

RECLAMATION

Managing Water in the West

Supplement to the Rio Grande Supplemental Water Programmatic Environmental Assessment and Finding of No Significant Impact



U.S. Department of the Interior
Bureau of Reclamation
Albuquerque Area Office

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Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Front Cover Photo: The Rio Grande near Socorro, NM, 5/26/05

Chapter 1 Purpose and Need for Action

1.1 Introduction

In order to improve the status and contribute to the recovery of the Rio Grande Silvery Minnow (RGSM) and the Southwestern Willow Flycatcher (SWWF), two federally endangered species, the Bureau of Reclamation has engaged in a Supplemental Water Program (Program) during the past decade. In February 2003, Reclamation and the U.S. Army Corps of Engineers (USACE) issued a Programmatic Biological Assessment (BA) of the Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation and Non-Federal Actions on the Middle Rio Grande, New Mexico, March 1, 2003 – February 28, 2013. In March 2003, the U.S. Fish and Wildlife Service (USFWS) issued Biological and Conference Opinions (BiOp) on the Effects of Actions Associated with the Programmatic BA. The Reasonable and Prudent Alternative includes components of the Program which USFWS has deemed necessary to avoid the likelihood of jeopardizing the continued existence of the RGSM and the SWWF.

This Supplement to the Programmatic Supplemental Water EA (PEA), completed in 2001 by Reclamation, is intended to serve three purposes. This document will update the elements of the Program, the existing environmental conditions as well as the environmental consequences of the Program for the identified resources. As a result, the other contents of the PEA are incorporated by reference into this Supplement. The second purpose of this document is to disclose information and impacts associated with the ongoing Low Flow Conveyance Channel (LFCC) Pumping Project. Last, the Supplement discloses additional specific information on the water leasing program. This EA shall serve as the appropriate documentation for future leasing activities by Reclamation for the benefit of the RGSM and the SWWF.

1.2 Proposed Action

The current Program consists of four components: leasing of available San Juan Chama (SJ-C) water from willing water contractors, concurrence with waiver requests, the pumping and conveyance of water from the LFCC to the Rio Grande including the operation of an outfall near Escondida, and the implementation of water conservation practices by water contractors and municipal and industrial (M &I) users. The extension of the Program for an additional five-year period through March 2011 is the federal action which requires this new review of the Program under the National Environmental Policy Act (NEPA).

1.3 Purpose and Need

The need for Reclamation's action is to fulfill elements of the RPA for the 2003 BiOp issued by the USFWS on the Effects of Actions Associated with the Programmatic Biological Assessment of Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation and Non-Federal Actions on the Middle Rio Grande, New Mexico. The purpose of the federal action is to provide supplementary water over an additional five-year period (2006 – 2011) to the Rio Grande between Cochiti Dam and Elephant Butte Reservoir, with emphasis on the reaches below Isleta Dam which historically are prone to drying during the summer months. A goal of the Program is to provide continuous flows in the Middle



Rio Grande from Cochiti Dam downstream to Elephant Butte Reservoir. However, due to environmental conditions and the availability of water, the attainment of this goal has been extremely difficult in the past and there have been periods of river drying in parts of each year since 1996 despite the implementation of the Program.

1.4 Relevant Statutes, Regulations and Other Plans

Rio Grande and Low Flow Conveyance Channel Modifications Draft Environmental Impact Statement (EIS)

As mentioned in the 2001 PEA, Reclamation is evaluating alternatives to realign the LFCC and the Rio Grande system to the west side of the Middle Rio Grande Valley below San Marcial. This EIS is still in progress and has not been completed. The Program has and will proceed independently of any alternative that may be selected in the LFCC Channel Modifications EIS.

Temporary Channel into Elephant Butte Reservoir

Reclamation has excavated a temporary channel through what was the Elephant Butte Reservoir delta. This project, jointly performed by Reclamation and New Mexico Interstate Stream Commission (NMISC), combined with subsequent phases in 2002 and 2004 effectively delivers water and sediment from the Tiffany, San Marcial, and upper delta areas into the reservoir pool. The project area is in the delta zone of the reservoir's headwaters, approximately 45 miles south of Socorro, New Mexico, and 30 miles north of Elephant Butte Dam in Sierra County. The project begins approximately 11.0 miles south of the Burlington, Northern and Santa Fe Railroad Bridge near San Marcial, New Mexico, and extends for a maximum distance of 7.0 miles downstream. The Section 404 Permit continued through February 28, 2006 and all work associated with the project, including enhancement activities, has been completed. Major channel excavation work on the project was completed in July 2004 and the last enhancement feature associated with this project was completed in December 2005. The spring 2005 runoff washed out a portion of the access road to the Temporary Channel in the north. The 404 permit was extended to the time frame given above to allow the repair of this road. The access road repairs, as well as maintenance activities along the channel are currently ongoing.

Upper Rio Grande Basin Water Operations Review and EIS

The long-term operations of the Rio Grande system, including the LFCC, is being reviewed and analyzed in an EIS prepared by Reclamation, the Corps, and the NMISC. The focus of this analysis is coordinating river operations within existing federal authorities to ensure that water contracts, compacts, and federal obligations are met efficiently. The environmental impacts concerning possible changes in water operations were assessed and analyzed, and the results are available for public review in the form of a Draft EIS. The Notice of Availability for the Draft EIS was released on January 20, 2006, providing for a 90-day public comment period. Following receipt of public comments and agency response, the Final EIS is expected to be released in the fourth quarter of 2006. All activities would be fully coordinated and be consistent with the environmental review for the Program as well.

Silvery Minnow Habitat Designation

In February 2003, the U. S. Fish and Wildlife Service designated 157 river miles as critical habitat for the endangered RGSM along the last remaining inhabited portion of its range in New Mexico. The Middle Rio Grande from Cochiti Dam to the utility line in Socorro County, marked on the USGS Paraje Well 7.5 minute quadrangle (1980), east of the Bosque Well is considered crucial habitat to the survival of the RGSM. The 300-foot riparian zone on both sides of the river is included except when the river is bounded by levees; then the designation also includes the levee. A portion of the tributary Jemez River that runs from Jemez Canyon Reservoir to its confluence with the Rio Grande was also designated.

During the past several years, river flows have been maintained in collaboration with the Bureau of Reclamation's voluntary supplemental water program. The designation of RGSM habitat was not affected by the amount of supplemental instream flow.

