USDA United States Department of Agriculture

Draft Watershed Plan and Environmental Assessment

Skull Valley Watershed Project

Tooele County, Utah

Lead Federal Agency:
USDA Natural Resources Conservation Services

Sponsoring Local Organizations:
Tooele County | Skull Valley Band of Goshute Indians

July 2026

Utah State Office
Natural Resources Conservation Service
nrcs.usda.gov/

Draft
Watershed Plan and Environmental Assessment
for the
Skull Valley Watershed Project
Tooele County, Utah

Lead Agency: U.S. Department of Agriculture Natural Resources Conservation Service (NRCS).

Sponsoring Local Organization: Tooele County and Skull Valley Band of Goshute Indians.

Cooperating Agency: None

Authority: This Watershed Plan and Environmental Assessment (Plan-EA) has been prepared under the authority of the NRCS Watershed and Flood Prevention Operations Program, which includes the Flood Prevention Operations Program authorized by the Flood Control Act of 1944 (Public Law [PL] 78-534) and the provisions of the Watershed Protection and Flood Prevention Act of 1954 [Public Law 83-566 (PL 83-566) Stat. 666 as amended (16 U.S.C Section 1001 et seq.).

Abstract: The Skull Valley Watershed Project (Project) includes flood prevention measures on the Skull Valley Band of Goshute Reservation in Tooele County, Utah. The purpose of the Project is to prevent flooding to the developed community of the Skull Valley Band of Goshute Reservation (Reservation). There is a need to protect the Reservation structures, roads, utilities, people, and property within the floodplain.

One No Action Alternative and two Action Alternatives were evaluated in detail in the Plan-EA. The proposed action (preferred alternative) for the Project is the Berm and Channel Improvements Reduced Riprap Alternative which was also determined to be the National Environmental Efficiency Alternative. Proposed modifications would redirect flood/debris flows from the Stansbury Mountains around the developed Reservation community by constructing diversion berms and conveyance channels, and by modifying existing conveyance channels. The alternative measures provide long-term benefits for reduced flooding to the developed Reservation community and decrease associated safety hazards. This alternative was determined to be the least cost alternative that successfully meets the goals for the flood prevention authorized Project purpose. The installation cost estimate for this Alternative is $1,533,000.

Comments: NRCS has completed this Draft Watershed Plan and Environmental Assessment (Plan-EA) in accordance with the National Environmental Policy Act (NEPA) and NRCS guidelines and standards. Reviewers should provide their comments to NRCS during the allotted Draft Plan-EA review period. Comments need to be submitted by September 10, 2026, to become part of the Administrative Record. Please send comments to NRCS:

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WATERSHED PLAN AGREEMENT

(TO BE INCLUDED IN FINAL PLAN-EA)

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Summary (Office of Management and Budget Fact Sheet)

S-1.0 Title of Proposed Action

Draft Watershed Plan and Environmental Assessment (Plan-EA) for the Skull Valley Watershed Project (Project)

S-2.0 Watershed Name

Skull Valley Watershed

S-3.0 County, State

Tooele County, Utah

S-4.0 Congressional District

Utah Congressional District 2

S-5.0 Sponsoring Local Organizations

The Sponsoring Local Organizations (SLOs) for the Project are Tooele County and Skull Valley Band of Goshute Indians.

S-6.0 Cooperating Agency

There are no cooperating agencies for the Project.

S-7.0 Authority

This Plan-EA has been prepared under the authority of United States Department of Agriculture Natural Resources Conservation Service (NRCS) Watershed and Flood Prevention Operations (WFPO) Program, which authorizes funding to help urban and rural communities protect, improve, and develop land resources in watersheds up to 250,000 acres in size. The WFPO Program includes the Flood Prevention Operations Program authorized by Flood Control Act of 1944 (Public Law [PL] 78-534) and the provisions of the Watershed Protection and Flood Prevention Act of 1954 (PL 83-566) Stat. 666 as amended (16 U.S.C. Section 1001 et seq.). The Plan-EA has been prepared in accordance with Section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969, Public Law 91-190, as amended (42 U.S.C. 4321 et seq.).

S-8.0 Purpose and Need for Action

The purpose of the Project is to prevent flooding to the developed community of the Skull Valley Band of Goshute Reservation. There is a need to protect the Reservation structures, roads, utilities, people, and property within the floodplain.

S-9.0 Description of Preferred Alternative

Proposed modifications would redirect flood/debris flows from the Stansbury Mountains around the developed Reservation community. This would be accomplished by constructing two diversion berms, installing new conveyance channels, and modifying existing conveyance channels.

S-10.0 Resource Information

Table S-1. Existing Resoure Information

Resource	Description
Latitude / Longitude (WGS84)	40.3987° / -112.7219°
Hydrologic Unit Name / Code[1]	Indian Hickman Canyon / 160203050203
Watershed Climate[2]	High Elevations (Mountains): July average high/low: 81°F / 47°F January average high/low: 47°F / 5°F Low Elevations (Desert): July average high/low: 90.4°F / 75°F January average high/low: 43°F / 13.5°F
Watershed Topography	Elevation Range 4,400 to 11,000 feet Steep mountain terrain transitioning to wide desert valley at the mountain base.
Average Annual Precipitation	High Elevations (Mountains): 34.75 inches Low Elevations (Desert): 10.0 inches
Proposed Skull Valley Watershed Area	107,558 acres (168 square miles)
Land Uses of Watershed	Reservation 19,865 acres Cultivated Agricultural 1,725 acres Public Lands (State/BLM/USFS) 63,635 acres Private Open Land 22,333 acres
Land Ownership of Watershed	Tribal 19,865 acres or 18% Federal/State 63,635 acres or 59% Private 24,058 or 23%
Population (Reservation[3])	30
Farms Present (Toole County[4])	540 Farms
Land in Farms (Toole County[4])	348,934 acres
Average Farm Size (Toole County[4])	646 acres

[1] Source: U.S. Environmental Protection Agency (EPA) 2021a
[2] Source: National Oceanic Atmospheric Administration (NOAA) 2021
[3] Rural Community Assistance Corporation 2019
[4] USDA 2017

S-11.0 Alternative Plans Considered

Alternative plans considered in detailed study and evaluated in this Plan-EA include the No Action Alternative and two Action Alternatives consisting of the Berm and Channel Improvements Full Riprap Alternative and the Berm and Channel Improvements Reduced Riprap Alternative. The Berm and Channel Improvements Reduced Riprap Alternative is the preferred alternative and is the National Economic Efficiency (NEE) Alternative for the Project. Several other alternatives were considered during the planning process but were eliminated from detailed study due to environmental impacts; if they were considered infeasible, had exorbitant costs, or did not meet the purpose and need of the Project; or other critical factors. A description of the alternatives

analyzed in detailed study and associated installation and operation and maintenance (O&M) costs are included below. The installation costs for the alternatives were prepared to equal levels of detail judged appropriate for identification of the NEE alternative. Installation costs include construction, engineering, permitting, and administration. Real property rights, natural resource rights, replacement in-kind, and relocation payments are not applicable to this Project.

No Action Alternative – The No Action Alternative considers the actions that would take place if no federal action or federal funding were provided for the Project. The No Action Alternative would not improve site conditions to reduce flooding and the developed Reservation community would continue to be flooded. There are no installation costs associated with this alternative. Operations and maintenance (O&M) activities would continue with an estimated annual cost of $6,000.

Berm and Channel Improvements Full Riprap Alternative – The Berm and Channel Improvements Full Riprap Alternative would consist of constructing berms and improving flood conveyance channels to divert floodwater around the Reservation community for all storm events up to and including a 100-year frequency flood. This includes installing diversion berms with flood conveyance channels on the north side and south side of the developed Reservation community, and modifications to an existing channel. Approximately 3,540 linear feet of new berms and channels would be installed and armored as appropriate. Modifications along an existing channel would consist of widening and armoring both banks of the channel along approximately 200 linear feet. The total installation cost is estimated at $2,742,000 with O&M estimated at $8,100 per year.

Berm and Channel Improvements Reduced Riprap Alternative – The Berm and Channel Improvements Reduced Riprap Alternative would consist of the same measures as described for the Berm and Channel Improvements Full Riprap Alternative, but the amount of riprap armoring would be reduced to the Reservation side of the new/modified channel segments. The total installation cost is estimated at $1,533,000 with O&M estimated at $8,100 per year.

S-12.0 Project Costs and Funding Source

The breakdown of the estimated installation cost of for the Berm and Channel Improvements Reduced Riprap Alternative (NEE Alternative and preferred alternative) is provided in Table S-2. NRCS provides full PL 83-566 funding for construction and engineering of measures with an authorized purpose of flood prevention. The SLO is responsible for permitting and costs associated with their own administrative time to install the Project. NRCS is also responsible for their own administrative time to install the Project measures.

Table S-2. Estimated Project Installation Cost

Item	PL 83-566 Funds		Other Funds		Total	
Construction	$1,365,000	100%	-	0%	$1,365,000	89%
Construction	$1,365,000	100%	-	0%	$1,365,000	89%
Engineering	$105,000	100%	-	0%	$105,000	7%
Permits	-	0%	$10,000	100%	$10,000	<1%
Project Administration	$32,000	N/A	$21,000	N/A	$53,000	3.5%
Total	$1,502,000	98%	$31,000	2%	$1,533,000	100%

S-13.0 Project Benefits

Benefits for the preferred alternative included flood damage reduction and were calculated at using the NRCS 2023 discount rate of 2.5% annualized over 100-years and a 101-year period of analysis. The annual flood damage reduction benefit was estimated at $80,700. All flood damage reduction benefits are considered agricultural related benefits based on the population of 30 people for the Reservation.

S-14.0 Net Economic Benefits

Net economic benefits were calculated by comparing the preferred alternative annual costs to the annual benefits and are included in Table S-3.

Table S-3. Estimated Annual Net Economic Benefits

Total Annual Benefits	Total Annual Costs	Benefit-Cost Ratio	Net Economic Benefits
$80,700	$48,800	1.7	$31,900

S-15.0 Period of Analysis

The period of analysis is the time required for installation of the Project plus the evaluated life (project life). All alternatives were evaluated with a period of analysis of 101 years (100-year project life plus 1 year for installation).

S-16.0 Project Life

The Project would meet a life of 100-years.

S-17.0 Environmental Impacts

Table S-4 lists the resources of concern and associated environmental consequences associated with the preferred alternative. Resources that would not be impacted by the project are not listed in this table.

Table S-4. Summary of Resource Concerns and Impacts

Resource Concern	Summary of Concern	Consequence
Soil		
Upland Erosion	Disturbance to soils from proposed Project actions	Proper Best Management Practices (BMPs) would be installed during and after construction and disturbed areas would be restored and/or stabilized. Direct minor impacts during construction are anticipated in the short term until ground cover becomes established and areas have been stabilized. No long-term impacts are anticipated.
Sedimentation	Sedimentation to developed Reservation Community from flooding	An indirect benefit of reduced sedimentation to the developed Reservation community is anticipated over the long term, reducing damage to Reservation structures, infrastructure, and property.

Resource Concern	Summary of Concern	Consequence
Prime and Unique Farmland	Soil designated as "farmland of statewide importance" is present in the Project area	Minor direct impacts to soil classified as "farmland of statewide importance" would occur from temporary disturbance in the short term, but the areas would be restored to preconstruction conditions after construction completion Permanent direct impacts would occur from fill/excavation activities but would be negligible considering the impact only occurs on approximately 0.06% of the available "farmland of statewide importance" within the Reservation. A long-term reduction in flooding to soil classified as "farmland of statewide importance" would occur that would have a minor indirect benefit to these lands.
Water		
Surface Water Quality	Construction activities have the potential to temporarily impact surface water quality.	Construction activities would have negligible impacts to water quality based on implementation of BMPs and construction timing occurring when water is not present. Construction BMPs would be used to reduce sediment entering waters and activities would not violate federal or state water quality rules and regulations. No long-term impacts are anticipated.
Waters of the U.S.	Disturbance within jurisdictional waters of the U.S.	Direct temporary impacts from disturbance to 895 linear feet of channel would occur, but the disturbed areas would be restored after construction completion to allow similar channel function. Direct permanent impacts would occur from removal of approximately 145 linear feet of channel, but approximately 3,740 linear feet of new channel would be constructed. This would result in a net increase of 3,595 linear feet of channel.
Floodplain Management	Change to floodwater conveyance	Long-term indirect benefits of reduced flooding to the developed Reservation community are anticipated. Flood protection would be provided to the developed community for up to and including a 100-year frequency flood, and flooding would be substantially reduced for the 500-year flood. This would improve the resilience to climate change stressors to better adapt to the anticipated rise in extreme precipitation events and flooding.
Air		
Air Quality	Emissions from construction activities	Short term minor increases in emissions concentrated around the construction site are anticipated. Construction activities would not violate air quality standards and BMPs would be implemented. There would be no long-term impacts to air quality.
Plants		
Noxious Weeds and Invasive Plant Species	Increases risk of noxious weeds and invasive species from ground disturbance.	Short-term direct impacts would occur during construction and until re-establishment of vegetative cover that would put the area at risk for invasion of noxious weeds and invasive plants. A Post Construction Rehabilitation Plan (PCRP) would be developed, and short-term impacts would be minor with implementation of BMPs and development of a PCRP. Long-term impacts are not anticipated.

Resource Concern	Summary of Concern	Consequence
Animals		
Wildlife and Wildlife Habitat	Disturbance to general wildlife habitat	Temporary direct disturbance would occur on approximately 32.93 acres of wildlife habitat, including crucial pronghorn habitat. These short-term impacts to wildlife/habitat would be minor and disturbed areas would be restored upon construction completion. Permanent removal of approximately 0.5 acres of habitat, including crucial pronghorn habitat, would occur from construction of a gravel access road. These long-term impacts are considered negligible as the permanent removal only consists of 0.004% of the available habitat within the Reservation. Measurable long-term impacts are not anticipated.
Migratory Birds / Golden Eagles	Construction disturbance in potential habitat	Migratory birds could be present for foraging and nesting, and golden eagles could be present in the Project area while foraging. Preconstruction surveys would be performed, and spatial buffers would be established as necessary in coordination with U.S. Fish and Wildlife Service (USFWS). Impacts to migratory birds and golden eagles and associated habitat would be short term and minor to negligible during construction based on the duration of construction, restoration of disturbed areas, abundant suitable habitat in the surrounding area, and avoidance/ minimization measures in place. Long-term impacts to migratory birds and golden eagles are not anticipated.
Special Status Animal Species	Construction disturbance to suitable habitat	There would be no impacts to Endangered Species Act (ESA) animal species, designated critical habitat, or suitable habitat because none are present. State Species of Greatest Conservation Need (SGCN) burrowing owl, ferruginous hawk, golden eagle, and kit fox have the potential to be present. Short-term direct disturbance to the species (if present) or habitat would be minor to negligible based on duration of construction, restoration of disturbed areas, abundant suitable habitat in the surrounding area, and avoidance/ minimization measures in place. Long-term impacts are not anticipated.
Human		
Socioeconomics	Economic and social implications to the flooded Reservation community	Long-term indirect benefits would be provided to the Reservation, which has been identified as a disadvantaged community, from reduced flooding and associated reduced flood damage. Benefits of avoided flood damage are estimated at $80,700 annually.
Public Health and Safety	Flood hazard safety risk to Reservation	The developed Reservation community would be protected from flooding for up to and including a 100-year frequency flood. This would have long-term indirect benefits that improve the tribe's health and safety by avoiding risk of flood-related loss of life and mental/physical health issues.

Resource Concern	Summary of Concern	Consequence
Visual Resources	Disturbed grounds and construction equipment	Short-term direct impacts to visual quality are anticipated during construction from disturbed ground and equipment parked or operating in the Project area. Impacts would be minor during construction, but disturbed areas would be restored. No measurable long-term impacts to visual quality are anticipated.
Transportation Infrastructure	Flooding to Skull Valley Reservation Road	Skull Valley Reservation Road would be protected from flooding for up to and including a 100-year frequency flood, providing long-term indirect benefits of reduced flood damage. There would be no measurable changes to flooding of Highway 196. Short-term impacts are not anticipated.
Noise	Construction activities would produce noise	Short-term minor impacts are anticipated during construction, but BMPs would be in place and there would be no violations of applicable noise programs/regulations. Long-term impacts to noise from O&M activities would be negligible.
Historic Properties/ Cultural Resources/ Native American Religious Concerns	Potential presence of cultural sites	Per 36 CFR 800.5(b), the NRCS determined that there would be no adverse effect to historic properties. Section 106 consultation was performed to comply with National Historic Preservation Act (NHPA), EO 13007, EO 13175, and the American Indian Religious Freedom Act (AIRFA). The State Historic Preservation Office concurred with the determinations of eligibility and the no adverse effect to historic properties determination for the Project in a letter dated April 20, 2023. No Native American religious concerns were identified by tribes during consultation, pursuant to EO 13007, EO 13175, the NHPA and the AIRFA.

S-18.0 Major Conclusions

The preferred alternative meets the purpose and need of the Project, as well as the goals and objectives. It provides long-term benefits for reduced flooding to the developed Reservation community that includes a disadvantaged community of minority and low-income populations, and decreases public health and safety hazards. It is the alternative with the lowest cost and greatest environmental, social, and economic benefits that successfully meets the goals for the flood prevention authorized Project purpose. Additionally, no measurable long-term adverse impacts are anticipated from implementation of the alternative measures.

S-19.0 Areas of Controversy and Issues to be Resolved

There are no known areas of controversy or issues for implementation of the preferred alternative.

S-20.0 Evidence of Unusual Congressional or Local Interest

There is no known evidence of unusual congressional or local interest in the Project.

S-21.0 In Compliance

Is this report in compliance with executive orders, public laws, and other statutes governing the formulation of water resource projects? ☒ Yes ☐ No

1.0 Actions Requiring Preparation of a Watershed Plan

1.1 Introduction

As the lead federal agency, the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) is proposing a new flood prevention watershed project within the NRCS proposed Skull Valley Watershed. The Skull Valley Watershed Project (Project) is proposed in cooperation with the Sponsoring Local Organizations (SLOs), Tooele County and Skull Valley Band of Goshute Indians. This Watershed Plan and Environmental Assessment (Plan-EA) evaluates alternatives to reduce flooding to the developed community within the Skull Valley Band of Goshute Reservation (Reservation).

The Project is being authorized through the Watershed and Flood Prevention Operations Program, which helps urban and rural communities protect, improve, and develop land resources in watersheds up to 250,000 acres in size. This Plan-EA was prepared for NRCS to comply with U.S. Department of Agriculture (USDA) requirements of the National Environmental Policy Act (NEPA) of 1969 and its implementing regulations at 7 CFR Part 1b; the Principles, Requirements, and Guidelines for Federal Investments in Water Resources (PR&G) (CEQ 2013 and 2014); and NRCS policy and guidelines (NRCS 2010 and 2016a). The Plan-EA assists NRCS in determining if the selected alternative would have a significant impact on the quality of the human environment and if preparation of an Environmental Impact Statement is required.

1.1.1 Plan-EA Format and Procedures

This document combines an NRCS Areawide Watershed Plan and an Environmental Assessment into one product. The format of this document follows the plan format outline that must be followed for Watershed Project Plans as outlined in the NRCS National Watershed Program Manual (NWPM) Parts 500 through 506 (NRCS 2015a), and as guided by the NRCS National Watershed Program Handbook (NWPH), Parts 600 through 606 (NRCS 2014). The planning and decision-making process followed PR&G (CEQ 2013 and 2014), the PR&G eight step evaluation process (refer to the PR&G Analysis Report included in Appendix E), and the nine-step planning procedures from the National Planning Procedures Handbook (NRCS 2021a).

Areawide Watershed Plans are voluntary, comprehensive plans for a watershed or other large geographic area. Planning policy for them requires consideration of all natural resources within a planning area, as well as social and economic considerations. Areawide Watershed Plans are developed through a voluntary locally led effort to achieve the following:

- Assess natural resource conditions and needs,
- Set goals,
- Identify programs,
- Alternative actions and other resources to solve those needs,
- Develop proposals and recommendations to solve those needs,
- Implement solutions, and
- Measure success

The NRCS planning process consists of nine steps, divided into three phases covering development, implementation, and evaluation of an Areawide Conservation Plan. The nine-step planning process was considered and incorporated into this Plan-EA as identified below.

Phase 1 - Collection and Analysis

- Step 1 - Identify Problems and Opportunities: Problems and opportunities were identified during the Project scoping process and are included in Section **Error! Reference source not found.** (Support for Purpose and Need and Watershed Problems). Input from the Sponsors, agencies, the public, organizations, and tribes were solicited as described in Sections 3.0 (Scope of the Plan-EA) and Section 7.3.2 (Project Scoping) to help identify problems and opportunities. Engineering analysis was completed to further identify and evaluate problems as documented in the engineering technical memorandums (TMs) included in Appendix E.
- Step 2 - Determine objectives: The purpose and need statement for the project was formulated with the problems and opportunities in consideration. Where the “purpose” identifies the fundamental reason why the action is being proposed and the “need” describes the problem/s that the proposed action is intended to address and explains the underlying causes of the problem/s. The purpose and need statement and information supporting the purpose and need is included in Section 2.0 (Purpose and Need).
- Step 3 – Inventory Resources: Resources relevant to the proposed action were determined during the scoping process as described in Section 3.0 (Scope of the Plan-EA). The existing conditions of resources determined to be relevant are documented in Section 4.0 (Affected Environment).
- Step 4 – Analyze Resource Data: The environmental baseline conditions for resources to be evaluated against alternative actions were identified and are included in Section 4.0 (Affected Environment). The best available data and science was used to inventory the existing resource conditions at the level and scale of analysis determined reasonable for evaluating alternatives and impacts.

Phase 2 Decision Support

- Step 5 – Formulate Alternatives: Project alternatives were formulated in consideration of the federal objective as set forth in the Water Resources Development Act of 2007, the PL 83-566 general purposes, and the Project purpose and need. Alternatives were formulated following procedures outlined in the NWPM, NWPH, and PR&G. Alternatives formulated are described in Section 5.0.
- Step 6 – Evaluate Alternatives: The effects of alternatives included in detailed study were determined for each resource relevant to the proposed action. The evaluation of alternatives is included in Section 6.0 (Environmental Consequences) and assessed the proposed alternatives against the baseline data presented in Section 4.0 (Affected Environment).
- Step 7 - Make Decisions: A National Economic Efficiency (NEE) alternative, also identified as the Project preferred alternative, was selected based on the evaluation performed. The selection was made for the alternative that best maximized public benefits (environmental, economic, and social) with appropriate consideration of costs. Section 8.0 (Preferred

Alternative) provides information on the decision-making process for selection of the preferred alternative.

Phase 3 Application and Evaluation (Future Work)

- Step 8 – Implement the Plan: The Plan-EA is the first phase of three phases to be completed for implementation of the preferred alternative. After the Final Plan-EA is completed, phase 2 would consist of final design, and phase 3 installation of the Project measures.
- Step 9 – Monitor the Plan: After the installation of measures from phase 3, NRCS and the Sponsors would evaluate the effectiveness of the plan in solving the resource concerns. Adjustments to the plan would be made as needed.

1.2 Proposed Watershed Boundary

The proposed Skull Valley Watershed developed for the Watershed Plan consists of a compilation of four sub-watersheds (Table 1-1 and Figure 1-1) totaling 107,558 acres (168 square miles) that are intersected by the Reservation (Appendix B – Map B1).

