Draft Environmental Assessment

Rehabilitation of the Acequia De Chamita
Rio Arriba County, New Mexico

US Army Corps of Engineers.

Albuquerque District

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ACRONYMS & ABBREVIATIONS

%	Percent
°	Degrees
ac	acre(s)
APE	Area of Potential Effects
BMP	Best Management Practice
C°	Celsius
CAA	Clean Air Act
cfs	cubic feet per second (ft^3/s)
CGP	Construction General Permit
cm	centimeters
CO	Colorado
CWA	Clean Water Act
DoD	U.S Department of Defense
EA	Environmental Assessment
EO	Executive Order
EPA	Environmental Protection Agency
F°	Fahrenheit
FONSI	Finding of No Significant Impact
ft.	feet
in	inch(es)
HTRW	Hazardous, Toxic and Radioactive Waste
IPaC	USFWS's Information Planning and Consultation tool
ISC	New Mexico Interstate Stream Commission
km	kilometer(s)
m.	meter(s)
mi	mile(s)
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NM	New Mexico
NMAQCA	New Mexico Air Quality Control Act

NMDGF	New Mexico Department of Game and Fish
NMED	New Mexico Environmental Department
NMEMNRD	New Mexico Energy, Minerals, and Natural Resources Department
NMHPD	New Mexico Historic Preservation Division
NMSF	New Mexico State Forestry Division
NOI	Notice Of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
PM	Particulate Matter
PVC	Polyvinyl chloride pipe
RCAA	Rio Chama Acequia Association
RCP	48-inch non-perforated reinforced concrete pipe
RCSA	Rio Chama Study Area
SHPO	State Historic Preservation Office
SWPPP	Storm Water Pollution Prevention Plan
TCP	Traditional Cultural Properties
THPO	Tribal Historic Preservation Office
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

1. INTRODUCTION

1.1 Background and Location

The United States Army Corps of Engineers (USACE), Albuquerque District in cooperation with the New Mexico Interstate Stream Commission (ISC), and at the request of the Rio Chama Acequia Association (RCAA), a community ditch association in Rio Arriba County, New Mexico (NM) is planning the rehabilitation of the Acequia de Chamita system (Project) to improve critical water supply infrastructure and address water delivery and sedimentation concerns.

The Water Resources Development Act of 1986 (Public Law 99-662) authorized the restoration and rehabilitation of irrigation ditch systems (acequias) in NM. Under Section 1113 of the Act, Congress has found that NM's acequias date from the eighteenth century and, due to their significance in the settlement and development of the western U.S., should be restored and preserved for their cultural and historic values to the region. The Secretary of the Army, therefore, has been authorized and directed to undertake, without regard to economic analysis, such measures as are necessary to protect and restore NM's acequias, with a non-Federal work share of 25%.

The headwaters of the Rio Chama originate in the San Juan Mountains between NM and Colorado (CO). Surface flow originates from the higher peaks such as the San Antonio Peak (elevation of 10,908 ft. [3,325 m]) at the eastern extent of the basin. The Rio Chama is aligned in a general southeasterly meandering pattern with moderate slopes except for its downstream confluence with the Rio Grande. The Rio Chama Study Area (RCSA), located in north-central NM, consists of the Rio Chama from downstream of Abiquiu Dam to confluence with the Rio Grande near Española, NM, an approximate reach of 48 kilometer (km), or 30 miles (mi); and along two tributaries of the Rio Chama: El Rito, located about 24 km (15 mi) upstream of Rio Chama's confluence with the Rio Grande, and Rio Ojo Caliente which is located about 9.6 km (6 mi) upstream of Rio Chama's confluence with the Rio Grande. The RCSA is defined as the above-river segments plus surrounding lands containing facilities for delivering water to members of numerous local acequia organizations. The RCAA includes 28 acequias within the RCSA and has the oldest water rights in the state (USACE, 1999).

The Project is located at the confluence of the Rio Chama and the Arroyo de la Presa, approximately 1.0 km (0.62 mi) northwest of the village of Chamita, Rio Arriba County, NM (Figure 1). The acequia conveys water from the left side of the diversion (looking downstream) and courses southeasterly, roughly parallel to State Road 74 (NM-74) for approximately 5.6 km (3.5 mi) (Figure 2). It terminates in the Rio Grande approximately 0.80 km (0.5 mi) west of Ohkay Owingeh Pueblo serving approximately 1,000 acres (ac) of irrigated land for various purposes.

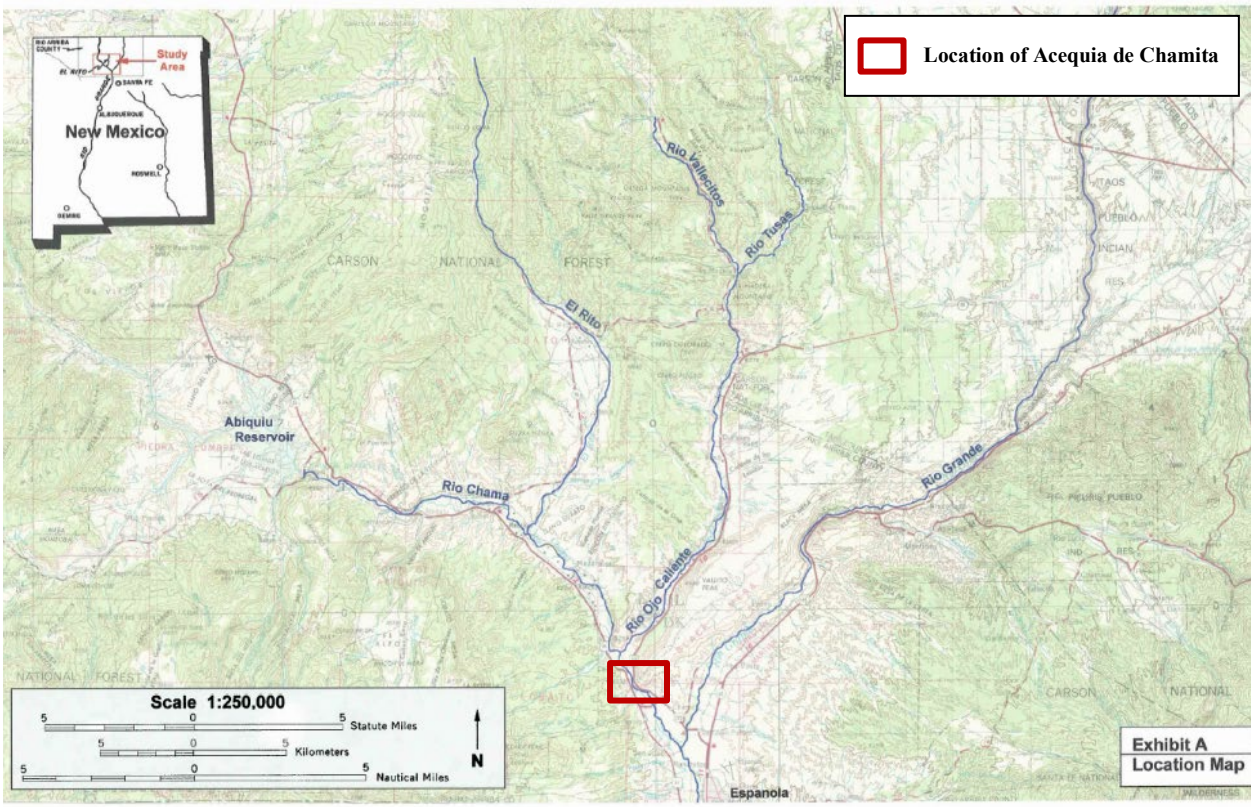

Figure 1. Location of the Acequia de Chamita, Rio Arriba County, New Mexico.

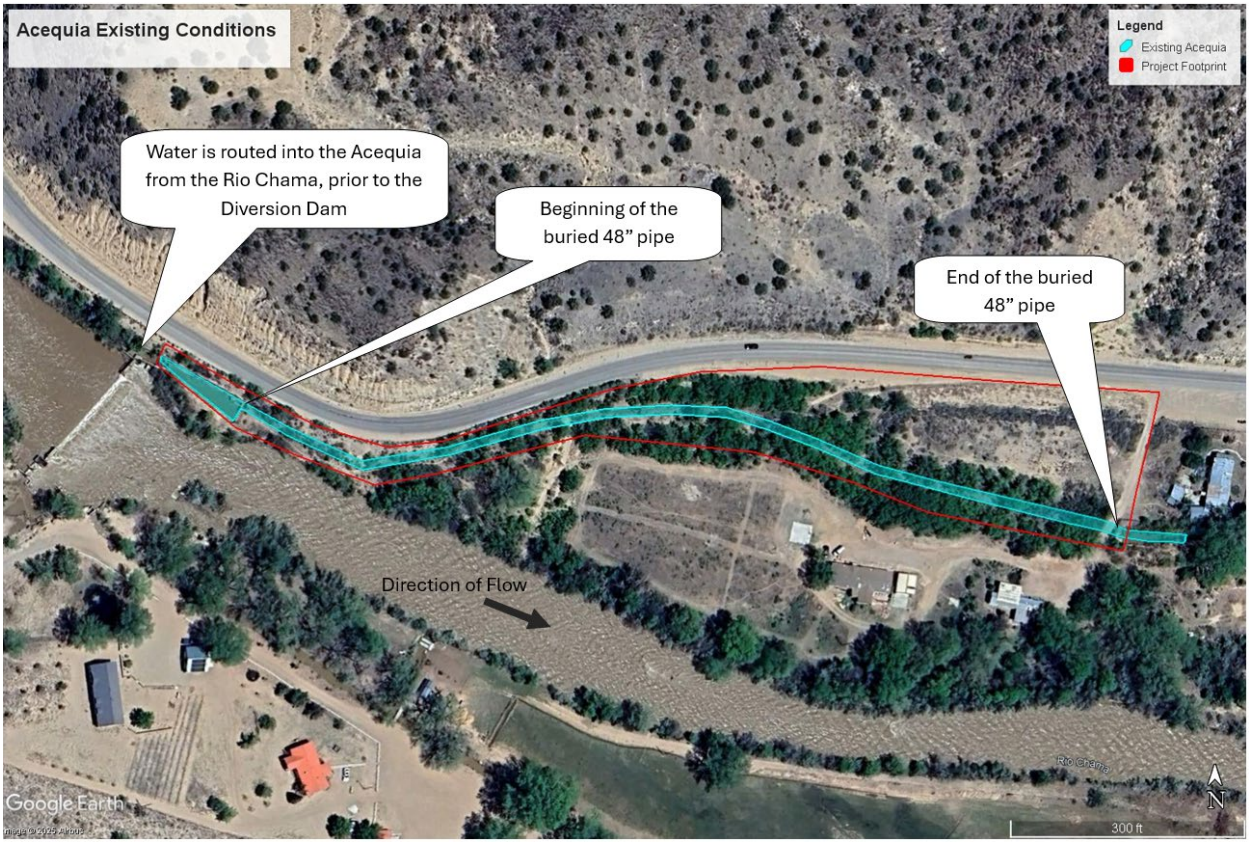

Figure 2. Close-up of the Existing Conditions of the Acequia de Chamita

In March 2000, Section 1113 rehabilitation work was completed on the acequia to correct serious aggradation problems attributed in part to frictional losses in beds and a lack of sluicing capability. Features of this work included: (1) Construction of a concrete headwall to match the diversion outlet to 48-inch polyvinyl chloride (PVC) pipe, (2) Installation of a total of 3,443 feet (ft) [1,049 meters (m)] buried 48-inch diameter PVC pipe at three sections within the ditch, and (3) Replacement of a flume and adding a gate and sluice pipe to an existing flume. Environmental impacts associated with this work were addressed in the Final Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) titled "*Rehabilitation of the Acequia de Chamita, Rio Arriba County, New Mexico*" which was signed on November 1998 (98 EA). A copy of this document is available upon request from the USACE Albuquerque District, Environmental Resources Section.

The Acequia de Chamita ties into an existing concrete diversion weir, directing flow into a diversion structure which removes sediment and delivers flow into the buried 48-inch PVC pipe that terminates at a downstream sluicing/return structure. As an environmental measure, the 48-inch PVC pipe was perforated to allow water seepage in support for the growth of riparian vegetation.

1.2 Purpose and Need

The 98 EA described work designed to correct problems in the ditch associated with aggradation resulting, in part, from frictional losses in bends and a lack of sluicing capability. Although the perforated 48-inch PVC pipe was designed to facilitate the development of saturated soils, roots from the surrounding vegetation have pierced through the pipe perforations, creating root networks within the 48-inch pipe that act as netting capturing sediment and debris. This effect has created a maintenance demand far greater than anticipated. Regularly, the acequia system experiences significant conveyance issues, resulting in water loss, safety risks, and high maintenance costs to dredge the conveyance channel and repair damages. This maintenance action usually involves someone (often the smallest person) climbing down into the 48-inch pipe to manually clear roots, organic debris and sediment build-up out of the 48-inch pipe to achieve water conveyance.