Southwestern Willow Flycatcher Designation

Critical habitat for the flycatcher was designated in October 2005 (Fish and Wildlife Service 2005) and includes the following river reaches in the Middle Rio Grande: from Taos Junction Bridge (State Road 520) in Taos County, downstream for 45.9 km (28.5 mi.) to the upstream boundary of the San Juan Pueblo in Rio Arriba County; from the southern boundary of the Pueblo of Isleta in Valencia County, downstream to the overhead powerline crossing of the Rio Grande near Milligan Gulch, immediately north of the pool of Elephant Butte Reservoir in Socorro County, excluding lands within the Sevilleta and Bosque del Apache National Wildlife Refuges.

Elephant Butte and Caballo Reservoir Resource Management Plan (RMP) Environmental Impact Statement

Reclamation issued a final EIS for this Resource Management Plan in February 2002 and the Record of Decision was signed a year later. The selected alternative was characterized by multi-purpose emphasis which provided for a variety of uses including expanded developed recreation areas, improved primitive recreation areas and wildlife management areas. The RMP EIS encompasses areas in Sierra and Socorro Counties which are also covered in this Supplement.

Programmatic Biological Assessment (BA) of the Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation and Non-Federal Actions on the Middle Rio Grande, New Mexico, March 1, 2003- February 28, 2013 and the USFWS issued Biological and Conference Opinions (BiOp) on the Effects of Actions Associated with the Programmatic BA

The BA analyzes the effects of the above proposed actions on federally protected species occurring in or near the Rio Chama watershed and the Rio Grande, including all tributaries, from the Colorado/New Mexico state line downstream to the headwaters of Elephant Butte Reservoir. This BA, written in February 2003, focuses on the Rio Grande silvery minnow (*Hybognathus amarus*), the southwestern willow flycatcher (*Empidonax traillii extimus*), and the bald eagle (*Haliaeetus leucocephalus*). Reclamation and the Corps submitted the BA to the USFWS Service

pursuant to Section 7(a)(2) of the Endangered Species Act (ESA). This BA incorporated by reference and summarized applicable and relevant portions of the BA submitted to the U. S. Fish and Wildlife Service on June 6, 2001, which was completed shortly after the PEA for the Program. Reclamation and the USACE made a determination of “may affect, likely to adversely affect” for the silvery minnow and willow flycatcher and “may adversely modify proposed critical habitat” for the silvery minnow and “may affect, not likely to adversely affect” for the bald eagle.

After reviewing the current status of the RGSM and the SWWF, the environmental baseline for the action area, including current and expected drought conditions, the effects of the proposed water operations and river maintenance activities, and the cumulative effects, the USFWS concluded that water operations and river maintenance of the Middle Rio Grande, as proposed in the February 2003 BA, are likely to jeopardize the continued existence of the RGSM and the SWWF and adversely modify critical habitat of the RGSM.

The USFWS developed the Reasonable and Prudent Alternative (RPA) to the March 1, 2003, through February 28, 2013, water operations and river maintenance proposed action that they believed would avoid jeopardy to the RGSM and the SWWF and also avoid adverse modification to RGSM critical habitat. Several elements of the RPA, i.e. the use of the LFCC and the provision of river flows under different water years, are closely associated with the release of supplemental water from the Program (Element B). The USFWS concurred with Reclamation’s determination of “may affect, is not likely to adversely affect” the bald eagle.

The 2003 BiOp, issued by the USFWS serves as the ESA consultation vehicle for the Program extension until 2011 (Parody, personal communication).

Middle Rio Grande Bosque Biological Management Plan

The Plan was released in 1993 and numerous projects have been implemented through the present. In June 2005, a review and update document was published in cooperation with the Middle Rio Grande Bosque Initiative and the Bosque Improvement Group.

Middle Rio Grande Endangered Species Act Collaborative Program

The Collaborative Program has been in existence as an interim program since 2000. Projects have been funded since 2001 through the present to benefit endangered species in the Middle Rio Grande, including habitat restoration, science research, and water management activities, some of which are related to the Program. Plans and or issue papers for each of the major categories of activities have been completed and are available to the general public. A Programmatic EIS (PEIS) is presently being prepared and the draft public document is anticipated to be issued in 2007. Elements of the Program will be discussed in the PEIS, as well as water acquisition strategies and impacts and other options discussed in Chapter 2.3, Alternatives Considered but Eliminated from Further Study.

Socorro County Regional Water Planning

The Socorro Sierra Regional Water Plan, prepared for the Socorro Soil and Water Conservation District was completed in December 2003. In addition, two other regional water plans (Jemez y Sangre and Middle Rio Grande) which encompass the MRG have been completed and accepted by the NMISC since the issuance of the PEA in 2001. Program activities that have been implemented have been coordinated with strategies identified in the Water Plans.

Chapter 2 Alternatives

2.1 Introduction

This chapter describes the two alternatives analyzed in the PEA, the No action alternative and the Proposed Action alternative. An analysis of alternatives considered but eliminated from further study is presented in this chapter.

2.2 Description of the Alternatives

2.2.1 Alternative A: No Action

The no action alternative for this Supplement is defined as discontinuing the Program, elements of which have been implemented since 1996. Basically, the water leasing program with willing lessors would be discontinued, no concurrence with waiver requests for the benefit of the RGSM would occur, pumping to transport water from the LFCC to the Rio Grande would cease, and water conservation opportunities would not be pursued by the farming community and the general public. It is extremely likely, absent extraordinary water runoff conditions and unusual monsoonal storm patterns, that drying of portions the Middle Rio Grande would result. The no action alternative would clearly not meet the stated purpose and need and would most likely result in non-compliance with the 2003 BiOp.

2.2.2 Alternative B: Proposed Action

As previously discussed, the proposed action consists of several components as follows:

San Juan-Chama Water

Leases - Reclamation would conduct a water leasing program to provide supplemental water to the Rio Grande for approximately five years, from 2006-2011. Fifteen entities have repayment or water service contracts with the Bureau of Reclamation for the use of San Juan-Chama (SJ-C) project water. Some of these entities may be willing to temporarily lease back to Reclamation some of this contracted water for use in its Supplemental Water Program. Reclamation would enter into lease-back agreements with such willing SJ-C project contractors. Primary purposes of the SJ-C project are to furnish a water supply via trans-basin diversions to the middle Rio Grande valley for M&I as well as irrigation uses. Incidental benefits include recreation and fish and wildlife. Reclamation is not proposing to take any actions that would involve reallocating contracted water or exceeding the firm yield of the SJ-C project. Reclamation will obtain all permits required for implementation and will conduct required consultation with appropriate parties.

