

REVIEW PLAN

**Sparks Arroyo Feasibility Study, El Paso County, Texas
General Investigations Report
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 Sparks Arroyo Feasibility Study, General Investigations Report in El Paso County, Texas.

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, 31 Mar 2011
3. Engineering Regulation (ER) 1110-1-12, Quality Management, 30 Sep 2006
4. ER 1105-2-101, Risk Analysis for Flood Damage Reduction Studies, 3 January 2006
5. ER 1105-2-100, Planning Guidance Notebook, Appendix H, Policy Compliance Review and Approval of Decision Documents, Amendment #1, 20 Nov 2007
6. Engineering Manual (EM) 1110-2-1619, Risk-Based Analysis for Flood Damage Reduction Studies, 1 August 1996
7. CW-CP Memo for Distribution, "Peer Review Process", 2007-03-30
8. Director of Civil Works' Policy Memorandum #1, CECW-P, dated 19 January 2011
9. QMS 02500-SPD, Preparation and Approval of Review Plans
10. QMS 02500.1-SPD, Supplemental Review Plan Checklist
11. Sparks Arroyo Feasibility Project Management Plan

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 US Army Corps of Engineers (USACE) 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. Sparks Arroyo, Texas is a single purpose study.

3. STUDY INFORMATION

a. Decision Document.

The purpose of the study is to investigate potential solutions to the flooding problems along Sparks Arroyo, adjacent watersheds and the Rio Grande Valley near Socorro, TX. The project is a General Investigations study undertaken to evaluate structural and non-structural Flood Risk Management (FRM) measures. The decision document will present planning, engineering, and implementation details of the array of alternatives including detention structures, channelization structures, Non-structural measures and levee structures. The feasibility phase of this project is cost shared 50/50 with the project sponsor, El Paso County, Texas.

Resolved by the Committee Of Environment and Public Works of the United States Senate, that the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act approved June 13, 1902, was requested to review the report of the Chief of Engineers on El Paso County, Texas, published as House Document Number 207, 89th Congress, 1st Session, and other pertinent reports with particular reference to providing a plan for development, vicinity of El Paso, Texas.

Pursuant to EC1105-2-410, coordination with the Planning Center of Expertise (PCX) for Flood Risk Management is recommended. 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, an Environmental Assessment (EA) will be written and this project study will require an IEPR since the total project cost is estimated to be in excess of \$45 million.

b. Study/Project Description. This single purpose study will focus on flood risk management alternatives south east of El Paso, Texas in the Sparks Arroyo and adjacent watersheds from the headwaters near Horizon City, southwest to the Rio Grande Valley bottom and associated drains near the City of Socorro, Texas. Runoff within the upper watershed catchment area flows southwesterly over the flat mesa. The topography then changes from flat mesa to steeper bluffs. At this point the flow path becomes defined in natural arroyos as it drops nearly 250 ft in elevation over approximately 2.5 miles. The flows continue southwesterly past residential, commercial properties, then under I-10 discharging, out of the bluffs and into the valley bottom residential areas or agricultural lands. The valley bottom is very flat and separated from the Rio Grande by a levee system. Floodwater entering the valley is eventually conveyed to the Rio Grande via irrigation drains. The

capacity of these drains, however, is not sufficient for larger rain events so that excessive runoff pools in the valley bottom to depths of several feet.

Damages in the form of flooding, erosion and sedimentation have occurred along the arroyos. Velocities of flash floods are a threat to life safety near arroyo channels and at low water crossings. High velocity flows and extreme sediment deposition occur in residential neighborhoods at the mouth of some arroyos and finally, pooling of floodwater causes damages to structures and infrastructure in the valley bottom.

El Paso County owns and operates a Waste Water Treatment Plant (WWTP) within the Sparks Arroyo study area. The main facility is located between 2 forks of Sparks Arroyo and is vulnerable to high flows from either tributary. Because of the WWTP's close proximity to Sparks Arroyo, any considered water resource plan will need to evaluate impacts to the facility.

