BUREAU OF RECLAMATION

Los Lunas River Mile 163 River Maintenance Project Environmental Assessment - DRAFT

Middle Rio Grande Project, New Mexico

U.S. Department of the Interior November 2024

Mission Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

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

Los Lunas River Mile 163 River Maintenance Project Environmental Assessment - DRAFT

Middle Rio Grande Project, New Mexico

Initially prepared by SWCA Environmental Consultants (2022) and updated by Bureau of Reclamation (2024)

SWCA Environmental Consultants

Matt McMillan, Project Manager
Coleman Burnett, NEPA Specialist
Andrea McArdle, NEPA Specialist
Lili Perreault, NEPA Specialist

Bureau of Reclamation

Ann Demint, MA, MWR, Project Manager
Jancoba Dorley, Ph.D., Project Manager
Michelle Klein, P.E., Hydraulic Engineer
James Fluke, P.E., Hydraulic Engineer
Ari Posner, Physical Scientist
Chris Grosso, Biologist
Scott Hebner, Environmental Protection Specialist
Lawrence Moore, Environmental Protection Specialist
Robert Padilla, PE, D.WRE, Supervisory Civil Engineer

New Mexico Interstate Stream Commission

Anders Lundahl, Hydrologist

Cover Photo: photo taken from project site RM 163.4 – 163.6 looking downstream in May 2021. (USBR/Ari Posner)

Contents

Figures

Page

Tables

Page

1.Acronyms and Abbreviations

BL	bank lowering
BMP	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CWA	Clean Water Act
CY	cubic yards
DBH	diameter at breast height
DOI	U.S. Department of the Interior
EA	Environmental Assessment
ESA	Endangered Species Act
ID team	interdisciplinary team
MRG	Middle Rio Grande
MRGCD	Middle Rio Grande Conservancy District
NEPA	National Environmental Policy Act
NM6	New Mexico State Highway 6
NMISC	New Mexico Interstate Stream Commission
NMOSE	New Mexico Office of the State Engineer
PL	Public Law
project	Los Lunas RM 163 River-System Maintenance Project
Reclamation	U.S. Bureau of Reclamation
RM	river mile
SHPO	State Historic Preservation Officer
THPO	Tribal Historic Preservation Officer
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
WSE	water surface elevations
WOTUS	waters of the U.S.

2.Chapter 1. Introduction and Location

The U.S. Bureau of Reclamation (Reclamation) is proposing to conduct a river maintenance project in the Rio Grande approximately 2 miles above the New Mexico State Highway 6 (NM6) bridge near Los Lunas, Valencia County, New Mexico (Figure 1). The proposed activities are part of Reclamation's requirement to accomplish its mission within the federal authorization of the Middle Rio Grande Project (Flood Control Acts of 1948 and 1950) and within other applicable federal environmental statutes (i.e., National Environmental Policy Act [NEPA], Clean Water Act [CWA], and Endangered Species Act [ESA]) (Reclamation 2012a). The project site River Mile (RM) 163 is within the Los Lunas subreach, a section of the Middle Rio Grande (MRG) extending from Isleta Diversion Dam (RM 169) to the community of Los Chaves (RM 153). The Los Lunas RM 163 River-System Maintenance Project (project) would be located along approximately 1.6 linear miles of the river and 73 acres of the MRG. The landowner of the project area is the Middle Rio Grande Conservancy District (MRGCD).

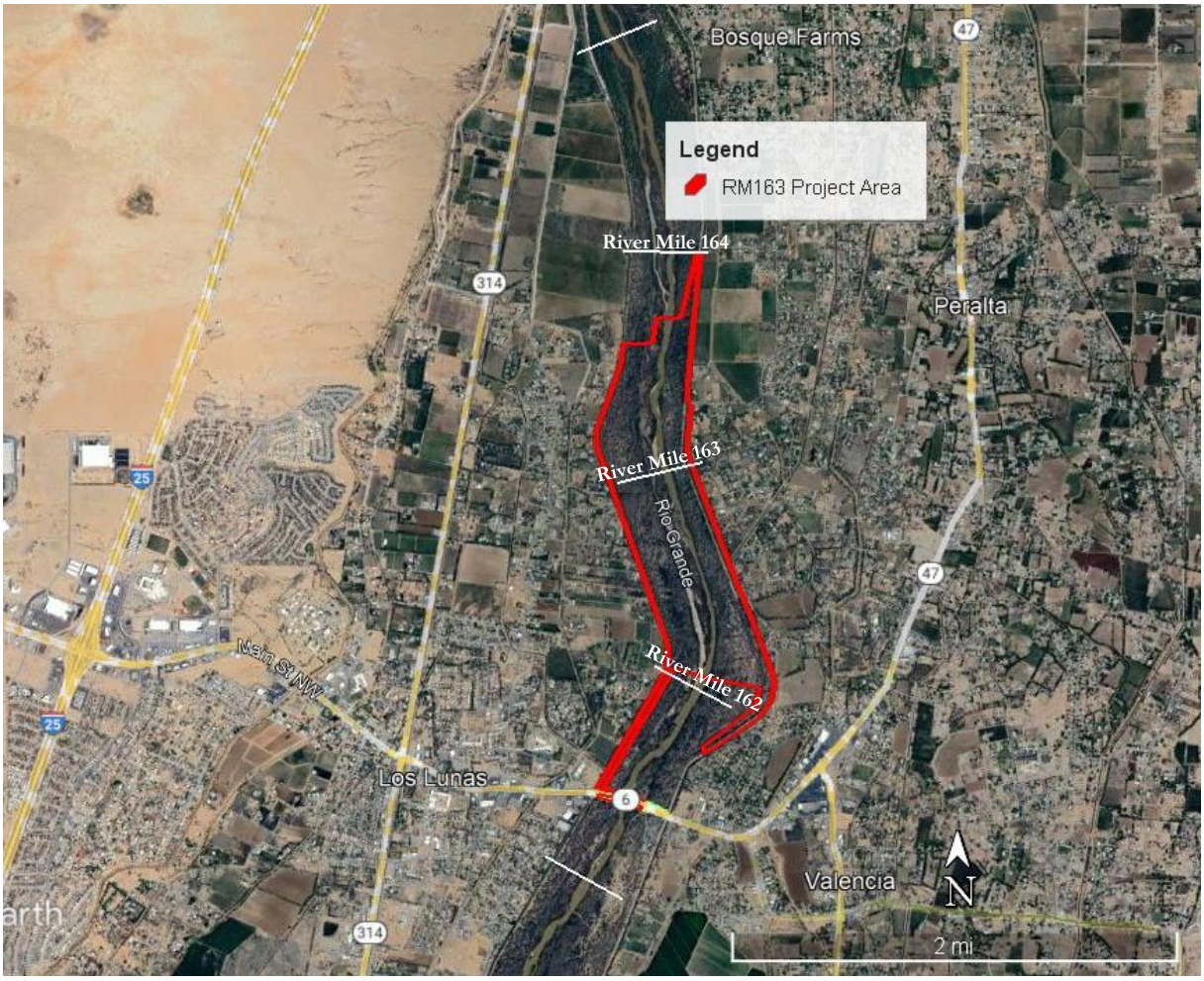


Figure 1. Project vicinity map

Background

This subreach has a semi-perched channel where the riverbanks are higher in elevation than the adjacent floodplain and spoil levee toes (Figure 2). The spoil levees are non-engineered river levees built for flood protection and are used to dispose of spoil from river and canal excavations. The toe is the base of the levee that contacts the river floodplain. Therefore, once flows overbank the main channel banks, the water tends to move laterally down to the levee toe, with some continuing downstream parallel to the levees. There are limited locations where the overbanked water can return to the main channel. During high flows, these conditions result in saturated levee toes (sometimes requiring emergency maintenance to prevent levee failure) and water stranding in the floodplain. The endangered Rio Grande Silvery Minnow (*Hybognathus amarus*; silvery minnow) may also be stranded in these areas. In 2019, repairs of spoil levee in this area cost the MRGCD over $1.2 million (Reclamation 2021)

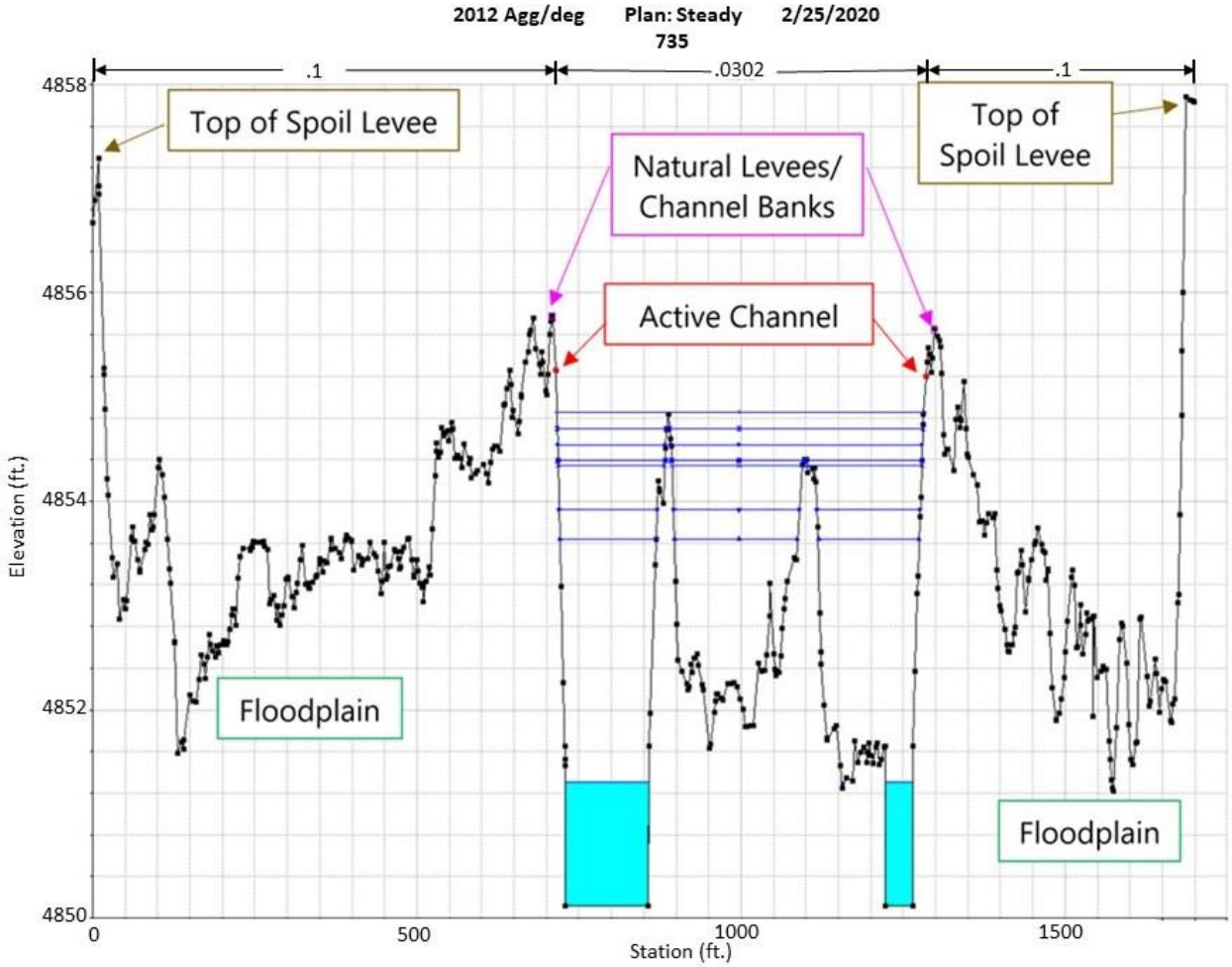


Figure 2. A semi-perched cross-section typical of Isleta to Belen (location is Agg-Deg Rangeline 735) (Kuria and Klein 2020b).

Anecdotal accounts suggest that in recent years the historic riverbanks in the subreach are overbanking at progressively lower flowrates. Field measurements of water surface elevations (WSE) at different flow rates over years also confirm this (Figure 3). In 2005, over 5500 cfs was conveyed below the same elevation that 3700 cfs was conveyed in 2019.

This can be attributed mostly to channel narrowing via vegetation encroachment and bank and bar sediment accretion, but minor channel bed aggradation between Isleta Diversion Dam and the NM6 bridge may also play a role. Channel narrowing and channel aggradation data between 1992 and 2012 are presented in Table 1.1 (Reclamation 2021). However, the 0.2 feet of aggradation between 2002 and 2012 is well within the margin of error over that period of time and length of river.

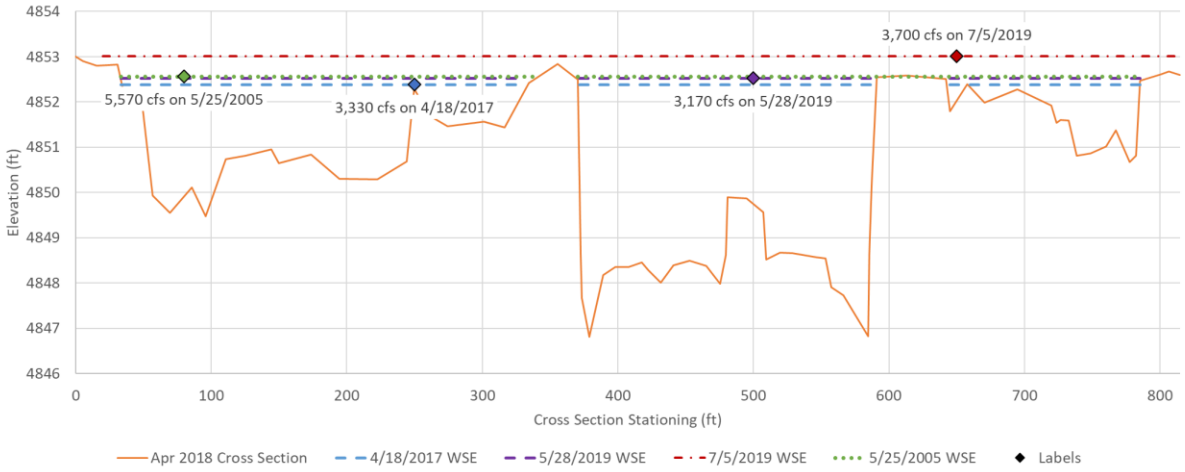


Figure 3. Water surface elevation from 2005 through 2019. The orange line shows the 2018 cross section profile of the river upstream of NM-6 bridge (CO-738.1 or RM161.4) (Kuria and Klein 2020b).

Table 1.1. Channel Narrowing and Aggradation between Isleta Diversion Dam and NM6 Bridge in Belen, 1992–2012

Time Span	Channel Narrowing (feet)	Channel Aggradation (feet)
1992–2002	90	0
2002–2012	50	0.2

Factors contributing to the channel narrowing include major changes to the hydrologic and sediment regimes of the MRG, with reduction in hydrologic peaks and a reduction in the volume and concentration of sediment. The hydrologic peak reduction as well as increased duration of low flows through supplemental water releases for ESA purposes and water management for irrigation are likely contributors to vegetation encroachment and thus channel narrowing.

Purpose and Need

Reclamation has a need to reduce overbanking flows in this reach to meet the requirements of conveyance by reducing overbank flows that strand water in the floodplain near the levee toe and to reduce potential safety issues related to levee protection. The purpose of the Los Lunas RM 163 project is to improve water conveyance through the Los Lunas subreach. The primary goal is to reduce the water surface elevation by increasing channel capacity to reduce overbanking into the historic floodplain (defined here as the floodplain outside the 550-foot-wide channel established by

jetty jacks in 1960s–1970s) at flows less than 3,500 cubic feet per second (cfs) between RM 164 and RM 162. This flow rate is a rough approximation of the 2-year flood flow as identified by Kuria and Klein (2020a). This type of work is considered River Maintenance Class 2, indicating that this work can be planned in advance but the consequences of no action could be substantial in the near term (i.e., the next normal spring runoff or within the next few years).

To keep the project within one construction season, the excavation is limited to a maximum of approximately 120,000 cubic yards (CY). However, more work is needed within the reach to improve conveyance capacity. Thus, this project will be a pilot project for a future width maintenance program, which may include partner agency cooperation from MRGCD and the New Mexico Interstate Stream Commission (NMISC) and others.

The secondary goals of this project are to consider the environmental and geomorphic benefits and impacts, and to be cost effective. Thus, project components were selected to include areas where encroaching vegetation and bar/island accretion have resulted in reduced channel capacity while keeping the excavations to less than 120,000 CY. Terraced banks were used to increase the inundated areas at lower flows to provide nursery habitat for the endangered silvery minnow. This will provide low-velocity and shallow depth floodplain habitat for the silvery minnow during low flow years when there is a minimal spring runoff peak. This design aspect helps to fulfill Reclamation's requirement to implement the Conservation Measures of the 2016 Middle Rio Grande Final Biological and Conference Opinion #02ENNM00-2013-F-0033 issued by the U.S. Fish and Wildlife Service (USFWS) to Reclamation, the Bureau of Indian Affairs, the NMISC, and the MRGCD (USFWS 2016; herein called the 2016 Biological Opinion). The proposed action would contribute to Conservation Measures 47 and 51–56 of the 2016 Biological Opinion.

Decisions to be Made

Reclamation will approve the project, approve the project with additional mitigation measures, or further evaluate the project through an Environmental Impact Statement if significant impacts are identified.

Relationship to Statues and Regulations

Reclamation is authorized to conduct work within the channel and floodplain of the Rio Grande under the federal Flood Control Acts of 1948 and 1950 (Public Laws [PLs] 858 and 516), which were created to authorize the projects carried out by Reclamation to rectify and maintain the river channel throughout the Middle Rio Grande.

This Environmental Assessment (EA) has been prepared in accordance with Reclamation's NEPA Handbook (Reclamation 2012b) pursuant to Council on Environmental Quality's (CEQ) and U.S. Department of the Interior (DOI) implementing regulations on the National Environmental Policy Act, as amended (PL 91-190, 42 United States Code [USC] 4321 et seq.).

This EA was prepared to thoroughly examine the potential environmental impacts of the proposed action and alterative actions in order to support informed decision-making. This EA is consistent with the purpose and goals of NEPA; the requirements of the CEQ implementing NEPA

regulations at 40 Code of Federal Regulations (CFR) 1500-1508; longstanding federal judicial and regulatory interpretations; the DOI's NEPA regulations (43 CFR 46); and Administration priorities and polices.

Reclamation would comply with all applicable federal, state, and local laws and regulations, as well as obtain the necessary permits for the implementation of the proposed action. These laws and regulations include, but are not limited to, the following:

- Antiquities Act of 1906, as amended (PL 52-209; 16 USC 431-433)
- American Indian Religious Freedom Act of 1978 (PL 95-431; 92 Stat. 469; 42 USC 1996)
- Archaeological Resources Protection Act of 1979 (PL 96-95; 93 Stat. 721; 16 USC 470aa et seq.), as amended (PL 100-555; PL 100-588)
- Clean Water Act, as amended (PL 107-303; 33 USC 1251 et seq.)
- Endangered Species Act of 1973, as amended (PL 93-205; 16 USC 1531 et seq.)
- Migratory Bird Treaty Act of 1918, as amended (16 USC 703-712; 50 CFR 21)
- Native American Graves Protection and Repatriation Act of 1990 (PL 101-601; 104 Stat. 3048; 25 USC 3001; 43 CFR 10)
- Section 106 of the National Historic Preservation Act of 1966 (PL 89-665; 80 Stat. 915; 16 USC 470 et seq.), as amended (implemented under regulations of the Advisory Council on Historic Preservation, 36 CFR 800)
- State Water Law, Chapter 72

Scoping and Issues

The project interdisciplinary (ID) team was composed of biologists and engineers from Reclamation, NMISC, and MRGCD. The ID team was integrally involved in the internal scoping to identify potential issues, understand the proposal, develop the purpose and need, and develop a range of alternatives. The ID team conducted an alternatives analysis of the configuration of bankline and floodplain lowering to ensure that the proposed action provides sustainable additional conveyance capacity and low-velocity floodplain habitat for the silvery minnow during low spring runoff years, while minimizing any potential negative consequences associated with the action.

Issues

Using input from the ID team, a list of issues to be analyzed in detail in this EA was developed in accordance with guidelines set forth in the Reclamation NEPA Handbook (Reclamation 2012b). The key issues identified during agency scoping are summarized in Table 1.2. The impact indicators provided are used to describe the affected environment for each issue in Chapter 3, measure change in the issue for the different alternatives, and assess the impacts of alternatives.

Table 1.2. Issues Identified for Detailed Analysis in the Environmental Assessment

	Issue Statement	Impact Indicator
Issue 1	How would the proposed action impact wetlands?	Acres of disturbance
Issue 2	How would the proposed action impact the vegetation community?	Acres of disturbance; Presence of invasive species; Qualitative discussion of historic river conditions
Issue 3	How would the proposed action impact federally listed species and designated critical and/or suitable habitats with potential to occur in the proposed project area?	Acres of available critical and/or suitable habitat within the proposed project area before and after construction; Incidental take of endangered silvery minnow, endangered flycatcher, and threatened cuckoo due to river crossings and construction activities
Issue 4	How would the bank lowering, use of access roads, and spoils disposal impact soils?	Acres of soils impacted
Issue 5	How would the proposed action impact water resources, including water quality and water depletions?	Channel capacity, depletions, turbidity
Issue 6	How would the proposed action change the visual aesthetics as seen by the adjacent landowners?	Modifications to the viewshed

Issues evaluated by the ID team and determined to not require a detailed analysis are provided in Table 1.3.

Table 1.3. Issues Not Analyzed in Further Detail in the Environmental Assessment

Resource/Resource Concern	Rationale for Dismissal
How would fugitive dust and emissions generated by ground-disturbing activities impact air quality and visibility?	All areas within Valencia County, New Mexico, are in attainment with National Ambient Air Quality Standards. During construction, air quality would temporarily be directly impacted by pollution from exhaust emissions and dust. Air pollution from the motorized construction equipment and dust dissemination would discontinue at the completion of the construction phase. The minor increase in emissions from short-term construction activity would not be expected to result in exceeding the ambient air quality standards for any criteria pollutants in the project area or Valencia County. Fugitive dust from construction activities would be tightly controlled and abated on the haul road and other locations, as necessary, with the application of water.
How would the proposed action impact cultural resources?	A Class III survey found two recorded historic properties, the historic alignment of NM6 and the Upper Belen Riverside Drain, in the area of potential effects (Wells et al. 2024). The NM6 historic alignment no longer exists in this location with the construction of the new bridge over the river and the realignment of the highway in that location. The Upper Belen Riverside Drain would not be impacted by the proposed project. Furthermore, the levees in the project area were recorded in detail with full Historic Cultural Properties Inventory forms and found to not be eligible for listing in the National Register of Historic Places under any criterion. Although no cultural or historical resources will be impacted, consultation with the New Mexico State Historic Preservation Officer (SHPO) and the Pueblo of Isleta Tribal Historic Preservation Officer (THPO) will occur (Appendix G). Therefore, this issue has been dismissed from detailed analysis.
How would construction of the proposed action affect hydrologic variability caused by greenhouse gas emissions?	The minor short-term increase in greenhouse gas emissions that could result from the proposed action would not produce hydrologic variability impacts that differ from the no action alternative. The incremental contribution to global greenhouse gases from the project cannot be translated into effects globally or in the area of this site-specific action.

Table 1.3 (continued). Issues Not Analyzed in Further Detail in the Environmental Assessment

Resource/Resource Concern	Rationale for Dismissal
How would the proposed action impact Indian Trust Assets?	Indian Trust Assets, or resources, are defined as legal interests in assets held in trust by the U.S. Government for Native American Indian tribes or individual tribal members. Examples of Indian Trust Assets are lands, minerals, water rights, other natural resources, money, or claims. No Indian Trust Assets were identified within the project area. Isleta Pueblo land is located to the north of the proposed action. Unless prior permission is obtained, no access through or disturbance of Isleta Pueblo land shall occur within the context of this project. There would be no impacts to Indian Trust Assets from implementing the proposed action. Reclamation archaeologists have discussed the project with Pueblo archeologists as part of government-to-government consultation and the Class III archaeological survey report will be shared with the Pueblo for their review and approval.
What impact would the proposed action have on transportation and the existing road network?	The access to the project area is through MRGCD gates. The public can pass through these gates with paid permits, but the permit language reserves the right to restrict access for activities such as construction. Signs would be posted at the gates restricting the public from entering the gates and potentially entering the construction operations. These restrictions would only be temporary for the duration of the project and would not create a permanent change in access. There would also be signs indicating heavy equipment entering NM6. Signage would be placed strategically indicating active construction site for people traveling through the bosque on official business. The proposed river crossing for construction equipment described in Chapter 2 is proposed to avoid any traffic conflicts along NM6. There would be no long term or permanent impacts to the existing transportation network from the proposed action.

Table 1.3 (continued). Issues Not Analyzed in Further Detail in the Environmental Assessment

Resource/Resource Concern	Rationale for Dismissal
How would the proposed action impact migratory birds?	Direct impacts to migratory birds would be avoided by conducting work activities outside of the normal breeding and nesting season (April 15 to August 15). In accordance with the 2016 Biological Opinion (USFWS 2016), if work is necessary between April 15 and August 15, disturbance to suitable/occupied migratory bird habitat will be avoided during construction activities to the greatest extent possible. Reclamation would survey for migratory bird nests and coordinate and consult with the USFWS prior to work commencing. If birds are detected, Reclamation would coordinate with the USFWS to determine appropriate next steps. Additionally, potential impacts to nesting migratory birds would be further avoided or minimized with the BMPs listed in Appendix B.
Would the proposed action use or produce hazardous materials?	No chemicals subject to reporting under the Superfund Amendments and Reauthorization Act Title III in an amount equal to or greater than 10,000 pounds would be used, produced, stored, or disposed of annually in association with the proposed action. No extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities, would be used, produced, stored, transported, or disposed of in association with the proposed action. BMPs have been identified to minimize or avoid effects from solid and hazardous wastes (Appendix B).

3.Chapter 2. Alternatives

Alternative A – Proposed Action

A detailed description of the proposed action is provided in Appendix D. The key details are summarized below.

The project components consist of five bank lowering areas within the historic channel (Figure 4, Table 2.1) that will create inset floodplain area. An inset floodplain is a lower, more frequently inundating area adjacent to a river channel between the channel and the older and usually drier floodplain. Bank lowering involves removing soil from the river banks vertically and horizontally so as to widen the river channel to create more space for water flowing in the channel. Lowering will include different elevations to create terraces that inundate at different flow levels. This would

lower the WSE by providing additional flow area and increasing channel capacity. These lowering areas would improve the channel conveyance by increasing the width of the river both on the west and east banks of the river. A relic berm in the eastern floodplain was included for removal in the Project Description, but the removal was deleted from the project to avoid impacts to the adjacent wetland and any possible cultural resource issues.

Table 2.1. Design Details for Proposed Project Components

Project Component[1]	RM Extent	Design Elevation (feet)	Length (feet)	Volume[2] (CY)	Area[2] (acres)
RM 162 BL	162.1–162.9	Varies (4,851–4,855)	Varies	57,402	13
RM 163.1 BL	163.1–163.3	4,857.5	720	7,652	2
RM 163.3 East BL	163.3–163.4	4,857.5	736	5,354	1
RM 163.4 BL	163.4–165.5	4,857	553	13,828	2
RM 163.6 BL	163.6–163.8	Varies (4,859.25–4,860)	Varies	7,758	2
Total	**–**	**–**		**91,994**	**20**

1. All project comments are inset floodplain bank lowering. BL = bank lowering.
2. Volumes and Area are expected values, maximum values are described below.

Three inset floodplain bank lowering (BL) areas have a single elevation for the entire polygon, as shown in Table 2.1. Two areas (RM 162 BL and RM 163.6 BL, Table 2.1) would have two elevations each to create floodplain terraces. The edges of the bank lowering would gently slope to existing ground at 4:1 horizontal to vertical ratio.

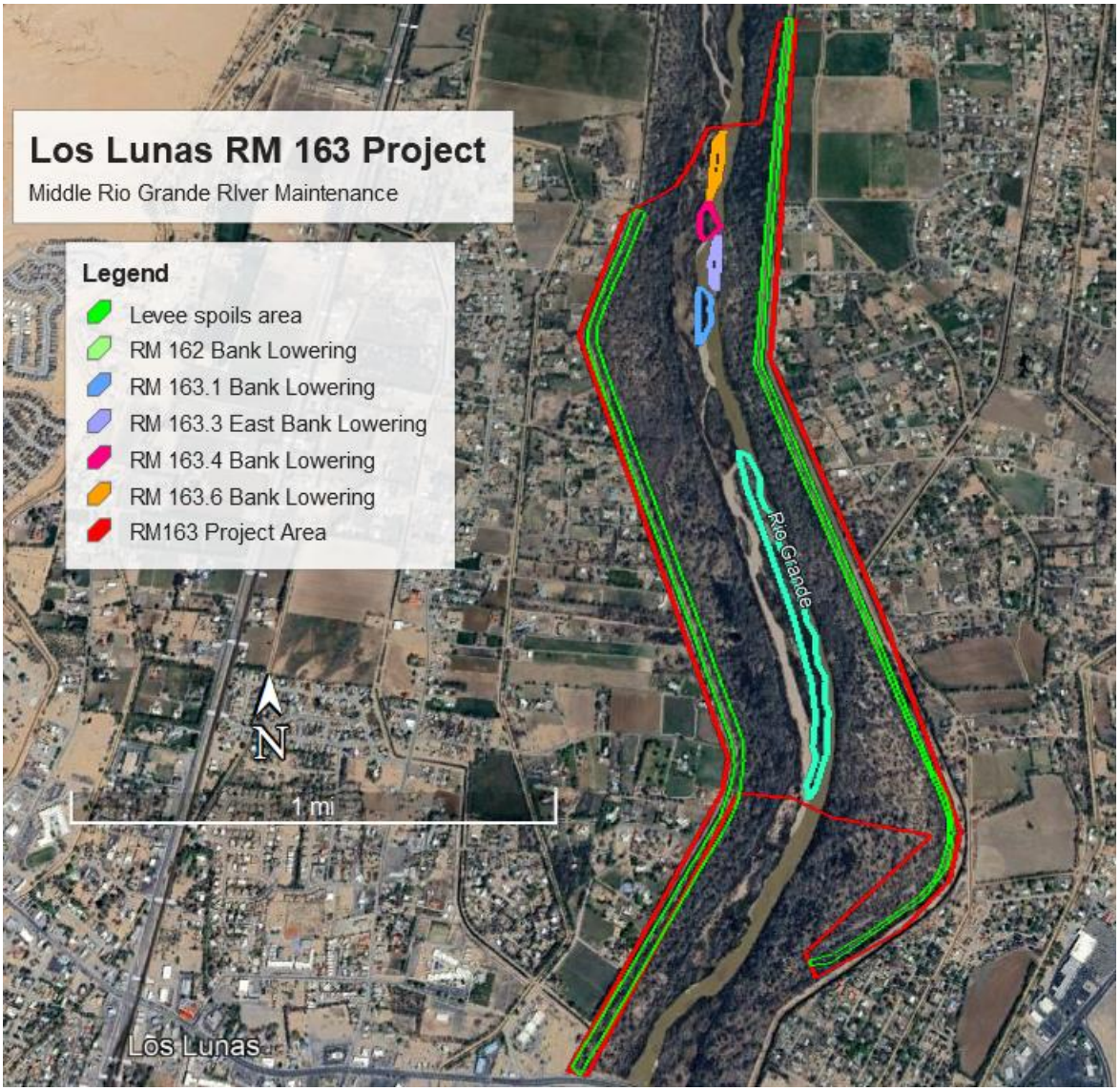


Figure 4. Project area along with the project components. See Appendix A for individual project component maps.

These project components are intended to inundate at a variety of flow rates. Due to geomorphic response and hydrologic uncertainties, it is unknown which channel elevations would experience sedimentation the quickest. It is hypothesized that designing surfaces for a variety of flow rates would help extend the project longevity by increasing the probability that one of the components would experience lower sediment accumulation rates. Also, this diversity would provide habitat for the silvery minnow at a variety of flow rates and regenerate riparian vegetation age and structural diversity. The target inundation flow rates are provided in Table 2.2.

Table 2.2. Target Inundation Flow Rates

Project Component	Inundation Flow Rate (cfs)[1]
RM 162 BL – Terrace elevation 4,851 feet	105
RM 162 BL – Terrace elevation 4,853 feet	105
RM 162 BL – Terrace elevation 4,854 feet	500 (1,000)
RM 162 BL – Terrace elevation 4,855 feet	500 (1,000)
RM 163.1 BL	500
RM 163.3 East BL	105
RM 163.4 BL	105
RM 163.6 BL – Terrace elevation 4,859.2 feet	500 (1,000)
RM 163.6 BL – Terrace elevation 4,860 feet	1,000 (1,800)

1. Some bank lowering components are relatively small and flat and transition from dry to fully inundated after only a minimal increase in flow. For these project components, only one inundation flow rate is shown in the table. Other project components begin inundating at one flow rate but don't become fully inundated until flows have risen significantly. For these components, the initial inundation flow rate is provided with the fully inundated flow rate in parenthesis.

Table 2.3 shows expected and maximum quantities for the proposed project. These numbers include updates and corrections to the project description. The expected area of site disturbance is approximately 51 acres, which includes 20 acres for the construction area, 8 acres of staging and access, and 23 acres for spoil disposal. The spoil disposal areas are along the levee near the Upper Belen and Upper Peralta Riverside Drains. The maximum possible quantity of site disturbance would be up to 73 acres, which includes up to 26 acres for the construction area, 17 acres of staging and access, and 30 acres for spoil disposal (Table 2.3). These areas are delineated larger than necessary to allow for field adjustments due to changes in conditions.

Table 2.3. Expected and Maximum Quantities of Surface Disturbance, Including Vegetation Removal

Project Component[1]	Units	Expected Quantity	Maximum Quantity
Bank lowering areas	acres	20	26
Access route areas	acres	5	10
Staging area	acres	3	7
Spoil disposal areas	acres	23	30
Total surface disturbance/vegetation clearing	acres	51	73
East access road— mature cottonwood/Goodding's willow	trees	7	11
West levee access road and staging area—mature cottonwood/Goodding's willow	trees	10	15
Spoils disposal—mature cottonwood/ Goodding's willow	trees	145	220
Total anticipated removal of mature cottonwood/Goodding's willow	trees	162	246
Excavated volume—east side	cubic yards	9,384	12,000
Excavated volume—west side	cubic yards	86,640	108,000
Total excavated volume	**cubic yards**	**91,994**	**120,000**
Total wetted impact	**acres**	**0.56**	**2.36**

1. The mature cottonwood/Goodding's willow tree removal estimates are based on a visual count from aerial imagery. These numbers are estimates and specific tree removal quantities would be recorded during construction. If possible, construction crews will remove less.

Access and Equipment Staging

Access to the project site for mobilization and demobilization would occur from NM6. Four of the bank lowering areas are located inside the active river channel with dry access via the western floodplain between RM 162 and RM 164. One bank lowering area is located on the eastern floodplain between RM 163.3 and RM 163.6. Therefore, access to these construction sites would be through the spoil levee roads on both the west and east sides of the river. Proposed access routes and the western staging area are shown in Figure 5 and additional maps are located in Appendix A. Unless prior permission is obtained, no access through or disturbance of Isleta Pueblo land shall occur within the context of this project.

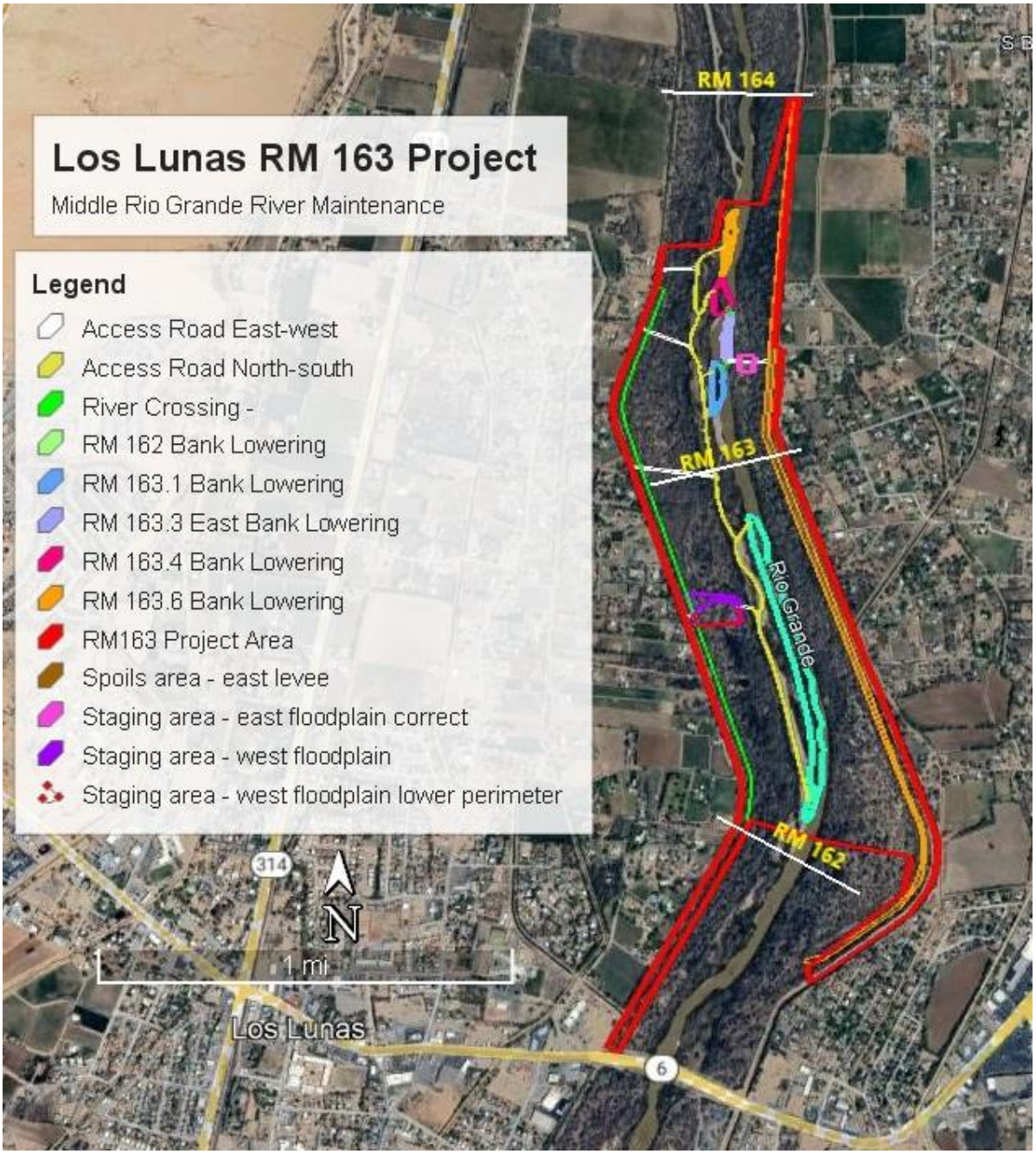


Figure 5. Project components along with staging areas and access routes

Access to the project area is through MRGCD gates. The public can pass through these gates with paid permits, but the permit language reserves the right to restrict access for activities such as construction. During construction, signs would be posted at the gates restricting the public from entering the gates and potentially entering the construction operations.

