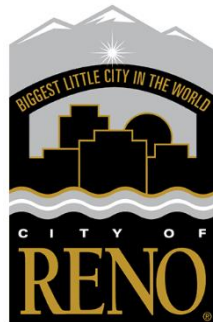


DRAFT SUPPLEMENTAL WATERSHED PLAN & ENVIRONMENTAL ASSESSMENT

**For the Peavine Creek-Truckee River Watershed (Washoe County,
Nevada) East Wash and West Wash Dam Rehabilitation Project**

Supplemental Plan Number 1

July 2026



**SPONSORING LOCAL
ORGANIZATION:**

City of Reno
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Reno, NV 89501
(775) 334-2461



PREPARED BY:

USDA-NRCS
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Draft
Supplemental Watershed Plan & Environmental Assessment
For the Peavine Creek-Truckee River Watershed East Wash and West Wash Dam Rehabilitation Project
Washoe County
City of Reno, Nevada

Prepared By:
United States Department of Agriculture, Natural Resources Conservation Service
In Cooperation With:
United States Environmental Protection Agency Region 9, and the City of Reno

AUTHORITY

The original watershed work plan was prepared, and works of improvement have been installed under the authority of the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566) as amended. The Peavine Creek-Truckee River Watershed East Wash and West Wash Dam Rehabilitation Project is authorized under Public Law 83-566 (as amended), and as further amended by section 313 of Public Law 106-472.

ABSTRACT

The East Wash Diversion Dam was constructed in 1961 under the authority of the Watershed Protection and Flood Prevention Act (Public Law 83-566). The West Wash Dam was constructed in 1960 under the same program. The East Wash Diversion Dam contributes storm water flow from Peavine Creek-Truckee River Watershed into the West Wash Dam, thereby creating a linked storm water control system. Both the East Wash and West Wash Dams are currently classified as High Hazard Dams. The purpose of the project is to rectify performance and safety issues with the existing structures in a cost efficient and environmentally acceptable manner. The needs of the project include addressing current safety and regulatory deficiencies at the East Wash and West Wash Dams, bringing both dams into compliance with current Natural Resources Conservation Service and Nevada Division of Water Resources safety regulations, engineering standards, and performance criteria to minimize the risk to lives and property in the surrounding and downstream urban area. The rehabilitation of the East Wash and West Wash Dams is The Preferred Alternative as well as the National Economic Development Alternative. The East Wash Dam would be rehabilitated by restoring the west dike of the principal spillway approach to the original design elevation and armoring of the auxiliary spillway. The West Wash Dam would be rehabilitated by raising the embankment crest 5 feet in elevation, lowering the auxiliary spillway crest by 2.6 feet and widening 50 to 100 feet, lowering the principal spillway crest 13.4 feet, removing and replacing the principal spillway conduit and impact basin, improving the filter drain by removing the filter drain and replacing with filter material, and constructing a chimney filter near the dam center line. A seepage cutoff wall would also be constructed along the bottom of the cutoff trench. The total estimated installation cost for this alternative is \$19,200,000.

COMMENTS AND INQUIRIES

Comments and inquiries must be received by **November 4, 2026**. Submit comments and inquiries to: NRCS personnel: Douglas Higbee, State Conservation Engineer | USDA-NRCS, C. Clifton Young Federal Building, 300 Booth Street, Room 2070, Reno, NV 89509 | 775-857-8500.

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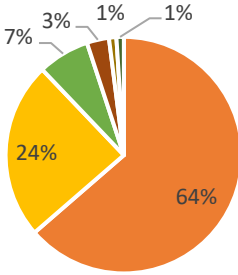
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1.0 SUMMARY (OFFICE OF MANAGEMENT AND BUDGET FACT SHEET)

Summary Supplemental Watershed Plan-Environmental Assessment Document for the Peavine Creek-Truckee River Watershed Rehabilitation Project Washoe County, Nevada Nevada's 2nd Congressional District

