arizona**

**LOS ANGELES DISTRICT**

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Location Map

Vicinity Map

Appendix A – Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure

Appendix B – 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure

Appendix C – Sample Certification

Appendix D – HDR/CDM Joint Venture Quality Control Plan for Channel Restoration and Grade Control Structure

Appendix E - HDR/CDM Joint Venture Quality Control Plan for Water Supply/Distribution System, between 19<sup>th</sup> Ave and 83<sup>rd</sup> Ave

**REVIEW PLAN**  
**RIO SALADO OESTE ENVIRONMENTAL RESTORATION PROJECT PHASE I**  
**(Including Channel Restoration Grade Control Structure and 31<sup>st</sup> – 38<sup>th</sup> Avenue Water**  
**Infrastructure)**  
**Phoenix, Arizona**

**July 3, 2012**

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## **1. INTRODUCTION**

a. Purpose. This Review Plan (RP) defines the scope and level of quality management activities and peer review for the Rio Salado Oeste (RSO) Environmental Restoration Project. The project is divided into two phases; Phase I includes the upstream reach from 19<sup>th</sup> to 51<sup>st</sup> Avenues and Phase II extends from 51<sup>st</sup> Avenue to 83<sup>rd</sup> Avenue. The scope of this Review Plan includes the plans and specifications (P&S) for the first two features of Phase I. The two sets of P&S for PH I include: 1) the Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure, and 2) the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure. This RP will be amended to include the remaining features as the funds are made available.

Five (5) separate plans and specification packages will be required to construct all of Phase I; however, the final two (2) sets of P&S are assumed to be designed during the Construction Phase after execution of the Project Cooperation Agreement (PCA). Therefore, the PED Phase only includes design activities for the first three (3) sets of P&S until the PCA is executed. Phase I of the project will be comprised of Design Documentation Reports (DDR), associated P&S, and an Operation & Maintenance (O&M) Manual.

b. References.

- (1) ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 Aug 1999
- (2) ER 1110-1-12, Engineering and Design Quality Management, 21 Jul 2006
- (3) EC 1105-2-410 Water Resources Policies and Authorities: Review of Decision Documents, 22 Aug 08
- (4) WRDA 2007 H. R. 1495 Public Law 110-114, 8 Nov 2007
- (5) EC 1165-2-209, Civil Works Review Policy, 31 Jan 2010
- (6) Army Regulation 15-1, Committee Management, 27 November 1992 (Federal Advisory Committee Act Requirements)
- (7) National Academy of Sciences, Background Information and Confidential Conflict Of Interest Disclosure, BI/COI FORM 3, May 2003

c. Review Requirements. This review plan was developed in accordance with EC 1165-2-209, which establishes the procedures for ensuring the quality and credibility of U.S. Army Corps of Engineers (USACE) decision and implementation documents through independent review. This Review Plan describes the scope of review for the current phase of work. All appropriate levels of review (DQC, ATR) are included in this Review Plan, and for the levels not included IEPR, the Review Plan provides documentation of the risk-informed decision not to undertake that level of review. The RP identifies the most important skill sets needed in the reviews, the objective of the review, and the

specific advice sought, thus setting the appropriate scale and scope of review for the individual project.

d. Review Management Organization (RMO). The RMO is responsible for managing the overall peer review effort described in this review plan. The SPD will coordinate and approve the review plan and procure the services of a suitable ATR lead and support the ATR team when appropriate. The SPL will post the approved review plan on its public website.

## 2. PROJECT DESCRIPTION

a. Project Authority. The feasibility report was prepared as an interim response to the following authorities provided by Congress. It presents the findings of a feasibility study of the Rio Salado Oeste, Salt River, Arizona. The Salt River is a significant tributary to the Gila River in the State of Arizona.

- The first authority is given by Section 6 of Public Law 761, dated June 28, 1938, known as the Flood Control Act of 1938, which reads in part as follows:

*“the Secretary of War is hereby authorized and directed to cause preliminary examinations and surveys...at the following localities: ...Gila River and tributaries, Arizona.”*

- The second and most recent authority is provided by a Resolution of the Committee on Public Works and Transportation, U.S. House of Representatives, adopted May 17, 1994 (Docket 2425) (Figure I-2), which states:

*“...the Secretary of the Army is requested to review the reports of the Chief of Engineers on the State of Arizona...in the interest of flood damage reduction, environmental protection and restoration, and related purposes.”*

The Energy and Water Appropriations Act, 2000, Public Law 106-60 appropriated funds for investigations of the civil works project prior to construction. A reconnaissance level review of the Salt River (Rio Salado Oeste) was conducted under that authorization and recommended that there was a Federal interest in proceeding to a second, feasibility phase of the General Investigation. The feasibility report was completed and Chief’s Report signed on December 19, 2006.

b. Project Location Description. The project is located in Maricopa County, Arizona, and is entirely within the City of Phoenix. The project will restore ecosystem functions to an 8-mile reach of the Salt River in Phoenix, Arizona (Maricopa County), between 19<sup>th</sup> Avenue and 83rd Avenue (See Exhibits A-1 and A-2 for a Vicinity and Project Location Map). The recommended plan includes the following measures to support restoration:

- (1) Restoring river channel through grading and terracing and grade control structure,
- (2) Restoring riparian habitat of 1,466 acres,
- (3) Modifying storm water outfalls to harvest available runoff,
- (4) A water supply and distribution system to establish vegetation and provide reclaimed water (8 mgd) to the project,
- (5) Maintenance roads and ramps for safety and river access,

- (6) Invasive species removal and control,
- (7) Grading of existing gravel pit lakes to coincide with the floodplain, and
- (8) A passive recreation plan consisting of approximately sixteen miles of multi-use non-motorized trails, pedestrian bridges, parking lots, comfort stations, and interpretive signs are also included in the recommended plan.

c. Value Engineering (VE). The VE study was conducted in Phoenix Arizona on June 2010. The study was based on the Conceptual Design Documentation Report dated May 2010. Tetrattech conducted the VE study. The VE study was applied to the entire Rio Salado Oeste Project. 31st – 38<sup>th</sup> Avenue Water Infrastructure is one of the design component of the Rio Salado Oeste Project. VE Study recommendation No. 1 applied to 31st – 38<sup>th</sup> Avenue Water Infrastructure. The remaining VE Study recommendations will apply to anticipated future design elements.