On the eastern floodplain a temporary access road would be developed from the east levee to the bottom of the RM 163.3 east bank lowering area. The east staging area is located along this access route (Figure 5). Native vegetation in this area would be avoided where possible and non-native

vegetation would be masticated. An alternative access route may be the top of the relic berm in this area (once archaeologists determine it is not a cultural/historical resource). The vegetation on the berm would be removed and masticated, and then the berm would be developed into an access road for the eastern bank lowering polygon area. Assuming the roads are 30 feet wide to allow a variety of equipment to safely travel, the anticipated site disturbance for the eastern access road is 0.37 acre.

Due to the long distance between work sites on the western floodplain, there would be multiple access points from the western levee road to create loops that minimize haul distances from the bank lowering area to the levee. There would be one temporary north-south road constructed (Access Road North-south in Figure 5) to connect the bank lowering areas within the western inset floodplain. This road is mainly free of woody vegetation, and the road's path was identified to avoid impacts to woody vegetation to the extent possible. To connect the river access road back to the levee, a maximum of four east-west "bosque access roads" would be required (Access Road East-west in Figure 5). These roads would also minimize the need to remove wood vegetation, to the extent possible. The proposed 5th access road (south of west staging area) was eliminated to avoid impacts to the freshwater pond in that area. The total estimated surface disturbance for the east and west access roads (30 ft width) would range from 5 to 10 acres (Table 2.3).

New access routes would be reseeded post-construction unless they are identified for longer-term maintenance activities. The road most likely to remain unseeded and kept for longer term maintenance access is the road through the west staging area since it is the least vegetated currently. The access road on the east floodplain may also remain unseeded. The combined acreage that may remain unseeded would be approximately 1 acre.

The staging area on the western floodplain is anticipated to disturb approx. 1.5 acre, but that 1.5 acre will be distributed within approximately 6 acres designated for the staging area in order to provide as much room as possible to avoid disturbing mature native vegetation (Figure 5). The staging area on the eastern floodplain is expected to disturb less than 1.5 acre (Figure 5). Maximum quantities for the staging area are listed in Table 2.3

Mobilization and River Crossings

A full list of construction equipment is provided in Appendix D, Section 3.1.4.

Tracked equipment would be unloaded at the northwest gate of NM6 bridge and would drive up to the western staging area. Due to safety concerns associated with large equipment on NM6, 2 potential river crossing locations have been identified to move equipment from the west side of the river to the east side (Figure 6), if river flow allows.

The proposed river crossing areas are both approximately 0.15 acre and it is anticipated that four pieces of equipment (one dozer, one excavator, and two articulating dump trucks) would cross one time at one of the locations. The total wetted impact area from equipment river crossings would be 0.56 acre.

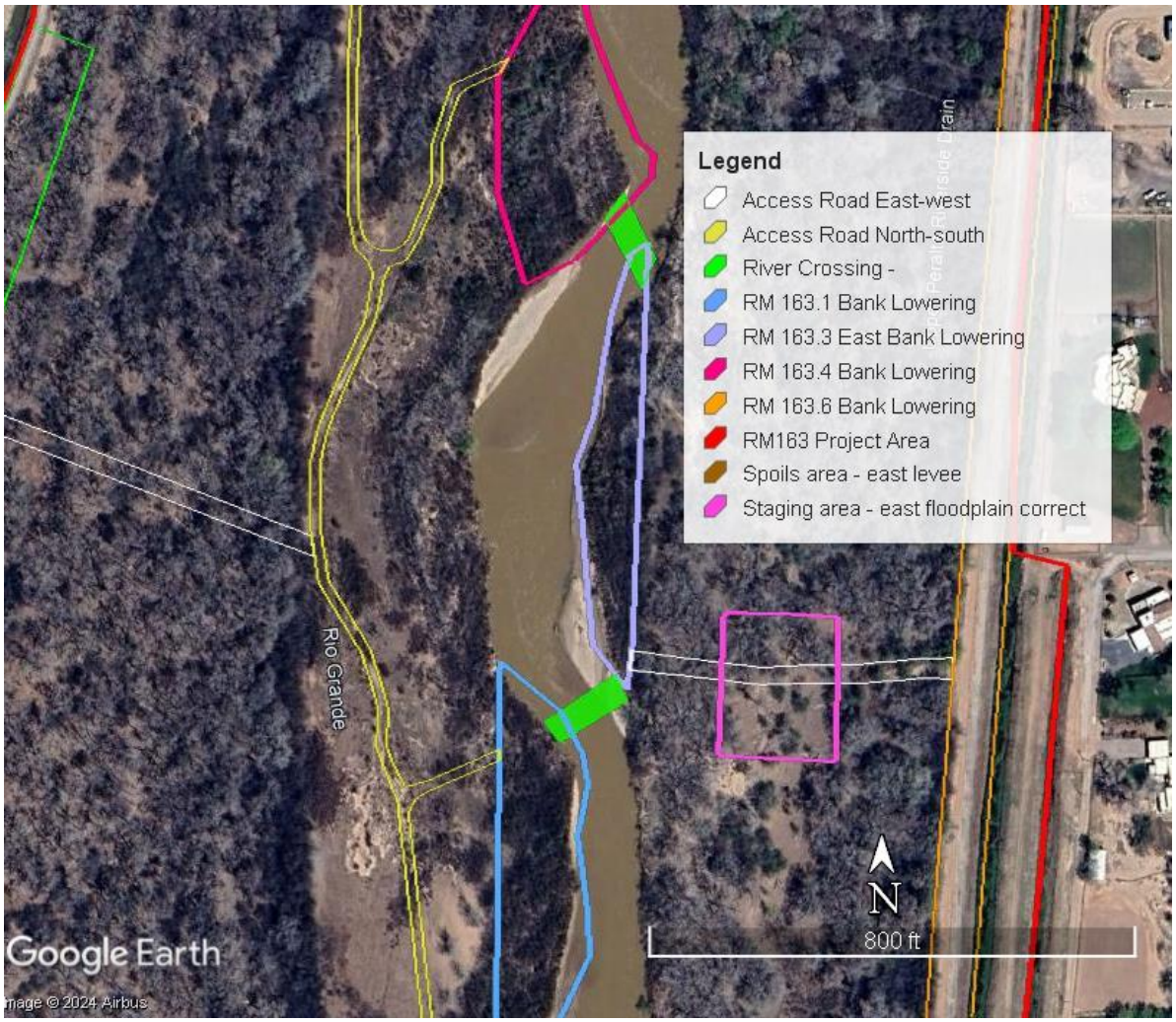


Figure 6. Potential river crossing locations (in green). Only one location would be used.

Construction Methods

Construction of the bank lowering areas would begin by masticating all vegetation, including juvenile native trees, within the bank lowering areas using land-based equipment. Vegetation within the bank lowering areas consists of upland vegetation, willows, non-native species, and mature cottonwoods, with willows dominating at the bankline. The juvenile native trees within the construction areas vary in size but may have a diameter at breast height (DBH) as large as 6 inches. Replacement of adult native trees greater than 6 inches DBH would follow as described in the Best Management Practices (BMPs), Vegetation Replanting and Control section on page B-3 (Appendix B), following an evaluation of the space availability, need for particular species, and any prohibitions against planting. The BMPs are also included in the Project Description and are derived from Reclamation's Biological Assessment (Reclamation 2015). Mitigation of trees removed may be affected by available locations that are suitable (depth to groundwater) for poles, as well as available space for equipment to operate. Live vegetation will not be removed to plant poles. If the project area can't accommodate the mitigation, other areas may be selected outside of the project area depending on space availability, water depletions, depth to groundwater, and other growing conditions.

The bank lowering construction method would be dependent on the current river flow rate in the main channel. The preferred construction method is to use low ground pressure or conventional bulldozers to push the material into piles, starting on the channel side of the work area into the bank side of the area. This method would only be used if the flow in the river channel is low enough that the bulldozers can work completely in the dry riverbed. This method would have zero acres of wetted impact.

If the flow is too high for the bulldozers to work in the dry riverbed, the equipment would be used to excavate material with either dozer or excavator, leaving a berm in place adjacent to the wet channel such that the work occurs in the dry riverbed. Then that berm would be removed by an excavator, resulting in 1.8 acres of wetted impact. This wetted impact may be less depending on the inundation extents at the time of excavation (some areas may be wet while other areas are still dry).

Biomass and Spoils Disposal

The excavated material would then be loaded in a 30-ton articulating dump truck and hauled to the spoil disposal area along the levees. The spoil disposal material would be placed in lifts, wetted, and compacted with the equipment tires or tracks.

Masticated (mulched material) vegetation that is mixed in with the soil would be disposed in the low spots on the bosque side of the levee. Current plans for spoils disposal include the following:

- For the east side work, excavated material would be hauled to the levee road where it would be spread out on the top of the levee roads and along the drain-side slope. The depth placed on the road will generally be 3 -6 inches but could be deeper in low spots. Depth placed on the drain-side slopes will vary between 6 inches and 1-2 feet depending on the slope and available room. The lower levee road at the south end of the project area will be the primary location for spoils, per MRGCD's request to improve that road. The east side disposal area would be approximately 10 – 15 acres, depending on the depths of placement.
- For the west side work, the excavated material would be spread out on the top and river-side of the levee for approximately 2 miles in length. The river-side slope is expected to be the same as the existing levee slope. Some of the material may be placed about 2 ft deep on the drain-side slope, so long as the placement does not decrease the width of the lower levee road. The depth of placement on the levee road would be approximately two feet and could extend at that same height into the bosque by 26 – 34 ft for a total width of 46 – 54 ft. The west side disposal area would be approximately 11 – 13 acres. The spoils would be disposed in the same footprint and vegetation-free zone established for the future USACE Bernalillo to Belen levee project. If it is safe and feasible at the time of construction (spoils quantity, cottonwood health), excavated material would not be placed around selected cottonwood trees in order to avoid removal of those trees. This may increase the height and width of material placement in other locations in the west side spoils area. These trees would then be removed later during construction of the USACE engineered levee, which will be in the same footprint. Also, crews may put some cottonwood trunk remnants on top of the levee road on the side adjacent to the bosque to break up any undesired traffic. This is only applicable to the west side.

No spoils would be disposed beyond the Isleta Pueblo boundary on the west side levee.

Vegetation Removal and Replacement

Vegetation within the maximum construction footprint, including bank lowering areas, road development, staging, and spoil disposal areas, consists of upland vegetation, willows, non-native species (Russian olive, saltcedar, Siberian elm, etc.) and cottonwoods, with willows dominating at the bankline. Juvenile and mature native trees within these areas (Table 2.3) would be masticated, removed with chainsaws, or plucked by an excavator or bulldozer. The bank lowering areas would be masticated to remove all vegetation from the surface. Vegetation clearing involves the removal of vegetation with some amount of subsurface disturbance of the vegetation roots. As described above, spoils placement along the west levee will be adjusted to avoid selected cottonwood trees to reduce tree removal. Also, crews may put some cottonwood trunk remnants on top of the levee road on the side adjacent to the bosque to break up any undesired traffic. This is only applicable to the west side. Replacement of these native vegetation would follow construction as described in BMPs page B-3 (Appendix B), following an evaluation of the space availability, need for particular species, and any prohibitions against planting.

Jetty Jack Removal

Jetty jacks encountered within the bank-lowering (excavation) areas or in the way of access road development would be removed. If jetty jacks are mostly buried and within an access road alignment, spoil material may be brought in to cover the jetty jack instead of removing it. Removed jetty jacks would be stockpiled, and MRGCD would salvage the removed jetty jacks.

Utilities

Prior to starting construction, the construction crew chief will notify 811 to locate and stake utilities within the project area.

Best Management Practices

Appendix B lists the BMPs that would be used to minimize the effects from the proposed action and are derived from Reclamation's Biological Assessment (Reclamation 2015). These BMPs generally apply to construction and/or maintenance activities (work) and may not be applicable in all cases.

Alternative B – No Action Alternative

While a no action alternative is not required in an EA under CEQ or DOI regulations, it is Reclamation's practice to include it because it provides an appropriate basis by which all other alternatives are compared (Reclamation 2012b). Under the no action alternative, the proposed river-system maintenance project would not be implemented. Channel capacity would not be increased and instream aquatic habitat for the endangered silvery minnow along approximately 1.7 linear miles of the Rio Grande would not be created. Reclamation would not be able to implement actions to partially meet Conservation Measures 47 and 51–56 of the 2016 Biological Opinion (USFWS 2016).

Alternatives Considered and Dismissed from Detailed Analysis

Reclamation conducted an alternatives analysis to identify opportunities and constraints for the project site (Appendix E). In addition to the proposed action, Reclamation reviewed four design concepts and determined them to be too impactful or ineffective for the project site conditions. The dismissed design concepts include historic bank lowering, floodplain drainage features, mowing and root raking, and cottonwood tree removal (Reclamation 2021).

Reclamation's preferred alternative (the proposed action) meets the project's purpose and need and the objectives of increasing channel capacity, creating habitat and wetlands, and site longevity.

4.Chapter 3. Affected Environment and Environmental Consequences

This chapter describes the existing conditions relevant to the issues presented in Table 1.2 and discloses the impacts of the proposed action and alternatives on those issues. Impacts can be either long term (permanent) or short term (temporary). Short-term impacts affect the environment for only a limited time and the environment usually reverts rapidly to the pre-construction condition.

Reasonably Foreseeable Trends and Planned Actions

The following information outlines the reasonably foreseeable environmental trends and planned actions that are closely related to the proposed action. The time frame for the cumulative impact analysis is 15 years (i.e., the 2016 Biological Opinion time frame).

In the Los Lunas subreach, the Rio Grande is used to provide water for irrigation in the valley and as conveyance of upstream water to the Elephant Butte impoundment. This reach contains irrigated agricultural croplands, the communities of Isleta Pueblo, Bosque Farms, Peralta, Los Lunas, and Los Chaves, with distribution of homes, barns, and other agricultural buildings. One bridge is located within the Los Lunas subreach, the NM6 highway bridge just south of the proposed action. Another bridge is being planned by the New Mexico Department of Transportation further south at Morris Road near RM 160.

Within the Los Lunas subreach, Reclamation would continue to maintain the river. Water operations upstream of this subreach by Reclamation, USACE, MRGCD, City of Santa Fe, City of Albuquerque, and other water users would continue to affect flows in this subreach. The State of New Mexico, MRGCD, and Reclamation would continue to conduct river maintenance activities as well as habitat restoration activities to benefit federally listed threatened and endangered species.

The engineered construction of the Belen East and West levees adjacent to the project area is expected to undergo improvement, which would remove additional trees within the vicinity of the project area (U.S. Army Corps of Engineers [USACE] 2019). USACE Engineer Technical Letter 1110-2-583, *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment*

Dams, and Appurtenant Structures (USACE 2014) requires that no woody vegetation be allowed to grow on the levee or within 15 feet of the toe of the levee on either side. This prevents root penetration into the levee that can compromise its structural integrity and allows for unobstructed visual inspections on a periodic basis. Following construction, a 15-foot-wide zone along the riverside toe of the levee would be permanently maintained to be devoid of trees and shrubs (USACE 2019:77–76).

Other ongoing activities along the Rio Grande can negatively impact water quality trends. Negative impacts can occur from erosion, and channel maintenance, which impact sediment levels, and riverine habitats. These include arroyo runoff, agricultural runoff, riparian clearing, and chemical use for vegetation control and crops. Recreation along and in the riparian zone, and riparian clearing without revegetation, could also affect multiple resources.

Issue 1: How would the proposed action impact wetlands?

Affected Environment

Waters of the United States (WOTUS) is a threshold term in the Clean Water Act (CWA) and can include wetlands as well as other jurisdictional waterways. Wetlands are defined by the USACE as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE 1987:9). According to the USACE (1987), for an area to be considered a wetland, it must contain the following three parameters under normal circumstances: 1) the presence of wetland hydrology showing regular inundation, 2) a predominance of hydrophytic (water-loving) vegetation, and 3) soils characteristic of frequent saturation (i.e., hydric soils). The presence or absence of wetlands was identified in the field using routine on-site delineation methods outlined in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0) (USACE 2008). Wetland classification was based on the classification system of Cowardin et al. (1979).

SWCA Environmental Consultants (SWCA) biologists, funded by NMISC, conducted an aquatics resources delineation survey of the proposed project area on June 24, 25, and 28, 2021, to identify and map the boundaries of potential jurisdictional wetlands, special aquatic sites, open waters, and other surface water features considered to be WOTUS. In September 2024, USACE regulatory staff and Reclamation biologists together checked some locations for hydric soils and found none. Reclamation staff returned the next day to check the soil pits for "wetlands 1, 2,3, and 5" in SWCA's delineation and found no hydric soils and therefore no wetlands. Wetland 6 was reviewed on Oct 18, 2024, and no hydric soils were found; therefore it is not a wetland. The original delineation also found one perennial stream (Rio Grande, 0.73 acres) and one freshwater pond.

Environmental Consequences

Alternative A: Proposed Action

The proposed action is focused on increasing channel capacity to reduce overbanking into the historic floodplain. The project footprint for the specific components is a smaller subset of the project area in regard to aquatic resources. The results of the aquatics resources delineation surveys

confirmed the presence of one perennial waterbody (Rio Grande, 0.73 acres) and one freshwater pond. More information can be found in the Aquatics Delineation Report and the Reclamation Supplement (Appendix F).

There are no wetland impacts from the proposed project. The freshwater pond will not be impacted as no project activities will occur in that area. The project is expected to result in riparian habitat improvements due to increased inundation in the excavated areas. This inundation area in the floodplain is designed to allow the water to return to the river channel when flows subside, thus not increasing overbank flow that is trapped in the floodplain.

Following construction, an increased amount of substrate area would have the potential to be inundated and/or saturated for significant time periods, which should lead to a net gain in the function of future wetlands. Often, restored low-flow slackwater areas develop a fine sediment layer that is conducive to establishing diverse herbaceous wetland communities. Some of the expected effects on wetland function include an increase in surface water storage, increase in the ability of wetlands to perform water quality improvement functions, an increased amount of organic carbon available for export, and beneficial effects on the ecosystem diversity. This would also increase the age diversity and structure of these species and connect the floodplain as an active ecological process. Reclamation is coordinating with USACE and NMED on the Section 404/401 permit/water quality certification for the project.

The reasonably foreseeable trends and planned actions associated with future river maintenance and habitat restoration activities would have similar impacts to the Los Lunas subreach, as described above for the proposed action. However, the reasonably foreseeable river maintenance and habitat restoration projects would be aiming to return river flow conditions that are more representative of historic dynamic conditions that occurred post-1930's after MRGCD was established, but prior to the reduction in spring runoff flows experienced in modern time. Under the reasonably foreseeable trends and planned actions, available wetland habitat within the Rio Grande channel and floodplain would continue to be dynamic, with increases in wetlands in newly inundated areas. Also, drought may impact wetlands and high river flows may erode some wetlands in natural processes.

Alternative B: No Action Alternative

The no action alternative would result in the current pattern of small fringe wetlands in limited locations. Continued drought, spring runoff flows, and monsoons will continue to impact existing wetlands.

Issue 2: How would the proposed action impact the vegetation community?

Affected Environment

The vegetation communities within the vicinity of the project site consist of semidesert grassland habitat (U.S. Geological Survey 2016) within the Arizona/New Mexico Plateau: Rio Grande Floodplain Level IV ecoregion (Griffith et al. 2006). The riverbank ecosystem found directly along the main channel of the river consists of open sandbars, riverbank areas with herbaceous and shrubby vegetation, and small, seasonally inundated areas characterized by a variety of riparian and

wetland flora. Open sandbars are subject to frequent disturbance from erosion caused by flood events and typically have little or no vegetation establishment.

Historically, the annual hydrologic regime for the project area was characteristic of southwestern rivers with high flows in the spring driven by snowmelt followed by long periods of low flows in the midsummer, fall, and winter. Occasional summer thunderstorms could produce short duration increases in flows in the Rio Grande. The river has changed drastically over the years from irrigated agriculture, flood control, and climatic variations. Levees were built in the 1920s and 1930s to cope with floods and to constrain the river's floodway. Agriculture has been the primary driver of controlling the river flow. Upstream water storage reservoirs, diversion dams, and valley drainage of shallow groundwater have altered the original patterns of water and sediment distribution within the river and floodplain (Crawford et al. 1993). These measures have an impact on the vegetation distribution as well. Smaller peaks and longer duration low flows in the river have led to changes from a braided and anastomosing channel to a narrow, single-threaded sinuous one, with vegetation encroachment filling in the gaps of the patchy mosaic vegetation pattern that once stood.

Native woodlands within the project area are characterized by an overstory of eastern cottonwoods (*Populus deltoides*) and Goodding's willow (*Salix gooddingii*), with understories including Canadian horseweed (*Conyza canadensis*), five-stamen tamarisk (*Tamarix chinensis*), sweetclover (*Melilotus officinalis*), rough cocklebur (*Xanthium strumarium*), Russian olive (*Elaeagnus angustifolia*), Siberian elm (*Ulmus pumila*), and vine mesquite (*Panicum obtusum*). Meadow grasses include black grama (*Bouteloua eriopoda*), sideoats grama (*Bouteloua curtipendula*), low woollygrass (*Tridens pulchellus*), saltgrass (*Distichlis stricta*), alkali sacaton (*Sporobolus airoides*), and annual rabbitsfoot grass (*Polypogon monspeliensis*). Species that are common within the floodplain are giant reed (*Arundo donax*), broadleaved pepperweed (*Lepidium latifolium*), and narrowleaf willow (*Salix exigua*).

Four of the common vegetation species within the project area are listed by the State of New Mexico as noxious weeds: five-stamen tamarisk (Class C noxious weed), Siberian elm (Class C noxious weed), Russian olive (Class C noxious weed), and broadleaved pepperweed (Class B noxious weed (New Mexico Department of Agriculture 2020). The pepperweed is likely present within the floodplain area where the realignment corridor and vegetation clearing areas are proposed. It can come in after disturbance as well. Non-native species five-stamen tamarisk has invaded much of the bottomland area since 1940, and now occurs in large monotypic tracts throughout the project area.

Russian olive and five-stamen tamarisk are prevalent throughout the floodplain, but especially along the channel margins. These non-native species, and Siberian elm, may have a competitive advantage over native riparian species in a condition of altered hydrological regimes that are exacerbated by the current climatological conditions. Non-native plant reproductive cycles are not as strongly tied to seasonal flood peaks as are their native counterparts. Additionally, these invasive species are able to withstand the drier soil conditions that result from channel incision and the reduction in peak flows.

The bosque's vegetation had previously been impacted by naturally occurring overbank floods and long dry periods. The last 50 years have seen wildfires begin to replace the flooding as a major force of disturbance in the bosque. The lack of spring flooding combined with increasing wildfires has influenced the bosque's vegetation organization and appearance. The effects from these fires have also been intensified by the spread of woody invasive species and the accumulation of deadwood, in addition to the increase in river regulation (Crawford et al. 2005). Also, many of the cottonwood

trees are old (Crawford et al. 2005), and are stressed by low water availability (Eichhorst et al. 2002; Leffler et al. 2000) and leaf beetle outbreaks (Eichhorst 1999).

Environmental Consequences

Alternative A: Proposed Action

The proposed action includes the removal of the standing woody vegetation within the five bank lowering areas (20 – 26 acres). The total spoil disposal area is expected to be 23 – 30 acres, which includes 11 – 13 acres of spoil area along the west levee. Staging areas (3 – 7 acres) and road development areas (5 – 10 acres) would be minimized, with native vegetation removal avoided as much as possible. The expected disturbance area for the entire project is 51 acres, with a maximum total disturbance of 73 acres (Table 2.3).

The removal of invasive species in the project area would aid in decreasing the spread of these species throughout the bosque. The BMPs for vegetation removal are included in the full list of BMPs in Appendix B. It is anticipated that a large number of mature cottonwood and Goodding's willow trees would need to be removed as a result of project activities, with the majority of trees removed in the west spoil disposal area. The disturbance area for spoils disposal, staging, and access on the west side is 17.5 – 26.5 acres within 173 acres of vegetated area in the west floodplain, not including the bank-lowering areas, leaving 85 – 90% of the vegetated area undisturbed. When the bank-lowering areas are included in the disturbed area total for the project, the undisturbed area on the west side would be 76 – 83% of the total 216 acres of vegetated area.

To reduce the removal of mature trees along the west levee, excavated material would not be placed around selected cottonwood trees. Tree health and spoils quantity may affect this. These trees would then be removed later during construction of the USACE engineered levee, which will be in the same footprint. Also, crews may put some cottonwood trunk remnants on top of the levee road on the side adjacent to the bosque to break up any undesired traffic. This is only applicable to the west side.

Removal of some native and non-native vegetation would be accomplished by mechanical means, primarily mastication. Some trees may be pushed over with a dozer or extracted with an excavator. Some existing stands of native vegetation may be left intact at the exterior fringes of the bank lowering areas and the majority of individual native trees within the staging area or along the road development area would be left standing to provide some irregular edges which will create vegetative diversity.

Some herbaceous floodplain species may be trampled, but impacts would be moderate in the disturbed areas. Removal of vegetation would result in soil disturbance. Trees in the spoils disposal along the levees would be removed; however, if it is safe and feasible at the time of construction (spoils quantity, cottonwood health), excavated material would not be placed around selected cottonwood trees in order to avoid removal of those trees. This may increase the height and width of material placement in other locations in the west side spoils area. The spoils placement in these areas would also bury some of the existing forbs and shrubs.

Revegetation strategies (native species) will typically involve natural regeneration/recruitment in areas adjacent to the river. Native species seeding will occur in the disturbed areas of the staging and access roads, except where access roads are determined to be needed for future maintenance. The

access roads that might remain unseeded would be approximately one acre in total or 0.4% of the bosque area in the project area (approx. 250 acres). Any roads that may remain unseeded would not be maintained regularly and forbs and shrubs are expected to naturally grow in those areas. Stem and pole cuttings for native species may be used depending on space availability, groundwater depth, salinity, and any prohibitions against planting along levee areas (USACE 2014). Live vegetation will not be removed to plant poles.

The reasonably foreseeable trends and planned actions associated with future river maintenance and habitat restoration activities, including the Belen East and West levee engineering project, would have similar impacts to the Los Lunas subreach, as described above for the proposed action. Short-term adverse impacts to vegetation would be expected due to the removal of vegetation within the project areas and the presence of construction equipment moving over ground-level vegetation over the duration of each planned project. Long-term modification to vegetation is also expected, as implementation of the projects would include the removal of invasive species and native vegetation in the project area, which would help to restore the patchy mosaic conditions of the bosque. The reasonably foreseeable USACE engineered levee project would permanently remove woody vegetation from 15 feet on either side of the levee. The reasonably foreseeable river maintenance and habitat restoration projects would use mechanical equipment to replicate the disturbance from large flooding events, with the goal of returning the river channel to conditions that are more representative of historic conditions. Thereby, vegetation within the Rio Grande channel would also be similar to the historic conditions.

Alternative B: No Action Alternative

The no action alternative would result in no removal of vegetation and allow for minimal changes to the vegetation in the project area. Vegetation would remain the same, regenerate or recruit new plants, and/or decline in health based on existing soil and water conditions. Monotypic exotic stands of vegetation would continue to exist.

Issue 3: How would the proposed action impact federally listed species and designated critical habitats with potential to occur in the proposed project area?

Affected Environment

In accordance with ESA Section 7(a)(2), federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally threatened, endangered, and proposed species. This proposed action tiers off of Reclamation's 2015 Programmatic Biological Assessment and the USFWS's 2016 Biological Opinion (USFWS 2016).

Three federally listed species have been recorded as occurring within or near the project area: Rio Grande Silvery Minnow (silvery minnow), Southwestern Willow Flycatcher (*Empidonax traillii extimus*; flycatcher), and the Western Yellow-billed Cuckoo (*Coccyzus americanus*; cuckoo) (Table 3.1). As part of the ESA Section 7 consultation process, Reclamation prepared a Memorandum for the USFWS with Notification of the Included Project under the Middle Rio Grande Biological and Conference Opinion (02ENNM00-2013-F-0033) to address the effects of the proposed project on the silvery minnow, the flycatcher, and the cuckoo.

Designated critical habitat for the three listed species is present in the project area. The proposed action is considered an included project under the Middle Rio Grande Biological and Conference Opinion (02ENNM00-2013F-0033; USFWS 2016).

Table 3.1. Federally Listed Species with Potential to Occur in the Project Area

Species	Federal Status and Type	Designated Critical Habitat
Fish		
Rio Grande Silvery Minnow (*Hybognathus amarus*)	Endangered fish species	Designated critical habitat in the project area (USFWS 2003)
Birds		
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	Endangered bird species	Designated critical habitat within the project area (USFWS 2005)
Western Yellow-billed Cuckoo (*Coccyzus americanus*)	Threatened bird species	Designated critical habitat in the project area (USFWS 2021b)

The purpose of this project is to improve water conveyance through the Los Lunas subreach by increasing channel capacity to reduce overbanking into the historic floodplain at flows less than 3,500 cfs, and to improve silvery minnow habitat. No resident cuckoos were recorded in the project area during official protocol surveys over the past 3 years. In addition, no nesting pairs of flycatchers were recorded in the project area during official protocol surveys over the past 3 years (Moore and White 2024, Siegle et al 2024, Moore pers. comm 2024).

Environmental Consequences

Alternative A: Proposed Action

Rio Grande Silvery Minnow

Equipment crossing the river and working in wetted areas of the river has the potential to cause direct mortality, injury, or harassment to silvery minnow. Construction crews would be instructed to have equipment enter the water slowly to minimize the likelihood of mortality, injury, or harassment. Once the equipment is in the water, work will be fairly continuous during the workdays to prevent fish from reentering the project site once work has begun. Hydraulic lines would be inspected each day to prevent spills and any damaged lines would be replaced. Additionally, sequencing of construction would minimize the wetted impact acreage, by planning work in the dry and leaving the existing outer edge of the bankline in place until the features are constructed. Additional BMPs are listed in Appendix B. The project has been designed to minimize the number of river crossings to the greatest extent possible to reduce the impact to silvery minnow. The proposed action would impact approximately 0.56 acre of silvery minnow habitat due to construction equipment crossing the river. However, if all the equipment crosses the river at once, it is expected that any fish in the area would flee, avoiding direct impacts. Approximately 1.8 acres of wetted impacts for excavation would occur, for a total wetted impact acreage of 2.36 acres. Water for dust abatement will be pumped from the river or the drains in accordance with the BMPs.

Indirect impacts to silvery minnow may include increased turbidity in downstream habitat when soil is being removed from the bankline or during equipment river crossings. Sequencing of construction

would minimize the wetted impact acreage, by planning work in the dry and leaving the existing outer edge of the bankline in place until the features are constructed. There would be a potential for accidental spills or release of materials (e.g., diesel, gasoline, or oil) that could impact local water quality. Potential direct and indirect impacts to silvery minnow from sediment transfer and accidental spills or releases of hazardous materials would be short term. BMPs stated above and in Appendix B would minimize the potential for adverse effects on water quality and the silvery minnow. In addition, adherence to the conditions of the Clean Water Act Sec 404/401 Permit/Certification would minimize the potential for adverse effects on water quality and the silvery minnow.

The proposed action would result in indirect long-term beneficial impacts to silvery minnow and its critical habitat by restoring the bankline and creating habitat. The proposed action would result in indirect long-term beneficial impacts to silvery minnow and its critical habitat by restoring the bankline and creating habitat in the excavated areas which will experience inundation at much lower levels, resulting in increased frequency and duration of inundated area. Terracing of the excavated areas will provide diversity of habitat, with some areas providing nursery habitat at lower flows (1,000 – 1,800 cfs, Table 2.2).

Any incidental take of silvery minnow that results from the project would be encompassed within Reclamation's annual accounting and reporting to the USFWS for the 2016 Biological Opinion (USFWS 2016).

Southwestern Willow Flycatcher Critical Habitat

The proposed project area encompasses approximately 44 acres of designated critical habitat for flycatcher. The primary constituent elements (PCEs) for flycatcher are 1) riparian woodlands, and 2) adequate prey base. The project area contains a combination of unsuitable habitat, moderately suitable, and suitable habitat for the species based on the PCEs. Suitable habitat for this species is associated with a native-dominated canopy and understory, such as willows, cottonwoods, saltcedar, false indigo, and Virginia creeper (USFWS 2013). This strongly suggests vegetation communities comprising a native overstory with understory structure are an important component of flycatcher breeding habitat. This dense riparian habitat with openings for access to water sources is ideal for flycatcher habitat. Although removal of invasive species such as saltcedar is part of the proposed action, the removal of invasive species would allow for native species to vegetate those areas and reestablish the historic patchy mosaic vegetation pattern. The proposed project would not prevent designated critical habitat within the project area from continuing to provide PCEs for the flycatcher because vegetation would be allowed to grow back following construction rather than be maintained as a zone clear of vegetation to ground level.

Western Yellow-Billed Cuckoo Critical Habitat

The proposed project area encompasses approximately 44 acres of designated critical habitat for cuckoos. The primary constituent elements (PCEs) for cuckoos are 1) riparian woodlands, 2) adequate prey base, and 3) dynamic riverine processes. The project area contains a combination of unsuitable habitat and suitable habitat for the species based on the PCEs. Reclamation survey results have indicated that the majority of cuckoo detections within suitable habitat are associated with vegetation communities with a native-dominated canopy (Reclamation 2016). This strongly suggests vegetation communities comprising a native overstory with understory structure are an important component of the cuckoo breeding habitat. Survey results also suggest that a dense understory

composed of exotic saltcedar, Russian olive, or native vegetation (e.g., *Salix* spp.) is an important requirement for territory establishment (Sechrist et al. 2009). Although removal of invasive species such as saltcedar and Russian olive is part of the proposed action, the removal of invasive species would allow for native species to vegetate those areas and reestablish the historic patchy mosaic vegetation pattern. The proposed project would not prevent designated critical habitat within the project area from continuing to provide PCEs for cuckoo because vegetation would be allowed to grow back following construction rather than be maintained as a zone clear of vegetation to ground level.

Impacts to the Southwestern Willow Flycatcher and Western Yellow-Billed Cuckoo

The proposed action would have no direct impacts to flycatcher and cuckoo nest territories as construction activities would take place outside the breeding and nesting season (BMP 1 in Appendix B). Also, no resident cuckoos or nesting flycatchers were recorded in the project area during official protocol surveys over the past 3 years (Moore and White 2024, Siegle et al 2024, Moore pers. comm 2024). Short-term indirect impacts would include habitat removal or modification. Reclamation biologists determined that approximately 14.37 acres of suitable habitat for flycatcher would be removed by the proposed action. No impacts would occur to moderately suitable habitat for the flycatcher nor to suitable habitat for the cuckoo as a result of project activities. Following construction, portions of the project area would be expected to develop into native riparian habitat. BMPs, such as construction timing to avoid the breeding season, avoiding construction within 0.25 mile of an active nest when possible, minimizing the removal of native species where possible, coordination with the USFWS, and avoiding any mechanized revegetation means from April 15 through September 1, would be implemented to minimize impacts to these bird species and their habitats. More details on BMPs can be found in Appendix B. Since construction will not occur during the breeding season, the proposed project will have no effect on nesting flycatchers and cuckoos.

The reasonably foreseeable trends and planned actions associated with future river maintenance and habitat restoration activities, including the Belen East and West levee engineering project, would have similar impacts to the Los Lunas subreach, as described above for the proposed action. Short-term impacts to the listed species habitat would be expected due to the removal of vegetation, construction within the river channel, and noise from the presence of construction equipment. Long-term modification to habitat is also expected in the proposed spoil area along the west levee. The reasonably foreseeable USACE engineered levee project would permanently remove woody vegetation from 15 feet on either side of the levee (same area as the proposed spoil area). Vegetation in the bank lowering areas are expected to return to the historical patchy mosaic condition with improved health due to the increased likelihood of inundation.