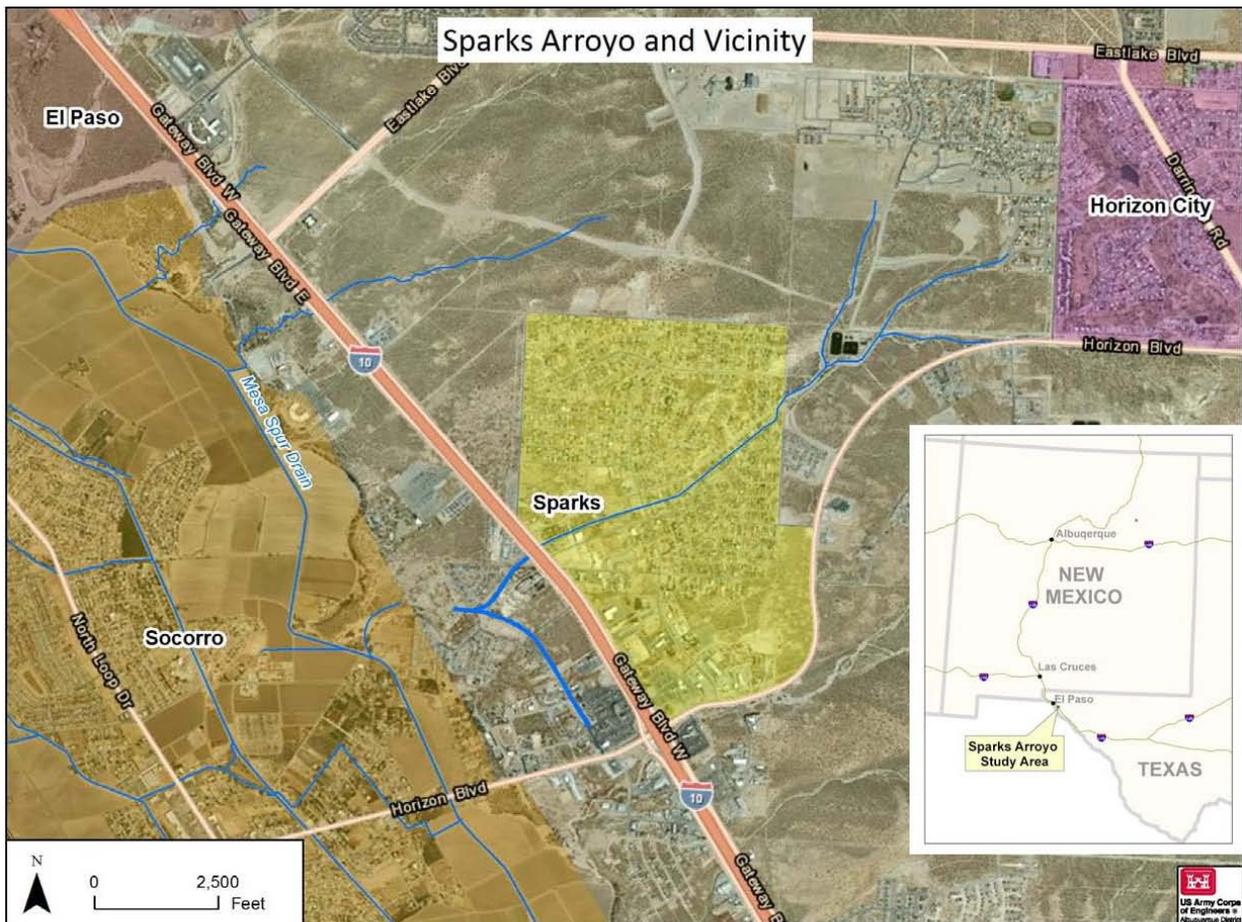


Figure 1 – Sparks Arroyo Study Area

Potential Alternatives:

Preliminary flood risk management measures include channelization, diversions and detention structures, as well as non-structural measures. The inability to convey water

to the river across the nearly flat Rio Grande floodplain at the mouth of the arroyos is a major constraint to conveyance measures.

c. Factors Affecting the Scope and Level of Review.

