REVIEW PLAN

Rio Grande Floodway,
San Acacia to Bosque del Apache Unit, New Mexico
General Reevaluation Report and Supplemental Environmental Impact Statement II

U.S. Army Corps of Engineers
Albuquerque District

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US Army Corps
of Engineers ®

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1. PURPOSE AND REQUIREMENTS

a. Purpose. This Review Plan defines the scope and level of peer review for the Rio Grande Floodway, San Acacia to Bosque del Apache Unit, New Mexico, General Reevaluation Report and Supplemental Environmental Impact Statement II (GRR/SEIS II), a single purpose Flood Risk Management study.

b. References

1) Engineering Circular (EC) 1165-2-209, Civil Works Review Policy, 31 Jan 2010
2) EC 1105-2-412, Assuring Quality of Planning Models, 13 Mar 2011
3) Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
4) ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
5) PMP for study
6) MSC and/or District Quality Management Plan(s)

c. Requirements. This review plan was developed in accordance with EC 1165-2-209, which establishes an accountable, comprehensive, life-cycle review strategy for Civil Works products by providing a seamless process for review of all Civil Works projects from initial planning through design, construction, and operation, maintenance, repair, replacement and rehabilitation (OMRR&R). The EC outlines four general levels of review: District Quality Control/Quality Assurance (DQC), Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Policy and Legal Compliance Review. In addition to these levels of review, decision documents are subject to cost engineering review and certification (per EC 1165-2-209) and planning model certification/approval (per EC 1105-2-412).

2. REVIEW MANAGEMENT ORGANIZATION (RMO) COORDINATION

The RMO is responsible for managing the overall peer review effort described in this Review Plan. The RMO for decision documents is typically either a Planning Center of Expertise (PCX) or the Risk Management Center (RMC), depending on the primary purpose of the decision document. The RMO for the peer review effort described in this Review Plan is the Flood Risk Management PCX.

The RMO will coordinate with the Cost Engineering Directory of Expertise (DX) to ensure the appropriate expertise is included on the review teams to assess the adequacy of cost estimates, construction schedules and contingencies.

3. STUDY INFORMATION

a. **Decision Document**. The Rio Grande Floodway, San Acacia to Bosque del Apache Unit Project is one unit within the comprehensive plan of development for flood control in the Rio Grande Basin, New Mexico that was authorized for construction by section 203 of the Flood Control Act of 1948 (Public Law 80-858) and amended by section 204 of the Flood Control Act of 1950 (Public Law 81-516), in accordance with the recommendation of the Chief of Engineers, as found in House Document No. 243, 81st Congress, 1st Session, dated 5 April 1948. Additional language was provided in the Water Resources Development Act (WRDA) of 1992 Section 102 that modified to more equitably reflect the non-Federal benefits from the project in relation to the total benefits of the project by reducing the non-Federal contribution for the project by that percentage of benefits which is attributable to the Federal properties; except that Federal property benefits could not exceed 50 percent of the total project benefits.

EC 1165-2-209 requires coordination with the appropriate RMO. The Flood Risk Management - Planning Center of Expertise (FRM-PCX) is the RMO for this study. It is anticipated that while this study will be challenging and beneficial, it will not be novel, controversial or precedent setting, nor have significant national importance. However, the estimated cost of the project is projected to be in excess of $45 million dollars, a Supplemental Environmental Impact Statement (EIS) will be prepared, and the study will require an Independent External Peer Review (IEPR).

b. **Study/Project Description.** This single purpose flood risk management project is located in the lower reach of the Rio Grande Floodway. Principal tributaries to the Rio Grande below Cochiti Dam are Galisteo Creek, Rio Jemez, Rio Puerco, and Rio Salado, with the Rio Puerco and Rio Salado being just upstream of the project area.

The San Acacia to Bosque Del Apache Unit extends from the San Acacia Diversion Dam, approximately 58 miles downstream to Elephant Butte reservoir. River channel, off channel wetlands, riparian woodlands, floodplain farmland, terraced plains of grasses and shrubs, basalt-capped mesas, and nearby mountains characterize the valley. The width of the Rio Grande valley along the proposed project area varies from eight to twelve miles, with the former Rio Grande floodplain varying from one to three miles wide. The current active floodplain averages 5,300 feet wide and is confined by an existing spoil bank on the west bank and bluffs or high ground on the east bank. The former floodplain and bordering terraces are mostly rural and used for irrigated farmland, livestock grazing, wildlife conservation and enhancement. The City of Socorro, New Mexico, located 12 miles south of the San Acacia Diversion, is the major population center in the project area with a 2000 population of 8,877. Smaller communities, such as San Acacia, Polvadera, San Luis, Lemitar, Escondida, San Pedro, and San Antonio, are scattered throughout the project area. Elephant Butte Reservoir, downstream of the project area, is the largest reservoir in New Mexico, storing water for flood risk management, irrigation, water supply, recreation and

downstream deliveries. The project area runs through the center of the Bosque del Apache National Wildlife Refuge, which provides habitat for wintering waterfowl and cranes, endangered species, and a rich diversity of resident and migrant wildlife.

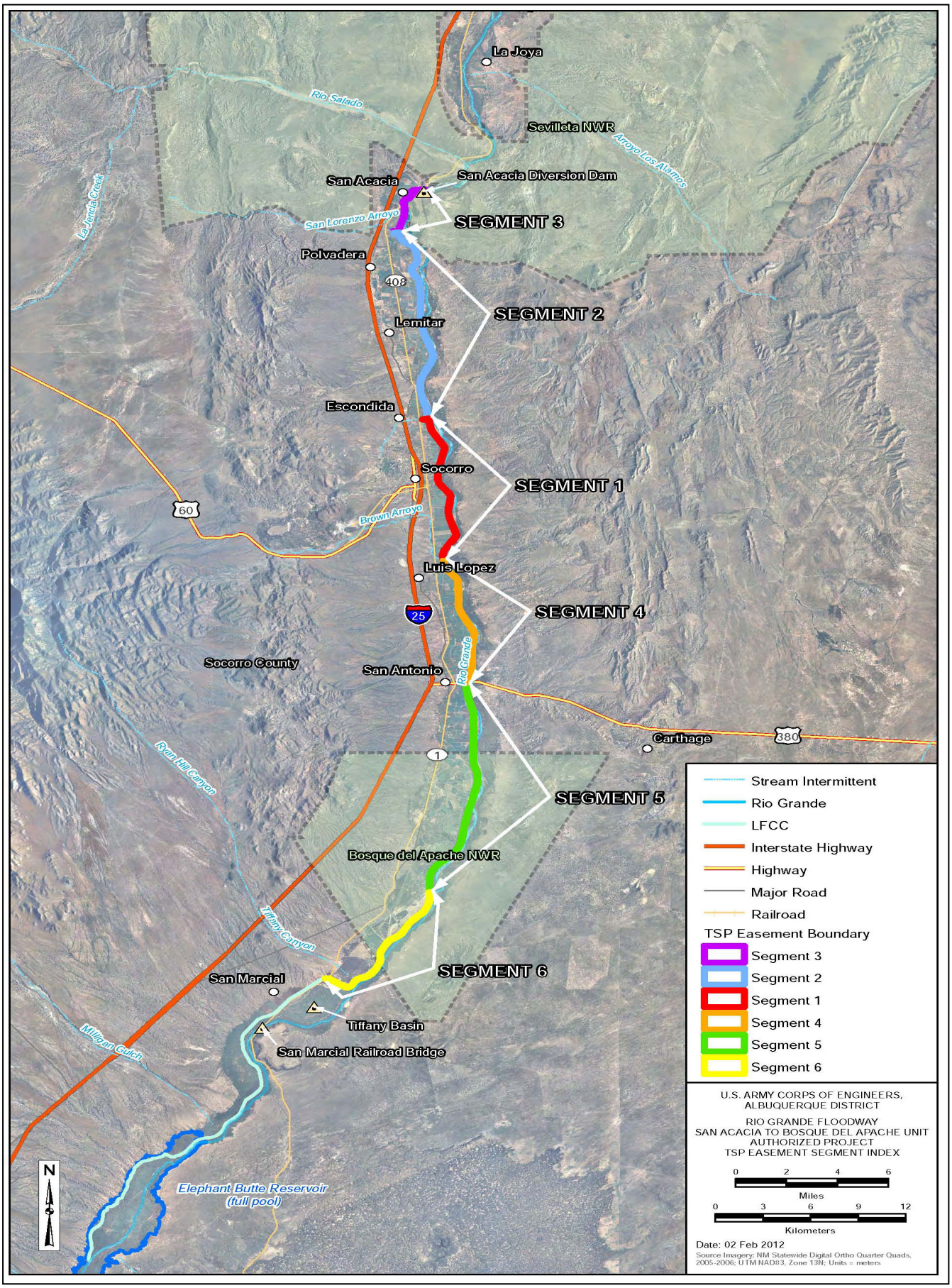
Preparation of this GRR/SEIS II became necessary due to several changes that have occurred since the project was authorized. These include the following:

- Rectification of the Rio Grande channel by Bureau of Reclamation as outlined in the 1948 authorization and construction of the Low Flow Conveyance Channel under the same authority.
- A longer period of record for hydrological data is now available, which permits improved and updated hydrological analysis.
- A levee design modification has been added to address long duration flows: any proposed plan would have to incorporate design features to prevent seepage through the levee due to prolonged flow against the riverward toe.
- The Corps has departed from the use of the freeboard methodology to account for uncertainty and instead uses probabilistic determination of flood risk and levee design.
- Three species have been listed as threatened or endangered since 1994 (the Rio Grande silvery minnow, the Southwestern Willow Flycatcher, and Pecos sunflower — each occurring within the study area, two with critical habitat).

Formulation and subsequent screening of alternatives resulted in eleven alternatives that were carried forward into CEICA. Preliminary alternatives included ring levees, non-structural solutions, railroad bridge realignment and breaches of existing spoil banks. The final array of eleven alternatives consisted of various combinations and increments of three major features including replacement of the existing spoil bank with engineered levees along the west bank of the Rio Grande for a total distance of approximately 43 miles; and acquisition of the 300 acre Tiffany area as a spoil disposal area. These analyses determined that the most economically justifiable and least environmentally damaging project is the alternative that only contains the levee.

The total project cost of $290.2 million was certified in March 2012 by the Walla Wall Cost Center of Engineering Technical Center of Expertise. Pending funding, the proposed levee construction would begin in 2013. The Middle Rio Grande Conservancy District (MRGCD) and New Mexico Interstate Stream Commission (NMISC) have been identified as project sponsors for this effort.

The vertical team has been engaged during F3 phase (completed December 2007) through this Review Plan, through the F4A (completed in February 2012) and will continue through the GRR/SEIS II report approval and Design.


La Joya
Rio Salado
Sevilleta NWR
Arroyo Los Alamos
San Acacia
San Acacia Diversion Dam
La Jencia Creek
San Lorenzo Arroyo
SEGMENT 3
Polvadera
408
SEGMENT 2
Lemitar
Escondida
Socorro
SEGMENT 1
60
Brown Arroyo
Luis Lopez
SEGMENT 4
25
Socorro County
San Antonio
Rio Grande
Carthage
380
1
Ryan Hill Canyon
SEGMENT 5
Bosque del Apache NWR
Tiffany Canyon
SEGMENT 6
San Marcial
Tiffany Basin
San Marcial Railroad Bridge
Milligan Gulch
Elephant Butte Reservoir
(full pool)
N
Stream Intermittent
Rio Grande
LFCC
Interstate Highway
Highway
Major Road
Railroad
TSP Easement Boundary
Segment 3
Segment 2
Segment 1
Segment 4
Segment 5
Segment 6
U.S. ARMY CORPS OF ENGINEERS,
ALBUQUERQUE DISTRICT
RIO GRANDE FLOODWAY
SAN ACACIA TO BOSQUE DEL APACHE UNIT
AUTHORIZED PROJECT
TSP EASEMENT SEGMENT INDEX
0 2 4 6
Miles
0 3 6 9 12
Kilometers
Date: 02 Feb 2012
Source Imagery: NM Statewide Digital Ortho Quarter Quads, 2005-2006; UTM NAD83, Zone 13N; Units = meters

c. Factors Affecting the Scope and Level of Review.

Challenges include:

1 New Corps policy and procedures for performing feasibility studies including:
   - Planning Guidance Notebook Appendix G is still in draft form
   - Peer Review Guidance is relatively new

2 Properly incorporating a project history spanning decades and many personnel changes;

3 Levee design criteria recently changed;

This project is considered to have low overall risk because:

1 The Corps has completed studies and projects of this nature recently and successfully;

2 Health and human safety factors are moderate;
   - Flood depths in some portions of the populated floodplain can reach 4-10 feet.
   - Population centers are concentrated in the northern portion of the project and largely not immediately adjacent to proposed levee alignments.
   - Several evacuation routes exist for populated areas at risk of flooding.
   - Width of floodplain results in low flow velocities

3 Non-engineered spoil banks already exist throughout the project area which gives surrounding areas a small measure of flood risk management.

This project study will require type I and type II IEPR's as it will include a Supplemental Environmental Impact Statement (SEIS) due to the only fact that total project cost is approximately $290.2 million and is in excess of $45 million. The PDT has determined that the study / project:

1 Is not expected to be controversial;
   - Proposed engineered, levee alternatives will follow the footprint of the existing, spoil bank and not result in significant changes in land use or ownership;
   - Public meetings have not shown there to be any public dispute as to the size, nature or effects of the project.
   - Public meetings have not shown there to be any public dispute as to the economic or environmental cost or benefit of the project.

2 Is not expected to have adverse impacts on scarce or unique cultural, historic, or tribal resources;
   - Cultural surveys have not identified cultural resources in the proposed footprint of FRM alternatives.
   - Tribal coordination on previous iterations and on the current iteration of the GRR/SEIS II did not identify any tribal concerns.
   - Proposed engineered levees will constructed in previously disturbed locations.

3 Is not expected to have adverse impacts on any fish or wildlife species or their habitat whether or not they are listed as endangered or threatened under the Endangered Species Act of 1973;

- Proposed engineered, levee alternatives will follow the footprint of the existing, spoil bank, therefore, not impacting any critical or important habitats;
- There is a potential to increase the amount of floodway available for riparian habitat and aquatic resources.

4 Is not likely to contain influential scientific information, nor is it likely to be a highly influential scientific assessment;
- Methods to achieve FRM used in the proposed alternative are similar to other FRM projects within the district.

5 Does not involve the rehabilitation or replacement of existing hydropower turbines, lock structures, or flood control gates;

6 Is not expected to be based on novel methods, does not present complex challenges for interpretation, does not contain precedent-setting methods or models, and will not present conclusion that are likely to change prevailing practices.
- Flood risk management within the Rio Grande Basin is an activity for which SPA has ample experience and industry to treat this activity as routine and to be able to determine what methods and models will be used.

7 Has minimal life safety risk.
- SPA has experience using FRM methods on Corps projects within the Rio Grande.
- There are limited number of population centers in the study area
- Small number of structures immediately adjacent to the floodplain
- Width of floodplain results in low flow velocities
- Inundation in the event of a breach or overtopping is about five feet
- Ample egress available in populated areas
- Structural alternatives provide high assurance of levee performance however levee failure would result in similar life safety risk as the without project condition

The Albuquerque District Chief of the Engineering and Construction Division has assessed the threat to human life and agrees with the PDT's life safety assessment that IEPR Type I and Type II (Safety Assurance Review) are warranted.