Recommendation No. 1 from VE study was incorporated into the Habitat re-evaluation report and design documents. The incorporation of this recommendation is documented in the Habitat re-evaluation report.

### **3. WORK PRODUCTS TO BE REVIEWED**

a. Project Features. This Review Plan is intended to cover the design process and work products for the features described in the attached appendices. This Review Plan will be amended in the future to describe the review for the final construction features of the Rio Salado Oeste Project.

b. Products for Review. Designs for the Rio Salado Oeste, have been, or will be, performed by various AE Contractors. Design products include Design Documentation Reports (DDR), Plans and Specifications (P&S), and Operation and Maintenance Manuals. All design for this project will be performed by AE Contractors as prescribed by Section 219 of WRDA 1992.

c. Authorization & Reference Materials. Electronic versions of the documents, including Feasibility Studies, VE Studies, a Conceptual Design Document Report, and all relevant information available shall be posted in Adobe Acrobat PDF format for the ATR Reviewers to review.

### **4. SCOPE OF REVIEW**

a. District Quality Control (DQC). DQC is the review of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan. It is managed in the home district in accordance with the MSC and district Quality Management Plan. DQC activities may be conducted by staff in the home district as long as they are not doing the work involved in the study. SPL will continue to follow the Standard Operating Procedures as outlined in ER 1110-1-2 Quality Management, where the DQC will consist of Quality Checks and Reviews, supervisory reviews, Project Delivery Team (PDT) Reviews, including input from the Local Sponsor, and Biddability, Constructability, Operability, and Environmental (BCOE) Reviews. The Independent Review function will be assumed by the ATR processes.

b. Agency Technical Review. ATR is undertaken to "ensure the quality and credibility of the government's scientific information" in accordance with ER 1110-1-12. In order to insure

incorporation of Corps national experience for Flood Risk Management Projects (as updated per post-Katrina investigations), and in addition to the DQC, an ATR will also be performed. Moreover, all provisions and checklists for RSO contained in EC 1165-2-209 will be incorporated into the charge to the ATR team.

(1) ATR Team responsibilities are as follows:

(a) Reviewers shall review project authorization material, design documents, and NEPA documents to confirm that work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Comments on the design documents shall be submitted into Document Review and Checking System (DrChecks).

(b) Reviewers shall pay particular attention to one's discipline but may also comment on other aspects as appropriate. Reviewers that do not have any significant comments pertaining to their assigned discipline shall provide a comment stating this fact.

(c) Grammatical and editorial comments shall not be submitted into DrChecks. Grammatical comments should be submitted to the ATR manager via electronic mail using tracked changes feature in the Word document or as a hard copy mark-up. The ATR manager shall provide these comments to the Study Manager.

(d) Review comments shall contain these principal elements:

- a clear statement of the concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
- the basis for the concern, such as law, policy, or guidance – cite the appropriate law, policy, guidance, or procedure that has not been properly followed;
- significance for the concern – indicate the importance of the concern with regard to its potential impact on the plan selection, recommended plan components, efficiency (cost), effectiveness (function/outputs) implementation responsibilities, safety, Federal interest, or public acceptability; and
- specific actions needed to resolve the comment – identify the action(s) that the PDT must take to resolve the concern.

(e) The "Critical" comment flag in DrChecks shall not be used unless the comment is discussed with the ATR manager and/or the Technical Project Leader in advance.

(2) PDT Team responsibilities are as follows:

(a) The team shall review comments provided by the ATR TEAM in DrChecks and provide responses to each comment using "Concur", "Non-Concur", or "For Information Only". Concur responses shall state what action was taken and provide revised text from the report if

applicable. *Non-Concur* responses shall state the basis for the disagreement or clarification of the concern and suggest actions to negotiate the closure of the comment.

(b) Team members shall contact the PDT and ATRT managers to discuss any “Non- Concur” responses prior to submission.

c. Independent External Peer Review (Safety Assurance Review).

- (1) General. Type I and Type II IEPRs are conducted in accordance with the guidance promulgated in EC 1165-2-209. Type I IEPRs are conducted on project studies. It is of critical importance for those decision documents and supporting work products where there are public safety concerns, significant controversy, a high level of complexity, or significant economic, environmental, and social effects to the nation. However, it is not limited to only those cases, and most studies should undergo Type I IEPR. In accordance with EC 1165-2-209, a Type II IEPR (SAR) shall be conducted on design and construction activities for hurricane and storm risk management and flood risk management projects, as well as other projects where potential hazards pose a significant threat to human life. This applies to new projects and to the major repair, rehabilitation, replacement, or modification of existing facilities.
- (2) Decision on Type II IEPR. In accordance with EC 1165-2-209, a Type II IEPR (SAR) is not required for this project. This project is to restore the Salt River to its natural state. This project will include habitat restoration, river channel restoration, stormwater outfall wetlands, re-vegetation, sand and gravel mining pit restoration, invasive species management, water supply and distribution, public access facilities, and maintenance road improvements. These features do not use innovative materials or techniques, unique construction sequencing, or a reduced or overlapping design construction schedule. This low complexity project does not pose a significant threat to human life. Even if the project failed, the risk of loss of life is very small. In the event of a failure, the river would be restricted, but likely still better than existing conditions.