Any incidental take of suitable habitat for the flycatcher resulting from the proposed project would be encompassed within Reclamation's annual accounting and reporting to the USFWS for the 2016 Biological Opinion (USFWS 2016).

Alternative B: No Action Alternative

No direct or indirect impacts to the silvery minnow, flycatcher, or cuckoo are expected as no habitat disturbance would occur under the no action alternative. There would be no improvements to water conveyance and flood control, nor any enhancement of suitable habitat for the silvery minnow. Also, when water is stranded in the floodplain there may be incidences where the silvery minnow

becomes stranded and are not able to return to the main channel flow, leading to increased mortality.

Issue 4: How would the bank lowering, use of access roads and staging areas, and spoils disposal impact soils?

Affected Environment

The proposed project area is located within the Middle Rio Grande Floodway, which encompasses the river channel and floodplain between the spoil bank levees. The maximum construction area (Appendix A) is entirely contained between the spoil bank levees, except for the spoils placement on the drain-side slope of the east levee, and includes the active riverbed channel, sandbars, and vegetated bank-attached bars and islands.

The riverbed and floodplains are composed of two soil types: riverwash and mixed alluvial land (Natural Resources Conservation Service 2021). Riverwash covers approximately 74% of the project area within the riverbed and lower floodplains and is primarily composed of sand within the upper soil profile. The remainder of the project area (25%) is covered by mixed alluvial land with moderately low to very high drainage potential and is composed of stratified sand with sandy loam and silt loam components.

Portions of the mixed alluvial land within the proposed project floodplain is prone to flooding, particularly near the levee on the eastern floodplain. Due to the semi-perched channel terrain (see Chapter 1 for description), during high flows levee toes become saturated and water tends to pool in the floodplain rather than returning to the main channel. These conditions have led to overbank sediment deposition and accretion, further contributing to lowering overbanking flow rates and to bed material coarsening.

Environmental Consequences

Alternative A: Proposed Action

Soils within the project area would be impacted in the short and long term by ground disturbance and vegetation removal associated with construction of the proposed river maintenance project. The proposed action is expected to result in a total of 51 acres and up to 73 acres of soil disturbance. Direct adverse impacts associated with the proposed action include soil erosion, compaction, and sediment disturbance and movement. Sediment transport and access road use may also generate fugitive dust, which constitute an indirect impact of construction activities. Fugitive dust would be carefully controlled during construction with the application of water via Reclamation water trucks.

Removal of vegetation within the construction footprint may contribute to long-term soil erosion on the bank-attached sand bars/islands by exposing the soil and removing bank stabilizing roots. Bank erosion where vegetation was disturbed during construction may delay revegetation after river maintenance activities have been completed. However, bank erosion within the inset floodplain may also provide positive outcomes by increasing channel capacity and creating habitat heterogeneity, in turn promoting vegetative and channel diversity (Florsheim et al. 2008). Sediment deposition in

these areas may also occur. This process of bank erosion and sediment deposition is part of the historic dynamic nature of the Rio Grande.

Riverbed and bank sediments would be disturbed and moved as a result of construction activities, and crossing within the riverbed at locations of shallow water would potentially contribute to sediment movement along the river crossing path. The Rio Grande would be crossed to move equipment from the west side of the river to the east side due to safety issues related to loaded trailers making left turns on high traffic NM6 (Figure 5). Overland travel would also be required along the bank lowering areas, along the access roads, and within the staging areas and spoil disposal areas. To lower the banklines, river sediment would be excavated which is expected to disturb 20 – 26 acres. The project would also require grading at the spoils disposal area, resulting in the removal of 96,024 – 120,000 CY of soil from the riverbank to be transported to the spoil location, for a total of 23 – 30 acres being disturbed from spoil disposal. The access roads that might remain unseeded would be approximately one acre in total or 0.4% of the bosque area in the project area (approx. 250 acres). Any roads that may remain unseeded would not be maintained regularly and some forbs and shrubs are expected to naturally grow in those areas.

BMPs would be used to limit soil disturbance associated with construction of the proposed project (Appendix B). Long-term impacts related to soil erosion and fugitive dust would be minimized by measures such as minimizing damage to native vegetation and wetlands (BMP 11), spreading mulched vegetation on-site (BMP 16), and using water pumped from the Rio Grande irrigation drains, sumps, or secondary channels for dust abatement (BMP 18). Long-term impacts related to soil compaction would be minimized by measures such as using existing roads whenever possible (BPM 11). Temporary roads will be ripped and reseeded following completion of construction. Briefing of construction operators and monitoring of the project would also be in place to ensure compliance with environmental requirement (BMPs 4, 6, 12) and to evaluate project effectiveness (BMP 19). To limit soil movement, disturbance of sediments, and to largely contain soils on-site, movement of excavator tracks and excavator contact with the riverbed when not excavating would be minimized (BMP 5).

The reasonably foreseeable trends and planned actions associated with future river maintenance, habitat restoration activities, and the USACE engineered levee project would have similar impacts to the Los Lunas subreach, as described above for the proposed action. Short- and long-term adverse impacts to soils would be expected due to the removal of bank vegetation and the potential for sediment movement. However, while impacts to soils are expected, the reasonably foreseeable river maintenance and habitat restoration projects would be aiming to return river flow conditions that are more representative of historic and natural conditions. Therefore, impacts to soils would be mostly temporary and expected to return to pre-disturbance condition. The reasonably foreseeable USACE engineered levee project would permanently remove woody vegetation from 15 feet on either side of the new levee, which would require ongoing maintenance and soil disturbance to maintain the area free of woody vegetation. This would contribute long-term adverse impacts to soils.

Alternative B: No Action Alternative

Under the no action alternative, no direct or indirect impacts to soils are expected as no soil disturbance would occur. Lowering of overbanking flow rates and sediment accretion would continue to occur.

Issue 5: How would the proposed action impact water resources, including water quality and water depletions?

Affected Environment

The project area lies along the Rio Grande, a perennial river of the U.S., which has seen major changes to river flows over the last century, due to hydrology changes and dam operations reducing peak flows; also, there has also been a reduction in the volume and concentration of sediment (Kuria and Klein 2020b). This has resulted in changes to the hydraulic and geomorphic characteristics of the river. Significant narrowing of the channel has occurred between Isleta and the Belen Bridge since 1990, reducing the channel capacity for higher flows. Also, this reach is semi-perched, with water becoming trapped along levee toes which can cause saturation and levee problems. Analysis by Kuria and Klein (2020b) found that "At the Los Lunas Highway 6 bridge, the water surface elevation at 5,570 cfs in 2005 was 0.5 feet lower than the water surface elevation observed at 3,700 cfs in 2019." Figure 7 shows the average monthly stream flow between 2006 and 2022 at the Bosque Farms gage (0833160).

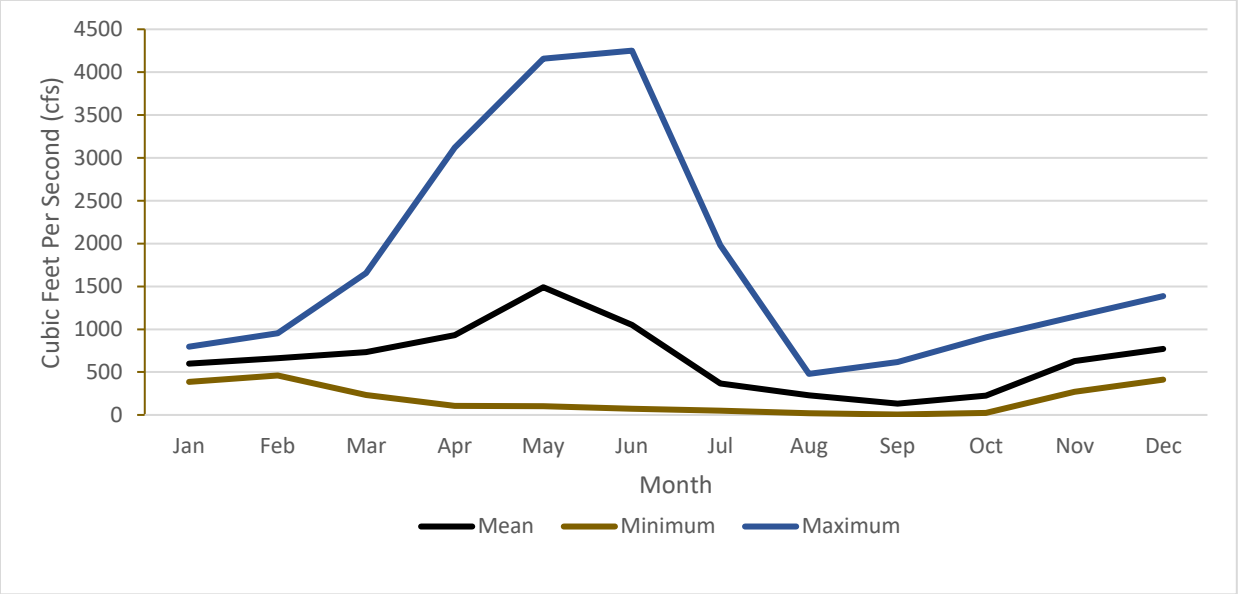


Figure 7. Streamflow in the Rio Grande at San Antonio, New Mexico, 2006-2022 (USGS 2024).

Current information on the water quality of the river in the MRG is available from the U.S. Geological Survey (USGS), USACE, Reclamation, University of New Mexico, New Mexico Environment Department (NMED), and Service, as well as other sources. The water quality parameter that may be affected by this project is turbidity. Relatively high turbidity is typical of the MRG, with an average annual of 158 Formazin Nephelometric Units (FNU) measured in the Rio Grande at the Highway 550 Bridge (RM 203.8) between January 2020 and December 2023. Turbidity is higher during monsoons flows, with an average of 801 FNU for July/August during 2020 – 2023 (Van Horn et al. 2024). Inflows of groundwater, as well as surface water discharges and tributary deliveries to the river, affect water quality spatially and temporally throughout its course.

The 1939 Rio Grande Compact is an agreement between Colorado, New Mexico, and Texas which limits the amount of surface water depleted on an annual basis on the Rio Grande. As the MRG is

fully appropriated, the New Mexico Office of the State Engineer (NMOSE) requires offsetting water rights when a habitat restoration project will result in water depletions from the MRG. However, when work is performed by Reclamation within the 600 ft MRG channel (created in the 1950's under the Flood Control Acts of 1948 and 1050), water use within that channel is not deemed to be depletions and does not require offsetting (NMOSE 2011).

Environmental Consequences

Alternative A: Proposed Action

Construction would cause short term temporary increases in turbidity but that would be minimized by completing the majority of the excavation in the dry. A small berm between the excavation area and the river would remain until the excavation is almost complete. Then the berm would be removed to connect the excavated area to the river, working from downstream to upstream so water movement would be gradual. As such, the turbidity increase is expected to be within the normally occurring levels. The river crossing would also cause a short term temporary increase in turbidity that is expected to abate quickly.

BMPs, including initial steam cleaning of all equipment prior to initiating construction, and checking the equipment several times per day for leaks, would be followed to avoid adverse effects to water quality. Staging and fueling of equipment will occur in higher areas well outside the OHWM. Water quality would be visually monitored and evaluated during work along the channel edge.

There would be a potential for accidental spills or release of materials (e.g., diesel, gasoline, or oil) that could impact local water quality. BMP #4 under Equipment and Operations requires the presence of a spill kit during construction. Potential direct and indirect surface water quality impacts from accidental spills or releases of hazardous materials would be short term during construction. Reclamation will follow the conditions of the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit and NMED Section 401 Water Quality Certification.

The bank-lowering areas are entirely within the 600 ft width Rio Grande channel; therefore, the project will cause no depletions per OSE (2011) guidelines.

The proposed project will increase river channel capacity, helping to reduce the incidence of levee toe saturation for flow levels that occur as often as every two years (on average). Higher and less frequent flows may still inundate low lying areas of the floodplain, causing stranding, but the improvement in channel capacity will help lessen that.

The reasonably foreseeable trends and planned actions associated with future river maintenance and habitat restoration activities would have similar impacts to the Los Lunas subreach, as described above for the proposed action. Short term temporary impacts to turbidity levels would be expected but would return quickly to pre-disturbance levels. River maintenance and restoration projects for this area would focus on improving channel capacity as well as employing habitat restoration techniques to improve habitat conditions.

Alternative B: No Action Alternative

Under the no action alternative, no direct or indirect impacts to water quality are expected as no disturbance would occur. Within this subreach, water quality would remain unchanged. Ongoing activities would continue to affect the water quality and quantity within the reach.

The no action alternative would not contribute to the primary purpose of the Los Lunas RM 163 project, which is to improve water conveyance through the Los Lunas subreach. There would be no project that would help reduce the water surface elevation by increasing channel capacity to reduce overbanking into the historic floodplain. It would continue the current amount of overbanking flows that would become trapped against the levees at certain flows, leading to continued levee toe saturation. This saturation can become a safety issue related to levee stability and may continue to occur at times, requiring emergency repairs and expenditure of taxpayer funds by MRGCD to protect the levee against possible failure. Spring runoff flows may have to be reduced by USACE (per requests from MRGCD to avoid levee failure) to lower flows than may occur with the project.

The no action alternative would maintain the current lower channel capacity and continue to allow water to become stranded in the floodplain. Much of this water remains on the floodplain and evaporates or infiltrates and thus is not able to be delivered through the system as needed to help maintain compliance with the Rio Grande Compact (Compact). The no action alternative would not allow an incremental improvement to water conveyance for the Isleta reach and not improve the ability for Reclamation's project partners, NMISC and MRGCD, to meet the Compact deliveries. The proposed project is considered Class 2, indicating that this work can be planned in advance but the consequences of no action could be substantial in the near term (i.e., the next normal spring runoff or within the next few years).

The reduced runoff flows may impact silvery minnow spawning and the growth of larval and juvenile silvery minnows. In the project area, there would not be improvement to low velocity and shallow habitat and not increase beneficial habitat conditions at lower flow. Also, when water is stranded in the floodplain there may be incidences where the silvery minnow becomes stranded and are not able to return to the main channel flow, leading to increased mortality.

Issue 6: How would the proposed action change the visual aesthetics as seen by the adjacent landowners?

Affected Environment

The Rio Grande riparian forest, referred to as the bosque, is valued for the visual and aesthetic appeal of the mature gallery forest combined with flowing water in an arid landscape as well as the contribution of solitude and natural environment within the suburban community of Los Lunas. The Rio Grande bosque is an evolving landscape. Historically, overbank floods were responsible for establishing and maintaining the bosque, including the cottonwood gallery forest that was likely established in the 1940s (Crawford et al. 2005). The historic flood regime has changed over time due to human influences, watershed practices, and climate change. Now, wildfires are replacing floods as one of the driving forces behind the changes to the bosque's organization and appearance (Crawford et al. 2005). Many of the established cottonwoods are relatively old, and are stressed by

low water availability (Eichhorst et al. 2002; Leffler et al. 2000) and leaf beetle outbreaks (Eichhorst 1999).

The aesthetics of the Rio Grande channel are also changing as a result of channel narrowing and vegetation encroachment. Factors contributing to the channel narrowing and aggradation include major changes to the hydrologic and sediment regimes of the MRG, with reduction in hydrologic peaks and a reduction in the volume and concentration of sediment. The hydrologic peak reduction as well as supplemental water releases for ESA purposes and water management for irrigation in the growing season are likely contributors to vegetation encroachment and thus channel narrowing (Kuria et al. 2021).

The project vicinity is characterized as residential and semi-rural, although these areas occur outside the limits of the managed floodplain and irrigation district. Recreation is allowed in the bosque but vehicular public access to the bosque requires a paid permit for entry.

On the west side of the Rio Grande, residences are separated from the project area by the elevated levee which has an unimproved road on top running parallel to the Belen Riverside drain and a dense stand of cottonwoods. To the east of the project area, there are additional residences, which are separated from the project by the levee and cottonwood bosque. Views from the adjacent residences and semi-rural agricultural lands are partially obstructed by the existing flood control levees but the cottonwood canopies are visible. The bosque and river are visible to the public from the NM6 bridge crossing but the project area is 0.68 miles from the bridge without a clear line of sight .

Figures 1 and 2 provide representative views of the project area from within the bosque (inside the levees).

Figure 1. Upland vegetation within the project area, view facing north.

Figure 2. The Rio Grande channel within the project area, view facing south.

Environmental Consequences

Alternative A: Proposed Action

Under the proposed action, the levee spoil areas (and vegetation removal) may be visible to adjacent homeowners or to pedestrians using the levees. The bank lowering areas may be visible to adjacent homeowners or to pedestrians walking near the river channel, particularly during leaf-off conditions (winter months). The southern end of the proposed construction area may be partially visible to vehicle traffic from the NM6 bridge, but only for a brief time as vehicles pass across the bridge.

During construction, there may be some temporary impacts to residences on either side of the river. It is possible that those using the bosque for recreation or residents near the river would experience some noise during construction and see hauling trucks and other equipment placing and grading spoils along the levee road. With some effort, they might also be able to see excavation equipment next to the river channel through the seasonally defoliated vegetation. Construction equipment access during mobilization and demobilization, and dump trucks hauling excavated sediment, would temporarily disrupt any recreational use of the bosque in the project area. Signs would be posted at the gates restricting the public from entering the gates and potentially entering the construction operations.

After construction the removal of upland vegetation along the Rio Grande channel, including willows, non-native species, and cottonwoods, on 51 acres and up to 73 acres, would result in a long-term modification of the visual and aesthetic characteristics of the area. An estimated 162 (expected) – 246 (maximum) mature cottonwood and Goodding's willow trees would be removed throughout the project area, which includes the estimated 145 – 220 trees removed in the west spoil

disposal area. These modifications are reflective of the dynamic disturbance-based MRG riverine ecosystem, but many viewers may not have experienced that in their lifetime and may perceive the vegetation removal as an adverse visual and aesthetic impact.

To reduce the removal of mature trees along the west levee below the estimated amount above, excavated material would not be placed around selected cottonwood trees. Tree health and spoils quantity may affect this. These trees would then be removed later during construction of the USACE engineered levee, which will be in the same footprint.

However, the impact area adjacent to the western levee is limited to a 26 – 34 ft width and the majority of the bosque vegetation, including the aging cottonwood overstory, will not be impacted. The disturbance area for spoils disposal, staging, and access on the west side is 17.5 – 26.5 acres within the 173 acres of vegetated area in the west floodplain, not including the bank-lowering areas. Thus, 85 – 90% of the vegetated area will remain undisturbed. When the bank-lowering areas are included in the disturbed area total for the project, the undisturbed area on the west side would be 76 – 83% of the total 216 acres of vegetated area. Therefore, these aesthetic impacts are expected to not be significant due to the extensive nearby cottonwood trees and the partially obstructed view caused by the flood control levees between the nearby residences and the project area.

The access roads that might remain unseeded would be approximately one acre in total or 0.4% of the bosque area in the project area (approx. 250 acres). Any roads that may remain unseeded would not be maintained regularly and some forbs and shrubs are expected to naturally grow in those areas.

The reasonably foreseeable trends and planned actions associated with future river maintenance and habitat restoration activities would have similar impacts to the Los Lunas subreach, as described above for the proposed action. Short-term adverse visual resource impacts would be expected due to the presence of construction equipment over the duration of each planned project. Long-term modification of visual and aesthetic characteristics of the area are also expected, although the type of impact (adverse versus beneficial), would depend on the perspective of the viewer. The reasonably foreseeable river maintenance and habitat restoration projects would aim to return river flow conditions that are more representative of historic conditions. The reasonably foreseeable USACE engineered levee project would permanently remove woody vegetation from 15 feet on either side of the new levee, which would occur in the footprint of the proposed spoil area. This would result in a long-term modification of the views from the adjacent residential areas into the bosque, similar to that described in the above paragraph.

Alternative B: No Action Alternative

Under the no action alternative, there would be no impacts to the visual aesthetics in the short term because the project would not be implemented. Over the long term, the visual quality of the bosque would be expected to change as mature cottonwoods reach the end of their life, decay, and die. Cottonwood mortality would contribute more dead woody material into the Rio Grande floodplain. This increased fuel could lead to an increase in the number of wildfires, further changing the visual aesthetics of the area.

5.Chapter 4. Summary

The purpose of this project is to improve water conveyance through the Los Lunas subreach. The primary goal is to reduce the water surface elevation by increasing channel capacity to reduce overbanking into the historic floodplain (defined here as the floodplain outside the 550-foot-wide channel established by jetty jacks in 1960s–1970s) at flows less than 3,500 cubic feet per second (cfs) between RM 164 and RM 162.

The analysis in this EA addresses potential impacts to vegetation communities, federally listed species and critical habitat, soils, water resources, and visual aesthetics. No other resources are expected to be affected. With the implementation of the BMPs (Appendix B), effects are largely beneficial and the adverse impacts were found to be temporary and/or not significant. The no-action alternative would not result in adverse impacts to the small fringe wetland, vegetation communities, critical habitat, soils, or visual aesthetics but may result in the occurrence of saturated levee toes during even low spring runoff flows, possibly requiring emergency maintenance and consequent expenditures of tax-payer funds to prevent possible levee failure.

Based on the analysis in this EA, implementing the Proposed Action would have no potentially significant direct, indirect, or cumulative impacts on the quality of the natural or human environment. In accordance with the NEPA of 1969, as amended, and based on the analysis in this EA, Reclamation has determined that implementing the Proposed Action would not result in a significant impact on the human environment and does not require preparation of an Environmental Impact Statement.

6.Chapter 5. Consultation and Coordination

Reclamation has consulted with the New Mexico State Historic Preservation Office regarding the proposed action as an operation and maintenance activity.

Reclamation has consulted with the USFWS regarding potential effects on federally listed species under Section 7 of the ESA. Incidental take of silvery minnow, flycatcher, and cuckoo that results from this project would be encompassed within Reclamation's annual accounting and reporting to the USFWS for the 2016 Biological Opinion, which will include post-project refined acreages across these types of covered projects (USFWS 2016).

Reclamation is currently consulting with the USACE and the New Mexico Environment Department to obtain CWA Section 404/401 permit/water quality certification.

Reclamation is also coordinating with the Valencia County Floodplain Manager and met with the Village of Los Lunas Floodplain Manager to provide information on the project.

Reclamation held a public meeting on 6 August. Notification of the project and public meeting was sent to immediately adjacent neighbors and published in the legal notice sections of the Albuquerque Journal (July 23, 2024 and July 28, 2024) and the Valencia County News-Bulletin (August 1, 2024). The legal notice sections were used because those are free and available to the general public. A

subsequent meeting was held on October 18, 2024 with landowners who communicated comments to USBR and/or USACE to discuss concerns. MRGCD, ISC, and USACE staff also attended that meeting to answer questions. Additionally, Reclamation staff will conduct a site visit on November 15, 2024 with interested landowners.

List of Preparers

Reclamation established an ID team made up of staff specialists who worked with cooperating agencies and a third-party contractor to develop the content and analysis in this EA. A list of preparers who participated in the development of this EA is provided in Table 4.1.

Table 4.1. List of Preparers

Name	Title	Organization
Ann Demint	MRG River Maintenance Project Manager	Reclamation
Michelle Klein	Hydraulic Engineer	Reclamation
Ari Posner	Physical Scientist	Reclamation
Chris Grosso	Wildlife Biologist	Reclamation
Scott Hebner	Environmental Protection Specialist	Reclamation
Lawrence Moore	Environmental Protection Specialist	Reclamation
Robert Padilla	Supervisory Civil Engineer	Reclamation
Anders Lundahl	Project Manager	NMISC
Matthew McMillan	Project Manager	SWCA Environmental Consultants
Coleman Burnett	NEPA Coordinator	SWCA Environmental Consultants
Andrea McArdle	EA author	SWCA Environmental Consultants
Lili Perreault	EA author	SWCA Environmental Consultants

7.Appendix A – Maps

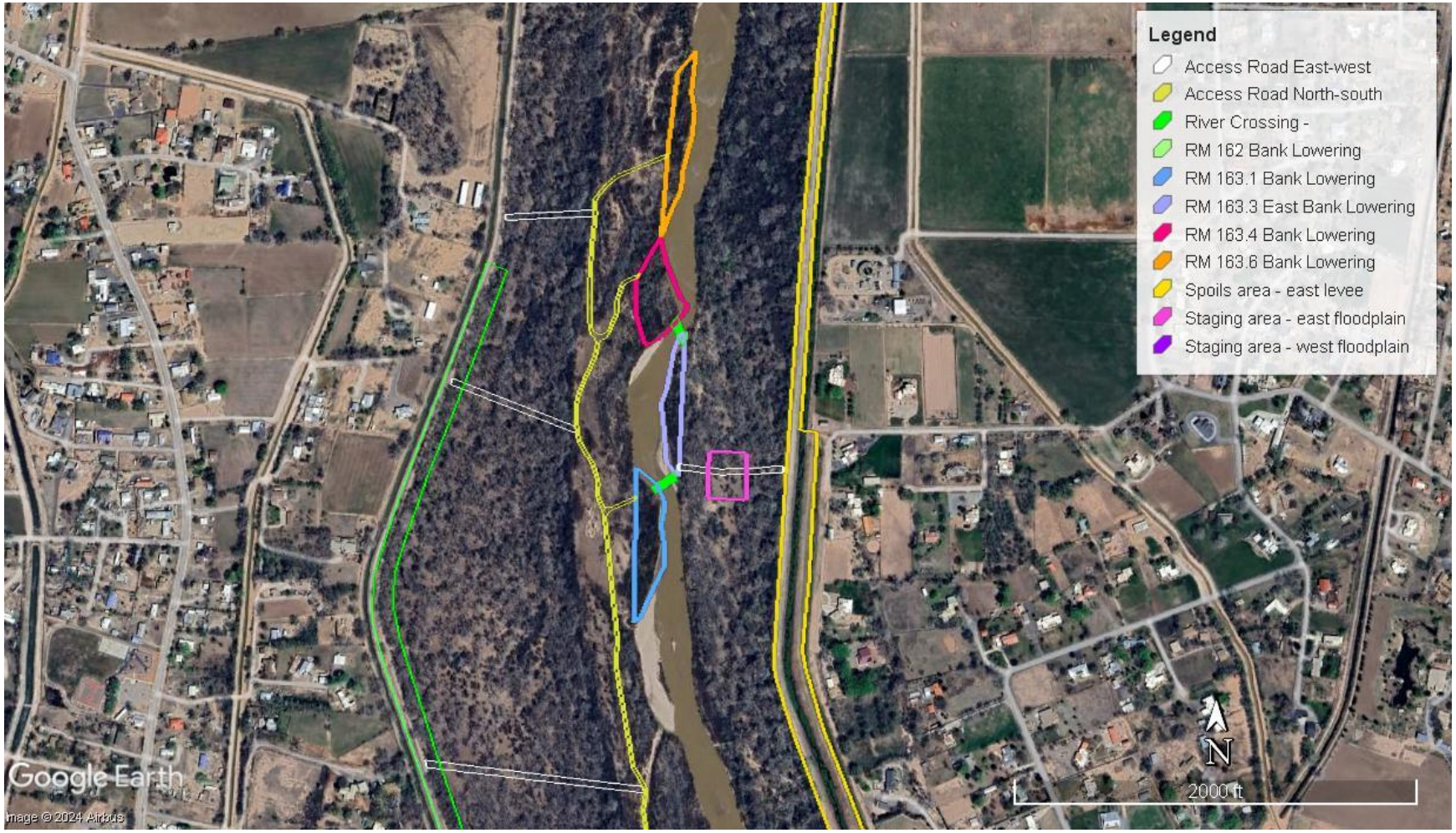


Figure A-1. Project area map showing bank lowering areas in the upper project area and spoil placement areas. The width of the west levee spoil placement area is not to scale in order to have it visible on the map. Actual total width of spoil placement will be 46 – 54 ft (including width of current levee road).

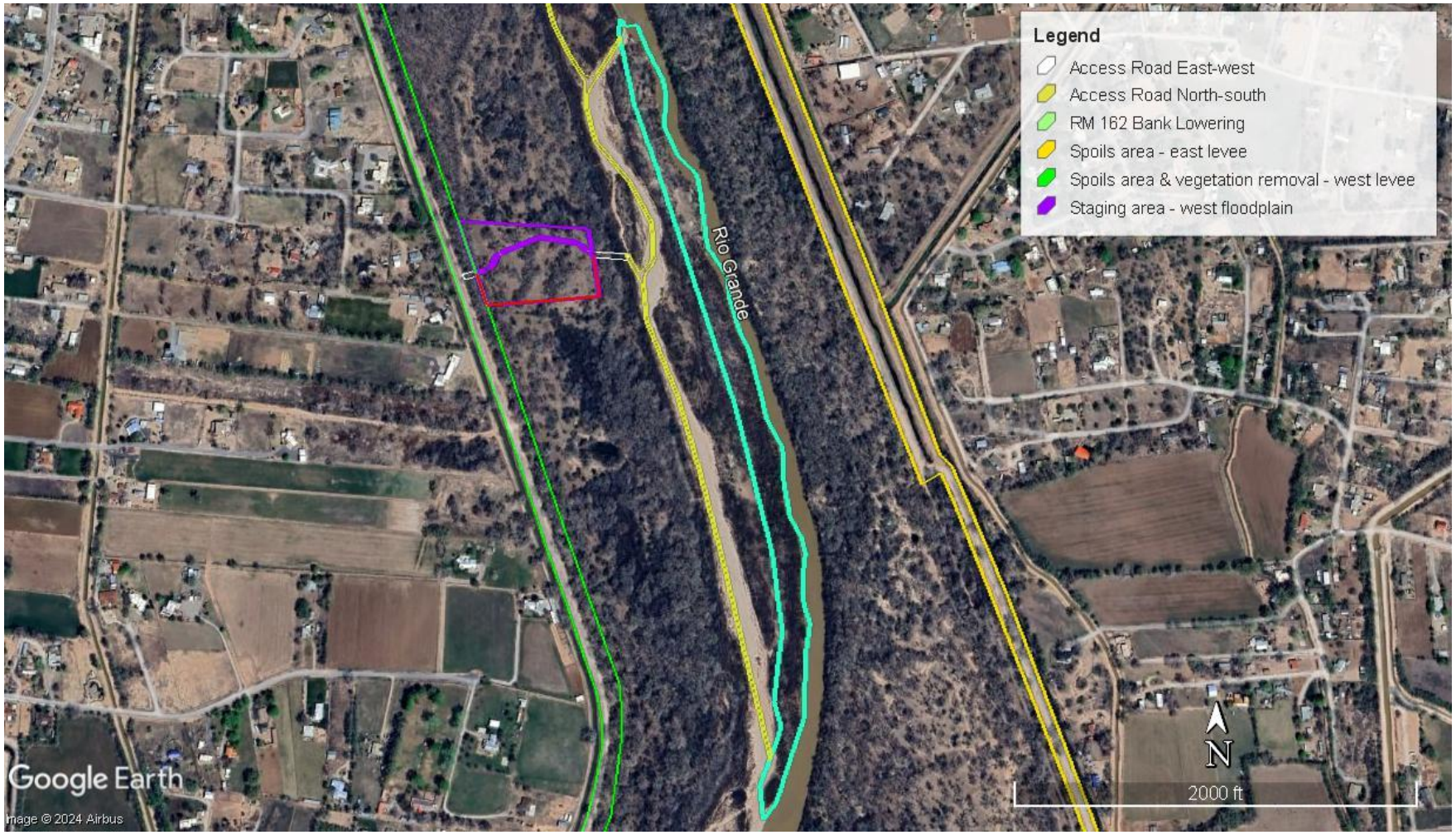


Figure A-2. Project area map showing bank lowering area in the lower project area and spoil placement areas. The width of the west levee spoil placement area is not to scale in order to have it visible on the map. Actual total width of spoil placement will be 46 – 54 ft (including width of current levee road).

8.Appendix B – Best Management Practices

The following BMPs will be used at the site to minimize the risk of effects from the RM 163 bank lowering project. Some of the BMPs may not directly apply to this project but are part of the 2015 BA and are included as they are imbedded in BMPs that may have applicable sections as well.

General BMPs, Timing of the Proposed Action

1. Reclamation will seek to avoid impacts to birds protected by the Migratory Bird Treaty Act (16 USC 703), including the federally listed endangered Southwestern Willow Flycatcher (*Empidonax traillii extimus*; flycatcher) and the threatened Western Yellow-billed Cuckoo (*Coccyzus americanus*; cuckoo), by conducting work activities outside of the normal breeding and nesting season (April 15 to August 15, or April 15 to September 1 for work in suitable cuckoo habitat).
    i. If work is necessary between April 15 and August 15 (or September 1 for work in suitable cuckoo habitat), suitable/occupied migratory bird habitat will be avoided during the construction activities as much as possible, using the most current annual survey results in conjunction with habitat suitability designations. Reclamation will use current flycatcher and cuckoo monitoring data to avoid work within 0.25 mile of an active nest as much as possible. Coordination and consultation with the U.S. Fish and Wildlife Service will occur prior to such work activities.
    ii. Reseeding or revegetation may be accomplished by hand or by mechanized means. Planting via mechanized means includes using a handheld or tractor-mounted auger. If mechanized means are used for either reseeding or replanting in the April 15 to August 15 timeframe (or September 1 for work in suitable cuckoo habitat), migratory nesting bird surveys will be conducted immediately prior to the work to determine if any breeding birds are present. If birds are detected, Reclamation will coordinate with the USFWS to determine appropriate next steps.

Water Quality

1. Reclamation will obtain all applicable permits and authorizations prior to implementation of the project, including those regulated under Section 401 (Water Quality Certification) and Section 404 (Permit Authorization for Dredge or Fill) of the CWA. Reclamation will comply with the requirements of all permits and authorizations of the CWA and any other permits associated with water quality for the project, including required reporting to the appropriate authorities as needed, and will not begin work until all required permits and authorizations are obtained.
2. Reclamation will visually monitor for water quality in the areas below areas of river work before and during the workday. Water quality will be monitored during construction and after equipment operates in the river channel. Monitoring will include visual observations and may include direct sampling, as appropriate.
    i. If direct sampling is needed, water-quality parameters to be tested include pH, temperature, dissolved oxygen, and turbidity. Parameters will be measured both upstream and downstream of the work area.
    ii. Responses to changes in water-quality measures exceeding the applicable standards would include reporting the measurements to the New Mexico Environment

Department Surface Water Quality Bureau and moving construction activities away from the shore.

Equipment and Operations

1. Reclamation-led work activities that have the potential for adverse impacts will be monitored by properly trained Reclamation personnel in order to ensure compliance.
2. Reclamation will excavate an area as few times as possible to minimize disturbance of sediment. When excavating within the wetted channel, the following practices will be used to minimize disturbance of sediment:
    i. Minimize movement of excavator tracks;
    ii. Minimize excavator bucket contact with riverbed when not excavating.
3. Each individual operator will be briefed on local environmental considerations specific to the project tasks.
4. Minimize impact of hydrocarbons: To minimize potential for spills into or contamination of aquatic habitat:
    i. Hydraulic lines will be checked each morning for leaks and periodically throughout each workday. Any leaky or damaged hydraulic hoses will be replaced.
    ii. All fueling will take place outside the active floodplain, where possible. All fueling will occur with a spill kit ready. If amphibious excavators are used, fueling will occur at the Rio Grande using airboats equipped with lined fuel containment. Fuel, hydraulic fluids, and other hazardous materials may be stored on-site overnight, but outside the normal floodplain, not near the river or any location where a spill could affect the river.
    iii. All equipment will undergo high-pressure spray cleaning and inspection prior to initial operation in the project area.
    iv. Equipment will be parked on pre-determined locations on high ground away from the river overnight, on weekends, and holidays.
    v. Spill protection kits will be on-site, and operators will be trained in the correct deployment of the kits.
    vi. External hydraulic lines are composed of braided steel covered with rubber. When there is increased risk of puncture such as during mastication while removing vegetation, external hydraulic lines will be covered with additional puncture-resistant material, such as steel-mesh guards, Kevlar, etc., to offer additional protection.
5. Equipment will be removed from the channel in the event of high storm surges.
6. To allow fish time to leave the area before in-water work begins, equipment will initially enter the water slowly. In-water work will be fairly continuous during workdays, so that fish are less likely to return to the area once work has begun.
7. Riprap to be placed in the water will be reasonably clean to the extent possible. If there are large clumps of soil bigger than 1 foot within the riprap, those clumps will be set aside during the loading or placing operations.

Access and Staging

1. Impacts to terrestrial habitats will be minimized by using existing roads whenever possible. In general, equipment operation will take place in the most open area available, and all efforts will be made to minimize damage to native vegetation and wetlands (also see Vegetation Replanting and Control below).
2. All necessary permits for access points, staging area, and study sites will be acquired prior to construction activity.

Vegetation Replanting and Control

1. A variety of revegetation strategies may be used: stem and pole cuttings (provided by Isleta Pueblo); long stem transplants (provided by Isleta Pueblo); and upland planting with and without a polymer, zeolite, or similar compound to maximize soil water retention (Dreesen 2008). Planting techniques may vary from site to site, and may consist of buckets, augers, stingers, and/or water jets mounted on construction equipment. In some areas, a trench may be constructed to facilitate the placement of a significant number of plants, specifically stem and pole cuttings. Seeding would be accomplished using a native seed drill, where feasible, and spread with a protective covering which would provide moisture to the seeds.
2. Vegetation control may consist of mechanical removal, burning, mowing, and/or herbicide treatment. Herbicides will be used when non-chemical methods are unsuccessful or are not economically feasible (see Herbicide and Pesticide Use below).
    i. Vegetation control will be completed between August 15 (or September 1 for work in suitable cuckoo habitat) and April 15. Any need for deviations from this work window will be considered on a project-specific basis and coordinated with the USFWS. If work is planned within 2 weeks before April 15 or after August 15 (or September 1 for work in suitable cuckoo habitat), Reclamation will conduct additional analysis and surveys (if warranted), to determine the presence of breeding flycatchers, cuckoos, or other breeding birds protected under the Migratory Bird Treaty Act. Reclamation and/or the appropriate project partner will coordinate monitoring and work activities with the USFWS, as appropriate, if bird nests are found.
3. Native vegetation at work sites will be avoided to the extent possible. If large, native woody vegetation (primarily cottonwood > 6-inch DBH) needs to be trimmed or removed, they will be replaced at a ratio of 10:1. When and where possible, small, native woody vegetation will be removed or harvested at the appropriate season to use for revegetation work at another location in the project area or at another project site. Native vegetation that cannot be replanted may be mulched (mulch will be removed or spread on-site at a depth of 3 inches or less) or temporarily stockpiled and used to create dead tree snags or brush piles in the project area upon completion.
4. Non-native vegetation that is removed at work sites will be mulched, burned, or removed off-site to an approved location. Mulched vegetation may also be spread on-site at a depth of three inches or less.