The San Acacia to Bosque del Apache Unit GRR/SEIS II does have significant interagency interest. The Bureau of Reclamation (BOR) performs flood fighting efforts as well as maintenance of river conveyance/water delivery within this unit. BOR would directly benefit from alternatives that reduce flood damages to the Low Flow Conveyance Channel and other BOR facilities. US Fish and Wildlife Service (USFWS) also benefits from alternatives that reduce damages to the Bosque Del Apache Wildlife Refuge and protect wildlife habitat within the Rio Grande Floodway. One endangered plant and two endangered animals along with critical habitat occur within the study area also requiring close coordination with the USFWS.

As a result, DQC, ATR and IEPR will focus on:

- Completeness and compliance of H&H analysis;

- Review of the planning process and criteria applied;
- Review of the methods of preliminary analysis and design;
- Compliance with sponsor, program, NEPA and ESA requirements;
- Completeness of preliminary design and support documents; and
- Spot checks for interdisciplinary coordination.

In accordance with Section 2035 of WRDA 2007, EC 1165-2-209 Errata #1 clarifies that "A Type ll IEPR SAR shall be conducted on design and construction activities for any hurricane and storm risk management and flood risk management projects, as well as other projects, where existing and potential hazards pose a significant threat to human life. Safety assurance factors must be considered in all reviews for those studies. Prior to preconstruction engineering and design (PED) of the project identified for construction, a PMP will be developed that will include safety assurance review. Safety assurance review will also be accomplished during construction.

In-Kind Contributions. Products and analyses provided by non-Federal sponsors as in-kind services are subject to DQC, ATR, and IEPR. The in-kind products and analyses to be provided by the non-Federal sponsor include:

1. Existing reports and hard data that they contribute to the study / project;
2. Assistance during public involvement actions;
3. Assistance during the formulation of alternatives;
4. Attendance at F3 and F4 conference and briefings.

Existing reports or data provided as part of the study are subject to peer review requirements.

4. DISTRICT QUALITY CONTROL (DQC)

All decision documents (including supporting data, analyses, environmental compliance documents, etc.) shall undergo DQC. DQC is an internal review process of basic science and engineering work products focused on fulfilling the project quality requirements defined in the Project Management Plan (PMP). The home district shall manage DQC. Documentation of DQC activities is required and should be in accordance with the Quality Manual of the District and the home MSC. DQC certification was completed in August 2011.

Documentation of DQC. Reviewers shall review the draft report to confirm that work was done in accordance with established professional principles, practices, codes, and criteria and for compliance with laws and policy. Comments, responses and backchecks will be documented in DrChecks software and provided as report in subsequent compliance packages.

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.

Review comments shall contain these principal elements:

- A clear statement of the concern;
- The basis for the concern, such as law, policy, or guidance;
- Significance for the concern; and
- Specific actions needed to resolve the comment.

A copy of the DQC comments were submitted to the ATR Team in August 2011 with the GRR/SEIS II documents for review.

Products to Undergo DQC. Products to undergo DQC include the GRR/SEIS II, appendices as well as the engineering technical appendices.

Required DQC Expertise. This optional section could identify the required expertise needed to conduct DQC consistent with the District/MSC Quality Management plans.

DQC Team Members/Disciplines	Expertise Required
Planning	The reviewer should have recent experience in reviewing Plan Formulation processes for multi-objective studies and be able to draw on "lessons learned" in advising the PDT of best practices.
Economics	The reviewer should be familiar with the processes used in evaluation of flood risk management projects and have recent experience in preparing economic analysis plans for flood risk management feasibility studies. HEC-FDA will be used for analysis, as will IMPLAN. Analysis will address all four project accounts during the F4 phase.
Environmental Resources	The reviewer 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.
Cultural Resources	The reviewer should have extensive Corps' experience regarding cultural resources on public and tribal lands. They need to be familiar with Department of Defense as well as USACE policies and procedures as they pertain to Corps studies and projects. http://www.usace.army.mil/CECW/Pages/cultural.aspx
Hydrology	The reviewer should have extensive knowledge of hydrology of the Rio Grande basin or similar.
Hydraulic Engineering	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 reviewer should carry a Professional Engineer's license and have recent experience in the Corps' design

	requirements for levee work. This person should also have experience in investigating existing subsurface conditions and materials; determining their physical/mechanical and chemical properties that are relevant to the project considered, assessing risks posed by site conditions; and designing earthworks and structure foundations.
Civil Engineering	The reviewer should have recent experience in the design and of plans and specifications for levees and river bridges, to include tie in to natural features.
Cost Engineering	The reviewer should have extensive Corps' experience in the application of scientific principles and techniques to problems of cost estimating, cost control, business planning and management science, profitability analysis, project management, and planning and scheduling.

5. AGENCY TECHNICAL REVIEW (ATR)

ATR is mandatory for all decision documents (including supporting data, analyses, etc.). The objective of ATR is to ensure consistency with established criteria, guidance, procedures, and policy. The ATR will assess whether the analyses presented are technically correct and comply with published USACE guidance, and that the document explains the analyses and results in a reasonably clear manner for the public and decision makers. ATR is managed within USACE by the designated RMO and is conducted by a qualified team from outside the home district that is not involved in the day-to-day production of the project/product. ATR teams were comprised of senior USACE personnel and team roster is provided in attachment 1. The ATR team lead was from the USACE Tulsa District.

DrChecks review software was used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments were limited to those that addressed content or policy compliance issues. Comments to grammar, style or spelling were not added to Dr Checks but were submitted to ATRT Leader via electronic mail using tracked Changes feature in the Word document.

The four key parts of a quality review comment included:

- The review concern – identify the product's information deficiency or incorrect application of policy, guidance, or procedures;
- The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
- The significance of 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
- The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

In some situations, especially addressing incomplete or unclear information, commenter's sought clarification by coordinating directly with PDT member to assess whether further specific concerns may exist.

The ATR documentation in DrChecks included the text of each ATR concern, the PDT response, a brief summary of the pertinent points in any discussion, including any vertical team coordination (the vertical team includes the district, RMO, MSC, and HQUSACE), and the agreed upon resolution. If an ATR concern cannot be satisfactorily resolved between the ATR team and the PDT, it will be elevated to the vertical team for further resolution in accordance with the policy issue resolution process described in either ER 1110-1-12 or ER 1105-2-100, Appendix H, as appropriate. Unresolved concerns can be closed in DrChecks with a notation that the concern has been elevated to the vertical team for resolution.

At the conclusion of each ATR effort, the ATR team prepared a Review Report summarizing the review. Review Reports were considered an integral part of the ATR documentation and shall:

- Identify the document(s) reviewed and the purpose of the review;
- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions;
- Identify and summarize each unresolved issue (if any); and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

ATR may be certified when all ATR concerns are either resolved or referred to the vertical team for resolution and the ATR documentation is complete. The ATR Lead will prepare a Statement of Technical Review certifying that the issues raised by the ATR team have been resolved (or elevated to the vertical team). A Statement of Technical Review should be completed, based on work reviewed to date, for the AFB, draft report, and final report. ATR was conducted on GRR/SEIS and concluded with the issuance of the ATR Review Report on December 14, 2011.

Products to Undergo ATR. The ATRT reviewed and commented on the GRR/SEIS II, appendices, planning models, the Engineering Technical Appendix and the MCACES. The ATRT Lead was provided comments and SPA responses to comments received through the Alternative Formulation Briefing, Type I Independent External Peer Review, HQUSACE Policy Compliance Review, and the Public Review processes. The ATRT Lead concluded that the revisions requested were not of sufficient significance to warrant any additional ATR involvement.

Required ATR Team Expertise for Review of the GRR-SEIS II. The expertise represented on the ATR reflected the significant expertise involved in the work effort and generally mirrored the expertise on the PDT.

Note: SPA reserves the right to nominate specific reviewers by technical discipline.