## **5. REVIEW TEAM**

a. Agency Technical Review. The ATR is undertaken to “ensure the quality and creditability of the government’s scientific information” in accordance with ER1110-1-12. In order to insure incorporation of the USACE national experience for Flood Risk Management Projects (as updated per post-Katrina investigations), and in addition to the A-E’s ITRs, the ATRs will also be performed. Moreover, all revisions and checklists for Safety Assurance Review (SAR) contained in EC 1165-2-209 will be incorporated into the ATR. The ATR team will be established per ER 1110-1-12 and EC 1165-2-209. The Corps will manage the ATR internally, and it will be conducted by individuals and organizations that are separate and independent from those that accomplished the work, in accordance with policy. The ATR Team Leader will be a Corps of Engineers employee outside the South Pacific Division. The required disciplines are described in the feature appendices.

## **6. PUBLIC COMMENT**

To ensure that the peer review approach is responsive to the wide array of stakeholders and customers, both within and outside the Federal Government, SPL will provide an opportunity for public comment by posting the approved RP on its public website, [http://spl.usace.army.mil/review\\_plans](http://spl.usace.army.mil/review_plans), for 30 calendar days. This is not a formal comment period; however, if and when comments are received, the PDT will consider them and decide if revisions to the review plan are necessary. If significant and relevant comments are made, the comments will be provided to the reviewers before they conduct their review.

## **7. REVIEW SCHEDULE**

a. Schedule. Based on SPL's commitment to executing the Rio Salado Oeste Environmental Restoration project schedule for design and construction, milestones for the DQC and ATR processes will be determined and documented as the PED funds are available in the Project Feature appendix. The project is projected for construction in FY13; therefore, the actual dates may have to be adjusted once the period draws closer.

b. ATR Funding. The Los Angeles District will provide labor funding by cross charge labor codes. Funding for travel - if needed- will be provided by way of a government order. The Project Manager will work with the ATR team leader to ensure that adequate funding is available and is commensurate with the level of review needed. The current cost estimate for these reviews is in the range of \$50,000-\$65,000. Any funding shortages will be negotiated on a case by case basis and in advance of a negative charge occurring.

The ATR team leader shall provide organization codes for each team member and a responsible financial point of contact (CEFMS responsible employee) for creation of labor codes. Reviewers shall monitor individual labor code balances and alert the ATR team leader to any possible funding shortages.

## **8. DOCUMENTATION OF REVIEW**

a. ATR Communication and Documentation. The communication and documentation plan for the ATR is as follows:

(1) The team will use the Document Review and Checking System (DrChecks) to document the ATR process. The Technical Project Leader will facilitate the creation of a project portfolio in the system to allow access by all PDT and ATR TEAM members. An electronic version of the documents, appendices, and any significant and relevant public comments shall be made available.

(2) The PDT shall send the ATR team leader one hard copy of the documents for each ATR team member such that the copies are received at least one business day prior to the start of the comment period.

(3) The PDT shall host an ATR kick-off meeting virtually to orient the ATR team during the first week of the comment period. If funds are not available for an on-site meeting, the PDT shall provide a presentation about the project, including photos of the site, for the team.

(4) The Technical Project Leader shall inform the ATR team leader when all responses have been entered into DrChecks and conduct a briefing to summarize comment responses to highlight any areas of disagreement.

(5) A revised electronic version of the documents with comments incorporated shall be made available for use during the back check of the comments.

(6) PDT members shall contact ATR team members or leader as appropriate to seek clarification of a comment's intent or provide clarification of information in the report. Discussions shall occur outside of DrChecks but a summary of discussions may be provided in the system.

(7) Reviewers will be encouraged to contact PDT members directly via email or phone to clarify any confusion. DrChecks shall not be used to post questions needed for clarification.

b. ATR Resolution.

(1) Reviewers shall back check PDT responses to the review comments and either close the comment or attempt to resolve any disagreements. Conference calls shall be used to resolve any conflicting comments and responses.

(2) Reviewers may "agree to disagree" with any comment response and close the comment with a detailed explanation. If reviewer and responder cannot resolve a comment, it should be brought to the attention of the ATR team leader. If the ATR team leader is unable to resolve the issue, the ATR team leader will implement the guidelines as described below in the paragraph on Dispute Resolution.

c. ATR Certification. To fully document the ATR process, a statement of technical review will be prepared for each product reviewed. The ATR documentation will include the text of each ATR comment, the PDT response, a brief summary of the pertinent points in the ensuing discussion, including any vertical coordination, and the agreed upon resolution. Certification by the ATR team leader and the Technical Project Leader will occur once issues raised by the reviewers have been addressed to the review team's satisfaction. Indication of this concurrence will be documented by the signing of a certification statement (Appendix C).

d. Dispute Resolution. The review team leader shall review the products and comments, project delivery team responses, and back check of responses to reviewer's comments to identify any outstanding disagreements between members of the project delivery team and the review team. When resolution is not readily achievable, the RMO should engage the PCX or MSC subject matter experts (SMEs) to help facilitate resolution, and they in turn may choose to engage HQUSACE SMEs. If a specific concern still remains unresolved, the district is to pursue resolution through the policy issue resolution processes described in Appendix H, ER 1105-2- 100; ER 1110-1-12, or other applicable guidance. HQUSACE may choose to defer the issue to the policy compliance review process or address it directly. The ATR shall be certified in accordance with ER 1110-1-12 when all ATR concerns are documented as either resolved or deferred by HQUSACE to a separate process.