Herbicide and Pesticide Use

1. The use of chemical herbicides or pesticides may be necessary to control undesirable plant species around stockpile sites and storage yards and also to prevent the spread of invasive species in areas cleared for maintenance activities. It also may be necessary to spray or control: arthropods (spiders, ants, cockroaches, and crickets) that pose a safety problem or are a nuisance in buildings and facilities; birds (pigeons and swallows) that are considered a nuisance roosting in building structures; and mice that get into structures and/or equipment. Since the application of herbicides and chemical spraying is tightly controlled by state and federal agencies, Reclamation will follow all state and federal laws and regulations applicable to the application of herbicides, including guidelines described by White (2007). Herbicides or pesticides will not be directly applied to or near water unless they are labeled for aquatic use and appropriate buffers will be observed. Communication with the U.S. Fish and Wildlife Service will occur prior to any application to sites with threatened or endangered wildlife species. Reclamation will follow the Albuquerque Area Office Integrated Pest Management Plan and Pesticide General Permit when applying herbicides or pesticides. All non-Reclamation project partners will follow their agencies' herbicide/pesticide guidance, if applicable. Herbicides or pesticides may be applied using low-pressure spray rigs mounted to off-highway vehicles, trucks and trailers with spray bars, or backpack sprayers (for spot applications). Treatments will be conducted by trained and approved personnel observing appropriate buffer distances and label directions. Treatment will not take place when winds exceed 10 miles per hour or when rain is forecasted for the local area within 48 hours of application. Care will be taken when mixing or applying any herbicide to avoid runoff onto the ground or into the water. Surfactants may also be added to certain herbicides to maximize herbicide/pesticide performance and minimize retreatments.

Dust Abatement

1. If water is needed for dust abatement or to facilitate grading of roads, water may be pumped from the Rio Grande, irrigation drains, sumps, or secondary channels adjacent to the river. During irrigation season (March 1 to October 31), water will not be pumped from the river but will be pumped from the irrigation drains if possible. If pumping from the river is required between April 15 and August 15 (or September 1 in suitable cuckoo habitat), and is needed between May 1 and July 1 (emergencies only), Reclamation and/or the appropriate project partner(s) will coordinate with the U.S. Fish and Wildlife Service to avoid impacts to silvery minnow eggs and larvae. Outside of the irrigation season, an amount not to exceed 5% of river flows at the time of pumping may be drawn from the Rio Grande. Pumping is short duration (minutes) for filling whatever water transport equipment is used. Sumps or secondary channels adjacent to the river will be used, whenever feasible. Pump intake pipes will use a 0.25-inch (0.64-centimeter) mesh screen at the opening of the intake hose to minimize entrainment of aquatic organisms.

Other Measure

1. All treatment and control areas will be monitored for 3 years following construction to determine the effectiveness of the methods implemented and identify project-related hydrologic and geomorphic alterations. The monitoring will consist of biological, vegetative,

geomorphic, and hydrologic monitoring, as appropriate to the project design and purpose. If USACE requires 5 years of monitoring and reporting, Reclamation will comply.

2. All project spoils and waste will be disposed of off-site at approved locations or may be used on-site as appropriate to the project purpose, consistent with applicable environmental requirements.
3. All work projects will have a contract in place for the rental of portable restroom facilities during the duration of the project.

9.Appendix C – References

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service Report No. FWS/OBS/-79/31. Washington, D.C. Available at: https://www.fws.gov/wetlands/Data/Wetland-Codes.html. Accessed October 2021.

Crawford, C., A. Cully, R. Leutheuser, M. Sifuentes, L. White, and J. Wilber. 1993. *Middle Rio Grande Ecosystem: Bosque Biological Management Plan*. Los Lunas, New Mexico: Middle Rio Grande Biological Interagency Team.

Crawford, C., Y. Najmi, and S. Grogan. 2005. *Bosque Landscape Alteration Strategy*. Los Lunas, New Mexico: Middle Rio Grande Conservancy District.

Dreesen, D.R. 2008. *Basic Guideline for Seeding Native Grasses in Arid and Semi-arid Ecoregions*. Los Lunas, New Mexico: USDA-NRC Plant Materials Center.

Eichhorst, K.E. 1999. Dynamics of defoliator activity along an urban to rural gradient in the Middle Rio Grande Riparian Corridor. M.S. thesis, Department of Biology, University of New Mexico, Albuquerque.

Eichhorst, K.E., M.C. Stuever, M.M. Dwyer, D.C. Shaw, and C.S. Crawford. 2002. *Bosque Ecosystem Monitoring Program (BEMP): First Annual Supplement: 2001*. Open-File Report 02-2. Albuquerque: University of New Mexico.

Florsheim, J.L., J.F. Mount, and A. Chin. 2008. Bank erosion as a desirable attribute of rivers. *BioScience* 58(6). DOI: 10.1641/B580608.

Griffith, G.E., J.M. Omernik, M.M. McGraw, G.Z. Jacobi, C.M. Canavan, T.S. Schrader, D. Mercer, R. Hill, and B.C. Moran. 2006. Ecoregions of New Mexico (two-sided color poster with map, descriptive text, summary tables, and photographs). Scale 1:1,400,000. Reston, Virginia: U.S. Geological Survey.

Kuria, F., and M. Klein. 2020a. *Los Lunas Subreach Hydraulic, Hydrologic, and Habitat Analysis*. Albuquerque, New Mexico: U.S. Bureau of Reclamation, Upper Colorado Basin.

Kuria, F., and M. Klein. 2020b. *Rio Grande Water Surface Elevation Changes in the Los Lunas Reach*. Albuquerque, New Mexico: U.S. Bureau of Reclamation, Upper Colorado Basin.

Kuria, F., M. Klein, and L. Pratt. 2021. *Project Description: Los Lunas RM 163 Conveyance Capacity Project*. Albuquerque, New Mexico: U.S. Bureau of Reclamation, Upper Colorado Basin.

Leffler, S.A., L.E. England, and J. Naito. 2000. Vulnerability of Fremont cottonwood (*Populus fremontii* Watts.) individuals to xylem cavitation. *Western North American Naturalist* 60:204–210.

Moore, S. and M. White. 2024. 2023 Middle Rio Grande Southwestern Willow Flycatcher Study Results. Technical Report No. ENV-2024-018. Bureau of Reclamation, Technical Service Center, Fisheries and Wildlife Resources. Denver, Colorado.

Natural Resources Conservation Service (NRCS). 2021. Web Soil Survey. Available at: http://websoilsurvey.nrcs.usda.gov/app/. Accessed December 2021.

New Mexico Department of Agriculture. 2020. New Mexico noxious weed list update. New Mexico State University. Available at: https://www.nmda.nmsu.edu/wp-content/uploads/2020/07/Weed-List-memo-and-weed-list-2020.pdf. Accessed November 2021.

New Mexico Office of the State Engineer (NMOSE). 2011. Depletions Offsetting for Habitat Restoration Projects within the Middle Rio Grande Project. October 28, 2011.

Sechrist, J., V. Johanson, and D. Ahlers. 2009. *Western Yellow-billed Cuckoo Radio Telemetry Study Results: Middle Rio Grande, New Mexico 2007-2008*. Denver, Colorado: U.S. Bureau of Reclamation, Technical Service Center.

Siegle, R., S. Moore, and E. Reibsome. 2024. Middle Rio Grande Yellow-billed Cuckoo Study Results – 2023. Technical Report No. ENV-2023-021. Bureau of Reclamation, Technical Service Center, Fisheries and Wildlife Resources. Denver, Colorado.

SWCA Environmental Consultants (SWCA). 2021. Personal communication, Matt McMillan, Biologist, with Chris Parrish, Regulatory Project Manager/Archeologist, USACE. August 27, 2021; October 19, 2021.

U.S. Army Corps of Engineers (USACE). 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Vicksburg, Mississippi: U.S. Army Corps of Engineers, Waterways Experiment Station.

———. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0. ERDC/EL TR-08-28. Vicksburg, Mississippi: U.S. Army Corps of Engineers, Engineer Research and Development Center.

———. 2014. *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures*. Available at: https://www.publications.usace.army.mil/Portals/76/Publications/EngineerTechnicalLetters/ETL_1110-2-583.pdf. Accessed January 21, 2022.

———. 2019. *Middle Rio Grande Flood Protection Bernalillo to Belen, New Mexico: Mountain View, Isleta, and Belen Units. Integrated General Reevaluation Report and Supplemental Environmental Impact Statement*. Available at: https://www.spa.usace.army.mil/Portals/16/docs/environmental/fonsi/Levee%20-%20MRG%20Bernalillo%20to%20Belen/Middle%20Rio%20Grande%20Flood%20Protection%20Bernalillo%20to%20Belen%20New%20Mexico%20General%20Reevaluation%20Report%20-%20SEIS.pdf?ver=2020-02-12-113400-980 Accessed January 21, 2022.

U.S. Bureau of Reclamation (Reclamation). 2012a. *Middle Rio Grande River Maintenance Program Comprehensive Plan and Guide*. Middle Rio Grande Project, New Mexico Upper Colorado Region.

———. 2012b. *Reclamation's NEPA Handbook*. Washington, D.C.

———. 2015. *Joint Biological Assessment - Bureau of Reclamation, Bureau of Indian Affairs, and Non-Federal Water Management and Maintenance Activities on the Middle Rio Grande, New Mexico*. Available at: https://www.usbr.gov/uc/albuq/envdocs/ba/MRG/index.html.

———. 2016. *Yellow-billed Cuckoo Study Results. Middle Rio Grande from Los Lunas to Elephant Butte Reservoir, New Mexico*. Denver, Colorado: U.S. Bureau of Reclamation, Fisheries and Wildlife Resources Group.

———. 2019. *2019 Determination of River Maintenance Need: Ratings, Results, and Recommendations*. Bureau of Reclamation Middle Rio Grande Project, New Mexico.

———. 2021. Los Lunas River Mile 163 Design Concepts Selection Briefing. Bureau of Reclamation Middle Rio Grande Project, New Mexico. Upper Colorado Basin Region, Albuquerque Area Office. Available in project file.

U.S. Fish and Wildlife Service (USFWS). 2003. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for the Rio Grande Silvery Minnow, Final Rule. *Federal Register* 68(33):8087–8135.

———. 2005. Designation of Critical Habitat for the Southwestern Willow Flycatcher (*Empidonax traillii extimus*); Final Rule. *Federal Register* 70:60886–61009.

———. 2013. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Southwestern Willow Flycatcher; Final Rule. *Federal Register* 78, No. 2.

———. 2016. *Final Biological and Conference Opinion for Bureau of Reclamation, Bureau of Indian Affairs, and Non-Federal Water Management and Maintenance Activities on the Middle Rio Grande, New Mexico*. Available at: https://www.fws.gov/southwest/es/newmexico/BO_MRG.cfm.

———. 2021a. National Wetlands Inventory data viewer. Available at: https://www.fws.gov/wetlands/Data/Data-Download.html. Accessed October 2021.

———. 2021b. Designation of Critical Habitat for the Western Yellow-billed cuckoo (*Coccyzus americanus*); Final Rule. *Federal Register* 70:60886–61009.

U.S. Geological Survey (USGS). 2016. Southwest Regional Gap Analysis Project. Available at: http://swregap.org/. Accessed October 2021.

———.2021. National Hydrography Dataset. Available at: http://nhd.usgs.gov/. Accessed October 2021.

———. 2024. USGS Surface-Water Monthly Statistics for New Mexico. USGS 08331160 Rio Grande near Bosque Farms, New Mexico. Available online: USGS Surface Water data for USA: USGS Surface-Water Monthly Statistics. Accessed October 28, 2024.

Van Horn, D. J., R. González-Pinzón, J. K. Reale, R. F. Brown, C. J. McGibbon, E. A. Joseph (2024). Continuous water quality data from the Rio Grande below Jemez Canyon Reservoir, New Mexico, USA, 2020-ongoing, HydroShare, http://www.hydroshare.org/resource/9e912c8455d64899a323d3fc11e9f27f

Wells, R., D. Unruh, P. Leckman, and K. Swope. A Cultural Resource Inventory and Evaluation of the Los Lunas RM 163 Conveyance Capacity Project, Valencia County, New Mexico. Technical Report 24-77. Statistical Research, Inc. Albuquerque, NM. NMCRIS Activity No. 156541.

White, J.A. 2007. *Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and* Wildlife Service. Austin, Texas: U.S. Department of the Interior, Fish and Wildlife Service.

Appendix D – Project Description: Los Lunas RM 163 Conveyance Capacity Project

Middle Rio Grande Project, New Mexico
Upper Colorado Basin Region
Albuquerque Area Office
Technical Services Division

prepared by

Technical Services Division
River Analysis Group
Faith Kuria, EIT, Hydraulic Engineer
Michelle Klein, PE, Senior Hydraulic Engineer
Luke Pratt, EIT, Hydraulic Engineer

Bureau of Reclamation Reviewers

Ann Demint, MA, MWR, Project Manager
Eric Gonzales, Biologist
Chris Grosso, Biologist
Scott Hebner, Environmental Specialist
Robert Padilla, PE, D.WRE, Supervisory Civil Engineer
Chris Torres, Construction Supervisor
Sue Woods, Realty Specialist

External Reviewers

Anders Lundahl, Hydrologist, NMISC
Alicia Lopez, Engineering Manager, MRGCD

Project Background and Purpose

Background

The project site River Mile (RM) 163 is within the Los Lunas subreach, a section of the Middle Rio Grande (MRG) river extending from Isleta Diversion Dam (RM 169) to the community of Los Chaves (RM 153).

This subreach has a unique topography involving a semi-perched channel where the banks are higher in elevation than the adjacent floodplain and spoil levee toes. Therefore, once flows overbank the main channel banks, the water tends to move laterally down to the levee toe and then continues flowing downstream parallel to the levees. There are limited locations where the overbanked water can return to the main channel. During high flows these conditions result in saturated levee toes (sometimes leading to levee failure) and water stranding in the floodplain. In 2019, repairs of levee in this area cost the Middle Rio Grande Conservancy District (MRGCD) over 1.2 million dollars.

Anecdotal accounts state that in recent years the historic banks in the subreach are overbanking at progressively lower flowrates. Field measurements of water surface elevations (WSE) at different flow rates over years have also confirmed this. This can be attributed mostly to channel narrowing via vegetation encroachment and bank and bar sediment accretion, but minor channel bed aggradation between Isleta and the NM-6 bridge may also play a role. Factors contributing to the channel narrowing and aggradation include major changes to the hydrologic and sediment regimes of the MRG, with reduction in hydrologic peaks and a reduction in the volume and concentration of sediment. The hydrologic peak reduction as well as supplemental water releases in the growing season are likely contributors to vegetation encroachment and thus channel narrowing.

Location and Land Ownership

The project site is located approximately 2 miles above the NM6 bridge in Los Lunas, New Mexico. Within the project area, the land between the spoil bank levees is defined as the Rio Grande Floodway. Reclamation has river channel rectification and maintenance authority under the Flood Control Acts of 1948 and 1950 that established the Middle Rio Grande (MRG) Project. The spoil bank levees and adjacent riverside drains are part of MRGCD's MRG Project Works and are currently held in title by the United States, but only until title transfer from Reclamation to the MRGCD is completed in 2021.

The specific location of the site is between RM 161.3 – 164 as shown in Figure 6. Also included in Figure 6 is the Maximum Construction Area which is approximated as 595 acres. This project site has been selected following a 2020 study for the Los Lunas subreach from Isleta Diversion Dam to RM 153 (Kuria and Klein, 2020). In this study, RM 163 – 164 East was identified as the location where overbanking happens first at about 2300 cubic feet per second (cfs) while RM 163 West identified as overbanking at around 3500cfs. No Isleta Pueblo Land will be disturbed in the context of this project. Due to the inverted cross section at this location, once overbanked, water flows to

the levee toe and flows downstream adjacent to the levees before draining back to the main channel at the NM6 bridge.

One feature in the project area is a man-made berm connected to the eastern spoil levee. The owner/installer of the berm is unknown but will be sought out prior to its potential removal.

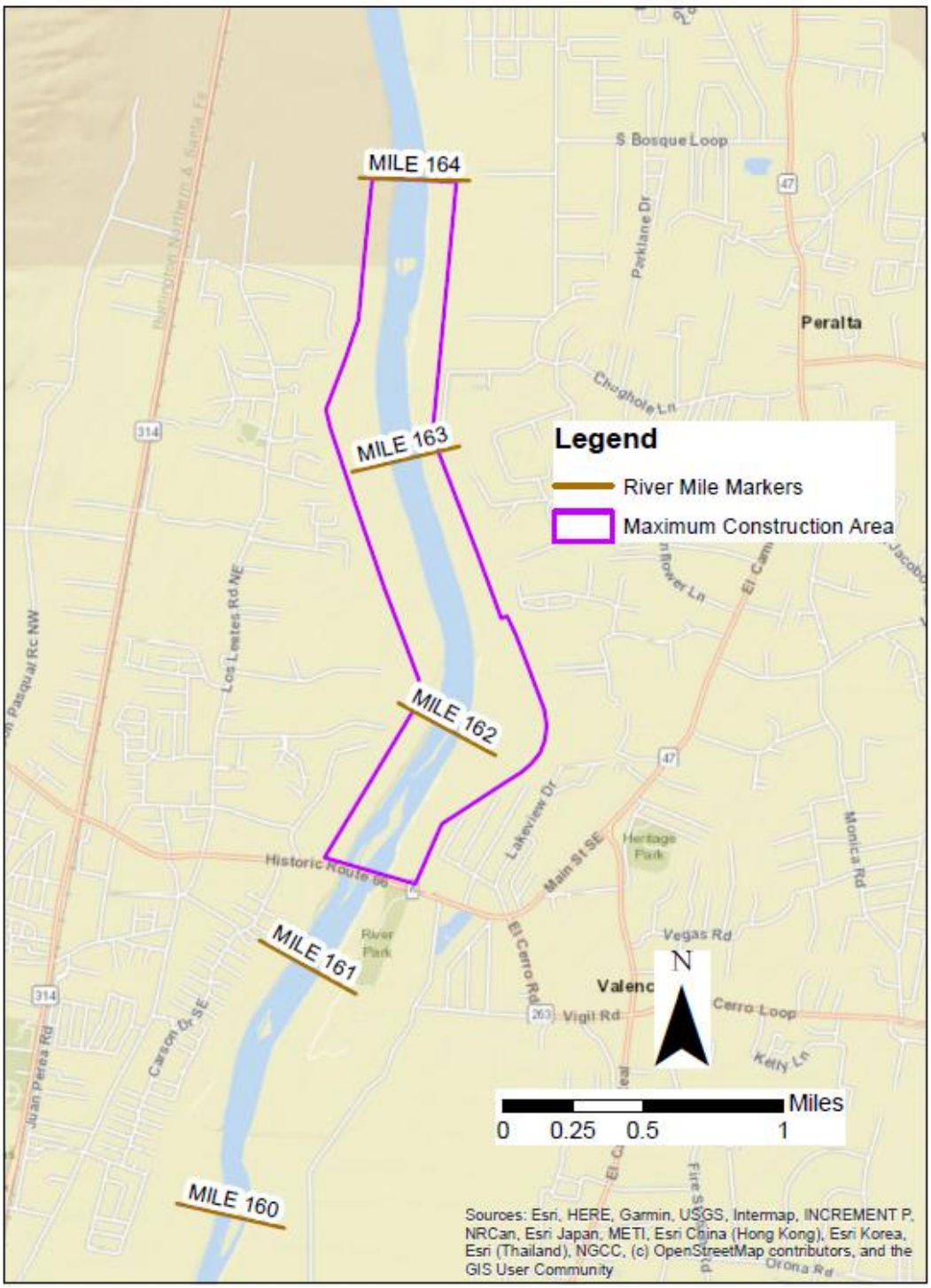


Figure 6: Project site location

Purpose

The purpose of the Los Lunas RM 163 project is to improve water conveyance through the Los Lunas subreach. The primary goal is to reduce the water surface elevation (WSE) by increasing channel capacity to prevent overbanking into the historic floodplain (defined here as the floodplain outside the 550-foot-wide channel established by jetty jacks in 1960s-1970s) at flows less than 3500 cfs between RM 164 and RM 162. This flow rate is a rough approximation of the 2-year flood flow as identified by Kuria and Klein, 2020. This type of work is considered River Maintenance Class 3a indicating that this work can be planned in advance and the consequences of no action are less likely to be substantial in the near term (the next normal spring runoff or within the next few years). Work can be described as preventative maintenance (Reclamation, 2014).

To keep the project within one construction season, the excavation is limited to less than 100,000 cubic yards (CY). However, more work is needed within the reach to improve conveyance capacity. Thus, this project will be a pilot project for a future width maintenance program which will include partner agency cooperation from MRGCD and the New Mexico Interstate Stream Commission (NMISC).

The secondary goals of this project are to consider the environmental and geomorphic benefits and impacts, and to be cost effective. Thus, project components were selected to include areas where encroaching vegetation and bar/island accretion have resulted in reduced channel capacity while keeping the excavations to less than 100,000 CY. Terraced banks were used to increase the inundated areas at lower flows in some of the areas where the project will be carried out, providing inundated nursery habitat for minnows.

Project Components

The project components consist of five bank lowering polygon areas withing the historic channel and one relic berm removal in the eastern historic floodplain. These project components will improve the channel conveyance by increasing the width of the river both on the west and east banks of the river. The relic berm will also be removed as it has been holding water on the floodplain against the levee and preventing the water from flowing downstream. The location of the five polygon areas where bank lowering will be done and removing of the relic berm are shown in Figure 7. These five polygon areas are identified by River miles (RM).

Table 1: Project components' identifying information

Project Component	River Mile Extents	Side of river	Type
RM 162 BL	RM 162.1 –162.9	West	Inset floodplain bank lowering
RM 163.1 BL	RM 163.1 – 163.3	West	Inset floodplain bank lowering
RM 163.3 East BL	RM 163.3 – 163.4	East	Inset floodplain bank lowering
RM 163.4 BL	RM 163.4 – 165.5	West	Inset floodplain bank lowering
RM 163.6 BL	RM 163.6 – 163.8	West	Inset floodplain bank lowering
Berm removal	RM 163.4 – 163.6	East	Relic berm removal

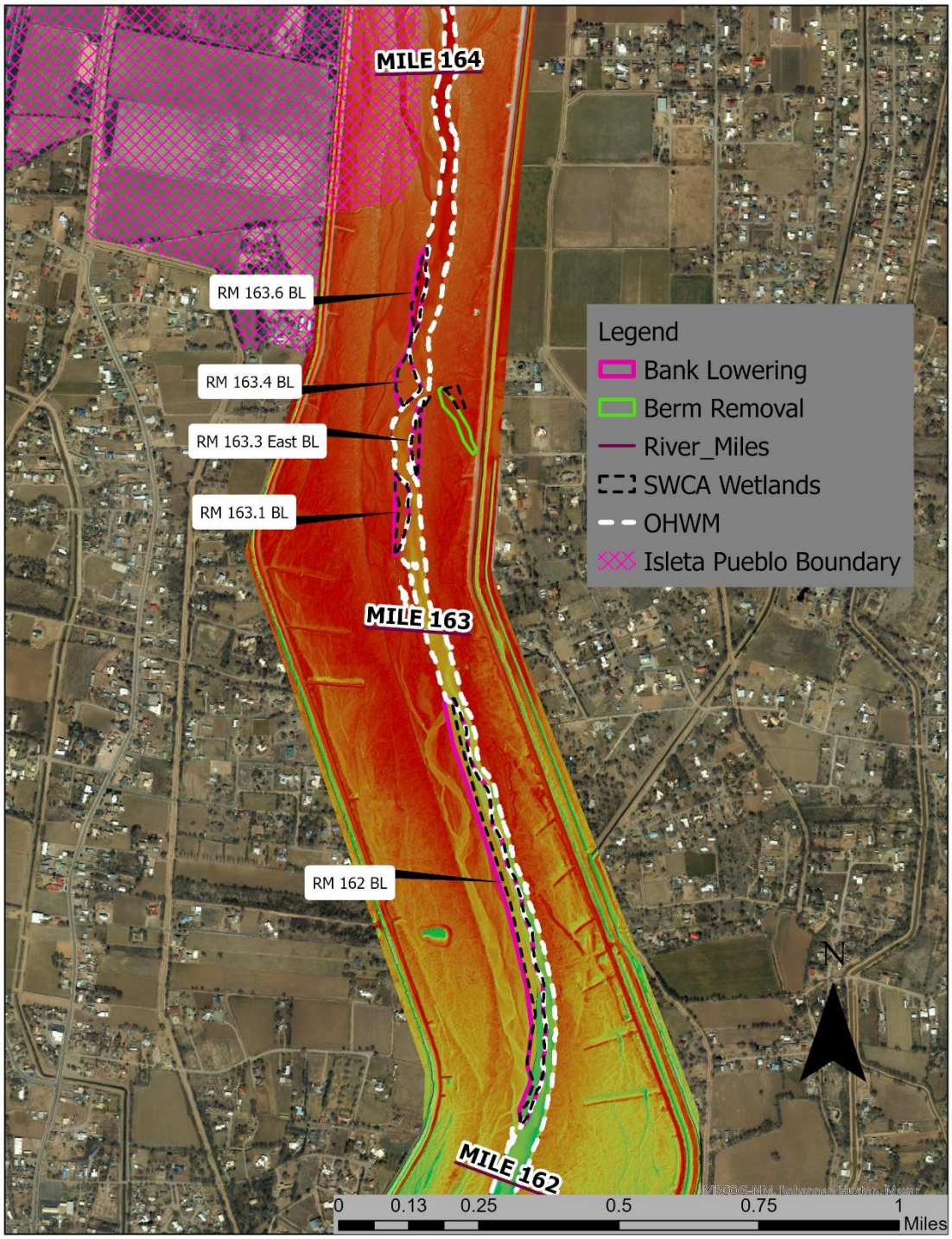


Figure 7: Project components

Dimensions

The inset floodplain bank lowering areas typically have a single elevation for the entire polygon as shown in Table 2. There are two exceptions where terracing is used for RM 162 and RM 163.6 as

described below. The edges of the bank lowering polygons will gently slope to existing ground at 4:1 H: V.

The relic berm will be removed down to the elevation of the surrounding terrain, generally around elevation 4860.5 feet (ft).

Table 2: Project component dimensions

Project component	Average Original Elevation (ft)	Design Elevation (ft)	Length (ft)	Volume (CY)	Area (Acres)
RM 162 BL	4856	Varies (4851-4855)	Varies	57,402	13
RM 163.1 BL	4860	4857.5	720	7,652	2
RM 163.3 East BL	4861.5	4857.5	736	5,354	1
RM 163.4 BL	4861.5	4857	553	13,828	2
RM 163.6 BL	4863	Varies (4859.25-4860)	Varies	7,758	2
Berm removal	4863	4860.5	749	4,030	1
TOTAL	--	--	--	96,024	21

RM 162 BL

This bank lowering component consist of four terraces as shown in Figure 8. The length of the whole polygon from the upstream end to the most downstream is 4095 ft. The design or finished ground elevation of the first terrace is 4853 ft and is 2845 ft long. The second terrace has a design elevation of 4855 ft and is 2000 ft long. Third terrace is at an elevation of 4854 ft and is 1580 ft long. And fourth terrace is at an elevation of 4851 ft and is 1200 ft long. **Figure 9** shows the profile cross sections of these four terraces.

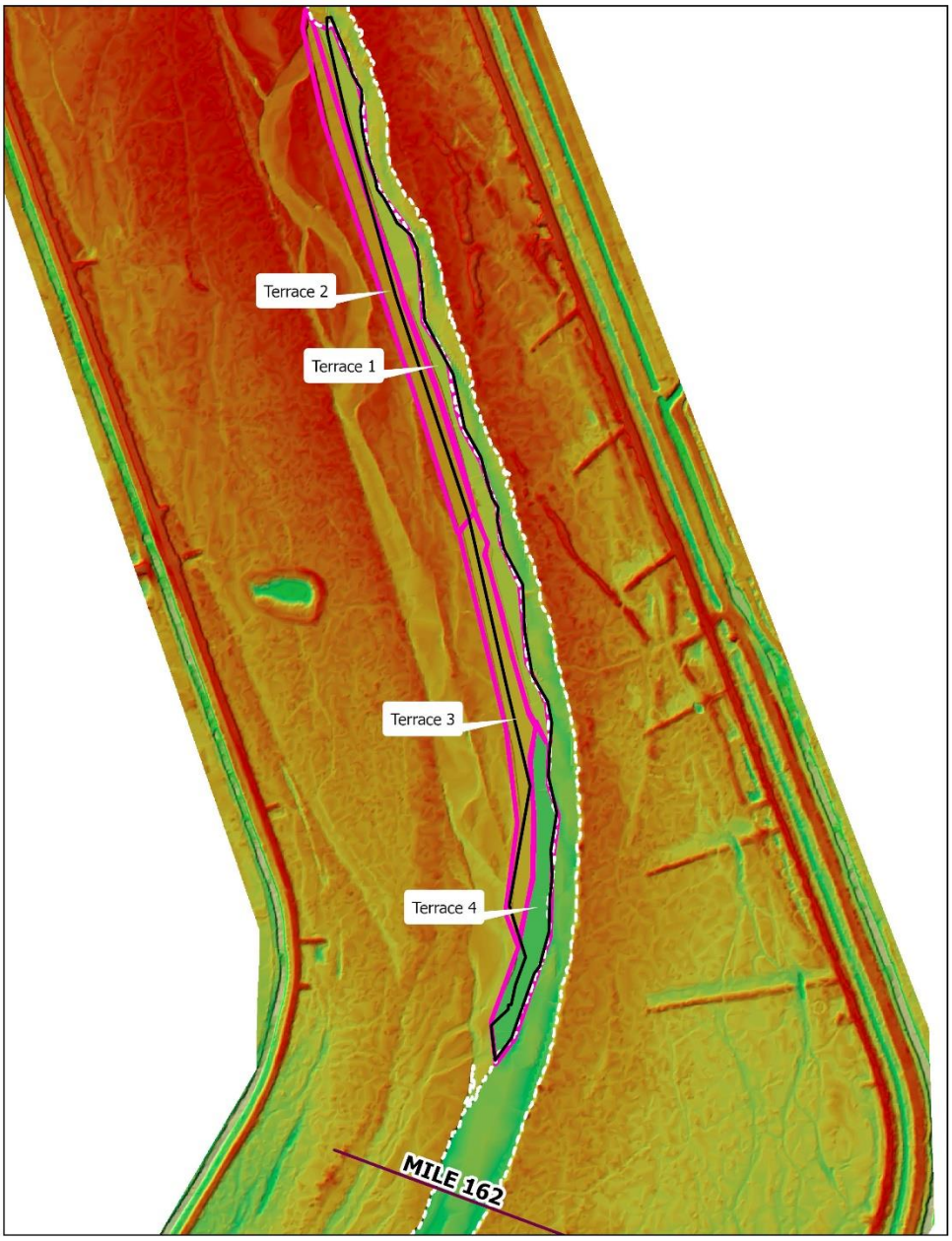


Figure 8: RM 162 BL component showing the four terraces

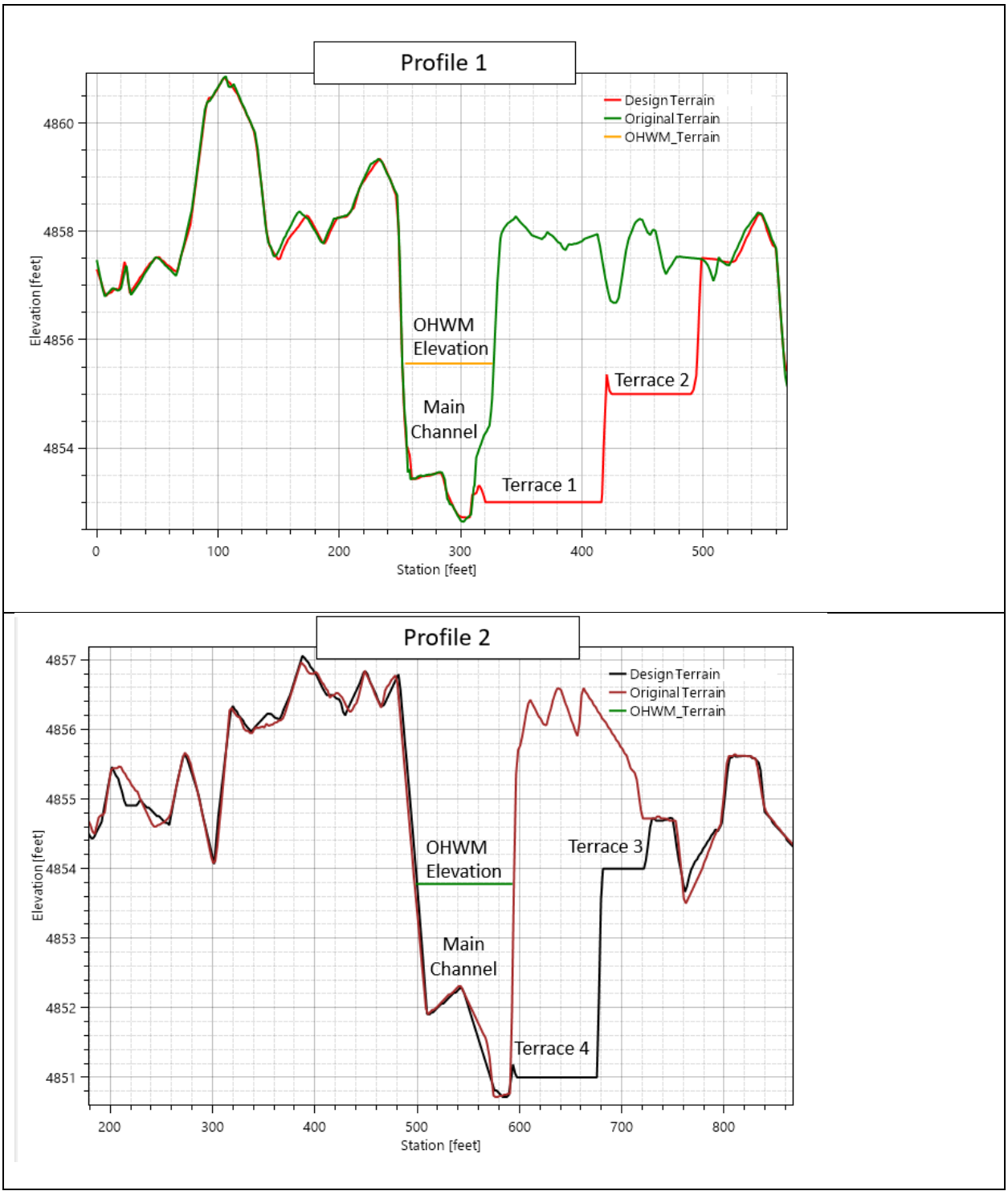


Figure 9: Profile 1 & 2 cross sections showing the elevation of the four terraces of RM 162 BL component. Also included is the elevation of the original terrain.

RM 163.6 BL

This bank lowering component consist of two terraces as shown in Figure 10Figure 8. The length of the polygon from the upstream end to the most downstream is 964 ft. The design elevation of

terrace 5 is 4859.25 ft and is 862 ft long. The design elevation for terrace 6 is 4860 ft and is 900 ft long. Figure 11 shows a cross section profile of this project component.