Table 1-1. Sub-watersheds of Skull Valley Watershed

Sub-watershed (HUC 12) Name	HUC 12 No.	Acres
Antelope Canyon	160203050202	30,531
Indian Hickman Canyon	160203050203	25,362
Spring Creek	160203050201	23,802
Wide Hollow	160203050301	27,863
	Total	**107,558**

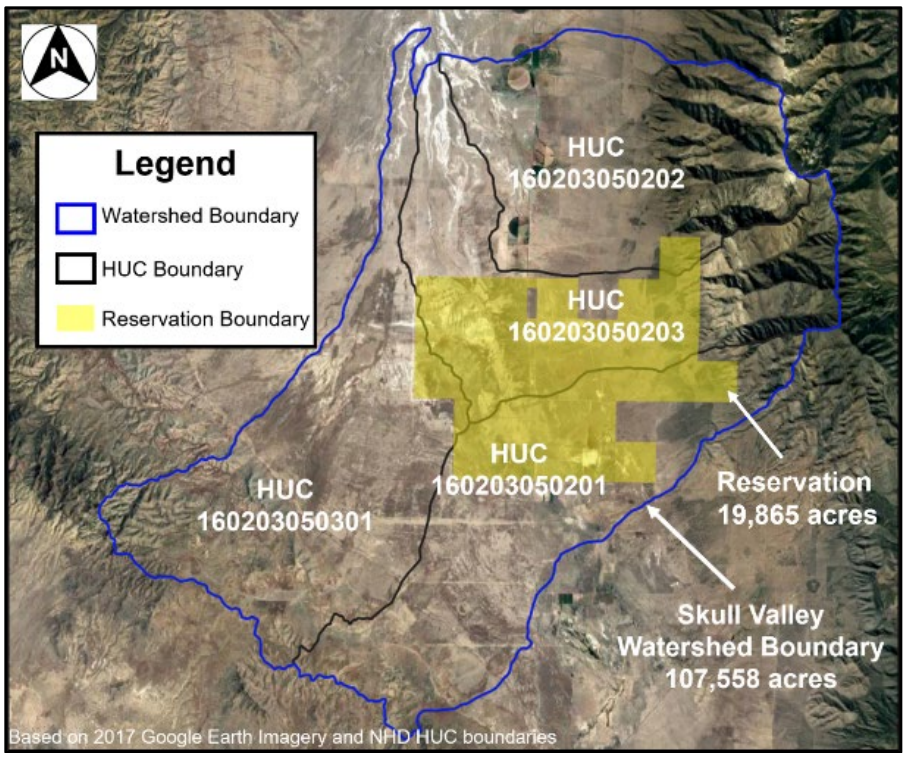

Figure 1-1. Sub-watersheds of Skull Valley Watershed

2.0 Purpose and Need

2.1 Purpose and Need Statement

The purpose of the Project is to prevent flooding to the developed community of the Skull Valley Band of Goshute Reservation. There is a need to protect the Reservation structures, roads, utilities, people, and property within the floodplain.

2.2 Support for Purpose and Need and Watershed Problems

The boundary of the Reservation, formed in 1912 and enlarged in 1917, limited tribal lands to approximately 19,865 acres on alluvial fan systems and low-lying areas that flood frequently. The developed Reservation community is located on an alluvial fan at the base of the Stansbury Mountains. The mountains are very steep, rising from an approximate elevation of 5,600 feet at the base where the alluvial fan begins to 10,000 feet at the summit. During precipitation events and snowmelt, water from the drainage areas is conveyed down two intermittent creeks, Indian Hickman Creek and an unnamed creek towards the developed Reservation community. When the water exits the canyons at the base of the Stansbury Mountains, flows spread out over the alluvial fan and flow paths may vary for each storm based on the loose soils/sediments and natural geologic nature of alluvial fan systems. This has resulted in historic alternating flood paths impacting the developed Reservation community.

A Floodplain Management Plan was developed for the Reservation (Skull Valley Band of Goshute 2018). The Floodplain Management Plan reported that the flood history of the Reservation is challenging due to a lack of written records and existing technology for data-collection (Skull

Valley Band of Goshutes 2018). Documentation for three flood events was provided in the Floodplain Management Plan occurring in 1878, 2013, and 2014. Anecdotal information was also gathered from elders living on the Reservation from floods occurring in the 1970's, early 1950's, and late 1930's, but documentation of these flood events does not exist (Skull Valley Band of Goshute 2018). The 1878 flood documentation from a historical manuscript noted the most torrential rain ever known in this locality causing the largest and most destructive flood since the settlement was made. The flood was caused by a cloud burst in the upstream drainage areas. Dry creek beds were filled with swift moving water so quickly after the storm, that two residents camped in the creek bed were unable to get out of the channel, were swept away, and drowned.

Some of the most damaging flooding occurred recently as debris flows following a fire in the upstream drainage areas. In 2013, the Patch Springs Fire burned more than 13,000 acres of land within the upstream drainage areas above the Reservation. The burn was followed by an intense rainstorm in September 2013 that triggered mud and debris flows, which mobilized out of Indian Hickman Canyon. The Floodplain Management Plan notes mud and debris was split into numerous paths with some along existing channels and others creating new paths. Mud was deposited across roads, in yards, in gardens, and around homes within the Reservation during the event (Skull Valley Band of Goshute 2018). In August 2014, Indian Hickman experienced several intense rainstorm events, leading to multiple flood events (Skull Valley Band of Goshute 2018). The Floodplain Management Plan reported that several hundred to thousands of cubic yards of debris were mobilized in Indian Hickman Canyon and deposited onto the alluvial fan. The event destroyed the irrigation water diversion and associated water pipeline, and washed out the culinary water delivery system to the Reservation. It filled the Reservation fire suppression pond with sediment, clogging the system. Residential structures and road infrastructure were impacted on the Reservation.

Emergency actions were taken following the 2013 and 2014 flood events. The Bureau of Land Management (BLM) invested $1.5 million to implement several Emergency Stabilization and Rehabilitation (ESR) treatments on the Patch Springs fire area to stabilize soils, reduce the threat of flash flooding, and combat cheatgrass invasion (Skull Valley Band of Goshute 2018). The NRCS placed over 2,800 feet of precast concrete road barriers (K-rails) after the 2013 flood to divert flood water and debris flows away from the developed Reservation community (Figure 2-1). The intense rainstorm that occurred in 2014 covered the K-rails (Figure 2-1), and new K-rails were placed in 2014 after the event (Figure 2-2). Subsequent flood events have since filled in sediment behind the new K-rails (Figure 2-2). The NRCS also installed 5,750 feet of waterline to an abandoned water tank on the Reservation to replace the lost water supply. The pond is no longer used to store water.

Measures are needed to protect the existing developed Reservation community from flooding and associated damage. Based on the Reservation Floodplain Management Plan (Skull Valley Band of Goshute 2018), critical structures that are defined as structures of economic, cultural, or resource value to the Skull Valley Band Goshute, may be in danger of flooding. The Floodplain Management Plan identified an area for critical structures that included their east well house, community center, cemeteries, and bison field. A hydrologic analysis was completed for the drainage areas upstream of the Reservation (Bowen Collins & Associates [BC&A] 2022a) to calculate flows produced during various frequency storm events (Appendix E). Flood modeling of these storm events show flooding occurs to Reservation community structures, including the area containing critical structures, for all modeled flood events that include a 20% probability (5-year flood) to a 0.2% probability flood event (500-year flood).

Figure 2-1. K-Rails 2013 and 2014 Flood

Figure 2-2. 2014 K-Rails and Current Condition

3.0 Scope of the Plan-EA

A scoping process was completed to identify relevant resources or environmental concerns to be analyzed in detail and to determine which resources or concerns could be eliminated from detailed study. Resource concerns were identified for the Project based on required scoping concerns outlined in the NWPM Section 501.24 B (NRCS 2015a) and from any additional concerns identified by the public, the SLOs, or agencies during the scoping meeting and/or other planning or public meetings.

A scoping meeting for the Project was held virtually on June 9, 2020. The meeting presented the overall project and Plan-EA process. It also provided opportunities for the public, tribes, SLOs, agencies, and any other attendees to express specific concerns and their relevance to the proposed action. The SLOs were involved in scheduling of the Scoping Meeting and personnel

from both Tooele County and the Skull Valley Band of Goshute Indians attended the meeting. All Skull Valley Band of Goshute Indian tribal members were invited to the meeting by the tribe chairperson. One scoping comment was received during the announced open comment period (May 26, 2020 through July 10, 2020). The comment received was considered in preparation of the Plan-EA. A Scoping Report was prepared summarizing the scoping process and is included in Appendix E.

A summary of resource concerns and their relevance to the proposed action was determined during the scoping process and is provided in Table 3-1 below. Resource items determined to not be relevant to the proposed action have been eliminated from detailed study. Resource items determined to be relevant to the proposed action have been included in detailed studies described in this Plan-EA.

Table 3-1. Resource Concerns Summary

Item/Concern	Relevant to the Alternatives?		Rationale
	Yes	No	
Soil			
Upland Erosion	X		Construction disturbance could increase erosion potential.
Sedimentation	X		Alternative measures would change sediment transport conditions.
Prime and Unique Farmland	X		The Project area does not contain prime and unique farmland, but does contain farmland of statewide importance.
Water			
Surface Water Quality	X		Alternative ground disturbing activities could affect surface water quality.
Surface Water Quantity		X	Alternative actions do not store, consume, or produce surface water resources. Therefore, there would be no change to surface water quantity. However, flow patterns around the Reservation would change and are discussed in the Waters of the U.S. and Floodplain Management resources.
Ground Water Quantity		X	There would be no change to groundwater quantity from alternative actions.
Waters of the U.S.	X		Waters of the U.S. are located within the Project area.
Wetlands		X	Based on a wetland delineation conducted for the Project area (see Skull Valley Aquatic Resources Report in Appendix E), no wetlands are present.

Item/Concern	Relevant to the Alternatives?		Rationale
	Yes	No	
Regional Water Mgt. Plans and Coastal Zone Management Areas		X	No regional water management plans are in place for the Project area based on review of the Utah Division of Water Rights management plans (Utah Division of Water Rights 2024) or the Tooele County Resource Management Plan (Tooele County 2022). Coastal Zone Management Areas are not applicable (N/A) because the watershed is located in a landlocked state with no coastal areas.
Floodplain Management	X		Project actions will directly modify flood conditions and impact floodplain management.
Wild and Scenic Rivers		X	None in or near the Project area, according to National Wild and Scenic Rivers System (NWSRS) interactive Map (NWSRS 2021) and the Nationwide Rivers Inventory (NPS 2024).
Sole Source Aquifers		X	No sole-source aquifers are in or near the Project area, according to U.S. Environmental Protection Agency (EPA) Sole Source Aquifer interactive map (EPA 2021b).
Air			
Air Quality	X		Alternative construction activities would produce emissions and fugitive dust.
Clean Air Act		X	The Project area is not located in a Utah Department of Environmental Quality (UDEQ) or EPA non-attainment area (UDEQ 2021 and EPA 2024a) and would not generate long-term emissions. The UDEQ Division of Air Quality (UDAQ) confirmed that a permit would not be required for construction activities that do not use non-road construction equipment (Appendix A).
Greenhouse Gases / Climate Change	X		Construction equipment could emit greenhouse gases during construction.
Plants			
Special Status Plant Species	X		Endangered Species Act (ESA)-listed plants, designated critical habitat, or suitable habitat are not located within the Project area, but are included in detail study to document compliance with Section 7 of the ESA.
Forest Resources		X	There are no forested lands located within the Project area.
Noxious Weeds and Invasive Plant Species	X		Alternative construction disturbance increases risk of invasive plant species becoming established.

Item/Concern	Relevant to the Alternatives?		Rationale
	Yes	No	
Protected Natural Areas/ Conservation Areas		X	There are no protected natural areas or conservation areas located in the Project area based on a review of BLM conservation areas (BLM 2024), U.S. Forest Service (USFS) Research Natural Areas (RNAs) (USFS 2024).
Riparian Areas		X	There is no riparian habitat located in the Project area based on site observations by Adaptive Environmental Planning performed on July 10, 2019 and November 9, 2021.
Animals			
Essential Fish Habitat		X	There is no essential fish habitat located in the Project area based on National Oceanic and Atmospheric Administration (NOAA) fisheries Essential Fish Habitat Mapper (NOAA 2024).
National Wildlife Refuges / Wilderness Areas		X	The Project area is located two miles west of the Desert Peak Wilderness (Wilderness Connect 2021), but alternative measures would not impact this wilderness. There are no Wildlife Refuges in or near the Project area (USFWS 2021a).
Fish and Wildlife Habitat	X		There is no permanent or regularly flowing surface water within the Project area that provide fish habitat. Alternative construction activities would disturb general wildlife and wildlife habitat.
Coral Reefs		X	Not applicable.
Special Status Animal Species	X		ESA-listed animals, designated critical habitat, or suitable habitat are not located within the Project area, but are included in detail study to document compliance with Section 7 of the ESA. State-listed Species of Greatest Conservation Need have the potential to occur in the Project area.
Invasive Animal Species		X	No potential for introduction of invasive animals.
Migratory Birds / Bald and Golden Eagles	X		Migratory birds/golden eagles and associated habitat are present within the Project area. Bald Eagles and associated habitat are not present.

Item/Concern	Relevant to the Alternatives?		Rationale
	Yes	No	
Human			
Socioeconomics	X		Alternatives could impact socioeconomic conditions of the Reservation.
Historic Properties / Cultural Resources / Native American Religious Concerns	X		Alternative actions were determined to have No Adverse Effect to historic properties. No cultural or native American religious concerns were identified. However, this resource is included in detailed study to document compliance with Section 106, EO 13007, EO 13175, the American Indian Religious Freedom Act (AIRFA), and the National Historic Preservation Act (NHPA)
Hazardous Materials		X	Hazardous materials within the Project area do not appear to be a concern at this time, but on-site surveys would be necessary to ensure the absence of potential hazardous materials prior to construction. Equipment and associated fuels would be working/stored on-site during construction, but no effects are anticipated based on adherence to applicable laws and regulations as discussed in Section 8.3.
Public Health and Safety	X		Alternatives are proposed to reduce flooding and safety risks to the developed Reservation community.
Recreation		X	No recreation sites or public lands occur in the Project area.
Land Use / Public Access		X	Public access is not permitted on Reservation land. Alternatives would not change land use.
Visual Resources	X		There are no scenic views within the Project area. Alternatives may impact visual resources from construction disturbance and equipment.
National Scenic and Historic Trails		X	There are no National Scenic and Historic Trails (NSHT) located in or near Project area according to a National Trails System Map (National Park Service [NPS] 2021a).
Natural Areas and Parklands		X	There are no natural areas or parks located within or near the Project area according to National Parks and Monuments Map (NPS 2021b) and Utah State Parks Map (Utah Department of Natural Resources [UDNR] 2021).
Transportation Infrastructure	X		Alternatives have the potential to change flood conditions for transportation infrastructure.
Noise	X		Alternatives would produce construction-related noise.

Item/Concern	Relevant to the Alternatives?		Rationale
	Yes	No	
Ecological Critical Areas		X	None present in or near the project area based on review of Areas of Critical Environmental Concern (ACEC) (UDOT 2021).
National Landmarks, Monuments, and Historical Sites		X	None located in or near Project area based on National Natural Landmarks Map (NPS 2021c), National Register of Historic Places (NRHP) data (NPS 2020), and National Parks and Monuments Map (NPS 2021b).
Significant Scientific Resources		X	There are no scientific resources in the Project area based on a review of the geologic map (Clark et al. 2012), paleontological sites (Paleobiology Database 2024), NPS maps (NPS 2021a, 2021b, 2021c), and lack of the following identified in this table above; ACECs, national landmarks/monuments, parklands, natural areas, protected areas, conservation areas, NSHT, RNAs, refuges, wilderness areas, and wild and scenic rivers.

4.0 Affected Environment

This section describes the resources that could be affected by the proposed alternatives. Describing the affected environment defines the context in which the impacts could occur. The environmental analysis process has been conducted in compliance with applicable federal, state, and local regulations. Resources relevant to the Project are described in Sections 4.1 through 4.6. The environmental consequences to each of the resources discussed in this section are included in Section 6.0.

The Project area is located within the Reservation, east of Highway 196 and west of the Stansbury Mountains in Tooele County, Utah (Appendix B – Map B1). It includes approximately 92.4 acres of land (Appendix B – Map B2) that contains areas proposed for access and improvements for alternative measures. Table 4-1 summarizes the physical setting of the Project area.

Table 4-1. Physical Setting Summary

Physical Setting Information		Information Source
Location		
The Project area is located on the Reservation, approximately 11 miles north of Dugway in Tooele County, Utah.		N/A
Size		
92.4 acres		Measured from QGIS version 3.16
Topography		
Elevation	4,590 to 5,000 feet	7.5-Minute Series Topographic Map for Deseret Peak West Quadrangle (USGS 2020)
General Topographic Gradient	Sloping west	
Geology		
Geologic Units	Younger alluvial-fan deposits (Qafy) – Holocene poorly sorted gravel with sand, silt, and clay. Sediments deposited by streams, debris flows, and flash floods on alluvial fans and in mountain valleys. Thickness is variable but could be 100 feet or more. Mixed-environment deposits (Qla) – Holocene to upper Pleistocene mixed and reworked, gravelly lacustrine and alluvial deposits on piedmont slopes. Deposits include pre-Bonneville alluvial fans and thin alluvial-fan deposits overlying fine- to coarse-grained lake sediments. Thickness exceeds 30 feet.	Utah Geological Survey Interim Geologic Map of the Rush Valley 30' x 60' Quadrangle (Clark et al. 2012)
Soil		
Soil Types	Hilo Peak gravelly loam (21), Medburn fine sandy loam (42), and Tooele fine sandy loam (69). See Section 4.1 below for soil descriptions.	Web Soil Survey (NRCS 2021b)
Land Information		
Land Ownership	Tribal (Skull Valley Band of Goshute Indians)	Tooele County Parcel Viewer (Tooele County 2021)

4.1 Soil Resources

Soil information presented in this section has been summarized from NRCS Web Soil Survey data (NRCS 2021b). Soils found within the Project area are depicted in Appendix C – Map C1 and listed in Table 4-2. Note that some areas within the Project extents consist of disturbed lands and may not be consistent with the soil descriptions listed below or depicted in the map.

Table 4-2. Soil and Farmland Classification Summary

Soil Unit Name	Landform	Ecological Site1	Slope	Description	Farmland Classification
Hiko Peak gravelly loam (21)	Fan remnants	Semidesert Gravelly Loam (Wyoming Big Sagebrush) North	2-15%	Gravelly to very gravelly loam consisting of mixed alluvium	Farmland of statewide importance
Medburn fine sandy loam (42)	Lake terraces, fan remnants	Semidesert Loam (Wyoming Big Sagebrush)	2-8%	Fine sandy loam consisting of alluvium and/or lacustrine deposits derived from sedimentary rock.	Farmland of statewide importance
Tooele fine sandy loam, (69)	Lake terraces, fan remnants	Desert Loam (Shadescale)	0-5%	Fine sandy loam to fine sand consisting of eolian material, lacustrine sediments, and alluvium derived from mixed rock sources.	Farmland of statewide Importance

[1] Ecological sites comprise a land classification system that describes ecological potential and ecosystem dynamics of land areas. They are used to stratify the landscape and organize ecological information for purposes of monitoring, assessment, and management.

4.1.1 Upland Erosion

Soils within the Project area vary and the erosivity is dependent upon soil characteristics and the erosional forces acting on them. Erosion of surface materials occurs from wind and water interaction. Chemical processes can also help breakdown surface materials and contribute to erosion. Water is the most powerful erosive force and does the most damage when combined with steep gradients. The steeper the terrain, the greater the potential for erosion from water interaction due to increased water velocities.

The soils in the Project area are unrated for erosion hazard potential (NRCS 2021b), but erosion potential is likely minor due to gentle slopes (0 to 15%) and coarse gravelly and sandy soils. More concerning is the erosion potential in the upstream drainage area that was greatly increased in the 2013 Patch Springs Fire. The fire was followed by intense rain events eroding the landscape and creating mud/debris flows that impacted the downstream developed Reservation community (see Section 2.2). The NRCS, Bureau of Indian Affairs (BIA), and Bureau of Land Management (BLM), have provided stabilization measures by constructing earthen berms and seeding the burned area (Skull Valley Band of Goshute 2018) that has helped to reduce erosion potential in the upstream drainage area.

4.1.2 Sedimentation

The Project area is located on an alluvial fan where sediments deposit at the base of steep mountains. These sediments are transported by water from the upstream drainage area and settle out when the steep terrain transitions to flatter terrain. This is the case for Indian Hickman Canyon with the transition to flatter terrain at the base of the Stansbury Mountains (Figure 4-1). An alluvial fan system deposits larger sediments and rock at the upstream areas near the cone and sediment sizes decrease as you travel down the alluvial fan to the base. This is due to the decrease in water channel confinement and velocities from the cone to the base as the fan and channel slopes

decrease, gradually reducing the sediment carrying capacity[1]. Because the developed Reservation community is situated on the alluvial fan and along the main alignment of the current flow path of Indian Hickman Creek, sediments will continue to deposit in and around the community during flood events.

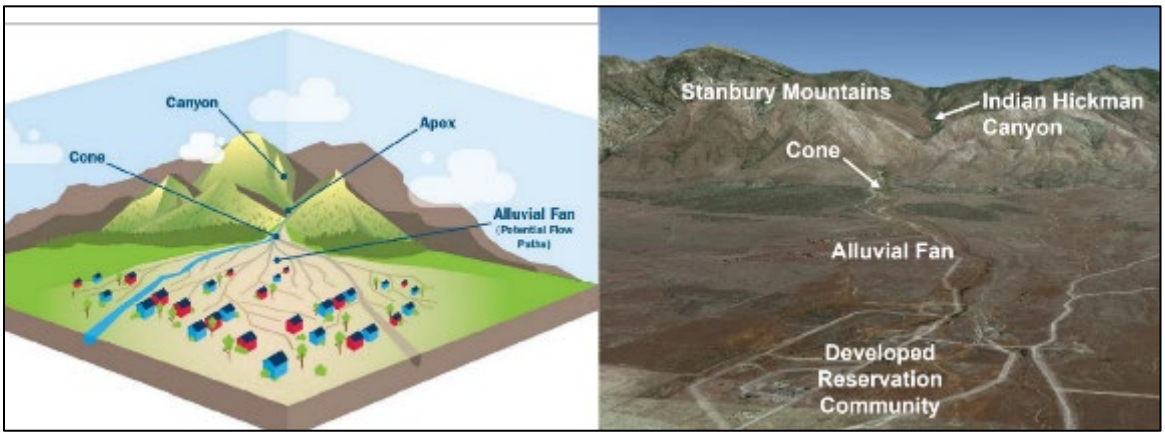

Figure 4-1. Alluvial Fan General Graphic and Aerial
(Source: The figure on the left was taken from the Floodplain Management Plan [Skull Valley Band of Goshute 2018] and the figure on the right is a tilted aerial photograph taken from a 2017 Google Earth Pro aerial image)

4.1.3 Prime and Unique Farmland

NRCS, in cooperation with other interested federal, state, and local governments, has inventoried land that can be used to produce the Nation's food supply. The extent and location of important soils that are best suited for food, feed, fiber, forage, and oilseed crops have been identified and classified as prime farmland, unique farmland, and farmland of statewide or local importance.

Prime or unique farmlands are not present, however, all soils within the Project are identified as farmland of statewide importance (NRCS 2021b). Note that areas developed with hard surfaces (roads, residences, parking areas, etc.) or modified (excavated/filled) would no longer be considered soils meeting the farmland of statewide importance classification. Developed and modified areas make up approximately 11.27 acres of the 92.4-acre Project area. Therefore, approximately 81.13 acres of remaining soil within the Project area would be considered farmland of statewide importance. This is only approximately 0.5% of the total farmland of statewide importance (15,805 acres) located within the Reservation.

4.2 Water Resources

4.2.1 Surface Water Quality

There are no permanent surface waters within the Project area. Intermittent channels run through the Project area that are dry for most of the year and only flow water during extreme precipitation or runoff events. Refer to Section 4.2.2 Waters of the U.S. for information regarding the existing intermittent channels within the Project area. There is no water quality data available for the intermittent channels present and no 303(d) impaired water bodies exist on the Reservation.

[1] Sediment carrying capacity – the amount of sediment that can be transported under the given flow conditions.

4.2.2 Waters of the U.S.

Section 404 of the Clean Water Act regulates the discharge of dredged or fill material into waters of the U.S. and requires a permit for these activities unless the activities are exempt from Section 404 regulation. A survey was performed and a report prepared (BC&A 2022b) for the Project area to identify aquatic resources that could be potential waters of the U.S. (see Skull Valley Aquatic Resources Report in Appendix E). For the purpose of this analysis, all aquatic features identified are assumed jurisdictional because they have connectivity to downstream waters of the U.S., however, it is the responsibility of the U.S. Army Corps of Engineers (USACE) to make the final determination of jurisdictional waters of the U.S. A USACE jurisdictional determination would be requested during future final design phases for this Project to support USACE Section 404 permitting that may be required.

