



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
441 G STREET, NW  
WASHINGTON, DC 20314-1000

CECW-ZB

28-May-24

MEMORANDUM FOR ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

SUBJECT: Tres Rios, Arizona Ecosystem Restoration Project, Post Authorization Change Report

1. Purpose. To provide for your review and concurrence the enclosed Tres Rios, Arizona Environmental Restoration Project, Post Authorization Change Report (PACR). The report presents a revised cost estimate and updated analysis of the authorized project to support the authorization of a new project cost. The report documents the need to increase the authorized project cost from \$99,320,000 at October 1999 price levels to \$332,062,000 at October 2023 price levels. The report recommends an increase to the cost limit imposed by section 902 of the Water Resources Development Act of 1986, as amended (33 U.S.C. § 2280), to accommodate changes in price levels and other updates that are within existing project authority.

2. Authorized Project. The project was authorized by Congress in Section 101(b)(4) of the Water Resources Development Act of 2000 (Pub. L. No. 106-541), to be carried out substantially in accordance with a Chief's Report if a report is completed not later than December 31, 2000. The Chief's Report was issued on December 12, 2000. The primary purpose of the project is ecosystem restoration. The project provides for ecosystem restoration of native vegetation and wildlife habitat for threatened and endangered species within the study area. The project also includes flood risk management (FRM) and recreation features.

a. The ecosystem restoration component of the authorized project includes water supply and infrastructure features consisting of a pump station and water distribution system to reestablish and support about 775 acres of native vegetation and wildlife habitat within and along the Salt River. Project features include constructing a regulating wetland about 184 acres in size to equalize diurnal variations in discharges from the 91st Avenue Wastewater Treatment Plant; providing for a 300 million gallon per day pump station to convey flow from the treatment plant to the regulating wetland; constructing approximately 128 acres of wetlands along the north bank of the Salt River; providing for a pipeline in the overbank wetland leading to a series of riparian corridors totaling about 38 acres west of El Mirage Road; constructing a series of open water/marsh areas totaling about 134 acres within the channel west of El Mirage Road; grading the Salt River to convey surface water to supply about 69 acres of riparian habitat; and distributing, via a series of pipelines, dewatering well water from the treatment plant to a series of large open water/marsh creation areas totaling about 206 acres and about 16 acres of riparian corridors along the south side of the Salt River.

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b. The authorized project also includes construction of about six miles of FRM levee on the north bank of the Salt River between the regulating wetland and approximately Dysart Road. The flood risk management levee, ranging in height from 4 to 10 feet, would provide structures on the north bank protection from a flood having 1 chance in 100 of occurring in any given year.

c. A passive recreation plan consisting of approximately 11 miles of multi-use non-motorized trails, parking lots with kiosks, and other amenities for viewing, picnicking, and exploring the area by foot, bicycle, or horseback is also included in the authorized project. Finally, at the request of the non-federal sponsor, the authorized project includes development of an environmental education interpretive center.

3. Post-Authorization Change. The project is currently in the construction phase and is approximately 70 percent physically complete. After authorization, the project was divided into five construction phases and several subphases to facilitate design and construction. A project cooperation agreement (PCA) was entered into with the City of Phoenix (City) for the completion of Phases 1 through 3.

a. Phase 1 includes the flood risk management levee and has been completed. Approximately 1.2 miles of levee section from 95th Avenue to 105th Avenue were eliminated at the upstream boundary of the project because it was determined to be unnecessary to achieve the FRM objectives based on updated engineering analyses. A downstream portion of the levee (Phase 1C) was also eliminated from the project based on additional hydrologic and hydraulic analysis. This analysis showed that improvements to El Mirage Road that raised the ground and bridge elevation thereby reducing the probability of overtopping removed the adjacent community from the design event floodplain.

b. Phase 2 includes the wetlands and pump station facility and has been completed. The construction of the Phase 2 flow regulating wetlands includes a total of 247 acres, an increase of about 63 acres compared to the authorized plan. The size of this feature was increased to accommodate the increased discharge capacity of the 91<sup>st</sup> Avenue treatment plant identified subsequent to project authorization. The Phase 2 overbank wetlands includes 128 acres, about 0.5 acres less than the authorized plan.