The Acequia de Chamita is slated for improvements aimed at increasing its operational efficiency, structural resilience, and safety. A key focus of the effort is to evaluate alternatives to the sections containing the existing 48-inch perforated PVC pipe, which has proven to be maintenance-intensive and operationally limiting. To reduce long-term maintenance demands while maintaining reliable downstream water delivery, the project team is exploring the replacement of the current subsurface system with an open, cement-lined channel. This design would improve accessibility and reduce clogging risks while also aligning with regional practices that emphasize gravity-fed systems, surface flow visibility, and multi-benefit infrastructure.

1.3 Regulatory Compliance

This EA was prepared by USACE, in compliance with all applicable Federal Statutes, regulations, and Executive Orders (EO), as amended, including, but not limited to, the following:

- Clean Water Act (33 U.S.C 1251 *et seq.*)
- Clean Air Act (42 U.S.C. 7401 *et seq.*)
- Section 106 of the National Historic Preservation Act [54 U.S.C. § 300101 et seq.]
- Archaeological Resources Protection Act (16 U.S.C. 470aa *et seq*.)
- Endangered Species Act (16 U.S.C. 1531 *et seq*.)
- EO 11988, Floodplain Management
- National Environmental Policy Act (42 U.S.C 4321 *et seq*.)
- Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 *et seq*.)
- EO 11593, Protection and Enhancement of the Cultural Environment
- EO 11990, Protection of Wetlands
- Farmland Protection Policy Act (7 U.S.C. 4201 *et seq.*)
- EO 13112, Invasive Species
- Federal Noxious Weed Act (7 U.S.C. 2814)
- Energy Independence and Security Act of 2007, P.L. 110-140, Section 438, 121 Stat.1492, 1620 (2007)
- Migratory Bird Treaty Act, 16 U.S.C. 703, et seq.
- Fish and Wildlife Coordination Act, 48 Stat. 401; 16 USC 661 et. seq.
- EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds
- EO 13751 - Safeguarding the Nation from the Impacts of Invasive Species

This EA also demonstrates accordance with the local project Sponsor (RCAA), and compliance with all relevant State of NM and local regulations, statutes, policies, and standards aimed at protecting and conserving the physical, biological cultural and socioeconomic environment, including soils, water, climate, land use, air quality, noise, aesthetics, species of special status, vegetation communities, wildlife and hazardous, toxic, and radioactive waste (HTRW).

This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. §§ 4321 et seq.) and the Department of Defense (DoD) NEPA Implementing Procedures. The Assistant Secretary of the Army for Civil Works (ASA(CW)) has removed most of the sections from 33 CFR 230 (USACE NEPA guidance originated in 1988) and indicated that the Civil Works program will follow the DoD Implementing Procedures for NEPA issued on 30 June 2025.

2. ALTERNATIVES CONSIDERED

Alternatives development may include design and/or location adjustments to minimize or reduce the impacts of a Proposed Action. This NEPA process helps decision-makers evaluate current and future conditions concerning the timing and implementation of an action at a specific site. Ultimately, the preferred design, based on the alternatives evaluated, can be implemented to serve the best interests of both the public, the natural environment and the cultural significance. This NEPA analysis considers two alternatives:

(1) the No-Action Alternative, which serves as the baseline for comparison.

(2) the Acequia Rehabilitation Alternative, which addresses the needs of the RCAA.

2.1 No-Action Alternative

The No-Action Alternative is a required pursuant to NEPA, which generally means that the Proposed Action would not take place and considers the likely future conditions in the project area in the absence of the cost-shared and locally supported project. The No-Action Alternative would not include any of the necessary acequia rehabilitation work, nor would it alleviate water conveyance and maintenance issues. Under this Alternative, there would neither be improvements nor modifications to the existing acequia system.

2.2 Acequia Rehabilitation Alternative (Proposed Action)

The Project proposes the following work as the preferred plan (Proposed Action) which would rehabilitate the existing acequia and address the current problems/concerns, with the goal to resolve long-standing maintenance issues while enhancing overall system functionality, durability and safety. The Proposed Action would involve a full replacement of the existing conveyance infrastructure with more resilient, safe and hydraulically efficient components by removing the entire perforated 48-inch pipe (≈ 1, 100 linear ft)(≈ 335 m), and in its place, install approximately 300 linear ft. (≈ 91 m) of 48-inch non-perforated reinforced concrete pipe (RCP) in combination with approximately 800 linear ft (≈ 244 m) of fiber-reinforced concrete-lined open irrigation channel (Figure 3).

In addition, the existing conduit has a total of two manholes and one sluicing box between the upstream diversion and downstream sluicing structure. All existing manholes and sluicing boxes would be demolished, removed and replaced. Depending on their function and location, they would be replaced with either new gated sluicing boxes or gated turnout structures, ensuring consistent water delivery and better sediment management throughout the system.

The proposed acequia modifications and improvements may be constructed over various phases based on priority needs. The total area of disturbance, (including the access, staging, and stockpile locations) is estimated at 3.4 ac. The duration for construction of the proposed action would last approximately 4 months and would occur during the winter season (i.e. non-irrigation season) (preferably between October and March). Restoration of all disturbed areas, including grading and seeding would occur after construction. The vegetative seed mix would increase the likelihood of successful re-establishment, as well as providing improved habitat for organisms typically found in floodplain riparian zones.

The Proposed Action offers an approach that balances structural reliability with accessibility for routine maintenance and water flow visibility; key elements in traditional acequia systems. This comprehensive redesign would position the Acequia de Chamita for long-term resilience while honoring its traditional irrigation function and supporting the water needs of agricultural users downstream.

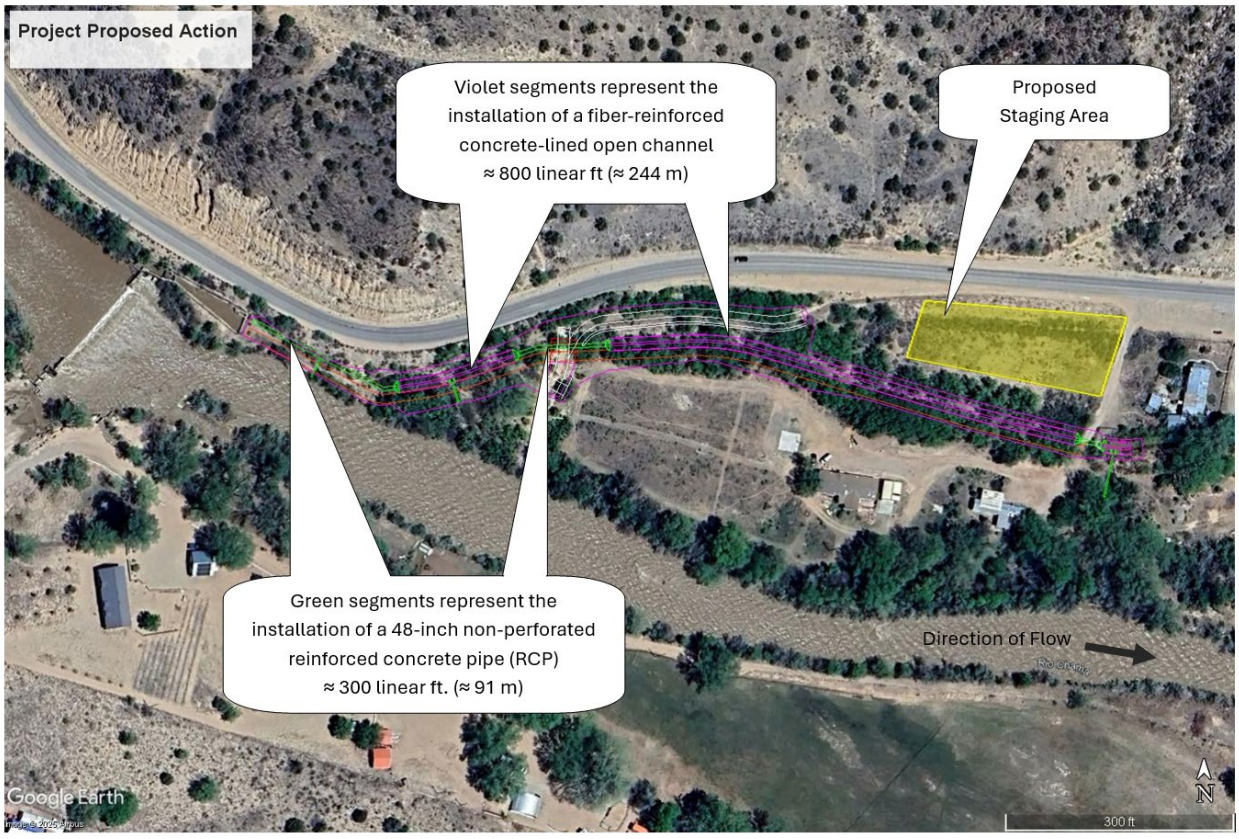

Figure 3. Summary and description of the Proposed Action including proposed Staging Area.

3. EXISTING ENVIRONMENT AND FORESEEABLE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

The sections below describe the affected environmental setting with emphasis on various categories pertinent to the RCSA surrounding the Project. The categories evaluated include the physical environment such as physiography, geology, soils, climate, hazardous waste, water resources, floodplains, wetland and land use as well as the biological environment such as vegetation communities, wildlife, threatened and endangered species (species of special status), and the cultural and socioeconomic environment.

3.1 Physical Environment

3.1.1 Physiography, Geology, and Soils

3.1.1.1 Existing Conditions

The Project is located within the Southern Rocky Mountain Physiographic Province which extends from CO into the north-central part of NM. The Rio Chama watershed covers a large area, and it extends to the Continental Divide to the west and north, and to the Rio Grande watershed to the east.

Predominant soils series in the project area are Abiquiu, Peralta, Gilco, Walree, Florita, and Fruitland. Soils in the Abiquiu series are classified as sandy-skeletal, mixed, mesic Typic Ustifluvents. These are generally deep and poorly drained soils formed in alluvium derived from igneous, metamorphic and sandstone rocks and are on floodplains. Soils in the Peralta series are classified as coarse-loamy, mixed (calcareous), mesic Typic Ustifluvents. These generally deep and poorly drained soils formed in alluvium derived from igneous, sedimentary and metamorphic rocks and are on floodplains.

Gilco soils are classified as coarse-loamy, mixed (calcareous), mesic Typic Torrifluvents. These soils are deep and well-drained and have their origin in alluvium derived from sedimentary and igneous rocks. They are found on floodplains and alluvial fans on slopes of 0 to 3 percent (%). Walrees soils are classified as fine-loamy over sandy or sandy-skeletal, mixed (calcareous), mesic Aquic Ustifluvents. They are generally deep and poorly drained soils formed in alluvium derived from mixed sources and are found on floodplains.

Soils in the Florita series are classified as coarse-loamy, mixed, non-acid, mesic Ustic Torriorthents. They are generally deep and well-drained soils formed in alluvium derived from sandstone and occur on hills and terrace risers. Slopes range between 2% - 45%. Fruitland soils are classified as coarse-loamy, mixed (calcareous), mesic Typic Torriorthents. These soils are deep and well-drained and have formed in alluvium derived from sandstone. They occur on adjacent stream terraces, alluvial fans and valley edges on slopes ranging from 0% - 5%.

To protect soils from wind and water erosion, all areas disturbed by project activities would be seeded with native vegetation (e. g. native forbs, grasses and shrubs) incorporated in the contract specifications. See Section 3.6 Best Management Practice (BMP) Summary for more detail for protection of soils.

3.1.1.2 **Alternative 1: No-Action Alternative**

The No-Action Alternative, there would be no significant impact that could directly contribute to changes in existing conditions of soil composition and other geological elements. Additional, benefits associated with the proposed rehabilitation of the acequia ditch, including providing a reliable, efficient, low-cost, and low-maintenance system for the continued conveyance and distribution of water for use by the members of the RCAA, would not be realized.

3.1.1.3 **Alternative 2: Proposed Action Alternative**

The Proposed Action could cause minor, short-term, negative impacts to soils during construction. However, such temporary adverse effects would be minimized through the implementation of BMPs and would cease once the project is completed (see section 3.6 BMP Summary).

3.1.2 **Climate**

3.1.2.1 **Existing Conditions**

The Project occurs in an area characterized as a semi-arid with mild summers and moderate winter snow events. Northern NM's climate is influenced by its location in the middle of the North American continent (i.e far from the effects of oceans). This region of the southern Rockies is of overall high elevation, and its complex topography provides a stage for frequent sunshine, low humidity and rapid and large variations in temperatures (Griffith, et al. 2006).