Authorization:	Public Law 83-566 Stat. 666 as amended (16 U.S.C. Section 1001 et. Seq.) 1954
Sponsor:	City of Reno
Period of Analysis	52 years
Preferred Alternative:	The Preferred Alternative consists of the rehabilitation of the East Wash and West Wash Dam, located in Washoe County, Nevada.
Purpose for Action:	The purpose of the project is to rectify performance and dam safety issues with the existing structures in a cost efficient and environmentally acceptable manner.
Need for Action:	The project needs include addressing current dam safety and regulatory deficiencies at the East Wash and West Wash Dams to bring both dams into compliance with current Natural Resources Conservation Services and Nevada Division of Water Resources safety regulations, engineering standards, and performance criteria to minimize the risk to lives and property in the surrounding downstream urban area.
Preferred Alternative:	The Preferred Alternative would include rehabilitation of both the East Wash and West Wash Dams to meet the dam safety requirements. The East Wash Dam would be rehabilitated by restoring the west dike of the principal spillway approach to the original design elevation and armoring of the auxiliary spillway. The West Wash Dam would be rehabilitated by raising the embankment crest 5 feet in elevation, lowering the auxiliary spillway crest by 2.6 feet and widening 50 to 100 feet, lowering the principal spillway crest 13.4 feet, removing and replacing the principal spillway conduit and impact basin, improving the filter drain by removing the filter drain and replacing with filter material, and constructing a chimney filter near the dam center line. A seepage cutoff wall would also be constructed along the bottom of the cutoff trench.

Resource Information:	Latitude and Longitude: 39°32'29.73" N, 119°50'46.89" W
	Eight-Digit (8) Hydrologic Unit Code: 16050102
	Climate and Topography: High desert environment with very low relative humidity. Diurnal temperature fluctuations can be extreme, often exceeding 50 degrees during the summer. The Sierra Nevada Mountain range to the west of the City of Reno forms a barrier to weather systems coming from the Pacific, which leaves the City of Reno in a rain shadow. The temperature in the City of Reno typically varies from 23°F to 90°F. The hot season lasts for 3 months, from June 14 to September 15 with an average daily high temperature above 81°F. The cold season lasts for 3.2 months, from November 20 to February 25, with an average daily high temperature below 53°F (US Climate Data, 2023). The rainy period in the City of Reno lasts for 8.1 months, from September to May with a sliding 31-day rainfall of at least 0.5 inches. February, the wettest month, has an average rainfall of 2.2 inches (Weather Spark, 2023). The average annual precipitation is approximately 7.4 inches (US Climate Data, 2023).

	Watershed size (acres): The Peavine Creek-Truckee River Watershed has an area of 28,421 acres (UC Davis, n.d.). The project area is approximately 53.2 acres. Land Uses (acres): Land uses within the project area include Washoe County designated land use code 170: Other, unbuildable, roads, restrictions, terrain (49.51 acres), 120: Vacant, single-family (0.83 acres), and rights-of-way (2.86 acres). Land Ownership: The City of Reno owns 94.6% of the land in the project area. Washoe County owns the remaining 5.4%. No private or federal entities own land within the project area.						
	Population and demographics: The total population in the City of Reno in 2020 was 250,903 (US Census Bureau, 2020). Approximately 36% of that was minority (Figure 1). The City of Reno is expected to grow by more than 62,000 residents between 2015 and 2036, reaching a population of over 301,000 in 2036 (City of Reno, 2017). The dams are estimated to provide protection against flooding to about 30,000 Nevadans who live and work downstream. Additionally, the dams protect downstream city roads, State Route 647, U.S. Route 395, and Interstate 80. There is a slightly higher proportion of minorities (43% versus 36%) living in downtown Reno compared with the City of Reno, as well as a lower median household income (69%), more transitory (33%), and older population, with a higher proportion of the downtown Reno population having a disability (11%) and living in poverty (9%) than in the City of Reno, the State of Nevada, and the United States (Hansford Economic Consulting LLC, 2022). Figure 1: Race and Ethnicity in The City of Reno Race and Ethnicity in The City of Reno (2020) <table><tr><td>Non-Minority (Non-Latino White) (63%)</td><td>Latino (24%)</td></tr><tr><td>Asian (7%)</td><td>Black (3%)</td></tr><tr><td>American Indian and Alaska Native (1%)</td><td>Native Hawaiian and Pacific Islander (1%)</td></tr></table>	Non-Minority (Non-Latino White) (63%)	Latino (24%)	Asian (7%)	Black (3%)	American Indian and Alaska Native (1%)	Native Hawaiian and Pacific Islander (1%)
Non-Minority (Non-Latino White) (63%)	Latino (24%)						
Asian (7%)	Black (3%)						
American Indian and Alaska Native (1%)	Native Hawaiian and Pacific Islander (1%)						
Scoping Concerns: <table><tr><th colspan="3">Categories of Comments Relevance for Planning (Y/N) Rationale</th></tr><tr><td>Contact/access to virtual meeting or webpage</td><td>Y</td><td>Meaningful public participation</td></tr></table>		Categories of Comments Relevance for Planning (Y/N) Rationale			Contact/access to virtual meeting or webpage	Y	Meaningful public participation
Categories of Comments Relevance for Planning (Y/N) Rationale							
Contact/access to virtual meeting or webpage	Y	Meaningful public participation					