The expertise that should be brought to the review team may include, but is not necessarily limited to, the following:

Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Planning	The reviewer should have recent experience in reviewing Plan Formulation processes for multi-objective studies and be able to draw on "lessons learned" in advising the PDT of best practices.
Economics	The reviewer should be familiar with the processes used in evaluation of flood risk management projects and have recent experience in preparing economic analysis plans for flood risk management feasibility studies. HEC-FDA will be used for analysis, as will IMPLAN. Analysis will address all four project accounts during the F4 phase.
Environmental Resources	The reviewer 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.
Cultural Resources	The reviewer should have extensive Corps' experience regarding cultural resources on public and tribal lands. They need to be familiar with Department of Defense as well as USACE policies and procedures as they pertain to Corps studies and projects. http://www.usace.army.mil/CECW/Pages/cultural.aspx
Hydrology	The reviewer should have extensive knowledge of hydrology of the Rio Grande basin or similar.
Hydraulic Engineering	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.
Risk Analysis	The risk analysis reviewer will be experienced with performing and presenting risk analyses in accordance with ER 1105-2-101 and other related guidance, including familiarity with how information from the various disciplines involved in the analysis interact and affect the results.
Geotechnical Engineering	The reviewer should carry a Professional Engineer's license and have recent experience in the Corps' design requirements for levee work. This person should also have experience in investigating existing subsurface conditions and materials; determining their physical/mechanical and chemical properties that are relevant to the project considered, assessing risks posed by site conditions; and designing earthworks and structure foundations.
Civil Engineering	The reviewer should have recent experience in the design and of plans and specifications for levees and river bridges, to include tie in to natural features.
Cost Engineering	The reviewer should have extensive Corps' experience in the application of scientific principles and techniques to problems of cost estimating, cost control, business planning and management science, profitability analysis, project management, and planning and scheduling.

Required ATR Team Expertise for Review of Engineering Technical Appendix and Implementation Documents:

Team Members/Disciplines	Expertise Required
ATR Lead	The ATR lead should be a senior professional with extensive experience in preparing Civil Works decision documents and conducting ATR. The lead should also have the necessary skills and experience to lead a virtual team through the ATR process. The ATR lead may also serve as a reviewer for a specific discipline (such as planning, economics, environmental resources, etc).
Geotechnical Engineering	The reviewer should carry a Professional Engineer's license and have recent experience in the Corps' design requirements for levee work. This person should also have experience in investigating existing subsurface conditions and materials; determining their physical/mechanical and chemical properties that are relevant to the project considered, assessing risks posed by site conditions; and designing earthworks and structure foundations.
Civil Engineering	The reviewer should have recent experience in the design

	and of plans and specifications for levees and river bridges, to include tie in to natural features.
Hydraulic Engineering	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.
Cost Engineering	The reviewer should have extensive Corps' experience in the application of scientific principles and techniques to problems of cost estimating, cost control, business planning and management science, profitability analysis, project management, and planning and scheduling.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR is the most independent level of review, and is applied in cases that meet certain criteria where the risk and magnitude of the proposed project are such that a critical examination by a qualified team outside of USACE is warranted. A risk-informed decision, as described in EC 1165-2-209, is made as to whether IEPR is appropriate. IEPR panels will consist of independent, recognized experts from outside of the USACE in the appropriate disciplines, representing a balance of areas of expertise suitable for the review being conducted.

- Type I IEPR. Type I IEPR reviews are managed outside the USACE and are conducted on project studies. Type I IEPR panels assess the adequacy and acceptability of the economic and environmental assumptions and projections, project evaluation data, economic analysis, environmental analyses, engineering analyses, formulation of alternative plans, methods for integrating risk and uncertainty, models used in the evaluation of environmental impacts of proposed projects, and biological opinions of the project study. Type I IEPR will cover the entire decision document or action and will address all underlying engineering, economics, and environmental work, not just one aspect of the study. For decision documents where a Type II IEPR (Safety Assurance Review) is anticipated during project implementation, safety assurance shall also be addressed during the Type I IEPR per EC 1165-2-209.

- Type II IEPR. Type II IEPR, or Safety Assurance Review (SAR), are managed outside the USACE and are conducted on design and construction activities for hurricane, storm, and flood risk management projects or other projects where existing and potential hazards pose a significant threat to human life. Type II IEPR panels will conduct reviews of the design and construction activities prior to initiation of physical construction and, until construction activities are completed, periodically thereafter on a regular schedule. The reviews shall consider the adequacy, appropriateness, and acceptability of the design and construction activities in assuring public health safety and welfare.

Decision on IEPR. Based on the criteria in EC 1165-2-209 and the discussion in Section 3 – "Factors Affecting the Scope and Level of Review", Type 1 IEPR will be conducted for this study. This project study will require Type I IEPR as it will include a Supplemental Environmental Impact Statement (SEIS) and the estimated total project cost ($290.2 million) is in excess of $45 million.

The IEPR will focus on the formulation of the tentatively selected flood risk management plan. The review panel will be composed of individuals with expertise in arid region riverine systems ecology, groundwater surface water interactions, geotechnical engineering, hydraulic, hydrologic and sediment modeling. The entire feasibility report with appendices will be provided to the IEPR team. It is not anticipated that the public, including scientific or professional societies, will be asked to nominate potential external peer reviewers. It is recommended that the panel conduct a site visit if possible.

The IEPR is being conducted by a contractor, Noblis Center for Sustainability, managed by the FRM-PCX. The IEPR panel roster is provided in attachment. The FRM-PCX will follow the process established in EC 1165-2-209 in managing the IEPR.

Products to Undergo Type I IEPR The IEPR panel will review and comment on the integrated GRR/SEIS II and appendices.

Required Type I IEPR Panel Expertise. Anticipated reviewers as well as number of reviewers– will be determined by the PDT and ATRT after the ATR process. At a minimum, the IEPR panel will consist of engineering, environmental and economics disciplines.

IEPR Panel Members/Disciplines	Expertise Required
Economics	The reviewer should be familiar with the processes used in evaluation of flood risk management projects and have recent experience in preparing economic analysis plans for flood risk management feasibility studies. HEC-FDA will be used for analysis, as will IMPLAN. Analysis will address all four project accounts during the F4 phase.
Environmental	The reviewer 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.
Engineering	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. The reviewer should also have recent experience in the design and of

	plans and specifications for levees and river bridges, to include tie in to natural features. Lastly, the reviewer should carry a Professional Engineer's license and have recent experience in the Corps' design requirements for levee work. This person should also have experience in investigating existing subsurface conditions and materials; determining their physical/mechanical and chemical properties that are relevant to the project considered, assessing risks posed by site conditions; designing earthworks and structure foundations; and monitoring site conditions, earthwork and foundation construction.

Documentation of Type I IEPR. The IEPR panel will be selected and managed by an Outside Eligible Organization (OEO) per EC 1165-2-209, Appendix D. Panel comments will be compiled by the OEO and should address the adequacy and acceptability of the economic, engineering and environmental methods, models, and analyses used. IEPR comments should generally include the same four key parts as described for ATR comments in Section 4.d above. The OEO will prepare a final Review Report that will accompany the publication of the final decision document and shall:

- Disclose the names of the reviewers, their organizational affiliations, and include a short paragraph on both the credentials and relevant experiences of each reviewer;
- Include the charge to the reviewers;
- Describe the nature of their review and their findings and conclusions; and
- Include a verbatim copy of each reviewer's comments (either with or without specific attributions), or represent the views of the group as a whole, including any disparate and dissenting views.

The final Review Report will be submitted by the OEO no later than 60 days following the close of the public comment period for the draft decision document. USACE shall consider all recommendations contained in the Review Report and prepare a written response for all recommendations adopted or not adopted. The final decision document will summarize the Review Report and USACE response. The Review Report and USACE response will be made available to the public, including through electronic means on the internet.

