

DOCUMENTATION OF REVIEW FINDINGS

**SANTA CRUZ RIVER (PASEO DE LAS IGLESIAS),
PIMA COUNTY, ARIZONA**

ECOSYSTEM RESTORATION PROJECT

FINAL FEASIBILITY REPORT

AND

ENVIRONMENTAL IMPACT STATEMENT

(July 2005)

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A. BACKGROUND.

1. Location. The study area is located on the Paseo de las Iglesias reach of the Santa Cruz River and its tributaries, including the Old and New West Branch Tributaries of the Santa Cruz River, in Pima County, Arizona. The study area includes approximately 5,005 acres along a 7-mile reach of the river between West Congress on the north and Los Reales Road on the south within the city of Tucson, Arizona.

2. Study Authority. The Santa Cruz River, Paseo de las Iglesias, Pima County, Arizona, Feasibility Study was specifically authorized by section 212 of the Water Resources and Development Act of 1999, Pub. L. No. 106-53, 33 U.S.C. 2332. Section 2332(a) states:

The Secretary [of the Army] may undertake a program for the purpose of conducting projects to reduce flood control hazards and restore the natural functions and values of rivers throughout the United States.

Subsection (b)(1), 33 U.S.C. 2332(b)(1), provides authority to conduct specific studies “to identify appropriate flood damage reduction, conservation, and restoration measures.” Subsection (c), 33 U.S.C. 2332(c), states the cost-sharing requirement applicable to studies and project conducted pursuant to section 2332. Subsection (e), 33 U.S.C. 2332(e), identifies priority areas. It states in pertinent part:

In carrying out this section, the Secretary shall examine appropriate locations, including - - (1) Pima County, Arizona, at Paseo de las Iglesias and Rillito River;

3. Non-Federal Sponsor. The non-Federal sponsor for the feasibility study and plan implementation is Pima County, Arizona. Project administration is provided by the Pima County Regional Flood Control District.

4. Problem. The report identified two interrelated problems -- degradation and loss of native wetland-riparian ecosystems, and flood damage. Key problems within the study area, although interrelated, are severe ecosystem degradation, water supply, and infrequent flood damage. Originally comprising approximately 1% of the landscape historically, over 95% of this rare riparian habitat has been lost in Arizona. The primary purpose of this study is to investigate alternatives to stabilize, restore, and improve lost features of the wetland-riparian ecosystems that are essential to the long-term survival of functioning, self-sustaining ecosystems. The second purpose of the study is to investigate flood damage reduction (FDR) alternatives that complement the ecosystem restoration (ER) purpose of the project. Incidental to addressing the ecosystem loss and flood

damages the project is expected to benefit compatible-use recreation, groundwater recharge, and general water management.

5. Recommended Plan. The recommended plan, Alternative 3E, is characterized by irrigated plantings of mesquite and riparian shrub on terraces above the low flow channel and in the historic floodplain with smaller areas of emergent marsh and cottonwood-willow habitat located at water harvesting features scattered throughout the project. Alternative 3E would restore approximately 718 acres of mesquite bosque (forest), 356 acres of riparian shrub, 18 acres of cottonwood-willow, and 6 acres of emergent marsh. The recommended plan would restore a significant ecosystem resource along the Pacific Flyway for neo-tropical birds, reconnect wildlife corridors, restore wildlife habitat for species significant to Pima County, provide potential habitat for threatened and endangered species, and restore threatened plant communities of cottonwood/willow riparian forest, emergent marsh and mesquite bosque. The ecosystem function increase would be fourteen (14) times greater than the expected future without project degraded condition. The recommended plan also provides recreation benefits, incidental flood damage reduction benefits, and incidental groundwater recharge benefits.

The recommended plan is both the National Ecosystem Restoration (NER) plan and the Locally Preferred Plan (LPP). Secondary to the ecosystem restoration, the project also produces recreation benefits.

6. Project Costs. Based on October 2004 price levels, the estimated first cost for the project is \$92,100,000 with an estimated Federal cost of \$59,700,000 and an estimated non-Federal cost of \$32,400,000. The estimated total first cost includes recreational features compatible with ecosystem restoration. The projected first costs of the recreational features are \$1,140,000 and are cost shared at 50% Federal, 50% non-Federal. Annual OMRR&R is estimated to be \$771,000 with an associated non-Federal sponsor water cost of \$1,100,000 annually.

7. Project Economics. Ecosystem restoration projects such as the Santa Cruz (Paseo de las Iglesias), Pima County, Arizona project are not subject to the same NED and monetary evaluations as most Corps projects. To insure recommendation of an efficient plan, the alternative environmental restoration plans were evaluated using functional assessment, cost effectiveness and incremental analysis techniques. The cost of the recommended environmental restoration features would be justified by the restoration of about 454 average annual functional capacity units and by achieving ecosystem function increases in the most cost effective manner. The recommended plan would restore a significant but diminishing ecosystem resource along the Pacific Flyway for neo-tropical birds, reconnect wildlife corridors, restore wildlife habitat for species significant to Pima County, provide potential habitat for threatened and endangered species, and restore vulnerable native plant communities of cottonwood/willow riparian forest, emergent marsh, and mesquite bosque. The ecosystem function would increase about 14 times over the expected future condition with this plan. Recreation benefits would also be produced, in addition to the ecosystem restoration benefits. The average

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annual National Economic Development benefit of the proposed recreation components of the plan is approximately \$135,000, with a benefit to cost ration of 1.29 to 1.0.

8. Cost Apportionment. Restoration measures are cost shared at 65 percent Federal and 35 percent non-Federal, and recreation measures are cost shared at 50 percent Federal and 50 percent non-Federal. The total operations, maintenance, repair, rehabilitation and replacement costs (OMRR&R) for the project are the responsibility of the non-Federal sponsor.

B. ADMINISTRATION SUPPORT: The plan conforms to essential elements of the U.S. Water Resources Council's Economic and Environmental Principles for Water and Related Land Resources Implementation studies and complies with other administration and legislative policies and guidelines. Washington level review indicates that the recommended plan is environmentally justified, technically sound, cost effective, and socially acceptable. It is consistent with current administration policy.

C. HQUSACE REVIEW TEAM FINAL ASSESSMENT: The HQUSACE review team has determined that no major policy issues remain to be resolved. The District has adequately addressed all the Policy Compliance Review comments as well as all non-Federal requirements and environmental compliance concerns. The views and comments of other interested parties, including Federal, State, and local agencies have also been considered.

D. RESOLUTION OF COMMENTS FROM FRC

1. EXECUTIVE SUMMARY pages iii and iv -- Neither the acres of restored habitats nor the cost/economics information presented for Alternative 3E in this discussion match the information presented on pages V-29, V-32, V-40, and IX-1. It appears recreation and other non-restoration costs may mixed in. These costs should not be mixed as they increase the average annual cost per FCU and alter the cost sharing. Further, by adding features not considered in the basic evaluation of all alternatives shows the alternatives were not equally considered, e.g. monitoring and adaptive management are intricate to each alternative but it appears these costs were added only after an alternative was selected.

Required Action: Verify which information is correct and modify the report and information in the EIS to show the correct information.

DISTRICT RESPONSE: The cost figures presented in the Executive Summary match those in Chapter VI and those on Page X-1 with the exception that the numbers presented in Chapter X have been rounded to the nearest thousand. The Recommended Plan has been subjected to a more detailed cost analysis by virtue of completing an MCACES cost estimate. In doing so both the costs and acres have changed slightly from those presented in Chapter V. In the process of completing a more detailed design, the total acres restored changed by less than 3% while the variations in the acreages of each cover type are in all cases favorable to the more valuable riparian forests covers. Nearly all of the

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increase in cost can be traced to increased real estate costs resulting from the completion of a gross appraisal.

HQUSACE Assessment: **RESOLVED. The explanation is satisfactory.**

Appendix I, Real Estate:

2. *Executive Summary, section 3, second paragraph -- The cite to ER 405-1-12-**8b** seems to be incorrect. Should it have been **9b**?*

Required Action: Verify the citation and correct as needed.

DISTRICT RESPONSE: Citation in subject paragraph currently cites "ER 405-1-12".

ACTION TAKEN: None, unless "9b" needs to be added.

DISCUSSION: None.

FURTHER REQUIRED ACTION: None.

HQUSACE Assessment: **RESOLVED.**

Draft Real Estate Plan:

3. *Section 12, first sentence, is it still true that there is no information regarding the necessity for facility relocations?*

Required Action: Verify the statement and correct as needed.

DISTRICT RESPONSE: A review of utility maps provided by the non-Federal sponsor did not indicate any conflicts with known utilities.

ACTION TAKEN: First sentence of subject paragraph has been revised to read:
"Preliminary review of existing utility maps did not reveal significant conflicts which would result in utility relocations in the project area."