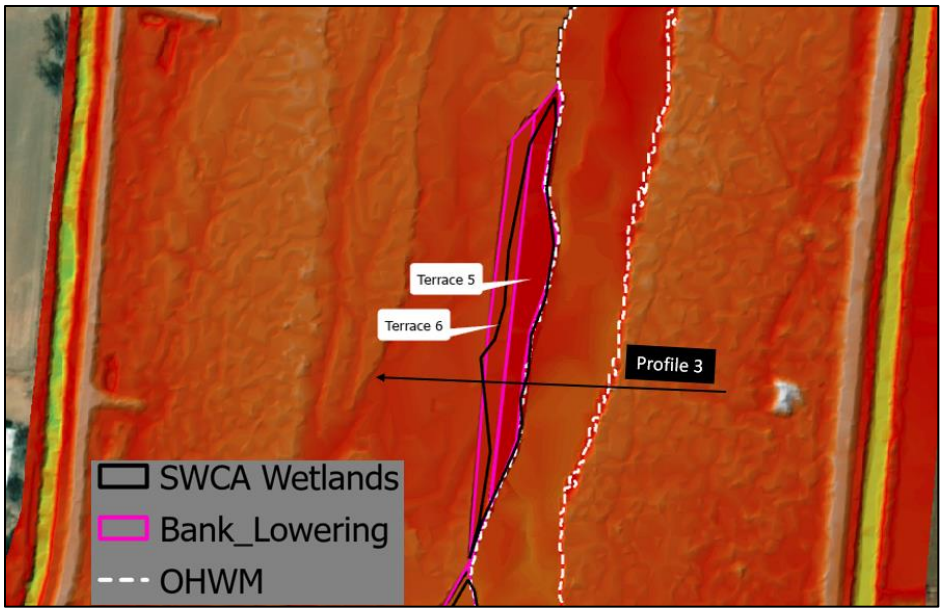


Figure 10: RM 163.6 BL component showing the two terraces

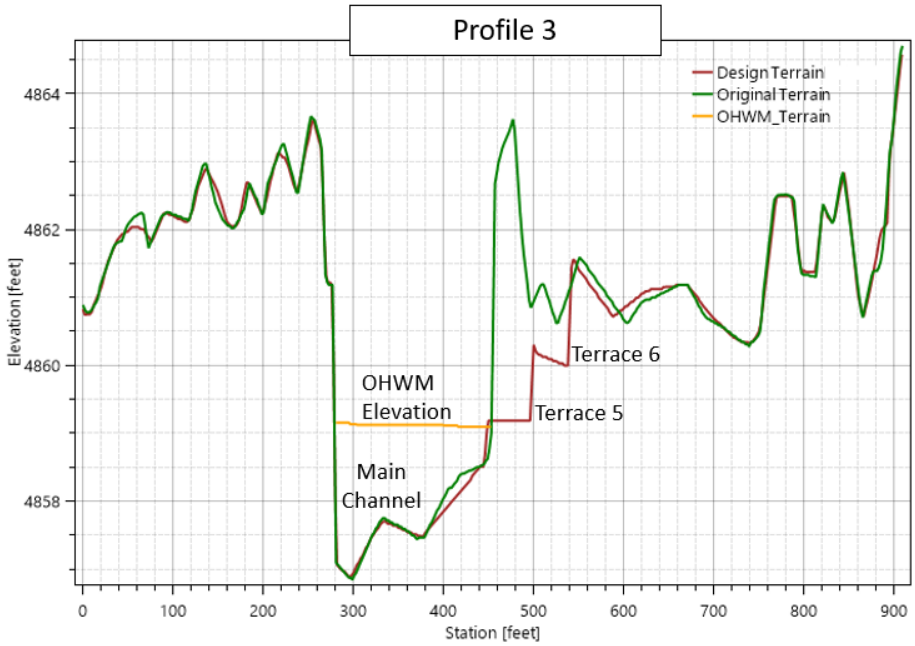


Figure 11: Profile 3 cross section showing elevation of the two terraces of RM 163.6 BL component. Also included is the elevation of original terrain

Inundation Flow Rates

Information on inundation flow rates has been provided here to demonstrate that the added channel capacity will impact not only high flows but also lower flows. Also, information on inundation flow rates demonstrates the nature of the aquatic habitat created.

These project components are intended to inundate at a variety of flow rates. Due to geomorphic response and hydrologic uncertainties, it is unknown which channel elevations will experience sedimentation the quickest. It is hypothesized that designing surfaces for a variety of flow rates will help extend the project longevity by increasing the probability that one of the components will experience lower sediment accumulation rates. Also, this diversity will provide habitat for the minnow at a variety of flow rates as well. The target inundation flow rates are provided in Table 3.

Some bank lowering components are relatively small and flat and transition from dry to fully inundated after only a minimal increase in flow. For these project components, only one inundation flow rate is shown in Table 3. Other project components begin inundating at one flow rate but don't become fully inundated until flows have risen significantly. For these components, the initial inundation flow rate is provided with the fully inundated flow rate in parenthesis in Table 3. The spatial distribution of the inundation of the project components is shown in Figure 12.

Table 3: Inundation flow rates for the project components

Project component	Inundation flow rate (cfs)
RM 162 - Terrace elevation 4851	105
RM 162 - Terrace elevation 4853	105
RM 162 - Terrace elevation 4854	500 (1000)
RM 162 - Terrace elevation 4855	500 (1000)
RM 163.1	500
RM 163.3 East	105
RM 163.4	105
RM 163.6 – Terrace elevation 4859.2	500 (1000)
RM 163.6 – Terrace elevation 4860	1000 (1800)

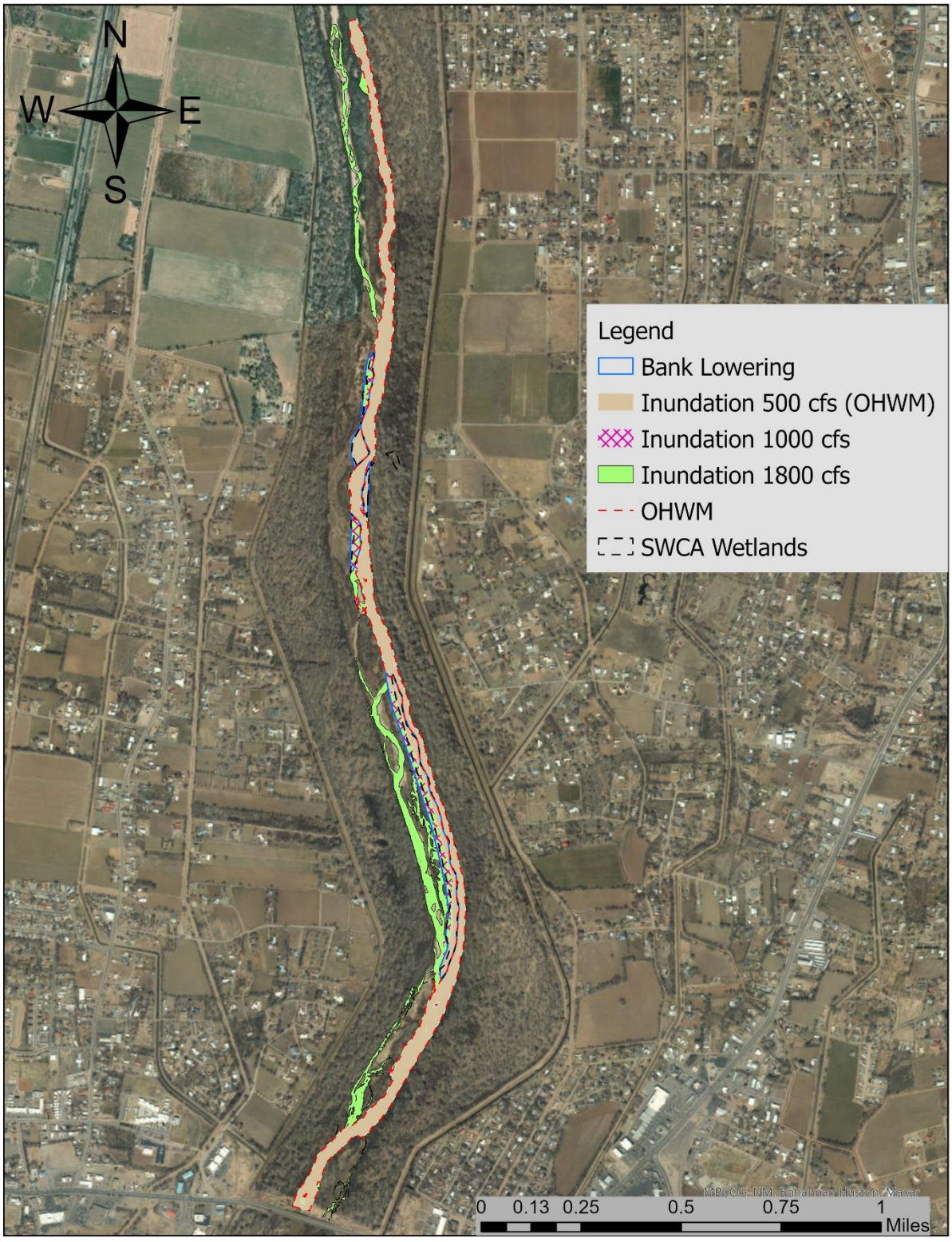


Figure 12: Spatial distribution of inundation of project components

Construction Operations

Site Access, Staging, and Spoils

Access to the project site for mobilization and demobilization will be through NM6 highway. Four of the bank lowering areas are located on the western floodplain between river miles RM 162 and RM 164. One bank lowering area and the relic berm removal are located on the eastern floodplain between river miles RM 163.3 and RM 163.6. Therefore, access to these construction sites will be through the spoil levee roads on both the West and East sides of the river respectively. Staging areas will be required on both sides of the river, and spoils will be placed on the levees on both sides of the river. Proposed access routes and staging areas are shown in Figure 13. Unless prior permission is obtained, no access through or disturbance of Isleta Pueblo land shall occur within the context of this project.

The access to the project area is through MRGCD gates. The public can access through these gates with paid permits, but the permit language reserves the right to restrict access for activities such as construction. During construction these gates will remain open in case of an emergency. Signs will be posted at the gates restricting the public from entering the gates and potentially entering the construction operations. There will also be signs indicating that there are heavy equipment entering the road. At each of the eastern and western temporary site access roads discussed in Section 3.1.1 and 3.1.2 there will be signs indicating active construction site just in case there are people travelling on official business.

Eastern Site Access

On the eastern floodplain a temporary access road will be developed on top of the berm area that is to be removed. The vegetation on the berm will be removed and masticated, and then the berm will be developed into an access road for the eastern bank lowering polygon. After the eastern bank lowering polygon is completed, the berm will be entirely removed. Figure 13 shows the access point. Assuming the roads are 30 feet wide with side slopes of 3:1, the anticipated site disturbance for the eastern access road is 0.13 acre.

Western Site Access

Due to the long distance between work sites on the western floodplain, there will be multiple access points from the western levee road to create loops that minimize haul distances from the bank lowering area to the levee. There will be one temporary north/south road constructed (which is hereafter called the river access road) to connect the bank lowering areas within the western inset floodplain. To connect the river access road back to the levee, a maximum of five east/west "bosque access roads" will be required. The proposed access roads are shown in Figure 13 and discussed in more detail below. The final location and specific number of these roads will be determined at the time of construction.

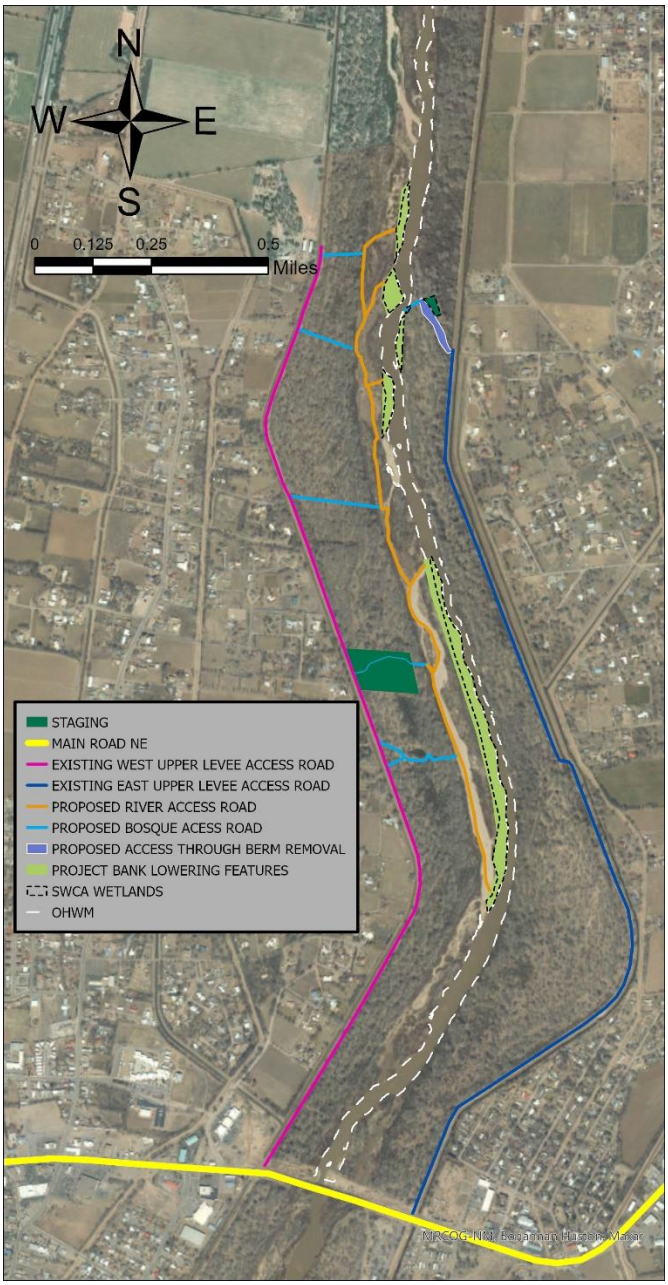


Figure 13: Project site access and staging areas

River Access Road (North/South)

The southern portion of the proposed north/south river access road is located mainly on bare sand, while the northern portion is sparsely populated with small vegetation, and thus the river access road development is anticipated to have minimal disturbance. Since this river access road is on the floodplain, fill materials excavated from the components on the westside will be used to improve the road by placing a layer of fill material up to 6 inches thick. Assuming the river access road is 15 feet wide, the anticipated disturbance of the river access road is less than 2.7 acres.

Modeling results indicate that the proposed north/south river access road will start becoming inundated at about 1200 cfs. Construction operations will need to stop if flows in the river get this

high. There is a chance that the flows will reach 1200 cfs towards the end of the typical construction period in March or April; thus, the western project area will be constructed first followed by the eastern project area.

Bosque Access Roads (East/West)

The proposed east-west bosque access roads connect the north/south river access road to the levee road. Four of the five proposed bosque access roads do not currently exist and would disturb vegetation to provide the necessary and safe vertical and horizontal clearance of the construction equipment. These four road sites were selected because they are either located in areas with sparse trees or they are in areas with non-native tree species. The amount of disturbance required for road development varies and includes understory mastication, tree limbing, native tree removal, and non-native tree removal.

The five proposed access roads will require ramps from the levee down to the bosque elevation. The ramps will be comprised of spoil materials brought in from the eastern floodplain spoils or from another source. After construction, these ramps will likely be left in place to improve bosque access for multiple purposes including vegetation management, data collection, and fire fighting. If they need to be removed, they will be removed by spreading the materials on the levee roads.

Assuming the roads are 15 feet wide, and if all five identified roads are developed, the anticipated site temporary disturbance for the western bosque access roads is less than 1.5 acres.

Equipment Staging

Due to the long distance between the western and eastern floodplains, as well as to avoid river crossings, an equipment staging area will be developed on each side of the river.

Both the western and eastern floodplain have sparse mature cottonwood trees with grass in some areas. Project staging areas are shown in Figure 14 and Figure 15 where it is expected that few cottonwood trees need to be trimmed or removed. The staging area on the western floodplain is anticipated to disturb less than 1 acre but a 7-acre area has been delineated to provide as much room as possible to avoid disturbing mature native vegetation. The staging area on the eastern floodplain is approximately 1 acre.

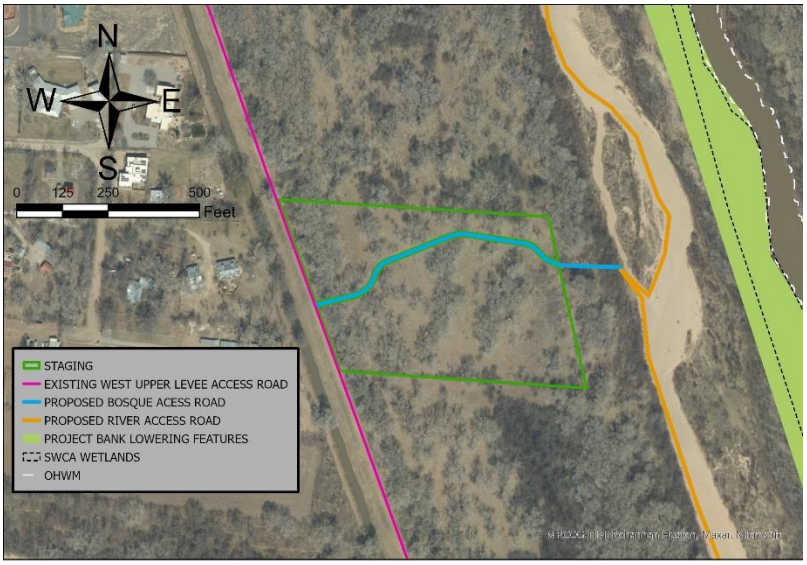


Figure 14: West side staging area

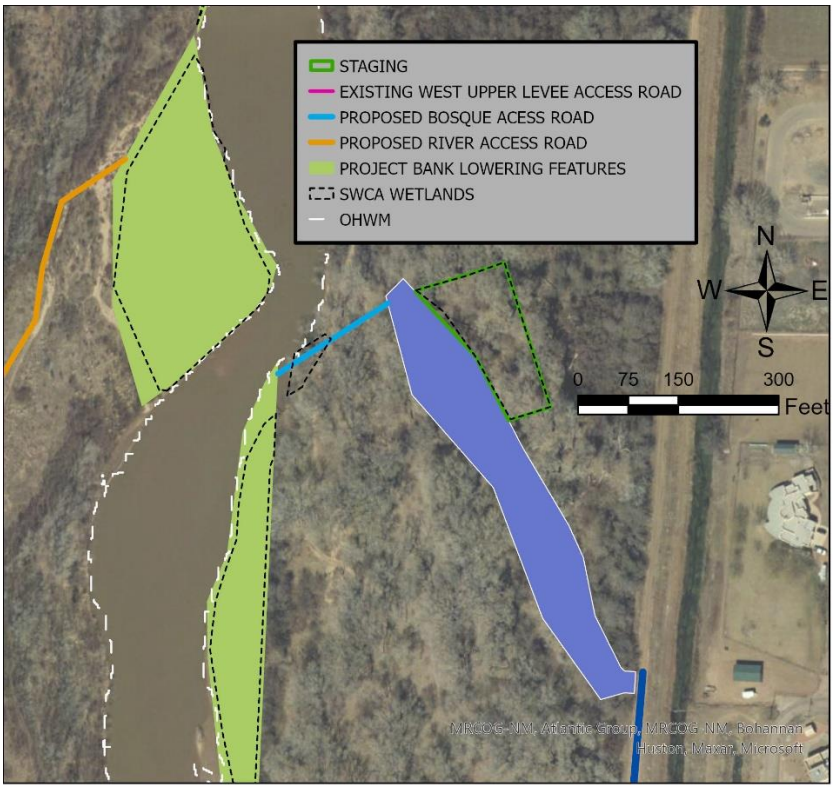


Figure 15: East side staging area

Mobilization and River Crossings

The project will be mobilized by bringing in the following likely construction equipment to the project site (actual available land-based construction equipment may vary by type and quantity):

- (1) 30-ton articulated water truck
- (2) on-road water trucks
- Up to (4) 30-ton articulated dump trucks

• Up to (4) 10-yd tandem dump trucks
• 1 motor grader
• (2) D-7 dozer
• (1) 40-ton excavator
• (2) 6-inch water pumps

Tracked equipment will be unloaded at the northwest gate of NM6 bridge and will drive up to the western staging area. Due to the difficult/safety issues of loaded trailers making left turns on the high traffic NM6, when the work on the western project bank lowering components are complete, it is preferred to have the equipment cross the river at a shallow location next to RM 163.3 East BL. Figure 16 shows the proposed river crossing location. Assuming the river crossing will happen around April and the river flows are about 1200 cfs, then the river water depth will be about 2 feet. When the eastern project components are completed, the equipment will drive to the northeast gate of NM6 bridge and be loaded onto trailers for demobilization.

If spring flows are too high when the equipment is ready to cross the river from the western side to the eastern side, the equipment will have to be transferred through the levee roads and via NM6 bridge instead.

The river crossing area is 0.14 acres and it is anticipated that 4 pieces of equipment (1 dozers, 1 excavator, and 2 articulating dump trucks) will cross. Thus, the total wetted impact area from equipment river crossings is 0.56 acres.

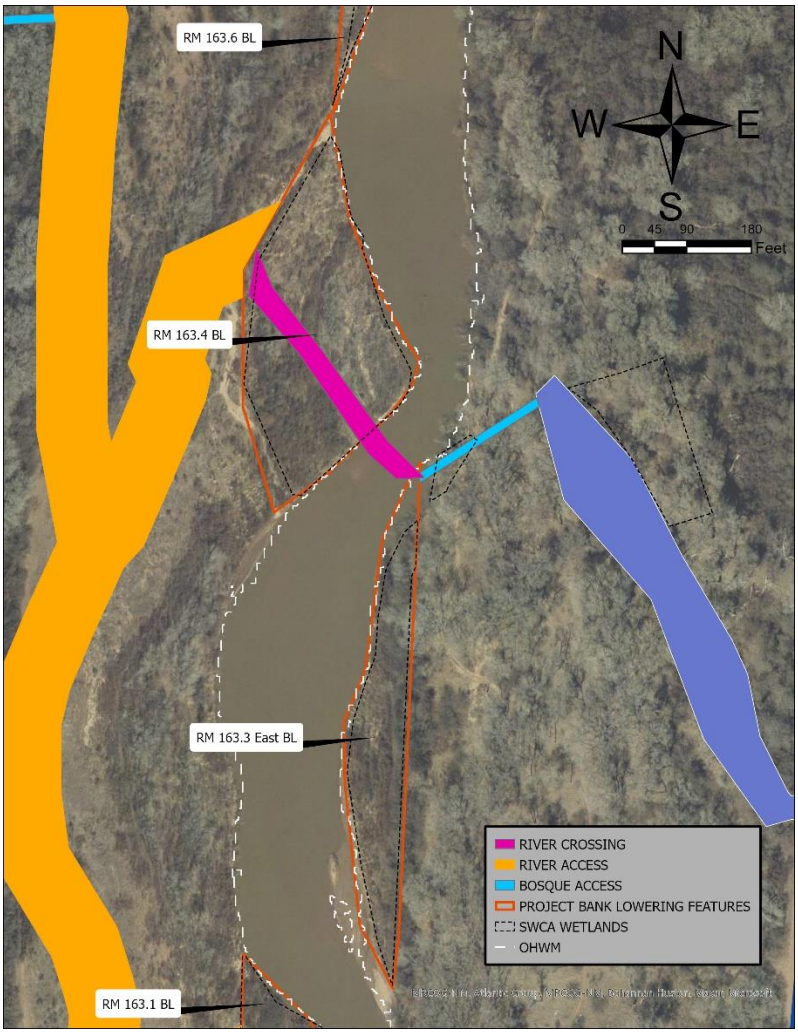


Figure 16: Western side to Eastern side river crossing location for the equipment

Dust Abatement

Water for dust abatement will be obtained from either the river or the riverside drains and appropriate BMPs (Section 5) will be utilized. If the water is obtained from riverside drains, a pad will need to be built up adjacent to the drains to place the water pump. The pump may disturb the residential areas nearby. Pumping from the riverside drains will require coordination with MRGCD. If the water is obtained from the river, a suitable location where it is flat and firm will be identified. Neither of these locations will require vegetation removal other than grasses and shrubs. Wetlands will not be impacted.

Reclamation has a surface water permit for pumping from the river (SP-04955). The volume of water pumped is reported weekly in the construction supervisor's reports, and the volume is compiled annually for reporting to the Office of the State Engineer (OSE).

Biomass and Spoils Disposal

Construction of the bank lowering areas will begin by masticating all vegetation within the bank lowering areas using land-based equipment. Vegetation within the bank lowering areas consists of upland vegetation, willows, and mature cottonwoods, with willows dominating at the bankline. Some

juvenile native trees are in the construction alignment and will also be masticated or removed by other means. The juvenile native trees within the construction areas vary in size but may have a diameter at breast height (DBH) as high as six to eight inches. Replacement of these native trees will be done in accordance with Best Management Practices (BMPs) (Section 5).

Masticated (mulched material) vegetation will be mixed in with the soil. Excavated material will be spoiled on top of the levee for the eastern side of the river. On the western side of the river, excavated material will be spoiled both on top of the levee and adjacent to the levee on the bosque side of the levee. This approximate maximum spoil area boundaries are shown in Figure 17. The spoil material could be spoiled higher and thus cover less acreage. No disturbance of Isleta Pueblo land is anticipated within the context of this project.

The levee spoils on the west side are anticipated to extend from near the NM-6 roadway north to just below the Isleta Pueblo boundary, or 10,907 feet of levee. The levee is anticipated to be raised up to two feet, and the remaining spoils will be placed adjacent to the levee on the bosque side. These spoils will be the same height as the levee, and will extend up to 60 feet wider than the levee. The westside spoils area is estimated at 17 acres with a maximum of 20 acres.

The spoils on the east side are anticipated to extend 600 to 2,400 feet along the levee surrounding the eastern project area near RM 163.3. Approximately 3–6 inches of fill material will be placed on the levee between 16 feet to 24 feet wide. The eastside spoils area is approximately 0.5 acre with a maximum of 1 acre.

No spoils will be dumped beyond the Isleta boundary on the westside levee. Another possible option for spoiling excavated materials is to stockpile the material at a location identified by MRGCD, and MRGCD will utilize the spoils later as needed for irrigation/agricultural facility maintenance. A third potential option is to spoil the excavated materials around the riverside drain to improve widths and slopes.

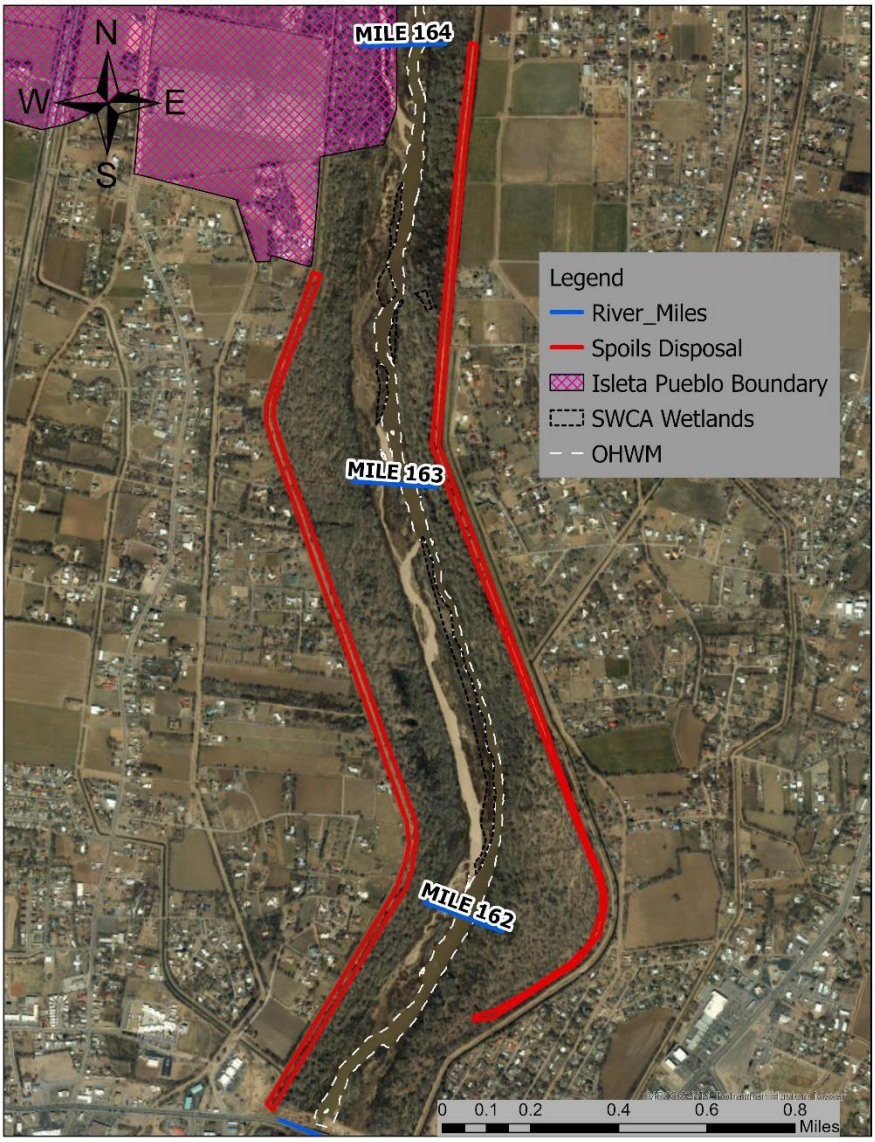


Figure 17: Spoil disposal areas on the levee roads and riverside-drain-side

The spoils will not be placed on wetlands, and the spoils will be placed around mature native trees, being buried a maximum of one foot and no greater. Non-native trees may be removed for spoiling operations. If any mature native trees are removed for spoiling operations, they will be not be replaced in accordance with BMPs because the tree removal falls under the authority of MRGCD's authority for preparing the levee for replacement under the Bernalillo to Belen levee project in partnership with the Army Corps of Engineers.

Removed mature cottonwood trees and rootwads may be disposed of in a variety of ways. Reclamation may haul and stockpile them onsite or at a Reclamation stockpile facility (Bernalillo, Escondida, etc.) for later use at a different project. They may be stockpiled along the levee system for MRGCD's utilization or disposal. They may be chipped and used as mulch. A few of the logs could be placed in the bank lowering areas as aquatic habitat according to engineering and

environmental BMPs. They may also be strategically placed in areas accessible to the public for use as firewood.

When removing the relic berm on the eastern floodplain, some of the mature cottonwoods that are on the sides of the berm may be saved by not excavating the berm in the immediate vicinity of the tree. This is acceptable if the saved trees and surrounding mound does not impede downstream flow through the area.

Jetty Jack Removal

While there is no planned removal of jetty jacks, any jetty jacks encountered within the project areas or in the way of access road development will be removed. If jetty jacks are mostly buried and within an access road alignment, spoil material may be brought in to cover the jetty jack instead of removing it.

Removed jetty jacks will be stockpiled, and MRGCD will salvage the removed jetty jacks.

Utilities

Prior to starting construction, the construction crew chief will notify 811 to locate and stake utilities within the project area. The Bosque Farms Wastewater Treatment Plant (Plant) has an outfall located approximately 90 feet north of the eastern staging area. Reclamation will coordinate with the Plant prior to construction and additional stakes and flagging will be placed if necessary to ensure avoidance of this area.

Construction Methods

The bank lowering construction method will depend on the amount of flow in the main channel. The preferred method is to use low ground pressure or conventional bulldozers to push the material into piles starting on the channel side and working in. This method will only be used if the flow in the channel is low enough that the bulldozers can work completely in the dry. This method would have zero acres of wetted impact.

If the flow is too high for the bulldozers to work in the dry, they will excavate material with either dozer or excavator, leaving a berm in place adjacent to the wet channel such that the work occurs in the dry. Then that berm will be removed by an excavator (wetted impact). The river-side perimeter of the bank lowering polygons is approximately 7,660 feet. Assuming the berm width is 5 feet, and assuming the excavator bucket scoops twice per location to reach the desired grade, the wetted impact is at most 1.8 acres. This wetted impact may be less depending on the inundation extents at the time of excavation (some areas may be in the wet while other areas are still dry).

The excavated material will then be loaded in a 30-ton articulating dump truck and hauled to the spoiling area along the levees.

To spoil on the levee, the spoil material will be placed in lifts, wetted, and compacted with the equipment tires or tracks. MRGCD may wish to compact and shape the levee themselves after Reclamation places it with the dump or articulated trucks.

Vegetation Removal and Replacement

The site disturbance is expected to be 52 acres, which includes 21 acres for the construction area, 9 acres of staging and access, and 23 acres for spoil disposal. The maximum possible quantity of site disturbance would be 595 acres (shown in Figure 6) which includes 28 acres for the construction area, 18 acres of staging and access, and 34 acres for spoil disposal. These areas are delineated larger than necessary to allow for field adjustments due to changes in conditions.

Vegetation within the maximum construction footprint consists of upland vegetation, willows, and cottonwoods, with willows dominating at the bankline. Some juvenile native trees are in the construction alignment and will also be masticated or removed by other means. The construction alignment will be masticated to remove all vegetation from the surface. Vegetation clearing involves the removal of vegetation with some amount of subsurface disturbance of the vegetation roots. Native vegetation will be replaced in accordance with the BMPs in section 5.0.

The amount of disturbance required for road development varies and includes understory mastication, tree limbing, native tree removal, small vegetation, and non-native tree removal. After construction works are completed, if certain access routes are not desired to be kept for permanent access, they will be reseeded in accordance with the BMPs in section 5.0.

Vegetation within the staging and spoils area consists of sparse mature cottonwood trees with grass. The staging area has been delineated as big as 7 acres to provide as much room as possible to avoid removing and disturbing mature native vegetation. If native vegetation is disturbed, it will be replaced in accordance with the BMPs in section 5.0.

Construction Sequencing

To facilitate construction at this site, the following steps are expected, although not necessarily in the exact sequence as provided.

1. Place restricted site access signage at entrances and exits to construction sites on both sides of the river.
2. Prepare access roads and equipment staging areas on the western bank. Prepare water pump for dust abatement.
3. Place clearing and grubbing staking on the western bank to determine the boundaries of the planned bank lowering according to the design construction drawing set.
4. Masticate the vegetation within the extents of the staked bank lowering.
5. Place construction staking on the western bank to determine the boundaries and cut values of the planned bank lowering.
6. Begin excavation of the planned bank lowering and hauling of spoil materials to the designated spoil or stockpile area on the western bank.
7. Transfer the equipment to the eastern bank either through river crossing or levee roads depending on the spring flows.
8. Repeat steps 2 to 6 above but on the eastern bank.

9. Once the eastern bank lowering is completed, remove relic berm while retaining access to the staging area. When all project components are complete, remove all construction staking and flagging material.
10. Reseed disturbed areas.
11. Remove water pump for dust abatement.
12. Remove construction access signage from both banks and demobilize all heavy equipment.

Construction Hours

The bank lowering components are located far enough from the residential neighborhoods on the other side of the riverside drains that the construction noise is likely to be minimal. However, the levee spoiling and berm removal noise may reach the residential neighborhoods. The noise will be mitigated by only conducting construction between 7 am and 5:30 pm, Monday through Thursday. It is possible that overtime construction may be authorized for Fridays and weekends (between 7 am and 5:30 pm) to complete the work in a shorter time frame. Thus, construction noise would have a shorter duration as well.

Construction Duration and Schedule

Work is expected to be completed within a four-month timeframe. The anticipated construction start date is January 2022 and expected to be completed by April 15, 2022. However, these dates are subject to change depending on availability of resources and environmental permitting. If delayed, construction could occur between September 1, 2022 and April 15, 2023.

It is recommended that the western project area be constructed before the eastern project area since the western project area may inundate as spring flows start to rise.

Material Quantities

These material quantities are summarized from previous sections of this Project Description. The site disturbance is expected to be 52 acres, which includes 21 acres for the construction footprint, 8 acres for staging and access roads, and 23 acres for levee spoiling. The maximum possible quantity of site disturbance when including the maximum project footprint would be 595 acres as shown in Figure 6. These areas are delineated larger than necessary to allow for field adjustments due to changes in conditions.

The anticipated cottonwood tree removal is based on visual estimates from aerial imagery. There are no mature cottonwoods within the inset floodplain including bank lowering areas and access roads.

Table 4: Expected and maximum quantities of site/vegetation disturbance

	Units	Expected Quantity	Maximum Quantity
Total bank lowering area	Acres	20	26
Total berm removal area	Acres	1	2
Total access routes area	Acres	5	10
Total staging area	Acres	1	8
Total spoils area	Acres	18	21
Total site disturbance / vegetation clearing	Acres	45	67
Anticipated mature native tree removal – berm removal*	Trees	10	15
Anticipated mature native tree removal – eastern access road and staging area*	Trees	7	11
Anticipated mature native tree removal – western access roads and staging area*	Trees	10	15
Anticipated mature native tree removal – spoils area*	Trees	145	220
Total anticipated mature native tree removal	Trees	172	261
Total excavated volume – east side	CY	9,384	12,000
Total excavated volume – west side	CY	86,640	108,000
Total excavated volume	CY	96,024	120,000
Total wetted impacts	acres	0.56	3

*The mature native tree removal estimates are based on a visual count from aerial imagery. Actual specific counts will be made immediately prior to construction; if possible, construction crews will remove less.

Best Management Practices (BMPs)

The following BMPs will be used at the site to minimize the risk of effects from the RM 163 bank lowering project.

General BMPs:
Timing of the Proposed Action

1. Reclamation will seek to avoid impacts to birds protected by the Migratory Bird Treaty Act (16 United States Code [U.S.C.] 703; MBTA), including the Federally listed Endangered Southwestern willow flycatcher (*Empidonax traillii extimus*; flycatcher) and Threatened Western

yellow-billed cuckoo (*Coccyzus americanus*; cuckoo), by conducting work activities outside of the normal breeding and nesting season (April 15 to August 15, or September 1 for work in suitable cuckoo habitat).

1.1. If work is necessary between April 15 and August 15 (or September 1 for work in suitable cuckoo habitat), suitable/occupied migratory bird habitat will be avoided during the construction activities as much as possible, utilizing the most current annual survey results in conjunction with habitat suitability designations. Reclamation will use current flycatcher and cuckoo monitoring data to avoid work within 0.25 miles of an active nest as much as possible. Coordination and consultation with the U.S. Fish and Wildlife Service (Service) will occur prior to such work activities.

1.2. Reseeding or revegetation may be accomplished by hand or by mechanized means. Planting via mechanized means includes using a hand-held or tractor-mounted auger. If mechanized means are used for either reseeding or replanting in the April 15 to August 15 timeframe (or September 1 for work in suitable cuckoo habitat), migratory nesting bird surveys will be conducted immediately prior to the work to determine if any breeding birds are present. If birds are detected, Reclamation will coordinate with the Service to determine appropriate next steps.