Planning Challenges include:

1. New Corps policy and procedures for performing feasibility studies including:
2. Civil Works Modernization has brought about changes in the scope of feasibility studies to reduce the amount of superfluous analysis and focus on decision points.
3. Clarification of the level of analysis and review and its effect on project cost and schedule will become clearer as experience is gained in the new paradigm.
4. Similarly, USACE regulations and guidance have not been updated to reflect the changes to USACE planning procedures required by SMART Planning. Because of this, some activities and products of the new paradigm are not defined. As of Dec 2012 several new requirements including charrette workshops and formal risk analysis present additional up-front costs to the project intended to expedite the study approval and lessen the cost during policy and compliance review.
5. The Planning Guidance Notebook update to Appendix G is still in draft form.
6. Properly incorporating project history through many personnel changes and stochastic funding streams has had a great impact on project schedule and cost.
7. Project specific (Technical) Challenges include:
 - a. The areas of southeast El Paso, Sparks and Horizon City are rapidly being developed. Although El Paso has been proactive in setting aside lands for watershed management measures and requirements for stormwater management in new development, planning models had to account for maximum development before project construction.
 - b. Co-mingling flows from multiple adjacent arroyos complicates the analysis of effects caused by any one arroyo or FRM measure. The optimization and efficiency of combinations of up to five retention structures becomes onerous.

This project is considered to have low risk because:

1. The Corps has recently and successfully completed studies and projects of this nature that include detention structures and improved channels;
2. The Sponsor has committed to the project despite a long study period and two study expansions; and
3. The study area is not environmentally sensitive due to the absence of endangered species or high value wildlife habitat.

Some Project risk exists due to life safety risk considerations.

1. Life safety risk under existing conditions includes:
 - a. The existing configuration of Sparks Arroyo above the Valley Ridge Addition is diverted from its original flow path. Larger rain events cause the water to jump the embankment and return to the original flow path which drops off a dirt embankment approximately 60-feet high into the neighborhood below. Due to the slope of the area, resulting flows have

high velocities and pose a risk to people inside some residences as well as anyone caught outside shelter or attempting to flee the area.

- b. There is a risk that in a large rain event the embankment could fail catastrophically adding large amounts of mud and debris to the flood.
 - c. Once the water reaches the valley floodplain in Socorro, TX water depths of 2.5 to 3.5 feet occur blocking ingress and egress along roads to the area. Emergency help may not be able to reach the area in the case of fire or a medical emergency until flood waters recede.
1. The With-Project life safety risk includes:
 - a. Most alternatives include one to five retention structures upstream of residential and commercial structures. The retention structures would be designed to state and/or Corps standards. In this case the dams would be designed to hold the design event and pass the Probable Maximum Flood.
 - b. Failure of any one of these structures would exacerbate existing flooding with by introducing a large amount of water to the floodplain in a short time. A single structure may cause 1-2 feet of flooding to the floodplain in Socorro. Any people, residences or vehicles in close vicinities to a structure when it fails may be subject to high velocity flows.
 - c. Failure of a dam at the upstream end of Sparks Arroyo would send a large wave of water down the relatively steep hillside. The WWTP as well as one to two rows of houses in the Sparks Addition and portions of Valley Ridge Subdivision would be subject to several feet of water at very high velocities that would likely carry large amounts of sediment and debris.
 - d. Catastrophic failure of more than one or all dams simultaneously would likely result in flood depths several inches or a few feet higher than the existing condition.