	Enhancements to the project area	Y	Funding
	Land use (open space/zoning/public access)	Y	City planning and priorities
	Historic properties	Y	Historic properties and National Historic Preservation Act
	Alternatives analysis	Y	Alternatives
	Mitigation for dust and noise	Y	Mitigation
	Plants: native habitat, weed abatement, herbicide use	Y	Biological resources
	Dam removal alternative	Y	Health and human safety
	Wildfires	Y	Hazards
	Flooding	Y	Hazards
	Public notice	Y	Meaningful public participation and National Environmental Policy Act requirements
	Existing development	Y	City planning and priorities
	Current dam safety (human safety)	Y	Health and human safety and risk uncertainty
	Cumulative impacts	Y	Impacts analysis and National Environmental Policy Act requirements
Alternative Plans Considered:	Alternative 1: No Action The East Wash and West Wash Dams provide stormwater retention and attenuation for the Peavine Creek-Truckee River Watershed. The two dams work in conjunction to protect downstream developments and convey storm flows into the City of Reno's storm drain system. Under this alternative, no improvements would be made; however, operation and maintenance activities would continue as usual. Operation and maintenance activities include sediment removal, vegetation removal on dam structures, and erosion restoration.		
	Alternative 3: Rehabilitate Both the East Wash and West Wash Dams (Preferred Alternative) Alternative 3 includes rehabilitation of both the East Wash and West Wash Dams to meet the dam safety requirements of Natural Resources Conservation Service and Nevada Division of Water Resources Division of Dams. Both dams have been identified as High Hazard Dams by the Nevada		

	Division of Water Resources Division of Dams. Rehabilitation of both dams would be confined to the already disturbed areas of the structures. The Preferred Alternative would include rehabilitation of both the East Wash and West Wash Dams to meet the dam safety requirements. The East Wash Dam would be rehabilitated by restoring the west dike of the principal spillway approach to the original design elevation and armoring of the auxiliary spillway. The West Wash Dam would be rehabilitated by raising the embankment crest 5 feet in elevation, lowering the auxiliary spillway crest by 2.6 feet and widening 50 to 100 feet, lowering the principal spillway crest 13.4 feet, removing and replacing the principal spillway conduit and impact basin, improving the filter drain by removing the filter drain and replacing with filter material, and constructing a chimney filter near the dam center line. A seepage cutoff wall would also be constructed along the bottom of the cutoff trench. Mitigation would be required for soils and geology, water resources, air quality, vegetation, wildlife, cultural and historic resources, and noise resources. Alternative 5: Remove Both the East Wash and West Wash Dams with Downstream Flood Improvements: Under Alternative 5, the existing East Wash and West Wash Dam embankments would be completely removed, including primary spillway and auxiliary spillway, and the area would be returned to pre-development conditions. In addition, trapezoidal concrete channels would be constructed to relay stormwater runoff up to the 100-year storm event. The channels would start at the location of the removed dams, combine into a single channel at the intersection of Keystone Avenue and Kings Row, and discharge all storm runoff into the Truckee River. Mitigation would be required for erosion and sedimentation, land use, water resources, air quality, vegetation, wildlife, socioeconomics, environmental justice, cultural and historic resources, public health and safety, scenic beauty, and noise resources.			
Project Costs:	Category	Public Law 83-566 Funds	Other Funds	Total Amount (\$)
	Construction	\$10,920,000	\$5,880,000	\$16,800,000
	Engineering	\$2,400,000	\$0	\$2,400,000
	Real Property	\$0	\$0	\$0
	Relocation Payments	\$0	\$0	\$0
	Project Admin	\$0	\$0	\$0
	Required Permits	--	\$0	\$0
	Total Non-Federal Costs	--	\$0	\$0
	Total Costs	\$13,320,000	\$5,880,000	\$19,200,000
Project Benefits:	The project would improve dam safety and mitigate potential flooding impacts and threats to human lives for nearly 30,000 downstream residents, business, and infrastructure in the City of Reno. Approximately 16,000 residents live in the direct pathway of flooding impacts should these dams fail in a local Probable Maximum Precipitation event. The NRCS population at risk (PAR) worksheet was used to analyze three failure scenarios: Static, Hydrologic and Seismic conditions. There is no PAR for a static or seismic failure as the East and West Wash Dams are dry dams and are only full during hydrologic events. Therefore, static condition has no water in the dam and if it fails in that condition, resulting in a PAR of zero. Similarly, there is no PAR for a seismic event because the statistical odds of a failure causing earthquake occurring during a hydrologic event are so improbable that we don't consider that a failure mode. However, a failure during a hydrologic event puts 3,896 lives at risk. There is a benefit-cost ratio of 0.11 to 1 for the Local Probable Maximum Precipitation event, meaning there is a eleven-cent (11) annualized return for every dollar spent on the project. It is not uncommon for dam rehabilitation projects to have dollar-quantified costs greater than their dollar-			