Water Quality

2. Reclamation will obtain all applicable permits and authorizations prior to implementation of the project, including those regulated under Section 401 (Water Quality Certification) and Section 404 (Permit Authorization for Dredge or Fill) of the Clean Water Act (CWA). Reclamation will comply with the requirements of all permits and authorizations of the CWA and any other permits associated with water quality for the project, including required reporting to the appropriate authorities as needed and will not begin work until all required permits and authorizations are obtained.

3. Reclamation will visually monitor for water quality in the areas below areas of river work before and during the workday. Water quality will be monitored during construction and after equipment operates in the river channel. Monitoring will include visual observations and may include direct sampling, as appropriate.

3.1. If direct sampling is needed, water-quality parameters to be tested include pH, temperature, dissolved oxygen, and turbidity. Parameters will be measured both upstream and downstream of the work area.

3.2. Responses to changes in water-quality measures exceeding the applicable standards would include reporting the measurements to the New Mexico Environment Department Surface Water Quality Bureau and moving construction activities away from the shore.

Equipment and Operations

4. Reclamation-led work activities that have the potential for adverse impacts will be monitored by properly trained Reclamation personnel in order to ensure compliance.

5. Reclamation will excavate an area as few times as possible to minimize disturbance of sediment. When excavating within the wetted channel, the following practices will be used to minimize disturbance of sediment:

    5.1. Minimize movement of excavator tracks;

    5.2. Minimize excavator bucket contact with riverbed when not excavating.

6. Each individual operator will be briefed on local environmental considerations specific to the project tasks.

7. Minimize impact of hydrocarbons: To minimize potential for spills into or contamination of aquatic habitat:

    7.1. Hydraulic lines will be checked each morning for leaks and periodically throughout each work day. Any leaky or damaged hydraulic hoses will be replaced.
    7.2. All fueling will take place outside the active floodplain, where possible. All fueling will occur with a spill kit ready. If amphibious excavators are used, fueling will occur at the Rio Grande using airboats equipped with lined fuel containment. Fuel, hydraulic fluids, and other hazardous materials may be stored on site overnight, but outside the normal floodplain, not near the river or any location where a spill could affect the river.
    7.3. All equipment will undergo high-pressure spray cleaning and inspection prior to initial operation in the project area.
    7.4. Equipment will be parked on pre-determined locations on high ground away from the river overnight, on weekends, and holidays.
    7.5. Spill protection kits will be onsite, and operators will be trained in the correct deployment of the kits.
    7.6. External hydraulic lines are composed of braided steel covered with rubber. When there is increased risk of puncture such as during mastication while removing vegetation, external hydraulic lines will be covered with additional puncture-resistant material, such as steel-mesh guards, Kevlar, etc. to offer additional protection.

8. Equipment will be removed from the channel in the event of high storm surges.

9. To allow fish time to leave the area before in-water work begins, equipment will initially enter the water slowly. In-water work will be fairly continuous during workdays, so that fish are less likely to return to the area once work has begun.

10. Riprap to be placed in the water will be reasonably clean to the extent possible. If there are large clumps of soil bigger than 1 foot within the riprap, those clumps will be set aside during the loading or placing operations.

Access and Staging

11. Impacts to terrestrial habitats will be minimized by using existing roads whenever possible. In general, equipment operation will take place in the most open area available, and all efforts will

be made to minimize damage to native vegetation and wetlands (also see BMP titled *Vegetation Replanting and Control* below).

12. All necessary permits for access points, staging areas, and study sites will be acquired prior to construction activity.

Vegetation Replanting and Control

13. A variety of revegetation strategies may be used: stem and pole cuttings (provided by the Pueblo); long stem transplants (provided by the Pueblo); and upland planting with and without a polymer, zeolite, or similar compound to maximize soil water retention (Dreesen, 2008). Planting techniques may vary from site to site, and may consist of buckets, augers, stingers, and/or water jets mounted on construction equipment. In some areas, a trench may be constructed to facilitate the placement of a significant number of plants, specifically stem and pole cuttings. Seeding would be accomplished using a native seed drill, where feasible, and spread with a protective covering which would provide moisture to the seeds.

14. Vegetation control may consist of mechanical removal, burning, mowing, and/or herbicide treatment. Herbicides will be used when non-chemical methods are unsuccessful or are not economically feasible (see section Herbicide and Pesticide Use below).

    14.1. Vegetation control will be completed between August 15 (or September 1 for work in suitable cuckoo habitat) and April 15. Any need for deviations from this work window will be considered on a project-specific basis and coordinated with the Service. If work is planned within two weeks before April 15 or after August 15 (or September 1 for work in suitable cuckoo habitat), Reclamation will conduct additional analysis and surveys (-if warranted), to determine the presence of breeding flycatchers, cuckoos, or other breeding birds protected under the MBTA. Reclamation and/or the appropriate project partner will coordinate monitoring and work activities with the Service, as appropriate, if bird nests are found.

15. Native vegetation at work sites will be avoided to the extent possible. If large, native woody vegetation (primarily cottonwood > 6 inch DBH) needs to be trimmed or removed, they will be replaced at a ratio of 10:1. When and where possible, small, native woody vegetation will be removed or harvested at the appropriate season to use for revegetation work at another location in the project area or at another project site. Native vegetation that cannot be replanted may be mulched (mulch will be removed or spread on site at a depth of three inches or less) or temporarily stockpiled and used to create dead tree snags or brush piles in the project area upon completion.

16. Nonnative vegetation that is removed at work sites will be mulched, burned, or removed offsite to an approved location. Mulched vegetation may also be spread on site at a depth of three inches or less.

Herbicide and Pesticide Use

17. The use of chemical herbicides or pesticides may be necessary to control undesirable plant species around stockpile sites and storage yards and also to prevent the spread of invasive species in areas cleared for maintenance activities. It also may be necessary to spray or control:

arthropods (spiders, ants, cockroaches, and crickets) that pose a safety problem or are a nuisance in buildings and facilities; birds (pigeons and swallows) roosting in building structures that are considered a nuisance; and mice that get into structures and/or equipment. Since the application of herbicides and chemical spraying is tightly controlled by State and Federal agencies, Reclamation will follow all State and Federal laws and regulations applicable to the application of herbicides, including guidelines described by White (2007). Herbicides or pesticides will not be directly applied to or near water unless they are labeled for aquatic use and appropriate buffers will be observed. Communication with the Service will occur prior to any application to sites with threatened or endangered wildlife species. Reclamation will follow the Albuquerque Area Office Integrated Pest Management Plan and Pesticide General Permit (Reclamation, 2015) when applying herbicides or pesticides. The non-Reclamation project partners will follow their agencies' herbicide/pesticide guidance, if applicable. Herbicides or pesticides may be applied using low pressure spray rigs mounted to OHVs, trucks and trailers with spray bars, or backpack sprayers (for spot applications). Treatments will be conducted by trained and approved personnel observing appropriate buffer distances and label directions. Treatment will not take place when winds exceed 10 miles per hour or when rain is forecasted for the local area within 48 hours of application. Care will be taken when mixing or applying any herbicide to avoid runoff onto the ground or into the water. Surfactants may also be added to certain herbicides to maximize herbicide/pesticide performance and minimize retreatments.

Dust Abatement

18. If water is needed for dust abatement or to facilitate grading of roads, water may be pumped from the Rio Grande, irrigation drains, sumps, or secondary channels adjacent to the river. During irrigation season (March 1 to October 31), water will not be pumped from the river but will be pumped from the irrigation drains if possible. If pumping from the river is is required between April 15 and August 15 (or September 1 in suitable cuckoo habitat), and is needed between May 1 and July 1 (emergencies only), Reclamation and/or the appropriate project partner(s) will coordinate with the Service to avoid impacts to minnow eggs and larvae. Outside of the irrigation season, an amount not to exceed 5% of river flows at the time of pumping may be drawn from the Rio Grande. Pumping is short duration (minutes) for filling whatever water transport equipment is used. Sumps or secondary channels adjacent to the river will be used, whenever feasible. Pump intake pipes will use a 0.25 inch (0.64 centimeter [cm]) mesh screen at the opening of the intake hose to minimize entrainment of aquatic organisms.

Other Measures

19. All treatment and control areas will be monitored for three years following construction to determine the effectiveness of the methods implemented and identify project-related hydrologic and geomorphic alterations. The monitoring will consist of biological, vegetative, geomorphic, and hydrologic monitoring, as appropriate to the project design and purpose.

20. All project spoils and waste will be disposed of offsite at approved locations or may be used on site as appropriate to the project purpose, consistent with applicable environmental requirements.

21. All work projects will have a contract in place for the rental of portable restroom facilities during the duration of the project.

Adaptive Maintenance Plan

Monitoring Frequency

An as-built survey will be conducted within one month of construction completion. This as-built survey will establish specific cross sections for future geomorphic and hydraulic monitoring. These cross sections will be surveyed after each spring runoff for the next 3 years unless the volume of spring runoff does not warrant a survey (as determined by project engineer).

Environmental monitoring will be conducted as described in the environmental permitting documents.

Expected Outcomes, Triggers, and Adaptive Maintenance

Sedimentation

It is anticipated that the bank lowering areas will experience sedimentation and become vegetated consistent with similar projects involving habitat restoration and the creation of inundation surfaces. This sedimentation may be in the form of bank-attached bars or islands. The sedimentation rates and patterns will be observed through the annual cross section monitoring surveys.

If sedimentation is experienced, it is likely that no adaptive maintenance will be performed even if it is a large volume. Large volumes of rapid sedimentation would demonstrate that inset floodplain bank lowering is an ineffective strategy for creating conveyance capacity in this subreach, and a new method or strategy would need development and implementation.

Maintenance will likely not be performed on areas experiencing small amounts of sedimentation because the effort would be better spent on additional conveyance capacity projects elsewhere in the subreach. This bank lowering project would be better left undisturbed to develop and progress through various age classes of vegetation while new age classes are developed through bank lowering projects elsewhere in the subreach.

Although sedimentation maintenance is unlikely, it may occur if an assessment of the situation determines maintenance is needed and cost effective.

Bank Erosion

Bank erosion is also a possibility, albeit an unlikely one. Bank erosion would be most likely to occur in the areas where vegetation was disturbed for construction.

It is highly unlikely that bank erosion will proceed past the historic banks where jetty jacks are currently embedded, but if the historic banks do erode then additional bank stabilization work may be required.

Bank erosion within the inset floodplain would be a positive outcome as this provides additional channel capacity and creates vegetative and channel diversity for habitat.

Citations

Dreesen, D.R. 2008. *Basic guideline for seeding native grasses in arid and semi-arid ecoregions*. USDA-NRC Plant Materials Center. Los Lunas, New Mexico. 4 pp.

Kuria F. and Klein M. 2020. *Los Lunas Subreach Hydraulic, Hydrologic, and Habitat Analysis.* Bureau of Reclamation, Upper Colorado Basin, Albuquerque, NM. 52 pp.

Reclamation. 2014. *Determination of River Maintenance Need at Individual Sites and Reaches on the Middle Rio Grande, NM*. Bureau of Reclamation, Upper Colorado Basin, Albuquerque, NM. 28 pp.

White, J.A. 2007. *Recommended protection measures for pesticide applications in Region 2 of the U.S. Fish and Wildlife Service*. U.S. Department of the Interior, Fish and Wildlife Service, Austin, Texas. 205 pp.

Document Revision History

June 4, 2021: Initial version distributed internally for review (Draft Project Description).

July 1, 2021: Revised version distributed externally for review (Draft Project Description).

July 19, 2021: Final version completed and distributed (Final Project Description).

January 11, 2023. Plan and section views updated to include OHWM and wetland delineations

Appendix E – Los Lunas River Mile 163 Design Concepts Selection Briefing

Reach Background

The Los Lunas subreach is a section of the Middle Rio Grande (MRG) river extending from Isleta Diversion Dam (RM 169) to the community of Los Chaves (RM 153). The reach has unique topography called a semi-perched channel where the banks are higher in elevation than the adjacent floodplain and spoil levee toes. Also, the channel and floodplain have subreach-specific geomorphic features. Those definitions are provided in Table 5 and are illustrated in Figure 18.

Table 5: Definitions of historic channel, historic floodplain, historic banks, and inset floodplain

Term	Definition	Figure 1 Key
Historic Channel	550-foot-wide channel established by jetty jacks in 1960s-1970s	(everything inside yellow lines)
Historic Floodplain	Floodplain outside the historic channel	(everything outside yellow lines)
Historic banks	Banks of historic channel that are 1-4 feet higher than historic floodplain and levee toes	(immediately outside yellow lines)
Inset Floodplain	Floodplain inside the historic channel, established in 2000s and later by vegetating sandbars	(vegetated areas inside yellow lines)
Active Channel	Non-vegetated channel	(non-vegetated areas)

Figure 18: Aerial image demonstrating historic channel, historic floodplain, historic banks, and inset floodplain

Trends

Due to the semi-perched channel terrain, once flows overtop the historic banks the water flows down to the levee toe and then continues flowing downstream adjacent to the levees. There are limited locations where the overbanked water can return to the main channel. These conditions result in saturated levee toes (sometimes leading to levee failure) and water stranding in the floodplain.

In recent years the historic banks in the subreach are overbanking at progressively lower flow rates. This can be attributed mostly to channel narrowing and vegetation encroachment, but minor channel aggradation between Isleta and the NM-6 bridge may also play a role. Narrowing and channel aggradation data between 1992 and 2012 is presented in Table . Additional changes since 2012 have not been compiled but likely contribute to the trend of overbanking at progressively lower flow rates.

Table 6: Channel narrowing and aggradation between Isleta and NM-309 bridge in Belen for 1992-2012

		Channel narrowing (feet)	Channel aggradation (feet)
Isleta to NM-6	1992-2002	90	0
	2002-2012	50	0.2
NM-6 to NM-309	1992-2002	160	0
	2002-2012	2	-0.5

Factors contributing to the channel narrowing and aggradation include major changes to the hydrologic and sediment regimes of the MRG, with reduction in hydrologic peaks and a reduction in the volume and concentration of sediment. The hydrologic peak reduction as well as supplemental water releases in the growing season are likely contributors to vegetation encroachment and thus channel narrowing.

The reduction in sediment volume and concentration are apparent in the downstream portion of the Los Lunas subreach, where the channel incised by a half foot in ten years. However, the upstream

portion of the reach has slightly aggraded in recent years. Potential causes include Isleta Diversion Dam and the semi-perched nature of the cross section. Both features remove water from the main channel at a lower sediment concentration than the main channel which effectively increases the sediment concentration in the main channel. The decreased water flow reduces the river's sediment transport capacity, and thus the sediment settles out.

Project Purpose and Goals

The purpose of the Los Lunas RM 163 project is to improve water conveyance through the Los Lunas subreach. The primary goal is to reduce the water surface elevation (WSE) by restoring channel capacity to prevent overflow into the historic floodplain at less than 3,500 cfs between RM 164 and RM 162. The budget goal is to stay below $1 million which limits the excavation to approximately 100,000 CY. This constraint may affect Reclamation's ability to achieve the primary goal. If so, additional project phases may be developed if they are cost-effective.

The secondary goals of this project are to redirect water from the historic floodplain back to the main channel for flows up to 6,000 cfs. Also, the project should consider environmental, geomorphic, and economic impacts.

Design Strategy

Lowering the inset floodplain is the least expensive way to make immediate improvements to the WSE and prevent historic bank overtopping. However, this short-term strategy is expensive to maintain as future sedimentation is likely and does not address any of the root causes of the water conveyance issues in the reach. To address the root causes, the semi-perched cross section needs to be modified to increase in elevation moving away from the river, but this would have an enormous cost and a significant environmental impact. The longevity of this effort is unknown depending on how fast natural levees build in this reach.

Ideally, the design strategy for this project would include design components that address immediate improvements and root causes. The immediate improvements could include inset floodplain lowering, historic bank lowering, floodplain drainage features, other topography drainage improvements, mowing and root raking, and cottonwood tree removal. The long-term design components could include raising the elevation of the low spots next to the levees and lowering the historic bank below the elevation of the low spots next to the levee. Inset floodplain lowering also helps the long-term strategy by providing spoil materials to raise the low spots adjacent to the levees.

Design Concepts

Inset floodplain lowering

Description: Inset floodplain lowering will lower the WSE by providing additional flow area and increase channel capacity. Lowering could occur along the active channel (bank lowering, point bar

lowering, and/or island removal) or further away such as enhancing natural side channels within the inset floodplain (within the 550-ft corridor). Modeling showed that enhancing natural side channels in one area unexpectedly lowered the flow rate at which the adjacent historic floodplain inundated because a barrier to overbanking was removed. Additionally, natural side channel enhancement would be susceptible to an inlet or outlet plugging, rendering the remainder of the lowered area ineffective. Thus, lowering along the channel may be preferrable to lowering elsewhere in the inset floodplain.

Inset floodplain lowering may remove juvenile cottonwood trees, which may affect permitting and a need for tree replacement. Inset floodplain lowering is likely to experience sedimentation in the near future. Sediment removal and other maintenance may or may not occur since a variety of age classes is beneficial within the bosque.

Sediment removed from the inset floodplain will be spoiled next to the levees. This spoil material will ideally reduce future levee toe saturation depths. Vegetation density will impact the ability to spoil in the desired locations.

Decision: Yes, inset floodplain lowering will be included in the final project design, especially at locations where the channel is narrowest.

Historic bank lowering

Description: Historic bank lowering will cut down the "natural levees" and place the spoils in the low spots next to the levees. This activity will lower the WSE by providing additional flow area. Other benefits include removing invasive species that are concentrated on the historic bank in this subreach and working towards the ideal river cross section where the banks are lower than the floodplain.

Risks of this design concept are that lowering the historic bank will also lower the flow at which the historic bank overtops, unless the changed WSE experiences a greater drop than the bank. Lowering the overtopping flow rate could lead to increased water stranding against the levees. There is a possibility that the lowered historic banks may return to their original elevation within a short time due to "natural levee" geomorphic processes. Also, there is a small potential that moving the river closer to the levee may someday result in a need for bank protection if the conditions and planform in this reach were to change to a meandering and eroding planform.

To fully alter the cross section for 1500 feet of eastern historic bankline with balanced cut and fill, approximately 15,000 CY of material would be moved. Vegetation would be completely removed between the levee and the channel. The fill material would be placed approximately four to five feet high on the levee, or around two thirds of its current height. The floodplain slope from the levee to the river would be around 1%. This example modified terrain is shown as an orange line in Figure 19.

An alternative strategy (purple line in Figure 19) is to limit the cut and fill activity to and leave a narrow middle strip of vegetation in the floodplain relatively undisturbed. The strip of undisturbed vegetation can't be widened without sacrificing proper drainage.

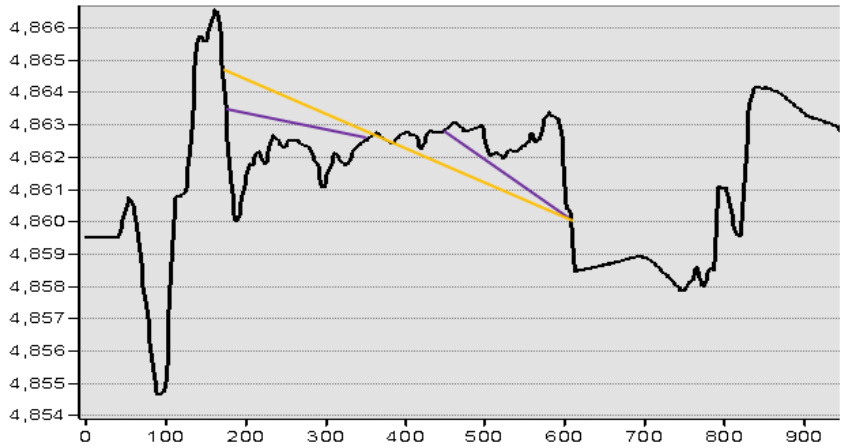


Figure 19: Example cross section demonstrating two potential modified terrains after cross section reset

Decision: No, historic bank lowering will not be included because the risk of increased overtopping is too great, and the alternative option of fully resetting the cross section has too great of environmental impacts, including vegetation removal and wetland impacts.

Floodplain drainage features

This design component redirects flows into the main channel from the low spots next to the levee. A small side channel would be excavated extending from a low spot next to the levee to the main channel, entering the main channel at an elevation where a 3,500 cfs flood will not back up and inundate the low spot next to the levees. The spoils from the small side channel will be used to build a berm on the downstream side of the side channel. The berm would be designed to catch and redirect all flood flows up to 6,000 cfs. The required length of the channel would require significant removal of vegetation in the bosque.

These drainage berms are suggested to be placed on the upstream and downstream sides of the project and/or immediately downstream of known overbanking locations. Maintenance of the channels and berms would likely need to be accomplished periodically, especially after large flows that may breach the berms.

Decision: No, floodplain drainage features will be not be included because the option has too great of environmental impacts, including vegetation removal and future maintenance could affect wetlands that developed within the drainage features.

Other topography drainage improvements

Description: There are numerous relic berms in the historic floodplain with unknown histories and purposes. At least one of these relic berms traps water against the levees. The only risk of removal is if the berm serves a currently unknown beneficial purpose.

Decision: Yes, contingent upon further stakeholder outreach, it would be beneficial to remove any relic berms that trap water against the levees.

Mowing and root raking

Description: Decreasing the roughness during flood flows will improve water conveyance and lower the WSE. The roughness can be decreased by mowing vegetation and root raking within the inset floodplain. Mowing by itself will likely stimulate new growth and possibly result in increased roughness within a few years. Root raking decreases the new growth but doesn't remove it altogether.

Field visits observed that there was a lot of senescent vegetation on both the inset and historic floodplains. Invasive plants were present but not abundant. Mowing and potentially including root raking could have habitat value by removing old growth to make room for new growth of native species.

The risks of mowing and root raking are that root raking stimulates growth of salt cedar, Siberian elm, tree of heaven, and annuals such as kochia. The root raking program would need to avoid these species; however, disturbed areas may still colonize with these species. Also, removing willows at higher elevations makes it more likely that invasives will establish. The root raking would be best to be located at lower elevations where natives are most likely to establish. Depth to groundwater and/or frequency of inundation are relevant criteria for native vegetation establishment.

A mowing and root raking program may not be feasible depending on environmental mitigation requirements due to vegetation replacement and wetland mitigation requirements.

Decision: No. The water conveyance benefits of mowing and root raking are too temporary to be considered cost-effective by Reclamation. The habitat benefits may be worth the cost, but there are a lot of risks in performing the program effectively.

Cottonwood tree removal

Description: Decreasing the roughness of the floodplain during flood flows will improve water conveyance and lower the WSE. The roughness can be decreased by removing the juvenile cottonwood patches throughout the inset floodplain. To prevent regrowth, the root structure would also need to be removed.

The cottonwood patches on the inset floodplain tend to be on higher ground which increases the likelihood that invasives will establish instead of natives. Since they are on higher ground, they are only inundated at very high flows and thus do not have a significant impact on water conveyance.

Current best management practices for Reclamation are to replace removed mature healthy cottonwoods by planting poles at a 10:1 ratio, with an expected end result of 1:1 replacement. Planting poles within the inset floodplain is contradictory to the roughness removal goals, and thus the poles would have to be planted on the historic floodplain with a low chance of survival, primarily due to depth to groundwater. Also, poles would only be planted if the planting can be accomplished without damage to other native vegetation. Thus, if conditions are not suitable to vegetation replacement, this particular BMP would not be applicable for this project.

A cottonwood removal program may not be feasible depending on environmental mitigation requirements. Potential locations for poles still need to be analyzed to determine feasibility.

Decision: No. The minimal water conveyance benefits of removing cottonwoods on higher ground within the inset floodplain are not considered cost-effective by Reclamation, and the regulatory process may pose a roadblock.

Summary

Table 7 presents a summary of the design concepts and whether the concepts will be included in the design moving forward.

Table 7: Summary of design concepts and inclusion decisions

Design Concept	Include?
Inset floodplain lowering	Yes
Historic bank lowering	No
Floodplain drainage features	No
Other topography drainage improvements	Yes
Mowing and root raking	No
Cottonwood tree removal	No

Proposed Implementation

The proposed implementation of these design concepts is provided in Figure 20. Five bank lowering projects have been selected within the inset floodplain. Lowering upstream of the proposed sites is not included due to respect in avoiding Pueblo land. The bank lowering areas are all located on narrower sections of the river. Their exact area is subject to change as design modeling determines the area necessary to achieve the water conveyance goals.

One relic berm has been identified for removal to improve historic floodplain drainage and reduce the depth of the water on the levee. This berm is located just downstream of the Bosque Farms wastewater outfall and its removal is subject to further stakeholder outreach.

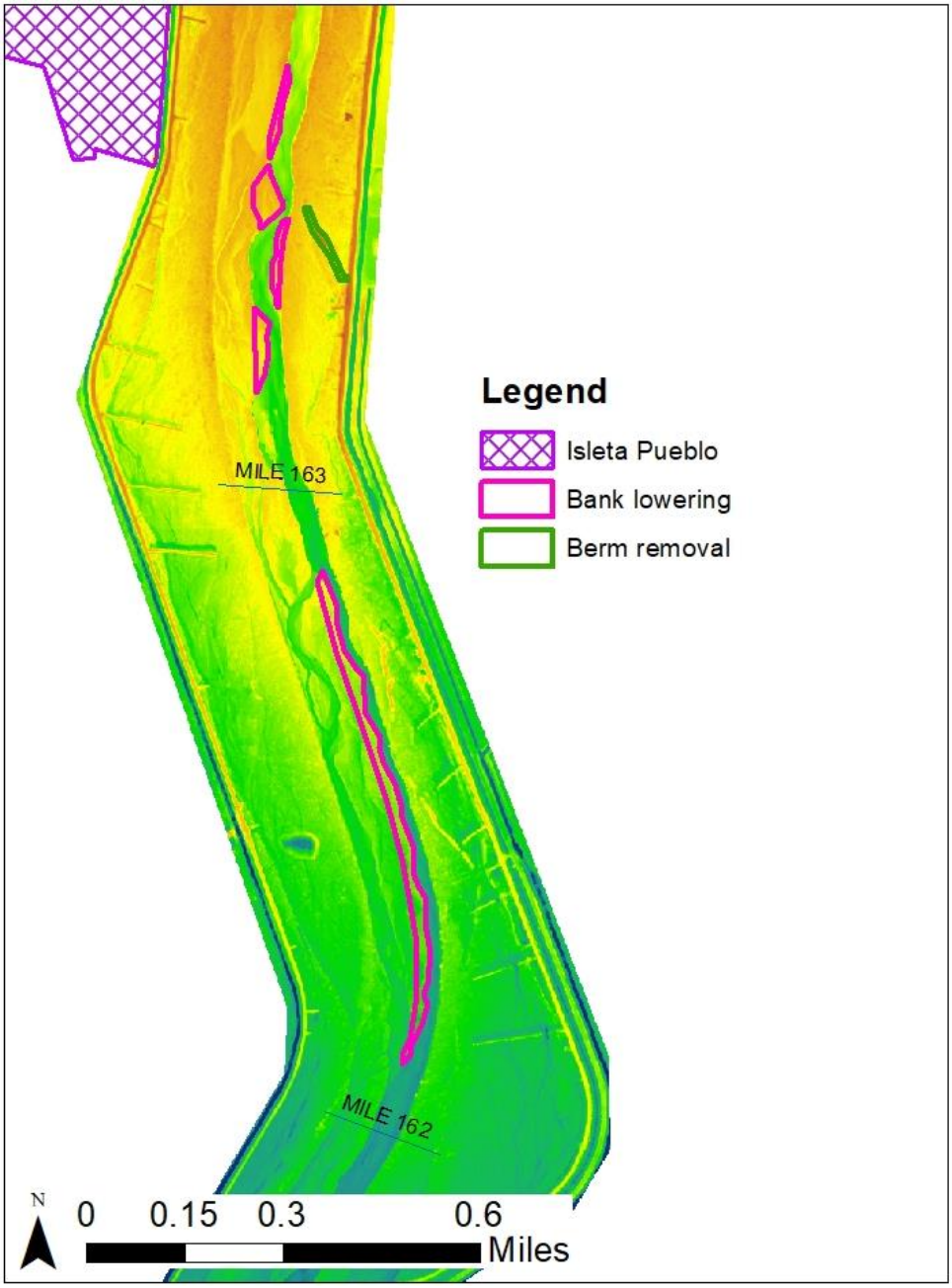


Figure 20: Proposed conceptual project desig

Appendix F – Aquatic Resources Delineation Report and Supplemen

This page left bank intentionally

Aquatic Resources Delineation Report for the New Mexico Interstate Stream Commission Los Lunas River Mile 163 River-System Maintenance Project, Valencia County, New Mexico

FEBRUARY 2022

PREPARED FOR

U.S. Army Corps of Engineers

ON BEHALF OF

New Mexico Interstate Stream Commission

PREPARED BY

SWCA Environmental Consultants

AQUATIC RESOURCES DELINEATION REPORT FOR THE NEW MEXICO INTERSTATE STREAM COMMISSION LOS LUNAS RIVER MILE 163 RIVER-SYSTEM MAINTENANCE PROJECT, VALENCIA COUNTY, NEW MEXICO

Prepared for

U.S. Army Corps of Engineers
Albuquerque Regulatory Office
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109

On Behalf of

New Mexico Interstate Stream Commission
5550 San Antonio Dr NE
Albuquerque, New Mexico 87109

Prepared by

SWCA Environmental Consultants
5647 Jefferson Street, NE
Albuquerque, New Mexico 87109
(505) 254-1115
www.swca.com

February 2022

EXECUTIVE SUMMARY

The New Mexico Interstate Stream Commission (NMISC) contracted SWCA Environmental Consultants to conduct an aquatic resources delineation survey for the proposed Los Lunas River Mile 163 River-System Maintenance Project. The purpose of the project is to improve water conveyance, to improve and diversify riverine habitat, and to reduce flood risk based on the existing hydrologic and geomorphic regimes. The project would be located on lands managed jointly by the Middle Rio Grande Conservancy District (MRGCD) and the U.S. Bureau of Reclamation (Reclamation) within an approximately 43.8-acre project area, approximately 0.25 mile northeast of the village of Los Lunas in Valencia County, New Mexico. The goal of the aquatic resources delineation survey is to document potential jurisdictional wetlands, special aquatic sites, open waters, and other surface water features considered to be waters of the U.S. (WUS) and regulated by the U.S. Army Corps of Engineers (USACE) under the Clean Water Act (CWA) Section 404 Program. The survey will help in assessing potential impacts from the proposed project and inform measures to minimize impacts during project design.

This report provides the results of the formal aquatic resources delineation that was conducted in the project area in June and August 2021. During the delineation, the presence-absence of potential WUS was identified in the field using routine on-site delineation methods outlined in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008).

The purpose of this aquatic resources delineation and associated report was to identify potentially jurisdictional WUS to inform the CWA permitting strategy in coordination with the USACE. Potential impacts to five of the eight features are greater than 0.5 acre each and may require a Standard Individual Permit per Section 404 of the CWA. However, a final permitting determination for the proposed project will be made after further consultation with the USACE, Reclamation, NMISC, and MRGCD.

CONTENTS

Appendices

Tables

ACRONYMS AND ABBREVIATIONS

°F	Fahrenheit
CWA	Clean Water Act
CY	cubic yard
EPA	U.S. Environmental Protection Agency
MRGCD	Middle Rio Grande Conservancy District
NHD	National Hydrography Dataset
NMISC	New Mexico Interstate Stream Commission
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWPR	Navigable Waters Protection Rule
OHWM	ordinary high-water mark
PCN	preconstruction notification
Reclamation	U.S. Bureau of Reclamation
RM	River Mile
SWCA	SWCA Environmental Consultants
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WUS	waters of the U.S.

This page intentionally left blank.

1 INTRODUCTION

On behalf of the New Mexico Interstate Stream Commission (NMISC), SWCA Environmental Consultants (SWCA) completed an aquatic resources delineation, commonly referred to as a wetland and other waters of the U.S. (WUS) delineation, for the proposed 43.8-acre project area for the Los Lunas River Mile (RM) 163 River-System Maintenance Project in Valencia County, New Mexico (see Appendix A, Figures A-1 through A-9). The U.S. Bureau of Reclamation (Reclamation), in partnership with the NMISC and the Middle Rio Grande Conservancy District (MRGCD), is proposing to conduct the project in the Rio Grande approximately 2 miles north of the New Mexico State Highway 6 bridge in Los Lunas, New Mexico. Land ownership of the project area includes federal ownership (Reclamation) and the MRGCD. To comply with the Clean Water Act (CWA), SWCA conducted the aquatic resources delineation to assess the presence of aquatic resources that may be considered WUS to inform the CWA permitting strategy in coordination with the U.S. Army Corps of Engineers (USACE). The delineation included a pre-field desktop review of publicly available mapped resources followed by in-field identification and recording of physical features that may indicate an area as a WUS. The methods and results of the desktop review and field survey are presented in this report.

1.1 Project Purpose

The purpose of the Los Lunas RM 163 project is to improve water conveyance, to improve and diversify riverine habitat, and to reduce flood risk through the Los Lunas Subreach. The primary goal is to reduce the water surface elevation by increasing channel capacity to prevent overbanking into the historic floodplain at flows less than 3,500 cubic feet per second (cfs) between RM 164 and RM 162. To keep the project within one construction season, the excavation is limited to less than 100,000 cubic yards (CY). However, more work is needed within the reach to improve conveyance capacity. Thus, this will be a pilot project for a future width maintenance program that will include partner agency cooperation from the NMISC, Reclamation, and MRGCD.

The secondary goals of this project are to consider the environmental and geomorphic benefits and impacts, and to be cost-effective. Thus, project components were selected to include areas where encroaching vegetation and bar/island accretion have resulted in reduced channel capacity while keeping the excavations to less than 100,000 CY. Terraced banks were used to increase the inundated areas at lower flows in some of the areas to provide inundated nursery habitat for the Rio Grande silvery minnow (*Hybognathus amarus*). This will provide low velocity floodplain habitat for the Rio Grande silvery minnow during low flow years when there is a minimal spring runoff peak, with expected transition into riparian habitat for the endangered Southwestern willow flycatcher (*Empidonax traillii extimus*) and the threatened Western yellow-billed cuckoo (*Coccyzus americanus*).

1.2 Project Components

The project components consist of five bank lowering polygon areas within the historic channel and one relic berm removal in the eastern historic floodplain (Table 1). These project components would improve channel conveyance by increasing the width of the river on both the west and east banks of the river. The relic berm would also be removed as it has been holding water on the floodplain against the levee and preventing the water from flowing downstream. Other project components include associated access roads, staging areas for equipment, and spoils areas (Reclamation 2021). The project components are depicted on Figures A-1 through A-9 in Appendix A. The site disturbance includes 21 acres for the construction area, 12.3 acres for staging and access, and 21 acres for spoil disposal (see Table 1).

Work is not planned to occur between April 15 and September 1 in consideration of nesting migratory birds. If work is needed during this time, the NMISC and Reclamation would coordinate with the U.S. Fish and Wildlife Service (USFWS) prior to the beginning of any work.

Table 1. Project Area Components

Project Component	Rive Mile Extent	Side of River	Type	Volume (CY)	Area (Acres)
RM 162 Bank Lowering	RM 162.1-162.9	West	Inset floodplain bank lowering	57,402	13
RM 163.1 Bank Lowering	RM 163.1-163.3	West	Inset floodplain bank lowering	7,652	2
RM 163.3 East Bank Lowering	RM 163.3-163.4	East	Inset floodplain bank lowering	5,354	1
RM 163.4 Bank Lowering	RM 163.4-165.5	West	Inset floodplain bank lowering	13,828	2
RM 163.6 Bank Lowering	RM 163.6-163.8	West	Inset floodplain bank lowering	7,758	2
Berm Removal	RM 163.4-163.6	East	Inset floodplain bank lowering	4,030	1
Total Project Components				**96,024**	**21**
River Access Road	RM 162-164	West	Access road	*	2.7
Eastern Access Road	RM 163.4	East	Access road		0.13
East/West Bosque Access Roads (5)	RM 162-164	West	Access road	*	1.5
Western Staging Area	RM 162.6	West	Staging area	*	7
West Spoils Area	RM 162-164	West	Levee spoiling	9,384	20
East Spoils Area	RM 162-164	East	Levee spoiling	86,640	1
Total Project Access, Staging, and Spoils				**96,024**	**32.33**

Source: Reclamation (2021)

*Possible vegetation removal

2 METHODS

Prior to the survey, SWCA reviewed baseline data for the project area, including the U.S. Geological Survey (USGS) topographic quadrangle, National Wetlands Inventory (NWI) maps (USFWS 2021), National Hydrography Dataset (NHD) data (USGS 2021), and Natural Resources Conservation Service (NRCS) soils data (NRCS 2021). Aerial photographs of the project area were accessed using Google Earth (Google Earth 2021).

On June 24, 25, and 28, 2021, SWCA biologists conducted a formal aquatic resources delineation survey of the proposed project area to identify and map the boundaries of potential jurisdictional wetlands, special aquatic sites, open waters, and other surface water features considered to be WUS under the U.S. Environmental Protection Agency's (EPA's) Navigable Waters Protection Rule (NWPR). In August 2021 the 2020 NWPR, including the elimination of ephemeral drainages from jurisdiction, was vacated. Currently, the EPA and USACE are reconsidering the definition of "waters of the United States" (The National Agricultural Law Center 2021).

The survey included the identification and recording of physical features that could be considered WUS as defined by the USACE and EPA. As currently defined under Section 404 of the CWA, WUS include 1) the territorial seas and traditional navigable waters; 2) perennial, intermittent, and ephemeral tributaries with a significant nexus to a traditional navigable water; 3) lakes, ponds, and impoundments of jurisdictional waters; and 4) wetlands. Special aquatic sites—including sanctuaries, refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes (USACE 1987)—were identified separately from other WUS, as required by the USACE for CWA Section 404 permit applications.