This project study will require Type I and Type II IEPRs due to the life safety risk described above and because the total project cost may exceed \$45 million. The PDT has determined that this study/project:

1. Is not expected to be controversial as:
 - a. Sparks Arroyo does not have significant public dispute or interagency interest because there are no endangered species or high value wildlife habitat present. Risk of flooding may impact I-25 and local roadways.
 - b. Land ownership within the project area is private, County, and local municipality.
 - c. SPA has experience doing similar types of measures (channels, detention) within El Paso County and along upstream reaches of the Rio Grande.
 - d. There is no request by the Governor of an affected state for a peer review by independent experts.
2. Is not expected to have adverse impacts on scarce or unique cultural, historic, or tribal resources based on database searches of known sites and surveys performed during the study:

3. Is not likely to contain influential scientific information, nor is it likely to be a highly influential scientific assessment. 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:
4. Does not involve the rehabilitation or replacement of existing hydropower turbines, lock structures, or flood control gates.

The SPA Chief of Engineering 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 - SAR) are warranted.

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;
- Spot checks for interdisciplinary coordination.

In accordance with Section 2035 of WRDA 2007, EC 1165-2-209, a Type II IEPR (SAR) shall be conducted on design and construction activities for any flood risk management projects where existing and potential hazards pose a significant threat to human life. The Sparks Arroyo General Investigation is a flood risk management project that will include an environmental assessment and project cost may exceed \$45M. 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.

d. 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.

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.

a. Documentation of DQC. DrChecks review software will be used to document all DQC comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

1. The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
2. The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
3. 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
4. The probable specific action needed to resolve the concern – identify the action(s) that the reporting officers must take to resolve the concern.

b. Products to Undergo DQC. The combined feasibility report and environmental assessment, supporting appendices and any existing, sponsor or contractor products used to inform the alternative analysis and decision to select one alternative will undergo DQC review.

c. Required DQC Expertise.

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 Feasibility 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 may impact native species of plants and animals.
Cultural Resources	The reviewer should have extensive Corps’ experience regarding cultural resources on public and tribal lands. They

DQC Team Members/Disciplines	Expertise Required
	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 arid-land, flashy wash systems and the Rio Grande or similar river system.
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. 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.
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, environmental compliance documents, 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 will be comprised of senior USACE personnel and may be supplemented by outside experts as appropriate. The ATR team lead will be from outside the home MSC.

Once actual costs are determined, this Review Plan will be revised. Until then, ATR review and assistance is estimated to be between \$60,000 and \$75,000 for the study.

- a. Products to Undergo ATR.** The combined feasibility report and environmental assessment, supporting appendices and any existing, sponsor or contractor products used to inform the alternative analysis and decision to select one alternative will undergo ATR. As alternative plans are formulated, the review process will focus on data, assumptions and the engineering, scientific, economic, social & environmental analysis process. Major review process milestones will include the preparation for Alternative Formulation Briefing and Civil Works Review Board including review of the Environmental Document.

Contractor or sponsor generated reports and data will be reviewed in conjunction or as part of the GI and supporting documentation during required review milestones for example ATR, IEPR, etc.

- b. Required ATR Team Expertise.** An ATR Leader shall be designated for the review by the FRM-PCX and will come from outside the MSC. The PDT requests that the PCX recommend an ATR Leader and ATR team from district(s) that have experiences in flood risk management projects in large, semi-arid river systems similar to that in El Paso County. In general, the ATR Leader is responsible for providing information necessary for setting up the reviews, to include value engineering, communicating with the Project Manager and Plan Formulator, providing a summary of critical review comments, collecting grammatical and editorial comments from the ATR team, ensuring that the ATR team has adequate funding to perform the review, facilitating the resolution of the comments, and certifying that the ATR has been conducted and resolved in accordance with policy. It is South Pacific Division policy to conduct a value engineering study during the Feasibility phase of the study. Therefore, the ATR Leader will also be responsible for identifying a value engineering officer to lead the value engineering study. Further the ATR will be coordinated with the Const Engineering Directory of Expertise. The ATR Leader will review the draft and final reports to determine if there is substantial new information that requires further review prior to ATR certification.