Four aquatic features were delineated within the Project area and were classified according to the Cowardin classification system (Cowardin et al. 1979). These features are described below and listed in Table 4-3. A map of the delineated features is provided in Appendix C – Map C2. The delineated aquatic features are located downstream of the apex of an alluvial fan where flow patterns are unpredictable and can change frequently between flow events.

- Indian Hickman Creek: This creek has many flow paths within the Project area due to the location on an alluvial fan. When Indian Hickman Creek flow exits the confined canyon at the base of the Stansbury Mountains, it discharges onto an alluvial fan and the flow paths frequently vary for each storm based on the loose soils/sediments and natural geologic nature of alluvial fan systems. Two separate intermittent channel sections and flow paths were delineated within the Project area (Indian Hickman Creek Channel 1 and Channel 2). These sections were observed as dry channels with limited upland vegetative cover (primarily cheatgrass) with no riparian or wetland vegetation (Figure 4-2).

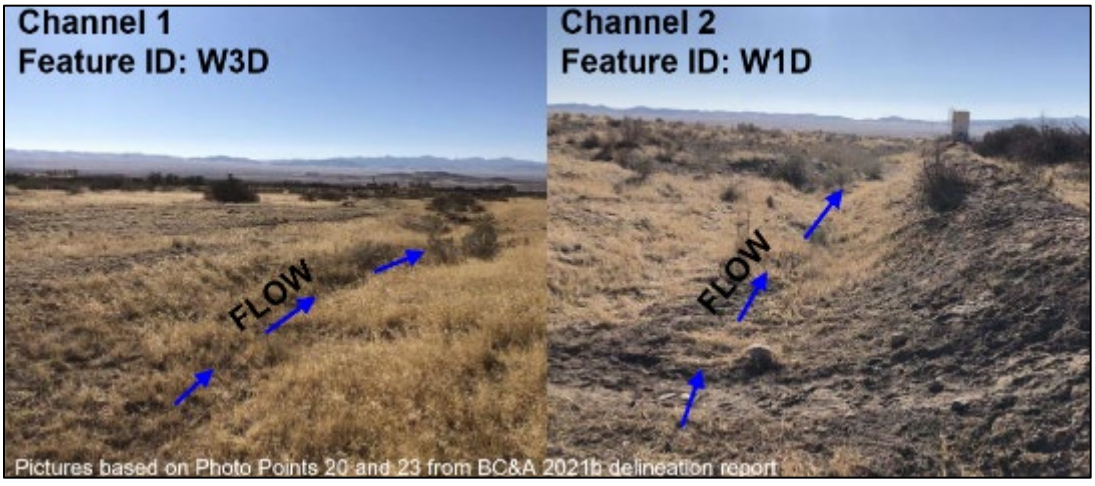

Figure 4-2. Indian Hickman Creek Channel 1 and 2

- Unnamed Intermittent Channel: This channel conveys water runoff from a drainage area in the foothills of the Stansbury Mountains. It is also located on an alluvial fan with many flow paths that overlaps with the Indian Hickman Creek alluvial fan. Flow paths from both alluvial fans intersect approximately at the upstream extent of the developed Reservation community. This section of channel was observed to be dry with limited upland vegetative cover (primarily cheatgrass) and no riparian or wetland vegetation (Figure 4-3).

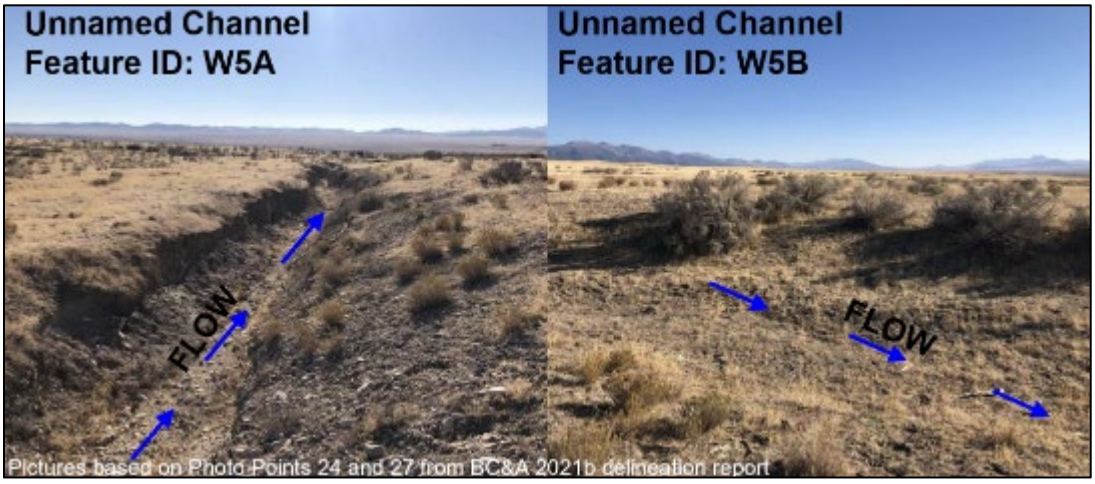

Figure 4-3. Unnamed Intermittent Channel

Table 4-3. Summary of Delineated Aquatic Features

Aquatic Resource Feature	Feature ID	Cowardin Classification				Length (Linear Ft)
		System	Subsystem	Class	Modifier	
Indian Hickman Creek Channel 1	W3D	Riverine (R)	Intermittent (4)	Stream Bed (SB)	Seasonally Flooded (C)	320
Indian Hickman Creek Channel 2	W1D	R	4	SB	C	584
Unnamed Intermittent Channel	W5A/ W5B	R	4	SB	C	2,308

4.2.3 Floodplain Management

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) are not available for the Project area. A Floodplain Management Plan was developed by the Reservation to accomplish and identify flood risk management goals (Skull Valley Band of Goshute 2018). The plan identifies three goals: 1) improve emergency response capability; 2) develop preventative measures to reduce flood damages; and 3) document flood history. A summary of the documented flood history for the Reservation is provided in Section 2.2.

The Reservation is located on approximately 19,865 acres of land which is entirely situated on alluvial fan systems or low-lying areas where flooding occurs. Flooding occurs primarily from precipitation events occurring on the adjoining Stansbury Mountains. Water during these events is conveyed down intermittent creeks and across the alluvial fan systems that cover the eastern half of the Reservation, eventually reaching the low-lying areas covering the western half of the Reservation. The low-lying areas also receive runoff from the Cedar Mountains to the west. As is typical on alluvial fan systems, water flow paths may vary for each storm based on the loose soil/sediment and natural geologic nature of alluvial fan systems. This results in variable and unpredictable flooding across the alluvial fan systems which the developed Reservation community has been historically impacted from. Refer to Section 2.2 for documentation of flooding on the Reservation.

Climate change has also influenced flooding and climate change studies indicate that more intense droughts and floods are expected in the future (Utah Division of Water Resources 2020). Extreme precipitation is projected to increase, potentially increasing the frequency and intensity of floods in Tooele County (NRCS 2023b). This has increased the importance of climate adaptation and developing mitigation measures to cope with and respond to climate change.

Flood modeling was performed by BC&A and shows that flooding occurs to Reservation community structures, including areas containing critical structures (see Section 2.2), for all modeled flood events that include a 20% probability (5-year flood) to a 0.2% probability flood event (500-year flood). Flood inundation for the 100- and 500-year floods based on the BC&A analysis (BC&A 2022a) are provided in Appendix C – Maps C3A and C3B. Table 4-4 below identifies structures and roads on the Reservation that are inundated for the 5-year through 500-year floods. Although FEMA FIRMs are not available for the Project area, documented flood history and recent modeling show that the developed Reservation community is located within a floodplain.

Table 4-4. Existing Condition Flooding Summary

Storm Event	Number of Features Inundated				Land Inundated (Acres)
	Residential Structures	Community Center	Commercial/ Industrial Buildings[1]	Road/Minor Highways[2]	
5-Year	13	1	0	2	577
10-Year	14	1	1	2	792
25-Year	14	1	1	2	1,079
50-Year	14	1	1	2	1,259
100-Year	16	1	1	2	1,402
200-Year	16	1	1	2	1,611
500-Year	16	1	2	2	1,914

[1] – Commercial/Industrial buildings consist of a large shop structure and an abandoned gas station.
[2] – Roads include Skull Valley Indian Reservation Road and Highway 196.

4.3 Air Resources

4.3.1 Air Quality and Climate Change

4.3.1.1 Air Quality

The U.S. Environmental Protection Agency (EPA) has established health-based National Ambient Air Quality Standards (NAAQS) for six pollutants considered harmful to public health and the environment, known as criteria pollutants. NAAQS pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), sulfur dioxide (SO_2), and lead (Pb). Monitoring of NAAQS pollutants in Utah is delegated to the Utah Division of Air Quality (UDAQ). UDAQ had 22 fixed air quality monitoring stations throughout the state of Utah that monitored the NAAQS pollutants in 2020 (UDEQ 2020). The closest station to the Project area is the Erda Station in Tooele and was monitored for NO_2, O_3, and PM 2.5 in 2020. Results for the Erda Station show all pollutants monitored in compliance with the EPA air quality standards.

Under Title R307 of the Utah Administrative Code, emission inventories must be undertaken to further characterize air quality throughout Utah. Emission inventories are conducted every 3 years, during which UDAQ collects information about the types and quantities of compounds released by all emission sources in the state. Sources can be categorized as point (large stationary industrial or commercial facilities), area (smaller stationary sources that are assessed as a group), or mobile (personal or commercial vehicles). The 2017 triennial inventory is the most recent state-wide inventory available. It covers 486 individual point sources, 128 area categories, 65 oil and gas categories, 32 on-road categories, and 215 non-road categories (UDEQ 2020). The data collected are used by UDAQ to review trends over time and manage the air quality program. Results in tons of compound emitted per year for Tooele County are shown in Table 4-5.

Table 4-5. 2017 UDAQ Emissions Inventory (tons/year)

County	CO	NO_x	PM10	PM2.5	SO_2	VOC
Tooele	33,952.33	5,774.69	7,645.79	2,681.10	202.63	48,353.36

UDEQ 2020; VOC = volatile organic compound

A portion of Tooele County is located within a nonattainment area for PM2.5, however, the Project area is located on the other side of the Stanbury Mountain Range from the nonattainment area and is outside of the nonattainment extents (UDEQ 2021a). No specific air quality issues were identified for the Project area based on a review of available air quality information.

4.3.1.1 Greenhouse Gasses and Climate Change

Climate change is driven primarily by the greenhouse effect where gases trap the sun's heat in the atmosphere. Gases that trap heat in the atmosphere are called greenhouse gases (GHG) and include CO_2, methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride). These GHGs are introduced into the atmosphere by a variety of sources including production of electricity, private and commercial transportation, industry practices, commercial and residential practices, agriculture, land use, and forestry. The largest source of GHG emissions from human activities in the U.S. is from burning fossil fuels for electricity, heat, and transportation (EPA 2024b).

The total gross GHG emissions by gas for the nation in 2021 was reported at 6,340.23 million metric tons of carbon dioxide equivalent (MMT CO_2 eq.) with Utah contributing 79.19 MMT CO_2 eq., or 1.2% of the nation's MMT CO_2 eq (EPA 2021c). From 1990 to 2021, the national GHG emissions had a total gross decrease of 2.3% while Utah had a total gross increase of 17.7% (EPA 2021c). In 2021 the primary economic sectors contributing GHG in Utah include transportation contributing 28.5%, electric power industry contributing 25%, and industry contributing 23.5%.

Climate change has had a ripple effect on resources in Utah. The average temperature in Utah has increased more than 2.5°F since the beginning of the 20th century, and over the last 50 years, Utah temperatures have risen about twice the global average (University of Utah 2024). The state is already experiencing increased drought, wildfires, flash floods, and extreme heat waves from climate change. In Tooele County, climate change projections show that more winter precipitation will fall as rain instead of snow, which will decrease snowpack water storage (NRCS 2023a). Extreme precipitation is projected to increase, potentially increasing the frequency and intensity of floods (NRCS 2023a).

4.4 Plant Resources

4.4.1 Noxious Weeds and Invasive Plants

Executive Order 13122 states that "a federal agency shall not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction and spread of invasive species in the U.S. or elsewhere." Noxious weeds and invasive plants are non-native plant species designated by state law or county ordinance because they cause, or have the potential to cause, extraordinary negative economic and ecological impacts.

Utah has 55 plant species listed as noxious and invasive (N&I) weeds in the state of Utah (Utah Department of Agriculture and Food [UDAF] 2019). Tooele County does not have a county-specific noxious weed list and defers to the UDAF for decisions and lists of noxious plants. No noxious weeds from the UDAF list were observed onsite during wetland delineation surveys (BC&A 2022b) or during a noxious weed inventory conducted on November 9, 2021 by Adaptive Environmental Planning, LLC (AEP). Even though the Project area did not contain Utah-listed noxious weeds, it is important to note that abundant non-native invasive species were present. These include five-stamen Tamarisk (*Tamarisk chinensis*), bull thistle (*Cirsium vulgare*), cheatgrass (*Bromus tectorum*), common mullein (*Verbascum Thapsus*), Russian thistle (*Salsola iberica*), and common stork's-bill (*Erodium cicutarium*). Cheatgrass and common stork's-bill were observed to be dominant grass/herbaceous cover and Russian thistle was observed to be a dominant shrub.

4.4.2 Special Status Plant Species

The ESA was established to protect endangered and threatened species and their habitats. Section 7 of the Act requires federal agencies to ensure that federal actions do not jeopardize the existence of any listed species. This is accomplished through Section 7 consultation with USFWS. A Biological Assessment (BA) was completed for the Project (see the Skull Valley BA in Appendix E) which included an official species list from the USFWS identifying Ute ladies'-tresses (*Spiranthes diluvialis*) as the only ESA-listed plant species that could occur in the Project area. Critical habitat for the species has not been designated and Ute ladies'-tresses are currently listed

as threatened. The BA concluded that there is no suitable habitat for the species within the Project area. Section 7 informal consultation was completed for the Project, and the results of the consultation are discussed in Section 6.4.2 of the Environmental Consequences section.

4.5 Animal Resources

4.5.1 Wildlife and Wildlife Habitat

Wildlife habitat in the Project area may support a range of native and non-native migratory birds, resident birds, mammals, and reptiles. Wildlife populations that are the most documented and understood include those that are listed for protection under the ESA, are a state species of concern, or are desired game or furbearers. No ESA-listed species have habitat within or near the Project area. State Species of Greatest Conservation Need (SGCN) have potential to occur within the Project area and are discussed in Section 4.5.3 Special Status Animal Species. The UDNR has mapped seasonal habitats for 23 wildlife species within Utah (UDNR 2021). Crucial and Substantial value habitats for wildlife species are in or near the Project area and are defined by UDNR as described below. Chukar, mule deer, pronghorn, and Rocky Mountain elk have Crucial or Substantial value habitats within 1-mile of the Project area (Table 4-6).

- Crucial – habitat on which the local population of a wildlife species depends for survival because there are not alternative ranges or habitats available. Crucial value habitat is essential to the life history requirements of a wildlife species. Degradation or unavailability of crucial habitat will lead to significant declines in carrying capacity and/or numbers of wildlife species in question.
- Substantial – Habitat used by a wildlife species but is not crucial for population survival. Degradation or unavailability of substantial value habitat will not lead to significant declines in carrying capacity and/or numbers of the wildlife species in question.

Table 4-6. Crucial/Substantial Wildlife Habitat

Wildlife	Habitat Value	Seasonal Occupancy	Location
Chukar	Substantial	Year-Long	Approximately ¼-mile east of the Project area.
Mule Deer	Crucial	Winter	Approximately 1-mile east of the Project area.
Pronghorn	Crucial	Year-Long	Within the Project area
Rocky Mountain Elk	Crucial	Winter/Spring	Approximately ½-mile east of the Project area

The Project area spans the Sagebrush Basins and Slopes semiarid ecoregion and Shadscale-Dominated Saline Basins arid ecoregion (Woods et al. 2001). Habitat cover was observed and mapped for the Project area based on site observations conducted by AEP on July 10, 2019 and November 9, 2021, and from review of aerial photography. Habitat types consist of grassland and mixed shrub/grassland. The grassland habitat consists of bare land with varying amounts of cheatgrass and common stork's-bill cover as dominant vegetation that change seasonally (Figure 4-4). Mixed shrub/grassland habitats include two types; sagebrush-dominate with shrub heights up to approximately 5 feet tall (Figure 4-5), and Russian thistle/broom snakeweed-dominant with shrubs less than 2 feet tall (Figure 4-6). A habitat map is provided in Appendix C – Map C4. The

Project area consists of approximately 9.49 acres of grassland, 10.10 acres of mixed grassland/shrubland (shrubs ≤5 feet tall), and 61.54 acres of mixed grassland/shrubland (shrubs <2 feet tall) cover. Approximately 11.27 acres within the project area are developed or disturbed and do not contain habitat cover.

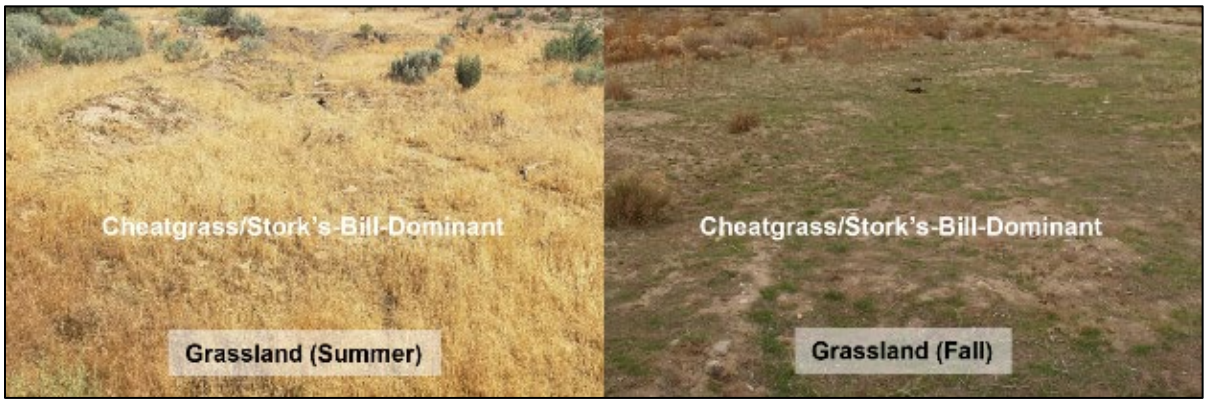

Figure 4-4. Grassland Vegetation

Figure 4-5. Shrub/Grassland Vegetation (Sagebrush-Dominant)

Figure 4-6. Shrub/Grassland Vegetation (Russian Thistle/Snakeweed-Dominant)

4.5.2 Migratory Birds and Golden Eagles

Eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C 668), which provides specific protection for bald and golden eagles. The act makes it illegal to take, possess, sell, purchase, barter, or transport any bald or golden eagle, alive or dead, or any part, nest, or egg thereof. Under the Bald and Golden Eagle Protection Act, the term *take* includes pursuing, shooting, shooting at, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing. Bald eagles (*Haliaeerus leucocephalus*) and associated habitat are not present, but golden eagles (*Aquila chrysaetos*) have potential to occur within the Project area. Refer to Section 4.5.3 for information on golden eagles and their potential to occur within the Project area.

Migratory birds are afforded protection under authority of the Migratory Bird Treaty Act (MBTA) (16 U.S.C 703-712). Under the MBTA, it is unlawful to take, kill, or possess migratory birds, their parts, nests, or eggs. Under the MBTA, the term *take* is defined as any attempt or success at pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting. Migratory bird permits must be obtained through the USFWS Migratory Bird Permit Office for any requested waiver or exception to the MBTA. Migratory birds have the potential to occur within the project area for breeding and foraging.

The USFWS maintains a list of Migratory Birds of Conservation Concern (MBCC), which are migratory non-game birds that are likely to become candidates for listing under the ESA without additional conservation actions. According to the USFWS IPaC list (USFWS 2021b) for the project area, there are no MBCC expected to occur at this location.

4.5.3 Special Status Animal Species

The ESA was established to protect endangered and threatened species and their habitats. Section 7 of the Act requires federal agencies to ensure that federal actions do not jeopardize the existence of any listed species. This is accomplished through Section 7 consultation with USFWS. A BA was completed for the Project (see the Skull Valley BA in Appendix E), which included an official species list from the USFWS identifying the monarch butterfly (*Danaus plexippus*) as the only ESA-listed animal species that could occur in the Project area. Critical habitat for the species has not been designated and the monarch butterfly is currently listed as a candidate species. The BA concluded that there is no suitable habitat for monarch butterfly within the Project area. Section 7 informal consultation was completed for the Project, and the results of the consultation are discussed in Section 6.5.3 of the Environmental Consequences section.

The state of Utah has developed a Wildlife Action Plan with the purpose and goal of managing native wildlife species and their habitats, sufficient to prevent the need for additional listings under the ESA (Utah Division of Wildlife Resources [UDWR] 2015). The Wildlife Action Plan identifies Species of Greatest Conservation Need (SGCN) that are considered jurisdictional wildlife under the plan. State-listed SGCN as identified in the Wildlife Action Plan, have potential to occur within the Project area. Based on a review of the SGCN status, and UDWR species known occurrence for the Deseret Peak West Quadrangle (UDWR 2022a), there are six SGCN that were identified for consideration of Project actions. Of the six SGCN, four were determined to have suitable habitat or potential occurrence within the Project area (Table 4-7). This includes kit fox (V*ulpes macrotis*), burrowing owl (*Athene cunicularia*), ferruginous hawk (*Buteo regalis*), and golden eagle (*Aquila chrysaetos*). Please refer to the species write ups below the table for additional information on species occurrence within the Project area.

Table 4-7. Utah State Species of Greatest Conservation Need

Common Name (Scientific Name)	Habitat/Range Requirements	Potential Occurrence in the Project area
Mammals		
Kit fox (*Vulpes macrotis*)	Primarily open desert shrubby or shrub-grass habitat (UDWR 2022b).	The Project area contains open desert shrubby and shrub-grass habitat that may provide suitable habitat for the species.
Birds		
Burrowing owl (*Athene cunicularia*)	Habitats include open grassland and prairies, but the species also use other open areas such as golf courses, cemeteries, and airports. They nest in a mammal burrow, or sometimes excavate their own burrow nest (UDWR 2022b).	The Project area contains open grassland areas where suitable breeding habitat for the species may be present.
Ferruginous hawk (*Buteo regalis*)	During breeding, flat and rolling terrain in grassland or shrub steppe is most often used. In Utah the species reside in lowland open desert terrain (UDWR 2022b)	The Project area is located in or near open lowland desert with areas of grassland and shrub steppe habitat that provide suitable breeding habitat for the species.
Golden Eagle (*Aquila chrysaetos*)	Nests are most often on rock ledges of cliffs but sometimes in large trees. They generally inhabit open and semi-open country such as prairies, sagebrush, arctic and alpine tundra, savannah or sparse woodland, and barren areas, especially in hilly or mountainous regions (UDWR 2022b).	There are no rock ledges, cliffs, or large trees present to support breeding habitat for the species. Foraging habitat for the species is present within the Project area.
Mollusks		
Lyrate mountainsnail (*Oreohelix haydeni*)	The species occupy the crevices of rocks occurring on limestone talus protected from rapid evaporation by overhanging bushes (UDWR 2022b).	Suitable habitat for the species is not present. The project area is covered in alluvial soils and no rock outcrops or talus is present.
Desert Tryonia (*Tryonia porrecta*)	The species is generally found living in springs and spring outflows (UDWR 2022b).	Suitable habitat is not present within the Project area as no springs, spring outflows, or permanent surface waters are present.

Bold indicates suitable habitat or potential occurrence in the Project area.