2.1 Wetlands

Wetlands are defined by the USACE as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE 1987:9). According to the USACE (1987), for an area to be considered a wetland, it must contain the following three parameters under normal circumstances: 1) the presence of wetland hydrology showing regular inundation, 2) a predominance of hydrophytic (water-loving) vegetation, and 3) soils characteristic of frequent saturation (i.e., hydric soils). The presence-absence of wetlands was identified in the field using routine on-site delineation methods outlined in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008).

2.2 Non-Wetland Waters

The potential jurisdictional limits of any lotic systems (e.g., creeks, rivers, arroyos, human-made ditches; collectively "streams") in the project area were identified in the field using the methods outlined in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008). An ordinary high-water mark (OHWM) is a "line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (33 CFR 328.3(c)). The OHWM is a defining element for identifying the lateral limits of non-wetland waters. Federal jurisdiction over a non-wetland WUS typically extends to the feature's OHWM.

Identified streams were characterized by seasonal persistence as perennial, intermittent, or ephemeral based on field observations and available desktop data. Perennial streams typically flow year-round

because the water table is located above the streambed; groundwater is therefore the primary source of surface water in the stream, but flows are also supplemented by upstream rainfall and snowmelt runoff. By contrast, intermittent streams only flow seasonally as the result of rainfall, snowmelt runoff, and/or rising groundwater that discharges into the stream channel. The groundwater rises in response to seasonal increases in upstream precipitation. Finally, ephemeral streams are above the water table throughout the year and only flow during and shortly after precipitation events.

The potential jurisdictional limits of any lentic systems (e.g., ponds, lakes, oxbows) and other open-water areas (e.g., outflows, deltas) in the project area were identified based on the presence of OHWM indicators.

2.2.1 Open Waters

The presence-absence of lentic systems (e.g., ponds, lakes, oxbows) and other open water areas (e.g., outflows, deltas) was identified in the project area by identifying the presence of OHWMs.

2.3 Mapping

A GPS unit with submeter accuracy was used to determine the spatial extent of features, geographically reference data points, and demarcate boundaries during the delineation survey.

Geographic information system software was used to analyze collected features, calculate impact areas, and generate the maps provided in Appendix A.

2.4 Photographs

During the delineation survey, ground-level photographs were taken of the surface water features within the proposed project area. Photographs are provided in Appendix B.

3 RESULTS

3.1 Landscape Setting

The average elevation of the project area is approximately 4,852 feet above mean sea level. Based on the climatic records for Los Lunas in Valencia County, New Mexico (COOP Station No. 295150), the project area has an average annual maximum temperature of 73 degrees Fahrenheit (°F) and an average annual minimum temperature of 37.8°F. The average annual rainfall is 8.93 inches, with the majority occurring between July and October, whereas the average annual total snowfall is 4.3 inches, which largely occurs between December and February (Western Regional Climate Center 2021). Weather during the delineation survey was approximately 80°F–90°F and sunny with winds of approximately 0 to 3 miles per hour.

3.2 Soils

According to the NRCS (2021), there are two mapped soil types in the proposed project area: mixed alluvial land and riverwash (Table 2). Both soils are deemed hydric.

Table 2. Mapped Soil Types in the Project Area

Soil Map Unit	Soil Type Symbol	Drainage Class	Project Area (acres)	Project Area (%)
Mixed alluvial land	Mn	Moderately low to very high	11	25.1%
Riverwash	Rv	High to very high	32.83	74.9%
Total			**43.83**	**100.00%**

Source: NRCS (2021)

3.3 Aquatic Resources

The project area crosses one watershed: Canon Monte Largo-Rio Grande (Hydrologic Unit Code 1302020306). The project area occurs within the Rio Grande surface and groundwater basins.

During the delineation survey in late June 2021, eight potentially jurisdictional surface water features were documented in the proposed project area: one perennial stream (Rio Grande), one freshwater pond, and six wetlands (see Figures A-2 through A-9 in Appendix A and Photographs B-1 through B-22 in Appendix B). Vegetation within each wetland, along with the wetland indicator status, percent cover, and dominance of each species, is listed in Table 3.

3.3.1 Wetlands

According to NWI maps (USFWS 2021), two wetlands (PEM1A and R2UBH) occur within the project area. The two NWI wetlands occur continuously throughout the entire active channel of the Rio Grande. PEM1A wetlands are defined as a palustrine emergent with persistent, dominant vegetation within a temporarily flooded water regime. R2UBH wetlands are defined as riverine, lower perennial wetlands with an unconsolidated bottom that is permanently flooded. The PUBFx freshwater pond is identified as palustrine, unconsolidated bottom that is semipermanently flooded that was excavated by humans.

During the delineation survey, five separate wetlands (R2UBH) were identified by SWCA biologists that overlap with the project area components (Table 4). Each of these wetland areas occurred within one or both NWI-mapped wetland areas and exhibited the three wetland parameters: wetland hydrology, a predominance of hydrophytic vegetation, and hydric soils. The 0.05-acre PEM1A wetland was recorded during the survey, but does not overlap any of the project area components (see Table 4). See Appendix C for the wetland determination data forms completed at each observation point.

3.3.2 Non-Wetland Waters

3.3.2.1 STREAMS

According to the NHD (USGS 2021), there is one linear feature that overlaps with the project area components, the Rio Grande (see Table 4). During the delineation survey, SWCA biologists confirmed the presence of the Rio Grande as a perennial stream within the proposed project area. The extent of the Rio Grande, including the boundaries of the OHWM, were mapped by SWCA during the delineation survey (see Figures A-2 through A-9 in Appendix A and Photographs B-1 through B-22 in Appendix B).

3.3.2.2 OPEN WATERS

According to the NHD (USGS 2021), one freshwater pond is mapped within the project area. The pond is also mapped as an NWI wetland (PUBFx). The NHD-mapped freshwater pond was recorded (0.03 acres) within the project area during the delineation survey, but does not overlap any of the project area components (see Table 4). The pond is approximately 50 feet from the proposed east–west haul road (see Figure A-8 in Appendix A and Photograph B-21 in Appendix B).

Table 3. Vegetation Identified within Each Wetland within the Proposed Project Area

Wetland Delineation Plant Data			Wetland 1 R2UBH		Wetland 2 R2UBH		Wetland 3 R2UBH		Wetland 4 PEM1A		Wetland 5 R2UBH		Wetland 6 R2UBH	
Common Name	**Scientific Name**	**Indicator Status**	Cover (%)	Dominant (Y/N)	Cover (%)	Dominant (Y/N)	Cover (%)	Dominant (Y/N)	Cover (%)	Dominant (Y/N)	Cover (%)	Dominant (Y/N)	Cover (%)	Dominant (Y/N)
Alkali sacaton	*Sporobolus airoides*	FACW	1	N	–	–	–	–	–	–	–	–	–	–
Annual rabbitsfoot grass*	*Polypogon monspeliensis*	FACW	9	Y	–	–	–	–	–	–	–	–	2	N
Broadleaved pepperweed†	*Lepidium latifolium*	FAC	<1	N	6	Y	–	–	–	–	–	–	–	–
Canadian horseweed	*Conyza canadensis*	N/A	4	N	–	–	–	–	–	–	–	–	2	N
Curly dock*	*Rumex crispus*	FAC	<1	N	<1		–	–	–	–	–	–	–	–
Giant reed†	*Arundo donax*	FACW	–	–	1	N	–	–	–	–	<1	N	2	N
Goodding's willow	*Salix gooddingii*	FACW	–	–	4	N	–	–	–	–	3	N	–	–
Narrowleaf willow	*Salix exigua*	FACW	64	Y	65	Y	47	Y	15	Y	68	Y	64	Y
Ravennagrass†	*Saccharum ravennae*	FAC	–	–	–	–	–	–	2	N	6	Y	–	–
Rio Grande cottonwood	*Populus deltoides wislizenii*	FAC	4	N	<1	N	13	Y	30	Y	10	Y	2	N
Rough cocklebur	*Xanthium strumarium*	FAC	5	Y	–	–	–	–	–	–	–	–	2	N
Russian olive†	*Elaeagnus angustifolia*	FAC	2	N	–	–	–	–	–	–	–	–	–	–
Saltcedar†	*Tamarix sp.*	FAC	7	Y	4	N	4	N	–	–	–	–	–	–
Saltgrass	*Distichlis spicata*	FAC	7	Y	–	–	1	N	2	N	1	N	4	N
Sand dropseed	*Sporobolus cryptandrus*	FACU	<1	N	–	–	–	–	–	–	–	–	–	–
Scouringrush horsetail	*Equisetum hyemale*	FACW	–	–	–	–	2	N	2	N	–	–	–	–
Siberian elm†	*Ulmus pumila*	UPL	2	N	–	–	5	Y	3	N	–	–	6	Y

Wetland Delineation Plant Data			Wetland 1 R2UBH		Wetland 2 R2UBH		Wetland 3 R2UBH		Wetland 4 PEM1A		Wetland 5 R2UBH		Wetland 6 R2UBH	
Spreading dogbane	*Apocynum androsaemifolium*	UPL	–	–	–	–	–	–	3	N	–	–	–	–
Sweetclover	*Melilotus albus*	FACU	2	N	–	–	–	–	–	–	–	–	3	N
Tobosagrass	*Pleuraphis mutica*	UPL	–	–	<1	N	–	–	–	–	–	–	–	–
Vine mesquite	*Hopia obtusa*	FACU	2	N	3	N	20	Y	3	N	–	–	–	
Virginia creeper	*Parthenocissus quinquefolia*	FAC	–	–	–	–	3	N	5	Y	–	–	–	–
White mulberry*	*Morus alba*	FACU	–	–	–	–	20	Y	7	Y	1	N	15	Y

*Non-native †NMDA (New Mexico Department of Agriculture) Noxious Weed; FAC : Facultative; FACU: Facultative Upland; FACW: Facultative Wetland; UPL: Upland.

Table 4. SWCA's Mapped Surface Water Features within the Proposed Project Area

Feature ID	Corresponding NHD/NWI	Field Survey Date	Location	Jurisdictional Determination	Average OHWM Width (feet)	Length (feet)	Cowardin Classification	Potentially Jurisdictional Waters within the Proposed Project Area (acres)
Rio Grande	NHD Perennial River	8/20/2021	34.818086° -106.715428°	Potentially Jurisdictional	35.8	8,782.60	Perennial Stream	0.73
Freshwater Pond	NHD/NWI Open Water (NWI Code: PUBFx)	6/27/2021	34.825837° -106.714542°	Potentially Jurisdictional	N/A	N/A	PUBFx	0.00
Wetland 1	NWI Wetland (NWI Code: PEM1A)	6/27/2021	34.818750° -106.713830°	Potentially Jurisdictional	N/A	N/A	R2UBH	9.10
Wetland 2	NWI Wetland (NWI Code: PEM1A)	6/27/2021	34.829599° -106.715724°	Potentially Jurisdictional	N/A	N/A	R2UBH	1.39
Wetland 3	NWI Wetland (NWI Code: PEM1A)	6/28/2021	34.831587° -106.715251°	Potentially Jurisdictional	N/A	N/A	R2UBH	0.76
Wetland 4	NWI Wetland (NWI Code: PEM1A)	6/28/2021	34.832447° -106.714075°	Potentially Jurisdictional	N/A	N/A	PEM1A	0.00
Wetland 5	NWI Wetland (NWI Code: PEM1A)	6/28/2021	34.832415° -106.715572°	Potentially Jurisdictional	N/A	N/A	R2UBH	1.62
Wetland 6	NWI Wetland (NWI Code: PEM1A)	6/28/2021	34.834023° -106.715414°	Potentially Jurisdictional	N/A	N/A	R2UBH	1.19
TOTAL								**14.79**

Source: USGS (2021); USFWS (2021)

Note: N/A = not applicable

4 SUMMARY

SWCA conducted a wetland and waterbody delineation of the proposed project area on June 24, 25, and 28, 2021. SWCA delineated six wetlands, one freshwater pond, and one perennial stream (Rio Grande). Based on our data collection and analysis, we conclude that the project would result in the temporary construction impact of 14.06 acres of riverine wetlands and 0.73 acre of WUS. Impacts from construction at these locations are expected to be in the form of sediment and vegetation removal.

Although individual wetland or stream crossings would result in the loss of greater than 0.5 acre of WUS from the proposed project, impacts from these activities are expected to be short-term and temporary as riparian and wetland habitat would increase due to increased inundation in the floodplain. Following construction, an increased amount of substrate would have the potential to be inundated and/or saturated for significant time periods, which should lead to a net gain in both the area and function of wetlands. Often, restored low-flow, slackwater areas develop a fine sediment layer that is conducive to re-establishing diverse herbaceous wetland communities. Some of the expected effects on wetland function include an increase in surface water storage, increase in the ability of wetlands to perform water quality improvement functions, an increased amount of organic carbon available for export, and beneficial effects on the ecosystem diversity. The proposed project is expected to improve conditions for native herbaceous wetland vegetation, as well as native shrubs and trees such as coyote willow (*Salix exigua*), Goodding's willow (*Salix gooddingii*), and Rio Grande cottonwood (*Populus deltoides wislizenii*), through increasing moist soil conditions at seed dispersal. This would also increase the age diversity and structure of these species and connect the floodplain as an active ecological process.

5 CONCLUSION

Eight potential WUS were identified within the project area during SWCA's aquatic resources delineation surveys: one perennial stream (Rio Grande), one freshwater pond, and six wetlands. Potential impacts to five of the eight features are greater than 0.5 acre and could require a Standard Individual Permit per Section 404 of the CWA. However, a final permitting determination for the proposed project will be made after further consultation with the USACE, Reclamation, NMISC, and MRGCD (SWCA 2021).

6 LITERATURE CITED

Google Earth. 2021. U.S. Department of State Geographer Image Landsat. Available at: https://www.google.com/earth/. Accessed October 2021.

Lichvar, R.W., and S.M. McColley. 2008. *Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States*. Hanover, New Hampshire: Cold Regions Research and Engineering Laboratory, USACE Research and Development Center.

The National Agricultural Law Center. 2021. Arizona Court Vacates WOTUS Rule. Available at: https://nationalaglawcenter.org/arizona-court-vacates-wotus-rule/. Accessed October 2021.

Natural Resources Conservation Service (NRCS). 2021. Web Soil Survey of Los Lunas, New Mexico. Available at: http://websoilsurvey.nrcs.usda.gov/app/. Accessed October 2021.

SWCA Environmental Consultants (SWCA). 2021. Personal communication with Chris Parrish, USACE. October 19, 2021.

U.S. Army Corps of Engineers (USACE). 1987. *U.S. Army Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. Vicksburg, Mississippi: U.S. Army Engineers Waterways Experiment Station Environmental Laboratory.

———. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)*, edited by J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.

U.S. Bureau of Reclamation (Reclamation). 2021. *Project Description: Los Lunas RM 163 Conveyance Capacity Project*. Technical Report. Bureau of Reclamation, Upper Colorado Basin, Albuquerque, New Mexico.

U.S. Fish and Wildlife Service (USFWS). 2021. National Wetlands Inventory. Available at: http://www.fws.gov/wetlands/Data/Mapper.html. Accessed October 2021.

U.S. Geological Survey (USGS). 2021. National Hydrography Dataset. Available at: http://nhd.usgs.gov/. Accessed October 2021.

Western Regional Climate Center. 2021. New Mexico Climate Summaries. Los Lunas 3 SSW, New Mexico (COOP Station No. 295150). Available at: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?nm5150. Accessed October 2021.

This page intentionally left blank.

APPENDIX A

Maps

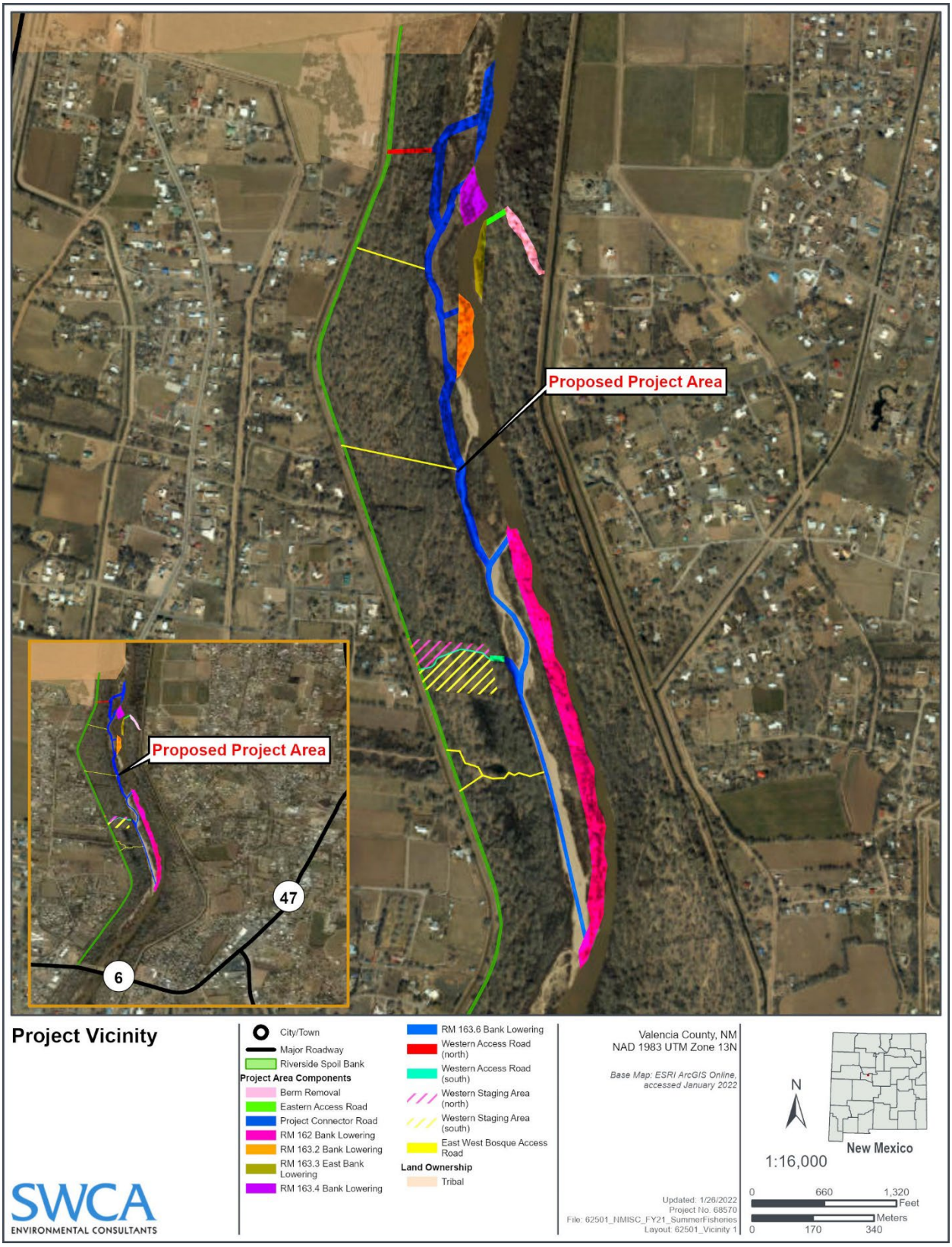


Figure A-1. Project vicinity map.

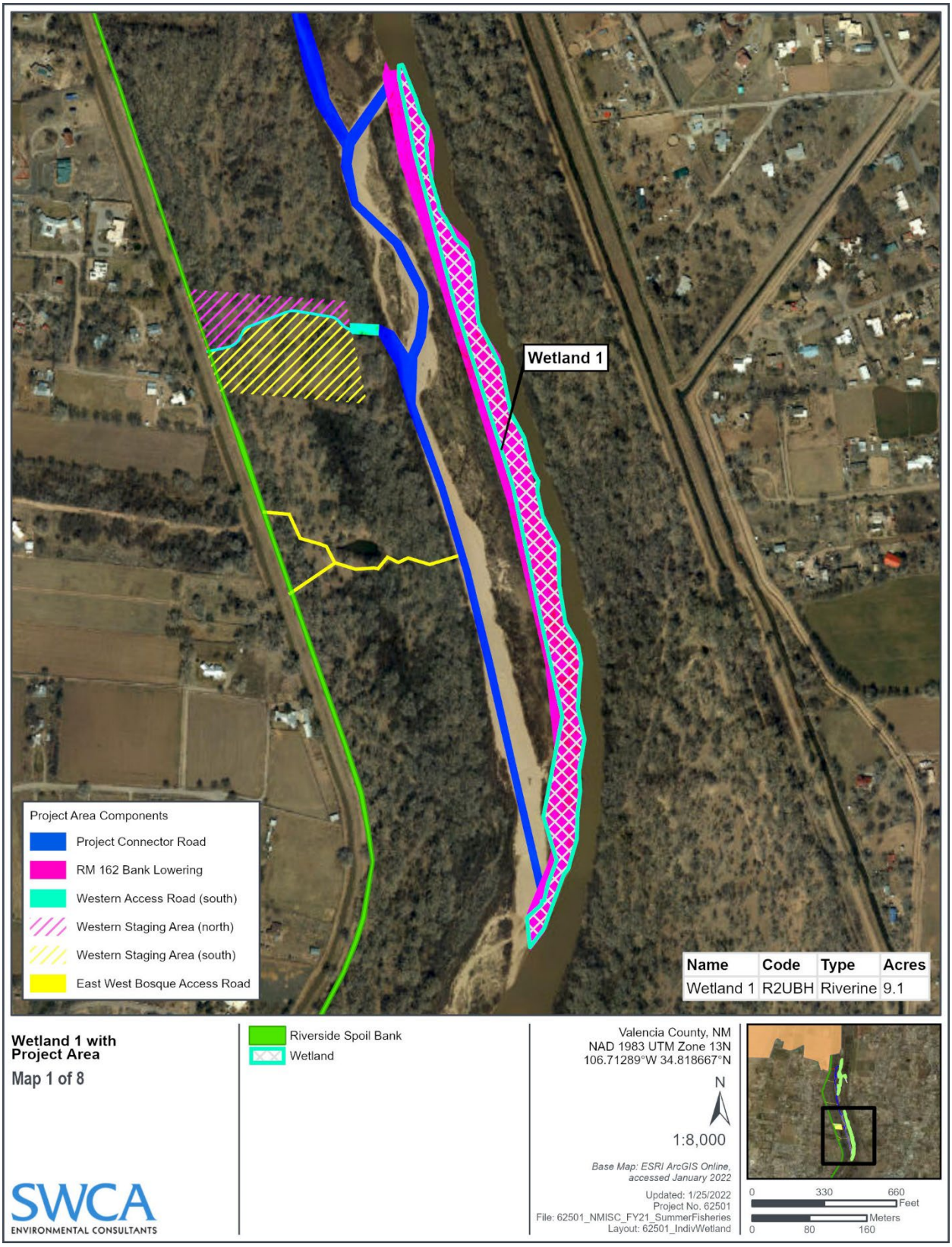


Figure A-2. Project area map with Wetland 1 (map 1 of 8).

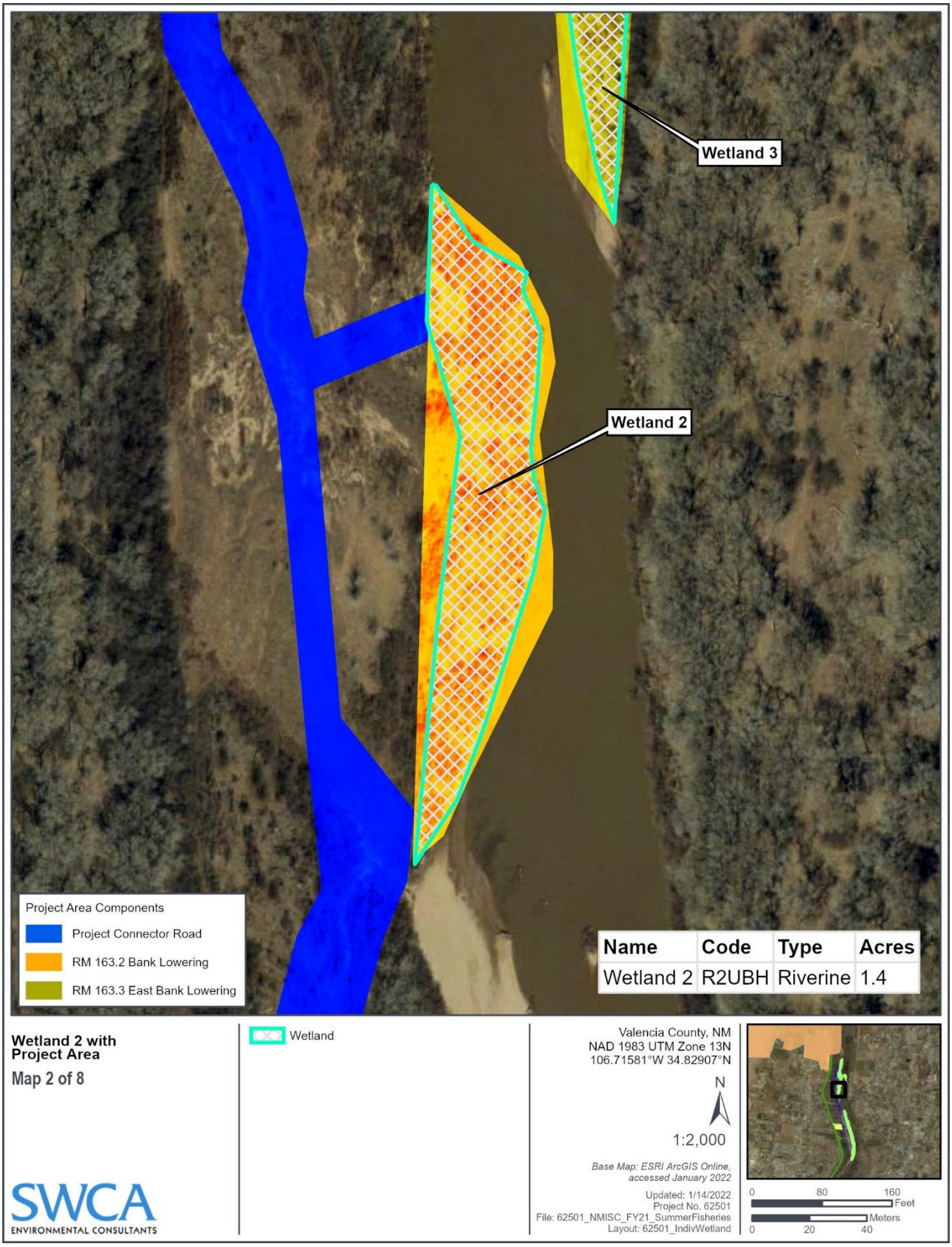


Figure A-3. Project area map with Wetland 2 (map 2 of 8).

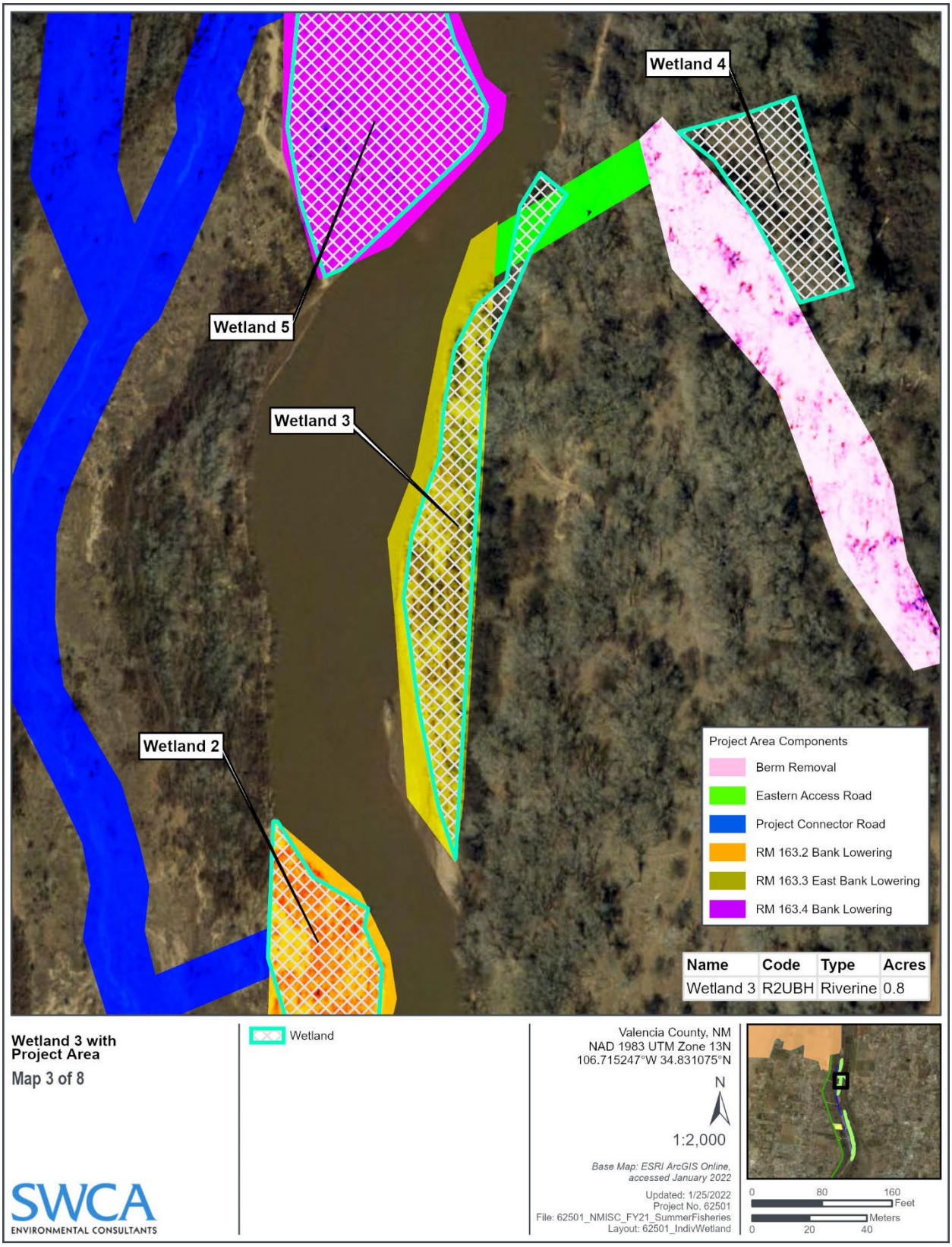


Figure A-4. Project area map with Wetland 3 (map 3 of 8).

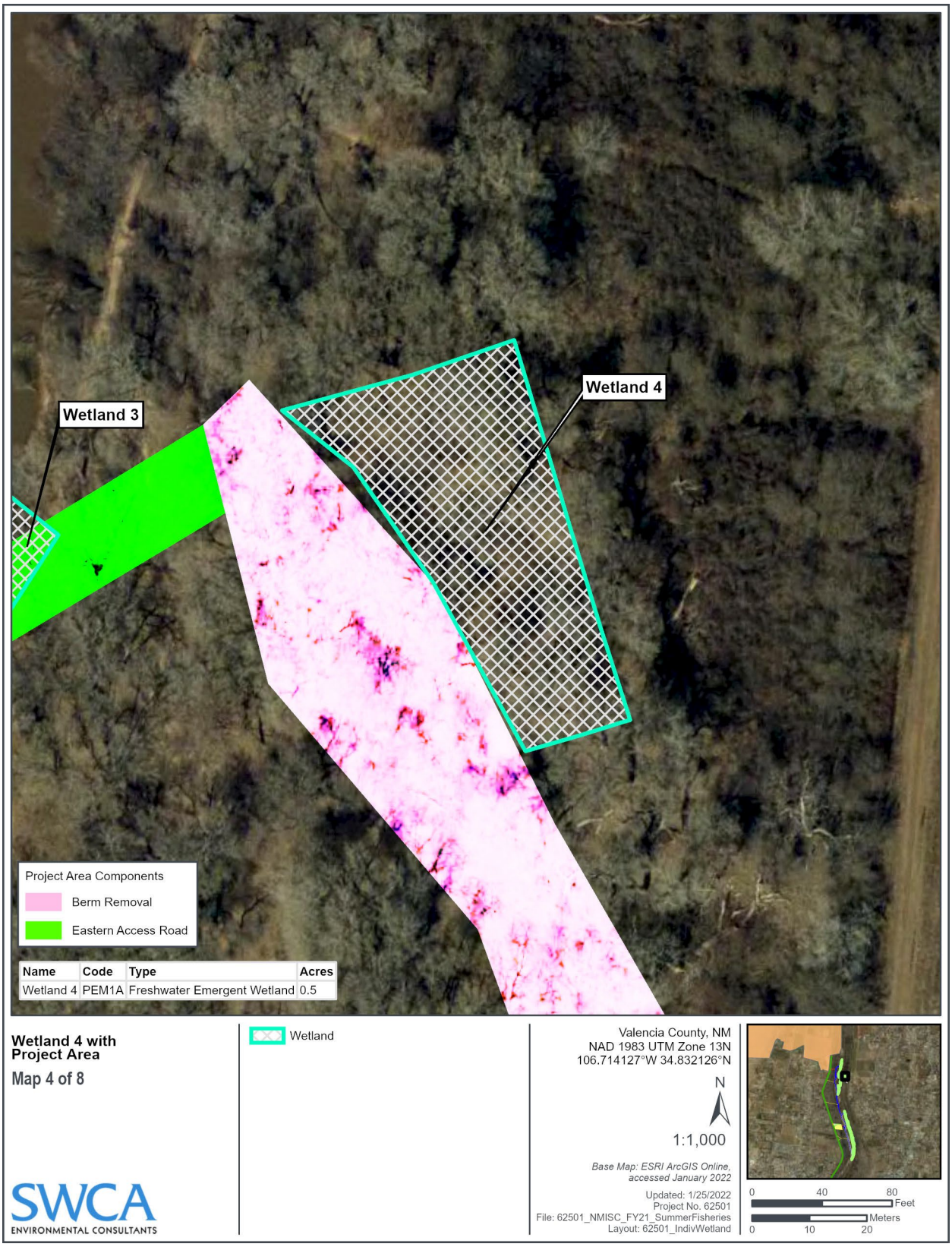


Figure A-5. Project area map with Wetland 4 (map 4 of 8).