DISCUSSION: None

FURTHER REQUIRED ACTION: None.

HQUSACE Assessment: **RESOLVED.**

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4. *Section 14, first paragraph -- The cite to ER 405-1-12 Chapter 12 Para 12-9c, should it have been to 12-9e?*

Required Action: Verify the citation and correct as needed.

DISTRICT RESPONSE: Concur. Citation is incorrect.

ACTION TAKEN: Citation has been corrected to "ER 405-1-12 Chapter 12 Para. 12-9e".

DISCUSSION: None.

FURTHER REQUIRED ACTION: None.

HQUSACE Assessment: **RESOLVED.**

5. *Section 14, second paragraph (i.e., the draft easement) -- in addition to "construct, operate, and maintain" I believe you should add reference to "repair, rehabilitate, replace." Also, the phrase "works and measures for channel improvement and environmental restoration" should be supplemented by including a list of relevant activities (meant to be illustrative but not exhaustive), similar to the channel improvement easement template found in 405-1-12, paragraph 8. Also, after the references to the statutes and Chief of Engineer's Report, a phrase such as "copies of which documents may be found at the office of the NFS located at...." should follow.*

Required Action: Correct these phrases as suggested.

DISTRICT RESPONSE: Concur.

ACTION TAKEN: Corrections and additions have been made to Section 14, paragraph 2 (draft easement) as noted in the comment.

DISCUSSION: None.

FURTHER REQUIRED ACTION: None.

HQUSACE Assessment: **RESOLVED.**

6. *It may be sufficient to have a permanent easement for City-owned lands. However, because there are 512 acres (out of 1,223 acres) involved, the REP should contain a description of what types of project activities and/or facilities are anticipated for these City-owned parcels before a determination as to sufficiency for project purposes of the non-standard estate can be made.*

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Required Action: Add a description of what types of project activities and/or facilities are anticipated for the City-owned parcels.

DISTRICT RESPONSE: The City of Tucson has reviewed and provided comments on the Real Estate Plan and has not indicated that there are future development plans for their parcels within the project area. The majority of the City owned land is located within the regulated floodplains or the regulatory floodway and are not currently developable due to erosion hazard setback requirements.

ACTION TAKEN: A statement has been added to Section 6 stating that there are no known future development plans or facilities for the State and City owned lands.

DISCUSSION: The action taken is sufficient.

FURTHER REQUIRED ACTION: None.

HQUSACE Assessment: **RESOLVED.**

7. As to the recommendation for a permanent easement for State-owned lands made in the fourth paragraph, I would like an Attorney SPL (LA) or SPL (Phoenix) to give their opinion that this is sufficient, particularly as to whether it will "run with the land" so as to bind future fee owners in Arizona. This opinion is required before HQ will approve the REP's recommendation relative to State-owned land.

Required Action: Provide an Attorney's opinion regarding the sufficiency of the proposed estate. This opinion should include a discussion as to whether "run with the land" will adequately bind future fee owners in Arizona.

DISTRICT RESPONSE: Proposed estate will be reviewed by District Counsel and coordinated with HQUSACE.

ACTION TAKEN: Language has been added to the subject easement such that the easement runs with the land, per discussions between District and HQUSACE Office of Counsel. In the event that a permanent easement estate is not acceptable, the State-owned land can be removed from the project area. The non-Federal sponsor is currently in the process of purchasing the subject State-owned land for cultural resource preservation and restoration purposes.

DISCUSSION: Numerous sidebar discussions were held to determine the best approach to resolving this issue. An additional concern was the fact that the State could only provide an easement for a 50-year period, which is insufficient for this project. After further investigation and discussion, it was decided that the required State lands be acquired in fee simple title. A legal citation of the State's authority to convey lands for conservation purposes was provided to HQ. In addition, minor edits of the Real Estate Plan were suggested by HQ, and accepted by the District.

FURTHER REQUIRED ACTION: None.

HQUSACE Assessment: **RESOLVED**.

Chapter VII. Section G. Non-Federal Requirements:

8. *Line 5 -- The \$1,906,221 figure for maintenance and operation costs, tenth line from top on , does not agree with the \$1,869,961 in Table 6.2 on page VI-6.*

Required Action: Verify the correct figure and modify as needed.

DISTRICT RESPONSE: Annual Operation and Maintenance costs for the recreation plan were incorrectly included in the figure listed in Chapter VII. Section G.

ACTION TAKEN: The O&M costs listed in Chapter VII have been revised to be consistent with those in Chapter VI.

HQUSACE Assessment: **RESOLVED**

9. *Section a. -- Replace "separable" in the first line and "separate" in the second line with "total" so that in each case it reads: "total project costs allocated to . . . "*

Required Action: Change the language as suggested in the comment.

DISTRICT RESPONSE: Concur

ACTION TAKEN: The suggested revisions have been made.

HQUSACE Assessment: **RESOLVED**

10. *Section a.(5) -- Replace "separable" in the second and third lines with "total".*

Required Action: Change the language as suggested in the comment.

DISTRICT RESPONSE: Concur

ACTION TAKEN: The suggested revisions have been made.

HQUSACE Assessment: **RESOLVED**

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11. Section b. -- Replace the present language with the following:

b. Assume responsibility for operating, maintaining, replacing, repairing, and rehabilitating (OMRR&R) the project or completed functional portions of the project, including mitigation features and the provision of water, at no cost to the Government, in a manner compatible with the project's authorized purpose and in accordance with applicable Federal and State laws and specific directions prescribed by the Government in the OMRR&R manual and any subsequent amendments thereto.

Required Action: Change the language as suggested in the comment.

DISTRICT RESPONSE: Concur

ACTION TAKEN: The suggested revision has been made.

HQUSACE Assessment: **RESOLVED**

12. Section l. -- Replace the present language with the following:

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

Required Action: Change the language as suggested in the comment.

DISTRICT RESPONSE: Concur

ACTION TAKEN: The suggested revision has been made.

HQUSACE Assessment: **RESOLVED**

13. Section m., first line, replace "mitigation and" with "archeological" so that it reads "archeological data recovery activities".

Required Action: Change the language as suggested in the comment.

DISTRICT RESPONSE: Concur

ACTION TAKEN: Suggested revision has been made.

HQUSACE Assessment: **RESOLVED**

14. EDITORIALS:

Page VII-6 -- G. Non-Federal Requirements:

Section g., fourth line -- place periods after the letters U.S.C. in the citation 42 U.S.C. 9601-9675.

Section K, second line, capitalize the "L" in Public Law 91-646.

Appendix I, Draft Real Estate Plan:

Section 5, 7th paragraph -- change "latter" to "later."

*Section 9, paragraph a -- change "**pubic** use zoning" to "**public** use zoning."*

Section 10 -- eliminate the phrase "and/or"-- either the maps are attached to the REP and the main report, or just one of the documents.

*Section 14, second paragraph (i.e., the draft easement) -- the phrase "Paseo de las **Inglesias**" should read "Paseo de las **Iglesias**".*

DISTRICT RESPONSE: Concur.

ACTION TAKEN: Editorial changes have been made as noted above.

HQUSACE Assessment: **RESOLVED**

E. RESOLUTION OF COMMENTS FROM AFB

GENERAL

1. The quality of figures, exhibits, maps, etc. must be reviewed for quality. Several foldouts have the legend cut-off. Street names are hard to read, several figures have labels upside down relative to others on the same axis.

District Response: Concur.

Discussion: Noted.

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Required Action: The District will review the quality of each figure, exhibit, and map to ensure that the required information (e.g., legends, street names) is present and legible in the draft report.

Action Taken: All graphics have been reviewed and revised as necessary to ensure that the required information (e.g., legends, street names) is present and legible in the draft report.

HQUSACE Assessment: **RESOLVED**

2. *Both the Feasibility Report (FR) and EIS go for pages without section numbers. This makes it difficult to reference anything in the documents and will make the required Index in the EIS nearly impossible.*

District Response: Concur.

Discussion: Noted.

Required Action: The District will add appropriate identifiers and numerical section designations to the feasibility report and DEIS for continuity and ease of referencing.

Action Taken: An additional level of section designations has been added to the Draft Feasibility Report and EIS.

HQUSACE Assessment: **RESOLVED**

3. There are several references to F3, F4, etc Reports throughout the documents. These are not standard Corps report designations and they are not defined, as such, they should be defined in terms anyone can find in the ERs, ECs, etc.

District Response: Concur. The F3, F4, etc. references are feasibility phase milestone designations used per CESP guidelines. A system (i.e., F1 – F9 milestones) has been developed SPD to designate milestones such as Study Initiation (F1), Initial Public Scoping/Workshop (F2), Feasibility Scoping Meeting (F3), etc.

Required Action: The “F” milestone references will be deleted and, where appropriate, replaced with the appropriate descriptive text.