Data from the nearby Española, NM weather station indicate an average annual maximum temperature of approximately 69 °F (≈ 21 °C) and an average annual minimum temperature of approximately 35 °F (≈ 2 °C) (Long-term (1981–2010) (U.S Climate Data, 2025) (Figure 4). Average annual precipitation is 11.4 inches (in) (≈ 29 cm), with an average annual snowfall of roughly 6 in (≈ 15 cm). The frost-free growing season averages about 136 days, with the last spring frost typically occurring around May 17 and the first fall frost around October 1. Nearby higher-elevation stations illustrate the influence of topography on local climate. For example, Los Alamos (≈ 7,300 ft) (≈ 2,225 m) averages 17.36 in (≈ 44 cm) of precipitation and 43 in (≈ 109 cm) of snowfall annually, with a growing season of approximately 156 days, while Santa Fe (≈6,300 ft) (≈ 1,920 m) averages 14.2 in (≈ 35 cm) of precipitation and 22 in (≈ 56 cm) of snowfall.

With the onset of spring/summer, the Project area is dominated by dry air masses and windy conditions in the late spring and early summer. In the late summer (July, August, and September), the North American Monsoon brings moist subtropical air masses into the region, and precipitation is dominated by localized convection and is highly variable within and between years. Local precipitation may reduce agricultural water demand, and cloudy conditions in late summer may reduce evaporative demand. Hydrologic modeling by the U.S Bureau of Reclamation indicate an up to 33% reduction in Rio Chama water supply throughout the 21st century (USBOR et al. 2013).

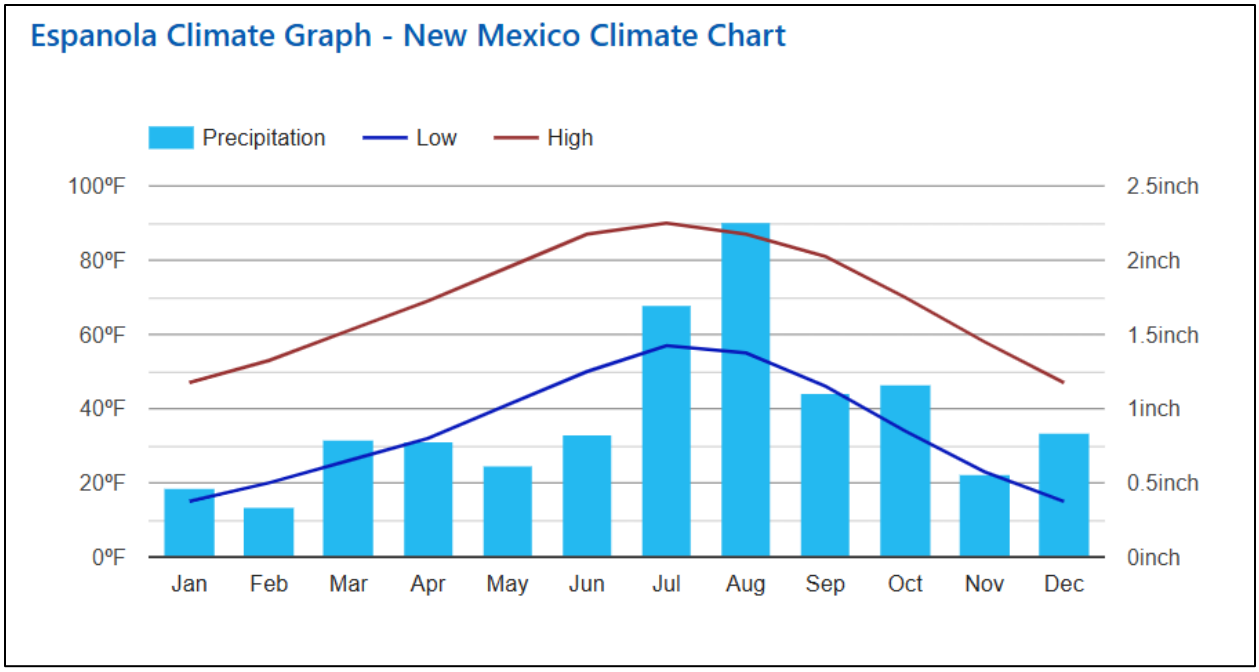

Figure 4. Española, NM Climate Graph (U.S Climate Data, 2025)

Climate models are unanimous in projecting a warmer climate future regionwide under all future emissions scenarios (Lukas et al. 2014). Models project substantial warming over the 21st Century of 5-7 °F (≈ 2-3 °C) by year 2100 as compared to late 20th Century average temperatures (Cyan et al. 2013). Such models suggest warming to increase as much as 8.5-10 °F (≈ 6-7 °C) by year 2100 under plausible high emissions scenarios, slightly higher than previous estimates. Even with no net changes in precipitation, such warming phenomenon would exert profound effects on regional hydrology, by altering snowpack, spring runoff, and evaporation rates.

3.1.2.2 **Alternative 1: No-Action Alternative**

The No-Action Alternative would have no influence on the regional climate. The climatic characteristic of the high-desert environment of north-central New Mexico, with marked seasonal temperature variability and relatively low annual precipitation would continue.

3.1.2.3 **Alternative 2: Proposed Action Alternative**

The Proposed Action would have a No Effect with no significant impact on regional climate or climate at the planetary scale.

3.1.3 **Water Resources**

3.1.3.1 **Existing Conditions**

The hydrology of the Chamita reach of the Rio Chama is defined by a snowmelt-driven flow regime that is substantially regulated by upstream reservoir operations and inter-basin water

transfers. Streamflow at the USGS gage "Rio Chama near Chamita" (site #08290000) (drainage area ~3,144 square miles) has averaged approximately 481 ft^3/s (cfs), with recorded extremes ranging from a low-flow rate of 10 ft^3/s to a high-flow rate of nearly 4,310 ft^3/s since the year 2010. Flow patterns are influenced by releases from Heron, El Vado, and Abiquiu reservoirs, which moderate seasonal runoff, reduce peak flows, and sustain baseflows during dry periods. Abiquiu Dam is the closest to the Chamita reach and maximum releases from Abiquiu Dam occur in spring and early summer (USACE, 2015). From July 1 to November 1, normal releases are limited to a calculated river base-flow. This base flow takes effects of upstream El Vado Reservoir and water from the San Juan Drainage (added through Heron Lake, a reservoir just upstream of El Vado) into account. Releases are increased as necessary between November 1 and March 31 to draw down the Abiquiu reservoir to levels consistent with its flood control mission. The San Juan–Chama Project contributes up to ~110,000 acre-feet per year of imported water to Heron Reservoir, augmenting supplies for downstream municipal, agricultural, and environmental uses (NMED, 2015). Local water rights are complex, with traditional acequia systems serving communities in Chamita and Ohkay Owingeh which primarily dependent on native Rio Chama flows and governed by cooperative water-sharing agreements (See Section 3.5 Socioeconomic Considerations for more on this region's Acequia culture). The hydrologic setting is further shaped by an upstream precipitation gradient (approximately 9 in annually near Chamita to over 25 in in headwater areas) and pronounced seasonal temperature variability, both of which affect snowpack accumulation, runoff timing, and ecological processes within the riparian corridor.

The Acequia de Chamita originates when surface water is diverted from the Rio Chama at the Rio Chama Diversion Dam, a concrete diversion weir, adjacent with the Arroyo de la Presa confluence. Flows then follow, in a relatively high flow velocity through the baffles within the open sluice box, where flows build fine sediments on the surface of the water column and gravel at the bottom of the channel. This sluice box removes most sediment and delivers flows into a 48-inch diameter conduit. The 48 in conduit is approximately 1,100 ft. long and ends at another sluice box located downstream. Irrigation water then continues through an unlined ditch for use by the acequia constituents. The stretch where the piped acequia is buried, is slightly elevated, portraying a dome-shaped fashion (See Appendix A – Site Photographs). This stretch is located on a relatively high terrace and is also where the bulk of the Proposed Action would occur, which can be currently characterized as an open canopy, sparse shrubby vegetation, and sandy/gravely soils.

3.1.3.2 **Alternative 1: No-Action Alternative**

The No-Action Alternative would not impact water resources along the Chamita stretch, nor to any waters of the U.S located upstream or downstream of the Project. However, the benefits associated with the Proposed Action (acequia rehabilitation), including providing a reliable, efficient, low-cost, and low-maintenance system for the continued conveyance and distribution of water for use by the members of the RCAA, would not be realized.

3.1.3.3 **Alternative 2: Proposed Action Alternative**

The Clean Water Act (CWA) (33 U.S.C 1251 *et seq.*) provides for the protection of waters and wetlands of the United States (U.S.) from impacts associated with irresponsible or unregulated

discharges of dredged or fill material in aquatic habitats, including wetlands, as defined under 404(b)(l). However, the CWA also states that certain discharges associated with the construction and maintenance of irrigation ditches are exempt from Section 404 permit requirements (33 CFR 323.4 (a), Exemption No.3):

> *Construction or maintenance of farm or stock ponds or irrigation ditches, or the maintenance (but not construction) of drainage ditches. Discharges associated with siphons, pumps, headgates, wingwalls, weirs, diversion structures, and such other facilities as are appurtenant and functionally related to irrigation ditches are included in this exemption.*

Therefore, a Section 404 permit would not be required for the Proposed Action. Since the action is exempt from permitting under Section 404, it is also exempt from state certification under Section 401 of the CWA. Section 402(p) of the CWA specifies that storm water discharges associated with construction activities disturbing 1 or more ac of total land area must be authorized by a National Pollutant Discharge Elimination System (NPDES) permit.

Construction related to the Proposed Action would disturb greater than 1 acre. As a result, the contractor and landowner would apply for coverage under the U.S. Environmental Protection Agency (EPA) NPDES Construction General Permit (CGP) at least 14 calendar days before commencing construction activities. Prior to submission of the notice of intent (NOI), the Contractor would develop a Stormwater Pollution Prevention Plan (SWPPP) that meets the minimum requirements of the CGP. Prior to the commencement of earth disturbing activities, site-specific stormwater BMPs would be installed by the Contractor to reduce impacts on the water quality of nearby waterways. The Contractor would be responsible for monitoring and maintaining stormwater BMPs until the construction project has concluded and a Notice of Termination (NOT) has been submitted to EPA. Upon completion of earth disturbing activities all disturbed areas would be stabilized per the CGP. Upon completion of the construction contract, all remaining areas that have not obtained final stabilization will be turned over to the local sponsor for continued adherence to the CGP.

3.1.4 **Floodplains & Wetlands**

3.1.4.1 **Existing Conditions**

The entire Project footprint is located within the floodplain of the Rio Chama. Although no wetlands exist within the Project footprint, marginal areas of temporary flooding during the growing season have the potential to develop. Overall, the Chamita reach supports periods tied to flood pulses and irrigation hydrology, with the extent and hydroperiod moderated by reservoir operations and event magnitude. The below EOs issued in 1977, are key form of guidance for federal agencies in minimizing environmental impairments and risk associated with development in functional floodplains and wetlands:

EO 11988 (Floodplain Management) (3 CFR § 121) provides Federal guidance for activities within the floodplains of inland and coastal waters. Preservation of the natural values of floodplains is of critical importance to the nation and the State of New Mexico. Federal agencies are required "to ensure that its planning programs and budget requests reflect consideration of flood hazards and floodplain management."

EO 11990 (Protection of Wetlands) (3 CFR § 1977 Comp., p. 117) requires the avoidance, to the extent possible, of long- and short-term adverse impacts associated with the destruction, modification, or other disturbances of wetland habitats.

3.1.4.2 **Alternative 1: No-Action Alternative**

Under the No-Action Alternative, operation and maintenance of the Acequia would continue. However, there would be no significant impact that could directly contribute to changes in existing conditions of the function and composition of the floodplain and wetlands. Therefore, the No-Action Alternative is projected to have no significant impact to floodplains and wetland resources in Chamita, nor to any waters of the U.S. However, benefits associated with the proposed ditch rehabilitation, including providing a reliable, efficient, low-cost, and low-maintenance system for the continued conveyance and distribution of water for use by the members of the RCAA, would not be realized.

3.1.4.3 **Alternative 2: Proposed Action Alternative**

In accordance with EO 11988 and EO 11990, the Project occurs within a mapped floodplain and involves modification of an existing floodplain feature. There were no practicable alternatives with the design of the Project that could occur outside the floodplain.

The Proposed Action design could have the potential to provide net benefits to floodplain and wetland functions by replacing a buried perforated conduit with an open, semi-permanently flooded channel. This modification is expected to increase visible surface water and provide opportunities for connection between surface-water and riparian/shrubland habitat along the channel margins, during periods of high flows. In addition, an increase in the spatial extent of surface water could improve edge habitat for hydrophytic vegetation, increased habitat availability for aquatic and semi-aquatic species, and increase the potential for shallow groundwater recharge through channel overspill. Overall, high flows would dictate if a semi-permanently flooded hydrologic regime could support wetland-like ecological functions, even though the feature is classified as Riverine Excavated (i.e. R5UBFx) per the U.S Fish and Wildlife Service (USFWS) National Wetlands Inventory.