	quantified benefits. The project is being driven by dam safety that impacts threat to human lives. The Benefit Cost Analysis is conducted for a 56-year period to include six (6) years of planning and construction, and fifty (50) years for the estimated useful life of the project. The National Economic Development Alternative is the alternative or combination of alternatives that reasonably maximizes the net economic benefit of the project consistent with protecting the nation's environment. The net economic benefit is the benefit minus the cost. According to the NWPM Sections 502.2 and 505.35.B(1)(iv), when human life is potentially at risk, the National Economic Development alternative is defined as the federally assisted alternative with the greatest net economic benefits. Based on the comparison of alternatives, Alternative 3 (Rehabilitate Both the East Wash and West Wash Dams) meets the dam safety requirements of the NRCS and the NDWR Division of Dams and is the National Economic Development. The National Economic Development analysis used the same 50-year period of analysis. The project installation costs include: 2025: \$0; 2026: \$0; 2027: \$615,298; 2028: \$601,759; 2029: \$8,827,756 2030: \$8,633,502.			
Project Life:	50 years			
Environmental Effects, Impacts:	Impacts under Alternative 3 include erosion and sedimentation, water resources, air quality, vegetation, wildlife, environmental justice, cultural and historic resources, public health and safety, visual resources, and noise. Resources were evaluated using a rating of impact intensity, context, and duration. Unless otherwise stated, the standard definitions for these terms are as follows: • Negligible: The impact would be at the lower level of detection, and there would be a small change. It would result in No Historic Properties effected under the National Historic Preservation Act Section 106. • Minor: The impact would be slight but detectable, and there would be a small change. It would result in No Adverse Effect to Historic Properties under National Historic Preservation Act Section 106. • Moderate: The impact would be apparent, and there would be a permanent measurable change. It would result in an Adverse Effect to Historic Properties under National Historic Preservation Act Section 106. • Major: The impact would be highly noticeable, and there would be a permanent measurable change. It would result in an Adverse Effect to Historic Properties under National Historic Preservation Act Section 106. Effects analysis indicated that with mitigating measures in place, these actions would have a minor impact on the environment.			
	Resource of Concern	Summary of Concern	Significance	Significance with Mitigation
	Soils & Geology			
	Geologic Resources and Erosion and Sedimentation	Erosion and runoff during construction is anticipated	Moderate	Construction best management practices would be followed, and a Dust Control Permit would be required Minor
	Water Resources			
	Surface and Groundwater Quality and Quantity	Temporary impact in water quality during construction due to runoff.	Moderate	Best management practices would be followed. National Pollutant Discharge Elimination System Minor