Action Taken: The “F” milestone references have been deleted from Draft Feasibility Report on the first page of the Executive Summary; Chapter II; and from the Draft EIS.

HQUSACE Assessment: **RESOLVED**

4. *Both the Feasibility Report and EIS have several pages and sections about flood damage. Although we are authorized to study flood damage reduction (FDR), it is not required by every study. FDR is not a stated purpose of this project, so consider saying concisely that a dual purpose project was considered and eliminated. Add no more than one short paragraph to summarize the reasons and a reference to a Corps report that documents the decision is sufficient.*

District Response: Concur. Flood damage reduction (FDR) was initially identified as a project purpose at the request of the non-Federal sponsor and is identified as an interest in the pertinent House Resolution 2425. For those reasons, the ITR team felt the report should clearly demonstrate a thorough consideration of potential federal interest in FDR. ITR comments suggested that the Feasibility Report contain a detailed discussion of the screening process involved in evaluating preliminary alternatives for flood control. These discussions showed the preliminary alternatives could not be justified. Such detail may be considered superfluous, however since the analysis was already conducted for the without project condition, some explanation is warranted to explain why flood damage reduction was not carried forward.

Discussion: Noted. Will be taken into consideration in future reporting.

Required Action: None.

Action Taken: None

HQUSACE Assessment: **RESOLVED**

5. *The FR and EIS must both be clear that the Corps is preparing these documents consistent with requirements for compliance with both Clean Water Act requirements for Section 401 State Water Quality Certification and Section 404(r) Exemption. See C-6 of ER 1105-2-100.*

District Response: Concur. The Section 404(b)(1) Water Quality Compliance analysis and 404(r) exemption had not been prepared at the time the AFB Report and DEIS were transmitted for review. A placeholder was included in the DEIS under Appendix 14.3. The Section 404(b)(1) analysis has since been completed by the District and will be included in Appendix 14.3 of the DEIS.

Discussion: Noted. District indicates that both local sponsor and state prefer the Section 404(r) exemption process. Timeliness of report submittal to Congress is of concern. District will pursue Section 404(r). As option, Section 401 certification or waiver may be pursued.

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Required Action: Specific references to these documents will be added to the Draft Feasibility Report and DEIS to be consistent with the requirements of both the Clean Water Act and State Water Quality Certification.

Action Taken: Discussion of these items has been added to Chapter VII, Section F of the Draft Feasibility Report and Section 14.3 of the DEIS.

HQUSACE Assessment: **PARTIALLY RESOLVED** – That the project meets all the requirements for compliance with Clean Water Act requirements for either a Section 401 State Water Quality Certification or Section 404(r) Exemption and that the district intends to pursue 404(r) exemption should be stated in a more prominent location than the third appendix of the EIS. Add a note with this information to the bottom of the “Relationship to Environmental Requirements” table on page 14 of the EIS SUMMARY.

DISTRICT RESPONSE: Concur. Section 401 State Water Quality concurrence has been received from the Arizona Department of Environmental Quality (ADEQ). Pursuit of a Section 404(r) Exemption by USACE and ADEQ concurrence will be clearly stated in the FR and FIES.

ACTION TAKEN: Section VII. F, Environmental Requirements of the FR now contains a clear statement concerning Section 404(r) and Section 401 State Water Quality Certification applicability and requirements. A note has been added to Environmental Requirements Table in the FEIS Summary and to the more detailed compliance summary table on Page 129 at the end of Chapter 7.

HQ ASSESSMENT: **PARTIALLY RESOLVED** – Section 404(r) of the CWA does not exempt the Corps or any other Federal agency from compliance with Section 404(b)(1) of the Clean Water Act. Regardless of the fact that the Corps of Engineers does not issue itself permits under the CWA. Section 404(r), with the approval of the Congress, exempts the Corps from obtaining the state certification required by Section 401 of the CWA. With or without the Section 401 certification the Corps must comply with Section 404(b)(1). The Executive Summary correctly states these requirements on page v. However, the 404(r) exemption is misstated as an exemption from 404 in VII.F. on page VII-3, in the footnotes of the environmental compliances table on page 15 of the EIS, and in the footnote on EIS page 129.

ACTION REQUIRED: The district must correct all references that Section 404(r) of the CWA exempts the project from Section 404 compliance. The statement must indicate “Section 404(r) exempts the Corps from obtaining the state certification required by Section 401 of the CWA”. It is also strongly suggested that the recommendation for the 404(r) exemption be added to the DE’s Recommendations on page X-1.

DISTRICT RESPONSE: Concur.

ACTION TAKEN: All references that Section 404(r) of the CWA exempts the project from Section 404 compliance have been corrected as noted in the action required and ER

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1105-2-100, Appendix C, Section C-6.g(1)(2). These corrections are located in Section VII. F on page VII-3 of the FR, the footnotes of the environmental compliance table on page 15 of the EIS, and in the footnote on page 129 of the EIS. The recommendation for the 404(r) exemption has been added to the DE's Recommendations on page X-1.

HQUSACE Assessment: **RESOLVED**

REAL ESTATE

6. There is no real estate plan (REP) included in this package. Although this is an AFB, and an REP is not required by the ER's, due to the past SPD administrative practice of treating these documents as draft Feasibility Reports, the District should prepare a real estate plan for HQ review. This plan should be prepared prior to any reports (such as the F5 document) being finalized for public review.

District Response: Concur. A draft/preliminary REP was provided in Appendix I of the AFB Feasibility Report (under separate cover via Adobe Acrobat file). The non-Federal sponsor has commenced with preparation of the gross appraisal, however, until a final Recommended Plan is chosen that the sponsor supports, the REP cannot be completed. The non-Federal sponsor will prepare the REP, with assistance of the Arizona Real Estate Office, prior to the draft report.

Discussion: Details based on the recommended plan will be included in the real estate plan to be included in the draft report.

Required Action: The REP will be submitted to the independent technical review team for quality control review, and subsequently to the technical review to HQUSACE for review concurrent with public review of the draft report/EIS.

Action Taken: The REP (see Appendix I of the Draft Feasibility Report) has been revised by the District Real Estate Division in accordance with the requirements of ER-405-1-12, Chapter 12. REP was submitted to ITR for back check and has been accepted.

HQUSACE Assessment: This comment, *per se*, is **RESOLVED**. However, since a preliminary REP was not included in the AFB review package provided for HQ review this is the first time CECC-R has reviewed the REP. This results in new comments based on the new submission.

7. The real estate plan must address the issue of the cost of water, and how this will impact the lands to be acquired.

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District Response: Concur. The cost of water is highly variable depending on the source, water rights, allocations, local planning initiatives, etc. A cost of water of \$105 per acre-foot was estimated for plan formulation, cost estimation, and cost effectiveness/incremental cost analysis purposes. It is difficult at this juncture for the sponsor to determine an exact source and cost of water at the time of construction due to variable water use, future allocations, and other potential sources in the future. The impact on lands acquired for the project would be separable from water costs and any delivery system the sponsor needs to construct to provide water for restoration. Any such delivery system would fall within existing sponsor owned lands or public rights-of-way.

Discussion: Noted. The costs of water delivery and associated costs were discussed and discussion will be included in the draft report.

Required Action: A discussion of variable water costs and impacts, if any, on project lands will be added to the REP.

Action Taken: A discussion of water source(s) has been added to Section 5 of the REP. Reclaim water is the identified source per the non-Federal sponsor.

HQUSACE Assessment: **RESOLVED**

8. *The real estate plan must incorporate relevant material from the gross appraisal.*

District Response: Concur. Gross appraisal, being prepared by the non-Federal sponsor, will be completed on the final Recommended Plan (as identified in the AFB PGM) prior to the draft report.

Discussion: Noted.

Required Action: The REP will incorporate all relevant material and findings from the gross appraisal.

Action Taken: Gross appraisal has been completed, reviewed and approved by the District Real Estate Division. All relevant findings and estimates from appraisal have been incorporated into Sections 2, 5, 6, and 16 of the REP.

HQUSACE Assessment: **RESOLVED**

9. *There is a great deal of non-public land ownership in the area (see page II-8). Relocation aspects must be part of the real estate plan.*

District Response: Concur. Table 2.2 on Page 11-8 of the feasibility report reflects land use for the entire study area (5,005) acres. The project area (or footprint) was refined down from the study area acreage to avoid existing residential, commercial, and

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industrial developments (including those under development). This was done, in part, to minimize the need for relocations.

Discussion: Noted.

Required Action: Any required relocations will be identified and included in the final REP. If no relocations are required, this will be explicitly stated in the REP.

Action Taken: Discussion of relocations is contained Section 12 of the REP. At this time, no structures, utilities, or bridge relocations have been identified.