Kit Fox (*Vulpes macrotis*)

Kit fox most often occur in open prairie, plains, and desert in shrubby or shrub-grass habitat. The species is nocturnal, but individuals may be found outside of their dens during the day. In Utah, most dens were on flat, well-drained uplands. The species mates in late winter and young first leave the den in late spring or early summer (UDWR 2022b). The Project area contains open desert shrubby and shrub-grass habitat that could be used by the species and there is documented occurrence of them in the area. The most recent observation of the kit fox within the

Deseret Peak West Quadrangle was noted in 2012 (UDWR 2022a). Therefore, there is potential for the species to be present within the Project area.

Burrowing Owl (*Athene cunicularia*)

The burrowing owl can be found in proper habitat throughout Utah during summer and in migration. Confirmed breeding occurrence is known in 17 counties within the state, including Tooele County. Breeding habitat in Utah includes arid grassland, cold desert shrub, and sagebrush-rabbitbrush. The species nest in mammal burrows, usually that of a prairie dog, ground squirrel, badger, or armadillo, and if a mammal burrow is not available, the owls will sometimes excavate their own nest burrow (UDWR 2022b). The species migrate to breeding grounds in the spring to begin nesting and leave for wintering grounds in the fall. The Project area contains suitable nesting and foraging habitat for the species and there is documented occurrence of the owl in the area. Known occurrence documented in the UDWR mapping system noted the most recent observation in the Deseret Peak West Quadrangle in 2001 (UDWR 2022a). Other observations of the species have occurred near agricultural fields approximately 8.5 miles north-northwest of the Project area as recent as 2018, and near the town of Terra, approximately 6.5 miles to the southeast, as recent as 2020 (ebird 2022). Based on this information, there is potential for the species to be present within the Project area for nesting and/or foraging.

Ferruginous Hawk (*Buteo regalis*)

Ferruginous hawks migrate to Utah by late February to early March and leave for wintering grounds August to early October. They are found mainly in open desert country in pinyon-juniper, barren cliffs/bluffs, sagebrush-rabbitbrush, and cold desert shrub habitats. Nesting occurs in trees, shrubs, cliffs, utility structures, and ground outcrops (UDWR 2022b). The Project area contains suitable nesting and foraging habitat for the species and there is documented occurrence of ferruginous hawks in the area. Known occurrence documented in the UDWR mapping system noted the most recent observation in the Deseret Peak West Quadrangle in 2002 (UDWR 2022a). Other observations of the species have occurred along Highway 196 on the Reservation as recent as 2017 (ebird 2022). Based on this information, there is potential for the species to be present within the Project area for nesting and/or foraging.

Golden Eagle (*Aquila chrysaetos*)

Golden eagles generally inhabit open and semi-open country such as prairies, sagebrush, arctic and alpine tundra, savannah or sparse woodland, and barren areas, especially in hilly or mountainous regions, in areas with sufficient mammalian prey base and near suitable nesting sites. Most populations in the western U.S. are year-round residents. Nests are most often on rock ledges of cliffs but sometimes in large trees, on steep hillsides, or on the ground (UDWR 20221b). Nesting habitat is not present within the Project area, but the species could be present while foraging. Known occurrence documented in the UDWR mapping system noted the most recent observation in the Deseret Peak West Quadrangle in 1982 (UDWR 2022a). Other observations of the species include four sightings, two to three miles south of the Project area along Highway 196 in 2015, 2018, and 2019 (eBird 2022). Based on this information, there is potential for the species to be present in the Project area for foraging.

4.6 Human Resources

4.6.1 Socioeconomics

The Reservation contains approximately 19,865 acres and includes 127 members (Utah Division of Indian Affairs 2021). The population on the reservation is about 30 people and virtually all residents live below the poverty line (Rural Community Assistance Corporation 2019). Additional information regarding population, demographics, and employment are not available for this community. However, the community has been identified as a disadvantaged community (refer to the PR&G Analysis Report included in Appendix E).

4.6.2 Public Health and Safety

Public health and safety are a concern where flooding has the potential to impact developed and occupied areas of the Reservation. The estimated population of the reservation is 30 people. The reservation currently contains 14 residential structures, a community center, a commercial shop building, and roads that are at risk of flooding. In addition, a well and well house that provide the Reservation with potable water is also at risk of flooding. Documented flooding has occurred to developed areas of the Reservation consisting of intense and dangerous floods and mudflow/debris flow events (see Section 2.2). The safety of occupants of the Reservation and the Reservation potable water supply would be at risk during a flood event.

Flooding can also result in mental health issues with associated costs. Floods destroy livelihoods, can result in fatality, can damage building/homes, and ruin possessions, turning lives upside down and disrupting communities. Increases in depression, post-traumatic stress disorder, and substance abuse are well documented in the aftermath of floods and can persist for years afterward (MarshMcLennan 2021).

4.6.3 Visual Resources

From the project area, scenic views of the Stansbury Mountains can be seen to the east. The Project area is in and adjoining developed and disturbed lands of the Reservation and these lands do no offer scenic landscapes. Most of the project area is a combination of bare land, grassland, and shrub/grassland mix as identified in Section 4.5.1. Most vegetative cover is dominated by non-native plant species, with exception of approximate 10.10 acres that contain sagebrush-dominant cover. There are no forested areas present in the Project area and the existing stream channels were observed to be dry and lacking riparian vegetative cover. A general view of the landscape within the Project area and of the scenic landscape view of the Stansbury Mountains is provided in Figure 4-7.

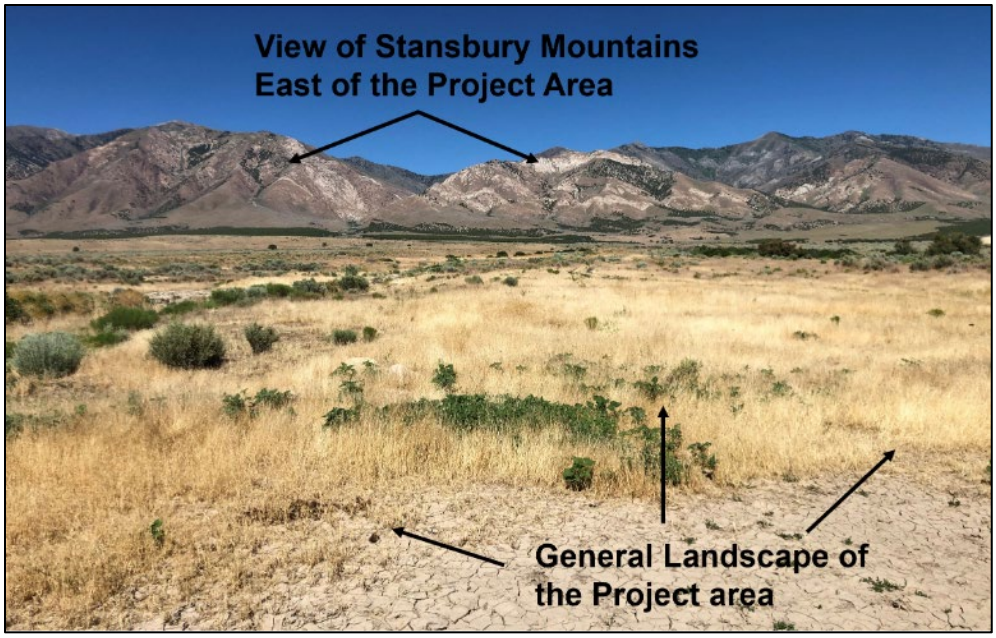

Figure 4-7. General view of Project Landscape and Stansbury Mountains

4.6.4 Transportation/Infrastructure

Two improved roads (Highway 196 and Skull Valley Indian Reservation Road) are present that have been impacted from past flooding events and that are of interest for this analysis. These roads are at risk for future flood. Skull Valley Indian Reservation Road runs east-west and provides the only improved access to the developed community of the Reservation. It consists of an approximate 25-foot-wide asphalt road, extending for approximately 2 miles. It can be accessed from Highway 196, which runs perpendicular to Skull Valley Indian Reservation Road. Highway 196 is the only improved road that connects to Skull Valley Indian Reservation Road and is an approximate 25-foot-wide, two-lane highway that connects to Interstate 80 (25 miles north of the Reservation) and to Highway 99 (12 miles south of the Reservation).

4.6.5 Noise

Applicable noise laws for the Project area are provided in the Noise Control Act of 1972 (42 U.S.C. 4901 et seq.), amended by the Quiet Communities Act of 1978 (42 U.S.C. 4913), which promotes the development of state and local noise control programs. Tooele Code also includes regulations regarding noise included in the Tooele County Code (Tooele County 1992). Noise ordinances for the Reservation have not been established by Skull Valley Band of Goshute.

Ambient noise in the Project area has not been measured, and therefore no baseline is available. General noise sources in the Project area are produced from vehicle traffic, agricultural operations, air traffic, and other general community operational noises.

Noise-sensitive receptors are those facilities, land areas, or wildlife populations that require lower noise levels for health and function. Examples include residential neighborhoods, medical facilities, schools, churches, research facilities, parks, and open space. The Project area is located in and near the developed community of the Reservation where residential structures are present.

4.6.6 Historic Properties / Cultural Resources / Native American Religious Concerns

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (54 U.S.C. 300101), requires federal agencies to consider the effects of their undertakings on historic properties. A Cultural Resource Assessment was conducted for the Project (Certus Environmental Solutions, LLC [Certus] 2021) to identify and document cultural resources with a potential to be impacted by alternative measures. Refer to Appendix D for a summary of survey/research methods and assumptions. Cultural resources include archaeological sites, historic structures, sacred sites, and traditional cultural properties (TCPs) that are important to a community's practices and beliefs, and are necessary to maintain a community's cultural identity. Cultural resources that are eligible for the NRHP are called historic properties, and consist of any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the NRHP. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria" (36 CFR 800.16(I)(1).

The survey area for the Area of Potential Effects (APE) included the entire Project area extents (areas proposed for modification, borrow areas, staging areas, access, etc.) with field work being performed on October 28, 2020, by a Principal Investigator exceeding the Secretary of the Interior Standards and Guidelines for archaeology and architectural history. A revised APE was established after the initial 2020 survey to incorporate an existing dirt access road that would be used for construction access. A file search and archival research was conducted prior to the survey which included the survey area plus a ½-mile buffer around the survey area. The file search and field survey identified five archaeological sites within the survey area consisting of two historical roads and three historical trash scatters. No prehistoric sites were identified within the survey area. Additional information for the archaeological sites identified is provided below (Certus 2021).

The identified cultural resource sites were evaluated for the NRHP eligibility using Criteria A, B, C, and D as defined below (NRHP 2023).

- Criterion A – Are associated with events that have made a significant contribution to the broad patterns of our history.
- Criterion B – Associated with the lives of significant persons in or past.
- Criterion C – Distinctive characteristics of a type, period, or methods of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction.
- Criterion D – Yielded or may be likely to yield information important in prehistory or history.

A summary of the identified sites and the NRCS NRHP eligibility determinations within the APE, based on recommendations from the Certus report (Certus 2021), is included below.

- **Skull Valley Highway/SR-196:** The Skull Valley Highway (Highway 196) was reportedly constructed in 1951 to provide access to Dugway Proving Ground. The road is actively used and maintained as a modern highway. It consists of a raised roadbed and 20-foot-wide paved surface. The highway has been previously documented and

determined eligible for the National Register of Historic Places (NRHP) under Criterion A, and ineligible under Criteria B, C, and D. The NRCS concurred with these previous determinations of eligibility.

- **Skull Valley Indian Reservation Access Road:** This road is the access road into the Reservation housing and administrative area from Highway 196. It is in active use and repair, except for a section near the east end that has been abandoned in-place and is no longer used. The road could have dated as early as 1912, which is when the Reservation was established. It consists of a typical asphalt-paved corridor with an approximate 25-foot-wide paved surface. The NRCS determined the site ineligible for the NRHP under all criteria and it would not qualify as a historic property for the purpose of 36 CFR 800.
- **Historical Trash Scatter:** This consists of a late-historic period scatter of mostly domestic refuse that is most likely associated with the residents of the Reservation. The estimated date of discard for artifacts in the dump was late-1950s to late-1960s. The NRCS determined the site as ineligible for the NRHP under all criteria and it would not qualify as a historic property for the purpose of 36 CFR 800.
- **Historical Trash Dump 1:** This consists of a historical trash dump that appears to represent a single event of domestic refuse disposal. The estimated date of discard for artifacts in the dump was 1920s or early 1930s that was most likely affiliated with residents of the Reservation. The NRCS determined the site as ineligible for the NRHP under all criteria and it would not qualify as a historic property for the purpose of 36 CFR 800.
- **Historic Trash Dump 2:** This consists of a historical trash dump that is a mix of modern trash and historical debris. The estimated date of discard for artifacts in the dump was during or after the 1950s that was most likely affiliated with residents of the Reservation. The NRCS determined the site as ineligible for the NRHP under all criteria and it would not qualify as a historic property for the purpose of 36 CFR 800.

Per 36 CFR 800.4, the NRCS consulted with the SHPO on November 15, 2021 and April 11, 2023, on the description of the APE and determinations of NRHP site eligibility of the sites above. The SHPO concurred with the eligibility of the sites on November 23, 2021 and April 20, 2023 (Appendix A). Tribal consultation letters regarding the description of the APE and determinations of site eligibility were also sent per 36 CFR 800.4 and to comply with EO 13007, EO 13175, the American Indian Religious Freedom Act (AIRFA), and the NHPA. Letters were sent to the Confederated Tribe of the Goshute Reservation, Skull Valley Band of Goshute Indians, and Ute Indian Tribe of the Uintah and Ouray Reservation. Refer to Section 7.1.6 for details on tribal consultation.

4.7 Ecosystem Services

An ecosystem services framework is required by the PR&G and provides for an integrated approach that allows consideration and transparent evaluation of the benefits (both tangible and intangible) and tradeoffs of potential alternatives. Four categories of ecosystem services are described in the PR&G and are included below for reference.

1) **Provisioning services** are tangible goods provided for direct human use and consumption, such as food, fiber, water, timber, or biomass.

2) **Regulating services** maintain a world in which it is possible for people to live, providing critical benefits that buffer against environmental catastrophe – examples include flood and disease control, water filtrations, climate stabilization or crop pollination.

3) **Supporting services** refer to the underlying processes maintaining conditions for life on earth, including nutrient cycling, soil formation, and primary production.

4) **Culture services** make the world a place in which people want to live – recreational use, spiritual, aesthetic viewsheds, or tribal values.

The project scoping process (see Section 3.0) identified resources relevant to the proposed action that were considered for the determination of applicable ecosystem services. Ecosystem service benefits can be both monetary and nonmonetary. Appropriate metrics should be based on current methodology to quantify impacted services over time for determination of project- and/or regional-specific effects. For reference, a list of ecosystem service categories and their subcategories is provided in Figure 4-8. The ecosystem service categories/subcategories relevant to this Project and the applicable resources pertinent to each subcategory that were analyzed in this document are provided in Table 4-8.

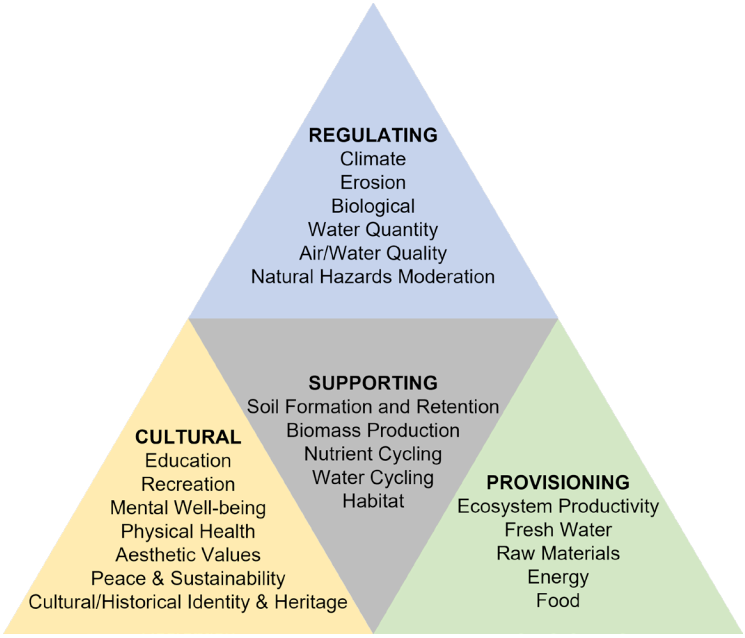

Figure 4-8. Ecosystem Services

Table 4-8. Applicable Ecosystem Services and Related Resources

Category	Service	Applicable Resources
Provisioning	Food/Biomass (agriculture)	Socioeconomics
Regulating	Flood Control	Floodplain Management, Public Health and Safety, and Transportation Infrastructure
Cultural	Well-being and Safety	Socioeconomics, Floodplain Management, Public Health and Safety, and Transportation Infrastructure, noise
Cultural	Cultural Identity & Heritage	Socioeconomics and Historic/Cultural Resources

The applicable ecosystem services from above were evaluated as part of the PR&G eight-step evaluation process. This process includes consideration of the federal objective, PL 83-566 general purposes, guiding principles, and ecosystem services to assist in decision making. Refer to the PR&G Analysis Report included in Appendix E (AEP and Long Watershed Planning Economics 2023) for documentation of the PR&G eight-step evaluation process used for decision making.

5.0 Alternatives

5.1 Project Scoping

Early in the scoping process, comments were requested from the public, Reservation members, and government agencies. Comments were accepted during the scoping open comment period (May 26, 2020 through July 10, 2020). The primary purpose of the scoping process was to gather input and feedback on the project's purpose and need, potential alternatives for consideration, environmental issues to be addressed in the Plan-EA, methodologies to be used to evaluate impacts, and the overall public participation process. There was one scoping comment received for the Project. Refer to Section 3.0 for additional Scoping information and the Scoping Report, included in Appendix E.

5.2 Formulation Process

The process of formulating alternatives for the project followed procedures outlined in the NRCS NWPM (NRCS 2015a) Parts 500 through 506; NRCS NWPH (NRCS 2014), Parts 600 through 606; PR&G (CEQ 2013 and 2014); and other NRCS watershed planning policy. Numerous alternatives were developed by the Project team with consideration for issues and concerns discovered during the scoping process and based on their ability to address the purpose and need of the Project. Alternatives were formulated in consideration of four criteria: completeness, effectiveness, efficiency, and acceptability. In accordance with NEPA, some initial alternatives were eliminated from further analysis due to high costs, logistics, environmental reasons, or other critical factors. The project team analyzed two Action Alternatives and one No Action Alternative in detailed study. Multiple additional alternatives were formulated but were eliminated from further study.

5.3 Decision Matrix

NRCS must identify the federally-assisted alternative that maximizes the economic, environmental, and social benefits, otherwise known as the NEE Alternative. A PR&G Analysis was completed to compare alternatives and support decision-making for selection of the NEE Alternative (Appendix E). NRCS must also decide whether the selected alternative would constitute a major federal action significantly affecting the quality of the human environment. If the NRCS State Conservationist (responsible federal official) determines that the selected alternative would not significantly affect the quality of the human environment, then the NRCS State Conservationist will prepare and sign a Finding of No Significant Impact (FONSI), and the project may proceed. If the NRCS State Conservationist determines that the selected alternative would significantly affect the quality of the human environment, then an Environmental Impact

Statement (EIS) and a Record of Decision (ROD) must be prepared and signed before the project can proceed.

5.4 Alternatives Considered but Eliminated from Detailed Study

5.4.1 Berm and Channel Improvements Full Riprap with Ford Crossing

This alternative consists of the same measures as described for the Berm and Channel Improvements with Full Riprap Alternative included in detailed study, with an additional installation of a ford crossing. The new crossing would increase conveyance capacity and reduce potential for blockage during flood events/debris flows. The existing culvert along Indian Hickman Creek would be removed and replaced with a 25-foot-wide concrete ford crossing. The crossing would extend 150 feet across the existing channel. The construction cost for the ford crossing improvements alone was estimated at approximately $570,000. The total installation cost for all improvements was estimated at $3,017,000. Damages associated with the culvert crossing were determined to be minimal, with no damages to structures, roads, utilities, or other infrastructure at the crossing if a 100-year flood was to occur, except for washing out of the culvert itself. The cost to replace the culvert at such an event was estimated at $100,000 and assumed to require replacement one time over the 100-year project life. Based on the cost of the ford crossing being five to six times greater than replacing the culvert, and no other damages occurring during flooding other than replacement of the culvert, the option to install a concrete ford crossing was determined unreasonable and eliminated from further study.

5.4.2 Debris Basin and Berm Alternative

This alternative consists of constructing a large detention/debris basin at the mouth of Indian Hickman Canyon. The basin would attenuate flood flows and reduce the peak discharge of 1,920 cubic feet per second (cfs) during a 100-year flood down to 330 cfs. The basin would require a flood storage volume of 202 acre-feet (ac-ft) and a sediment storage volume of 92 ac-ft (total storage). Two berms would be constructed just upstream of the developed community, to deflect flood water into an existing stream channel that conveys flows south around the developed community. A culvert crossing along this existing channel would be removed and replaced with a ford[2] crossing to increase the capacity and reduce the potential for debris blockages. To construct the basin, an 80-foot-tall dam embankment would need to be constructed in addition to excavation of approximately 225,000 cubic yards of material. The cost to excavate the sediment alone were estimated at over $7,000,000. Costs to construct the basin, berms, and ford crossing were not advanced because they would have been much greater than other alternatives that provide the same level of benefit. Therefore, it was not reasonable to move this alternative forward and it was eliminated from further study.

5.4.3 Landform and Berm Alternative

This alternative consists of constructing a landform at the mouth of Indian Hickman Canyon and an 8,250-foot-long berm extending from the landform downstream to a point where flows from the

[2] Ford crossing – a stabilized road crossing through a channel bottom designed to be overtopped by high flows and debris.

canyon would be deflected north around the Reservation community. Flows from the unnamed channel draining from the foothills would continue to flow down its regular path (south of the community), but the culvert crossing along this channel would be removed and replaced with a ford crossing to increase the capacity and reduce the potential for debris blockages. The construction cost estimated for this alternative is $11,637,000 and over two and a half times the cost of other alternatives that provide the same level of benefit. Therefore, it was not reasonable to move this alternative forward and it was eliminated from further study.

5.4.4 Relocate Reservation Community (Nonstructural Alternative)

A nonstructural alternative was considered to relocate the Reservation community to another area within the Reservation. Land within the Reservation is split through the center by Highway 196. All land east of the highway experiences similar flood issues because they are located on alluvial fan systems at the base of the Stansbury Mountains. If the community was relocated anywhere on the east side of the Highway, additional flood prevention measures would be necessary to protect the community, similar to what is being proposed by this Project. Alternately, the land within the reservation west of Highway 196 is the low-lying area that all drainage off the Stansbury Mountains to the east and Cedar Mountains to the west flows toward during large storm events, which is then conveyed along this corridor generally north through Reservation land. This alternative was eliminated from further study because it would not be reasonable to relocate a community, if the new location would also require installation of similar flood protection measures.

5.4.5 Flood Proofing Alternative (Nonstructural)

This alternative consists of constructing berms around Reservation buildings to protect them from flood damage. While this alternative protects Reservation buildings, it still leaves a risk of loss of life to the Reservation residents. It does not protect Reservation roads which residents use to access their homes and community buildings. The well and water distribution pipes for the Reservation potable water source remain at risk. Additionally, the American Society of Civil Engineers (ASCE) design standard does not allow substantial improvements in active alluvial fan areas unless protective works have been designed and constructed to safely pass the design flood at the apex, within the capacity of the constructed channels (ASCE 2014). This alternative was eliminated from detailed study due to the remaining threat to loss of life, insufficient level of protection for roads that would impact the ability for individuals or emergency responders to access or leave the reservation community if a flood were to occur, and risk to the potable water system. The alternative does not meet the purpose and need of the Project nor the ASCE design standards for structures on alluvial fans.