The Project would not result in increased flood elevations, adverse redirection of flows, or a reduction in the floodplain's existing natural functions. Additionally, the Proposed Action would not alter any floodplain uses and is therefore consistent with the above EOs. No induced development of any floodplain because of the Proposed Action is foreseen. There are no significant wetlands in the project area and none that would be affected by the planned action. Therefore, the Proposed Action would have a Minor Effect and would not present any adverse impacts on wetland habitats. The Proposed Action could cause minor, short-term, negative impacts to areas within the floodplain during construction. However, such temporary adverse effects would be minimized through the implementation of BMPs, listed in Section 3.6 BMP Summary and would cease once the project is completed.

3.1.5 Land Use

3.1.5.1 Existing Conditions

The primary land uses in the vicinity of the Project area are characterized as a mix of irrigated agriculture, livestock grazing with some recreation and natural resource conservation deeply rooted in the region's cultural and economic history (USFS, 2019a). Agriculture remains a significant activity, with traditional Hispano and Pueblo communities using the river's water for irrigation of various crops through acequia systems (see Section 3.5 Socioeconomic Considerations for more on the acequia culture). This reach of the Rio Chama valley also supports livestock grazing, particularly cattle, sheep and poultry occurring on the floodplain and upland areas (USFS, 2019a). Recreation activities, such as fishing, boating, and wildlife viewing, occur along the river and its tributaries, attracting residents and visitors to the area's scenic and ecological beauty. On the broader landscape, the Upper Rio Chama watershed is a mix of public lands managed by the U.S. Forest Service and Bureau of Land Management, with important wildlife corridors and riparian habitats that support a variety of species. Recent land use trends show an increased interest in conservation easements, riparian restoration, and water management projects, with efforts aimed at balancing agricultural needs with ecological preservation to sustain the health of the Rio Chama's aquatic and riparian ecosystems.

3.1.5.2 Alternative 1: No-Action Alternative

Under the No-Action Alternative, operation and maintenance of the Acequia would continue. However, there would be no significant impact that could directly contribute to changes in land use practices of the region. Therefore, the No-Action Alternative is projected to have no significant impact to land use.

3.1.5.3 Alternative 2: Proposed Action Alternative

The Proposed Action is projected to not reduce the capability of the land to support these uses or convert lands to other uses. The lands in which improvements to the acequia would occur are non-public rights-of-ways and therefore would be used for construction and permanent access. The RCAA presently has a perpetual easement from the landowners to operate and maintain the ditch system (NMAA 2020). No problems are anticipated in obtaining necessary easements and rights-of-entry for construction. Therefore, the Proposed Action would have a No Effect and not present any adverse impacts on land use.

3.1.6 Air Quality, Noise, and Aesthetics

3.1.6.1 Existing Conditions

The Acequia de Chamita is located in a rural agricultural region with relatively low urbanization, resulting in generally good air quality. The region is in attainment for most National Ambient Air Quality Standards (NAAQS**)**, as defined by the Clean Air Act (CAA), and complies with state-level standards under the New Mexico Air Quality Control Act (NMAQCA). Local air quality is influenced by agricultural activities, including irrigation and harvesting, which can periodically generate dust and temporarily increase particulate matter (PM10) levels (NMED, 2020). Wood burning for heating in the winter months and wildfires during dry seasons can also contribute to PM2.5 emissions, impacting local air quality, particularly during stagnant air conditions.

However, monitoring data from the New Mexico Environment Department (NMED) confirms that the region generally maintains good air quality, with no significant violations of federal or state air quality standards. The primary threats to air quality in this region include potential increases in wildfire frequency and agricultural dust, which may require continued monitoring and the implementation of BMPs to mitigate impacts. Ongoing air quality monitoring by NMED would ensure compliance with both the CAA and NMAQCA, and conservation measures such as dust control during farming and fire management are recommended to maintain air quality standards in the Rio Chama basin. The CAA regulates air emissions from stationary and mobile sources to ensure that air quality meets specific health-based standards. The CAA is enforced by the Environmental Protection Agency (EPA), which sets NAAQS and de minimis threshold for six common air pollutants: particulate matter (PM10 and PM2.5), ground-level ozone (O3), nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), and lead (Pb).

The noise levels in and around the Project footprint are typically dominated by natural sounds such as flowing water, wildlife calls, and wind through trees. However, human-generated noise pollution can occur due to agricultural activities (e.g., machinery, irrigation systems), vehicular traffic on local roads, and livestock operations. These sources can introduce temporary increases in noise levels, especially during planting or harvesting seasons. Traffic noise from the adjacent State Road and other nearby routes can also impact the acoustical environment in the vicinity of the Rio Chama, particularly near farming communities. The NMED and local land management agencies monitor noise in areas of public recreation and sensitive habitats to ensure compliance with noise regulations (NMED, 2020).

The aesthetics of the Rio Chama Valley near Chamita offers scenic beauty with its rugged terrain, riparian zones, agricultural fields, and forested hillsides. These visual elements contribute to the region’s cultural identity and attract visitors for recreation and ecotourism. However, the aesthetic value of the landscape can be diminished by future drivers of land use changes, such as intensive farming, grazing, and development that may alter the natural features. The preservation of visual character is particularly important in riparian areas, where overuse, construction, and altered vegetation patterns can impact viewsheds and diminish the area's natural appeal. Public and community-based involvement in land use planning is key to safeguard the visual integrity of the area, with attention to the unique Southwestern cultural and agricultural landscape that defines the region (EPA, 1974).

3.1.6.2 **Alternative 1: No-Action Alternative**

The No-Action Alternative is projected to not present any significant impacts that could directly contribute to changes in the existing conditions of air quality, noise pollution and aesthetics.

3.1.6.3 **Alternative 2: Proposed Action Alternative**

Under the Proposed Action Alternative, construction and maintenance of the project would comply with air quality control regulations set forth by the CAA and the NMAQCA. Project emissions would not exceed EPA’s de minimis threshold rates and therefore would not cause or contribute to a violation of the NAAQS, nor would they interfere with attainment or maintenance of air quality standards. With implementation of standard dust-control and equipment-emissions BMPs, the Project would comply with the CAA. While the process to rehabilitate the acequia may cause temporary air quality impacts during construction, such as dust emissions and vehicular emissions from heavy machinery, the long-term effects on air quality will be minimal.

The construction phase, involving excavation, regrading, and ditch restoration, could generate particulate matter, especially in dry or disturbed areas. Additionally, the use of bulldozers, backhoes, and trucks may temporarily impact local air quality, particularly near Chamita, Tierra Amarilla, and surrounding rural communities. To mitigate these impacts, dust control measures like water spraying and dust suppressants will be implemented during excavation, and high-emission activities (e.g., material hauling) will be scheduled during non-peak hours to minimize disruption. Once the rehabilitation is completed, the project is expected to have minimal long-term air quality impacts, and it could even improve air quality over time by reducing the frequency of maintenance activities such as dredging or excavation, which can create dust or particulate matter. A new and revamped acequia would also support surrounding riparian habitats and native vegetation, which naturally supports air quality improvements by stabilizing soil and enhancing vegetation cover.

Similarly, noise pollution is expected to be temporary and primarily associated with the construction phase. Machinery operations, such as excavators and bulldozers, will generate elevated noise levels in the construction area, with potential disruption to nearby residential communities. However, once rehabilitation is complete, noise from the project will be minimal. Vehicle traffic related to the transportation of materials may also increase noise levels temporarily, particularly along local roads.

Regarding landscape aesthetics, the construction phase may result in temporary visual disturbances due to earthmoving activities and the presence of construction equipment. The visual impact of these activities will likely detract from the natural and rural aesthetic of the area in the short term. However, long-term positive effects on the landscape are anticipated, as the Project would restore disturbed areas along the ditch with a native seed mix, which would enhance the visual appeal and reinforce the region's cultural landscape of traditional agriculture. The lush green vegetation associated with a healthy acequia would contribute to the area’s visual richness and sense of place and purpose.

In summary, while the Proposed Action would have a Minor Effect with no adverse effects, it may cause temporary increases in noise, air quality impacts, and visual disturbances during the construction phase, the long-term effects will be minimal. The Proposed Action would likely result in improved air quality, reduced noise from ongoing maintenance, and enhanced aesthetics by restoring native vegetation and infrastructure. The implementation of BMPs, such as dust control and scheduling activities to avoid peak disturbance times, would help mitigate short-term impacts on air quality, noise, and landscape aesthetics (see Section 3.6 BMP Summary).

3.2 Hazardous, Toxic, and Radioactive Waste Environment

3.2.1.1 Existing Conditions

The RCAA is responsible in identifying and documenting the presence or likely presence of any potential HTRW within the Project footprint.

3.2.1.2 Alternative 1: No-Action Alternative

Under the No-Action Alternative, there would be no effect or significant impact that could directly contribute to changes in existing conditions of known HTRW as no recognized HTRW concerns exists within or near the Project footprint.

3.2.1.3 Alternative 2: Proposed Action Alternative

If areas of concern or contaminants are identified under the Proposed Action, construction shall be postponed and the USACE would coordinate with the RCAA to determine the appropriate course of action. No HTRW releases are expected from the Proposed Action, therefore a No Effect determination is expected.

3.3 Biological Environment

3.3.1 Vegetation Communities

3.3.1.1 Existing Conditions

The Chamita reach of the Rio Chama supports a diverse mosaic of vegetation communities influenced by perennial surface water from the river and sections of the acequia system, seasonal floodplain connectivity, and a varied geomorphic setting (Table 1). Intact riparian gallery forest along portions of the reach is dominated by Rio Grande cottonwood (*Populus deltoides* var. *wislizeni*) and Goodding's willow (*Salix gooddingii*), with a mixed understory of native shrubs (e.g., New Mexico olive, coyote willow) and non-native species such as Russian olive (*Elaeagnus angustifolia*) and Siberian elm (*Ulmus pumila*). Wetland and moist-soil patches occur in localized areas with persistent saturation, such as near the Rio Chama Diversion Dam at the Arroyo de la Presa confluence, and where the acequia returns to the river where flows may deposit fine sediment over gravel substrates.

The section where the acequia is currently buried in perforated pipe occupies a relatively high terrace with sandy and gravelly soils, an open canopy, sparse shrubby cover, and dominance by upland vegetation, most notably exotic Siberian elm, scattered prickly pear (*Opuntia* spp.), sagebrush (*Artemisia* spp.), and rabbitbrush (*Chrysothamnus* spp.), indicating a shift away from riparian conditions, likely due to a fluctuating water table insufficient to sustain phreatophytic vegetation. This upland-dominated corridor offers limited riparian habitat value and is periodically disturbed for maintenance to remove accumulated organic matter (roots, soil, vegetative debris) from the perforated pipe (see Appendix A, Site Photos).

Aquatic vegetation occurs primarily in low-velocity habitats such as side channels, backwaters, and reservoir inlets and bays. Common submerged and floating-leaved species include pondweeds (*Potamogeton pectinatus*, *P. crispus*), coontail (*Ceratophyllum demersum*), and water milfoil (*Myriophyllum sibiricum*) (Derrick, 1999). Duckweed (*Lemna minor*), watercress (*Nasturtium officinale*), and common water-plantain (*Alisma triviale*) occupy shallow margins, while emergent stands of bulrush (*Schoenoplectus acutus*), spikerush (*Eleocharis palustris*), and sedges (*Carex nebrascensis*, *C. praegracilis*) provide structural habitat and bank stability (During periods of low flow, periphyton and filamentous algae (e. g. genus *Cladophora* and *Spirogyra*), which can develop in depositional zones (NRCS, 2017). Collectively, these riparian and aquatic plant assemblages contribute to the Rio Chama's ecological integrity by supporting

sediment retention, nutrient cycling, and habitat for native aquatic fauna. Overall, vegetation structure in the Chamita acequia corridor ranges from high-quality, hydrologically connected riparian patches to upland-dominated, hydrologically disconnected terraces, reflecting both natural variability and long-term infrastructure influences.

Table 1. Summary of Rio Chama's riparian, wetland, and aquatic plant communities.