HQUSACE Assessment: **RESOLVED**

10. There are numerous landfills and/or HTRW sites in the area (see page V-2). Potential HTRW impacts on land acquisition, if any, must be addressed in the real estate plan.

District Response: Concur. There are seven documented landfills within the study area boundaries. Specific information on each landfill can be found in Appendix G, Phase I Site Assessment, of this report. Site reconnaissance did not reveal evidence of any Reportable Environmental Conditions (REC's). Due to voids, decomposition of materials and lack of compaction, these existing landfills can pose engineering and/or structural risks to restoration efforts. Throughout the plan formulation process, every effort has been made to avoid these areas.

Discussion: Noted.

Required Action: Potential HTRW impacts to land acquisition, if any, will be documented in the REP. If no impacts are identified, this will be explicitly stated in the REP.

Action Taken: A discussion of HTRW assessments has been added Section 19 of the REP, including potential impacts.

HQUSACE Assessment: **RESOLVED** – HTRW is addressed in the REP, Feasibility Report, and the EIS.

PLAN FORMULATION

11. The basic purpose of this project should be stated early in the FR. Chapter II would be a good place.

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District Response: Concur. The basic purpose of this project is Ecosystem Restoration. Flood Damage Reduction was eliminated as project purpose during plan formulation. The Executive Summary and Chapter II identify the study purpose as being primarily focused on investigation of ecosystem restoration as a solution to environmental degradation and related problems. Flood damage reduction is clearly identified as not being a primary project purpose.

Discussion: Study purposes in comparison to project purposes were discussed. It was determined that study purposes will be clearly described in Chapter 2.

Required Action: Study purposes will be retained in Chapter 2. The project purposes will be reflected in Chapter 5.

Action Taken: All references to “purpose” in Chapter 5 have been reviewed to ensure that they are identified appropriately as either project purpose or study purpose.

HQUSACE Assessment: **RESOLVED**

12. Table 2.2 – Break out how much of this area is Some kind of natural cover. Define “ROW”.

District Response: Concur. The intent of Table 2.2 is to identify land use acreages within the 5,005-acre study area. Very little or no identifiable “natural cover” currently exists within the study area due to impacts such as urbanization, groundwater overdraft, erosion, and invasive species. Distribution of existing plant communities and cover types are discussed in detail Chapter IV. A natural cover designation simply does not exist.

Discussion: Noted.

Required Action: “ROW” represents rights-of-way and will be replaced with “rights-of-way” in Table 2.2.

Action Taken: Table 2.2 has been revised as described in the Required Action.

HQUSACE Assessment: **RESOLVED**

13. Chapter III – There are several other Corps projects being considered in the Pima County area. These must also be described along with the current status of each. These other Corps projects may affect or be affected by this project. The cumulative effects of these projects must be considered and discussed.

District Response: Concur. There are three other ecosystem restoration feasibility studies being conducted within the Tucson area, all in various stages of completion. While the cumulative ecosystem effects can reasonably be forecast as positive based on

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restoration of connectivity along the Santa Cruz River corridor and tributaries, the cumulative effects of the associated resource allocations will be qualitatively described.

Discussion: Noted.

Required Action: A discussion of other Corps studies/project in Pima County will be added to Chapter III of the draft report.

Action Taken: Section B of Chapter III has been revised and the discussion of other Corps studies/projects has been expanded.

HQUSACE Assessment: **RESOLVED**

14. Explain why both HEP and HGM are used. It is not apparent that the HEP information is used anywhere else in the FR or EIS. The FR explains HEP is a modified version; similar detail should be given to explain the HGM is also a modified version since the notebook is based on limited reference sites and a notebook that is not validated or verified.

District Response: Concur. The HEP analysis was intended to provide reviewers a basis for directly comparing the two habitat analysis methodologies. For that reason, HEP was not used to assess all alternatives for the study (simply the baseline and recommended plan's impacts from a traditional habitat perspective). Detailed information on the application of HEP and HGM is provided in Appendix D of the report. Although there are crosswalks between HEP and HGM, it is not the District's intention to compare the results of the HEP and HGM outputs for all alternatives evaluated. HGM is the primary habitat evaluation tool used for plan formulation and alternative development.

Discussion: Noted.

Required Action: The report will be revised to delete all references to the HEP analysis while retaining this information in Appendix D for reference only.

Action Taken: All discussion of the HEP analysis has been deleted from the Draft Feasibility Report. The HEP analysis remains in the Habitat Appendix for reference purposes only.

HQUSACE Assessment: **RESOLVED.**

15. Table 4.1 – “BLP Code” is never defined.

District Response: Concur. BLP refers to the vegetation classification system developed by Brown, Lowe, and Pase, which is the regional standard and was used in the analysis that is summarized in Table 4.1.

Discussion: Noted.

Required Action: The BLP code will be defined in Table 4.1 or in the accompanying text.

Action Taken: Table 4.1 was part of the discussion of the HEP analysis and was deleted in response to Comment No. 14.

HQUSACE Assessment: **RESOLVED** –“BLP” is now defined at its second use in 5.5.1.

16. FIGURE 4.7 – Define “SWCA”. Unless similar maps will be produced that show Plant Communities in future or historic conditions that include Cottonwood-Willow it should be dropped from the legend or parenthetically add “none present”. Map symbols in the legend should match exactly what is used on the map, e.g., the Palloverde-cactus symbol is rotated 90° from what is used in the map (caught this looking for Cottonwood-Willow).

District Response: SWCA refers to a USACE subcontractor, SWCA, Inc., that prepared this analysis and figure. With regard to the inclusion of Cottonwood-Willow in the legend, the reviewer’s attention was directed to the southeast corner of the study area where two remnants of this cover type remained at the time of the analysis. The legend is intended for the reader to use while viewing the map from with North facing up.

Discussion: Noted.

Required Action: Reference to SWCA will be deleted from Figure 4.7 and the legend will be appropriately revised.

Action Taken: Figure 4.7 was part of the discussion of the mHEP analysis and was deleted along with that discussion in response to comment 14.

HQUSACE Assessment: **PARTIALLY RESOLVED.** The District response refers to remnants of Cottonwood-Willow in the southeast corner of the study area. Magnification of this area from the CD shows the referenced areas covering at least 10 acres, however Table 4.2 in the Feasibility Report and Tables 6 & 9 of Appendix D indicate there is no Cottonwood-Willow habitat. These same reports indicate the Cottonwood-Willow habitat as very important components of the riparian corridor referring to it as “one of the most rare and most threatened forest types in North America”. Table 20 of Appendix D also shows no Cottonwood-Willow habitat in the baseline or future No Action. Without running a detailed analysis, alternative effectiveness in terms of net ecosystem improvement and costs of preserving or restoring the 10 acres of Cottonwood-Willow habitat shown on the baseline map cannot be determined. Clearly some Cottonwood-

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Willow habitat exists, the District needs to determine the correct the acreage of Cottonwood-Willow habitat and make the figure consistent throughout the report and the EIS. If the correct acreage changes the outcome of the HEP analyses or the project costs these changes should also be made.

DISTRICT RESPONSE: The Cottonwood-Willow referenced in the comment does not exist. In the past, some cottonwood-willow habitat was artificially supported by washout water from the sand and gravel operation. This Cottonwood-Willow habitat no longer exists and the correct acreage is zero (0). No field sampling of this habitat type in the study area was possible, therefore there is not affect the outcome of the mHGM analysis for baseline or future without-project conditions.

ACTION TAKEN: Baseline maps have been corrected to reflect the absence of cottonwood-willow habitat. In addition, the following text has been added to the discussion of the Cottonwood-Willow Forest cover type on page IV-21:

“Two small stands of Cottonwood-Willow, supported by water from gravel washing operations, remained at the start of this investigation however; the cessation of gravel mining eliminated the water supply and the trees have since died.”

HQUSACE Assessment: **RESOLVED**.

17. FIGURE 4.8 – “Buffer” is a stretch of the word, since these are the developed areas on Figure 4.7.

District Response: Concur. Buffer should not have been included as a cover type on Figure 4.8. Buffer was originally a function under the HGM model. However, after field data collection for baseline conditions, the lack of any substantial buffer or likelihood of developing a buffer under alternatives, the decision was made to drop the function and incorporate a single variable into the habitat functions to capture urban encroachment or distance to human interference.

Discussion: Noted.

Required Action: “Buffer” will be deleted.

Action Taken: Depiction of “Buffer” has been deleted from what is now Figure 4.7, Distribution of Cover Types.

HQUSACE Assessment: **RESOLVED**

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18. Table 4.3 & 4.4 – There are more cover types in addition to those in Fig 4.7 and 4.8. Try producing a single map showing all cover types and use consistent names. Maybe a second map showing land uses.