The ATR team will identify significant issues that they believe are not satisfactorily resolved and will note these concerns in the Technical Review Certification documentation. The ATR team will prepare a Review Report, which includes a summary of each unresolved issue. Review Reports will be considered an integral part of the ATR documentation.

Significant unresolved ATR concerns that are documented by the RMO will be forwarded through the MSC to the HQUSACE RIT, including basic research of Corps guidance and an expression of desired outcome, for further resolution in accordance with the policy issue resolution process described in ER 1110-2-12 or Appendix H, ER 1105-2-100, as appropriate. HQUSACE may choose to defer the issue to the policy compliance review process or address it directly. At this point the ATR documentation for the concern may be closed with a notation that will note these concerns in the Technical Review Certification documentation. The ATR team will prepare a Review Report which includes a summary of each unresolved issue. Review Reports will be considered an integral part of the ATR documentation.

## **9. POINTS OF CONTACT**

Questions about this Review Plan may be directed to the Los Angeles District Project Delivery Team, Design Lead Supervisor, Mr. Stephen H. Vaughn (213) 452-3654, or to the Project Manager for the Rio Salado Oeste, Mr. Brian Kenny at (602) 230-6934. The Chief, Engineering Division is Mr. Richard J. Leifield, PE at (213) 452-3629. Inquiries to the MSC should be directed to Paul Bowers at (415) 503-6556.

## **10. REVIEW PLAN APPROVAL**

In summary, the Los Angeles District proposes to fully comply with all existing guidance, to add ATR, and conduct it in accordance with EC 1165-2-209. Approval of this plan as outlined above will help facilitate the District's completion of the Rio Salado Oeste features within the authorized schedule. In order to ensure the RP is in compliance with the principles of EC 1165-2-209, the RP must be approved by the applicable MSC, in this case the Commander, South Pacific Division (SPD). Once the RP is approved, the District will post it to its district public website and notify SPD. If necessary, any changes to the review plan will be approved by following the process used for initially approving the plan.

The Los Angeles District requests that the South Pacific Division endorse the above recommendations and approve this Review Plan as described in Appendix B of EC 1165-2-609.

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**APPENDIX A**  
**CHANNEL RESTORATION (19<sup>th</sup> to 51<sup>st</sup> Avenue) AND 35<sup>th</sup> AVENUE GRADE CONTROL STRUCTURE**

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**A-1. FEATURE DESCRIPTION**

The Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure include the following major components:

- **Channel Restoration:** The Channel Restoration is proposed to keep more frequent flows confined to certain areas of the river in order to return the stream channel to more natural river morphology. As described in the Feasibility Report, average depth of the Channel Restoration would be approximately 5 feet, with a width varying from 200 to 400 feet. The Channel Restoration is to be graded from existing materials on the site and is not intended to be a hardened channel. The Channel Restoration design will be a 5-year event (20,200 cfs) with occasional flooding to be expected on the adjacent terrace at low depths and velocities.

The current Channel Restoration design has a bottom width ranging from 170 feet to 400 feet in width, with depth ranging from 5 to 20 feet, and 3 horizontal to 1 vertical side slopes. The Channel Restoration thalweg roughly parallels the existing river thalweg between 19<sup>th</sup> Avenue and 35<sup>th</sup> Avenue, most of which is currently in a sump condition due to sand and gravel mining. Consequently, the Channel Restoration between a point approximately 1,300 feet upstream of 35<sup>th</sup> Avenue to approximately 7,500 feet upstream of 35<sup>th</sup> Avenue will not drain except in flows that exceed the thalweg elevation at a point 1,300 feet upstream of 35<sup>th</sup> Avenue. The maximum ponding depth within the Channel Restoration in this reach would be approximately 6 feet. The Channel Restoration between a point approximately 1,300 feet upstream of 35<sup>th</sup> Avenue and 51<sup>st</sup> Avenue would have a constant downstream slope of 0.0015.

The Channel Restoration reach between 35<sup>th</sup> Avenue and 19<sup>th</sup> Avenue would require a cut of 650,000 cubic yards and a fill of 750,000 cubic yards. The reach between 51<sup>st</sup> Avenue and 35<sup>th</sup> Avenue would require a cut of 1,650,000 cubic yards and a fill of 150,000 cubic yards.

The Channel Restoration alignment at 51<sup>st</sup> Avenue follows the existing low flow pattern due to geomorphic conditions. This pattern brings the Channel Restoration close to the south bank at that point. Additional topography has been obtained downstream of 51<sup>st</sup> Avenue to assist the design analysis in ensuring no induced bank erosion in the vicinity of the 51<sup>st</sup> Avenue bridge.

The Channel Restoration will bypass two major gravel pits with a potential for overflow into these pits at flows up to and exceeding the Channel Restoration design discharge. The design is being evaluated to minimize the frequency of overflows and to minimize maintenance needs resulting from overflows.

- **Grade Control Structure:** The grade control structure is proposed to control bed degradation resulting from sand and gravel mining downstream of 35<sup>th</sup> Avenue. This structure will be

constructed of roller-compacted concrete and grouted stone and span the width of the Salt River channel floodway.