Reclamation would expect to lease 10,000 to 15,000 acre-feet per year of SJ-C contracted water from 2006 to 2011. However, depending on environmental conditions, water availability, funding, and the willingness of SJ-C water contractors to enter into leasing agreements with Reclamation, the quantity of SJ-C water to be leased could be as low as 5,000 acre-feet per year or as great as 70,000 acre-feet per year. The M&I contractors from whom Reclamation could lease SJ-C water may include the following: City of Albuquerque, City of Santa Fe, Santa Fe



County, Jicarilla Apache Nation, San Juan Pueblo, City of Espanola, County of Los Alamos, City of Belen, Town of Bernalillo, Town of Taos, Village of Los Lunas, Town of Red River, and the Village of Taos Ski Valley. Reclamation does not contemplate leasing irrigation water. Reclamation would exchange the leased SJ-C water with the MRGCD for native Rio Grande flows. The SJ-C water leased each year by Reclamation would be used beneficially in New Mexico for irrigation, while native waters would augment stream flow and would benefit the silvery minnow.

Table 2-1 Leased Supplemental San Juan-Chama Project Water (1997-2005)

CONTRACTOR	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
City of Albuquerque	10,000	10,000	10,000	64,500		40,000				134,500
City of Belen			800	700	400	470	504	354	242	3,470
City of Bernalillo						300				300
City of Espanola		2,000	2,000	5,000		1,687		1,650	1,000	13,337
Jicarilla Apache Nation			6,500	6,500	6,500	6,500	6,500	6,500	6,500	45,500
County of Los Alamos		3,650	3,600	5,000	1,200	1,529	1,200	1,200	1,200	18,579
Town of Los Lunas		500	500	300	200	500	100			2,100
San Juan Pueblo						2,000	2,000	2,000	2,000	8,000
City of Santa Fe and Santa Fe County		10,000	10,000	10,000			2,500			32,500
Town of Red River			60	60	60	60	60	60	60	420
Town of Taos			400	400		937	419	400	400	2,956
Taos Ski Valley			50	50		53				153
Total	10,000	26,150	33,910	92,510	8,360	54,036	13,283	12,164	11,402	261,815

Uncontracted - Pursuant to the 1902 Reclamation Act giving the Secretary of the Interior has discretion in the use of project water, thus the uncontracted portion of SJ-C water which is reserved for future Indian water rights settlement in the Taos, New Mexico area is available for use in Reclamation's Program. This water would be exchanged with MRGCD as described above.

Emergency Drought Water

Reclamation may also release water captured, stored, and made available under the Emergency Drought Water Agreement (EDWA) to meet the needs of the Middle Rio Grande Project and to benefit the listed federally endangered species. EDWA water is stored and made available by the State of New Mexico consistent with the relevant interstate compacts and with state and Federal law as a conservation pool upstream of Elephant Butte Reservoir. Water that is native to the Rio Grande basin may be stored in reservoirs upstream of Elephant Butte following relinquishment of New Mexico's Rio Grande Compact credits, and upon acceptance of the relinquishment by



the State of Texas under Article VII of the Rio Grande Compact. As specified in the agreement (2003-2013), the amount of relinquished water made available to the United States was to be prorated in the event that the full amount of relinquishment between New Mexico and Texas that was anticipated in April 2003 did not occur. Accordingly, New Mexico is to make available to the United States up to 56,483 acre-feet of EDWA water. Reclamation may release up to 20,000 acre-feet of water in any one calendar year. To date, Reclamation has released approximately 30,000 acre-feet of EDWA water.

Concurrence with Waiver Requests

Reclamation would concur with temporary waiver requests from SJ-C water contractors to modify the date of their water delivery into the following calendar year, if such waivers would benefit the United States. In the past, temporary waivers have been used for activities such as enhancing winter flows and fisheries management on the Rio Chama and taking advantage of opportunities for supplemental water storage and management. Waivers generally would allow SJ-C water to remain in Heron Reservoir through April 30 of a particular year. This date has been extended in the past, but only under extreme circumstances. Reclamation concurs with waivers for reasons other than benefits to the RGSM, but those actions are not considered within this NEPA process. This part of the proposed Program addresses Reclamation policy on SJ-C contractors requesting temporary waivers of the contract requirement to take delivery of the annual allocation of project water prior to December 31 of each year, allowing flexible management of water releases to benefit the RGSM. Reclamation would concur with waiver requests that would assist it in its program for conservation of the RGSM, in compliance with the ESA. These requests could be initiated by the SJ-C contractors and would be honored at the discretion of Reclamation if conditions were appropriate.

Waivers for delivery of San Juan-Chama project allocations for a given year allow for delivery of such water in the following year. Changes in timing of these deliveries occur when concurred to by Reclamation and the appropriate contractor. Reclamation concurs to waivers at times when maintaining water in Heron will allow for use of such water as part of the Supplemental water program at a later date or when changing of timing of deliveries helps maintain fishery flows on the Rio Chama. The Rio Chama Instream Flow Assessment published by the Bureau of Land Management in 1992 is utilized as a guide for fishery flows on the Rio Chama.

LFCC Water Management Options and Temporary Pumping Operations and Maintenance

Reclamation proposes each year, as required, to reinstall pumps at four locations along the LFCC adjacent to the Rio Grande, which shall be used to convey supplemental water from the LFCC to the Rio Grande for the benefit of the RGSM and the SWWF. These sites are located at the northern boundary and southern boundary of Bosque del Apache Wildlife Refuge, Neil Cupp and at Fort Craig. Each location may require different actions before pumping may begin or to maintain the facility integrity and operations.