District Response: Concur. Figure 4.7 represents a distribution of plant communities based on the modified Habitat Evaluation Procedure (mHEP) analysis. Figure 4.8 represents a distribution of cover types used in the HGM analysis. The same holds true for Tables 4.3 and 4.4 respectively.

Discussion: Noted.

Required Action: The mHEP analysis section along with the related tables and figures will be removed from the report. The mHEP will remain in the Habitat Appendix as a reference.

Action Taken: Per the action taken for Comment No. 14, the mHEP discussion, figures and tables have been removed from draft report.

HQUSACE Assessment: **RESOLVED**

19. Page IV-33. There is no lead in to the sudden discussion of NEPA, FWCA, and ESA. Describe the status of compliance with each.

District Response: Concur. Intent of this section is to provide information on “Sensitive Areas” that exist or must be complied with within the study area for the Base Year Condition.

Discussion: Noted.

Required Action: The section will be revised to include an appropriate heading and lead in information to set up discussion of NEPA, FWCA, and ESA. The status of the NEPA, USFWS CAR, and ESA compliance are more appropriately reported in Chapters V or VI and will be added accordingly.

Action Taken: The section has been renamed “4. NEPA Compliance/Issues & Concerns” and revised for greater clarity on Page IV-30.

HQUSACE Assessment: **RESOLVED**

20. Page IV-36 – Several military facilities including an Air Force Base, a major bombing, and gunnery range are near this project. A discussion of the potential for groundwater contamination by these facilities must be included.

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District Response: Concur. Davis-Monthan Air Force Base is located 7 to 10 miles east-southeast of the study area. The Phase I Site Assessment (refer to Appendix G of the report) did not report any finding of documented or potential groundwater contamination from any military facilities in the Tucson area.

Discussion: Noted.

Required Action: A statement identifying the location of military facilities relative to the study area will be added to this section along with an explicit statement that no evidence was found of groundwater contamination in the study area from military facilities in Tucson.

Action Taken: The location of the Davis Monthan Air Force Base relative to the study area was noted Section 6, Geotechnical Phase I Environmental Assessment (Page IV-33) along with the following statement “No evidence was found suggesting the presence of groundwater contamination from the base that would pose a problem in the study area.”

HQUSACE Assessment: **RESOLVED**

21. FIGURES 4.11, 4.12, 4.13 & 4.14 – According to the EIS project purpose statement; this is an Ecosystem Restoration Project. Explain the need for floodplain maps.

District Response: Concur. Figures 4.11 – 4.14 represent the baseline conditions floodplains and were included under Chapter IV to depict existing conditions with their associated potential problems and opportunities. As previously discussed, the FDR was included at the non-Federal sponsor’s request in accordance with HR 2425. While, no Federal interest was justified for FDR, the ITR team felt it important to “tell the story” of how FDR was eliminated. In addition, ecosystem restoration has the potential to produce either positive or negative effects on floodplain boundaries. Comparison of the future with and without project floodplains is an important part of the evaluation of restoration plans (i.e., with project floodplain and conveyance).

Discussion: Noted.

Required Action: These maps will be deleted from the feasibility report and appear in the Hydraulics Appendix only. The floodplain discussion will remain in the feasibility report and the reader will be directed to the Hydraulics Appendix for additional information.

Action Taken: The subject maps have been removed from the Draft Feasibility Report and remain in the Hydraulics Appendix for reference.

HQUSACE Assessment: **RESOLVED**

22. *Page IV-52 - Without Project Conditions (Water Availability)*

Water availability is one of the key drivers for past degradation and an impetus for this project, yet this parameter is not specified (i.e. how much and what type) in either the discussion of Future Without-Project Conditions, or later in the Planning Constraints (V-2)

Understanding the availability of water and future demands for the water (surface and ground) are key to plan formulation and selection, as well as to determining the viability of the restoration through time - the extent to which it will be naturally sustaining. Details on the present and future availability of water in the basin need to be specified, and assumptions need to be presented in order to document the completeness and effectiveness of the alternatives, and to support plan selection. There appears to be some information presented in various places throughout (there is some discussion of the base-year, pp IV-40-41, although much of this seems aimed more at flood than restoration; there is a discussion of 2000 acre-feet source cited on V-48) but the whole water budget situation needs a concise and comprehensible presentation in the report. (The five water management opportunities listed on IV-58 might present a good framework for presenting this information.) Needs to include institutional factors too - what agencies and entities have interest in the water, what are their plans, etc. so Corps plans can be seen in the broader systems context.

District Response: Concur. A Groundwater and Water Budget analysis was prepared and is contained in Appendix C and Chapter IV of the report. However, this does not represent a comprehensive institutional framework for the greater Tucson area and Pima County. Numerous mitigating factors complicate the issue, including but not limited to competing interests, adjudication requirements and allocations, water rights, groundwater recharge credits, statutory requirements, development pressures, and environmental quality regulations. A commitment of water resources will be made on the part of the non-Federal sponsor for the draft report.

Discussion: A letter of local support for the recommended plan will be needed as a part of the draft report. The letter should include language that commits the necessary items of local cooperation as long as the project remains authorized. The community supports ecosystem restoration.

Required Action: A discussion of present and future water availability and commitment of the local sponsor will be included in the draft report.

Action Taken: Revisions to clarify issues surrounding water availability have been made to Chapter V, Section B – Planning Constraints; Chapter V, Section J - Analysis of the First Array; and Chapter V, Section K - Selection of a Recommended Plan.

HQUSACE Assessment: **PARTIALLY RESOLVED** -- The District has better addressed the existing water budget, but neglected the issue of future demands upon water availability. Anything that could affect either the amount of base flow, or price of

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supplements, or both, could in turn affect alternative selection. The District needs to address who else might be further depleting or competing for each of the available sources of water. The District must insure they have a commitment from the sponsor for additional water supplements. Further, the District must address how the sponsor will assure the minimum base will not be reduced to such an extent that the project will fail.

DISTRICT RESPONSE: The non-Federal sponsor and the City of Tucson have developed an Institutional Framework that will be included in the Tres Rios del Norte Draft Feasibility Study Report. This framework contains detailed information on available sources of water and future demands as they relate to restoration projects. The non-Federal sponsor will provide a revised Letter of Support that outlines available water sources and contains a commitment of the supplemental water required for project implementation, operation, and maintenance.

ACTION TAKEN: The non-Federal sponsor has provided a revised Letter of Support that contains a commitment for required water supplements and discusses various water sources considered.

HQUSACE Assessment: PARTIALLY RESOLVED – The promise of the Institutional Framework appearing in a future draft feasibility report for another project is not sufficient. As the earlier comments have clearly stated how water will be distributed, depleted, etc., in the future has significant bearing on the decisions related to this project and this must be clearly stated and soundly supported in all future scenarios. The Framework probably provides this firm future plan. As the foundation of assumptions regarding the water constraint, basic terms of the Framework MUST be summarized in the feasibility report. Further, the EIS MUST include a full citation of the Institutional Framework to incorporate it by reference along with a reference to the summary in the Santa Cruz Feasibility Report.

ACTION REQUIRED: A summary of the Institutional Framework must be included in the feasibility report to support the future conditions scenarios. A full citation of the Institutional Framework must be included in the EIS to incorporate it by reference. The EIS should also include a reference to the summary in the Feasibility Report.

DISTRICT RESPONSE: The District's reference the Institutional Framework developed for the Tres Rios del Norte (TRDN) Feasibility Study was not appropriate. The subject Framework was developed specifically for the TRDN study due to fact that there are three (3) sponsors, each of whom possesses specific legal rights and "wheeling" agreements to treated effluent, groundwater, reclaimed water, etc. that may be used for TRDN. The Framework is not a comprehensive inventory of available water sources and future competing interests; it is a legal framework developed by the three sponsor's attorneys defining how water rights can be transferred and is not applicable to Paseo de las Iglesias. The Framework also is not a foundation of the assumptions regarding the water constraint identified in Paseo de las Iglesias, therefore including a summary of the basic terms of the framework and a full citation of the Institutional Framework in the EIS

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would be misleading and improper. Discussion of the available water sources are contained in the FR, EIS, and Technical Appendix C (Groundwater and Water Budget).

ACTION TAKEN: The non-Federal sponsor has identified potential water sources for the project and has made a commitment to provide the necessary water. The sponsor has numerous options at its disposal and it is likely that a combination of these sources will be used to provide the required water. A single water source should not be identified and additional water sources not currently identified may become available in the future. No further action is proposed at this time.

HQUSACE Assessment: RESOLVED

23. Page IV-55, Economics -- According to the EIS project purpose statement; this is an Ecosystem Restoration Project. This discussion and any others like it should be oriented towards the Ecosystem Restoration Project, e.g., any increase in recreation, tourism, property values, employment, etc.