## **A-2. WORK PRODUCTS TO BE REVIEWED**

a. Project Features. Design for the Channel Restoration was initiated on March 01, 2010 presuming no major coordination issues for this feature. However, during the 30% review, due to a Real Estate concern, the local sponsor requested to remove one of the gravel pits, located approximately 1,500 feet downstream of 35<sup>th</sup> Avenue (West Pit). In the 30% design, Low Flow Channel (Channel Restoration) enters directly into the upstream end of the West Pit, and exits over the downstream lip of this pit. The RSO project will include a total of approximately 156 acres of emergent wetlands - 28 acres of storm water outfall wetlands, up to 34 acres within the restored channel, and the remaining at the sand and gravel pits. SPL, AE, and the Local Sponsor are coordinating to ensure the new project will provide adequate wetland to meet the requirement of the authorized project.

b. Products for Review. District Quality Control activities for the Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure features have been on-going. Revisions to the (Channel Restoration) alignment and changes will be documented in a DDR. The draft DDR will include all revisions. This Review Plan proposes the DQC and ATR reviews to be conducted on the following draft and final design products:

- Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure Design Documentation Report
- Channel Restoration (19<sup>th</sup> to 51<sup>st</sup> Avenue) and 35<sup>th</sup> Avenue Grade Control Structure, Plans and Specifications

c. Reference Materials. An electronic version of the following documents will be provided:

- Final Feasibility Study and Environmental Impact Statement, USACE, September 2006
- Final Conceptual Design Document Report July 2010

## **A-3. SCOPE OF REVIEW**

a. District Quality Control. District Quality Control activities for the Channel Restoration plans and specifications will consist of quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, Local Sponsor review, and a BCOE Review as required by the ER 1110-1-12.

b. Agency Technical Review. Agency Technical Review (ATR) will examine the Channel Restoration plans and specifications, focusing on compliance with established policy, principles and procedures using clearly justified and valid assumptions. It includes the verification of assumptions, methods, procedures, and material used in analyses based on the level of complexity of the analysis. The ATR should verify the alternatives evaluated, appropriateness of data used and level of data obtained, functionality of the project, and verify the reasonableness of

the results, including, whether the project meets the customer’s needs consistent with law and existing policy and engineering and scientific principles. The ATR should also determine if the proposed alternative is feasible and will be safe, functional, constructible, and environmentally sustainable within the Federal interest, and whether the concepts and project costs are valid. The final review will confirm whether all relevant engineering and scientific disciplines have been effectively integrated and that the content is sufficiently complete for the current phase of the project. The ATR team should also ensure that the Channel Restoration design satisfies all of the concerns on the design and construction.

**A-4. REVIEW SCHEDULE**

a. ATR Schedule. The ATR process for the Channel Restoration will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

DQC & BCOE Review of DDR and P&S	01 Feb 12– 22 Feb 12
Submittal of Final DDR and P&S Package	23 Apr 12
ATR Review	TBD as funds are available
ATR Complete Back Checking	TBD as funds are available
ATR Certification	TBD as funds are available
BCOE Certification Complete	TBD as funds are available
Advertise Construction Contract	TBD as funds are available
Construction Contract Award	TBD as funds are available

b. ATR Funding. The current cost estimate for the review of the Channel Restoration design materials is in the range of \$50,000 to \$65,000.

**A-5. REVIEW TEAM**

a. District Quality Control. District Quality Control. Reference is made in the RSO PMP that identifies the activities and roles of the DQC team members.

b. Agency Technical Review Team Qualifications. The ATR team for the RSO should be comprised of the following disciplines:

Hydrology and Hydraulics. The reviewer should have extensive knowledge of HEC-RAS modeling including the use of GIS (ARC-INFO) inputs to the model. The reviewer should also have a solid understanding of the geomorphology of alluvial rivers.

Geotechnical Engineering. The team member should have 10 or more years experience in geotechnical engineering. Team member must demonstrate significant experience in the geotechnical aspects of analysis, design, and construction of Ecosystem Restoration Project. Specifically surface and subsurface soil and rock sampling , restoration features, foundations in soils and rock, retaining structures, groundwater investigation, slope stability studies, shallow and deep foundation explorations, slope protection, evaluating QA/QC and record test data, and evaluating earthwork construction and differing site condition claims.

Environmental Specialist. The team member should have a solid background in the habitat types to be found in the arid southwestern United States and understand the factors that influence the reestablishment of native species of plants and animals. The team member also should have 10 or more years experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact statements for complex civil/site work projects.

Structural Engineering. The team member should have 10 or more years experience in structural engineering. Experience needs to include design and evaluations of large complex hydraulic structures associated with flood risk management projects.

Civil Engineering. The team member should have 10 or more years experience with large scale civil/site work projects and be knowledgeable in the art of science Ecosystem Restoration Projects such as design of channels, detention ponds, and site layout.

Landscape Architect. The team member should have 10 or more years experience in the habit types to be found in the southwestern United States and understand the factors that influence the reestablishment of native species of plants.

ATR Team Leader. The ATR Team Leader should have 10 or more years experience with Civil works projects, preferably on environmental restoration projects, also capable of performing ATR Team Lead duties on complex civil works projects.