5.4.6 Raise Structure Elevations Alternative (Nonstructural)

This alternative consists of raising the ground surface elevation below structures to protect them from flooding. While this alternative protects Reservation buildings, it still leaves a risk of loss of life to the Reservation residents. It does not protect Reservation roads which residents use to access their homes and community buildings. The well and water distribution pipes for the Reservation potable water source remain at risk. Additionally, the ASCE design standard does not allow substantial improvements in active alluvial fan areas unless protective works have been designed and constructed to safely pass the design flood at the apex, within the capacity of the constructed channels (ASCE 2014). This alternative was eliminated from detailed study due to

the remaining threat to loss of life, insufficient level of protection for roads that would impact the ability for individuals or emergency responders to access or leave the reservation community if a flood were to occur, risk to the potable water system. The alternative does not meet the purpose and need of the Project nor the ASCE design standards for structures on alluvial fans.

5.4.7 Berm Alternative

This alternative consists of constructing two flood diversion berms. One berm would extend approximately 2,640 feet along the north side of the Reservation community to deflect surface flows north around the community. Another approximately 3,080-foot-long of berm would be constructed along the south side of the Reservation community to deflect flows into an existing channel that conveys flows south around the community. This alternative had higher construction costs and higher O&M costs when compared to the preferred alternative and did not provide any additional benefits. Therefore, this alternative was eliminated from further study.

5.4.8 Protection for 50-Year Flood Alternative

This alternative consists of the same measures as described for the two Action Alternatives included in detailed study, but would only provide protection for up to an including a 50-year (2 percent annual chance) flood. This alternative would have similar costs to the 100-year level of protection alternatives included in detailed study with minimal difference in cost, as determined by BC&A (BC&A 2022). Per the NRCS regulations in the NWPH 602.0 (C), disadvantaged communities have exceptions to increase the level of protection beyond the level that maximizes benefits. The Reservation was determined to meet the criteria for this exception (refer to the PR&G Analysis Report included in Appendix E). Based on the minimal cost difference, meeting exception criteria for an increased level of protection, and considering the purpose and need of the Project to meet a 100-year flood level of protection, this alternative was eliminated from detailed study.

5.4.9 Protection for 500-Year Flood for Sensitive Facilities Alternative

Sensitive facilities and infrastructure were considered for flood protection for up to and including a 500-year (0.2 percent annual chance flood). This alternative is not applicable to the Project because no sensitive facilities or infrastructure are flooded during routing of a 500-year flood. Therefore, this alternative was eliminated from detailed study.

5.5 Alternatives Considered for Detailed Study

Several levels of flood protection were considered as part of the alternative formulation including a 2 percent annual chance flood (50-year flood), 1 percent annual chance flood (100-year flood), and 0.2 percent annual chance flood (500-year flood). Alternatives for a 50-year and 500- year flood protection level were removed from further study because they were determined insufficient or not applicable as described in Sections 5.4.8 and 5.4.9.

Structural and nonstructural alternatives were considered during alternatives development. Alternatives consisting of only nonstructural measures were found to be unreasonable or failed to meet the purpose and need of the Project to protect Reservation roads and utilities. Protection of Reservation roads are necessary to maintain tribe member access and emergency services access to and from residential structures. The protection of the potable water well and piping

infrastructure is crucial to sustain the Reservation community. The nonstructural measures also left a risk to loss of life for Reservation occupants and do not meet ASCE design standards (see Sections 5.4.5 and 5.4.6). For this reason, a combination of structural and nonstructural measures was required to meet the purpose and need of the Project.

One No Action Alternative and two Action Alternatives, which provide a level of protection to the developed Reservation community for a 100-year flood, were included in detailed study. A detailed description of the alternative formulation and decision-making process for alternatives is provided in the PR&G Analysis Report included in Appendix E. Alternative descriptions and cost estimates are provided in Sections 5.5.1 through 5.5.3 below and detailed cost estimates are provided in the PR&G Analysis Report included in Appendix E. The cost estimates for the alternatives provide a level of detail judged appropriate for the purpose of identifying the NEE Alternative among the alternatives considered. Project costs provided for alternatives selected for detailed study include installation and O&M costs. Installation costs include costs to be incurred for installing the works of improvement after the Project is authorized for installation. Installation costs include, as applicable, construction, engineering, real property rights, natural resource rights, permitting, replacement in-kind relocation payments, and Project administration costs (NRCS 2015a).

5.5.1 No Action Alternative

The No Action Alternative considers the actions that would take place if no federal action or federal funding were provided for the Project. The No Action Alternative would not improve site conditions to reduce flooding to the developed Reservation community. The O&M costs anticipated to maintain the existing channels and culvert crossing are anticipated to be $6,000 per year with a culvert replacement occurring once over the 100-year life at a cost of $100,000.

5.5.2 Action Alternative - Berm and Channel Improvements Full Riprap

The Berm and Channel Improvements Full Riprap Alternative includes structural measures to install berms and improve flood conveyance channels to divert floodwater around the Reservation community for all storm events up to and including a 100-year frequency flood. The structural measures provide protection for the existing Reservation development and reduce flooding in the approximately 411.8 acre benefited area (see Appendix B – Map B2). Nonstructural measures would be implemented to regulate the remaining floodplain areas. Nonstructural measures consist of the Reservation restricting development within the remaining 100-year floodplain outside of the protected community. A detailed description of the proposed structural measures is included below and a map is provided in Appendix B – Map B3.1 and B 3.2.

5.5.2.1 Berms and Flood Conveyance Channels

To divert water and debris from the upstream drainage areas away from the developed Reservation community, two diversion berms would be constructed (Figure 5-1). An approximate 2,640-foot-long flood diversion berm with a 6-foot top width and 3:1 side slopes would be constructed on the north side of the developed area to divert flood flows north around the community. A flood conveyance channel would be constructed along the toe of the berm. The berm and conveyance channel would be designed to accommodate the flow rate anticipated at the 100-year flood of 150 cfs. An approximate 900-foot-long diversion berm with a 6-foot top width and 3:1 side slopes would be constructed to divert flows into an existing conveyance channel that

flows around the community to the south. A flood conveyance channel would be constructed along the toe of the berm. The berm and conveyance channel would be designed to accommodate the flow rate anticipated at the 100-year flood of 1,200 cfs. Riprap armoring would be installed along both the north and south berms up to the anticipated 100-year flood water surface elevation. The remaining berm surfaces would not be exposed to channel water flow and would be seeded or hydroseeded with an approved grass/forb mix to provide protection against surface erosion. Flows would continue along the natural alluvial fan course downstream of the berms, the same as they do currently.

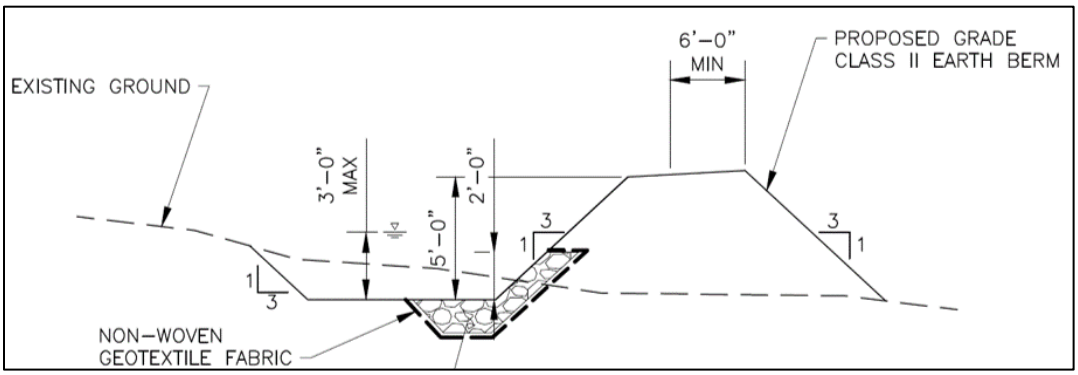

Figure 5-1. Berm and Flood Channel Section
Source: BC&A 2023a

A new approximately 200-foot-long conveyance channel with a 25-foot base width and 3:1 side slopes would be constructed from the southern end of the south berm/conveyance channel to connect into an existing conveyance channel. This section of channel would be designed to carry the anticipated 100-year flow of 1,200 cfs and both banks armored. The existing conveyance channel section, downstream of the southern new conveyance channel, would require modification along an approximate 425-foot length to safely convey the 100-year design flow of 2,200 cfs. This would consist of widening the existing channel for a 25-foot base width with 3:1 side slopes and armoring the channel banks on both sides to protect from erosion as needed (Figure 5-2).

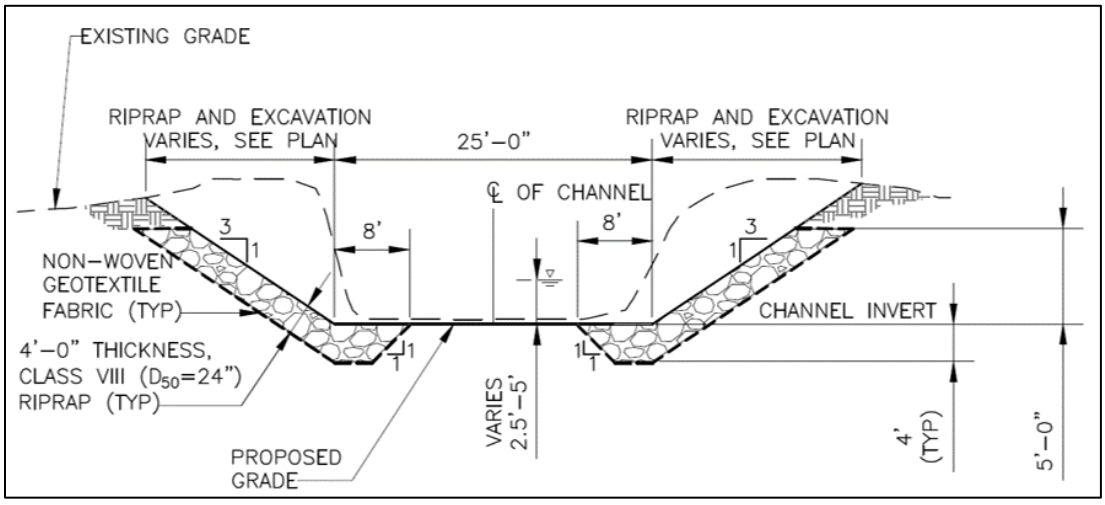

Figure 5-2. Channel Modification Section
Source: BC&A 2023a

5.5.2.2 Construction Staging/Access and Borrow Areas

Access to the site would be from the improved Skull Valley Indian Reservation Road. An approximate 25-acre area in the uplands south of the developed Reservation community, would be used for construction staging. This area may also be used for disposal or borrow and has been used for borrow in the past for construction of berms during the K-rail installation in 2013/2014.. Access to the area would follow an existing graveled access road. An additional access road to the south berm may be improved along an existing road alignment and a new temporary access road would be constructed between the north and south berm to facilitate construction access. Construction staging would occur within the proposed disturbed areas for berm construction/channel improvement and at the borrow area. An existing 2-track access road would be improved from the east end of Skull Valley Indian Reservation Road to the proposed south berm (approximately 1,100 feet). A new 1,550-foot-long gravel access road would be constructed from the south berm north then east to connect to the Reservation existing access road into the Stansbury Mountains. The new access road would be used for construction access and stay in place to maintain the Reservation existing access.

5.5.2.3 Construction Sequencing and Timing

Construction would take place over an approximately 6-month period (early spring through late summer) of 2025.

5.5.2.4 Costs

The installation cost is estimated at $2,742,000. O&M costs are estimated to be $8,100 per year with a culvert replacement occurring once over the 100-year life at a cost of $100,000.

5.5.3 Action Alternative - Berm and Channel Improvements Reduced Riprap (Preferred Alternative)

This alternative includes structural measures to install berms and improve flood conveyance channels to divert floodwater around the Reservation community for all storm events up to and including a 100-year frequency flood. The structural measures provide protection for existing Reservation development and reduce flooding in the approximately 411.8 acre benefited area (see Appendix B – Map B2). Nonstructural measures would be implemented to regulate the remaining floodplain areas. The alternative is similar to that described in Section 5.5.2, but avoids modifying or placing riprap on the non-Reservation side of the existing channel banks to preserve natural channel migration of the alluvial system outside the protected developed Reservation and to reduce installation costs. Nonstructural measures consist of the Reservation restricting development within the remaining 100-year floodplain outside of the protected community. A detailed description of the proposed measures is included below and a map is provided in Appendix B – Map B3.1 and Map B3.3.

5.5.3.1 Berms and Flood Conveyance Channels

The reduced riprap alternative was developed to reduce costs and limit bank modifications of natural channel segment to the greatest extent feasible. The reduced riprap alternative provides protection from channel migration and associated flooding into the developed Reservation

community while allowing the remaining fan system to continue its natural migration and sediment deposition patterns outside of the developed Reservation.

To divert water and debris from the upstream drainage areas away from the developed Reservation community, two berms and associated flood conveyance channels, and a new 200-foot-long conveyance channel would be constructed as described for the Berm and Channel Improvements Full Riprap Alternative from Section 5.5.2 and shown in Figure 5-1. However, the new conveyance channel would be armored on the Reservation side to protect from channel migration and associated flooding occurring toward the developed community, and the other side seeded or hydroseeded with an approved grass/forb mix to provide protection against surface erosion (Figure 5-3). The 425-foot-long existing channel segment would limit disturbance to the Reservation bank side. The alternative considered avoiding channel modifications along the existing channel all together, but channel overtopping and flooding of structures would occur from lack of channel capacity. To achieve the flood prevention benefits, modifications to increase capacity along that segment were needed and limited to the Reservations side of the channel. The bank of the modified 425-foot-long channel segment would be armored on the developed Reservation side to protect from channel migration and associated flooding occurring toward the developed community (Figure 5-3).

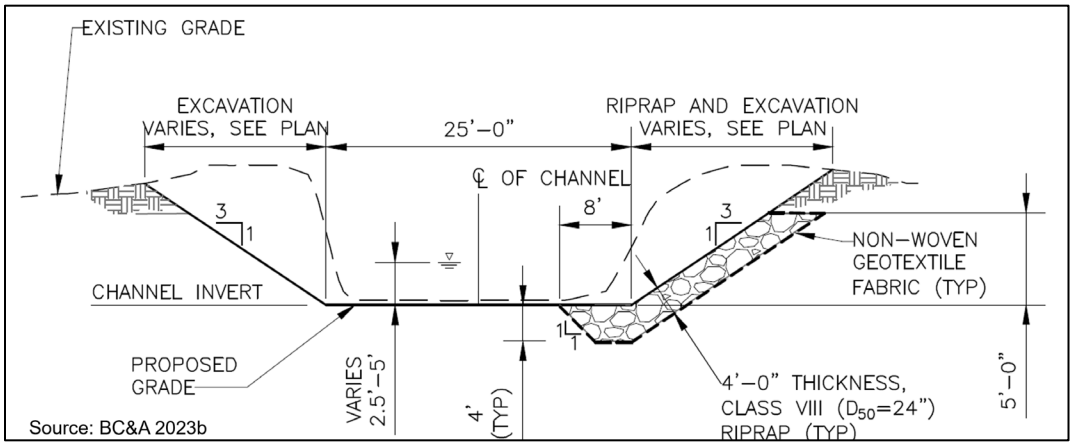

Figure 5-3. Channel Modification Section

5.5.3.2 Construction Staging/Access and Borrow Areas

These measures would be the same as those described for the Berm and Channel Improvements Full Riprap Alternative in Section 5.5.2.2.

5.5.3.3 Construction Sequencing and Timing

Construction would take place over an approximately 6-month period (early spring through late summer) of 2025.

5.5.3.4 Costs

The installation cost is estimated at $1,533,000. O&M costs are estimated to be $8,100 per year with a culvert replacement occurring once over the 100-year life at a cost of $100,000.

5.6 National Economic Efficiency Alternative

Alternatives were compared to select one alternative that "best" maximized public benefits (environmental, economic, and social goals) with appropriate consideration of costs, guiding principles, the federal objective, PL 83-566 general purposes, and ecosystem services. This alternative is known as the NRCS NEE Alternative. The NEE Alternative for the Project was determined to be the Berm and Channel Improvements Reduced Riprap Alternative based on the analysis performed. A PR&G Analysis was completed in support of decision making for the NEE Alternative and is included in Appendix E. The NEE Alternative was also determined to be the locally preferred, environmentally preferred, and socially preferred alternative (see the PR&G Analysis in Appendix E).

5.7 Summary and Comparison of Alternative Plans

The alternatives proposed for consideration and analyzed in detail in this Plan-EA have been compared against each other to discern the merits and disadvantages of each alternative. This comparison of environmental, social, and economic effects is summarized in Table 5-1. The detailed analysis of environmental consequences for each alternative is provided in Section 6.0.

Table 5-1. Summary and Comparison of Alternative Plans

Resource Concern/Item	No Action Alternative	Berm and Channel Improvements Full Riprap Alternative	Berm and Channel Improvements Reduced Riprap Alternative
Upland Erosion and Sedimentation			
Upland Erosion	There would be no change from existing conditions and erosion would continue at the same rate it has historically.	Short-term direct minor impacts during construction would occur from soil disturbance but Proper Best Management Practices (BMPs) would be installed during and after construction and disturbed areas would be restored and/or stabilized. An indirect benefit of reduced erosion potential to the developed Reservation community is anticipated over the long term. Effects on erosion conditions in the drainage outside of the developed Reservation community during future floods would be negligible.	This alternative has the same short-term direct minor impacts and indirect long-term benefits as described for the other action alternative. There would be no change to sedimentation condition in the drainage outside of the Reservation community.

Resource Concern/Item	No Action Alternative	Berm and Channel Improvements Full Riprap Alternative	Berm and Channel Improvements Reduced Riprap Alternative
Sedimentation	The indirect adverse impacts of sedimentation to the developed reservation community would continue over the long term, causing reoccurring damage to Reservation structures, infrastructure, and property.	An indirect benefit of reduced sedimentation to the developed Reservation community is anticipated over the long term, reducing damage to Reservation structures, infrastructure, and property. Effects on sedimentation conditions in the drainage outside of the developed Reservation community during future floods would be negligible.	This alternative has the same indirect benefit of reduced sedimentation to the Reservation community. There would be no change to sedimentation conditions in the drainage outside of the Reservation community.
Prime and Unique Farmlands	The indirect adverse impacts of flooding to soil classified as “farmland of statewide importance” would continue over the long term.	Minor direct impacts to soil classified as “farmland of statewide importance” would occur from temporary disturbance in the short term, but the areas would be restored to preconstruction conditions after construction completion. Permanent direct impacts would occur from fill/excavation activities but would be negligible considering the impact only occurs on approximately 0.06% of the available “farmland of statewide importance” within the Reservation. A long term reduction in flooding to soil classified as “farmland of statewide importance” would occur that would have a minor indirect benefit to these lands.	This alternative has the same impacts as described for the other action alterative.
Water			
Surface Water Quality	No Impact	Construction activities would have negligible short-term impacts to water quality based on implementation of BMPs and construction timing occurring when water is not present. Construction BMPs would be used to reduce sediment entering waters and activities would not violate federal or state water quality rules and regulations. No long-term impacts are anticipated.	This alternative has the same impacts as described for the other action alterative.

Resource Concern/Item	No Action Alternative	Berm and Channel Improvements Full Riprap Alternative	Berm and Channel Improvements Reduced Riprap Alternative
Waters of the U.S.	No Impact	Direct temporary impacts from disturbance to 895 linear feet of channel would occur, but the disturbed areas would be restored after construction completion to allow similar channel function. Direct permanent impacts would occur from removal of approximately 145 linear feet of channel, but approximately 3,740 linear feet of new channel would be constructed resulting in a net increase of 3,595 linear feet of channel. Reduction of natural channel migration of the alluvial fans system away from the developed community would occur along 570 linear feet from bank armoring.	This has similar impacts of the Berm and Channel Improvements Full Riprap Alternative, but armoring would only occur on the developed Reservation side of channel banks. This would allow continuation of natural channel migration and sediment deposition patterns in areas of the alluvial fan away from the developed Reservation, where there is no existing or proposed development.
Floodplain Management	The indirect adverse impacts from flooding to the developed Reservation community would continue over the long term, causing reoccurring damage to Reservation structures, infrastructure, and property. Climate change stressors of increased frequency and intensity of floods would remain.	An indirect benefit of reduced flooding to the developed Reservation community is anticipated over the long term. Flood protection would be provided to the developed community for up to and including a 100-year frequency flood, and flooding would be substantially reduced for the 500-year flood. This would improve the resilience to climate change stressors to better adapt to the anticipated rise in extreme precipitation events and flooding.	This alternative has the same impacts as described for the other action alterative.
Air Quality			
Air Quality	No Impact	Short term minor increases in emissions concentrated around the construction site are anticipated. Construction activities would not violate air quality standards and BMPs would be implemented. There would be no long-term impacts to air quality.	This alternative has the same impacts as described for the other action alterative.

Resource Concern/Item	No Action Alternative	Berm and Channel Improvements Full Riprap Alternative	Berm and Channel Improvements Reduced Riprap Alternative
Plants			
Noxious Weeds and Invasive Plants	No Impact	Short-term direct impacts would occur during construction and until re-establishment of vegetative cover that would put the area at risk for invasion of noxious weeds and invasive plants. A Post Construction Rehabilitation Plan (PCRP) would be developed, and short-term impacts would be minor with implementation of BMPs and development of a PCRP. Long-term impacts are not anticipated.	This alternative has the same impacts as described for the other action alterative.
Special Status Plant Species	No special status plant species, designated critical habitat, or suitable habitat are present and there would be no impact to these species from alternative measures.	No special status plant species, designated critical habitat, or suitable habitat are present and there would be no impact to these species from alternative measures.	No special status plant species, designated critical habitat, or suitable habitat are present and there would be no impact to these species from alternative measures.
Animals			
Wildlife and Wildlife Habitat	No Impact	Temporary direct disturbance would occur on approximately 32.93 acres of wildlife habitat, including crucial pronghorn habitat. These short-term impacts to wildlife/habitat would be minor and disturbed areas would be restored upon construction completion. Permanent removal of approximately 0.5 acres of habitat, including crucial pronghorn habitat, would occur from construction of a gravel access road. These long-term impacts are considered negligible as the permanent removal only consists of 0.004% of the available habitat within the Reservation. Measurable long-term impacts are not anticipated.	This alternative has the same impacts as described for the other action alterative.

Resource Concern/Item	No Action Alternative	Berm and Channel Improvements Full Riprap Alternative	Berm and Channel Improvements Reduced Riprap Alternative
Migratory Birds/ and Golden Eagles	No Impact	Migratory birds could be present for foraging and nesting, and golden eagles could be present in the Project area while foraging. Preconstruction surveys would be performed, and spatial buffers would be established as necessary in coordination with USFWS. Impacts to migratory birds and golden eagles and associated habitat would be short term and minor to negligible during construction based on the duration of construction, restoration of disturbed areas, abundant suitable habitat in the surrounding area, and avoidance/ minimization measures in place. Long-term impacts to migratory birds and golden eagles are not anticipated.	This alternative has the same impacts as described for the other action alterative.
Special Status Animal Species	No Impact	There would be no impacts to ESA animal species, designated critical habitat, or suitable habitat because none are present. State SGCN burrowing owl, ferruginous hawk, golden eagle, and kit fox have the potential to be present. Short-term direct disturbance to the species (if present) would be minor to negligible based on duration of construction, restoration of disturbed areas, abundant suitable habitat in the surrounding area, and avoidance/ minimization measures in place. Long-term impacts are not anticipated.	This alternative has the same impacts as described for the other action alterative.
Human			
Socioeconomics	The indirect adverse impacts from flooding to the developed Reservation community would continue over the long term resulting in damage and associated costs to the community.	Long-term indirect benefits would be provided to the Reservation, which was identified as a disadvantaged community, from reduced flooding and associated reduced damage. Benefits of avoided flood damage are estimated at $80,700 annually.	This alternative has the same impacts as described for the other action alterative.