District Response: The EIS project purpose statement accurately describes the project that resulted from the feasibility investigation. That result was not a foregone conclusion prior to the conduct of the study. Page IV-52 through IV-58 is a synopsis of the future without-project conditions. While ecosystem restoration is the primary focus of the study, other purposes such as flood damage reduction were not eliminated until the associated opportunities had been analyzed. Presenting all information regarding the without project conditions as if restoration was the only consideration would create an erroneous impression regarding the conduct of the investigation.

Discussion: Reference response to Comment No. 4.

Required Action: All parts of the report will be reviewed to ensure that all references to study purposes and project purposes are consistently used throughout both the feasibility report and EIS.

Action Taken: *The discussion of future without project conditions was reviewed and found appropriate to the study purpose. Revising the section to focus on project purpose was not considered advisable (see Comment No. 4).*

HQUSACE Assessment: PARTIALLY RESOLVED – The project purpose statement in the Feasibility Report must be the same as the project purpose statement in the EIS. Change the project purpose statement in one or the other to make them consistent.

DISTRICT RESPONSE: Concur. The project purpose is ecosystem restoration.

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ACTION TAKEN: The Feasibility Report and Environmental Impact Statement have been reviewed and edited, if necessary, to ensure project purpose parallelism throughout the FR, FEIS, and technical appendices. The Feasibility Report contains no statements indicating any project purpose except ecosystem restoration and so is consistent with the FEIS.

HQUSACE Assessment: RESOLVED

24. Page V-1, Specific Planning Objective – Where practicable, measurable objectives should be stated. Quantifiable objectives can be used to eliminate alternatives. Statements as broad as “Increase acreage of functional riparian and floodplain habitat within the study area” are project purpose statements not objectives.

Also, note that inclusion of recreation and FDR implies they are project purposes and not incidental. As purposes, they may be subject to different cost sharing. Not to reduce existing conditions is a valid constraint. Consider removing recreation bullet and first seven words of fourth bullet. Integration of local desires is a scoping goal not a project objective. Make changes everywhere objectives are described.

District Response: Planning guidance does not recommend inclusion of targets as a part of planning objectives as they would tend to eliminate alternatives as indicated in the comment. As part of the HGM analysis steps, the study team established a list of quantifiable ecosystem restoration success criteria (i.e., performance targets on the basis of restored acreages and functional lift) to gauge the success of the proposed alternatives, and compared these alternatives in an iterative fashion. In most instances, the success criteria focused on the recovery of a specific community defined on the basis of quantity recovered (measured in acres, and obtainable functionality (quality measured in terms of functional lift).

Discussion: Recreation and flood damage reduction were study purposes. Flood damage reduction purpose was eliminated. Recreation was determined to be a project purpose.

Required Action: Reference to incidental recreation and FDR benefits will be deleted. A recreation plan is currently under development that will be cost shared in accordance with all applicable USACE regulations.

Action Taken: The text concerning flood damage reduction was deleted from the fourth specific planning objective.

HQUSACE Assessment: RESOLVED -- The **Action Taken** adequately addresses the **Required Action**. For future reference, Section 2-3.a.(4) of ER 1105-2-100 says, “Objectives must be clearly defined and provide information on the effect desired (quantified, if possible), the subject of the objective (what will be changed by

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accomplishing the objective), the location where the expected result will occur, the timing of the effect (when would the effect occur) and the duration of the effect.”

25. Page V-3, Planning Constraints – Where practicable, measurable constraints should be stated. Quantifiable constraints can be used to eliminate alternatives. Availability of water is a critical example. What is the most water available and provide support for the limit.

District Response: Water availability was not identified as a project constraint because there are various sources of unallocated water available for restoration projects. To avoid predetermining the outcome of the alternative selection, full range reasonable water demands and alternatives were developed.

Discussion: See discussion in response to Comment No. 22.

Required Action: See action in response to Comment No. 22.

Action Taken: See action taken in response to Comment No. 22.

HQUSACE Assessment: **RESOLVED**

26. Page V-20 – If the historic floodplain was flooded by 25-year and greater events calling them riparian is a thin link, but now down-cutting and dropping of water tables makes this a more tenuous link. OMB and ASA-CW have been taking serious exception that these areas are still riparian and that they are within Corps authority. Make a very strong ecological case that these areas are still riparian.

District Response: Concur. Historically, the Santa Cruz River low flow channel was braided and at or near the same elevation as the adjacent floodplain. The historic floodplain was 1,000+ feet wide. The 25-year reference linking the channel to the historic over bank floodplain incorrectly represents historic conditions. Even the 2-10 year historical flood events would inundate large over bank areas.

Discussion: Noted.

Required Action: Subject section will be revised accordingly to accurately describe the historic floodplain as it related to the channel.

Action Taken: The discussion of geomorphic settings was revised on Page V-20 to accurately describe the historic floodplain as it relates to the channel.

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HQUSACE Assessment: **RESOLVED** – the revised text does a better job linking the existing & future floodplain ecosystems to the river.

27. Table 5.8 – Fails to Provide Sufficient Habitat Diversity is not basis to eliminate any alternative – if an alternative provides any increase in diversity it meets the goal as stated on Page 5-2. The objective must have a quantifiable minimum based on ecological reasons. Please define Natural Pattern before the table or as a footnote. As later defined, this is a technical issue as basic as water runs down hill, but without the definition, this appears to relate to vegetative communities.

District Response: The first two objectives are to “Increase the acreage of functional riparian and floodplain habitat within the study area” and to “Increase wildlife habitat diversity by providing a mix of riparian habitats within the river corridor, riparian fringe and historic floodplain.” While all alternatives provide some increase in the acreage of functional riparian and floodplain habitat not all alternatives “Increase wildlife habitat diversity by providing a mix of riparian habitats...” Alternatives screened out for failing to provide sufficient habitat diversity tended to be dominated by a single cover type in addition to often consisting of small islands of habitat with little connectivity. Thus, they failed to meet the second objective. The use of the phrase “natural pattern” was intended to stand as an abbreviation of “inconsistent with the appropriate geomorphic setting of riparian communities or restoration practices.”

Discussion: Noted.

Required Action: Table 5.8 will be revised and a footnote will be added indicating that “natural pattern” refers to maintaining appropriate geomorphic setting and associated plant communities.

Action Taken: Table 5.8 was edited to include the footnote described in the District response above.

HQUSACE Assessment: **RESOLVED** by the modification.

28. Page V-26. Use of a quantified water availability constraint would eliminate several of the alternatives that made it through the first screening, including the alternative that is being recommended. This project should be formulated with all supportable objectives and constraints considered from the beginning of the Cost Effectiveness and Incremental Cost Analyses. This would possibly change the best buy alternatives if all alternatives requiring over 2,000 ac-ft (any number used must be supportable) of water were eliminated. If a minimum acceptable increase in AAFUCU can be determined, this is an acceptable objective. If 3E gives acceptable habitat restoration, for 20% of the water, and an AAC of \$1M less it should be fairly evaluated, not as an after thought.

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District Response: See response to comment 22.

Discussion: See discussion for comment 22.

Required Action: See action in response to comment 22.

Action Taken: See action taken in response to comment 22.

HQUSACE Assessment: **NOT RESOLVED** – The referenced response (at comment 22) specifically addresses the link between water constraints and plan selection. The referenced response does not adequately answer the formulation, evaluation, & selection aspect of the comment 28. Table 5.10 on page V-32 does not appear to support the recommended alternative. The District needs to explain how the recommended plan was selected when another alternative appears to have lower first cost, uses less water to operate making it more sustainable over the long-term, has a lower significantly lower average annual cost per FCU.

DISTRICT RESPONSE: Concur. Table 5.10 did not reflect the sponsor identified water constraint. See response to Comment No. 30.

ACTION TAKEN: The discussion of riparian forests in Section IV.B Baseline Conditions has been expanded to better document the significance of the Cottonwood-Willow and Mesquite habitats.

The second specific planning objective (shown below) has also been expanded to include mention of importance of these habitats, which was the intent of original objective.

Planning Objective 2: *“Increase wildlife habitat diversity by providing a mix of riparian habitats with an emphasis on restoration of riparian forests within the river corridor, riparian fringe and historic floodplain.”*

Additional citations on the importance and scarcity of these respective habitats have been included in Section IV.B.2., on page IV-16., as follows:

“These riparian communities had been extremely rich in species diversity, supporting several hundred species of plants and sustaining a rich food base for wildlife. While southwest riparian areas represent less than 1% of the regions area (Knopf, F. L., 1989), still 80-90% of vertebrate wildlife species depend on them for food, water, cover and migration (Gillis, 1991). In fact, over 100 state and federally listed species in New Mexico and Arizona are riparian dependent (Johnson 1989).