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

The ATR team that was used for the Feasibility Scoping Meeting in July 2005 has been added to Appendix A. Additional reviewers (if necessary) have yet to be determined, but will be determined by the PCX. If necessary, as reviewers are determined, their names, qualifications and years of relevant experience will be added to the Review Plan.

ATR 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 ATR 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 Feasibility 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 may impact 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 arid-land, flashy wash systems and the Rio Grande or similar river system.
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; designing earthworks and structure foundations; and monitoring site conditions, earthwork and foundation construction.
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.

ATR Team Members/Disciplines	Expertise Required
Risk Analysis	The risk analysis reviewer should be a senior professional with extensive experience in performing and presenting risk analysis in accordance with ER 1105-2-101, EM 1110-2-1619 and any other pertinent guidance, including experience with hydrologic, hydraulic and geotechnical uncertainties, the guidelines described in the FEMA / USACE memo on Levee Certification for the NFIP, annual exceedance probabilities, long-term risk rather than level-of-protection, and performance analyses such as: capacity exceedance at the least damaging or other planned location. This may include providing superiority at critical locations.
Real Estate	The Real Estate reviewer should be a senior real estate specialist with experience in flood risk management studies.

c. Documentation of ATR. DrChecks review software will be used to document all ATR comments, responses and associated resolutions accomplished throughout the review process. Comments should be limited to those that are required to ensure adequacy of the product. The four key parts of a quality review comment will normally include:

1. The review concern – identify the product’s information deficiency or incorrect application of policy, guidance, or procedures;
2. The basis for the concern – cite the appropriate law, policy, guidance, or procedure that has not be properly followed;
3. 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
4. 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, comments may seek clarification in order to then assess whether further specific concerns may exist.

The ATR documentation in DrChecks will include 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 will prepare a Review Report summarizing the review. Review Reports will be 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. A sample Statement of Technical Review is included in Attachment 2.

6. INDEPENDENT EXTERNAL PEER REVIEW (IEPR)

IEPR may be required for decision documents under certain circumstances. 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. There are two types of IEPR:

- **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.

- a. **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 I IEPR will be conducted for this study. This project study will require Type I IEPR as it will include existing life safety risk and the estimated total project cost may exceed \$45 million.

IEPR will focus on the formulation of the 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. A representative of the panel will attend the Civil Works Review Board.

IEPR will be conducted by a contractor and managed by the FRM-PCX. The FRM-PCX will follow the process established in EC 1105-2-410 in managing the IEPR.

- d. **Products to Undergo Type I IEPR** The combined feasibility report and environmental assessment, supporting appendices and any existing, sponsor or contractor products used to inform the alternative analysis and decision to select one alternative will undergo IEPR review.
- a. **Required Type I IEPR Panel Expertise.** The IEPR will be conducted by a contractor and managed by the FRM-PCX. The FRM-PCX will follow the process established in EC 1105-2-410 in managing the IEPR.

Primary disciplines or expertise needed for the review – the IEPR panel may include the same disciplines as the ATR team, but for most studies the makeup of the IEPR panel is a subset of the ATR disciplines and may focus on more specific aspects of the study. Final determination of the review disciplines required for IEPR will be determined later in the study process through consultation between the PDT and ATR team. At a minimum, the IEPR panel will consist of engineering, environmental and economics.

Anticipated reviewers as well as number of reviewers – will be determined by the PDT and ATR team after the ATR process. At a minimum, the IEPR panel will consist of Engineering, Hydrology and Hydraulics, environmental and economics.

Type I 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 Feasibility 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 may impact native species of plants and animals.
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.
Hydrology	The reviewer should have extensive knowledge of hydrology of arid-land, flashy wash systems and the Rio Grande or similar river system.
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.