- The following operations and maintenance activities may be performed utilizing various types of heavy equipment at one or more of the pump sites:

- Pumping sites may require clearing of vegetation on both sides of the LFCC up to the Rio Grande within existing rights-of-way. Vegetation (weeds) may also be cleared or mowed on the eastern access road of the LFCC. In addition, vegetation (weeds) will be cleared at or near the pumps and the levee access road for safe access and as a precaution to prevent fires.
- The removal of sediment from conveyance channels west of the weirs and LFCC sumps and placement (spreading) the material in an area adjacent to channels and LFCC may be required.
- Pumping sites may require excavation of the adjacent Rio Grande levee (west levee) for removal or replacement of corrugated metal pipe (CMP) and polyvinyl chloride (PVC) pipe if they fail or if they are damaged. Excavation of levee material would be accomplished and spoil material would be placed on or adjacent to the Rio Grande west levee. The existing CMP or PVC pipe may need to be removed and replaced with new pipe as required.
- The trimming of vegetation within existing cleared areas of outfall channels and pipelines to improve access may be performed in the vicinity of the pump sites. Trimming of vegetation may be accomplished using chainsaws, other hand tools, and/or equipment.
- Pumping sites may require maintenance, resetting, and calibration of sheet pile weirs in existing conveyance channels. Maintenance may include excavation or re-grading of conveyance channels adjacent to weirs using excavating equipment.
- Breached or inundated conveyance channels east of the Rio Grande levee to the Rio Grande may require re-excavation. Excavation of deposited sediment will be accomplished using excavation equipment and the material will be placed adjacent to the conveyance channels within the existing rights-of-way. Also, dewatering of breached or inundated conveyance channels east of the Rio Grande levee to the Rio Grande channel may be necessary. The dewatering process will include first seining the channel for stranded RGSM and then pumping water from the channel while screening the pump to prevent RGSM from entering the pump intake.
- Pumping sites may require removal or demolition of existing facilities (fences, pipelines, earth channels) or structures (sheet pile weirs) associated with, or adjacent to, the existing pumping stations. Also, personnel may need to enter the Rio Grande channel on foot to remove material or debris that has become dislodged or otherwise been freed from existing pumping facilities.
- Placement of riprap, gravel material, earth fill, or synthetic erosion protection at required locations adjacent to the pumping stations may be performed in the floodplain or in the Rio Grande channel in order to maintain the integrity of the pumping facilities. Material placed may be used for bedding, bank stabilization, or area restoration. In addition, pumping sites may require placement of concrete at existing pumping facilities to seal breaches or protect the pumping facilities.

- Pumping sites may require construction, removal, or reconstruction of riprap check dams in the LFCC to provide a checked water surface for the pumps. This work will require use of heavy equipment to lift or relocate large rocks and large quantities of gravel material (used to seal voids in rock dams).

Water Conservation Measures

There are numerous water conservation and efficiency efforts taking place within the Middle Rio Grande Project system which include cooperative efforts by Reclamation and the Middle Rio Grande Conservancy District (MRGCD) under Reclamation's Water 2025 program.

With the challenges of meeting water demands on the Rio Grande in New Mexico, there is a need to provide for improvement on irrigation facilities to increase water management efficiencies. These improvements include gate canal and diversion dam gate automation and control with telemetry and water measurement to better track and control water deliveries, canal lining and studies for other system improvements. These measures will improve and modernize irrigation surface water conveyance facilities to increase water conveyance efficiency, reduce system losses due to seepage and evaporation, and improve water management in the Middle Rio Grande Valley. System improvements include but are not limited to: replacement of turnouts and old gates, concrete lining of canals, telemetry and measurement devices, automation, and a computer system able to manage hundreds of gates whose information can be dumped into the internet for access by other water agencies for managing flows of the Rio Grande. In addition, the potential for water conservation savings exists for individual on-farm improvements.

In addition, there are opportunities in the M&I sector for further water conservation savings in the Middle Rio Grande area. Examples would include but are not limited to more stringent usage of water for landscaping, retrofitting of shower heads and low flow toilets, the use of more efficient appliances such as clothes washers and dishwashers, and recycling of water in industrial processes

The long term impacts from these projects and M&I conservation measures on Reclamation's Program acquisition efforts are not fully known, however improvements to the Middle Rio Grande Project system will allow more flexibility in operations by the MRGCD.

2.3 Alternatives Considered but Eliminated from Further Study

In addition to alternatives considered and eliminated in the 2001 PEA, the following alternatives have been eliminated from further analysis in this document, but may be addressed in the Programmatic EIS for the CP. Reasons that further analysis was not pursued include the unavailability of funds, long-term nature of the alternatives which will be addressed in the Middle Rio Grande Endangered Species Collaborative Program Programmatic EIS, and jurisdiction and concurrence may reside with other identities.

Off-channel Interim Storage of Water at Refuges

In the 2001 PEA, it was proposed to utilize potential capacity in existing ponds in Federal and state refuges along the Rio Grande, which included the the Sevilleta National Wildlife Refuge, La Joya State Game Refuge, and the Bosque del Apache National Wildlife Refuge. Reclamation has explored opportunities at these refuges and with the state of New Mexico to store water, which might be available as a result of Reclamation's water leases or intervening high flow events. With this option, Reclamation would collaborate with the refuges to manage the release of this water to maintain native flows for silvery minnow benefits, and to ensure compatibility with refuge programs and operations.

After further study, it was concluded that there were constraints due to the logistics of the delivery system, i.e. inlet and outlet operations which would result in an extremely limited amount of wet water that would be made available to the river, and the threat of reduced water quality due to evaporation. There were concerns about growth of invasive species and the potential for growth of algae and bacteria associated with the ponded water.

Use of groundwater wells

This alternative which was part of the proposed action of the 2001 PEA, would entail the drilling of new wells by Reclamation. In addition, Reclamation could obtain the right to pump existing supplemental wells from willing lessors to augment Rio Grande flows during emergencies. Another component of this alternative includes the leasing by Reclamation of water from wells developed by other entities. The wells could be used to provide water in exchange for maintaining native flows.

It was determined that this option, which would result in a very limited amount of wet water available to the river, was constrained by water availability as the surface and groundwater supplies are hydraulically connected in the fully appropriated Middle Rio Grande.

Forbearance

This alternative involves the voluntary reduction of use of irrigation water so that water can be provided in the upstream reservoirs for storage. With the storage of water, instream flow could be maintained to benefit endangered species in the Middle Rio Grande. However, there are constraints on the storage of water, i.e. lack of storage facilities below El Vado for Rio Chama flows as well as timing of irrigation.