Riparian dependent plant communities are considered at risk vegetation communities in the Southwest, particularly in Pima County. The Arizona State Park Commission (1988) estimated riparian losses in Arizona and New Mexico to be on the order of 90%, while the Arizona Nature Conservancy (1987) rates the

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cottonwood-willow community as North America's rarest forest type. In addition to outright destruction of riparian habitat in the western United States, the small size of existing fragments and the great distances between them decrease their ability to support healthy distributions, abundances and diversities of bird species (MacArthur and Wilson 1967, Burgess and Sharpe 1981)."

The plan selection discussion (a portion of which is shown below) now describes how Alt. 3E better meets all the planning objectives, as well as incorporating the references to public acceptability.

Both alternatives would restore similarly large areas of habitat. However, Alternative 3E would possess the greatest diversity of habitat and would restore extensive areas of mesquite and areas of rare Cottonwood-willow vegetation. Alternative 3E would have the greatest potential benefits to the greatest number of wildlife species in the study area, especially to species that are regionally rare or declining. This alternative would result in the creation of Emergent Marsh and Cottonwood-willow vegetation that is potentially suitable habitat for several species that are Federally-listed, candidates for listing of concern to Federal and state agencies, and regionally rare, endemic, or otherwise sensitive. Alternative 2A includes the same acreage of Emergent Marsh as Alternative 3E, but restores less than half the acres of mesquite and does not provide for the restoration of any of the rare Cottonwood-willow habitat. More species of concern would benefit under Alternative 3E than under Alternative 2A.

See also ACTION TAKEN for Comment No. 30.

HQUSACE Assessment: **RESOLVED**

29. *p V-36. A cost-effectiveness graph is shown; associated incremental analysis graph should be included.*

District Response: Concur.

Discussion: Noted.

Required Action: Incremental cost analysis was included in the Economics Appendix and omitted from report. ICA graph will be inserted as suggested.

Action Taken: The referenced ICA graph has been added to the analysis of restoration alternatives as Figure 5.3 on Page V-37.

HQUSACE Assessment: **RESOLVED**

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30. p V-38 Alternatives 2A and 4F are deemed complete, yet later the water constraint is identified suggesting they are not technically feasible due to lack of necessary water. Which is right? How real is the local sponsor's constraint, and how is that constraint documented. Relates to broader water availability Comment 22. above. We need a clear story on what the water situation is, in its many facets.

District Response: Alternatives 2A and 4F are deemed complete and are technically feasible. Please refer to the preceding responses to Comments No. 22 regarding availability of water as a project constraint in the plan formulation process.

Discussion: While water is available, there are fiscal, institutional, political, and public acceptability issues that affect water allocation decisions and thus will likely constrain selection of the recommended plan. Viable plans should be carried forward for analysis and determination as to reasons for selection.

Required Action: District will revise the final array by inclusion of Alternative 3E and include in the discussion the compelling reasons for carrying Alternative 3E forward as noted in above discussion.

Action Taken: Chapter V, Section J - Analysis of the First Array, has been revised accordingly. In the section titled "Final Array of Alternatives" the inclusion of Alternative 3E has been documented and reasons for carrying the alternative forward have been presented. Chapter V, Section K - Selection of a Recommended Plan, has been revised to include a comparative analysis of Alternatives 2A, 3E and 4F with the result that Alternative 3E is presented as the recommended plan.

HQUSACE Assessment: **NOT RESOLVED** -- This response gets at the selection a bit. But 3E is way more expensive than 2A, what's the justification? It's OK that 3E is not a "best buy", but the justification for 3E stated on page V-40 is "that is comes closest to presenting a mid-point in water demand". The District is justifying the recommended alternative based on inputs rather than outputs, based on the public expecting an intermediate usage. Lacking an economics or ecological justification for selecting the higher priced 3E instead of 2A the sponsor may be required to pay for implementation of the additional increment.

DISTRICT RESPONSE: Concur. Additional economic and ecological analysis and justification will be completed to better describe selection of Alternative 3E. Because the economic burden of procuring and delivering water is placed entirely on local entities, the non-Federal sponsor's judgment regarding what constitutes a sensible investment in water for restoration is crucial and therefore becomes a reasonable constraint on plan selection. The timing and basis for the introduction of a water constraint will be clearly discussed in the report. Having introduced the constraint, another iteration of plan formulation analysis will be presented in the report.

ACTION TAKEN: The "Final" array presented in the Draft FR has been re-titled as the second array and, following the discussion of the 2,000 AF/YR constraint, the

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results of a CE/ICA analysis of the plans meeting that constraint are now presented as the “Final Array”. This information was present in the Economic Appendix to the Draft Report but was, unfortunately, omitted from the main report. That analysis, based on adoption of the sponsor’s water constraint, resulted in a final array consisting of two best buys, 2A and 3E with the consequence that Alternative 3E becomes the NER plan. Ecologically, Alternative 3E provides high value, scarce cottonwood-willow and mesquite riparian habit that is not provided by Alternative 2A.

HQUSACE Assessment: **RESOLVED**

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31. The alternatives in the final analysis are not clearly described in the reports. A description can be pieced together but a fairly detailed description of each should be presented in the FR and EIS.

District Response: Concur.

Discussion: Noted.

Required Action: More detailed descriptions of each alternative will be included. Sections 3.2.1 and 3.2.2 will be revised to include sufficient detail.

Action Taken: Section 3.2.1 – 3.2.3 have been revised to include detailed descriptions of each of the final alternatives.

HQUSACE Assessment: **RESOLVED**

32. The EIS does not present a general description of ‘reasonable alternatives eliminated’ and reasons for their elimination.

District Response: Concur.

Discussion: Noted.

Required Action: A new Section 3.3, “Alternatives Eliminated from Detailed Consideration”, will be developed and included.

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Action Taken: Section 3.3, Alternatives Eliminated from Detailed Consideration has been added on page 45 the DEIS.

HQUSACE Assessment: **RESOLVED**

33. Reasonable alternatives that are not in the Corps' jurisdiction are not discussed. Discussion of these alternatives is required in the EIS by Corps regulations and 40 CFR 1502.14(c) and should be included in the Main Report.

District Response: Concur. Given the stated purpose and need, no alternatives were identified outside the Corps jurisdiction that could be implemented and achieve the restoration objectives of the project. In the absence of Corps involvement, the project would not be completed and the purpose and need would not be met. The expected without project (no action) alternative explains the likely future conditions without Corps action.

Discussion: Noted.

Required Action: A new Section 3.4, "Alternatives outside the Corps Jurisdiction", will be added to address the issue to discuss activities, if any, that the local sponsor could feasibly take to prevent further degradation or disturbance.

Action Taken: Section 3.4, Alternatives Outside the Corps Jurisdiction, has been added on pages 45 and 46 of the DIES.

HQUSACE Assessment: **RESOLVED**

34. The ten-page discussion about why this project does not include flood damage reduction (FDR) is not required. Include a statement in the Needs and Purposes that summarizes why FDR was not included as an objective with a cross-reference to the document that fully discusses this decision is sufficient.

District Response: Request clarification. The referenced ten-page discussion regarding flood damage reduction does not appear in the DEIS; perhaps this is referring to the main report. The last paragraph of Section 4.3.3 in the DEIS addresses the issue.

Discussion: This topic was addressed in comment 4 on the feasibility report.

Required Action: None.

Action Taken: None

HQUSACE Assessment: **RESOLVED**

35. EIS page 4. The objectives and constraints of this project should be for this specific project. See earlier Formulation comment “Page V-1, Specific Planning Objective” Objectives should be quantifiable to be useful in formulation. E.g., “Increase the acreage of functional riparian and floodplain habitat within the study area” is a purpose statement but it should be measurable to be a meaningful objective.

District Response: Increase in the acreage of functional riparian and floodplain habitat within the study area is measurable. Alternatives considered would produce different acreages thereby making for meaningful comparison among the alternatives. Please refer to previous response to Plan Formulation Comment No. 24.

Discussion: Noted.

Required Action: None.

Action Taken: None

HQUSACE Assessment: **RESOLVED**

36. EIS page 7, Issues and Concerns – Water availability is a major issue, but it is not included. None of these Native American / cultural concerns is addressed in the FR.

District Response: Concur.

Discussion: See response to comment 22 for the water availability issue.

Required Action: Additional discussion on the issue of water availability will be included in the Issues and Concerns section. Native American / Cultural Resources concerns will be expanded in the feasibility report to parallel this information in the EIS.

Action Taken: A paragraph discussing water availability has been added to the Issues and Concerns section beginning on page 8. Section F of Chapter VII in the Draft Feasibility Report discusses cultural resources requirements for implementation.