Products to Undergo Type II IEPR The IEPR panel will review and comment on the integrated GRR/SEIS II and appendices.

The following documents will be provided for review for phase 1:

- Engineering Technical Appendix
- 95% Plans and Specifications for Phase 1
- 95% Cost Estimate for Phase 1

The following documents will be provided for review as subsequent phases of design are completed:

- 95% Plans and Specifications
- 95% Cost Estimate
- Design Documentation Report
- OMRR&R Manual

Required IEPR Type II Team Expertise for Review of Implementation Documents:

Team Members/Disciplines	Expertise Required
Geotechnical Engineering	The reviewer should carry a Professional Engineer's license and have recent experience in the Corps' design requirements for levee work. This person should also have experience in investigating existing subsurface conditions and materials; determining their physical/mechanical and chemical properties that are relevant to the project considered, assessing risks posed by site conditions; and designing earthworks and structure foundations.
Civil Engineering	The reviewer should have recent experience in the design and of plans and specifications for levees and river bridges, to include tie in to natural features.
Hydraulic Engineering	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.
Cost Engineering	The reviewer should have extensive Corps' experience in the application of scientific principles and techniques to problems of cost estimating, cost control, business planning and management science, profitability analysis, project management, and planning and scheduling.

7. POLICY AND LEGAL COMPLIANCE REVIEW

All decision documents will be reviewed throughout the study process for their compliance with law and policy. Guidance for policy and legal compliance reviews is addressed in Appendix H, ER 1105-2-100. These reviews culminate in determinations that the recommendations in the reports and the supporting analyses and coordination comply with law and policy, and warrant approval or further recommendation to higher authority by the home MSC Commander. DQC and ATR augment and complement the policy review processes by addressing compliance with pertinent published Army policies, particularly policies on analytical methods and the presentation of findings in decision documents. Policy and legal compliance review was

completed with the issuance of the final Program Guidance Memorandum in July 2012.

8. COST ENGINEERING DIRECTORY OF EXPERTISE (DX) REVIEW AND CERTIFICATION

All decision documents shall be coordinated with the Cost Engineering DX, located in the Walla Walla District. The DX will assist in determining the expertise needed on the ATR team and Type I IEPR team (if required) and in the development of the review charge(s). The DX provided Cost Engineering DX certification in March 2012. The RMO is responsible for coordination with the Cost Engineering DX.

9. MODEL CERTIFICATION AND APPROVAL

EC 1105-2-412 mandates the use of certified or approved models for all planning activities to ensure the models are technically and theoretically sound, compliant with USACE policy, computationally accurate, and based on reasonable assumptions. Planning models, for the purposes of the EC, are defined as any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision making. The use of a certified/approved planning model does not constitute technical review of the planning product. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

EC 1105-2-412 does not cover engineering models used in planning. The responsible use of well-known and proven USACE developed and commercial engineering software will continue and the professional practice of documenting the application of the software and modeling results will be followed. As part of the USACE Scientific and Engineering Technology (SET) Initiative, many engineering models have been identified as preferred or acceptable for use on Corps studies and these models should be used whenever appropriate. The selection and application of the model and the input and output data is still the responsibility of the users and is subject to DQC, ATR, and IEPR (if required).

Planning Models. The following planning models have been used in the development of the decision document:

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
HEC-FDA 1.2.4	Provides the capability for integrated hydrologic engineering and economic analysis for formulating and evaluating flood risk management plans using risk-based analysis methods. The program was used to evaluate and compare the future without- and with-project plans	Certified

	along the Middle Rio Grande Valley between Cochiti Dam and Elephant Butte Reservoir to aid in the selection of a recommended plan to manage flood risk.	

Engineering Models. The following engineering models are anticipated to be used in the development of the decision document:

Model Name and Version	Brief Description of the Model and How It Will Be Applied in the Study	Approval Status
HEC-RAS 4.0 (River Analysis System)	HEC-RAS provides the capability to perform one-dimensional steady and unsteady flow river hydraulics calculations. The program will be used for steady flow analysis to evaluate the future without- and with-project conditions along the Wild River and its tributaries. This model was used for with project flood stages and levee design for this project. It was reviewed in house June 2009.	HH&C CoP Preferred Model
MCACES	This is a cost estimating model that was developed by Building Systems Design Inc. The Corps began using this model in 1989. This will be used as a tool to determine cost estimates for project alternatives before Design.	
Flo- 2D	It is used by the Corps Flood Plain Management Group and includes graphics and reporting. This model was used for hydrologic routing for with and without project floodplains and flood stages. This model was reviewed for this project in 2006.	Approved for flood routing and floodplain mapping.
Geostudio, SLOPE/W Slope Stability Program	The Corps of Engineers stability analysis as presented in EM-1110-2-1902, Engineering and Design, Stability of Earth and Rockfill Dams and programmed for computer analysis using the Geostudio, SLOPE/W Slope Stability Program, was used for the levee and flood wall stability analysis.	

10. REVIEW SCHEDULES AND COSTS

ATR Schedule and Cost.
ATR on the GRR/SEIS II was initiated in August 2011 and completed in December 2011. The cost for the ATRT effort to date is $93,598.62 approximately $80,000 for SPA efforts to respond to comments and revise the GRR/SEIS II. Additionally as part of the ATR, the Hydrologic Engineering Center (HEC) and the Cost Engineering Mandatory Center of Expertise (MCX) confirmed the models used were appropriate and were applied properly with reasonable results. Cost for ATR review by the HEC was $7,556.61. Cost/Schedule risk analysis and the MCACES review by the MCX was $12,272.91.

Planned schedule for ATR on the implementation documents for phase 1 is shown on page 21.

Type I IEPR Schedule and Cost.
Because of the complexity of the project, the IEPR occurred in two stages with phase I IEPR regarding document content and technical attributes awarded Noblis, Inc., 3150 Fairview Park Dr., Falls Church, VA 22042-4519 in September 2011 at a cost of $114,607.90. Phase 1 of the IEPR was completed in July 2012. Public review was completed on June 11, 2012 and the IEPR team was provided the public comments with Corps draft responses for information only on August 8, 2012. Phase 2 of the IEPR began on July 18, 2012. The IEPR Final Report was completed and submitted on August 11, 2012 within 60 calendar days of the close of the public comment period to satisfy statutory requirements. Final Panel Phase 2 IEPR Comments with Corps final responses and IEPR panel's concluding backcheck comments as the final deliverable were completed and submitted on September 11, 2012. Phase cost was $93,987.18. The total cost for the two phase IEPR type 1 was $208,679.90. The Corps Baltimore District cost for administration of the IEPR was $16,982.88 and the fee for contracting was 3% of the award price or $6,260. The total IEPR type 1 cost was $232,747.96.

Type II IEPR Schedule and Cost.
The recommended plan consists of replacement of the existing spoil bank with an engineered levee for 43 miles on the west bank of the Rio Grande from the upper end of the U.S. Bureau of Reclamation's low flow conveyance channel at the San Acacia Diversion Dam to the Tiffany Basin along the alignment of the existing spoil bank. The implementation strategy was to first break the 43 miles into segments with varying lengths chosen for their natural or logical end points, associated with structures or west bank land features for tie back, as well as concurrence with this implementation strategy by the non-Federal Sponsors. Each segment can function, when completed, independent of or in concert with other segments from a risk management perspective, though the project has been formulated to maximize benefits as a whole system. As each segment is completed, it will be turned over the non-Federal Sponsors for OMRR&R. Each segment is further broken into smaller phases controlled by known and anticipated annual funding amounts. It is anticipated that this project will be constructed in no less than 20 phases with an approximate duration of 1 year for each phase. Type II IEPR, Safety Assurance Review (SAR) will be conducted on phases of the project with the approval of the South Pacific Division.