Type II IEPR Panel Members/Disciplines	Expertise Required
Natural 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.
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 Feasibility phase.
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.
Hydrology	The reviewer should have extensive knowledge of hydrology of arid-land, flashy wash systems and the Rio Grande or similar river system.
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.

b. Documentation of Type I and Type II IEPR. Documentation of Type I and Type II 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.

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.

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 will also provide the Cost Engineering DX certification. 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).

- a. Planning Models.** The following planning 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	Certification / Approval Status
HEC-FDA 1.2.4 (Flood Damage Analysis)	The Hydrologic Engineering Center's Flood Damage Reduction Analysis (HEC-FDA) program 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 will be used to evaluate and compare the future without- and with-project plans to aid in the selection of a recommended plan to manage flood risk.	Certified

- b. 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-HMS (Hydrologic Modeling System)	Corps approved for assessing and reducing flooding in a watershed to simulate the precipitation-runoff processes of dendritic watershed systems. It implements the risk-	Certified

	based analysis procedures contained in EM 1110-2-1619 to develop hydrology models and determine water usage in the study area.	
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 Rio Grande and its tributaries. This model will be used for with project flood stages and levee design.	HH&C CoP Preferred Model
MCASES	This is a cost estimating model that was developed by Building Systems Design Inc. The Army Corps of Engineers began using this model in 1989. This will be used as a tool to determine cost estimates for project alternatives.	
FLO-2D	It is used by the Corps Flood Plain Management Group and includes graphics and reporting. This model will be used for hydrologic routing for with and without project floodplains and flood stages.	Approved for flood routing and floodplain mapping

- c. Value Engineering (VE). The PDT used value management knowledge gained from previous projects in the Rio Grande Valley including the Central and Southeast El Paso Flood Risk Management systems. During the plan formulation portion of the feasibility phase, the input will be solicited from the personnel listed in the table shown in Attachment 1, who possess the experience and collective knowledge in development and construction of similar projects.

10. REVIEW SCHEDULES AND COSTS

- a. ATR Schedule and Cost. The Albuquerque District shall provide labor funding by cross charge labor codes. Funding for travel, if needed, will be provided through 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. 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 Leader to any possible funding shortages.

Once actual costs are determined, this RP will be revised. Until then, ATR review and assistance is estimated to be about \$50,000-\$70,000 for the study.

- b. Type I IEPR Schedule and Cost. The IEPR will follow the GRR/SEIS ATR. The IEPR is estimated to cost approximately \$150,000. As additional information becomes available, this Review Plan will be updated.

- c. **Type II IEPR Schedule and Cost.** This IEPR will take place during PED. The IEPR is estimated to cost approximately \$100,000. As additional information becomes available, this Review Plan will be updated.
- d. **Model Certification/Approval Schedule and Cost.** All models are certified or approved for use without further model review. The hydrology and hydraulic models will be certified as part of the ATR by the Hydraulic Engineering Center. Cost/Schedule risk analysis and the MCACES will be certified by the Cost Center of Expertise also as part of the ATR. As additional information becomes available, this Review Plan will be updated.
- e. **In-Progress Reviews.** To facilitate the study process and to access the vertical team, In-Progress Reviews (IPRs) have been incorporated into the PDTs detailed task schedule. These IPRs are currently scheduled to take place during Plan Formulation of Alternatives, at the Tentatively Selected Plan, at the NED Plan determination and at the draft GRR/SEIS. Additional IPRs may be added to achieve USACE vertical team alignment on particular issues if they are identified.
- f. **Value Engineering (VE) studies** have not been completed and are expected to cost about \$20,000 for this project. VE studies are anticipated prior to the Alternative review Conference in accordance with CESP R 1110-1-8.