Discipline/Role	Name	Agency/Office	Phone No.
SPL District Lead include:			
Project Team Leader	Huma Nisar	CESPL-ED-DB	(213) 452-3665
SPL Project Manager	Brian Kenny	CESPL-PM-I	(602) 230-6934
Civil Engineer	Juan Martinez	CESPL-ED-DA	(213) 452-3649
Structural Engineer	Robert Ngo	CESPL-ED-DS	(213) 452-3609
Geotechnical Engineer	Julia Yang	CESPL-ED-DG	(213) 452-3468
Materials Engineer	Francis Omoregie	CESPL-ED-GI	(213) 452-3599
Geologist	Jeff Devine	CESPL-ED-GG	(213) 452-3579
Hydraulic Engineer	Mylene Guron	CESPL-ED-HH	(213) 452-3551
Cost Engineer	Phillip Eng	CESPL-ED-DS	(213) 452-3744
Landscape Architect	Sandra Willis	CESPL-ED-DA	(213) 452-3638
Environmental	Michael Fink	CESPL-PD	(602) 230-6908
Real Estate	Gale, Steven	CESPL-RE-AR	(602) 230-6965
Construction Engineer	Joel Rodriquez	CESPL-CO-AV-AW	(623) 463-5881

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ATR Team includes:

ATR Team Leader			
Civil Engineer			
Geotechnical Engineer			
Hydraulic Engineer			
Structural Engineer			
Landscape Architect			
Environmental Specialist			

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**APPENDIX B**  
**31<sup>st</sup> – 38<sup>th</sup> AVENUE WATER INFRASTRUCTURE**

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**B-1. FEATURE DESCRIPTION**

The RSO Project is located in the Salt River corridor between 19<sup>th</sup> Avenue and 83<sup>rd</sup> Avenue, within the city limits of Phoenix, Arizona. The 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure feature includes the design of three major water infrastructure system elements that supply habitat irrigation water to the Rio Salado Oeste Environmental Restoration Project (RSO Project) between approximately 31<sup>st</sup> Avenue and 38<sup>th</sup> Avenue.

The main water supply for the RSO Project will be provided from City of Phoenix (COP)–Water Service Department’s (WSD) 23<sup>rd</sup> Avenue Wastewater Treatment Plant (WWTP). Currently there is a 66 inch effluent line that discharges into the Salt River at an outfall structure located just east of 35<sup>th</sup> Avenue. The 35<sup>th</sup> Avenue Reservoir will supply water to eight (8) habitat areas, totaling 72.6 acres.

a. Basis of Design.

- An average daily continuous flow of 8 mgd is expected be available in the 66 inch effluent disposal line from the 23<sup>rd</sup> Avenue WWTP. The project sponsor (COP) will make available a supplemental source of water supply to meet the 8 mgd requirement.
- The water from the 23<sup>rd</sup> Avenue WWTP is dechlorinated tertiary WWTP class A effluent.
- 35<sup>th</sup> Avenue Reservoir capacity of 3 mg.

b. Conceptual Hydraulic Model. A conceptual level hydraulic model was developed for the water supply and distribution system to more accurately determine pipe and reservoir sizes, and to be used as a basis of design for future phasing of the entire water system. The model was developed in H2ONet with nodes and pipe network. The H2ONet model was simulated using both 5 and 10 day demand schedules.

c. Pump Station and Reservoir Design. The 8 million gallons per day (mgd) pump station will collect and pump tertiary effluent from the COP’s 23<sup>rd</sup> Avenue WWTP 66 inch effluent disposal line to the 35<sup>th</sup> Avenue Reservoir. A gravity-type drop box structure will be used to divert water to the pump station. Two (2) pumps (2 services) will be provided initially to deliver water to the 35<sup>th</sup> Avenue Reservoir. Space will be provided for a third and fourth pump, which will provide the hydraulic flexibility to concurrently deliver water to the future 67<sup>th</sup> Avenue Reservoir.

The 35<sup>th</sup> Avenue Reservoir will store water for irrigation of approximately 72 acres of future riparian habitats and be a public use facility ,which includes trails and recreation areas. The reservoir will have two separate chambers that hold approximately 3.5 million gallons (mg) of total water (1.75 mg each). There will be three (3) different distribution lines to irrigate the habitats assigned to this reservoir. The site will have a 10-foot asphalt paved maintenance road on the perimeter that will also serve as the primary trail when that phase (public facilities) of the project is incorporated.

d. Electrical / Instrumentation and Controls. The pump station and reservoir will have an electronic control system that will include instrumentation and a local programmable logic controller (PLC) to monitor the status of the entire pump station and locally control the pumps. The level of the reservoir will be monitored and displayed at the pump station local control panel through a wireless input/output (I/O) connection between the pump station and the reservoir. Supervisory control and monitoring of the pump station will be accomplished by connecting the pump station's PLC to the COP's existing Supervisory Control and Data Acquisition (SCADA) system through the licensed SCADA radio system. The electrical power system design will incorporate energy efficient electrical components. The electrical design will include new power distribution systems at new facilities, grounding, lighting, and miscellaneous systems. Both the pump station and reservoir electrical system design will require new electric services from Arizona Public Service (APS) to accommodate the electrical loads for the facilities.

## **B-2. WORK PRODUCTS TO BE REVIEWED**

a. Project Features. Design for the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure was initiated on June 29, 2010. The Design Documentation Report (DDR) is an implementation document that provides the technical basis for design of two elements of the RSO project: (1) an update to the conceptual level design of the water supply and distribution system from 19<sup>th</sup> Avenue to 83<sup>rd</sup> Avenue and (2) final design of the water system between approximately 31<sup>st</sup> Avenue and 38<sup>th</sup> Avenue. The DDR presents the project design requirements, criteria, guidance, assumptions, analysis, calculation, and coordination related to the design.

b. Products for Review. District Quality Control activities for the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure features have been on-going. Any revisions and changes will be documented in a DDR. The 30%, 60%, and 90% DDRs include all revisions. This Review Plan proposes the DQC and ATR reviews will be conducted on the following final design products:

- 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure Design Documentation Report
- 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure Plans & Specifications

c. Reference Materials. An electronic version of the following documents will be provided:

- Final Feasibility Study and Environmental Impact Statement, USACE, September 2006
- Final CDDR, July 2010

## **B-3. SCOPE OF REVIEW**

a. District Quality Control. District Quality Control activities for the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure plans and specifications will consist of quality checks and reviews, supervisory reviews, Project Delivery Team (PDT) reviews, Local Sponsor review, and a BCOE Review as required by the ER 1110-1-12.

b. Agency Technical Review. Agency Technical Review (ATR) will examine the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure plans and specifications, focusing on compliance with established policy, principles and procedures using clearly justified and valid assumptions. It includes the verification of

assumptions, methods, procedures, and material used in analyses based on the level of complexity of the analysis. The ATR should verify the alternatives evaluated, appropriateness of data used and level of data obtained, functionality of the project, and verify the reasonableness of the results including whether the project meets the customer’s needs consistent with law and existing policy and engineering and scientific principles. The ATR should also determine if the proposed alternative is feasible and will be safe, functional, constructible, and environmentally sustainable within the Federal interest, and whether the concepts and project costs are valid. The final review will confirm whether all relevant engineering and scientific disciplines have been effectively integrated and that the content is sufficiently complete for the current phase of the project. The ATR team should also ensure that the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure design satisfies all of the concerns on the design and construction.

**B-4. REVIEW SCHEDULE**

a. ATR Schedule. The ATR process for the infrastructure facilities will follow the following timeline. Actual dates may have to be adjusted once the period draws closer.

DQC & BCOE Review of DDR and P&S	14 Nov 11– 05 Dec 11
Submittal of Final DDR and P&S Package	21 Feb 12
ATR Review	TBD as funds are available
ATR Complete Back Checking	TBD as funds are available
ATR Certification	TBD as funds are available
BCOE Certification Complete	TBD as funds are available
Advertise Construction Contract	TBD as funds are available
Construction Contract Award	TBD as funds are available

b. ATR Funding. The current cost estimate for the review of the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure design materials is in the range of \$65,000 to \$80,000.

**B-5. REVIEW TEAM**

a. District Quality Control. District Quality Control. Reference is made in the RSO QMP that identifies the activities and roles of the DQC team members.

b. Agency Technical Review Team Qualifications. The ATR team for the RSO should be comprised of the following disciplines:

Hydrology and Hydraulics. The team member should be a registered professional with 10 or more years experience in planning, hydrologic and hydraulic analysis, modeling and design of water distribution systems, pumping stations, and treatment facilities.

Geotechnical Engineering. The team member should have 10 or more years experience in geotechnical engineering. Team member must demonstrate significant experience in the geotechnical aspects of analysis, design, and construction of Ecosystem Restoration Project. Specifically surface and subsurface soil and rock sampling , restoration features, foundations in soils and rock, retaining

structures, groundwater investigation, slope stability studies, shallow and deep foundation explorations, slope protection, evaluating QA/QC and record test data, and evaluating earthwork construction and differing site condition claims.

Mechanical Engineering. The team member should have 10 or more years experience in mechanical engineering. Experience needs to include engineering and design of water distributions system project features such as pump stations, related systems and components.

Electrical Engineering. The team member should have 10 or more years experience in electrical engineering. Experience needs to include engineering and design of water distributions system project features such as pump stations, related systems and components.

Structural Engineering. The team member should have 10 or more years experience in structural engineering. Experience needs to include design and evaluations of large complex hydraulic structures associated with flood risk management projects. Practical knowledge of construction methods and techniques as it relates to structural portions of projects is encouraged.

Civil Engineering. The team member should have 10 or more years experience with large scale civil/site work projects and be knowledgeable in the art of science Ecosystem Restoration Projects such as design of channels, detention ponds, and site layout.

Environmental Engineer. The team member should have 10 or more years experience in NEPA compliance activities and preparation of Environmental Assessments and Environmental Impact statements for complex civil/site work projects.

ATR Team Leader. The ATR Team Leader should have 10 or more years experience with large civil works environmental restoration projects and/or water infrastructure projects, including the pump station design, and be capable of performing ATR Team Leader duties on complex civil works projects such as the 31<sup>st</sup> – 38<sup>th</sup> Avenue Water Infrastructure.

Following is the SPL Review Team Roster:

Discipline/Role	Name	Agency/Office	Phone No.
SPL District Lead include:			
Project Team Leader	Huma Nisar	CESPL-ED-DB	(213) 452-3665
SPL Project Manager	Brian Kenny	CESPL-PM-I	(602) 230-6934
Civil Engineer	Juan Martinez	CESPL-ED-DA	(213) 452-3649
Structural Engineer	Robert Ngo	CESPL-ED-DS	(213) 452-3609
Geotechnical Engineer	Julia Yang	CESPL-ED-DG	(213) 452-3468
Materials Engineer	Francis Omoregie	CESPL-ED-GI	(213) 452-3599
Geologist	Jeff Devine	CESPL-ED-GG	(213) 452-3579
Hydraulic Engineer	Mylene Guron	CESPL-ED-HH	(213) 452-3551
Cost Engineer	Phillip Eng	CESPL-ED-DS	(213) 452-3744
Landscape Architect	Sandra Willis	CESPL-ED-DA	(213) 452-3638
Mechanical Engineer	Alton Pitre	CESPL-CO-AN	(602) 640-2018 x 236

Electrical Engineer	Mehrdad Hugh	CESPL-CO-AN	(602) 230-6861
Environmental	Michael Fink	CESPL-PD	(602) 230-6908
Real Estate	Gale, Steven	CESPL-RE-AR	(602) 230-6965
Construction Engineer	Joel Rodriquez	CESPL-CO-AV-AW	(623) 463-5881

ATR Team includes:

ATR Team Leader			
Civil Engineer			
Structural Engineer			
Geotechnical Engineer			
Materials Engineer			
Geologist			
Hydraulic Engineer			
Landscape Architect			
Mechanical Engineer			
Electrical Engineer			
Environmental			

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**APPENDIX C**  
**SAMPLE CERTIFICATION**

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**COMPLETION OF AGENCY TECHNICAL REVIEW**

The Agency Technical Review (ATR) has been completed for the Design Documentation Report and Plans and Specifications for the \_\_\_\_\_, Rio Salado Oeste, Arizona.