The first vital segment of this system is the Socorro Diversion channel to Brown Arroyo reach which consists of removing the existing spoil bank and replacement with an engineered levee along the existing spoil bank alignment for an approximate segment length of 7.1 miles. Phase 1 of Segment 1 consists of design of approximately the first 3 miles.

The objective is to conduct an Independent External Peer Review (IEPR) Type II for design and construction of phase 1 of the project in accordance with the Water Resources Development Act (WRDA) 2007 (Public Law 110-114), Section 2035. The IEPR Type II is planned to begin in October/November 2012 timeframe.

The following documents will be provided for the Phase 1 IEPR Type II:

- 100% Geotechnical Report
- Design 95%
- Plans and Specifications

The estimated cost for the IEPR Type II for phase 1 is $82,000.

The project is planned in twenty separate phases. As future phases of the project are developed, additional information will be added by SPA for future IEPR type II reviews.

Value Engineering (VE)

Value Engineering During Feasibility

The Project Delivery Team (PDT) used value management knowledge gained from previous projects in the Rio Grande Valley including the Albuquerque Levee System, Corrales Levee, and the Albuquerque West Levee projects to investigate and apply cost savings to the Rio Grande Floodway, San Acacia to Bosque del Apache project. During the plan formulation portion of the feasibility phase, the input was solicited from the personnel listed in table I, who possess the experience and collective knowledge in development and construction of similar projects in the VE during Design and Construction.

Value Engineering During Design

Segment 1 - Phase 1 Design

Value Engineering was used to study the functions that phase 1 of the project was to provide. As a result, VE took a critical look at how these functions were met and developed alternative ways to achieve the same function while increasing the value of the project. In the end, it was hoped that the project would realize a reduction in cost, but added value over reducing cost was the focus of VE.

The Value Engineering Study was initiated during the week of 26 to 30 March 2012 at the Albuquerque District. The final VE Study Summary Report was issued on 4 April 2012. Phase 1 of the project was studied using the Corps of Engineers standard Value Engineering (VE) methodology, consisting of five phases:

Information Phase: The Team studied drawings, figures, descriptions of project work, and cost estimates to fully understand the work to be performed and the functions to be achieved. Cost Models were compared to determine areas of relative high cost to ensure that the team focused on those parts of the project which offered the most potential for cost savings.

Speculation Phase: The Team speculated by conducting brainstorming sessions to generate ideas for alternative designs. All team members contributed ideas and critical analysis of the ideas was discouraged.

Analysis Phase: Evaluation, testing and critical analysis of all ideas generated during speculation was performed to determine potential for savings and possibilities for risk. Ideas were ranked by priority for development. Ideas which did not survive critical analysis were deleted.

Development Phase: The priority ideas were developed into written proposals by VE team members during an intensive technical development session. Proposal descriptions, along with sketches, technical support documentation, and cost estimates were prepared to support implementation of ideas. Additional VE Team Comments were included for items of interest which were not developed as proposals, and these comments follow the study proposals.

Presentation Phase: Presentation was a two-step process. The published VE Study Summary Report was distributed for review by project supporters and decision-makers. A briefing was later conducted to decide which proposals merit implementation into project design.

Sixty Three ideas for ways to improve the project or reduce costs were generated during the Speculation Phase of this study. The Analysis Phase of the study reduced the number of ideas to Twenty Four for development, of which fifteen ideas were designated as design comments and are included in the VE Study Summary Report issued on 4 April 2012.

Of all the ideas from the Analysis and Development Phases, Nine ideas became proposals which, when accepted, can result in maximum possible cumulative savings of $709,000**.**

Model Certification/Approval Schedule and Cost.
All models used in this study have been certified or approved for use.

SAN ACACIA			
Task	**Activity**	**Date**	
		Start	**End**
Draft GRR/SEIS II			
	Draft Report Complete		7/8/2011 (A)
	DQC complete	7/11/2011 (A)	8/22/2011 (A)
	Draft Document Ready for ATR		8/22/2011 (A)
Agency Technical Review - GRR/SEIS II			
	Review Start	8/23/2011 (A)	
	ATR Comments		9/12/2011 (A)
	District Responses	9/12/2011 (A)	11/30/2011 (A)
	Backcheck	11/30/2011 (A)	12/14/2011 (A)
SPD - Issue Resolution Conference, Pre-AFB Review			
	SPD Review	8/23/2011 (A)	9/28/2011 (A)
	Issue Resolution Conference		9/29/2011 (A)
	SPA incorporate IRC Comments	9/30/2011 (A)	12/7/2011 (A)
	Backcheck	12/8/2011 (A)	12/16/2011 (A)
SPD-HQ F4A			
	Review Start	12/22/2011 (A)	2/6/2012 (A)
	F4(a) conference		2/7/2011 (A)
	SPA - Policy Compliance Memo	2/8/2011 (A)	2/10/2011 (A)
	SPA incorporate AFB Comments	2/13/2011 (A)	3/30/2011 (A)
Engineering Technical Appendix			
	Complete Draft		12/23/2011 (A)
	DQC review, incorporate, backcheck	12/26/2011 (A)	2/10/2012 (A)
	ATR Engineering Tech Appendix	2/13/2012 (A)	3/29/2012 (A)
	Complete		3/30/2012 (A)
IEPR Type I			
Noblis Inc.	Review Start	9/29/2011 (A)	
	Review Complete		9/14/2012 (A)
Submit BA to USFWS	Review Start	12/7/2011 (A)	
Receive Draft BO			8/16/2012 (A)
Receive Final BO			30-Oct-12
Policy Compliance			
Review	Review Start	4/27/2012 (A)	
	Review Complete		6/11/2012 (A)
Public Review 45 days			
	Review Start	4/27/2012 (A)	
	Public Meeting		5/22/2012 (A)
	Review Complete		6/11/2012 (A)
Final Draft to SPD	Review Start/End	19-Nov-12	28-Dec-12
Final Draft to HQ	Review Start/End	26-Nov-12	28-Dec-12
Final Report Approval			23-Jan-13
Sign PPA		28-Jan-13	31-Jan-13
Phase 1 Design			
	95% P&S Phase 1 Complete		16-Nov-12
	DDR		16-Nov-12
ATR Phase 1 Design			
(Tentative)	Review Start	19-Nov-12	
	Review Complete		21-Dec-12
IEPR Type II (SAR)			
(Tentative)	Review Start	24-Dec-12	
	Review Complete		23-Jan-13
Phase 1			
	RTA	Mar-13	
	Issue	Mar-13	
	Award		May-13
(A) - Actual Date			

11. PUBLIC PARTICIPATION

Previous iterations of the study have undergone public review including the decision document and EIS leading to the authorized plan in 1992. Public coordination in this study has consisted of a public meeting held on July 1979. The 1992 SEIS was distributed to approximately 120 Federal, state, and local government agencies, and private individuals. The public notice solicited comments and information to evaluate the probable effect of the proposed action (54-mile levee) on the public interest. A Draft SEIS for the 1999 LRR was completed and distributed for public review and comments. The public notice solicited comments and information on the modified action being proposed (43-mile levee, replacement of the railroad bridge at San Marcial, and sediment basin at Tiffany). Tribal coordination was also performed for each public review document. Finally, there have been numerous formal and informal discussions with the Bureau of Reclamation, the Unites State Fish and Wildlife Service (USFWS) Ecological Services, USFWS Bosque del Apache National Wildlife Refuge, USFWS Sevilleta National Wildlife Refuge, the Bureau of Land Management, and the New Mexico Office of the State Engineer regarding this project.

The formal public review of the GRR/SEIS II was from April 27, 2012 through June 11, 2012 with one public meeting held in Socorro, New Mexico on May 22, 2012. Four members of the public and two state or Federal agencies attended the meeting. Two comment letters were received from environmental organizations as well as two letters from U. S. EPA and U. S. Fish and Wildlife Service were received during the public review period.