c. Phase 3 includes cottonwood-willow corridors and open water-marsh areas on the north side of the river, west of the Phase 2 wetlands. Phase 3 is subdivided into three subphases (3A; 3B; and 3C) to facilitate design and construction. To date, Phases 3A and 3B have been completed, with only Phase 3C remaining as part of the signed PCA with the City of Phoenix. Phase 3A is the eastern-most segment of Phase 3, located immediately downstream and to the west of the Phase 2 regulating wetlands,

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while Phase 3C is the western-most segment at the downstream end of the project area.

(1) The Phase 3 habitat design was refined from the authorized project to reflect the natural and historic flow pattern of the Salt River rather than artificially created habitat areas. This refinement was made based upon the determination that the Phase 2 constructed pump station and wetlands would be sufficient to supply the necessary water to support Phase 3 restoration features along the existing low-flow channel within the Salt River. This included integrating the design with the current and historically open water areas, existing topography, and other existing site conditions, which together influence associated habitat development. The refined design targets aggressive removal and control of salt cedar and the restoration of native habitats and natural functions to include zones of open water and marsh, cottonwood-willow, mesquite bosque, and quailbush/saltbush in the floodplain. Phases 3A and 3B, which include all these habitat types, have been constructed. Phase 3C, which includes open water marsh and cottonwood-willow habitat, is partially designed; construction has not begun at Phase 3C.

(2) Integration of the proposed restoration features into the existing active river channel will result in a more naturally functioning and self-sustaining system. The footprint of project features within Phase 3 is 321 acres, which is approximately 80 acres larger than the Phase 3C area described by the authorized plan.

d. A project partnership agreement (PPA) has not been executed for Phases 4 and 5 of the project. The Gila River Indian Community (Community) and the City are the anticipated non-federal sponsors for these phases of the project. Phase 4 is comprised of a well water distribution system to pump and convey non-effluent ground water to the Community, on the south side of the Salt River to supply water to restoration areas of Phase 5. Phase 4 has no standalone ecosystem restoration benefits but is necessary for Phase 5 benefits to be realized. Phase 5 is comprised of conveyance channels, riparian corridors, and open water marshes on the south side of the Salt River, on Community land, between 79th Ave and the confluence with the Gila River. The Phase 4 and Phase 5 designs have not progressed beyond the design level effort completed for the project's Feasibility Phase.

e. The original recreation plan called for construction of an environmental education interpretive center. This has since been removed from the project at the request of the City. With the exception of removing the interpretive center, the recreation plan has not changed.

f. Total project first costs have increased by approximately \$232,800,000 (from \$99,300,000 to \$332,100,000) since the project was authorized. Approximately \$85,800,000 of this increase is due to changes in price levels between Fiscal Year 2000

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and Fiscal Year 2024, with another \$147,000,000 representing increases associated with other factors. The primary reasons for these increases include substantial underestimates of costs in the project authorization for the following categories:

(1) Contingency: The contingency used for authorized project costs was 20% for the levee components of the project and 15% for the environmental components of the project. These contingencies were only applied to construction costs and not planning, engineering and design (PED), engineering during construction (EDC) and supervision and administration (S&A) costs. Updated contingency estimates for the remaining project features, based upon the results of the cost and schedule risk analysis, are estimated at 42%, and are applied to construction costs and PED/Construction Management (CM) costs.

(2) Ecosystem Restoration: Ecosystem restoration construction costs were only estimated at about \$62,000,000 in the authorized project cost but are now estimated at about \$169,000,000. This increase was due to several factors, including underestimates of contingency as described above, increases in unit prices, substantial increases in costs for monitoring and adaptive management, and required design changes such as the need for a larger pump station and a more extensive regulating wetland system.

(3) LERRD: Real Estate costs, which were only estimated at about \$19,000,000 in the authorized cost, are now estimated at over \$66,000,000. The authorized cost did not include costs for several utility relocations that are required at a cost of nearly \$11,000,000. The increases in these costs were driven by significant increases in local land values in the project area.