Although forbearance may be a promising alternative, it is beyond the scope of this document and the timing of such will require study in the PEIS for the Middle Rio Grande Endangered Species Act Program

Water Banking & Supplemental Water

Water banking is a fairly generic term applied to the temporary transfer of water between willing sellers/lessors and end users to stretch water supplies in times of shortage. In some cases, these

can be simple paper transactions that allow a change in the place of use over a single irrigation season. In other situations, water banking involves a complex transfer of water not just in place, but also in time. Transfers in time require a storage component for physical wet water. Surface water storage is typically accomplished by reservoir storage. However, groundwater storage may also be used thereby offering opportunities for conjunctive management of both surface and groundwater resources. For example, the state of Arizona is storing surplus Colorado River water supplies in their underground aquifer for future use as a water supply. Interstate water banking is then applied wherein the state of Nevada pays Arizona to store Nevada's excess Colorado River water in Arizona aquifers. When Nevada wants to redeem its storage credits, Nevada water users take surface water from Lake Mead. Arizona users benefit from the water stored underground in the aquifer.

Water banking may be pursued in the future, but is beyond the scope of this supplement and would require future environmental analysis.

Operation of Existing Reservoirs & Construction of New Reservoirs

In the middle Rio Grande, the greatest opportunities for improved water management lie in enhancing the ability to manage and store water along the mainstem of the Rio Grande. With the exception of a single flood control facility, Cochiti Lake, all other storage reservoirs are located on tributaries, most notably along the Rio Chama. The Rio Chama contributes about one third of flows into the middle Rio Grande. With the exception of flood control, the remaining two thirds of flows along the middle Rio Grande are largely unregulated. Cochiti Lake is operated by the U.S. Army Corps of Engineers and is authorized for the purposes of flood control and sediment control, recreation, and fish and wildlife resources.

The addition of new storage capacity in the Rio Grande system is a long-term endeavor requiring activities such as Congressional authorization, siting and feasibility studies, NEPA compliance, stakeholder and landowner concurrence, as well as time for the actual construction of a facility. The examination of re-regulation opportunities in Abiqui or Cochiti reservoirs or the benefits of creating new storage opportunities for mainstem flows is beyond the scope of this PEA and this alternative may be studied at a future date.



Chapter 3 Affected Environment and Environmental Consequences

3.1 Introduction

This section serves as an update of selected resources in the Program area and the associated environmental consequences resulting from the Proposed Action. Resources and related topics included in this chapter include hydrology and hydraulics, water resources and net depletions, fish and wildlife and threatened, endangered and special status species, environmental justice and Indian Trust Assets. Information contained in the 2001 PEA is incorporated by reference and will not be described in this document if the status of the resources has not changed over time. Also, included is a table of environmental consequences of the no action alternative and the various components of the proposed action alternative.

3.2 Description of Relevant Affected Resources and the Associated Environmental Consequences

3.2.1 Hydrology and Hydraulics

The Upper Rio Grande Water Operations Model (URGWOM) was originally used to evaluate the impacts on reservoir drawdown and river discharge for SJ-C contractor leases of 5,000 acre-feet, 25,000 acre-feet, and 70,000 acre-feet during dry, average, and wet probability inflows. The modeling methodology and results are described in detail in the 2001 PEA.

In general, the model runs predicted that the addition of supplemental water to the river system reduces the probability that intermittency and drying will occur below San Acacia, and the probability of drying is lowest when the greatest volume (70,000 acre-feet) of supplemental water is added to the system. The model runs showed that there is still some chance that the river could go dry below San Acacia even in wet years with as much as 70,000 acre-feet of leased water available for release. Conversely, the modeling indicated that the river could also maintain continuous flow during a dry runoff year depending on summer monsoonal activity and other hydrologic factors. Overall, the modeling results predict that the Supplemental Water Program can reduce the likelihood of the river going dry in several different types of runoff years.

Historic operations since 2001 have confirmed the river discharge predictions obtained through the initial modeling. River drying is most likely to occur during dry runoff years with poor monsoon seasons, and is least likely to occur during relatively wet runoff years with average to above average summer monsoons. As predicted by the model, the Supplemental Water Program has decreased the occurrence of river intermittency, and decreased the duration of river drying when intermittency has occurred.

The Supplemental Leasing Program likely results in slightly lower storage levels in Heron Reservoir, although there are no impacts on Heron Reservoir that are outside of the operational parameters envisioned during the authorization of the SJ-C Project. All water is leased from the existing annual allocations of SJ-C contractors that make up the 96,200 acre-feet annual firm yield of the SJ-C Project. Since full utilization of Heron's firm yield would result in annual delivery of the full 96,200 acre-feet allocation, reservoir drawdown is no greater than will be experienced once all contractors are taking delivery of their annual allocations. The potential

impact would be the result of a contractor's annual allocation not reverting back to the firm yield pool in Heron if the contractor were not able to obtain storage space in a downstream pool or find another party to lease and utilize their annual allocation.

With the City of Albuquerque's diversion project nearing completion, and the Cities of Santa Fe and Española moving toward direct diversion of their SJ-C allocation, it is likely that the SJ-C Project will soon experience full annual delivery of the 96,200 acre-feet firm yield with or without Reclamation's Supplemental Leasing Program. Some SJ-C contractors that have historically leased some or all of their annual allocations to Reclamation are being approached by other parties interested in negotiating leases for their annual allocations. The Supplemental Leasing Program is not anticipated to have any significant impacts to reservoir levels at El Vado, Abiquiu, or Cochiti reservoirs.

The Supplemental Water Program will provide water managers with an adaptive management tool to help compensate for the complexity and variability of the Rio Grande, allowing them to reduce the likelihood that the river will go dry. Changes in channel morphology and habitat are minimal from additional flow releases. The river transitions back and forth between single thread, homogenous cross sections (lower habitat value) and braided, highly variable cross sections (higher habitat value) downstream from Cochiti Lake. Supplemental water deliveries could potentially decrease the habitat value in the lower quality habitat reaches made up of single thread, homogenous cross sections by increasing flow depths and velocities. However, habitat values will increase in the high habitat reaches characterized by cross sections with braided, more variable flow depths and velocities. The increases in flows primarily act to keep the channel wet but can also wet side channels, backwater, sand bar, and embayment areas considered good silvery minnow habitat. Another concern regarding low flow augmentation is that riparian vegetation will become established on bar and depositional features, thereby narrowing the channel. Wetted areas maintained by the Supplemental Water Program primarily are those that are frequently inundated. Therefore, any vegetation establishing itself in these frequently inundated areas are exposed to sediment scouring and deposition, and it is unlikely that they will become established.

Another potential consequence of water leasing and delivery waivers is the effect on irrigation operations from the change in timing water deliveries. Reclamation will coordinate with the MRGCD and local irrigators to ensure that changes in delivery operations will account for irrigation deliveries. Supplemental Water Program deliveries will assist in providing more flow at Isleta and San Acacia Diversion Dams, which will ultimately allow for both diversion and passing water at the dams.