12. REVIEW PLAN APPROVAL AND UPDATES

The South Pacific Division Commander is responsible for approving this Review Plan. The Commander's approval reflects vertical team input (involving district, MSC, RMO, and HQUSACE members) as to the appropriate scope and level of review for the decision document. Like the PMP, the Review Plan is a living document and may change as the study progresses. The home district is responsible for keeping the Review Plan up to date. Minor changes to the review plan since the last MSC Commander approval are documented in Attachment 3. Significant changes to the Review Plan (such as changes to the scope and/or level of review) should be re-approved by the MSC Commander following the process used for initially approving the plan. The latest version of the Review Plan, along with the Commanders' approval memorandum, should be posted on the Home District's webpage. The latest Review Plan should also be provided to the RMO and home MSC.

13. REVIEW PLAN POINTS OF CONTACT

Public questions and/or comments on this review plan can be directed to the following points of contact:

- SPA Contact, Planning Chief (505-342-3201)
- PCX Director, (415-503-6852)
- SPD Reviewer, District Support Team Lead, (415-503-6556)

ATTACHMENT 1: TEAM ROSTERS

PDT - Albuquerque

Name	Discipline	Phone
Jerry Nieto	Project Management	505-342-3362
William DeRagon	Environmental	505-342-3358
Bryse Davis	Cost Engineering	505-342-3401
John Stages	Structural Engineering	505-342-3442
Cecilia Horner	Environmental Engineering	505-342-3474
Bruce Jordan	Geotechnical	505-342-3427
Mark Doles	Plan Formulation	505-342-3364
Gregory Everhart	Cultural Resources	505-342-3352
Mark Turkovich	Real Estate	505-342-3229
Robert Browning	Economics	505-342-3366
Corina Chavez	Civil Engineering	505-342-3343
Darryl Eidson	Hydrology, Hydraulics	505-342-3327
Vince Vigil	Hydrology and Hydraulics	505-343-6289

Agency Technical Review Team

Name	Discipline	District	Phone
Marc Masnor Marc.L.Masnor@usace.army.mil	ATR Team Lead/ Plan Formulation	SWT	918-669-7349
Douglas Lilly Douglas.E.Lilly@usace.army.mil	Formulation	SWT	918-669-7349
Michelle Michelle.C.Horn@usace.army.mil	Cultural Resources	SWT	918-669-7642
Roger Allred or Arnold Austin Roger.B.Allred@usace.army.mil Arnold.Austin@usace.army.mil	Structural	SWL	501-324-5010
James McKinnie James.McKinnie@usace.army.mil	Mechanical	SWL	501-324-5634
David Williams or Russ Wyckoff David.J.Williams@usace.army.mil Russ.Wyckoff@usace.army.mil	Hydrology and Hydraulics	SWT	918-669-7107
Ethan Thompson Ethan.A.Thompson@usace.army.mil	Hydrology and Hydraulics	SPK	916-557-7142
Matthew McPherson Matthew.McPherson@usace.army.mil	HEC Risk and Uncertainty	HEC	530-756-1104
Rhonda Sallee Rhonda.Sallee@usace.army.mil	Real Estate	SWT	918-6697255
Brian Harper	Economics	SWG	409-766-3886

Brian.K.Harper@usace.army.mil			
Name	Discipline	District	Phone
Sandra Stiles Nathan Dayan Sandra.E.Stiles@usace.army.mil Nathan.S.Dayan@usace.army.mil	NEPA	MVD	504-862-1583 504-862-2530
Mark Fredricks Mark.C.Fredricks@usace.army.mil	Civil Design	SWL	501-324-5104
Ronald O. Smith Ronald.O.Smith@usace.army.mil	Geotechnical	MVM	901-544-3291
James G.Neubauer James.G.Neubauer@usace.army.mil	Cost Engineering	NWW	509-527-7332
Glenn R. Matlock Glenn.R.Matlock@usace.army.mil	Cost Schedule Risk Analysis	NWW	509-527-7083

Independent External Pier Review

Noblis Center for Sustainability - Project Management Team	
Ahmad Faramarzi, PE,	Project Manager
Tammy Ryan	Co-Task Leader and Project Coordinator
M. R. "Peaches" Callier, PG	Co-Task Leader
Michael Barba	Research Assistant
Christina Gannett	Research Assistant
IEPR Panel Member Name	Discipline
Mr. Paul Bovitz	Biology/Ecology
Dr. Patrick Creegan	Civil/Cost Engineering and Geotechnical/Structural Engineering
Mr. Elvidio Diniz	Civil Works Planning and Hydrologic/Hydraulic Engineering
Dr. David Jaffe	Hydrologic/Hydraulic Engineering
Dr. Roger Mann	Economics

Value Engineering – Phase 1

Name	Discipline	Phone
Ronald Burkhard	VE Study Leader	(843) 860-3541
Jerry Nieto	Project Manager	505-342-3362
Chris Velasquez	General Engineering	505-342-3307
Michael Porter	Environmental	505-342-3264
Ricardo Montano	VE Study Leader - Cost Engineering	505-343-6268
Shelly Ramos	Geotechnical	505-342-3266
Steve Boberg	Hydrology, Hydraulics	505-342-3336

ATTACHMENT 2: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number
16 Nov 2009	Original MSC Approval date	
Jan 2011	Revised from Limited Re-evaluation Report to General Reevaluation Report and Supplemental Environment Impact Statement II	Title Page
Dec2012	Revised and updated Chapter 10 and Chapter 11	Page 15 & 16
Feb2012	Added ATRT Required Disciplines for Engineering Technical Appendix	Section 5 – Agency Technical Review
Aug 2012	Revised last two paragraphs to include PCX certified cost amount and date	Page 3
Aug 2012	Middle Paragraph – corrected total project cost amount	Page 5
Aug 2012	Section 4. – first paragraph added DQC certification date.	Page 7
Aug 2012	4th paragraph from top – corrected total project cost	Page 13
Aug 2012	Section 8. – Added date of receipt of the final PGM	Page 15
Aug 2012	Section 9. – Added date Cost PCX certified total project cost.	Page 15
Aug 2012	Section 10. - Updated review schedule and costs	Page 17
Aug 2012	Added Value Engineering paragraphs for VE during Feasibility and VE during Design	Page 18 -19
Aug 2012	Section 11. - Updated public participation paragraph	Page 20
Aug 2012	Updated PDT roster, added ATR Team roster, added IEPR Panel roster, and added VE Phase roster.	Page 22 – 23 Attachment 1
Aug 2012	Deleted Sample Statement of Technical Review for Decision Documents	
Aug 2012	Deleted Acronyms and Abbreviations table	

ATTACHMENT 3: REVIEW CERTIFICATIONS

QUALITY CONTROL CERTIFICATION

COMPLETION OF QUALITY CONTROL ACTIVITIES

The District has completed the Rio Grande Floodway-San Acacia to Bosque del Apache Unit, Socorro County, New Mexico, General Reevaluation Report/Supplemental Environmental Impact Statement Report prior to the Alternative Formulation Briefing. Certification is hereby given that all quality control activities defined in the Quality Control Plan appropriate to the level of risk and complexity inherent in the product have been completed. Documentation of the quality control process is enclosed.

GENERAL FINDINGS

Compliance with clearly established policy principles and procedures, utilizing clearly justified and valid assumptions, has been verified. This includes assumptions; methods, procedures and materials used in analyses; alternatives evaluated; the appropriateness of data used and level of data obtained; and the reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing Corps policy. The undersigned recommends certification of the quality control process for this product.

Charles Wilson
Chief, Plan Formulation Section

8/25/11
Date

QUALITY CONTROL CERTIFICATION

As noted above, all issues and concerns resulting from technical review of the product have been resolved.