(4) PED/CM: Costs for PED, EDC, and S&A included in the authorized cost were based upon rule of thumb percentages consistent with guidance at the time the costs were developed. These estimates have increased substantially, based upon costs incurred to date and remaining cost estimates that were developed in accordance with current cost guidance. Also, as noted, the costs for these items in the authorized cost estimate did not include contingency.

#### 4. Project Justification.

a. The cost of the ecosystem restoration project features remains justified by the ecosystem restoration benefits. Overall, the project is expected to result in 918 acres of restored habitat within the project footprint, an increase of 143 acres in comparison to the authorized plan. These restored habitats are considered especially valuable due to scarcity and dependence of certain species on these resources. The project also generates ecosystem restoration benefits to over 4,500 acres of adjacent areas (in between physical footprints of the project features). When accounting for design refinements and outputs over the period of analysis, the project results in a slight

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increase in average annual habitat units (AAHUs), from 571 AAHUs for the authorized plan to the current estimate of 573 AAHUs.

b. Based on a discount rate of 2.75 percent amortized over 50 years and including annual operation, maintenance, repair, replacement and rehabilitation (OMRR&R), average annual ecosystem restoration costs are estimated at \$17,546,000. The average annual cost per AAHU is estimated at \$30,600.

c. The FRM features of the project have been completed and have been providing flood risk reduction benefits to the study area since 2008. There have not been any significant storm events that have caused any breaches or major damages to the levee since it was constructed. Based upon the most current risk assessment for the levee, the FRM improvements provide risk reduction for a population of 2,135 individuals and 690 structures valued at approximately \$155,000,000.

d. Based on a discount rate of 2.75 percent amortized over 50 years and including annual OMRR&R costs, average annual recreation costs are estimated at \$1,262,000. Average annual recreation benefits attributable to the recreation component of the project are estimated at \$2,635,000. Net benefits are estimated at \$1,373,000, with a benefit to cost ratio of 2.1.

## 5. Environmental Compliance.

a. An Environmental Impact Statement (EIS) was completed in 2000 as part of the Feasibility Report for the project. This includes environmental compliance approvals under the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), Clean Water Act (CWA), state water quality certification, and National Historic Preservation Act (NHPA). Proposed design refinements are within the authorized scope of the project and previously completed EIS. Coordination and consultation with resource agencies has been conducted and will continue to be conducted to ensure the project remains in compliance with applicable environmental laws, regulations, and policies. Further NEPA evaluation may be required as detailed engineering designs are further developed. Compliance under the CWA Section 404 and 401, including coordination with the Arizona Department of Environmental Quality for a water quality certification, would occur.

b. The area of potential effects (APE) for the Phase 3C refined designs includes some areas that were not included in the original authorized project design and not considered for consultation under Section 106 of the NHPA. These additional areas are all within the active channel of the Salt River. A previous geoarchaeological study indicates there is no possibility of intact cultural deposits in these areas. The refined design's changes are all within the authorized project's footprint and were covered under NEPA and other related compliance documentation but were not considered part

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of the original APE. USACE will consult with the Arizona State Historic Preservation Office (AZ SHPO) and affiliated Tribes to request concurrence on a determination of "No Historic Properties Affected" for the proposed Phase 3C environmental restoration activities.

c. In addition, updated compliance documentation as well as agency and Tribal consultation will be required prior to construction of Phases 4 and 5, pending execution of a PPA with the non-federal sponsors. The District will conduct Government-to-Government consultation with the Community prior to signing of the PPA for Phases 4 and 5.

d. Environmental Justice and Justice40 needs of the surrounding communities and Tribal Nations were assessed and specific concerns identified. Completion of the project presents opportunities to benefit area communities and Tribal Nations, specifically the Community.

6. Recommendation. I report that the project remains engineeringly feasible, environmentally acceptable, and justified based upon the benefits provided. I recommend the enclosed post authorization change report be transmitted to Congress as a basis for increasing the authorized project cost of the Tres Rios, Arizona Environmental Restoration Project to \$332,062,000 at October 2023 price levels.

Edward E. Belk, Jr

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Director of Civil Works