Therefore, the implementation of the Action Alternative will likely result in less drying of the river and beneficial impacts to the RGSM and the SWWF will occur. Without the implementation of water conservation measures, there may be more groundwater seepage, which would result in less conveyance of water through the various reaches of the Rio Grande system. In addition, with the No Action Alternative, it is extremely likely that the Rio Grande will dry in reaches that provide habitat for the RGSM. No additional water would be available to keep the river continuously wet. However, there would be no reservoir drawdown from delivering water that was previously stored upstream. Also, without pumping from the LFCC, there is a much greater risk of river drying in the San Acacia reach of the river.

3.2.2 Water Resources and Net Water Depletions

The Rio Grande Compact, in effect, limits the amount of surface water that can be depleted in the MRG based upon the natural flow of the river measured at the Otowi gage (Rio Grande Compact 1939). In addition, the New Mexico State Engineer has determined the MRG is presently fully appropriated. Therefore, any increase in water use in one sector of use must be offset by a reduction in use in another sector such that senior water rights or the ability of the state of New Mexico to meet its downstream delivery obligations are not impaired. The New Mexico State Water Plan (Office of the State Engineer/Interstate Stream Commission 2003) requires that new projects will not result in increases in net water depletions or that any increases in net water depletions are offset by purchased or leased water rights.

The No Action Alternative would result in no change in water resources or net water depletions as the Program would not be continued. The Proposed Action is not expected to have any impact on net water depletions to native Rio Grande waters. Any impact on native Rio Grande water depletions as a result of the pumping and conveyance of water from the LFCC to the Rio Grande is addressed through Reclamation's permanent pumping permit issued by the New Mexico Office of the State Engineer.

3.2.3 Biological Resources

Fisheries

The Middle Rio Grande is a high gradient, warm water river. The river is characterized by warm summer water temperature, low velocity, high turbidity, shallow water with large exposed area, and small particle substrate. Eleven of the original 24 native fish species in the Middle Rio Grande have been completely extirpated from the river; two are presumed extinct, and one, the RGSM, is a federal and state listed endangered species. Seventeen nonnative fish species are found in the river and include robust populations of common carp, mosquitofish, and channel catfish. A combination of factors is responsible for the loss of half the native fish community in the Middle Rio Grande, including modification of river discharge patterns, channel dewatering resulting from irrigation, channel incision leading to habitat degradation, the presence of instream barriers to migratory fish movement, entrainment of fish into less suitable habitat in irrigation canals and the LFCC at diversion dams, changes in water quality, and possible competition and predation by nonnative species. Aquatic habitats in reaches of the Rio Grande below San Acacia Diversion Dam are thought to be more representative of native conditions than habitats elsewhere in the Middle Rio Grande, though substantial habitat degradation has occurred. High spring runoff and summer thunderstorms cause large variability in discharge. Part of the river can dry during the summer and the habitat can become fragmented and intermittent. The most severe impact to riverine fish habitat from San Acacia Diversion Dam to the headwaters of Elephant Butte Reservoir is channel dewatering.

The LFCC contains a diverse assemblage of fish species. Recent surveys (2001-2004) of the LFCC have collected seventeen species. A single RGSM was observed in 2001 in the Tiffany reach of the LFCC, and may have moved upstream from the confluence with the Rio Grande. The LFCC is not believed to provide suitable habitat for long-term survival and recruitment of this species. Sampling following the LFCC experimental diversion operations in 2003 and 2004

did not observe any silvery minnows in the upper nine miles of the LFCC. Changes in scheduling experimental operations to avoid the prime spawning appear to have excluded RGSM from entrainment.

The No Action alternative is likely to result in increased river drying and adverse effects to long reaches of the MRG as documented in the 2003 BA and BiOp, which would negatively impact fisheries. By contrast the Proposed Action will result in less drying of river reaches especially south of the San Acacia Dam, which would positively impact the fisheries resource.

3.2.4 Threatened, Endangered and Special Status Species

The RGSM and the SWWF are discussed in this subsection and information concerning these species described in the Programmatic Biological Assessment (BA) of the Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation and Non-Federal Actions on the Middle Rio Grande, New Mexico, March 1, 2003 – February 28, 2013 and the associated 2003 BiOp are incorporated by reference. Updated information from the 2001 PEA concerning these two species is summarized in this subsection as well as the other listed species.

Rio Grande Silvery Minnow (*Hybognathus Amarus*)

The RGSM, *Hybognathus amarus*, was listed as an endangered species in 1994 (Fish and Wildlife Service 1994). The RGSM was formerly one of the most widespread and abundant species in the Rio Grande basin in New Mexico, Texas, and Mexico. Currently, the RGSM occupies a 280 km (174 mi) reach of the Rio Grande in New Mexico, from Cochiti Dam to the headwaters of Elephant Butte Reservoir (Bestgen and Platania 1991, Dudley et al. 2005a,b). Critical habitat for this species was designated on February 19, 2003 (Fish and Wildlife Service 2003) for the Rio Grande immediately downstream of Cochiti Dam, to the Power Lines Crossing at the top of the Elephant Butte pool.

The decline of the RGSM has been attributed to dewatering of portions of the Middle Rio Grande below Cochiti Dam through water-regulation activities, the construction of main stem dams, the introduction of non-native competitor/predator species, and degradation of water quality (Fish and Wildlife Service 1999, 2006). Recent studies (Porter and Massong 2004, 2005) have linked successful spawning and recruitment with channel morphology and spring hydrograph. Habitat degradation following the closure of Cochiti Dam and intermittency in populated reaches are major factors in the decline of the RGSM (Platania and Altenbach 1998; Porter and Massong 2004; Dudley et al. 2005a).

The RGSM has been collected in shallow water (<20 cm) characterized by low velocities (<10 cm/sec) over a silt or sandy substrate. These conditions are typical of pools, backwaters, and secondary channels (Dudley and Platania 1997). Spawning occurs in May-June coinciding with spring runoff with individual females producing up to 3,000 semi-buoyant, non-adhesive eggs (Platania, 1995; Platania and Altenbach, 1996). Egg hatching time is temperature dependent but rapid, and generally occurs in 24-48 hours (Platania 2000). Successful hatching and recruitment are correlated with the availability of inundated floodplain habitat. Lower spring flows result in higher numbers of drifting eggs and reduced recruitment. Suitable spawning conditions with high

larval and juvenile survival are key to species survival. Survival of young fish depends on the availability of shallow, low velocity nursery habitats.