Hydrologic Zone	Representative Community Type	Dominant / Characteristic Species	Hydrologic Conditions	Ecological Notes
Upland Terrace / Transition Zone	Semi-arid woodland and shrub–steppe ecotone	*Artemisia tridentata* (big sagebrush), *Atriplex canescens* (fourwing saltbush), *Chrysothamnus nauseosus* (rubber rabbitbrush), *Sporobolus cryptandrus* (sand dropseed)	Infrequently flooded; well-drained soils above floodplain	Provides transition to uplands; supports pollinators and upland wildlife; often degraded by grazing and road encroachment
Floodplain / Gallery Forest	Rio Grande cottonwood–willow forest	*Populus deltoides ssp. wislizeni* (Rio Grande cottonwood), *Salix gooddingii* (Goodding's willow), *Salix exigua* (coyote willow), *Forestiera pubescens* (New Mexico olive), *Lycium andersonii* (wolfberry), *Prunus americana* (wild plum)	Periodically flooded; shallow groundwater within 1–3 m	Primary riparian forest type; dependent on overbank flooding for recruitment
Lower Bank / Shrub–Willow Thicket	Willow–Dogwood–Herbaceous complex	*Salix exigua* (coyote willow), *Cornus sericea* (red-osier dogwood), *Muhlenbergia asperifolia* (scratch muhly), *Eleocharis palustris* (creeping spikerush), *Asclepias incarnata/speciosa* (marsh milkweed)	Seasonally inundated or saturated for weeks to months	High wildlife use; stabilizes banks and promotes sediment deposition
Wet Meadow / Marsh Edge	Graminoid and emergent wetland	*Sporobolus airoides* (alkali sacaton), *Carex nebrascensis* (Nebraska sedge), *Carex praegracilis* (clustered field sedge), *Typha latifolia* (cattail), *Sagittaria latifolia* (arrowhead), *Scirpus pungens* (three-square bulrush)	Frequently saturated soils or shallow inundation; prolonged moisture availability	Filters sediments and nutrients; transitional habitat for amphibians and waterfowl
Aquatic / Channel Margin	Submerged and floating macrophytes	*Potamogeton pectinatus* (sago pondweed), *Potamogeton crispus* (curlyleaf pondweed), *Ceratophyllum demersum* (coontail), *Myriophyllum sibiricum* (water milfoil), *Lemna minor* (duckweed), *Nasturtium officinale* (watercress), *Alisma triviale* (common water-plantain)	Shallow to moderate water depth; low to moderate velocity; persistent inundation	Provides cover and forage for fish and aquatic invertebrates; sensitive to turbidity and flow regulation
Disturbed / Invasive Zones	Non-native shrub–tree thickets	*Tamarix ramosissima* (saltcedar), *Elaeagnus angustifolia* (Russian olive), *Kochia scoparia* (kochia), *Salsola tragus* (Russian thistle)	Variable hydrology; often colonizing abandoned channels and disturbed banks	Displaces native species; alters soil salinity and channel structure

3.3.1.2 Alternative 1: No-Action Alternative

The No-Action Alternative, that is without the construction of the Proposed Action, there would be no significant impact that could directly contribute to changes in existing conditions of the vegetation communities in the Project footprint.

3.3.1.3 Alternative 2: Proposed Action Alternative

The Proposed Action could cause a Minor Effect, with minor, short-term, negative impacts to soils during construction. However, such temporary adverse effects would be minimized through the implementation of BMPs and would cease once the project is completed (please see Section

3.6 BMP Summary). The Proposed Action will result in localized, direct impacts to vegetation communities along approximately 1,100 linear feet of the Chamita acequia, including both the 300-foot section where the buried perforated pipe will be replaced with non-perforated reinforced concrete pipe and the 800-foot section to be converted to a lined open channel.

Construction activities will require clearing of existing vegetation within the project footprint, including native riparian species such as Rio Grande cottonwood (*Populus deltoides* var. *wislizeni*), Goodding's willow (*Salix gooddingii*), and native sedges and rushes, as well as portions of the herbaceous and shrub understory. Ground disturbance, grading, and equipment access may compact soils, alter root-zone moisture conditions, and create bare ground susceptible to colonization by invasive species such as saltcedar (*Tamarix ramosissima*) and Russian olive (*Elaeagnus angustifolia*).

The use of non-perforated pipe and fully lined channel segments could reduce localized seepage and limit bank soil moisture, potentially affecting recruitment of moisture-dependent vegetation. However, the project also offers opportunities for ecological improvement. The open channel will increase visible surface water and support fringe hydrophytic vegetation, while targeted revegetation with native riparian plants can restore disturbed areas and improve community composition. Long-term benefits may include greater vegetation stability due to reduced emergency maintenance, improved hydrologic support for moist-soil species through managed seepage zones, and enhanced connectivity between riparian patches in the Rio Chama floodplain.

3.3.2 **Wildlife**

3.3.2.1 **Existing Conditions**

The Chamita reach of the Rio Chama contains a mosaic of riparian gallery forest, emergent wetland patches, irrigated agricultural land, and adjacent upland habitats. This reach supports a high diversity of terrestrial and aquatic organisms due to its proximity to perennial surface water, seasonal floodplain connectivity, and a complex vegetation structure dominated by Middle Rio Grande biodiversity (Table 2).

Table 2. Summary of Rio Chama's wildlife communities.

Habitat Type	Representative Species	Taxa / Group	Ecological Role / Habitat Use
Riparian Forest and Willow Thickets	Yellow warbler (*Setophaga petechia*), Song sparrow (*Melospiza melodia*), Black-chinned hummingbird (*Archilochus alexandri*), Western wood-pewee (*Contopus sordidulus*), Great horned owl (*Bubo virginianus*), Woodhouse's toad (*Anaxyrus woodhousii*)	Birds, Amphibians	Nesting and foraging habitat; dense willow and cottonwood canopy provide cover and insect-rich foraging zones
Open Water and Backwaters	Mallard (*Anas platyrhynchos*), Blue-winged teal (*Spatula discors*), American coot (*Fulica americana*), Great blue heron (*Ardea herodias*), Belted kingfisher (*Megaceryle alcyon*), Western painted turtle (*Chrysemys picta bellii*)	Waterfowl, Wading Birds, Reptiles	Breeding and feeding areas; shallow waters and vegetated margins support aquatic invertebrates and amphibian prey

Riverine Channel and Side Channels	Rio Grande chub (*Gila pandora*), Rio Grande sucker (*Pantosteus plebeius*), Fathead minnow (*Pimephales promelas*), Plains killifish (*Fundulus zebrinus*), Stonefly nymphs (*Plecoptera spp.*)	Native Fish, Aquatic Invertebrates	Occupy riffles and runs; serve as key forage for piscivorous birds and contribute to nutrient cycling
Wet Meadow and Emergent Marsh	Northern leopard frog (*Lithobates pipiens*), Tiger salamander (*Ambystoma mavortium*), Red-winged blackbird (*Agelaius phoeniceus*), Marsh wren (*Cistothorus palustris*), Muskrat (*Ondatra zibethicus*)	Amphibians, Birds, Mammals	Depend on saturated soils or standing water for breeding and foraging; muskrats build dens and influence wetland hydrology
Floodplain and Terrace Shrublands	Mule deer (*Odocoileus hemionus*), Coyote (*Canis latrans*), Raccoon (*Procyon lotor*), Desert cottontail (*Sylvilagus audubonii*), Rock wren (*Salpinctes obsoletus*)	Mammals, Birds	Use open shrublands and edges for foraging and movement corridors; rely on riparian cover for thermoregulation and protection
Beaver Pond and Woody Debris Zones	Beaver (*Castor canadensis*), Spotted sandpiper (*Actitis macularius*), Common yellowthroat (*Geothlypis trichas*), Dragonfly larvae (*Odonata spp.*)	Mammals, Birds, Invertebrates	Create and maintain aquatic habitat complexity; increase water retention and biodiversity through dam-building activities

The riparian forests and willow thickets provide important breeding and foraging habitat for migratory and resident birds such as yellow warbler (*Setophaga petechia*), song sparrow (*Melospiza melodia*), black-chinned hummingbird (*Archilochus alexandri*), western wood-pewee (*Contopus sordidulus*), and great horned owl (*Bubo virginianus*) (NMDGF, 2025). Open water and emergent wetlands support waterfowl and wading birds including mallard (*Anas platyrhynchos*), blue-winged teal (*Spatula discors*), great blue heron (*Ardea herodias*), and American coot (*Fulica americana*). The riverine and backwater habitats sustain native fish communities dominated by the Rio Grande chub (*Gila pandora*), Rio Grande sucker (*Pantosteus plebeius*), and fathead minnow (*Pimephales promelas*), along with aquatic invertebrates critical to the food web. Amphibians such as western chorus frog (*Pseudacris triseriata*) and tiger salamander (*Ambystoma mavortium*) occur on side channels and oxbows, while northern leopard frogs (*Lithobates pipiens*) are occasionally present in wetter areas below Abiquiu Reservoir (Degenhardt et al. 1996). Terrestrial mammals including raccoon (*Procyon lotor*), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), mountain lion (*Puma concolor*), elk (*Cervus canadensis*), black bear (*Ursus americanus*) and various small mammals utilize the floodplain and adjacent uplands for foraging, cover, and denning. Semi-aquatic mammals such as beaver (*Castor canadensis*) and muskrat (*Ondatra zibethicus*) are also present in aquatic and riparian habitats. Collectively, these wildlife communities illustrate the ecological diversity of the Rio Chama system and the importance of maintaining connected riparian, wetland, and upland habitats to support native fauna.

The Chamita reach is used as a wildlife corridor and provides a continuous movement route linking the Rio Chama with the Rio Grande and surrounding uplands. It is also a stage for foraging and nesting, supporting high insect prey availability for birds, bats, and fish. In certain areas the seasonal overbank flows and irrigation return flows sustain fringe wetlands and moist soil zones important for amphibians and invertebrates. Several species occurring throughout the Chamita reach have state and/or federal conservation status, as discussed in Section 3.3.3 Special Status Species.

3.3.2.2 **Alternative 1: No-Action Alternative**

The No-Action Alternative would result in no proposed project-associated effects on wildlife and other organisms associated with riparian and riverine systems.

3.3.2.3 **Alternative 2: Proposed Action Alternative**

The Proposed Action could cause Minor Effects, with minor, short-term, disturbance to wildlife from construction of the acequia de Chamita and would be temporary and limited to the project area footprint, leading to a determination of "May Affect, Not likely to adversely affect", but will likely result in long-term habitat improvements. The Project would result in the removal of a relatively small amount of woody riparian vegetation. The project would result in small, dispersed disturbances to upland woody vegetation patches, and the losses would not be significant because of the abundance of this vegetation in and around the project area. Permanent and temporary losses of herbaceous vegetation would not occur, native grasses would be seeded on disturbed sites to support the establishment of vegetation and revamp the re-vegetation establishment of this site.

Additionally, construction would take place during the fall and into winter, which is outside the period when most terrestrial vertebrate species have or rear young, therefore impacts to wildlife from direct disturbance would be minimal. Due to the low level of disturbance to wildlife habitat, the Project is projected to not produce significant or long-term impacts to terrestrial and shoreline wildlife resources from the proposed project. Environmental protection and revegetation clauses in the construction contract would be used to minimize impacts to water quality and habitat of aquatic organisms, including fish.

3.3.3 **Special Status Species**

While all Federal, State and Tribal agencies have the responsibility for the protection and conservation of organisms in the proposed Project Area, three agencies have this task as their primary responsibility. The USFWS, under authority of the Endangered Species Act of 1973 (16 U.S.C. 1531) as amended, has the responsibility for federal-listed species. The New Mexico Department of Game and Fish (NMDGF) has the responsibility for state-listed wildlife species. The New Mexico State Forestry Division (Energy, Minerals and Natural Resources Department) (NMSF) is responsible for state-listed plant species. Each agency maintains a continually updated list of species that are classified, or are candidates for classification, as protected based on their present status and potential threat to future survival and recruitment into viable breeding populations. These types of status rankings represent an expression of threat level to a given species survival as a whole and/or within local or discrete populations.

3.3.3.1 **Existing Conditions**

The Rio Chama system harbors suitable habitat for several federally and state-listed threatened, endangered, and candidate species associated with riverine, riparian, montane, and wetland ecosystems of northern New Mexico (Table 3). Below is a summary of the federally-listed species with special status:

- **The New Mexico meadow jumping mouse** (*Zapus hudsonius luteus*), is federally listed as Endangered, and occupies dense riparian herbaceous zones with tall sedges and grasses adjacent to perennial streams; populations have been documented in tributary reaches with sustained summer flows (USFWS, 2014). This is a riparian rodent subspecies that occupies a highly specialized riparian niche characterized by dense, tall herbaceous vegetation associated with perennial or seasonally persistent water. Within the Rio Chama system, suitable habitat occurs along low-gradient stream and spring-fed reaches, oxbows, and irrigated floodplain pastures where hydrologic conditions maintain moist to saturated soils through the growing season (typically June–September) (USFWS, 2020a). Optimal vegetation structure includes a dense canopy of sedges and grasses exceeding 24 inches in height (commonly dominated by *Carex nebrascensis*, *Carex praegracilis*, *Juncus balticus*, and *Poa pratensis*) which can provide cover from predators and thermal protection during daylight hours (Wright, 2014)). The subspecies relies on a multi-strata herbaceous community, often interspersed with coyote willow thickets, which stabilize soils and trap sediment to sustain moisture. The jumping mouse is primarily nocturnal and hibernates for up to nine months of the year (generally from late September through June), depending on climatic conditions and food availability (Frey, 2012). It requires an intact hydrologic regime that supports continuous soil moisture and plant growth during its short active period, as well as undisturbed ground cover for nesting and hibernation (Morrison et al. 2012). Degradation or alteration of these habitats (often driven by livestock grazing, mowing, bank stabilization, or hydrologic changes), can rapidly reduce habitat suitability by lowering vegetation height, compacting soils, or desiccating root zones (NMDGF, 2016). Populations are typically small, patchily distributed, and highly sensitive to fragmentation, making connectivity of riparian corridors and maintenance of sustained baseflows essential for recovery and long-term persistence within the Rio Chama basin.