HQUSACE Assessment: **RESOLVED**

37. *EIS page 13, Compliance Table –*

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a. This table by itself is not sufficient to address Compliance, add text to describe what has been done, issues raised and what has/will be done to resolve, and what remains to be done to comply with each. Typically, cultural resources laws, and SHPO and Native American coordination are covered as a group, as are the HTRW laws and those agencies. Clean Air, Clean Water, Endangered Species NEPA, Environmental Justice are individually addressed.

b. "Rivers & Harbors Act" is not a single act, but a series like the WRDAs. Fully cite which Rivers & Harbors Act being referenced. Consider leaving this out unless there is a specific Act, or add the WRDAs that are relevant.

c. The Farmlands Protection Policy Act is missing. The CEQ Memo of 11 AUG 1980 only gives guidance on compliance. Compliance requires completion and submission of a specific form to the USNRCS for their input. The determination of the presence on protected farmlands is an USDA jurisdictional responsibility. The required form documents Corps/NRCS coordination.

District Response:

- a. Concur. Supporting text will be added to elaborate on the compliance status.
- b. Concur. Reference will be deleted.
- c. Concur. Coordination with the NRCS is required, but submission of a Farmland Impact Assessment Rating form is only required if the proposed project is believed to effect those lands designated as Prime and Unique Farmland or Farmlands of Special Importance to the state.

Discussion: Noted.

Required Action: Text will be revised as indicated in the District Response. Further coordination with NRCS will be conducted to confirm no effects and the documentation will be included in the revised EIS.

Action Taken:

- a. The compliance table Section 7 has been expanded to include summary statements regarding compliance. More detailed text regarding compliance is found in the various subdivisions of Section 5. The table on page 13 is intended only to summarize compliance status.*
- b. The reference to the Rivers and Harbors Act has been deleted.*
- c. "Farmlands Protection Policy Act" has been added to the compliance table in an and identified as Not Applicable (N/A).*

HQUSACE Assessment: **RESOLVED**

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38. EIS – Section 2.2 – See above discussion of purpose. Do not identify FDR or recreation as purposes or objectives, not even secondary. They are incidental benefits. Consideration may be given FDR and Recreation by adding constraints that this project will not have significant adverse effects to these resources.

District Response: The District rationale for discussing purposes other than restoration is provided in the responses to preceding Comments 4 and 23.

Discussion: Noted.

Required Action: The District will clarify the study and project purposes in the draft report.

Action Taken: The draft report was reviewed to ensure that all references to study purposes and project purposes were consistently used throughout both the Draft Feasibility Report and DEIS.

HQUSACE Assessment: **RESOLVED**

39. EIS, Section 3.1, para 2,

a. *Bullet 5 – indicate whether subsurface HTRW from these landfills and remote sources, e.g., local Air Force facilities, are likely to be problems. Geologic maps of subsurface gradients can give adequate information for feasibility level.*

b. *Bullet 7 – insert comma between “pristine” and “native”.*

District Response:

a. Section 3.1 discusses the process through which locations favorable for restoration were identified and is not intended to present that level of detailed information. Characterization of the baseline groundwater conditions and HTRW are addressed Sections 4.4.2 and 4.14, respectively. There is no evidence to support hydrologic connection to “remote sources” or to indicate releases from any of the known landfills.

b. Concur.

Discussion: Noted.

Required Action: Editorial change will be made to bullet 7 as suggested.

Action Taken: Section 3.1, ¶ 2, Bullet 5 was revised to indicate that these issues were investigated as part of the Phase I Site Assessment and that the information in the assessment was used to practice avoidance of potential sites. Bullet 6 was edited as indicated in comment.

HQUSACE Assessment: RESOLVED

40. EIS – Sections 2.3 and 2.4 – The objectives are repeated within three paragraphs. However, constraints are not mentioned.

District Response: Concur. The objectives are listed Sections 2.3 and 3. Section 2.3 addresses only the project objectives, as indicated by the section heading. Because section 3 addresses alternative development, the constraints should also be listed.

Discussion: Noted.

Required Action: Section 3 will be appropriately revised.

Action Taken: Planning constraints were added to Section 3.

HQUSACE Assessment: RESOLVED

41. EIS – Sections 4 and 5:

a. There is no discussion of potential issues related to using harvested water. There are residual nutrient loads in these waters that may exceed natural levels. It is also a concern that the flow regime is being changed from a very pulsed system of flood and drought to a steady supply with flood pulse system. These changes may be conducive to exotic plants over native species or a shift in the plant communities from the native community structure.

b. Discuss if water from all sources will remain available in perpetuity, or will other uses supercede the restoration project and draw-off needed water as the Tucson area grows. Discuss these concerns.

c. Pursuant §122 of the Rivers & Harbors Act of 1970 – discuss whether this project will induce unwanted community growth, affect the local tax revenues, or aesthetics. Discussion of these resources should be commensurate with the significance of any impacts to them.

d. Threatened & Endangered Species – since the BA in the appendices includes these same discussions there is no reason to describe each here, summarize the no effects determination, the concurrence by the USFWS and local authorities, and reference the appendix for more detailed discussions.

District Response:

a. Potential effects of using harvested water are identified Section 5.4.2 Surface Water Quality and 5.4.5 Groundwater Hydrology and 5.4.6 Groundwater Quality. The

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intent of the restoration is to restore the system to a low flow and pulsed system with residual organic loads. As characterized under the existing conditions discussion, the project area is currently substantially devoid of nutrients and is dominated by exotics/weeds. The O&M plan identifies weed control for the project area.

- b. Concur.
- c. Concur.
- d. Concur.

Discussion: Noted.

Required Action:

- a. Appropriate sections will be revised in the draft EIS.
- b. A discussion of water source in perpetuity will be included based on information provided by the sponsor on long-term commitment of water.
- c. Text will be added to EIS to address consideration under Rivers & Harbors Act.
- d. Text will be deleted and reference made to the Biological Assessment in Appendix.

Action Taken:

- a. The following sentence has been added to the discussion of the biological effects of each alternative Section 5.5: "Prescribed operation and maintenance activities include periodic removal of invasive plants."
- b. The availability of water is discussed in Issues and Concerns Section beginning on page 8.
- c. The discussion of these resources in Chapter 5 was reviewed and determined to be commensurate with their significance.
- d. The referenced text is already minimal, stating that no T&E species occur in the project area and thus would not be affected. The following sentence has been added to end of Section 5.5.4: "Please see Biological Appendix for detailed information."

HQUSACE Assessment: **RESOLVED**

42. EIS – Section 6 – Discuss the other Corps projects in the area along with other major commercial plans and the effects of expected housing developments. This section and supporting documentation should be consistent with CEQ Guidance of January 1997, "Considering Cumulative Effects Under the National Environmental Policy Act". It is recognized that accuracy of projections will diminish going into the future, but there will be other changes related to the regional ecosystem and how this project may relate to those changes must be considered.

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District Response: Concur. Other Corps projects, as well as City of Tucson's Rio Nuevo, are discussed Sections 6 and 6.1. We are currently unaware of any "major commercial plans", but would expect the sponsor's review to offer any additional information on the subject. Section could address the extent to which housing projects could expand into areas where erosion setbacks currently exist. However, much of the property that could be developed as residential is in County or city ownership and would need to be sold prior to commercial development. Input from the Sponsor regarding local commercial plans as well as potential residential development will be discussed.

Discussion: Noted.

Required Action: District will revise Section 6 accordingly.

Action Taken: No revisions were made to the text since there has been no information from the local sponsor indicating the potential for major commercial plans.

HQUSACE Assessment: **RESOLVED**

43. EIS, Section 7.4 – The compliance text mentioned above should appear here with a reference to the earlier Table. Do not repeat a table in the EIS.

District Response: Concur.

Discussion: The discussion of how each law and regulation was complied with will be included Section 7.4, referencing the table. The reference is to where the table is also presented in the Summary (p.13); the DEIS summary necessarily repeats much information from the DEIS, including the table.

Required Action: The table Section 7.4 will be removed.

Action Taken: Rather than delete the table, it was expanded to include summary statements regarding compliance. More detailed text regarding compliance is found in the various subdivisions of Section 5

HQUSACE Assessment: **RESOLVED**

44. EIS, Section 9 – Prepare this Table in accordance with ERs and CEQ Guidance. It must indicate Corps staff is responsible for this EIS. Contractors may be included, but this is a Corps document.

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District Response: Concur.

Discussion: The review draft should have contained the list of Corps staff that contributed to the DEIS.

Required Action: Revision will include Corps staff.

Action Taken: Section 9 has been revised and all Corps staff that contributed to the DEIS are now included.

HQUSACE Assessment: **PARTIALLY RESOLVED** – 40 CFR 1502.17 says “Where possible the persons who are responsible for a particular analysis, including analyses in background papers, shall be identified.” This table should be revised to indicate the Role each person listed had in preparing the EIS.

DISTRICT RESPONSE: Concur.

ACTION TAKEN: Subject table in Section 9 has been expanded to indicate the role each individual listed had in preparing the EIS.

HQUSACE Assessment: **RESOLVED**