Population monitoring from 1999 through 2005 showed declining abundance of silvery minnows associated with years of poor spring runoff and floodplain connectivity. Spike flow releases in 2002 and 2003 resulted in high numbers of drifting eggs and declining populations. Increased spring runoff in 2004 and 2005 inundated floodplain habitat resulting in fewer eggs in the drift, significantly increased recruitment and fall silvery minnow populations (~40-50x from the previous year) based on October fish community surveys (Dudley et al. 2005a, b; Platania and Dudley 2003, 2004, 2005)."

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The SWWF has been a federally-listed endangered subspecies since 1995 and is also classified by the State of New Mexico as endangered. The SWWF is an obligate riparian species occurring in habitats adjacent to rivers, streams, or other wetlands, characterized by dense growths of willows, seepwillow, arrowweed, saltcedar, or other similar species. This habitat is often associated with a scattered overstory of cottonwood.

In New Mexico, the species has occurred in the Rio Grande, Rio Chama, Zuni, San Francisco, Pecos, and Gila River drainages. Available habitat and overall numbers of Willow Flycatchers have declined statewide. Its decline has been largely attributed to the hydrological and ecological changes which have affected the composition and extent of floodplain riparian vegetation along the Middle Rio Grande; introduction of exotic species, such as saltcedar, which have decreased the availability of dense willow stands and associated habitat; fragmentation of forested breeding habitat; and rapid deforestation in tropical areas. In addition, brood parasitism by Brown-headed Cowbirds has been implicated in their decline.

Surveys and nest monitoring have been conducted since 1994 within the Rio Grande Basin during the May to August breeding season. In recent years, breeding pairs have been found within the Middle Rio Grande above Elephant Butte Reservoir, in the San Marcial and Tiffany areas, and between Española and Velerde, New Mexico. Most breeding territories have been found in young and mid-aged riparian vegetation dominated by dense growths of willow at least 10 feet high. Within these willow patches, nests occasionally have been found on saltcedar plants, especially in older, taller willow patches where an understory of saltcedar provides suitable nesting substrate (Moore and Ahlers 2005, Moore 2005).

Bald Eagle (*Haliaeetus leucocephalus*)

The Bald Eagle is federally- and state-listed as threatened. This species prey mostly on fish and waterfowl and are therefore attracted to waterbodies where there are concentrations of fish and wintering waterfowl. Eagles arrive about mid-November and depart around mid-March. In the Middle Rio Grande, most Bald Eagles use ponds at Bosque del Apache National Wildlife Refuge and the shoreline of Elephant Butte and Caballo reservoirs (R. Doster, pers. comm.). Bald Eagles occasionally use cottonwood trees in the riparian zone for perches and night roosts. The closest known breeding territory to the project area is west of Caballo Reservoir.

Interior Least Tern (*Sterna antillarum athalassos*)

This subspecies is federally- and state-listed as endangered. The Least Tern nests in open sandy areas, such as river sandbars and alkali flats. The major portion of the population resides in the Mississippi River basin, although breeding is known to occur at Bitter Lake National Wildlife Refuge, near Roswell, New Mexico, and Brantley Lake, near Carlsbad, New Mexico. Occasional migrant Least Terns have been observed at Bosque del Apache National Wildlife Refuge. Sandbars on the Rio Grande are probably unsuitable for nesting because of fluctuating water levels and periodic flash flows.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*)

This subspecies is under consideration for listing under the ESA because of serious declines throughout the west. The magnitude of threats to the Western Yellow-billed Cuckoo has been determined to be high and the threats are ongoing and considered imminent (USFWS 2005). Despite the magnitude of threats facing this species, the Service maintains that listing is precluded by other, higher-priority species. Suitable breeding habitat exists within the project area and detections of cuckoos are made regularly during the course of Willow Flycatcher surveys (Moore and Ahlers 2005) and other field work, however population levels have not yet been quantified.

Loggerhead Shrike (*Lanius ludovicianus*)

This species is a former federal candidate species and is currently considered a Species of Conservation Concern by the USFWS (USFWS 2002). Its habitat is comprised by desert, grasslands, agricultural fields, and/or open woodlands.

Neotropic Cormorant (*Phalacrocorax brasilianus*)

The State of New Mexico list the Neotropic Cormorant as threatened. The species is found at Bosque del Apache National Wildlife Refuge and other wetlands within the project area, such as the delta of Elephant Butte Reservoir. The species appears to be in decline as nesting colonies have not been observed in recent years (S. Williams, pers. comm.)

Bell's Vireo (*Vireo bellii*)

This species is listed by the State of New Mexico as threatened and is considered a Species of Conservation Concern by the USFWS (USFWS 2002). Its habitat requirements overlap, to some extent, those of the SWWF, nesting in dense, periodically flooded stands of willows and other riparian shrubs. However, unlike the Willow Flycatcher, its territories include adjacent open stands of upland desert shrub, mesquite, and dry saltcedar. Bell's Vireos are relatively mainly found in the San Marcial area of the Middle Rio Grande Project area (R. Doster, pers. comm.).

As noted in the environmental consequences discussion for Fisheries, the No Action alternative is likely to result in increased river drying and adverse effects to long reaches of the MRG as documented in the 2003 BA and BiOp which would negatively impact the RGSM, SWWF, western Yellow-billed Cuckoo as well as the other special status species and their associated

habitat. Conversely, with the availability of increased flows of water and the flexibility of releases of this water from water leasing, waiver requests, water agreements, and LFCC pumping, the habitat available to the above species should be enhanced as well as the survivorship of these species in the MRG. Impacts to the RGSM in the LFCC are considered to be minimal as the RGSM is not commonly found in the channel. All O&M activities would be carefully mitigated with silt curtains and other applicable BMPs to mitigate for any adverse impacts to the RGSM. No long term impacts are anticipated to the Bald Eagle, if the Program were implemented. The Proposed Action may affect but is not likely to adversely impact the Bald Eagle due to work associated with the LFCC pumping O&M activities during the winter period.

3.2.5 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994)*, directs federal agencies (as well as State agencies receiving federal funds) to assess the effects of their actions on minority and/or low-income populations within their region of influence. The order requires agencies to develop strategies to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

The U.S. Environmental Protection Agency (EPA) published the *Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses (1998)*, which indicates that a minority population exists when either:

- The minority population of the affected area is greater than fifty percent of the affected area's general population, or
- The minority population percentage of the affected area is meaningfully greater than the population percentage in the general population or other appropriate unit of geographic analysis.