Resource Concern/Item	No Action Alternative	Berm and Channel Improvements Full Riprap Alternative	Berm and Channel Improvements Reduced Riprap Alternative
Public Health and Safety	The indirect adverse impacts of flood-related risk to loss of life and mental/ physical health issues would remain continuing to threaten the tribe's health and safety.	The developed Reservation community would be protected from flooding for up to and including a 100-year frequency flood. This would have indirect long-term benefits that improve the tribe's health and safety by avoiding risk of flood-related loss of life and mental/physical health issues.	This alternative has the same impacts as described for the other action alterative.
Visual Resources	No Impact	Short-term direct impacts to visual quality are anticipated during construction from disturbed ground and equipment parked or operating in the Project area. Impacts would be minor during construction, but disturbed areas would be restored. No measurable long-term impacts to visual quality are anticipated.	This alternative has the same impacts as described for the other action alterative.
Transportation Infrastructure	The indirect adverse impacts from flooding to Skull Valley Indian Reservation Road and Highway 196 would occur over the long term, continuing to cause damage to the roads.	Skull Valley Indian Reservation Road would be protected from flooding for up to and including a 100-year frequency flood, providing long-term indirect benefits of reduced flood damage. There would be no measurable change to flooding of Highway 196.	This alternative has the same impacts as described for the other action alterative.
Noise	No Impact	Short-term minor impacts are anticipated during construction, but BMPs would be in place and there would be no violations of applicable noise programs/regulations. Long-term impacts to noise from O&M activities would be negligible.	This alternative has the same impacts as described for the other action alterative.

Resource Concern/Item	No Action Alternative	Berm and Channel Improvements Full Riprap Alternative	Berm and Channel Improvements Reduced Riprap Alternative
Historic Properties/ Cultural Resources/ Native American Religious Concerns	No Impact	There would be no adverse effects to historic properties, cultural resources, or Native American religious sites. Section 106 and tribal consultation was performed to comply with NHPA, EO 13007, EO 13175, and the AIRFA. The State Historic Preservation Office concurred with the determinations of eligibility and the no adverse effect to historic properties determination for the Project in a letter dated April 20, 2023 (Appendix A). No Native American religious concerns were identified by tribes during consultation, pursuant to EO 13007, EO 13175, the NHPA and the AIRFA. Refer to Section 7.1.6 for a list of tribes consulted, dates of consultation, and responses received from tribes.	This alternative has the same impacts as described for the other action alterative.

Table 5-2. Cost and Benefit Summary

Item	No Action Alternative	Berm and Channel Improvements Full Riprap Alternative	Berm and Channel Improvements Reduced Riprap Alternative
Construction Cost	$0	$2,449,000	$1,365,000
Other Costs[1]	$0	$293,000	$168,000
Total Project Cost (Installation Cost)	$0	$2,742,000	$1,533,000
Cost Sharing (NRCS)	$0	$2,694,000	$1,502,000
Cost Sharing (SLOs)	$0	$48,000	$31,000
Annual Installation Cost[1]	$0	$73,100	$40,800
Annual O&M and Replacement Cost[2]	$6,300	$8,000	$8,000
Annual Sum Cost[2]	$0	$81,100	$48,800
Annual Benefit[1]	-	$81,400	$81,400
Annual Net Economic Benefit	($6,300)	($400)	$31,900
Benefit Cost Ratio	-	1.0	1.7

1 – Other costs include Engineering, Permitting, and Administration

2 – Calculated using FY 2023 Water Resources Discount Rate (2.5%), annualized over 100-year evaluation period, and using 101-year period of analysis.

6.0 Environmental Consequences

NRCS has the responsibility under NEPA to identify and address effects on the environment that may result from the proposed alternatives. These alternatives include the No Action Alternative, The Berm and Channel Improvements Full Riprap Alternative, and the Berm and Channel Improvements Reduced Riprap Alternative (preferred alternative). This section describes the potential effects of the alternatives within each resource category as defined in Section 4.0.

The following lists the specific terminology used to describe impacts associated with alternative measures:

Type

- Direct Effect: Impacts caused by a proposed action and occurring at the same time and place.
- Indirect Effect: Impacts caused by an action that are later in time or farther removed in distance but are still reasonably foreseeable.
- Cumulative Effect: The impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person is undertaking such other action.

Duration

- Temporary and Permanent Impacts: Temporary impacts are impacts that are not lasting and the affected resource will return or be restored to its previous (pre-project) state. Permanent impacts are those in which the affected resource will not return to its previous state within one's lifetime.
- Short- and Long-Term Impacts: Short-term impacts are those that last through the duration of construction and shortly after (duration of impact is approximately 6 months to 1-year). Long-term impacts are those that last for an extended duration of time. For this evaluation, long-term impacts extend beyond year 1 up to the evaluated life of the project (100 years).

Intensity

- No Impact – Resource conditions would not change.
- Negligible – Resource condition changes would be so slight there would be no measurable or perceptible consequence to the resource.
- Minor – A small measurable effect to the resource, but localized, small, and of little consequence to the resource. Mitigation measures, if needed to offset adverse effects, would be easily implemented and successful based on knowledge and experience.
- Moderate – A measurable effect on the resource from the alternative actions. Mitigation measures would likely be needed to offset adverse effects and could be extensive, moderately complicated to implement, and probably successful based on knowledge and experience.
- Substantial – A large, measurable effect to the resource from the alternative actions. Mitigation measures would be needed to offset adverse effects and could be extensive and complicated to implement.

6.1 Soil Resources

6.1.1 Upland Erosion

Please refer to Section 4.1.1 for existing upland erosion conditions for the Project area.

6.1.1.1 No Action Alternative

For this alternative, upland erosion conditions would not change from existing conditions and erosion would continue at the same rate it has historically occurred. No measurable impacts are anticipated for continuation of O&M activities.

6.1.1.2 Berm and Channel Improvements Full Riprap Alternative

Ground disturbed during construction would have an increased short-term potential for erosion. Proper Best Management Practices (BMPs) would be installed during and after construction to prevent and control soil erosion. Areas disturbed during construction activities would be restored and stabilized through the establishment of ground cover. Flood conveyance channels would be armored or restored for surface erosion protection. Direct minor impacts during construction in disturbed areas are anticipated until ground cover becomes established and areas have been stabilized. No measurable long-term direct impacts to upland erosion are anticipated from alternative measures or from O&M activities.

Alternative actions divert channel flow around the developed Reservation. This has an indirect benefit of reduced erosion potential to developed Reservation lands during future flood events. Areas outside of the protected developed Reservation would continue to experience upland erosion during future flood events similar to the baseline conditions, but a decrease in channel migration and erosion away from the Reservation would occur along 625 linear feet of armored channel. However, with approximately 207,100 linear feet of stream in the drainage, this 0.3% change would have a negligible effect on erosion conditions in the drainage during future floods.

6.1.1.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same negligible direct impacts during construction as those described for the Berm and Channel Improvements Full Riprap Alternative. No measurable long-term direct impacts to upland erosion are anticipated from alternative measures or from O&M activities.

The indirect benefit of reduced erosion potential to Reservation lands during future flood events would be the same as described for the Berm and Channel Improvements Full Riprap Alternative. Channel migration and erosion outside of the protected Reservation would remain the same as the baseline conditions.

6.1.2 Sedimentation

Please refer to Section 4.1.2 for existing sedimentation conditions for the Project area.

The indirect adverse impacts of sedimentation to the developed reservation community would continue over the long term. Sedimentation around the K-rails and into the developed Reservation community would occur during flood events as it has historically, continuing to cause reoccurring damage to Reservation structures, infrastructure, and properties.

6.1.2.1 Berm and Channel Improvements Full Riprap Alternative

No short-term impacts are anticipated. An indirect benefit of reduced sedimentation to the developed Reservation community is anticipated over the long term. This alternative diverts flood/debris flows around the developed Reservation community through construction of berms and improvements to conveyance channels. It is anticipated that the developed Reservation community would be protected over the long term from sedimentation during future flood events for up to and including a 100-year frequency storm by implementing alternative measures. Sedimentation downstream of the developed Reservation community is anticipated to continue similar as it has historically with negligible changes because there are no measurable changes to flood depths and extents downstream. No impacts to sedimentation conditions are anticipated from O&M activities.

Areas outside of the protected developed Reservation would continue to experience sedimentation during future flood events similar to the baseline conditions, but a decrease in channel migration and erosion away from the Reservation would occur along 625 linear feet of armored channel. However, with approximately 207,100 linear feet of stream in the drainage, this 0.3% change would have a negligible effect on sedimentation conditions in the drainage outside of the developed Reservation community during future floods.

6.1.2.2 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

No short-term impacts are anticipated. This alternative has the same indirect benefits of reduced sedimentation to the developed Reservation community as those described for the Berm and Channel Improvements Full Riprap Alternative. Channel migration and sedimentation outside of the protected Reservation would remain the same as the baseline conditions. No measurable long-term direct impacts to sedimentation are anticipated from alternative measures or from O&M activities.

6.1.3 Prime and Unique Farmland

The Project area sits entirely on soils classified as “farmland of statewide importance”, but prime and unique farmlands are not present. Please refer to Section 4.1.3 for a description of existing farmland of statewide importance within the Project area.

6.1.3.1 No Action Alternative

There would be no change from existing conditions and no disturbance above what is currently experienced would occur on soil designated as “farmland of statewide importance.” The risk of flooding to the Reservation community would remain that would continue to have an indirect adverse impact to soil classified as “farmland of statewide importance.”

6.1.3.2 Berm and Channel Improvements Full Riprap Alternative

This alternative would directly impact approximately 34.19 acres of soil designated as “farmland of statewide importance” (Appendix C – Map C1) from installation of alternative measures. Short-term impacts to approximately 25.46 acres from temporary disturbance during construction would occur and are minor as these areas would be restored to preconstruction conditions or better after construction completion. Approximately 8.73 acres would experience permanent disturbance

from construction of berms and excavation of channels, but long-term adverse impacts are anticipated to be negligible when considering that permanently disturbed soils only account for 0.06% of the soil classified as “farmland of statewide importance” within the Reservation. No measurable impacts are anticipated from O&M activities.

A Long term reduction in flooding to soil classified as “farmland of statewide importance” would occur that would have a minor indirect benefit to these lands. Approximately 194 acres of soil classified as “farmland of statewide importance” (1.2% of lands within the Reservation) would be protected from flood damage during a 100-year flood event.

6.1.3.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative would have the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.2 Water Resources

6.2.1 Surface Water Quality

Please refer to Section 4.2.1 for existing surface water quality conditions for the Project area.

6.2.1.1 No Action Alternative

There would be no change to surface water quality conditions for this alternative.

6.2.1.2 Berm and Channel Improvements Full Riprap Alternative

Project design elements, including required BMPs, would be implemented to reduce the quantity of sediment (1) entering drainages, and (2) flowing downstream and violating any federal or state water quality rules and regulations. This alternative would also meet Utah antidegradation requirements. Construction BMPs would include, but are not limited to, the following:

- A Storm Water Pollution Prevention Plan would be required and implemented that contains erosion and sediment control and pollution prevention BMPs, such as, but not limited to, silt fences, fiber wattles, and/or earthen berms.
- Water bodies adjacent to construction and staging areas would be identified, and such measures as straw bales, silt fences, and other appropriate sediment control BMPs would be implemented to prevent the entry of sediment and other contaminants into waters.
- To ensure that accidental spills do not enter waters, the storage of petroleum-based fuels and the refueling of construction machinery would not occur outside of approved designated staging/batch plant areas. Furthermore, the alternative would comply with state and federal water quality standards and toxic effluent standards to minimize any potential adverse impacts from discharges to waters of the U.S.
- No construction materials would be stockpiled or deposited in or near any water bodies.

Construction activities would occur during the dry season, when intermittent flows have typically subsided. Based on implementation of BMPs and construction timing when water is not present, construction activities would have negligible impacts on surface water quality. Long-term impacts

are not anticipated with the implementation of BMPs and restoration of disturbed areas after construction completion. The O&M activities are also anticipated to be performed in the dry and are not expected to have measurable impacts to surface water quality.

The alternative would stabilize new and modified channel banks by armoring with riprap. Changes in sediment load in the channel would be negligible considering most sediment originates from the upstream drainage area and the channel modifications are along the alluvial fan depositional area. In addition, the modifications only account for 0.003% of the area contributing to channel sediment load.

6.2.1.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same negligible impacts during construction as those described for the Berm and Channel Improvements Full Riprap Alternative.

The alternative would stabilize new and modified channel banks by armoring with riprap or seeding. Changes in sediment load in the channel would be negligible considering most sediment originates from the upstream drainage area and the channel modifications are along the alluvial fan depositional area. In addition, the modifications only account for 0.003% of the area contributing to channel sediment load.

6.2.2 Waters of the U.S.

Waters of the U.S. were identified and delineated within the Project area (See Skull Valley Aquatic Resources Report included in Appendix E). Refer to Section 4.2.2 for a list of all waters of the U.S. within the Project area.

6.2.2.1 No Action Alternative

Temporary modifications to waters of the U.S. may occur during routine O&M activities. However, these modifications are not anticipated to have a measurable impact on waters of the U.S. and the stream systems would continue to function as they do currently.

6.2.2.2 Berm and Channel Improvements Full Riprap Alternative

This alternative places permanent fill in approximately 145 linear feet of channel, temporarily modifies approximately 895 linear feet of channel, and adds 3,740 feet of new channel (Table 6-1). This would result in a net increase in 3,595 linear feet of channel. Armoring the banks along the 570 linear feet of the modified channel segment along the unnamed intermittent channel would occur, but this armoring is anticipated to be outside of the mapped approximate 10-foot-wide delineated OHWM due to a proposed bottom channel width of 25 feet. However, armoring both sides of the channel along the 570 liner foot length would reduce natural channel migration capabilities of the alluvial fan stream along that length. Maps showing existing waters and alternative impacts are included in Appendix C – Map C2.

Table 6-1. Impacts to Waters of the U.S.

Potential Water of the U.S.	Feature ID	Length Disturbed (linear feet)	Impact	Description
Indian Hickman Creek Channel 1	W3D	65	Permanent	Fills channel through construction of berm and access road.
		90	Temporary	Channel grading within the OHWM.
Indian Hickman Creek Channel 2	W1D	80	Permanent	Fills channel through construction of berm.
		235	Temporary	Channel grading within the OHWM.
Unnamed Intermittent Channel	S5A/W5B	570	Temporary	Channel grading within the OHWM.
Total Permanent		**145**	**Permanent**	**Project Modifications**
Total Temporary		**895**	**Temporary**	**Project Modifications**
Total New Channel Added		**3,595**	**Permanent**	**New Channel**

Channel modifications would maintain a natural open channel bottom to allow the temporarily modified channel to function the same as it does currently. Section 404 permitting would be completed with the USACE for alternative measures prior to the start of construction to comply with Section 404 of the Clean Water Act. The alternative measures are anticipated to be self-mitigating with no net decrease of stream channel and an increase of 3,595 linear feet of stream channel. Modifications are not anticipated to have a measurable change to stream flow patterns downstream of the developed Reservation community based on hydraulic modeling performed.

6.2.2.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

The impacts to waters of the U.S. would be the same as those described for the Berm and Channel Improvements Full Riprap Alternative. Only the Reservation side of the channel bank along the 570-foot length of the unnamed intermittent channel would be armored instead of both channel banks. As noted for the Berm and Channel Improvements Full Riprap Alternative, armoring would be outside of the delineated OHWM. Armoring the Reservation side of the banks would protect channel migration toward the Reservation while allowing natural channel migration capabilities of the alluvial fan stream away from the Reservation along that length. This would allow continuation of natural migration and sediment deposition patterns in areas of the alluvial fan away from the Reservation, where there is no existing or proposed development. Section 404 permitting would be completed with the USACE for alternative measures prior to the start of construction to comply with Section 404 of the Clean Water Act.

6.2.3 Floodplain Management

Refer to Section 4.2.3 for existing floodplain conditions within the Project area and Appendix C – Maps C3A and C3B for flood inundation extents determined from BC&A modeling. FEMA flood maps are not available for the Reservation. The local community has the right to request a map revision from FEMA to change the FEMA flood zone designations.

6.2.3.1 No Action Alternative

The indirect adverse impacts from flooding to the developed Reservation community would continue over the long term. The developed Reservation community would experience flooding as it has historically, continuing to cause long term and reoccurring flood damage to Reservation structures, infrastructure, and properties. Climate change stressors of increased frequency and intensity of floods due to a rise in extreme precipitation events would remain and threaten the developed Reservation community.

6.2.3.2 Berm and Channel Improvements Full Riprap Alternative

No short-term impacts are anticipated. An indirect benefit of reduced flooding potential to the developed Reservation community is anticipated over the long term. This alternative provides flood prevention measures for the developed Reservation community for up to and including a 100-year frequency flood (Appendix C – Map C3A). Flood protection measures are designed for a 100-year flood, but reduced flooding would also occur during the 500-year flood (Appendix C – Map C3B). The Sponsors would prohibit development within the remaining floodplain.

Based on the level and extent of flood protection provided, the measures would provide a substantial flood prevention benefit to the developed Reservation community. The modifications would reduce flooding and associated damage to Reservation structures, infrastructure, and properties. All inhabited structures of the developed Reservation community and Skull Valley Indian Reservation Road would be protected. A former gas station, located 1-mile south of the developed Reservation community, may still experience shallow flooding during a 100-year frequency flood at depths of less than ½-foot, but the gas station is abandoned and out of operation. Additionally, one residential structure located ¾-miles west of the developed Reservation community and west of Highway 196, would still experience shallow flooding at less than ½-foot in depth, but is not anticipated to cause substantial damage to the structure. Nonstructural measures would restrict development within the remaining 100-year floodplain outside of the protected community to avoid future flood damage. The measures would also increase resilience to climate change stressors to better adapt to the anticipated rise in extreme precipitation events and associated flooding.

It is recommended that the SLO consult with the local floodplain zoning authority and appropriate FEMA region staff to keep floodplain maps up to date.

6.2.3.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same indirect benefit of reduced flooding as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.3 Air Resources

6.3.1 Air Quality and Climate

Please refer to Section 4.3.1 for existing air quality conditions for the Project area.

6.3.1.1 No Action Alternative

This alternative would have no change to the air quality conditions for the Project area.

6.3.1.2 Berm and Channel Improvements Full Riprap Alternative

Construction activities would temporarily emit several air pollutants. PM10 emissions are associated with the dust created from demolition, land clearing, ground excavation, cut-and-fill operations, and road construction. All other pollutants (PM2.5, CO, sulfur oxides [SOx], nitrous oxides [NOx], mobile source air toxics [MSATs], and greenhouse gases [GHGs]) are generated from heavy-duty diesel engines used by the construction equipment. Construction emissions are greatest during the earthwork phases because of the dust associated with this activity. Fugitive dust can also be produced by winds blowing through the construction site and by trucks carrying uncovered loads. Additionally, mud tracked onto paved roads leading to and from the construction site creates a source of fugitive dust (i.e., road dust) after it dries.

Fugitive dust, MSAT, and GHG emissions increases associated with construction would be minimized by implementing applicable BMPs. These include the following:

- Spraying the soil on-site with water or other similar approved dust suppressant/soil binder.
- Wetting materials hauled in trucks, providing adequate freeboard (space from the top of the material to the top of the truck), or covering loads to reduce emissions during material transportation/handling.
- Providing a stabilized construction entrance (track-out pad), wheel washers, and/or other similar BMPs at construction site access areas to reduce track-out of site materials onto the adjacent roadway network.
- Removing tracked-out materials deposited onto adjacent roadways.
- Wetting material stockpiles to prevent wind-blown emissions.
- Establishing vegetative cover on bare ground as soon as possible after grading to reduce wind-blown dust.
- Requiring appropriate emission-control devices on all construction equipment.
- Requiring the use of cleaner burning fuels.
- Using only properly operating, well-maintained construction equipment.

Alternative measures would have minor direct increases in emissions from trucks and construction equipment powered by heavy-duty diesel engines. These increases would be short term and concentrated around the construction site. Construction activities are not expected to violate air quality standards, based on the implementation of BMPs and the short duration of construction. Long-term impacts to air quality or climate change from GHG emissions are not anticipated. This is due to the short 6-month construction schedule, small scale of the construction measures, and minimal construction equipment in operation during construction. No measurable

impacts to air quality or climate from GHG emissions are anticipated from O&M activities based on the duration, frequency, and limited equipment operations to perform those activities.

6.3.1.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.4 Plant Resources

6.4.1 Noxious Weeds and Invasive Plants

Noxious and Invasive (N&I) weeds were not identified within the Project area, but the dominant plant species present are non-native invasive species to the area. Please refer to Section 4.4.1 for existing information on N&I weeds and non-native plants.

6.4.1.1 No Action Alternative

There would be no change to existing plant communities including N&I weeds for this alternative.

6.4.1.2 Berm and Channel Improvements Full Riprap Alternative

This alternative would have minor impacts that would put the Project area at risk for future invasion of N&I weeds from disturbance on approximately 32.93 acres of land. These lands are currently dominated by invasive herbaceous and shrub cover of cheatgrass (*Bromus tectorum*), Russian thistle (*Salsola iberica*), and common stork's-bill (*Erodium cicutarium*). BMPs would be implemented during construction to prevent the spread of N&I plant species and comply with Executive Order 13112. During construction and until restoration areas are fully established, they would be maintained on a regular basis to prevent the establishment of N&I plant species. Non-desirable plant species would be controlled by cleaning equipment prior to delivery to the Project site and eradicating these species before the start and during construction as discovered. In addition, a Post Construction Rehabilitation Plan (PCRP) would be developed and would include mechanisms for addressing weed establishment and treatment. Disturbed areas would be restored to preconstructions conditions or better after construction completion. The increased risk for invasion of N&I weeds is anticipated to be short term and minor based on the minimal area disturbed, implementation of PCRP, and restoration of disturbed areas. No measurable long-term adverse impacts are anticipated based on restoration of disturbed areas and implementation of the PCRP.

6.4.1.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.4.2 Special Status Plant Species

A BA was completed for the Project area (Refer to Skull Valley BA included in Appendix E) and determined that ESA plant species, designated habitat, or suitable habitat are not present. The

BA was submitted to the USFWS on April 6, 2022, with a No Effect determination for ESA plant species to comply with Section 7 of the ESA (Appendix A). Refer to Section 4.4.2 for additional information on ESA plant species within the Project area.

6.4.2.1 No Action Alternative

ESA plant species, designated critical habitat, or suitable habitat would not be impacted because none are present.

6.4.2.2 Berm and Channel Improvements Full Riprap Alternative

ESA plant species, designated critical habitat, or suitable habitat would not be impacted because none are present.

6.4.2.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

ESA plant species, designated critical habitat, or suitable habitat would be not impacted because none are present.

6.5 Animal Resources

6.5.1 Wildlife and Wildlife Habitat

Please refer to Section 4.5.1 for information regarding the presence of wildlife and wildlife habitat within the Project area.

6.5.1.1 No Action Alternative

There would be no change to existing wildlife habitat or wildlife communities within the Project area for this alternative.

6.5.1.2 Berm and Channel Improvements Full Riprap Alternative

Direct short-term impacts to wildlife habitat area anticipated. Approximately 32.93 acres of wildlife habitat would be temporarily disturbed for this alternative. Disturbance includes excavation, grading, placement of fill, and construction equipment traffic to install alternative measures. Construction activities would be completed within 6 months. Wildlife species, if present, may be temporarily disturbed and displaced to adjacent habitats from construction disturbance and noise. Temporarily disturbed areas would be restored upon construction completion. Once construction is completed, wildlife could return to the area. No ESA-listed animal species or habitat is present. Avoidance and minimization would be in place for bird species and special status species as described in Sections 6.5.2.2 and 6.5.3.2. Temporary adverse disturbance to wildlife for construction would be minor based on the duration of construction, avoidance/minimization measures, minor amount of area disturbed, and restoration of disturbed areas after construction completion. Temporary adverse disturbance to habitat would also be minor based on lack of: wetlands, riparian areas, permanent surface water, and tree cover; restoration of disturbed areas; and the extensive better quality habitat surrounding the Project area suitable for wildlife.

Minor modifications to habitat types would occur from alternative measures, but are not anticipated to have measurable long-term impacts to wildlife or wildlife habitat availability because

these areas would be restored, including areas designated as crucial pronghorn habitat. Permanent removal of approximately 0.5 acres of vegetation within crucial pronghorn habitat would occur from construction of the permanent access road. Long-term impacts to habitat availability and wildlife would be negligible considering the permanent modifications only account for 0.004% of the available habitat within the Reservation. There would be no impact to chukar, mule deer, or Rocky Mountain elk crucial/substantial habitat because they are not present in the Project area. Impacts to wildlife or wildlife habitat from O&M activities would be negligible, based on the small scale, short timing for activities (less than a day), and duration (once a year).