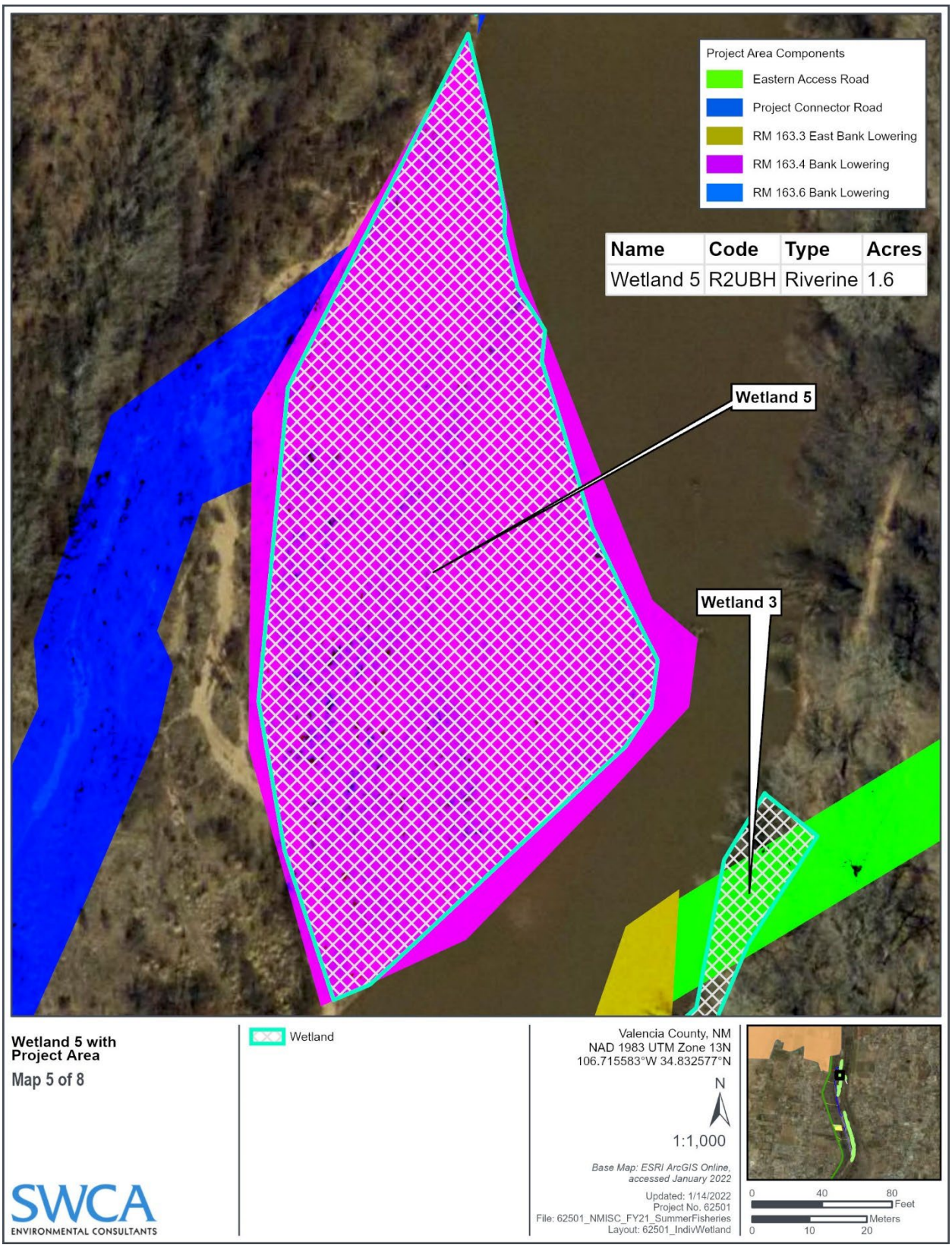


Figure A-6. Project area map with Wetland 5 (map 5 of 8).

s

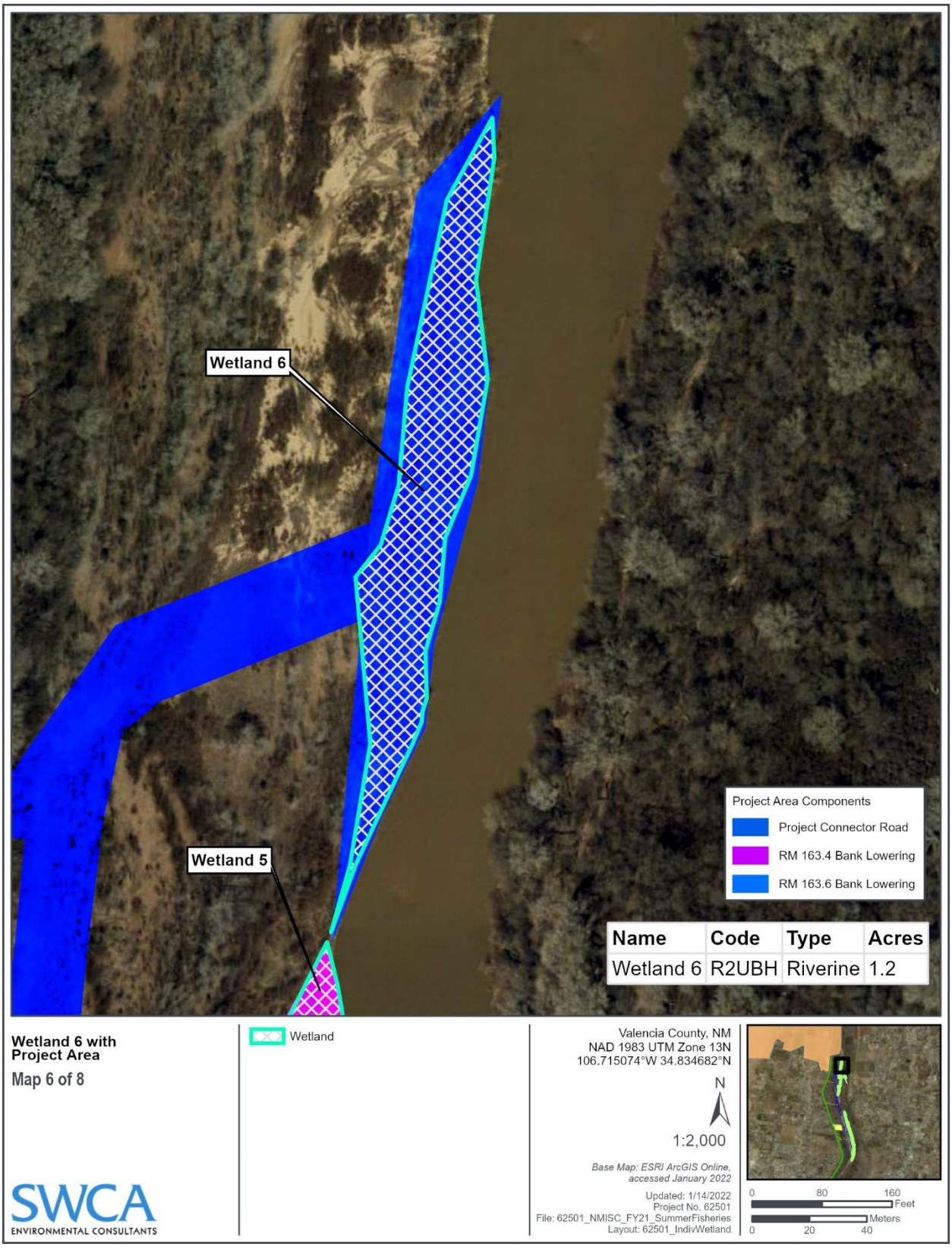


Figure A-7. Project area map with Wetland 6 (map 6 of 8).

Figure A-8. Project area map with the Freshwater Pond (map 7 of 8).

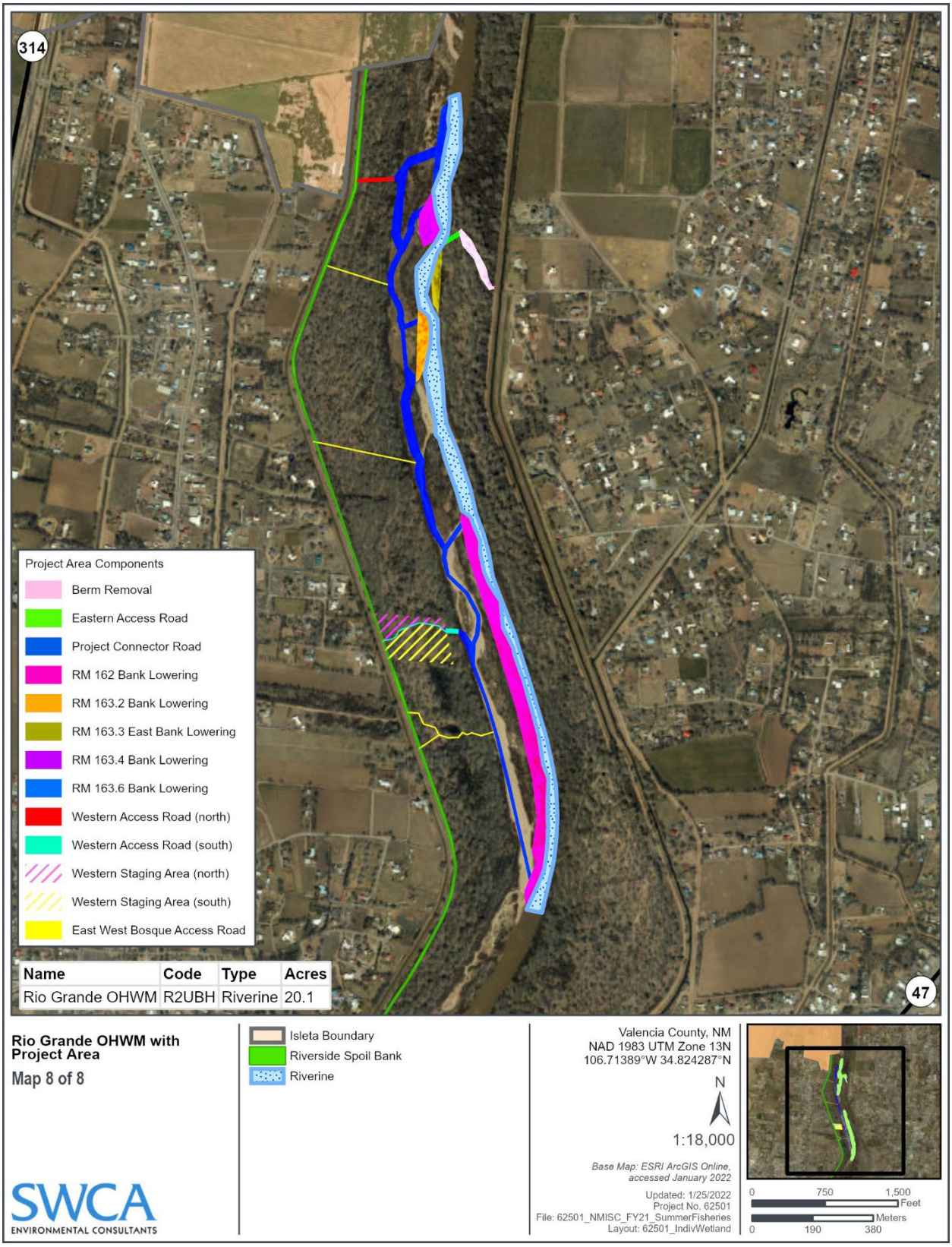


Figure A-9. Project area map with the Rio Grande OHWM (Map 8 of 8).

APPENDIX B

Photographs

Photograph B-1. View of the Rio Grande channel within the project area, facing south.

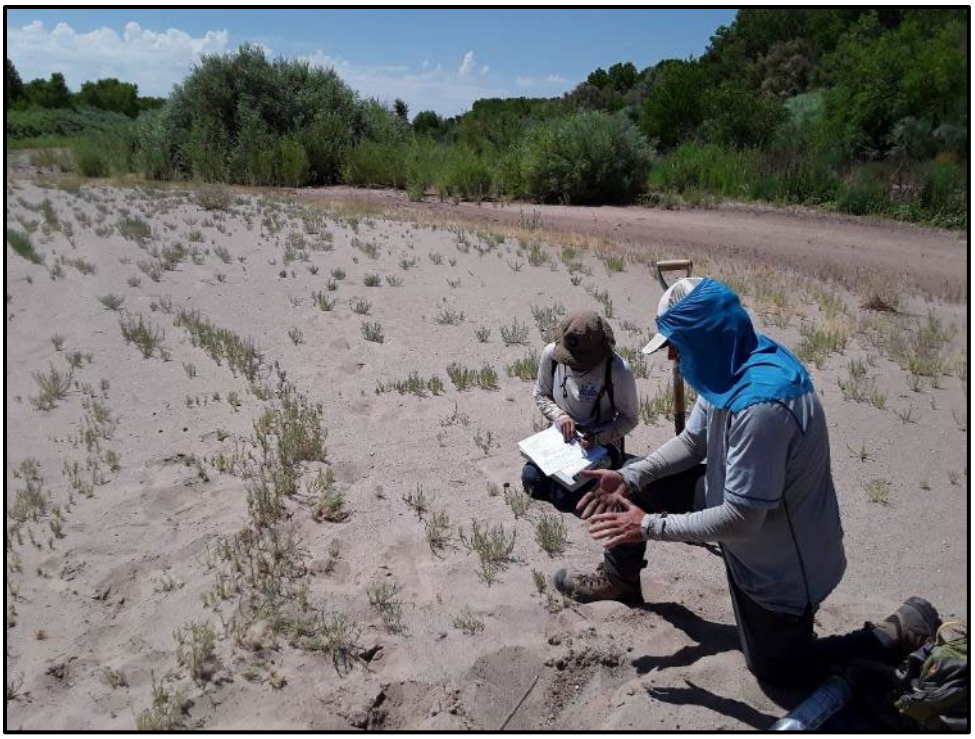
Photograph B-2. View of the Rio Grande channel within the project area, facing north.

Photograph B-3. View of upland vegetation within the project area, facing north.

Photograph B-4. View of upland vegetation within the project area, facing south.

Photograph B-5. Representative view of proposed east–west haul road, facing east.

Photograph B-6. Representative view of proposed east–west haul road (OP76), facing east.



Photograph B-7. View of proposed river access road (OP32), facing south.

Photograph B-8. View of proposed river access road (OP50), facing south.

Photograph B-9. View of Wetland 1 (OP16), facing south.

Photograph B-10. View of Wetland 1 (OP10), facing south.

Photograph B-11. View of Wetland 2 (OP108), facing northwest.

Photograph B-12. View of Wetland 2 (OP110), facing north.

Photograph B-13. View of Wetland 3, facing south.

Photograph B-14. View of Wetland 3 (OP101), facing west.

Photograph B-15. View of Wetland 4 (OP99), facing west.

Photograph B-16. View of Wetland 4 (OP99), facing south.

Photograph B-17. View of Wetland 5 (OP95), facing south.

Photograph B-18. View of Wetland 5 (OP92), facing south.

Photograph B-19. View of Wetland 6 (OP84), facing west.

Photograph B-20. View of Wetland 6 (OP87), facing west.

Photograph B-21. View of pond (OP08), facing west.

Photograph B-22. View of wetland soil profile with hydric soil indicators.

This page intentionally left blank.

APPENDIX C

Wetland Determination Data Forms

BUREAU OF RECLAMATION

Supplement to "Aquatic Resources Delineation Report for the New Mexico Interstate Stream Commission Los Lunas River Mile 163 River-System Maintenance Project, Valencia County, New Mexico"

Middle Rio Grande Project, New Mexico
Upper Colorado Basin Region
Albuquerque Area Office

Mission Statements

The Department of the Interior (DOI) conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

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

Supplement to "Aquatic Resources Delineation Report for the New Mexico Interstate Stream Commission Los Lunas River Mile 163 River-System Maintenance Project, Valencia County, New Mexico"

Middle Rio Grande Project, New Mexico
Upper Colorado Basin Region
Albuquerque Area Office

prepared by

Bureau of Reclamation
Shamarie Nez, Biologist
Chris Grosso, Biologist
Gary Vance, Biologist

reviewed by

Bureau of Reclamation
Ann Demint, MA, MWR, Project Manager
Jancoba Dorley, Ph.D, Project Manager

Cover Photo: Aerial photo of the Corrales Siphon bend in May 2021 (Reclamation/Ari Posner)

A wetland delineation report (SWCA, 2022) prepared by SWCA Environmental Consultants was submitted to the U.S. Army Corps of Engineers in February 2022 on behalf of the New Mexico Interstate Stream Commission as part of the application process for a Section 404/401 of the Clean Water Act (CWA) permit for the Bureau of Reclamation Los Lunas River Mile (RM) 163 River-System Management Project. In this report, SWCA delineated 14.79 acres of potentially jurisdictional waters within the project area for Los Lunas RM 163. The field work was conducted by SWCA in August and September of 2021.

Upon receipt of the final wetland delineation report and further review by Bureau of Reclamation, including a site visit with the U.S. Army Corps of Engineers (USACE) regulatory staff, Reclamation concluded that SWCA's wetland delineation should be checked to verify accuracy of the report. During a subsequent site visit on September 25, 2024, with Reclamation and USACE regulatory staffs, soil pits were dug at a variety of locations within the SWCA-delineated wetlands, but no hydric soils were found. Therefore, Reclamation conducted a full revision with new soil pits. On September 26 and October 3, 2024, Reclamation biologists reviewed the SWCA-delineated wetlands in the field: Wetland 1, Wetland 2, Wetland 3, and Wetland 5. Wetland 6 was reviewed on October 18, 2024.

After Reclamation biologists conducted these additional site visits to investigate the soils, plants, and hydrology, it was determined no wetlands exist in the SWCA-delineated Wetlands 1, 2, 3, 5 and 6 due to the lack of hydric soils. The berm removal that may have impacted Wetland 4 has been eliminated from the project. The Ordinary High-Water Mark (OHWM) boundary intersecting the project features is included in the attached map (Figure S1), and the table (Table S1) below shows the revised changes to acres of wetland impact. Also included in Appendix A are the wetland delineation sheets and photographs for the areas Reclamation Biologists visited.

We respectfully request that the final jurisdictional wetland areas for this project be revised to include the information provided here. A Letter of Permission (LOP) application will be submitted for the project and all BMPs associated with mitigating impacts will be followed.

Table S1. Reclamation's Mapped Surface Water Features within the Proposed Project Area

Feature ID	Corresponding NHD/NWI	Field Survey date	Location	Jurisdictional Determination	Average OHWM Width (feet)	Length (feet)	Cowardin Classification	Potentially Jurisdictional Waters within the Proposed Project area (acres of impact)
Rio Grande	NHD Perennial River	8/20/21	34.818086° -106.715428°	Potentially Jurisdictional	35.8	8,782.60	Perennial Stream	0.73
Freshwater Pond	NHD/NWI Open water (NWI Code: PUBFx)	6/27/21	34.825837° -106.714542°	Potentially Jurisdictional	N/A	N/A	PUBFx	0.00
Wetland 1	NWI Wetland (NWI Code: PEM1A)	9/26/24	34.818750° -106.713830°	Non-Jurisdictional/upland	N/A	N/A	R2UBH	0.00
Wetland 2	NWI Wetland (NWI Code: PEM1A)	9/26/24	34.829599° -106.715724	Non-Jurisdictional/upland	N/A	N/A	R2UBH	0.00
Wetland 3	NWI Wetland (NWI Code: PEM1A)	10/3/24	34.831587° -106.715251°	Non-Jurisdictional/upland	N/A	N/A	R2UBH	0.00
Wetland 4	NWI Wetland (NWI Code: PEM1A)	6/28/21	34.832447° -106.714075°	Potentially Jurisdictional	N/A	N/A	PEM1A	N/A (removed from project)
Wetland 5	NWI Wetland (NWI Code: PEM1A)	9/26/24	34.832415° -106.715572°	Non-Jurisdictional/upland	N/A	N/A	R2UBH	0.00
Wetland 6	NWI Wetland (NWI Code: PEM1A)	10/18/24	34.834023° -106.715414°	Non-Jurisdictional/upland	N/A	N/A	R2UBH	0.00
							TOTAL:	**0.73**

Source: USGS (2021); USFWS (2021)

Note: N/A = not applicable

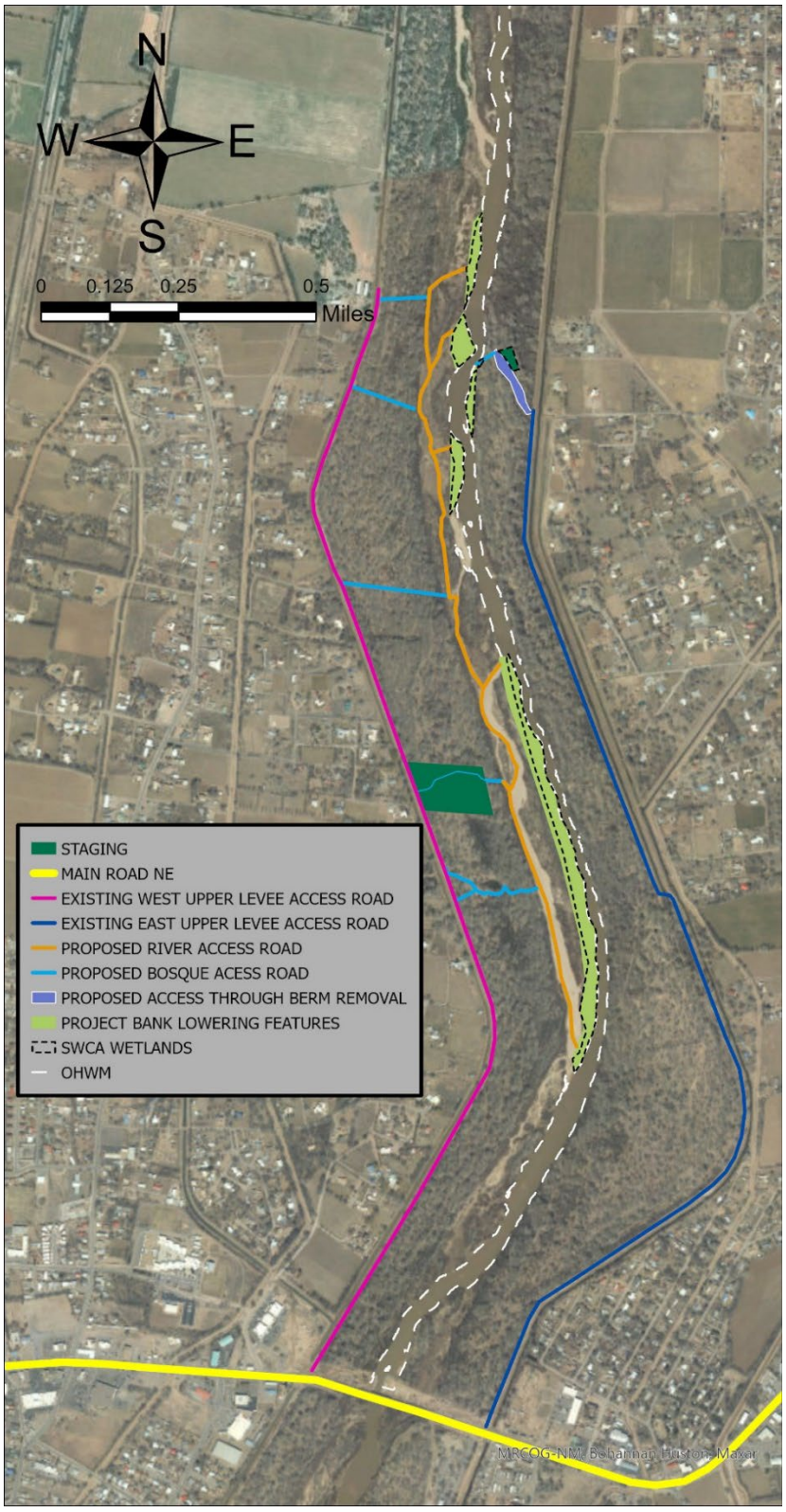


Figure S1. Map of the project area within the Rio Grande, the OHWM along with the project bank lowering features. All features shown are correct except for the proposed access through berm removal, this feature has been removed from the project to avoid potential impact to the adjacent wetland.

Literature Cited:

SWCA Environmental Consultants (SWCA). 2022. Aquatic Resources Delineation Report for the New Mexico Interstate Stream Commission Los Lunas River Mile 163 River-System Maintenance Project, Valencia County, New Mexico

Appendix A

Wetland Determination Data Forms and Photographs

Wetland 1

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: River Mile 163 (wetland 1) City/County: Valencia Sampling Date: Sept. 26, 2024

Applicant/Owner: Bureau of Reclamation State: NM Sampling Point: Pit1/Site1

Investigator(s): Chris Grosso & Shamarie Nez Section, Township, Range: T7N-R2E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Convex Slope (%): 1

Subregion (LRR): D Lat: 34.8205167 Long: -106.7129567 Datum: NAD83

Soil Map Unit Name: Mixed Alluvial Land/River Wash NWI classification: R2UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix chinensis	15	Yes	FAC
2. Populus deltoides	10	No	FAC
3.			
4.			
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix exigua	85	Yes	FACW
2.			
3.			
4.			
5.			
	85	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Sporobolus airoides	20	Yes	FAC
2. Sporobolus crytandrus	10	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	30	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	85	x 2 =	170
FAC species	45	x 3 =	135
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	140 (A)		345 (B)

Prevalence Index = B/A = 2.46

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Closest SWCA wetland point = OP16 (132.27')

SOIL

Sampling Point: Pit1/Site1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
1-16"	7.5 YR 5/4	100	no redox				sand loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Figure A-1. Soil pit #1 in SWCA Wetland #1.

Wetland 2 – Soil Pit #1

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: River Mile 163 (wetland 2) City/County: Valencia Sampling Date: Sept. 26, 2024

Applicant/Owner: Bureau of Reclamation State: NM Sampling Point: Pit1/Site2

Investigator(s): Chris Grosso & Shamarie Nez Section, Township, Range: T7N-R2E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 1

Subregion (LRR): D Lat: 34.8292467 Long: -106.7158683 Datum: NAD83

Soil Map Unit Name: Mixed Alluvial Land/River Wash NWI classification: R2UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix exigua	60	Yes	FACW
2.			
3.			
4.			
5.			
	60 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Solidago canadensis	10	Yes	FACU
2. Persicaria lapathifolia	10	Yes	FACW
3. Panicum obtusum	5	No	FAC
4. Helianthus annuus	1	No	FACU
5.			
6.			
7.			
8.			
	26 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 70	x 2 = 140
FAC species 5	x 3 = 15
FACU species 11	x 4 = 44
UPL species 0	x 5 = 0
Column Totals: 86 (A)	199 (B)

Prevalence Index = B/A = 2.31

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Closest SWCA wetland point = OP108 (41.01')

Solidago canadensis & Panicum obtusum wetland indicator found in "National List of Plant Species that Occur in Wetlands: Southwest (Region 7)", May 1988.

SOIL

Sampling Point: Pit1/Site2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
1-16"	7.5 YR 5/4	100	0				sand loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Figure A-2. Soil pit #1 in SWCA Wetland #2.

Wetland 2 – Soil Pit #2

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: River Mile 163 (wetland 2) City/County: Valencia Sampling Date: Sept. 26, 2024

Applicant/Owner: Bureau of Reclamation State: NM Sampling Point: Pit2/Site2

Investigator(s): Chris Grosso & Shamarie Nez Section, Township, Range: T7N-R2E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 1

Subregion (LRR): D Lat: 34.8292017 Long: -106.7156183 Datum: NAD83

Soil Map Unit Name: Mixed Alluvial Land/River Wash NWI classification: R2UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix exigua	60	Yes	FACW
2.			
3.			
4.			
5.			
	60 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Lepidium latifolium	20	Yes	FAC
2. Arundo donax	10	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	30 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		200 (B)

Prevalence Index = B/A = 2.22

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Closest SWCA wetland point = OP108 (79.30')

SOIL

Sampling Point: Pit2/Site2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1-16"	7.5 YR 5/4	100	0				sand loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Figure A-3. Soil pit #2 in SWCA Wetland #2.

Wetland 3 – Soil Pit #1

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: River Mile 163 (wetland 3) City/County: Valencia Sampling Date: Oct. 3, 2024

Applicant/Owner: Bureau of Reclamation State: NM Sampling Point: Pit1/Site3

Investigator(s): Chris Grosso & Shamarie Nez Section, Township, Range: T7N-R2E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 1

Subregion (LRR): D Lat: 34.8310633 Long: -106.7154017 Datum: NAD83

Soil Map Unit Name: Mixed Alluvial Land/River Wash NWI classification: R2UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Wetland 3 deemed by SWCA is a vegetated point bar and not an adjacent wetland. The bank line is a vegetated river channel within the OHWM.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Ulmus pumila	5	No	UPL
2.			
3.			
4.			
	5	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix exigua	50	Yes	FACW
2. Tamarix chinensis	50	No	FAC
3.			
4.			
5.			
	100	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Salix exigua	35	Yes	FACW
2. Erigeron canadensis	25	No	FACU
3. Sorghum halepense	10	No	FACU
4. Solidago canadensis	5	No	FACU
5.			
6.			
7.			
8.			
	75	= Total Cover	
Woody Vine Stratum (Plot size: n/a)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 75 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 85	x 2 = 170
FAC species 50	x 3 = 150
FACU species 40	x 4 = 160
UPL species 5	x 5 = 25
Column Totals: 180 (A)	505 (B)

Prevalence Index = B/A = 2.81

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Closest SWCA wetland point = OP102 (126.81')

Indicator status of Solidago canadensis taken from "National List of Plant Species that Occur in Wetlands: Southwest (Region 7)", 1988

SOIL

Sampling Point: Pit1/Site3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1-12"	7.5 YR 4/4	100	no redox				sand loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Figure A-4. Soil pit #1 in SWCA Wetland #3.

Wetland 4

Wetland 4 was not re-evaluated because the relic berm removal was eliminated from the project

Wetland 5 – Soil Pit #1

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: River Mile 163 (wetland 5) City/County: Valencia Sampling Date: Sept. 26, 2024

Applicant/Owner: Bureau of Reclamation State: NM Sampling Point: Pit1/Site5

Investigator(s): Chris Grosso & Shamarie Nez Section, Township, Range: T7N-R2E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 1

Subregion (LRR): D Lat: 34.8321167 Long: -106.7157267 Datum: NAD83

Soil Map Unit Name: Mixed Alluvial Land/River Wash NWI classification: R2UBH

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix exigua	70	Yes	FACW
2.			
3.			
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Saccharum ravennae	25	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 75 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 70	x 2 = 140
FAC species 25	x 3 = 75
FACU species 0	x 4 = 0
UPL species 0	x 5 = 0
Column Totals: 95 (A)	215 (B)

Prevalence Index = B/A = 2.26

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Closest SWCA wetland point = OP92 (83.16')

SOIL

Sampling Point: Pit1/Site5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1-16"	7.5 YR 5/4	100	no redox				sand loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Figure A-5. Soil pit #1 in SWCA Wetland #5.

Wetland 6 – Soil Pit #1

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: River Mile 163 (wetland 6) City/County: Valencia Sampling Date: Oct. 18, 2024

Applicant/Owner: Bureau of Reclamation State: NM Sampling Point: Pit1/Site6

Investigator(s): Chris Grosso/Gary vance Section, Township, Range: T7N-R2E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): <1

Subregion (LRR): D Lat: 34.83520 N Long: -106.71506 W Datum: WGS84

Soil Map Unit Name: Mixed Alluvial Land/River Wash NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Tamarix chinensis	5	No	FAC
2. Populus deltoides	15	No	FAC
3.			
4.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Salix exigua	60	Yes	FACW
2.			
3.			
4.			
5.			
	60	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Carex spp.	50	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____	= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 50	x 1 = 50
FACW species 60	x 2 = 120
FAC species 20	x 3 = 60
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 130 (A)	230 (B)

Prevalence Index = B/A = 1.769

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: Pit1/Site6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1-16"	7.5 YR 5/4	100	No redox				Sand loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Figure A-6. Soil pit #1 in SWCA Wetland #6.

Appendix G – Reclamation letters to New Mexico State Historic Preservation Officer and Pueblo of Isleta Tribal Historic Preservation Officer

United States Department of the Interior
BUREAU OF RECLAMATION
Albuquerque Area Office
555 Broadway NE, Suite 100
Albuquerque, NM 87102-2352

IN REPLY REFER TO:
ALB-702
2.1.1.04

November 1, 2024

VIA ELECTRONIC MAIL

Ms. Michelle Ensey
Interim State Historic Preservation Officer and State Archaeologist
New Mexico Historic Preservation Division
Bataan Memorial Building
407 Galisteo Street, Suite 236
Santa Fe, NM 87501

Subject: Section 106 Consultation for the Proposed River Mile (RM) 163 Conveyance Capacity Project, Valencia County, NM

Dear Ms. Ensey:

The Bureau of Reclamation is planning to improve water conveyance at RM 163, through the Los Lunas subreach, in Valencia County, New Mexico (see attached). The river has become semi-perched within the project area, meaning that its banks are higher than the surrounding floodplain (also known as floodway). This causes water to inundate the levee toes, threatening levee damage or breach, and traps water against the levee because there are few places in the floodway in this area that the water can return to the river. The primary goal is to reduce the water surface elevation by increasing channel capacity to prevent overbanking into the historic floodplain (defined here as the floodplain outside the 550-foot-wide channel established by jetty jacks in 1960s-1970s) at flows less than 3500 cubic feet per second between RM 164 and RM 162. This flow rate is a rough approximation of the 2-year flood flow. This type of work is considered River Maintenance Class 3a indicating that this work can be planned in advance and the consequences of no action are less likely to be substantial in the near term (the next normal spring runoff or within the next few years). Work can be described as preventative maintenance.

To keep the project within one construction season, the excavation is limited to 120,000 cubic yards. However, more work is needed within the reach to improve conveyance capacity. Thus, this project will be a pilot project for a future width maintenance program which will include partner agency cooperation from the Middle Rio Grande Conservancy District and the New Mexico Interstate Stream Commission.

The secondary goals of this project are to consider the environmental and geomorphic benefits and impacts, and to be cost effective. Thus, project components were selected to include areas where encroaching vegetation and bar/island accretion have resulted in reduced channel capacity. Terraced banks were used to increase the inundated areas at lower flows in some of the areas where the project will be carried out, providing inundated nursery habitat for minnows.

The proposed undertaking will entail ground disturbing activities and as such requires compliance with Section 106 of the National Historic Preservation Act (36 CFR 800, as amended [NHPA]). The legislation requires that federal agencies consider the effects that a proposed undertaking might have on

historic properties. To comply with Section 106, an Area of Potential Effect (APE) of 46 acres was established and a Class III Cultural Resources Inventory was completed between 5 and 11 September 2024 by Statistical Research, Incorporated (SRI). The subsequent report will be sent under separate cover.

The APE is within the Los Lunas subreach, a section of the Middle Rio Grande Valley between Isleta Diversion Dam (RM 169) and the community of Los Chaves, at RM 153.

The survey resulted in the documentation of two historic linear feature segments and eighteen Isolated Occurrences (IOs). The linear segments are the north/south oriented levees on the east and west sides of the river (Historical Cultural Property Inventory [HCPI] 54858 and 54859 respectively). The HCPIs were recommended as not contributing to the overall eligibility of the entire length of these features. The IOs were recommended not eligible for inclusion in the National Register of Historic Places (NRHP).

Project Components

The project components consist of five bank lowering polygon areas within the channel/floodway. These project components will improve the channel conveyance by increasing the width of the river both on the west and east banks of the river.

Recommendations and Determinations of Eligibility

SRI recommended that the segments of HCPI 54858 and 54859 documented for this undertaking non-contributing elements to the overall eligibility of the two linear features. Additionally, SRI recommended that the IOs are not eligible for inclusion in the NRHP. Reclamation concurs with these recommendations and finds that the historic levee segments are non-contributing and none of the IOs are eligible.

Recommended Mitigation

The project area was thoroughly surveyed, and all cultural resources recorded. There will be no impact to significant cultural properties and Reclamation finds that there will be *no affect* to historic properties in this undertaking. The project should go forward with no further archaeological stipulations. At this time Reclamation is requesting concurrence from your office with these findings.

As always, we look forward to working with you on this important project. Please direct your questions and comments to Dr. John Cater at (505) 418-6377 or email jcater@usbr.gov. Individuals who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services.

Sincerely,

SHARON WIRTH
Digitally signed by SHARON WIRTH
Date: 2024.11.01 08:08:15 -06'00'

FOR
Jennifer Faler, P.E.
Area Manager

Enclosure

United States Department of the Interior
BUREAU OF RECLAMATION
Albuquerque Area Office
555 Broadway NE, Suite 100
Albuquerque, NM 87102-2352

IN REPLY REFER TO:
ALB-702
2.1.1.04

November 1, 2024

VIA ELECTRONIC MAIL

Dr. Henry Walt
Tribal Historic Preservation Officer
PO Box 1270
Isleta Pueblo, NM 87022

Subject: Tribal Consultation for the Proposed River Mile (RM) 163 Conveyance Capacity Project, Valencia County, NM

Dear Dr. Walt:

The Bureau of Reclamation is planning to improve water conveyance at RM 163, through the Los Lunas subreach, in Valencia County, New Mexico (see attached). The river has become semi-perched within the project area, meaning that its banks are higher than the surrounding floodplain (also known as floodway). This causes water to inundate the levee toes, threatening levee damage or breach, and traps water against the levee because there are few places in the floodway in this area that the water can return to the river. The primary goal is to reduce the water surface elevation by increasing channel capacity to prevent overbanking into the historic floodplain (defined here as the floodplain outside the 550-foot-wide channel established by jetty jacks in 1960s-1970s) at flows less than 3500 cubic feet per second between RM 164 and RM 162. This flow rate is a rough approximation of the 2-year flood flow. This type of work is considered River Maintenance Class 3a indicating that this work can be planned in advance and the consequences of no action are less likely to be substantial in the near term (the next normal spring runoff or within the next few years). Work can be described as preventative maintenance.

To keep the project within one construction season, the excavation is limited to 120,000 cubic yards. However, more work is needed within the reach to improve conveyance capacity. Thus, this project will be a pilot project for a future width maintenance program which will include partner agency cooperation from the Middle Rio Grande Conservancy District and the New Mexico Interstate Stream Commission.

The secondary goals of this project are to consider the environmental and geomorphic benefits and impacts, and to be cost effective. Thus, project components were selected to include areas where encroaching vegetation and bar/island accretion have resulted in reduced channel capacity. Terraced banks were used to increase the inundated areas at lower flows in some of the areas where the project will be carried out, providing inundated nursery habitat for minnows.

The proposed undertaking will entail ground disturbing activities and as such requires compliance with Section 106 of the National Historic Preservation Act (36 CFR 800, as amended [NHPA]). The legislation requires that federal agencies consider the effects that a proposed undertaking might have on historic properties. To comply with Section 106, an Area of Potential Effect (APE) of 46 acres was established and a Class III Cultural Resources Inventory was completed between 5 and 11 September

2024 by Statistical Research, Incorporated (SRI). The subsequent report will be sent under separate cover.

The APE is within the Los Lunas subreach, a section of the Middle Rio Grande Valley between Isleta Diversion Dam (RM 169) and the community of Los Chaves, at RM 153.

The survey resulted in the documentation of two historic linear feature segments and eighteen Isolated Occurrences (IOs). The linear segments are the north/south oriented levees on the east and west sides of the river (Historical Cultural Property Inventory [HCPI] 54858 and 54859 respectively). The HCPIs were recommended as not contributing to the overall eligibility of the entire length of these features. The IOs were recommended not eligible for inclusion in the National Register of Historic Places (NRHP).

Project Components

The project components consist of five bank lowering polygon areas within the channel/floodway. These project components will improve the channel conveyance by increasing the width of the river both on the west and east banks of the river.

Recommendations and Determinations of Eligibility

SRI recommended that the segments of HCPI 54858 and 54859 documented for this undertaking non-contributing elements to the overall eligibility of the two linear features. Additionally, SRI recommended that the IOs are not eligible for inclusion in the NRHP. Reclamation concurs with these recommendations and finds that the historic levee segments are non-contributing and none of the IOs are eligible.

Recommended Mitigation

The project area was thoroughly surveyed, and all cultural resources recorded. There will be no impact to significant cultural properties and Reclamation finds that there will be *no affect* to historic properties in this undertaking. The project should go forward with no further archaeological stipulations. At this time Reclamation is requesting concurrence from your office with these findings.

As always, we look forward to working with you on this important project. Please direct your questions and comments to Dr. John Cater at (505) 418-6377 or email jcater@usbr.gov. Individuals who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services.

Sincerely,

SHARON WIRTH Digitally signed by SHARON WIRTH
Date: 2024.11.01 08:05:00 -06'00'

FOR Jennifer Faler, P.E.
Area Manager

Enclosure