Major Milestone Activity	Complete
Feasibility Scoping Meeting (F3)	September 2005
Agency Technical Review (ATR)	March 2014 – April 2014
Alternative Review Conference (F4)	June 2014
Alternative Formulation Briefing (F4a)	August 2014 – September 2014
Independent External Technical Review	July 2014 – October 2014
Public Review of EA	January 2015 – March 2015
Feasibility Review Conference	May 2015
Civil Works Review Board	September 2015
ASA Approval and Congressional Authorization	December 2015

- g. **Type I IEPR Schedule and Cost.** The IEPR will begin concurrently with the ATR, with an estimated cost of \$150,000 to include District, ATR team, and Contract efforts. Following is the draft schedule for the IEPR:

RESOURCE	TASK	DURATION	EST. START	EST. FINISH
PDT / ATR Team	Write IEPR Scope of Work	20d	3 March 2014	28 March 2014
IEPR	A/E Review of IEPR SOW	30d	31 March 2014	11 April 2014
PM / Contracting / Battelle	Negotiate IEPR Contract	15d	14 April 2014	25 April 2014
SPA Contracting	Award IEPR Contract	1d	26 April 2014	
Battelle	IEPR	130d	25 May 2014	25 Oct 2014

h. Model Certification/Approval Schedule and Cost. HEC- FDA 1.2.4 is a certified model, therefore, no additional model certification is anticipated.

11. PUBLIC PARTICIPATION

To date there have been no public meetings for Sparks Arroyo Project alternatives, however coordination of future meetings and limited public involvement have occurred.

Jan 29, 2009 Michael Fies (PM) and Mark Doles (Planner) attended a constituent meeting in the city of Socorro, TX. The meeting was held by the neighborhood association at Valley Ridge with the mayor of Socorro and El Paso County Commissioner in attendance. The Corps was invited to present the findings of the initial study and planning to date on the Sparks Arroyo project.

Public Comment Action	Estimated Date
Public Meetings	June 2014
Public Comments or Questions	January 2015 – March 2015
Public Meetings During Public Review of the EA	January 2015

The public will have opportunity to provide written comments on the draft EA in January 2015.

Release of the draft combined Feasibility Report/EA for public review will occur after issuance of the AFB policy guidance memo and concurrence by HQUSACE. The public for comment period will coincide with finalization of the policy compliance review. Upon completion of the review periods, comments will be consolidated in a matrix and addressed, if needed. A summary of the comments and resolutions will be included in the document.

Tribal coordination has been performed and will continue once a tentatively selected plan is identified. There have also been numerous formal and informal discussions with the County of El Paso, City of Socorro, and the United States Fish and Wildlife Services (USFWS) regarding this project.

12. REVIEW PLAN APPROVAL AND UPDATES

The Albuquerque District's 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:

- Planning Chief, Kris Schafer (505-342-3201, Kristopher.T.Schafer@usace.army.mil)
- Review Management Organization: FRM PCX Deputy Director, Eric Thaut (415-503-6852, Eric.W.Thaut@usace.army.mil)
- SPD Reviewer: District Support Team Lead: Paul Devitt (415) 503-6556

ATTACHMENT 1: TEAM ROSTERS

Project Delivery Team Members

Name	Discipline	Phone
Robert Browning	Economics	505-342-3366
Bryse Davis	Cost Engineering	505-342-3411
Lisa Debettignies	Hydrology, Hydraulics & Sedimentation [H&H]	505-342-3329
Jeremy Decker	Cultural Resources	505-342-3671
Jennifer Denzer	Geotechnical	505-342-3469
Mark Doles	Plan Formulation	505-342-3364
Lynette Giesen	Project Management	505-342-3187
David Henry	Environmental Engineering	505-342-3139
Michael Porter	Environmental	505-342-3264
Ted Solano	Civil Engineering	505-342-3419
Marvin Urban	Real Estate	505-342-3229

ATR Team (TBD by FRM-PCX)

These were the reviewers for the Feasibility Scoping Meeting report ATR that took place in September 2005.