6.5.1.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative would have the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.5.2 Migratory Birds / Golden Eagles

Please refer to Section 4.5.2 for a description of migratory birds/golden eagles and potential occurrence within the Project area.

6.5.2.1 No Action Alternative

There would be no impact to migratory birds or golden eagles for this alternative.

6.5.2.2 Berm and Channel Improvements Full Riprap Alternative

If present, migratory birds may be disturbed and displaced to adjacent habitats during construction activities. If construction activities occur during migratory bird breeding/nesting periods, the Project area (and surrounding habitats) would be surveyed by a qualified biologist for active nests no more than 5 days prior to the commencement of work. If active nests were found during surveys, spatial buffers would be established around such in coordination with USFWS and NRCS. Construction activities within the buffer areas would be prohibited until a qualified biologist confirmed that all nests are no longer active. Direct short-term impacts of this alternative to migratory birds and associated habitat would be minor to negligible based on implementation of avoidance/minimization measures, preconstruction surveys, restoration of disturbed areas, and abundant suitable habitat in the surrounding area.

Golden eagles would only be present in the Project area for foraging and, if present, may avoid foraging in the Project are during construction activities. Short-term impacts to golden eagles would negligible based on the short construction duration, restoration of disturbed areas, and abundant suitable foraging habitat in the surrounding area.

There would be no measurable long-term impacts to migratory birds or golden eagles for this alternative or for O&M activities.

6.5.2.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.5.3 Special Status Animal Species

A BA was completed for the Project area (Refer to Skull Valley BA included in Appendix E) and determined that ESA animal species, designated habitat, or suitable habitat are not present. The BA was submitted to the USFWS on April 6, 2022, with a No Effect determination for ESA animal species to comply with Section 7 of the ESA (Appendix A).

State-listed SGCN have the potential to occur in the Project area including kit fox (V*ulpes macrotis*), burrowing owl (*Athene cunicularia*), ferruginous hawk (*Buteo regalis*), and golden eagle (*Aquila chrysaetos*). Refer to Section 4.5.3 for additional information on SGCN and their potential occurrence within the Project area.

6.5.3.1 No Action Alternative

ESA animal species, designated critical habitat, or suitable habitat would not be impacted because none are present. There would be no impact to SGCN.

6.5.3.2 Berm and Channel Improvements Full Riprap Alternative

ESA animal species, designated critical habitat, or suitable habitat would not be impacted because none are present.

If construction activities occur during breeding/nesting periods for SGCN burrowing owl, ferruginous hawk, or golden eagle, the Project area (and surrounding habitats) would be surveyed by a qualified biologist and avoidance and minimization measures implemented as described in Section 6.5.2.2. Areas of disturbance would also be surveyed by a qualified biologist prior to the commencement of work for kit fox dens. If dens were found during surveys, UDWR would be notified and applicable conservation measures implemented in coordination with UDWR. If activities occur outside of breeding/nesting periods, bird SGCN species may be detoured from foraging in or near the Project area. Based on the short duration of construction, preconstruction surveys, implementation of avoidance/minimization measures, abundant better suited foraging habitat outside of the Project area, and restoration of disturbed areas after construction completion, short-term construction impacts to SGCN and associated habitat are expected to be minor to negligible. No measurable long-term impacts would occur to SGCN from project measures or from O&M activities.

6.5.3.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.6 Human Resources

6.6.1 Socioeconomics

Please refer to Section 4.6.1 for existing socioeconomic conditions.

6.6.1.1 No Action Alternative

The indirect adverse impacts from flooding to the developed Reservation community would

continue over the long term. The developed Reservation community would experience flooding as it has historically, continuing to cause long term and reoccurring flood damage to Reservation structures, infrastructure, and properties with associated costs to the community.

6.6.1.2 Berm and Channel Improvements Full Riprap Alternative

Measures for this alternative provide flood prevention for the developed Reservation community for up to and including a 100-year frequency flood. This would decrease flood damage and the associated costs to the community. Indirect long-term benefits from reduced risk to life and property from these flood prevention measures are anticipated. Benefits of avoided flood damage are estimated at $80,700 annually.

6.6.1.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.6.2 Public Health and Safety

Please refer to Section 4.6.2 for existing public health and safety conditions for the Reservation.

6.6.2.1 No Action Alternative

The indirect adverse impacts of flood-related health and safety issues for the tribe would remain over the long term. During flood events the tribe would continue to be at risk of loss of life and could suffer mental or physical harm, threatening the well-being of the tribal community.

6.6.2.2 Berm and Channel Improvements Full Riprap Alternative

This alternative has an indirect benefit to flood-related health and safety issues for the tribe. The Reservation community would be protected from flooding for all flood events up to and including a 100-year frequency flood, and flooding would be substantially reduced at a 500-year frequency flood. The developed Reservation community would no longer be at risk of loss of life for the 100-year frequency flood. Flood-related mental and/or physical harm would be reduced, improving the well-being of the tribal community. Short-term impacts are not anticipated.

6.6.2.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.6.3 Visual Resources and Scenic Beauty

Please refer to Section 4.6.3 for existing visual resources and scenic beauty conditions within the Project area.

6.6.3.1 No Action Alternative

There would be no change to visual resources and scenic beauty for this alternative.

6.6.3.2 Berm and Channel Improvements Full Riprap Alternative

Short-term direct impacts to visual quality are anticipated due to disturbed lands and construction equipment parked or operating on those lands. Areas disturbed during construction activities would be restored after construction completion by grading to match natural contours and stabilizing through establishment of ground cover. These areas would be reestablished by seeding with an herbaceous plant seed mixture and revegetation with NRCS-approved plant species to match the surrounding plant community. Impacts would be minor, as disturbance would be short term and disturbed areas would be restored after construction completion.

The alternative constructs berms around the Reservation that may be visible from areas within the Reservation. The berms would be restored with vegetation to match the surrounding communities and be of minimal height (approximately 3 feet) above the existing topography. This is not anticipated to have a measurable impact to the visual quality of the area and would not impact scenic views of the surrounding Stansbury Mountains.

6.6.3.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.6.4 Transportation Infrastructure

Please refer to Section 4.6.4 for a description of existing transportation infrastructure with the potential to be impacted.

6.6.4.1 No Action Alternative

The indirect adverse impacts from flooding to Skull Valley Indian Reservation Road and Highway 196 would continue to occur over the long term. This would result in reoccurring flood damage to the Reservation road and the highway.

6.6.4.2 Berm and Channel Improvements Full Riprap Alternative

Measures for this alternative provide flood prevention for the developed Reservation community for up to and including a 100-year frequency flood that would have long-term indirect benefits for Skull Valley Indian Reservation Road. The Reservation Road would be protected from flooding at a 100-year flood and substantially reduced for a 500-year flood. There would be no measurable change to flooding of Highway 196 downstream of the developed Reservation community. Hydraulic modeling results show negligible changes in flood depths over Highway 196 that are within the model error.

6.6.4.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.6.5 Noise

Please refer to Section 4.6.5 for existing noise conditions within the Project area.

6.6.5.1 No Action Alternative

There would be no noise impacts for this alternative.

6.6.5.2 Berm and Channel Improvements Full Riprap Alternative

During construction activities, noise could be generated that would constitute a nuisance to nearby residential and other community properties. This effect would be short term in nature, and noise minimization efforts would be used. In addition, noise control programs (42 U.S.C. 4913) and any appliable noise regulations would be followed. Short-term direct noise impacts would be minor based on the duration of construction, implementation of BMPs, and adherence to noise programs/regulations. Long-term noise impacts from O&M activities would be negligible.

6.6.5.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same impacts as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.6.6 Historic Properties / Cultural Resources / Native American Religious Concerns

The Project area contains one site that qualifies as a historic property for the purpose of 36 CFR 800, which includes Skull Valley Highway/SR-196 (Highway 196). No prehistoric sites are present within the Project area. Please refer to Section 4.6.6 for information regarding historic properties/cultural resources within the Project area.

6.6.6.1 No Action Alternative

There would be no impact to historic properties or cultural resources for this alternative.

6.6.6.2 Berm and Channel Improvements Full Riprap Alternative

Per 36 CFR 800.5(b), this alternative was determined by NRCS to have no adverse effect to historic properties eligible for the NRHP. Factors considered in determining whether a proposed project would have adverse effects to historic properties include the extent or degree to which its implementation would result in:

1) Damage to, or loss of, a site of archaeological, tribal, or historical value that is listed, or eligible for listing, in the NRHP.

2) Loss or degradation of a traditional cultural property (TCP) or sacred site, or if the property or site is made inaccessible for future use.

3) Disturbance to any human remains, including those interred outside formal cemeteries.

4) Isolation of cultural resources from the context considered significant; and

5) An effect to project elements that would be out of character with the property or site and its setting

Project measures would not include ground disturbing activities or modifications to Highway 196 because it is an actively used road. As such, the NRCS determined there would be no adverse effect to historic properties.

Per 36 CFR 800.4, a Cultural Resources Assessment of the APE was completed (Certus 2021) and submitted to the Utah SHPO by NRCS on November 15, 2021, for concurrence with a determination that the alternative actions would result in No Adverse Effect to historic properties. A SHPO concurrence letter, dated November 23, 2021, was received and has been included in Appendix A. An Addendum Cultural Resource Assessment was submitted to SHPO by NRCS on April 11, 2023, to address a slight change in APE extents which did not change the determination. SHPO concurred that No Adverse Effect to historic properties would occur from Project measures in a letter dated April 11, 2023 (Appendix A).

The NRCS submitted the Cultural Resources Assessment with consultation letters to BIA, Ute Indian Tribe, and Confederated Tribes of the Goshute Reservation on November 15, 2021, and submitted the addendum on April 11, 2023, to comply with EO 13175 and the NHPA (Appendix A). The addendum report and a consultation letter was sent to the Skull Valley Band of Goshute Indians by NRCS on July 13, 2023 (Appendix A), and the tribe was also kept in close Project coordination as an SLO (see Section 7.2.1). A reasonable and good faith effort was made per 36 CFR pt. 800(f)(2) to consult with these tribes via letter, email, and telephone (see Section 7.1.6). At the issuance of this report no responses, opposition to the Project determination of effect, cultural concerns, or Native American religious concerns have been received from the tribes or BIA.

In the event that cultural/archaeological resources or human remains/funerary objects are found during construction activities, construction would stop, the appropriate agencies notified, and procedures followed in the NRCS Prototype Programmatic Agreement with the SHPO.

6.6.6.3 Berm and Channel Improvements Reduced Riprap Alternative (Preferred Alternative)

This alternative has the same effects as those described for the Berm and Channel Improvements Full Riprap Alternative.

6.7 Risk and Uncertainty

A 100-year project life was assumed for alternative costs and economic evaluations. Estimating alternative costs and benefits involves a certain degree of risk and uncertainty. During the planning process, decisions are made with information that is uncertain, including errors in measurements and climatic changes that could alter rainfall storm events. Assumptions made during the planning process are based on the best available science, technology, and information. Extended delays between the planning process and construction increase the degree of risk and uncertainty. Estimated alternative costs are based on computed work quantities multiplied by the appropriate unit cost for that type of work. Unit costs are based on current market prices of similar projects. Costs can be influenced by economic factors that cannot be predicted between the planning process and construction that could increase the actual cost and decrease the availability of materials.

Economic benefits from projects are based values of floodplain property, infrastructure, agricultural land, equipment, and services. Such items are expected to become more valuable in

the future, but it can be difficult to predict future economic conditions. There is also uncertainty in estimating the social and environmental costs associated with each alternative because interested party values, judgments, and opinions may shift over time.

Additional risk and uncertainties associated with the project include the following:

- Upland Erosion and Sedimentation: Erosion and sedimentation are dependent upon several unpredictable factors. Sedimentation could vary based on conditions in drainage area, including construction activity, wildfires, storm events, and off-highway vehicle/pedestrian traffic, among others.
- Flood Protection: Flood frequencies and magnitudes used in the analysis always carry a degree of uncertainty. Economic estimates of flood control measures are not precise. The intention is that they are reasonably accurate and can assist in making good decisions.
- Climate Change: Climate change tends to amplify the risks climate poses to people, infrastructure, and ecosystems. Uncertainties exist regarding the timing and magnitude of climate change impacts, but the scientific evidence predicts that continued increases in greenhouse gas emissions will lead to increased climate change.

6.8 Irreversible and Irretrievable Resource Commitments

NEPA requires that environmental analysis include identification of "… any irreversible and irretrievable commitments of resource which would be involved in the Proposed Action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects this use could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural resource).

Implementing the No Action Alternative or Action Alternatives would involve a commitment of a range of natural, physical, human, and fiscal resources. Considerable amounts of fossil fuels, labor, and construction materials would be expended to construct the Action Alternatives or to cleanup and rebuild after a flood event for the No Action Alternative. Additionally, large amounts of labor and natural resources would be used in the fabrication and preparation of construction materials. These materials are generally not retrievable. They are not, however, in short supply, and their use would not have an adverse effect upon the continued availability of these resources. Any construction would also require a substantial one-time expenditure of federal and cost-share funds that would not be retrievable.

The commitment of these resources would be based on the premise that residents in the immediate area, the state, and the region would benefit from the improved quality of post-construction conditions. These benefits generally are anticipated to outweigh the permanent commitment of resources.

7.0 Consultation, Coordination, and Public Participation

This section describes the coordination efforts with the public, agencies, tribes, and SLOs for the Project.

7.1 Consultation

7.1.1 U.S. Fish and Wildlife Service

The USFWS was invited to comment on the Project during the scoping period, but no comment was received. A formal request to be a cooperating agency on the Project was submitted to USFWS on May 29, 2020 (Appendix A). In accordance with Section 12 of PL 83-566, a letter was sent to the USFWS on May 2, 2024 to welcome their participation in preparation of the Plan-EA (Appendix A). No response from USFWS was received for the cooperating agency or the Section 12 letters. A BA was completed for the Project (Appendix E, BC&A 2022c) to comply with Section 7 of the ESA. The BA was submitted to the USFWS on April 6, 2022, to comply with Section 7 of the ESA with a No Effect determination for ESA-listed species from Project actions (Appendix A).

7.1.2 Bureau of Indian Affairs

A formal request to be a cooperating agency on the Project was submitted to BIA on May 29, 2020 (Appendix A). BIA declined cooperating agency status during a phone conversation on June 25, 2020 (Appendix A). The BIA was provided a consultation letter containing the Cultural Resource Assessment and No Adverse Effect determination to historic properties on November 15, 2021 and April 11, 2023, but no response was received. The BIA will be invited to comment on the Draft Plan-EA during the review period, and the results will be documented in the Final Plan-EA.

7.1.3 Utah State Historic Preservation Office

Utah State Historic Preservation Office (SHPO) was invited to comment on the Project during the scoping period, but no comment was received. A Cultural Resources Assessment was completed and NRCS determined that there would be No Adverse Effect from Project actions. Per 36 CFR 800.3 to 800.5, the Cultural Resources Assessment, description of APE, site eligibility, and effects determination was submitted to the Utah SHPO by NRCS on November 15, 2021, and an addendum submitted April 11, 2023. The SHPO concurrence was received on November 23, 2021 and April 20, 2023. The consultation letters and SHPO concurrence letters are included in Appendix A.

If cultural/archaeological resources or human remains/funerary objects are found during construction activities, construction would stop, the appropriate agencies notified, and procedures followed in the NRCS Prototype Programmatic Agreement with the SHPO.

7.1.4 U.S. Bureau of Land Management

Land managed by the BLM is located within the proposed Skull Valley Watershed, but no measures are proposed within those lands. A formal request to be a cooperating agency on the Project was submitted to BLM on May 29, 2020 (Appendix A). BLM declined cooperating agency status in an email dated June 29, 2020 (Appendix A). The BLM was invited to comment on the

Project during the scoping period, but no comment was received. The BLM will be invited to comment on the Draft Plan-EA during the review period, and the results will be documented in the Final Plan-EA.

7.1.5 U.S. Forest Service

Lands managed by the USFS is located within the proposed Skull Valley Watershed, but no measures are proposed within those lands. A formal request to be a cooperating agency on the Project was submitted to U.S. Forest Service (USFS) on May 29, 2020 (Appendix A), but no response was received. The USFS was invited to comment on the Project during the scoping period, but no comment was received. The USFS will be invited to review and comment on the Draft Plan-EA during the review period, and the results will be documented in the Final Plan-EA.

7.1.6 Tribal Consultation

Utah NRCS identified tribes who hold ancestral land, traditional use, and/or traditional cultural property claims in and near the Project area using the NPS Native American Graves Protection and Repatriation Act Native American Consultation Database (NACD), a database through which any federally recognized tribe could identify those counties in Utah where they had consultation interests. The U.S. Department of Housing and Urban Development Tribal Directory Assessment Tool (TDAT), the BIA website, and the Utah Division of Indian Affairs (UDIA) website was also used as supplemental sources to identify tribes with consultation interests. The assembled list of tribes identified from the NACD, TDAT, BIA website, and UDIA website are included in Table 7-1.

Tribes and THPOs (where applicable) were consulted to comply with NEPA, EO 13007, 13175, the AIRFA, and the NHPA (Appendix A). During the NEPA scoping process, the NRCS reached out to the assembled list of tribes regarding known historic properties or places of traditional religious and cultural importance near the Project area. Tribes were also asked about any additional tribes that should be contacted. No responses were received during NEPA scoping. A reasonable and good faith effort was made per 36 CFR pt. 800.3(f)(2) to consult with these tribes via letter, email, and telephone. Per 36 CFR 800.3-800.5, the NRCS consulted with Tribes listed in Table 7-1 on the description of the APE, site eligibility, and effects determination. Letters and copies of the cultural resources report were sent on November 15, 2021. Consultation for the supplemental cultural resources inventory report was sent on April 11, 2023. Follow-up emails and phone calls were made to the tribes in October, November, and December 2023. In a December 8, 2023 telephone call, the Ute Tribal Historic Preservation Officer indicated that they have no concerns with the Project (Appendix A). Table 7-1 provides a general summary of tribal consultation and Appendix A contains a detailed table. The Skull Valley Band of Goshute Indians were also kept in close Project coordination as an SLO (see Section 3.0 and 7.2.1). No tribal concerns have been identified during the current consultation process.

Table 7-1. Tribal Consultation Summary

Tribe	Consultation	Follow Up	Follow Up	Response
Confederated Tribe of the Goshute Reservation	11/15/2021 & 4/11/2023	10/30/2023	12/1/2023	None
Skull Valley Band of Goshute Indians	7/13/2023	10/30/2023	11/29/2023, 12/1/2023, &	None
Ute Indian Tribe of the Uintah & Ouray Reservation, Utah	11/15/2021 & 4/11/2023	10/30/2023	12/8/2023	12/8/2023

Summary responses received from the tribes are included below and detailed communication documentation is provided in Appendix A.

- Ute Indian Tribe of the Uintah and Auray Reservation, Utah: The tribe has no concerns for the Project and will prepare response letters to send next week.

The tribes will also be offered a chance to review and comment on the Draft Plan-EA, and the results will be documented in the Final Plan-EA.

7.1.7 U.S. Army Corps of Engineers

USACE has jurisdiction over work in waters of the U.S. under Section 404 of the Clean Water Act. A formal request to be a cooperating agency on the Project was submitted to USACE on May 29, 2020 (Appendix A), but no response was received. The USACE was invited to comment on the Project during the scoping period, but no comment was received. The USACE will be invited to comment on the Draft Plan-EA during the review period, and the results will be documented in the Final Plan-EA. Section 404 permitting would be completed with the USACE for alternative measures prior to the start of construction to comply with Section 404 of the Clean Water Act.

7.2 Coordination

7.2.1 Sponsoring Local Organizations

Tooele County and Skull Valley Band of Goshute Indians are the SLOs for the Project. Financial assistance for the Project was requested from NRCS through Standard Form 424-Application for Federal Assistance. Initial coordination was conducted with the Sponsors regarding the Project and the proposed measures. Meetings were conducted throughout the planning and engineering process to discuss the Project measures and identify potential concerns. The SLOs were provided copies of the preliminary Plan-EA for review prior to issuance of the Draft Plan-EA to the public. SLO report comments or concerns were addressed and/or corrected prior to issuance of the Draft Plan-EA to the public.

7.2.2 Natural Resources Conservation Service

Appropriate NRCS Plan-EA reviews were performed prior to issuance of the Draft Plan-EA to the public. The sequential review process included the following.

1) NRCS Utah review
2) NRCS National Water Management Center (NWMC) review
3) NRCS Headquarters review
4) Issue the Draft Plan-EA for public review

7.3 Public Participation

7.3.1 Public Participation Plan

A Public Participation Plan was prepared to provide effective procedures that define outreach to the general public, recreationists, local businesses, associations, stakeholders, affected landowners, tribes, and affected government agencies. The main goal of public participation is to involve a diverse group of public and government agency participants to solicit input and provide timely information throughout the NEPA review process. As part of the public participation process, the plan seeks to meaningfully engage minority, low-income, and traditionally under-represented populations during the NEPA review process.

7.3.2 Project Scoping

The participation of the public is a vital component of the Project so that those who are interested in or potentially affected by proposed alternatives have an opportunity to share their concerns and provide input regarding the Plan-EA during the initial stages of the process. The Project Scoping Report (Appendix E) outlines the scoping efforts and comments received from the agencies and public during the scoping process.

Project scoping questions, comments, and concerns were requested from the public and government agencies during the preliminary scoping period, both orally at public meetings and via written submittal of comments.

7.3.3 Draft Plan-EA Public Comment

This portion will be completed in the Final Plan-EA to document the Draft Plan-EA public comment process. Comments and responses on the Draft Plan-EA will be included in Appendix A of the Final Plan-EA.

7.3.4 Final Plan-EA and FONSI Public Comment

When the Final Plan-EA and FONSI are issued, a Notice of Availability (NOA) will be published locally to notify the public of the finding and copies made available on the Project website.

7.3.5 Public Outreach

Table 7-2 lists the Project's public outreach activities. The public, agencies, and/or organizations were notified of activities as described below and provided with opportunities to comment on the Project.

Table 7-2. Public Outreach Activities

Date	Description
May 26, 2020	The scoping announcement was sent to interested parties* and the scoping public comment period opened
May 28, 2020 & June 4, 2020	Scoping announcement was published in the Tooele Transcript Bulletin newspaper
June 9, 2020	Virtual scoping meeting held
July 10, 2020	Scoping public comment period closed
August 4, 2026	Draft Plan-EA NOA to interested parties* and in newspaper
August 11, 2026	Draft Plan-EA Open Comment Period
August 11, 2026	Draft Plan-EA Meeting
September 10, 2026	Draft Plan-EA Comment Period Closed
October 2026	Final Plan-EA and FONSI

* Interested parties includes local/state/federal agencies, tribes, organizations, landowners, members of the public, etc. included in the Project mailing list.

8.0 Preferred Alternative

8.1 Rationale for Preferred Alternative Selection

The boundary of the Reservation restricts Skull Valley Band of Goshute Indian lands to 19,865 acres that are located on alluvial fan systems or low-lying areas that see frequent flooding from runoff on the Stansbury and Cedar Mountains. Several alternatives were developed to protect the developed Reservation community from flooding for up to and including a 100-year frequency flood as documented in Section **Error! Reference source not found.**. The NEE alternative for the Project, also identified as the preferred alternative, was selected based on the best option determined from the comparison of alternatives developed. The NEE alternative selected provided the greatest cost-benefit, met the guiding principles, provided the greatest benefits for ecosystem services, and was in line with the federal objective and PL 83-566 general purposes. The NEE Alternative was determined to be the locally preferred, environmentally preferred, and socially preferred alternative. Non-structural measures were also considered, but there were no reasonable non-structural measures that could meet the purpose and need of the Project. Refer to the PR&G Analysis Report included in Appendix E (AEP and Long Watershed Planning Economics 2023) for documentation of the alternative decision-making process.