- **The Mexican spotted owl** (*Strix occidentalis lucida*) is listed as Threatened and it inhabits mature mixed-conifer and ponderosa pine forests within steep canyon environments of the upper watershed. This species nests and forages in shaded, closed-canopy drainages (USFS, 2019b). Optimal nesting and roosting habitat is characterized by high canopy closure (≥ 60–70 %), multi-layered vertical structure, and a high density of large-diameter trees, typically Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), ponderosa pine (*Pinus ponderosa*), and Gambel oak (*Quercus gambelii*), which can provide shaded microclimates and numerous cavities or broken-top snags for nesting (Ganey et al. 2005). These stands often include abundant downed woody debris and snags, which contribute to thermal buffering and prey habitat. Owls forage primarily on small mammals such as woodrats, deer mice, and voles, using a mosaic of mature forest interspersed with small openings or canyon benches where prey is more abundant (Block et al. 2005). Breeding occurs from March through August, and sites are typically reused in successive years, indicating high fidelity to suitable nesting territories. Within the Rio Chama basin, potential habitat occurs in forested canyon reaches above El Vado Reservoir and in north-facing drainages

that maintain cool, humid conditions. The species is highly sensitive to canopy alteration, mechanical thinning, and human disturbance during the breeding season; thus, management emphasizes retention of large trees, maintenance of closed-canopy stands, protection of nesting sites, and implementation of seasonal restrictions on high-noise or vegetative-removal activities to sustain long-term occupancy within the region (USFS, 2015).

- **The Southwestern willow flycatcher** (*Empidonax traillii extimus*), is listed as Endangered, and breeds in dense willow–cottonwood stands and tamarisk thickets along low-gradient portions of the Rio Chama and its floodplain (USFWS, 2002). This is a flycatcher subspecies that depends on dense riparian vegetation associated with perennial or seasonally flowing water throughout the Rio Chama system. The species nests exclusively in dense thickets of native willows (*Salix exigua, S. gooddingii*), cottonwoods (*Populus deltoides ssp. wislizeni*), and occasionally non-native tamarisk (*Tamarix spp*), where canopy cover exceeds 70% and vegetation height typically ranges between 2–6 meters (6–20 feet) (Stoleson et al. 2001). Suitable habitat occurs in linear riparian zones, backwater sloughs, oxbows, and floodplain terraces that maintain moist soils and surface water during the breeding season (May–August). Nests are typically constructed 1–3 meters above ground in dense shrub layers over or near saturated soils, providing concealment and proximity to abundant insect prey such as flies, beetles, and dragonflies (Sedwick, 2000). Successful nesting is closely tied to "stable hydrology" and persistent riparian vegetation, as habitat can be lost rapidly following drought, channel incision, or vegetation removal. In the Rio Chama corridor, potential breeding and migratory stopover habitat occurs in broad floodplain reaches below El Vado and Abiquiu Reservoirs, where willows and cottonwoods form extensive, multi-layered canopies (USBR, 2013). The species is highly sensitive to habitat fragmentation, nest parasitism by brown-headed cowbirds (*Molothrus ater*), and hydrologic alteration that limits regeneration of native riparian vegetation (Durst et al. 2008). Management for this species emphasizes maintaining sustained baseflows, recruitment of native willows and cottonwoods, control of invasive woody vegetation, and seasonal restrictions on construction and vegetation clearing during the breeding period to avoid disturbance and ensure habitat integrity.

- **The Western yellow-billed cuckoo** (*Coccyzus americanus*), is federally listed as Threatened and utilizes extensive riparian woodlands with multi-layered canopy structure for nesting and foraging during the summer breeding season (USFWS, 2020c). This species is a long-distance Neotropical migrant that depends on large tracts of structurally diverse riparian woodland for breeding and foraging. Within the Rio Chama system, suitable habitat occurs along broad floodplain reaches where mature cottonwood (*Populus deltoides ssp. wislizeni*) and Goodding's willow (*Salix gooddingii*) form multi-story canopies interspersed with dense mid- and understory vegetation such as New Mexico olive (*Forestiera pubescens*), wolfberry (*Lycium andersonii*), and false indigo (*Amorpha fruticosa*). The cuckoo's nesting territories are typically associated with moist alluvial soils,

proximity to surface water, and patches exceeding 50–100 ac in size, as the species requires extensive continuous woodland for successful breeding (Johnson et al. 2012). Nests are generally placed 1–5 meters above ground in dense foliage and are used from late June through August, coinciding with the Southwestern monsoon, when insect prey (particularly katydids, cicadas, caterpillars, and grasshoppers) are most abundant (Sechrist et al. 2013). The cuckoo exhibits a strong preference for multi-layered riparian stands that provide shade, humidity, and cover from predators, and it avoids narrow or fragmented riparian corridors (Hughes, 1999). In the Rio Chama basin, suitable habitat is most likely present downstream of Abiquiu Reservoir where broad floodplain forests persist. Habitat loss due to flow regulation, channel incision, vegetation clearing, and invasive species encroachment has reduced the extent of suitable riparian woodland (USFWS, 2020). Management and conservation of this species emphasize maintaining natural floodplain hydrology, promoting regeneration of native riparian vegetation, reducing human disturbance during the breeding season, and restoring habitat continuity between riparian patches.

- **The Jemez Mountains salamander** (*Plethodon neomexicanus*), is listed as Endangered, and occurs in high-elevation mixed-conifer forests of the upper Chama watershed and relies on moist soils, downed wood, and subsurface microhabitats for survival (NMDGF, 2016). This species is entirely dependent on moist, cool, forested environments at elevations between 7,200 and 9,500 ft (2,195–2,895 m), typically within mature mixed-conifer and spruce–fir forests composed of Douglas-fir (*Pseudotsuga menziesii*), blue spruce (*Picea pungens*), Engelmann spruce (*Picea engelmannii*), and white fir (*Abies concolor*) (Hakkila et al. 2002). The salamander occupies subsurface habitats (including rock fissures, decaying logs, and soil voids beneath talus or volcanic tuff substrates) where stable moisture and temperature conditions are maintained by forest canopy cover and organic litter (LANL, 2020). It is nocturnal and surface-active primarily during the monsoon season (July–September), when humidity and soil moisture levels are high. Because the species lacks lungs, respiration occurs through the skin and mouth lining, making it extremely sensitive to desiccation, soil compaction, canopy loss, and microclimate changes (Cummer, 2007). Within the broader Rio Chama watershed, potential habitat exists in high-elevation tributaries and forested slopes near the southern and eastern headwaters, particularly in areas with undisturbed canopy and coarse woody debris (USFWS, 2013). Primary threats include wildfire and post-fire erosion, forest thinning or logging, road construction, and climate-induced drying of montane microhabitats.

- **The Monarch butterfly** (*Danaus plexippus*), is a candidate to be listed as Threatened (USFWS, 2020d). This flying insect is a wide-ranging pollinator whose populations depend on the availability of plants for breeding and nectar-rich flowering plants for foraging and migration. Within the Rio Chama riparian corridor, suitable habitat occurs in wet meadows, floodplain terraces, and riparian margins that support native milkweeds such as showy milkweed (*Asclepias speciosa*) and swamp milkweed (*Asclepias incarnata*), often in association with

spikerush (*Eleocharis palustris*), scratch muhly (*Muhlenbergia asperifolia*), and sedges (*Carex* spp.) (Jepsen et al. 2015). Monarchs use these areas for oviposition and larval development from late May through early September, depending on elevation and temperature. Adult butterflies rely on a continuous sequence of nectar sources, including rabbitbrush (*Ericameria nauseosa*), goldenrod (*Solidago spp.*), sunflowers (*Helianthus spp.*), and alfalfa (*Medicago sativa*) to fuel migration (Pelton et al. 2019). The Rio Chama serves primarily as a migration corridor for monarchs moving between summer breeding grounds in the interior West and overwintering areas in central Mexico, though localized reproduction is possible where milkweed density is high. Key threats include habitat loss due to vegetation clearing or hydrologic alteration, pesticide use, and declines in native milkweed abundance (Pelton et al. 2019).

- **The Nokomis fritillary also known as Silverspot butterfly** (*Speyeria nokomis nokomis*), a State Threatened species dependent on wet meadows supporting Viola host plants (USFWS, 2020b). This butterfly occupies perennial wet meadow and spring-fed riparian habitats at elevations generally between 4,500 and 7,500 ft (1,370–2,285 m), where saturated soils and lush herbaceous vegetation persist through late summer (NMDGF, 2016). Suitable habitat occurs in sedges (*Carex* spp.), rushes (*Juncus* spp.), and grasses interspersed with violets (*Viola nephrophylla*, *V. sororia*, or *V. adunca*), which serve as the sole larval host plants. Adult fritillaries rely on abundant nectar sources such as monarda (*Monarda fistulosa*), thistle (*Cirsium spp.*), and goldenrod (*Solidago spp.*) blooming from July through September, corresponding with the adult flight season (Austin, 1998). Within the Rio Chama system, potential habitat occurs in irrigated wet meadows, cienegas, and riparian benches that retain late-season soil moisture, particularly along spring-fed tributaries and floodplain pastures. The species is non-migratory and has limited dispersal capability, making populations highly localized and vulnerable to habitat fragmentation (Pyle, 2002). Primary threats include groundwater withdrawal, livestock trampling, vegetation mowing or haying during the flight or larval period, and hydrologic alteration that degrades spring or seep hydrology. Conservation of the Nokomis fritillary depends on maintaining perennial soil moisture, protecting host-plant populations, preventing overgrazing and mowing during the active season, and restoring native wet meadow vegetation to ensure long-term population viability.

- **The Suckley's cuckoo bumble bee** (*Bombus suckleyi*), a State Endangered and Candidate for federal listing species that parasitizes colonies of other bumble bees and depends on intact riparian foraging corridors with diverse native flowering plants (USFWS, 2023). This species is an obligate social parasite that depends on the colonies of other bumble bees, particularly *Bombus occidentalis* (Western bumble bee), for reproduction. Unlike typical bumble bees, *B. suckleyi* does not form its own colony; instead, mated females infiltrate host nests during the early summer, kill or subdue the resident queen, and rely on the host workers to rear their offspring (Richardson et al. 2019). The species is strongly associated with high-elevation meadows, riparian corridors, and open montane habitats where

host species are abundant and a diverse, native flowering plant community provides continuous forage from May through September (Koch et al. 2012). Within the Rio Chama system, potential habitat occurs in riparian benches, wet meadows, and montane grasslands supporting flowering forbs such as lupine (*Lupinus argenteus*), penstemon (*Penstemon barbatus*), milkweed (*Asclepias speciosa*), monarda (*Monarda fistulosa*), and rabbitbrush (*Ericameria nauseosa*). These areas provide nectar and pollen sources necessary for both *B. suckleyi* and its host species. Because of its dependence on host populations, the species' persistence is closely tied to the health and diversity of native bumble bee communities, which are threatened by habitat fragmentation, pesticide exposure, disease spillover from managed bees, and loss of floral diversity (Richardson et al. 2019). Conservation of *B. suckleyi* focuses on protecting native pollinator habitats, restricting pesticide use in sensitive areas, maintaining late-season nectar resources, and monitoring host bee populations to assess ecosystem integrity and pollinator network stability within northern NM.

Collectively, these species represent a wide range of ecological niches and emphasize the importance of maintaining hydrologic connectivity, native vegetation structure, and high-quality riparian and montane habitats throughout the Rio Chama basin.

Table 3. Summary of Federal and State listed species known to occur in the Rio Chama system.