An environmental justice screening analysis must determine whether any significant impacts of the Proposed Action (if any) would disproportionately adversely affect local low-income and/or minority populations. If a disproportionate impact is determined, mitigation measures must be implemented to reduce the adversity of the impact to a less-than-significant level. According to the federal guidelines, the environmental justice screening analysis assesses whether "the potentially affected community includes minority and/or low income populations." The guidelines indicate that a minority population exists when the minority population is 50 percent or more of the affected area's total population. The 50 percent threshold is also used to determine the presence of low-income populations in the study area.

For the purposes of this analysis, the area affected is defined as the Middle Rio Grande basin in the state of New Mexico. As reported in the 2004 U.S. Census, none of the jurisdictions in the affected area have low-income populations of greater than 50 per cent, however some of the counties in the project area have Hispanic/Latino populations that are over 50 per cent of their population. As was determined in the 2001 PEA, no disproportionate adverse effects on minority or low-income populations would result from the Proposed Action since only willing lessors would enter into water leases and no economic losses to farmers or an impairment of the

amount of irrigation water is expected from the Proposed Action. No adverse effects on minority or low-income populations are anticipated as a result of the No Action alternative.

3.2.6 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in assets held in trust by the United States Government for Indian tribes or for Indian individuals. Some examples of ITAs are lands, minerals, water rights, hunting and fishing rights, titles, and money. ITAs cannot be sold, leased, or alienated without the express approval of the United States government. The United States has a trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or individuals by treaties, statutes, Executive Orders, and rights further interpreted by the courts. This trust responsibility requires that all Federal agencies take all actions reasonably necessary to protect such trust assets.

As noted in the 2001 PEA, the Program could potentially affect ITAs, which include allocated and contracted SJ-C water and impairment of the Rio Grande and general environmental quality. However, as previously described, the effects of the Proposed Action are beneficial to the environment, which results primarily from increased streamflow. Potentially, the release and management of leased water for RGSM could increase river flows through Pueblo lands. Therefore, the Program is not expected to impair the use, access or the value of any ITAs.

With the No Action alternative, no impacts to ITAs would occur.

3.2.7 Irretrievable Commitment of Resources

The implementation of the Project will result in the commitment of resources such as fossil fuels, construction materials, and labor. In addition, Federal funds will be expended for the water leasing program, operations associated with the O& M activities for the LFCC pumping operations, and the implementation of water conservation measures.

3.2.8 Cumulative Impacts

The National Environmental Policy Act (NEPA) defines cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (42 U.S.C. 4331-4335). Cumulative environmental impacts associated with the following projects have been evaluated for the following projects relative to the Proposed Action.

Middle Rio Grande Endangered Species Act Collaborative Program

The Middle Rio Grande Endangered Species Act Collaborative Program has solicited and funded multiple habitat restoration projects, RGSM augmentation projects, water acquisition planning, and various science research projects. RGSM augmentation funded by the Collaborative Program should provide positive interactions with the various elements of the Program, and the various habitat restoration projects should also experience some positive cumulative impacts to the RGSM and SWWF as well as their associated habitats as a result of the Proposed Action.

Upper Rio Grande Water Operations (URGWOPS) Environmental Impact Statement

Currently, the USACE, the ISC, and the Bureau of Reclamation are signatories of a MOA to develop integrated water operations rules for several dams on the Rio Grande upstream of the project area (URGWOPS 1999). As previously noted, all activities would be fully coordinated and be consistent with the implementation of rules implemented from the URGWOPS study.

3.2.9 Summary of Effects to Each Resource

As documented in the table below, positive impacts or no impacts would result from the proposed action; the no action alternative will have adverse impacts on some resources due to river drying and no impact on the other resources analyzed. The overall effects of the continuation of the Program (Proposed Action) and the discontinuation of the Program (No Action) are summarized in Table 3-2.

Table 3.1 Environmental Consequences of Proposed Action and No Action Alternatives

Environmental Resources	Proposed Action	No Action
Hydrology and Hydraulics	No impacts to reservoir levels on the MRG with the exception of Heron Reservoir; adaptive management may result in less river drying	More drying of river is anticipated; no impacts to any MRG reservoirs
Water Resources and Net Depletions	No change in water resources and net depletions	No change in water resources and net depletions
Biological Resources	Positive impact on fisheries due to lower likelihood of river drying	Adverse impact to fisheries and wildlife due to increased river drying
Threatened, Endangered, and Special Status Species	Positive impacts to the RGSM, SWWF and Western Yellow-billed Cuckoo are anticipated. LFCC operations may affect but not likely to adversely affect the bald eagle	Adverse impacts to the RGSM, SWWF and Western Yellow-billed Cuckoo are anticipated due to increased river drying; no impacts to the bald eagle are anticipated
Environmental Justice	No adverse effects are anticipated	No change in existing conditions
Indian Trust Assets	No impairment of ITAs are anticipated	No change to any existing ITAs

Chapter 4 Environmental Commitments

Appropriate ESA compliance for LFCC O & M work will be undertaken.

Clean Water Act compliance is anticipated for the LFCC O&M activities since most of the work will be completed within aquatic areas, which will require individual 404 permits. State water quality certification permits under Section 401 of the CWA will also be obtained, as required.

OSE permitting as required

Standard Best Management Practices (BMPs) shall be employed as appropriate to include the following elements.

The Government or Contractor shall:

- 1) grade the applicable worksites so that the land surface conforms to the surrounding natural or pre-existing topography,
- 2) construct drainage channels or berms to control runoff
- 3) clean all equipment outside the floodplain and work in a manner to minimize the spread of noxious weeds
- 4) clean all equipment outside the floodplain prior to entering the Rio Grande or its tributaries and prior to cleaning, identify areas for cleaning equipment
- 5) maintain hazardous spill prevention kits at all pumping sites and clean-up any spills or leaks immediately, including spills on earthen surfaces

Chapter 5 Consultation and Coordination

In preparation of this EA, formal or informal coordination was conducted with the following entities:

- U.S. Army Corps of Engineers (Cooperating Agency)
- U.S. Fish and Wildlife Service
- New Mexico Interstate Stream Commission (Cooperating Agency)
- Middle Rio Grande Conservancy District (Cooperating Agency)
- Sandia Pueblo

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