The ATR was conducted as defined in the project's Review Plan 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, alternatives evaluated, 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. 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 DrChecks.

_____ NAME ATR Team Leader	_____ Date
----------------------------------	---------------

_____ NAME Project Manager	_____ Date
----------------------------------	---------------

_____ Nate Snorteland Review Management Office Representative	_____ Date
---	---------------

**CERTIFICATION OF AGENCY TECHNICAL REVIEW**

Significant concerns and the explanation of the resolution are as follows:

As noted above, all concerns resulting from the ATR of the project have been fully resolved.

_____ NAME Chief, Engineering Division	_____ Date
--	---------------



**Legend**

 Rio Salado Oeste Project

Source: ADOT and ALRIS 2009

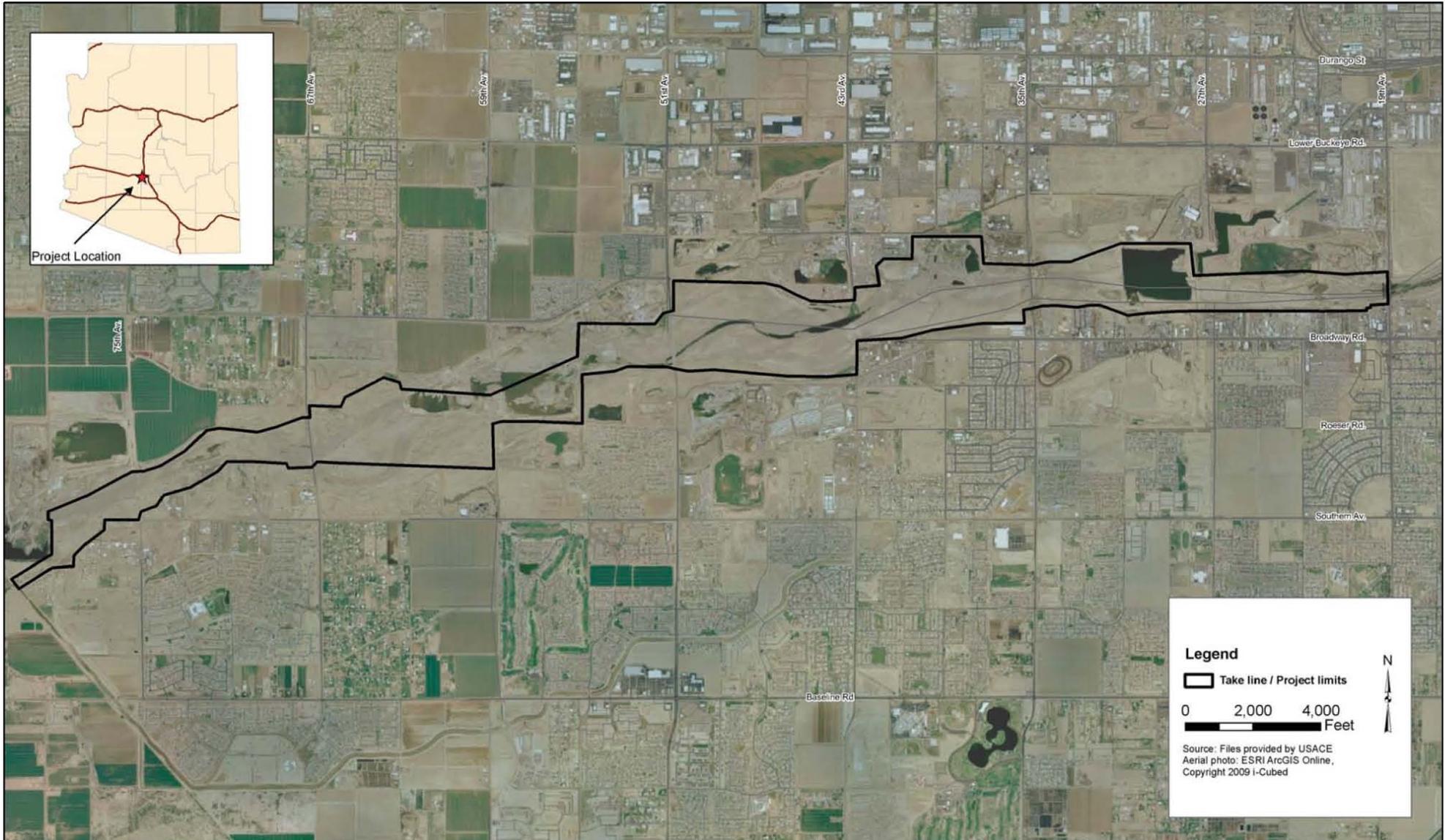
**RIO SALADO OESTE**  
VICINITY MAP

DATE	12/15/09
EXHIBIT	A-1



City of Phoenix





**Legend**

 Take line / Project limits

0      2,000      4,000  
 Feet

Source: Files provided by USACE  
 Aerial photo: ESRI ArcGIS Online,  
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