Name	Discipline	Dist rict	Qualifications/ Experience	Phone
Ron Ganzfried	Chair, Planning Compliance	SPK		916-557-XXXX
Matt Davis	Environmental Compliance	SPK	Regional Technical Specialist (RTS) for NEPA Compliance. 25 years of Corps experience as an environmental planner Education: MS degree in Biological Sciences	916-557-6708
Greg Kukas	Hydraulic Design	SPK		916-557-7259
Gary Bedker	Economics	SPK		916-557-6707
Bob Collins	Hydrologic Design	SPK		916-557-7132
Mike Ramsbotham	Geotech	SPK		916-557-7174
Richard Perry	Cultural Resources	SPK		916-557-5218
Bob Vincent	Real Estate	SPK		916-557-XXXX
Sherman Fong	Cost Engineering	SPK		916-557-6983

A new ATR Team Lead outside the MSC will need to be determined.

**ATTACHMENT 2: SAMPLE STATEMENT OF TECHNICAL REVIEW FOR
DECISION DOCUMENTS
COMPLETION OF AGENCY TECHNICAL REVIEW**

The Agency Technical Review (ATR) has been completed for the Sparks Arroyo Feasibility General Investigations Report for Sparks Arroyo Feasibility Study, El Paso County, Texas. 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 DrChecksSM.

SIGNATURE

Name

ATR Team Leader

Office Symbol/Company

Date

SIGNATURE

Lynette Giesen

Project Manager, *PMC*

Date

SIGNATURE

Name

Architect Engineer Project Manager¹

Company, location

Date

SIGNATURE

Name

Review Management Office

Representative

Office Symbol

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.

SIGNATURE

John Moreno
Chief, Engineering Division
EC

Date

SIGNATURE

Kris Schafer
Chief, Planning Division
PML

Date

¹ Only needed if some portion of the ATR was contracted

ATTACHMENT 3: REVIEW PLAN REVISIONS

Revision Date	Description of Change	Page / Paragraph Number
4 Dec 2012	Format Update to meet guidance; Schedule and Cost Updates	Whole Document

ATTACHMENT 4: ACRONYMS AND ABBREVIATIONS

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>
AFB	Alternative Formulation Briefing	NED	National Economic Development
ASA(CW)	Assistant Secretary of the Army for Civil Works	NER	National Ecosystem Restoration
ATR	Agency Technical Review	NEPA	National Environmental Policy Act
CSDR	Coastal Storm Damage Reduction	O&M	Operation and maintenance
DPR	Detailed Project Report	OMB	Office and Management and Budget
DQC	District Quality Control/Quality Assurance	OMRR&R	Operation, Maintenance, Repair, Replacement and Rehabilitation
DX	Directory of Expertise	OEO	Outside Eligible Organization
EA	Environmental Assessment	OSE	Other Social Effects
EC	Engineer Circular	PCX	Planning Center of Expertise
EIS	Environmental Impact Statement	PDT	Project Delivery Team
EO	Executive Order	PAC	Post Authorization Change
ER	Ecosystem Restoration	PMP	Project Management Plan
FDR	Flood Damage Reduction	PL	Public Law
FEMA	Federal Emergency Management Agency	QMP	Quality Management Plan
FRM	Flood Risk Management	QA	Quality Assurance
FSM	Feasibility Scoping Meeting	QC	Quality Control
GRR	General Reevaluation Report	RED	Regional Economic Development
Home District/MSD	The District or MSC responsible for the preparation of the decision document	RMC	Risk Management Center
HQUSACE	Headquarters, U.S. Army Corps of Engineers	RMO	Review Management Organization
IEPR	Independent External Peer Review	RTS	Regional Technical Specialist
ITR	Independent Technical Review	SAR	Safety Assurance Review
LRR	Limited Reevaluation Report	USACE	U.S. Army Corps of Engineers
MSC	Major Subordinate Command	WRDA	Water Resources Development Act

<u>Term</u>	<u>Definition</u>	<u>Term</u>	<u>Definition</u>