Common Name	Scientific Name	Federal Status	State Status	Potential of Occurrence
New Mexico Meadow Jumping Mouse	*Zapus hudsonius luteus*	Endangered	Endangered	**Low**— suitable riparian habitat does not occur along perennial reaches and irrigated pastures adjacent to the Rio Chama and its tributaries
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened	Threatened	**Low** — potential in upper canyon reaches and tributaries (e.g., El Vado Canyon, Chama Canyon Wilderness)
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered	Endangered	**Low** — potential breeding and nesting habitat does not occur within the Project footprint and along the upstream and downstream reaches of the Rio Chama
Western Yellow-billed Cuckoo	*Coccyzus americanus*	Threatened	Threatened	**Low** — potential breeding and nesting habitat does not occur within the Project footprint and along the upstream and downstream reaches of the Rio Chama
Jemez Mountains Salamander	*Plethodon neomexicanus*	Endangered	Endangered	**Low** — habitat does not occur within the Project footprint.
Monarch Butterfly	*Danaus plexippus*	Candidate (Proposed Threatened)	Species of Concern	**Moderate** — frequent migrant and breeder in riparian areas with milkweed and nectar plants
Nokomis Fritillary (Silverspot Butterfly)	*Speyeria nokomis nokomis*	Threatened	Threatened	**Moderate** — potential in wet meadow areas near perennial tributaries and irrigated pastures
Suckley's Cuckoo Bumble Bee	*Bombus suckleyi*	Candidate (Proposed Endangered)	Endangered	**Moderate** — foraging and host bee habitat present in riparian and meadow communities along the Rio Chama

Spotted Bat	*Eudema maculatum*	-	Threatened	**Moderate –** This microbat prefers rocky cliffs, caves, and barren habitats for roosting and foraging, making the Chamita reach potentially suitable due to the proximity of rocky outcrops and riparian zones. The species is not commonly found in dense forested areas, but the Rio Chama provides some potential habitat for foraging and roosting
Pacific Marten	*Martes caurina*	-	Threatened	**Low –** This carnivorous mammal is found in dense, mature coniferous forests and is generally restricted to higher elevations. The Rio Chama area is not ideal for this species, as it lacks the extensive forested habitat preferred by the Pacific marten, and the region is not within its typical range
White-Tailed Ptarmigan	*Lagopus laucura*	-	Endangered	**Low –** This ground bird is a high-elevation species that inhabits alpine tundra and rocky outcrops. Given the lower elevation of the Rio Chama near Chamita and the lack of alpine habitat, the white-tailed ptarmigan is highly unlikely to occur in this area
Least Tern	*Sternula antillarum*	Protected under MBTA	Endangered	**Low –** This bird is typically found in coastal areas or large river systems with sandy or gravelly islands for nesting. While the Rio Chama provides suitable wetlands and sandbars, the species is more commonly associated with lowland river systems and coastal regions, making its occurrence in the Chamita reach unlikely.
Bald Eagle	*Haliaeetus leucocephalus*	Protected under the BGEPA	Threatened	**Moderate to High –** This raptor is commonly found near large rivers and lakes, particularly during the winter when they fish and begin their courtship/nesting behaviors. The Rio Chama is an important habitat for bald eagles, especially near open water (like Abiquiu lake) and forested habitats along the river. The species is likely to be found in the Chamita reach, particularly during migration and winter months
Common Black Hawk	*Buteogallus anthracinus*	Protected under the MBTA	Threatened	**Low to Moderate –** This raptor is a riparian species that nests in tall trees along rivers and feeds on fish and amphibians. The Rio Chama provides some suitable habitat, particularly in forested areas and riparian zones with large cottonwoods and willows, though the species is not widely distributed in this area.
Boreal owl	*Aegolius funereus*	Protected under the MBTA	Threatened	**Low –** this owl typically occurs in high-elevation coniferous forests with dense understories. The Chamita reach is at a lower elevation and dominated by riparian habitats and agriculture, it is unlikely to host boreal owls, which are more common in high-mountain habitats.
Peregrine falcon	*Falco peregrinus*	Protected under the MBTA	Threatened	**Low to Moderate –** This raptor is typically found in high cliff or tall structures, such as rocky outcrops, buildings, and may pass through the area during the migratory season.
Gray vireo	*Vireo vicinior*	Protected under the MBTA	Threatened	**Low –** this bird prefers shrubby, lowland habitats near riparian corridors. While the Chamita reach may offer some suitable habitat, the species is not commonly found in this area, making the likelihood of occurrence low
Baird's sparrow	*Centronyx bairdii*	Protected under the MBTA	Threatened	**Low –** this bird is a grassland species that prefers shortgrass prairie and dry, open habitats. The conditions near Chamita are not ideal for this species and its presence is unlikely.
Boreal toad	*Anaxyrus boreas boreas*	-	Endangered	**Low –** this amphibian typically inhabits wetlands, springs, and high-elevation riparian habitats in northern New Mexico. The species is generally found at higher elevations than those near Chamita, limiting its occurrence
Rountail chub	*Gila robusta*	-	Endangered	**Moderate –** this is a native fish found in warm, slow-moving rivers with rocky substrates and riparian vegetation. The Rio Chama provides suitable habitat for this species, especially in areas with minimal disturbance and appropriate water quality

3.3.3.2 **Alternative 1: No-Action Alternative**

The No-Action Alternative would result in no proposed project-associated effects on Federally- or State-listed species with special status.

3.3.3.3 **Alternative 2: Proposed Action Alternative**

The Proposed Action may present a Minor Effect, and could have some temporary effects on special-status species (Table 4), but these impacts are expected to be minimal or mitigable with proper measures (see Section 3.6 BMP Summary). For federally listed species like the New Mexico meadow jumping mouse, Monarch butterfly, Nokomis fritillary, Suckley's cuckoo bumble bee, and State-listed species such as the Bald eagle, Common black hawk, Peregrine falcon, and Gray vireo, the Proposed Action could cause short-term disruptions (such as habitat disturbance, noise or displacement). Any disturbances during construction can be minimized through timing restrictions and vegetation restoration (see Section 3.6 BMP Summary), leading to a determination of **"May Affect, Not likely to adversely affect"**, but will likely result in long-term habitat improvements.

For species such as the Jemez Mountain salamander, Mexican spotted owl, Yellow-billed cuckoo and Southwestern willow flycatcher are not expected to be affected as the project, leading to a determination of No Effect, since the Project occurs outside of any suitable habitat. Overall, the Proposed Action is determined to have minimal and temporary adverse effects on special status species, which would be abated with appropriate BMP strategies ensuring that impacts are temporary and limited.

Table 4. Summary of the potential effects and effects determination from the proposed project to Species with Special Status.

Common Name	Scientific Name	Federal Status	State Status	Potential Effects of the Proposed Action	Effect Determination
New Mexico Meadow Jumping Mouse	*Zapus hudsonius luteus*	Endangered	Endangered	Temporary disturbance to riparian habitat, soil compaction, and vegetation loss during construction may affect, but not likely adversely affect this species.	**May Affect, Not likely to adversely affect** Temporary impacts can be mitigated with proper measures.
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened	Threatened	Possible disturbance to foraging areas in riparian or forested areas, but highly unlikely since construction zones occur outside of known habitats.	**No Effect** The project would not occur in the salamander's suitable habitat.
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered	Endangered	Temporary disturbance to riparian habitats during construction, including vegetation removal and water diversion. However, highly unlikely since the suitable habitat does not occur within project footprint.	**No Effect** The project does not occur in species' s suitable breeding habitat; however impacts can be minimized through strategic timing and restoration.
Western Yellow-billed Cuckoo	*Coccyzus americanus*	Threatened	Threatened	Disturbance to riparian woodlands, particularly nesting sites and foraging habitats during construction. However, highly unlikely since the suitable habitat does not occur within project footprint.	**No Effect** The project does not occur in species' s suitable breeding habitat; however, impacts can be minimized through strategic timing and restoration.

Jemez Mountains Salamander	*Plethodon neomexicanus*	Endangered	Endangered	Minimal impact expected as project is not in high-elevation forested areas; potential indirect effects from disturbance to soil moisture.	**No Effect** The project would not occur in the salamander's suitable habitat.
Monarch Butterfly	*Danaus plexippus*	Candidate (Proposed Threatened)	Species of Concern	Temporary disruption of milkweed and nectar sources in riparian or wetland areas.	**May Affect, Not likely to adversely affect** Temporary habitat disturbance and impacts can be minimized through strategic timing and restoration, but long-term restoration benefits anticipated.
Nokomis Fritillary (Silverspot Butterfly)	*Speyeria nokomis nokomis*	Threatened	Threatened	Temporary habitat disturbance due to vegetation clearing or soil disturbance during construction.	**May Affect, Not likely to adversely affect** Temporary habitat disturbance and impacts can be minimized through strategic timing and restoration, but long-term restoration benefits anticipated.
Suckley's Cuckoo Bumble Bee	*Bombus suckleyi*	Candidate (Proposed Endangered)	Endangered	Temporary loss of nectar sources and host colonies during construction.	**May Affect, Not likely to adversely affect** Temporary habitat disturbance and impacts can be minimized through strategic timing and restoration, but long-term restoration benefits anticipated.

3.4 Cultural Resources

Section 106 of the National Historic Preservation Act [54 U.S.C. § 300101 et seq.] (NHPA) and its 36 CFR Part 800 implementing regulations require Federal agencies to take into account the effects of their undertakings (e.g., projects or permits) on historic properties.

Historic properties are legally considered to be those properties (cultural resources) eligible for listing on the National Register of Historic Places (NRHP). To be eligible for listing, a property must have "the quality of significance in American history, architecture, archeology, engineering, and culture" that can be "present in districts, sites, buildings, structures, and objects," must "possess integrity of location, design, setting, materials, workmanship, feeling, and association," *and* must meet at least one of a set of four criteria relating to (A) association with historical events; (B) historically significant people; (C) distinctive characteristics of a period or style, and/or (D) are likely to yield information important to prehistory or history. There are many possible examples of historic properties, including archaeological sites, historic buildings, traditional cultural properties (TCPs), and historic districts. As such, the identification and evaluation of historic properties (including archaeological sites, historic buildings, and other features constructed or modified by humans in the past) is an important component of this project.

The Section 106 process includes the identification of historic properties that might be affected by a project, the evaluation of those properties, determinations of effect on those properties, consultation with various parties (including the New Mexico State Historic Preservation Officer [SHPO], Tribes, local governments, and the public) about those effects, and resolution of any adverse effect on historic properties.

3.4.1.1 Existing Conditions

The Area of Potential Effect (APE) for the proposed project work is the construction footprint, plus areas subject to ground disturbance for associated investigations (e.g. geotechnical investigations), as well as staging areas. The portion of the acequia within the APE was previously constructed by USACE in 2002, and has been subjected to USACE modification and rehabilitation during the 1990s and early 2000s under "no adverse effect" determinations (see previous NMCRIS activities 38809 and 49652, and HPD log # 65821), and none of the portions of the acequia planned for the current construction project are expected to involve original or older components. On 4 September 2024, USACE archaeologist Jonathan Van Hoose surveyed the APE encompassing proposed geotechnical borings, as well as the portions of the acequia currently planned for rehabilitation, for cultural resources (NMCRIS 156910). This survey found no evidence for any archaeological site or cultural resources within the APE aside from the acequia itself, which has the archaeological site number LA 100724. All portions of LA 100724 within the APE have been built or substantially modified within the last three decades.

3.4.1.2 Alternative 1: No-Action Alternative

Under the no-action alternative, no new impacts would be introduced to the resource within the APE, LA 100724. As a general statement, to the extent that lack of ongoing maintenance and improvement to the acequia system threatens the ongoing functioning of the acequia, the no-action alternative may allow future adverse effects to the system to occur.

3.4.1.3 Alternative 2: Proposed Action Alternative

While USACE determined the acequia system (LA 100724) itself eligible for NRHP listing during its earlier consultations, we determine that, for the purposes of this project, the portions of the acequia that were constructed or replaced during or since the 1990s are not themselves significant and do not contribute to the resource's significance. As such, we determine that any work that might directly affect these elements would result in no adverse effect to LA 100724.

Because the entire portion of the Acequia de Chamita within the APE was completely reconstructed within the last 25 years, we determine that this portion of the acequia does not contribute to the eligibility of the overall resource, and that continued rehabilitation work on this portion would result in **no adverse effect** to LA 100724 as a historic property. SHPO concurred with this determination on 13 December 2024 (HPD Log # 124037) and concurred with the same determination for the use of an adjacent area for staging on 4 November 2025 (HPD Log #126562). USACE also consulted with the following Tribes with connections to the area: the Comanche Nation of Oklahoma, the Jicarilla Apache Nation, the Kiowa Tribe, the Navajo Nation, Ohkay Owingeh, the Pueblo of Picuris, the Pueblo of Pojoaque, the Pueblo of San Ildefonso, the Pueblo of Santa Clara, the Pueblo of Taos, the Pueblo of Tesuque, the Pueblo of Zia, and the Hopi Tribe. USACE received a response from the Pueblo of Pojoaque Tribal Historic Preservation Officer (THPO) on 5 November 2024 indicating no concerns and a statement deferring to the Pueblo of Ohkay Owingeh for any concerns regarding the project. USACE received no indications of concern from Tribes during consultation. See Appendix C for cultural resources consultation correspondence.