Kristopher T. Schafer, PE
Chief, Planning Branch

8/25/11
Date

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ATTACHMENT 3: REVIEW CERTIFICATIONS (CONTINUED)

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the for the Rio Grande Floodway, San Acacia to Bosque Del Apache Unit, Socorro County, New Mexico, General Reevaluation Report and Supplemental Environmental Impact Statement, August 2011. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. 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, but could be improved. Six comments were not closed by agreement of the District, Division, and FRM PCX – one geotechnical and five economic comments. The geotechnical comment remains open to highlight the need for ATR of engineering documentation in an engineering appendix. A process was implemented with the objective of resolving the economic issues prior to the AFB.

Digitally signed by MASNOR.MARC.L.1231275556
Date: 2011.12.14 13:13:47 -06'00'

Marc L. Masnor, P.E. — Date
ATR Team Leader
CESWT

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Date: 2011.12.15 09:08:44 -07'07'

Jerry D. Nieto, P.E. — Date
Project Manager
CESPA-PM-C

Digitally signed by THAUT.ERIC.WILLIAM.1231631824
Date: 2011.12.14 13:43:48 -08'00'

12/13/12

Eric W. Thaut — Date
Review Management Office
Representative
CESPD-PDS-P

CERTIFICATION OF AGENCY TECHNICAL REVIEW

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

- Potentially no significant concerns

MORENO.JOHN.D.1231913889
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Date: 2011.12.15 09:30:37 -07'07'

John D. Moreno, P.E. — Date
Chief, Engineering and Construction Division
CESPA-EC

SCHAFER.KRISTOPHER.T.1231449783
Digitally signed by SCHAFER.KRISTOPHER.T.1231449783
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=SCHAFER.KRISTOPHER.T.1231449783
Date: 2011.12.15 13:03:42 -07'07'

Kristopher T. Schafer, P.E. — Date
Chief, Planning Branch
CESPA-PM-L

ATTACHMENT 3: REVIEW CERTIFICATIONS (CONTINUED)

COMPLETION OF AGENCY TECHNICAL REVIEW

The Agency Technical Review (ATR) has been completed for the for the Rio Grande Floodway, San Acacia to Bosque Del Apache Unit, Socorro County, New Mexico, **Engineering Appendix** (work product) to the General Reevaluation Report and Supplemental Environmental Impact Statement, August 2011. The ATR was conducted as defined in the project's Review Plan to comply with the requirements of EC 1165-2-209. 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.

Digitally signed by MASNOR.MARC.L.1231275556
Date: 2012.03.29 16:50:26 -05'00'

Marc L. Masnor, P.E.
ATR Team Leader
CESWT

Date

NIETO.JERRY.D.1265588650

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Date: 2012.03.30 16:11:41 -06'00'

Jerry D. Nieto, P.E.
Project Manager
CESPA-PM-C

Date

ATTACHMENT 3: REVIEW CERTIFICATIONS (CONTINUED)

WALLA WALLA COST ENGINEERING TECHNICAL CENTER OF EXPERTISE

COST AGENCY TECHNICAL REVIEW

CERTIFICATION STATEMENT

For

SPA – San Acacia to Bosque Del Apache
General Re-Evaluation Report

The San Acacia to Bosque Del Apache GRR as presented by Albuquerque District has undergone a successful Cost Agency Technical Review (Cost ATR), performed by the Walla Walla District Cost Engineering Technical Center of Expertise (Cost TCX) team. The Cost ATR included study of the project scope, report, cost estimates, schedules, escalation, and risk-based contingencies. This certification signifies the products meet the quality standards as prescribed in ER 1110-2-1150 Engineering and Design for Civil Works Projects and ER 1110-2-1302 Civil Works Cost Engineering.

As of March 16, 2012, the Cost TCX certifies the estimated total project cost of:

FY 2013 Price Level: $229,499,000 excluding spent funds
Fully Funded Amount: $290,237,000 including spent funds

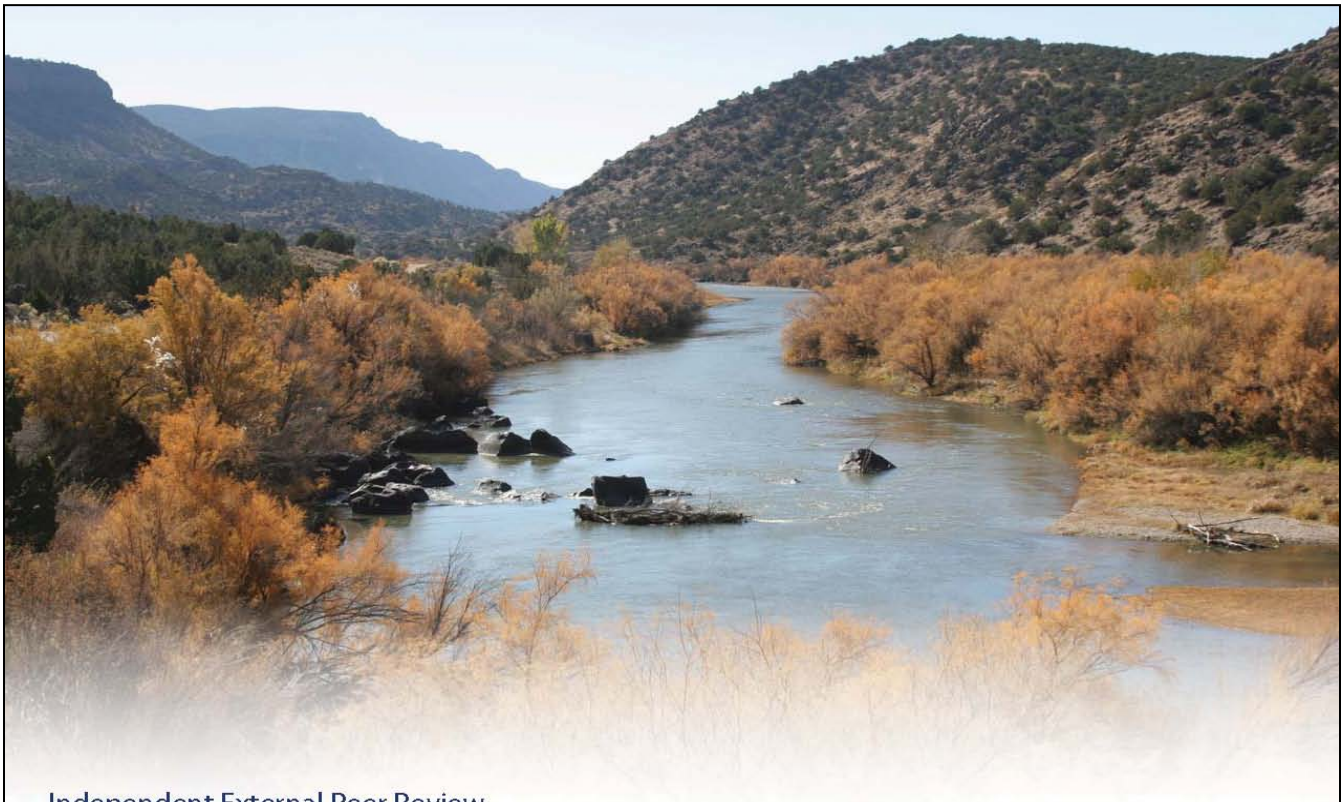
It remains the responsibility of the District to correctly reflect these cost values within the Final Report and to implement effective project management controls and implementation procedures including risk management throughout the life of the project.

Kim C. Callan, PE, CCE, PM1
Chief, Cost Engineering
Walla Walla District

US Army Corps of Engineers®

Date 3/16/2012

ATTACHMENT 3: REVIEW CERTIFICATIONS (CONTINUED)



Independent External Peer Review

Rio Grande Floodway, San Acacia to Bosque Del Apache, New Mexico Flood Risk Management General Reevaluation Report and Supplemental Environmental Impact Statement (Rev. 1)

Contract No. W912HQ-11-D-0002

10 August 2012

noblis.

For the best of reasons