The NEE Alternative and preferred alternative selected for the Project is the Berm and Channel Improvements Reduced Riprap Alternative. It provides long-term benefits for reduced flooding to the developed Reservation community that includes a disadvantaged community of minority and

low-income populations, and decreases public health and safety hazards. It is the alternative with the lowest cost and greatest environmental, social, and economic benefits that successfully meets the goals for the flood prevention authorized Project purpose. Additionally, no measurable long-term adverse impacts are anticipated from implementation of the alternative measures.

8.2 Measures to be Installed

A summary of the preferred alternative measures is provided below. Refer to Section 5.5.3 for a detailed description of the alternative. A map of alternative measures is provided in Appendix B – Map B3.1 and Map B3.3, and conceptual design drawings are provided in Appendix E. The concept design for the preferred alternative was developed in accordance with NRCS Conservation Practice Standard 356 for Dikes and Levees (NRCS 2022a), 582 for Open Channels (NRCS 2015b), and 362 for Diversions (NRCS 2022b).

- An approximate 2,640-foot-long flood diversion berm and conveyance channel would be constructed on the north side of the developed Reservation community to divert flood/debris flows (up to approximate 150 cfs) around the community.

  An approximate 900-foot-long diversion berm and conveyance channel would be constructed on the south side of the developed Reservation community to convey flood/debris flows (up to approximately 1,200 cfs) around the community. An approximate 200-foot-long conveyance channel would be constructed to connect the north berm and conveyance channel into an existing conveyance channel at its downstream end. The existing conveyance channel downstream of this new connection would be modified by widening the channel and armoring the Reservation side of the channel bank. Modifications would not induce flooding to areas outside of the conveyance channels.

8.3 Avoidance, Minimization, and Mitigation

Compensatory mitigation would not be required for the preferred alternative. The general avoidance and minimization measures proposed are described in Sections 8.3.1 through 8.3.9 below.

8.3.1 Erosion

Erosion may occur on disturbed and cleared areas within the Project boundary during precipitation events. Proper BMPs would be installed during and after construction to prevent and control soil erosion. Areas disturbed during construction activities would be restored and stabilized through the establishment of ground cover.

8.3.2 Surface Water Quality

Construction activities may temporarily affect surface water quality, but Project design elements, including BMPs, would be implemented to reduce the quantity of sediment (1) entering drainages, and (2) flowing downstream and violating any federal or state water quality rules and regulations. Construction BMPs would include, but are not limited to, the following:

- A Storm Water Pollution Prevention Plan (SWPPP) would be required and implemented that contains erosion and sediment control and pollution prevention BMPs, such as, but not limited to, silt fences, fiber wattles, and/or earth berms.

- Construction and staging areas would be assessed for the feasibility of such measures as straw bales, silt fences, and other appropriate sediment control BMPs, which would be implemented to prevent the entry of sediment and other contaminants into downstream drainages.
- To ensure that accidental spills do not enter waters, the storage of petroleum-based fuels and other hazardous materials and the refueling of construction machinery would not occur outside of approved designated staging/batch plant areas. Furthermore, the Project would comply with federal and state water quality standards and toxic effluent standards to minimize any potential adverse impacts from discharges to waters of the U.S. or wetlands.

8.3.3 Air Quality

Construction activities would temporarily emit air pollutants. Fugitive dust, MSAT, and GHG emission increases associated with construction would be minimized through implementation of the following applicable BMPs:

- Spraying the soil on-site with water or other similar approved dust suppressant/soil binder.
- Wetting materials hauled in trucks, providing adequate freeboard (space from the top of the material to the top of the truck), or covering loads to reduce emissions during material transportation/handling.
- Providing a stabilized construction entrance (track-out pad), wheel washers, and/or other similar BMPs at construction site accesses to reduce track-out of site materials onto the adjacent roadway network.
- Removing tracked-out materials deposited onto adjacent roadways.
- Wetting material stockpiles to prevent wind-blown emissions.
- Establishing vegetative cover on bare ground as soon as possible after grading to reduce wind-blown dust.
- Requiring appropriate emission-control devices on all construction equipment.
- Requiring the use of cleaner-burning fuels.
- Using only properly operating, well-maintained construction equipment.

8.3.4 Noxious Weeds and Invasive Plants

BMPs would be implemented during construction to prevent the spread of N&I plant species and comply with Executive Order 13112. During construction and until restoration areas are fully established, they would be maintained on a regular basis to prevent the establishment of N&I plant species. Non-desirable plant species would be controlled by cleaning equipment prior to delivery to the Project site and eradicating these species before the start and during construction as discovered. In addition, a PCRP would be developed and would include mechanisms for addressing weed establishment and treatment. Disturbed areas would be restored to preconstructions conditions or better after construction completion.

8.3.5 Wildlife and Wildlife Habitat

Construction activities would be limited to the smallest extent practicable within the Project area. Disturbed areas would be restored after construction completion.

8.3.6 Special Status Animal Species

If construction activities occur during breeding/nesting periods for SGCN burrowing owl, ferruginous hawk, or golden eagle, the Project area (and surrounding habitats) would be surveyed by a qualified biologist and avoidance and minimization measures implemented as described in Section 8.3.7. Areas of disturbance would also be surveyed by a qualified biologist prior to the commencement of work for kit fox dens. If dens were found during surveys, UDWR would be notified and applicable conservation measures implemented in coordination with UDWR.

8.3.7 Migratory Birds/Bald Eagles

Construction activities would be limited to the smallest extent practicable within the Project area. Disturbed areas would be restored after construction completion. If construction activities occur during migratory bird breeding/nesting periods, the Project area (and surrounding habitats) would be surveyed by a qualified biologist for active nests no more than 5 days prior to the commencement of work. If active nests are found during surveys, spatial buffers would be established around them in coordination with USFWS and NRCS. Construction activities within the buffer areas would be prohibited until a qualified biologist confirms that all nests are no longer active.

8.3.8 Hazardous Materials

NRCS requires that contractors comply with all federal, state, and local laws and regulations pertaining to pollution and contamination of the environment to prevent pollution of surface water, groundwater, soil, and air with any hazardous materials. If any hazardous materials/sediment or suspect hazardous materials/sediment are encountered during ground disturbing activities, the contractor shall follow all applicable state and federal regulations for handling, disposing, and reporting of hazardous materials.

8.3.9 Visual Resources

Areas disturbed during construction activities would be restored after construction completion by grading to match natural contours and stabilizing through establishment of ground cover. These areas would be reestablished by seeding with an herbaceous plant seed mixture and revegetation with NRCS-approved plant species to match the surrounding plant community.

8.4 Permits and Compliance

The federal, state, and local permits and compliance actions described in this section would be required for construction of the preferred alternative. A Watershed Agreement and a Memorandum of Understanding shall be completed and signed by the NRCS and SLOs prior to the obligation of construction funds for the Project. The Project is located on tribal lands outside of the county jurisdiction and county permitting requirements would not apply.

8.4.1 Federal

USACE: Section 404 permitting would be required for work in jurisdictional waters of the U.S. It is anticipated that an individual permit would be needed for the Project, based on the anticipated impact.

USFWS: A BA was completed for the Project (Appendix E) with a determination of No Effect for ESA species and submitted to the USFWS on April 6, 2022 (Appendix A). No further Section 7 consultation is required for the Project unless the proposed action changes or ESA-listed species designations change within the Project area.

FEMA: It is recommended that the SLOs consult with the local floodplain zoning authority and appropriate FEMA region staff to keep floodplain maps up to date. Before construction of any project for local flood protection, or any project for hurricane or storm damage reduction, the non-Federal interest shall agree to participate in and comply with applicable federal floodplain management and flood insurance programs.

EPA: Because the State of Utah lacks jurisdiction on tribal lands, EPA is the regulating agency for the CWA 401 certification. Projects on tribal lands in the Pacific Southwest with a discharge requiring a federal license or permit, must submit a CWA 401 certification request to EPA.

8.4.2 State

Utah SHPO: Section 106 consultation has been completed as described in Section 7.1.3. No further Section 106 consultation is required for the Project unless the proposed action changes or cultural/archaeological resources are found during construction. If cultural/archaeological resources or human remains/funerary objects are found during construction activities, construction would stop, the appropriate agencies notified, and procedures followed in the NRCS Prototype Programmatic Agreement with the SHPO.

Utah Division of Oil, Gas and Mining: Tribal lands are not subject to Utah mining regulations.

Utah Department of Environmental Quality: Tribal lands are not subject to UDEQ air quality regulations.

Utah Division of Water Rights: Written authorization from the State Engineer would need to be obtained to comply with the state Stream Alteration Program before any stream bed or banks could be altered for alternative measures.

8.4.3 Local

No county or local permits would be required for works of improvement within the Reservation.

8.4.4 Tribal

Lands proposed for modification are owned by the Skull Valley Band of Goshute Indians and not held in trust by the BIA, therefore, permits through the BIA are not anticipated. There are no known tribe permits required for installation of alternative measures.

8.5 Installation and Financing

8.5.1 Planned Sequence of Installation

SLOs would complete all approvals and permits for the Project prior to the start of construction; these may take up to 1 year to obtain. The major construction elements for the preferred alternative would be sequenced to complete the critical path items first. Construction would take place over an approximately 6-month period during one season beginning in early spring, following a decrease in spring snowmelt runoff, with completion in late summer.

8.5.2 Responsibilities

This Watershed Work Plan sets forth the responsibilities of NRCS and the SLOs. The roles and responsibilities for NRCS and the SLOs would be in accordance with this Plan-EA, the Watershed Agreement, MOU, and the O&M Agreement. NRCS is responsible for leading the planning efforts and providing engineering support, SLOs are responsible for environmental permits and construction implementation, and NRCS or SLOs are responsible for the Project design. NRCS would assist SLOs during construction by providing oversight and certifying completion of the Project.

8.5.3 Contracting

Improvements installed from NRCS funding mechanisms would be procured using contracts awarded. SLOs would oversee and administer construction of the Project in coordination with NRCS.

8.5.4 Real Property and Relocations

Property within the Project area is on tribal lands and no easements to construct Project measures are anticipated.

8.5.5 Financing

The watershed plan must be authorized before funding may be made available for Project operations. NRCS would provide 100% of the total construction cost and 100% of engineering/technical assistance cost for flood prevention measures of the preferred alternative. This funding would be made available through the WFPO Program authorized by Flood Control Act of 1944 (Public Law [PL] 78-534) and the provisions of the Watershed Protection and Flood Prevention Act of 1954 (PL 83-566) Stat. 666 as amended (16 U.S.C. Section 1001 et seq.). SLOs are responsible for providing the remaining non-federally funded portions of the Project which include costs associated with permitting and SLO administrative costs. Funding for O&M of facilities after construction would be derived from normal revenues of the SLOs. This O&M cost would be budgeted annually so that the facilities are kept in good condition.

8.6 Operation and Maintenance

Operation of the installed measures includes the administration, management, and performance of non-maintenance actions needed to keep the facilities safe and functioning as planned. Refer to Section 8.2 for the installed measures. Maintenance includes recurring activities necessary to retain or restore a practice in a safe and functioning condition, including the management of

vegetation, the repair or replacement of failed components, the prevention or treatment of deterioration, and the repair of damages caused by flooding or vandalism. Maintenance includes both routine and as-needed measures.

The O&M activities for the installed measures include: annual inspections; berm grading and channel sediment removal as needed to maintain the existing features and capacities; and replacing and maintaining riprap as needed. The SLOs would be responsible for the O&M and future modifications to installed measures at an estimated annualized O&M cost of $8,000. A specific O&M Plan would be prepared by NRCS and the SLOs in accordance with the NRCS National Operation and Maintenance Manual (NRCS 2003). This plan and agreement would be entered into prior to the start of construction activities and would be in place for the 100-year life of the Project. The agreement would provide for inspections, reports, and procedures for performing the maintenance items. The agreement would include specific provisions for retention, use, and property improved with PL 83-566 (as amended by PL 106-472) assistance.

8.7 Costs

The installation cost estimate for the preferred alternative is $1,533,000, as identified in Table 8-1. Economic tables have been included to present information relevant to the costs and benefits of the preferred alternative and NEE Alternative. Structural tables have been included to present the relevant structural information pertinent to the design of the preferred alternative. The costs for the preferred alternative are conceptual-level cost estimates only, with a level of detail judged appropriate for the purpose of identifying the NEE Alternative. Detailed structural designs and construction cost estimates would be prepared for the Project during the final design phase and prior to the start of the competitive bidding process. The final cost of the Project would be the price received from the winning construction bid plus or minus the amount of contract modifications. Assessments, considerations, and calculations are based on a 100-year evaluation period, a 101-year period of analysis, and a discount rate of 2.5 percent (NRCS 2023b).

The estimated installation cost in Table 8-1 documents land status upon which the Project structures reside, as well as federal and non-federal funding sources, respectively. NRCS is the only federal agency participating in the installation of works of improvement and all works of improvement are on non-federal land.

Table 8-1. Economic Table 1 - Estimated Installation Cost

Skull Valley Watershed, Utah

(Dollars) [1]

Works of Improvement	PL 83-566 Funds	Other Funds	Total
Berms & Channel Work	$1,502,000	$31,000	$1,533,000

1 - Price base: 2023 Prepared May 2023

Table 8-2 shows the various items of installation cost for individual works of improvement between NRCS (PL 83-566 funds) and the SLO (other funds).

Table 8-2. Economic Table 2 - Estimated Cost Distribution - Water Resource Project Measures

Skull Valley Watershed, Utah

(Dollars)[1]

	Installation Cost - PL 83-566				Installation Cost - Other Funds				Total
Works of Improvement	**Const.**	**Eng.**	**Project Admin**	**Total Public Law 83-566**	**Const.**	**Permits**	**Project Admin**	**Total Other**	**Installation Costs**
Berms & Channel Work	$1,365,000	$105,000	$32,000	**$1,502,000**	$-	$10,000	$21,000	**$31,000**	**$1,533,000**

1 - Price base: 2023 Prepared May 2023

The structural data in Table 8-3 (NWPM Structural Table 3b) shows the channel work for the preferred alternative. Figure 8-1 below depicts the reaches described in Table 8-3.

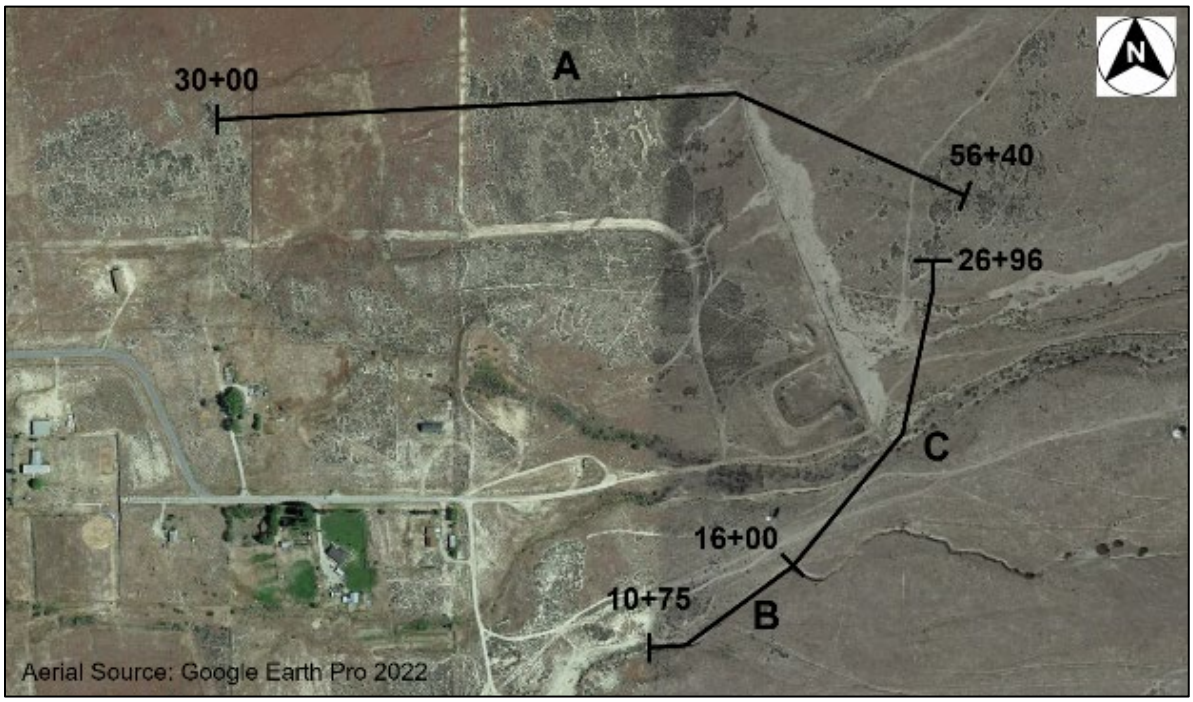

Figure 8-1. Channel Reaches

Table 8-3. Structural Data - Channel Work

Skull Valley Watershed, Utah

Channel Reach	Station	Drain Area (mi^2)*	Year Freq Design Discharge (cfs)	Water Surface Elevation (ft)	Hydraulic Gradient (ft/ft)	Channel Dimensions				*n* Value		Velocities (ft/s)		Excavation Volume (yd^3)	Type of Work[1]	Existing Channel Type[2]	Present Flow Condition[3]
						Gradient (ft/ft)	Bottom Width (ft)	Elevation (ft)	Side Slope (H:V)	Aged	As-Built	Aged[4]	As-Built[4]				
A	30+00 to 56+40	7.22	150	4856.9 to 4957.1	0.038	0.038	25	4956.0 to 4856.0	3:1	0.045	0.045	5.0 to 7.1	5.0 to 7.1	6,280	I	O	I
B	10+25 to 16+00	7.22	2,200	4898.1 to 4920.2	0.037	0.037	25	4917.7 to 4896.5	3:1	0.045	0.045	6.6 to 10.0	6.6 to 10.0	4,460	II	N	I
C	16+00 to 26+96	7.22	1,200	4919.3 to 4954.5	0.031	0.031	25	4952.0 to 4917.7	3:1	0.045	0.045	6.6 to 10.0	6.6 to 10.0	8,450	II	N	I

A = North Berm Channel, B = South Channel at Ford Crossing, C = South Berm Channel (lower portion), D = South Berm Channel (upper portion)
Prepared May 2023

* Shown as total drainage area for hydrology modeling. Design discharge was determined from maximum flow in the model reaching each channel reach for the 24-hour/100-year flood modeling.

1 - I Establishment of new channel including necessary stabilization measures.
II Enlargement or realignment of existing channel or stream.

2 - N = An unmodified, well-defined natural channel or stream. O= None or practically no defined channel.

3 - I = Intermittent

4 - Velocities are based on 24-hour/100-year flood

Table 8-4 shows the Project cost amortized over the period of analysis (101 years).

Table 8-4. Economic Table 4 - Estimated Average Annual Costs

Skull Valley Watershed, Utah

(Dollars)[1]

Improvements	Project Outlays Amortization of Installation Cost	Project Outlays O&M and Replacement Cost	Total
Berms & Channel Flood Conveyance	$40,800	$8,000	$48,800

Prepared May 2023

1 - Price base: 2023. Calculated using FY 2023 Water Resources Discount Rate (2.5%), annualized over 100 years, and 101-year period of analysis.

Table 8-5 summarizes the results of the flood damage reduction analysis conducted for this Project.

Table 8-5. Economic Table 5 - Estimated Average Annual Flood Damage Reduction Benefits

Skull Valley Watershed, Utah

(Dollars)[1]

Item	Estimated Average Annual Damage[2]		Damage Reduction Benefit
	Without Project (No Action Alternative)	With Project (Preferred Alternative)	
Structures	$86,200	$5,500	$80,700

Prepared May 2023

1 - Price base: 2023. Calculated using FY 2023 Water Resources Discount Rate (2.5%), annualized over 100 years, and 101-year period of analysis.

2 - All flood damage is agriculture. Agriculture-related damage includes damage to rural communities.

3 - Other includes Community Center.

Table 8-6 summarizes the benefits and costs of the Project and documents the overall benefit to cost ratio of the proposed improvements.

Table 8-6. Economic Table 6 - Comparison of Annual Benefits and Costs

Skull Valley Watershed, Utah

(Dollars)[1]

Item	Average Annual Costs[2]	Flood Damage Reduction[3]	Benefit Cost Ratio	Net Economic Benefits
Berms & Channel Flood Conveyance	$48,800	$80,700	1.7	$31,900

Prepared May 2023

1 - Price base: 2023. Calculated using FY 2023 Water Resources Discount Rate (2.5%), annualized over 100 years, and 101-year period of analysis.

2 - From Table 8-4

3 - From Table 8-5

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10.0 List of Preparers

Table 10-1 lists the people who participated in the preparation of this document.

Table 10-1. List of Preparers

Name	Title (Years of Experience)	Education	Other
NRCS – Utah (Review and Coordination)			
Norm Evenstad (ret.)	Water Resources Specialist (30+) Retired July 2023	B.S. – Geology	Utah P.G.
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AEP (Plan-EA Preparation)			
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Long Watershed Planning Economics, LLC (Economic Analysis)			
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BC&A (Engineering, Concept Design, & Resource Surveys			
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Cameron Jenkins	Engineer (14+)	B.S. – Civil Engineering M.S. – Civil Engineering	Utah P.E. Idaho P.E. California P.E. Arizona P.E.
Craig Bagley	Engineer (30+)	B.S. – Civil and Environmental Engineering M.S. – Civil Engineering	Utah P.E. Idaho P.E.
Merissa Davis	Biologist (17+)	B.S. – Conservation Biology, Wildlife Emphasis	
Certus Environmental Solutions, LLC (Cultural Resource Assessment)			
Sherry Murray Ellis	Principal Investigator (30+)	M.S. American Studies	

11.0 Distribution List

This section lists the government agencies and organizations that are included on the Project distribution list for scoping notice and notice of availability for the Draft Plan-EA.

Table 11-1. Distribution List

Federal Government	
BIA	USACE
BOR	USFWS
EPA	USFS
FEMA	
State Government	
State Representative	Utah Division of Emergency Management
State Senator	Utah Division of Forestry, Fire & State Lands
U.S. Representative	Utah Division of Water Rights
U.S Senator	Utah Division of Wildlife Resources
Utah Department of Agriculture and Food	Utah Natural Heritage Program
Utah Department of Environmental Quality	Utah Public Land & Policy Coordination Office
Utah Department of Heritage and Arts	Utah Reclamation Mitigation & Conservation Office
Utah Department of Public Safety	Utah School and Institutional Trust Lands Administration
Utah Department of Transportation	
Local Government	
Tooele County	
Tribes	
Confederated Tribes of the Goshute Reservation	Ute Indian Tribe of the Uintah and Ouray Reservation
Skull Valley Band of Goshute Indians	
Private Parties	
Not listed for privacy	

12.0 Acronyms, Abbreviations, and Short Forms

ac	acre
ac-ft	acre-feet
AIRFA	American Indian Religious Freedom Act
BA	Biological Assessment
BMPs	Best Management Practices
BOR	Bureau of Reclamation
Census Bureau	U.S. Census Bureau
CFR	Code of Federal Regulations
cfs	cubic feet per second
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
ft	feet
GHG	greenhouse gas
IPaC	Information for Planning and Consultation
MBCC	Migratory Birds of Conservation Concern
MBTA	Migratory Bird Treaty Act
MSAT	Mobile Source Air Toxics
N&I	Noxious and invasive weeds
NAAQS	National Ambient Air Quality Standards
NEE	National Economic Efficiency Alternative
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPS	National Park Service
NRCS	U.S. Department of Agriculture Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWSRS	National Wild and Scenic River System
O&M	Operations and Maintenance
PCRP	Post Construction Rehabilitation Plan
PL	Public law
Plan-EA	Watershed Plan and Environmental Assessment
PM	particulate matter
SHPO	State Historic Preservation Office
SITLA	Utah School and Institutional Trust Lands Administration
SWPPP	Storm Water Pollution Prevention Plan
TCP	Traditional Cultural Properties

UDAF	Utah Department of Agriculture and Food
UDAQ	Utah Division of Air Quality
UDNR	Utah Department of Natural Resources
UDWR	Utah Division of Wildlife Resources
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WFPO	Watershed and Flood Prevention Operations