3.5 Socioeconomic Considerations

3.5.1.1 Existing Conditions

The Rio Chama valley is one of northern New Mexico's most culturally rich and historically continuous human landscapes, reflecting centuries of interaction between people, water, and land (USFS, 2017). The valley's communities, stretching from Chama and Tierra Amarilla south through Abiquiu, Cañones, and Medanales to Española, are rooted in a Hispano agricultural heritage that dates to the 17th and 18th centuries, when settlers established acequia irrigation systems to divert water from the Rio Chama and its tributaries onto small fields, or "milpas" (Rivera et al. 2003). These community-managed ditches, governed by traditional mayordomos and local acequia associations, remain vital social and ecological institutions that distribute water equitably while maintaining riparian vegetation and wetland corridors that support biodiversity (Rodriguez, 2006; Trujillo, 2012). The acequia culture embodies a deep ethic of reciprocity and communal stewardship, where land and water are treated as shared resources essential to livelihood and identity (Fernald et al. 2015; OSC, 2016; NMAA, 2020). Today, family farms and ranches continue to cultivate alfalfa, chile, corn, and native grasses, sustaining both local economies and cultural continuity in the face of modernization and water scarcity. The area's population includes descendants of Indigenous peoples, Spanish settlers, and mixed-heritage families, many of whom maintain traditional lifeways that integrate Catholic, Puebloan, and agrarian worldviews, expressed through festivals, land tenure patterns, and collective labor (faenas) along the acequias (Rivera, 2003). These communities represent a unique cultural nexus where Indigenous and Hispanic traditions blend through centuries of coexistence and adaptation to the landscape. The Rio Chama's living culture, anchored in language, land, water, and ritual practice, illustrate the enduring human dimension of northern NM's river valleys, where cultural identity and ecological function remain inseparable.

The Chamita reach of the Rio Chama lies within Rio Arriba County, an economically challenged region with a strong historical foundation in agriculture heritage. Traditional and contemporary agricultural enterprises in the area include orchards, hay production, livestock rearing, and subsistence farming, all of which depend heavily on reliable irrigation from the acequia network. Rio Arriba County is characterized by rural, and predominantly a region of Hispanic heritage, (EDD, 2025). Approximately 67.3% of residents identify as Hispanic, Non-Hispanic White about 28%, Two or More Races at 23% and Native American at 16.7% (EDD, 2025; Data USA, 2025).

In recent decades, the relative economic importance of agriculture has declined, with a corresponding increase in the role of government employment and services. Several socioeconomic challenges. The area's median household income (~$53,900) falls below state and national averages, and income growth over the past decade has significantly lagged behind broader trends (US Census Bureau, 2025). Elevated poverty rates (around 20%) further underscore the county's economic constraints. Although current unemployment appears moderate (3.5–4.5%), these figures can understate chronic underemployment and the seasonal variability typical of the local agricultural economy.

These indicators collectively reflect a community facing ongoing economic vulnerability, diminished opportunity, and reliance on traditional livelihoods, making infrastructure investments that support stability and productivity, such as acequia rehabilitation, highly consequential. The Chamita acequia is a vital component of the local agricultural economy, supporting both commercial production and traditional subsistence uses. Over 55% of households reported speaking Spanish at home, with just 37% primarily using English. Although a non-English language at home is the County's primary shared language, this does not consider the potential for a multi-lingual nature of households, but only the primary self-reported language spoken. The high use of Spanish reflects deeply rooted New Mexican Spanish dialects, distinct from Spanish spoken in Mexico and other nations of Latin-America, an indication of centuries of local linguistic tradition (Espinosa, 1913; Romero, 2023).

3.5.1.2 Alternative 1: No-Action Alternative

With the No-Action Alternative, there would be no significant impact that could directly contribute to changes in existing conditions of socioeconomic components and all-at-risk communities. Additional, benefits associated with the proposed rehabilitation of the acequia ditch, including providing a reliable, efficient, low-cost, and low-maintenance system for the continued conveyance and distribution of water for use by the members of the RCAA, would not be realized.

3.5.1.3 Alternative 2: Proposed Action Alternative

The Proposed Action would have a No Effect determination, this would be appropriate for the Project regarding its potential impacts to all-at-risk communities and socioeconomic considerations. The project footprint is limited to an existing acequia corridor and adjacent disturbed areas, therefore, there would be no displacement/loss of housing or access to community resources. Other minor, short-term, negative impacts to surrounding communities during construction could include temporary access disruptions, unexpected traffic patterns and other minor stressors, but not economically harmful. However, such temporary effects would be minimized through the implementation of BMPs and would cease once the project is completed (see Section 3.6 BMP Summary).

The Proposed Action would provide long-term reliability for irrigation deliveries, ensuring the continued use of existing agricultural lands. This, in turn, could help sustain local livelihoods tied to farming and related agricultural services, maintain the cultural heritage of acequia-based land use, and contribute to the stability of the rural economy. No adverse socioeconomic effects are anticipated from the Project; rather, its implementation is expected to provide a modest but meaningful benefit by preserving agricultural productivity and supporting the community's traditional economic base.

3.6 BMP Summary

The following BMPs would be implemented to reduce impacts from the Proposed Action on existing resources (Table 5).

Table 5. Summary of Best Management Practices

BMP Category	Description of BMP	Additional BMP Notes
Soils (Erosion Control)	Implement erosion control techniques (e.g., silt fences, hay bales, mulching) to prevent soil loss, such as a Stormwater Pollution Prevention Plan (SWPPP).	Ensure erosion control measures are in place prior to construction activities, especially near active flow ways and disturbed areas.
Soils (Soil Stabilization)	Soil Stabilization: Use temporary or permanent cover crops to stabilize disturbed soil areas.	Cover crops should be native species that support riparian restoration.
Climate (Climate-Resiliency)	Promote a design to use native vegetation to sequester carbon and reduce greenhouse gas emissions.	Use climate-adaptive species for re-vegetation actions.
Water Resources (Sediment Control)	Install sediment traps or barriers to prevent sediment from entering water bodies during construction.	Minimize disturbance to water flow and storm runoff by scheduling excavation activities during dry periods.
Floodplains (Spill Control)	All fuels, oils, hydraulic fluids, and other similar substances would be appropriately stored outside of the floodplain.	Construction equipment would be inspected daily and monitored during operation to prevent leaking fuels or lubricants from entering any surface water.
Floodplains (Excavation design)	Ensure the rehabilitation does not alter existing floodplain hydrology or increase flood risk.	Avoid unnecessary excavation or filling-in actions in floodplain areas unless necessary for the ditch rehabilitation.
Hazardous Waste (Waste Material Control)	A plan would be implemented regarding the treatment and disposal of waste material.	Waste material would be disposed of properly at commercial disposal areas or landfills.
Air Quality (Dust Control)	Implement dust control measures such as water spraying, chemical dust suppressants, or covering soil piles.	Apply dust suppression throughout the construction phase, especially during dry months.
Air Quality (Equipment Maintenance)	Ensure all construction equipment is well-maintained to minimize exhaust emissions.	Prioritize low-emission construction equipment and limit idle times.
Noise (Noise Management)	Schedule high-noise activities (e.g., heavy machinery operations) during non-peak hours and non-sensitive seasons to minimize disruption.	Use quieter machinery where possible and avoid working near sensitive habitats during sensitive times of season.
Aesthetics (Re-vegetation)	Restore disturbed areas with native plant species seed-mix to enhance the visual quality of the landscape.	Focus on species that align with the regional aesthetic and the natural/cultural heritage.

Aesthetics (Dark Skies)	Exterior lighting systems and controls must be shielded to minimize light trespass.	This includes fully shielded luminaires to eliminate direct light above the horizontal plane.
Vegetation Communities (Minimize Disturbance)	Except in areas to be cleared, do not remove, cut, deface, injure, or destroy vegetation patches without the Contracting Officer's permission.	Any vegetation that is planned to be removed, thinned, or modified should be analyzed by the USACE Project Manager/Environmental Resources Biologist.
Vegetation Communities (Invasive Flora Control)	Equipment and tools should be cleaned and free of plant and soil residue.	All construction equipment should be pressure washed and/or steam cleaned before entering the project site to ensure that all equipment, machinery, rocks, gravel, and other materials are cleaned, weed free and inspected daily for leaks.
Vegetation Communities (Tree Protection)	Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations	Any trees that are planned to be demolished shall be analyzed prior to their removal and any activity that involves in tree removal or tree trimming must be coordinated with the USACE Project Manager/Environmental Resources Biologist to schedule a biological survey at least 3 days prior to beginning work.
Wildlife (Protection)	Conduct pre-construction surveys to identify presence or signs of occupancy of wildlife (e. g. birds or burrowing animals) to avoid disturbance.	Avoid construction in areas with wildlife presence.
Wildlife (Buffer zones)	If wildlife is detected, create buffer zones around active wildlife or active wildlife elements (e.g., nests, dens) to avoid disturbance during construction.	Monitor wildlife activity before and during construction to avoid disturbance.
Wildlife (Human-Wildlife Interactions)	Approaching wildlife could further becoming a nuisance. Implement measures to prevent negative wildlife interactions or wildlife damages to property.	Keep tools and other equipment closed to the extent possible to prevent inhabitation of wildlife. Trash and unneatened food must be policed to prevent wildlife attraction and the development of nuisance behavior.
Species of Special Status (Protection)	Conduct pre-construction surveys to identify presence or signs of occupancy of any Species of Special Status to avoid disturbance.	Avoid construction in areas with Species of Special Status presence. Impacts to nesting birds would be avoided by scheduling work outside of the migratory/nesting season or conducting a bird presence and nest survey at least 3 days prior to any vegetation disturbance, removal or associated construction activities.

Species of Special Status (Timing Restrictions)	Avoid construction activities during the sensitive season (e. g. courtship, breeding and nesting) for special-status species.	Use seasonal restrictions and buffer zones to protect sensitive species during construction.
Species of Special Status (Habitat Restoration)	Include restoration of riparian habitats through native vegetation seeding post-construction to benefit special-status species.	Focus on species that align with the habitat requirements and the natural/cultural heritage.
Cultural Resources (Protection)	Conduct pre-construction surveys for archaeological and cultural sites to avoid disturbance.	Avoid construction in areas with significant cultural or historical resources, or proceed with appropriate protections.
Socioeconomic Considerations (Opportunity and Support)	Prioritize the use of local labor for construction and rehabilitation activities to support community involvement.	Provide information on job availability or job training for local communities.

4. CONCLUSIONS

The Proposed Action analyzed in this draft EA outlines the approach and potential impacts for the planned water conduit and infrastructure rehabilitation. Environmental impacts would be minor, short-term, and limited to the construction phase. The project is not expected to cause any moderate or significant short-term or long-term negative effects. As a result, the Proposed Action is not anticipated to significantly impact the quality of the human and natural environment and is recommended for implementation.

5. PREPARATION, CONSULTATION AND COORDINATION

5.1 Preparation

This draft EA was planned and prepared by the USACE in cooperation with, and at the request of the RCAA. Personnel primarily responsible for preparation include:

Christopher M. Zayas	Acequia Program Manager, Program Management, USACE
Johnathan Van Hoose	Archaeologist, Environmental Resources, USACE
Jorge Rodrigo Sedeno	Biologist, Environmental Resources, USACE

5.2 Consultation and Coordination

Per 40 CFR §§ 1507.3 the USACE initiated public involvement and agency scoping activities to solicit input on the 2026 draft EA, titled Rehabilitation of the Acequia de Chamita, Rio Arriba County, NM.

Members of the public were provided a Notice of Availability for a 30-day public review period of the draft EA commencing on 15 January 2026 and concluding on 13 February 2026. A

hardcopy of the draft EA was made available for public review at the Española Public Library (405 N. Paseo de Oñate, Española, NM 87532) during the public review period. An electronic copy of the draft EA was made available in the following USACE webpage:

https://www.spa.usace.army.mil/Missions/Environmental/Environmental-Compliance-Documents/Environmental-Assessments-FONSI/

The Notice of Availability was published in the local newspaper of the region, the Rio Grande Sun, prior to the start of the public review period (please see Appendix D).

Agencies and entities that were contacted in preparation of this draft EA include:

Mr. Shawn Sartorius
U.S. Fish and Wildlife Service
New Mexico Ecological Services Field Office

Ms. John Irizarry
U.S. Bureau of Reclamation
Albuquerque Area Office

Mr. Jack Marchetti
New Mexico Department of Game and Fish
Fisheries Management Division

Ms. Jennifer Baca
New Mexico Interstate Stream Commission
Office of the State Engineer

Sami Naibauer
Taos Field Office
U.S Bureau of Land Management

Mr. Jeremy G. Maestas
County Manager
Rio Arriba County

Ms. Sandra Imler-Jacquez
Española Ranger Station
U.S Forest Service

Mr. Eli Martinez
Office of Communities, Tribes and Environmental Assessment
U.S. Environmental Protection Agency

A comment response table (Table 6) is provided below that summarizes the comments received during the 30-day Public Review and Comment period, scheduled from January 15th, 2026, until February 13th 2026.

Table 6. Summary of Comments from the 30-day Public Review (table would be finalized following the public review period from January 15th, 2026, until February 13th 2026.)

Agency	**Comment**	**USACE response**

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