				permit and Storm Water Pollution Prevention Plan would be needed for the project	
	Air Quality				
	Clean Air Act / National Ambient Air Quality Standards	Construction activities would temporarily emit several air pollutants	Moderate	A Dust Control Permit and a Construction Stormwater Permit would be required. Construction best management practices would be followed.	Minor
	Vegetation				
	Noxious Weeds and Invasive Species	Vegetation identified within the project area would be excavated. The area of disturbance is approximately 11 acres.	Moderate	Best management practices to prevent the spread of Noxious Weeds would be followed.	Minor
	Natural Areas	Vegetation identified within the project area would be excavated. The area of disturbance is approximately 11 acres.	Moderate	Avoidance fencing would be used to minimize ground disturbance, reducing the impacts to vegetative communities.	Minor
	Riparian Areas	Disturbance of riparian corridor is not anticipated but may occur. The Riparian Corridor is approximately 8 acres.	Minor	Avoidance fencing would be used to minimize ground disturbance, reducing the impacts to vegetative communities.	No Change
	Wildlife				
	Wildlife and Wildlife Habitat	Impacts to wildlife habitat would occur. Most Wildlife habitat exists in the riparian corridor and would be largely avoided	Moderate	Best management practices to protect habitat and wildlife during construction would be followed.	Minor

		(approximately 8 acres).			
	Special Status Animal Species	Impacts to monarch butterfly breeding areas would occur	Moderate	Avoidance fencing would be used to minimize impacts to sensitive species habitat, if identified within the excavation area. Where possible, milkweed strands should not be removed during the summer breeding period (May through August)	Minor
	Migratory Birds, Bald Eagles, and Golden Eagles	Impacts to Migratory Birds are not anticipated, but may occur	Minor	A migratory bird clearance survey would be necessary depending on construction timing and breeding seasons.	No Change
	Human				
	Cultural and Historic Resources	Design alteration of the East Wash and West Wash Dams	Moderate	Public Interpretation such as the production of brochures or other publications, web-based and published presentations, museum exhibits, or historic markers	Minor
	Public Health and Safety	Risk of flooding remains for extreme flooding events.	Minor	Dam Emergency Action Plans would be revised for new flooding events and warning times.	Minor
	Visual Resources and Scenic Beauty	Minor aesthetic changes within the project area	Negligible	No mitigation anticipated	Negligible
	Noise	Temporary construction noise	Minor	Construction best management practices will be followed.	Minor
	*See Appendix E for a list of all best management practices for the project.				
Major Conclusions:	Alternative 3, Rehabilitate Both the East Wash and West Wash Dams, is The Preferred Alternative based on meeting the Purpose and Need for the project and National Economic Development requirements. This Alternative would minimize the risk of loss of life within the breach area and provide continued flood prevention, with only a minor impact to the environment. According to Section 505.35.B.(1)(iv) of the National Watershed Program Manual, to avoid seeking individual				

	exceptions in those cases where human life is at risk in the event of catastrophic failure of an existing dam, the National Economic Development plan is the federally assisted alternative with the greatest net economic benefits. This removes The No Action Alternative as a National Economic Development plan option where human life is at risk in the event of catastrophic failure of an existing dam. During times of flooding, the integrity of the dams and spillway systems is crucial to public safety, therefore, Alternative 3 is the National Economic Development Alternative.
Areas of Controversy:	No areas of controversy were identified.
Issues to be Resolved:	Concerns brought forth by the public during Scoping are listed below. Issues were responded to directly and are addressed in this Supplemental Watershed Plan and Environmental Assessment. • Loss of public recreation area during and after the project • Increased noise and dust for residential areas during construction • Loss of wildlife habitat and native vegetation • Usage of chemical biocides for vegetation management
Evidence of Unusual Congressional or Local Interest:	No evidence of unusual congressional or local interest was identified.
Compliance:	Is this report in compliance with executive orders, public laws, and other statutes governing the formulation of water resource projects? Yes.

2.0 INTRODUCTION

2.1 CHANGES REQUIRING PREPARATION OF A SUPPLEMENT

The West Wash Dam was constructed in 1960 under the authority of the Watershed Protection and Flood Prevention Act (Public Law [PL] 83-566). The East Wash Dam was constructed in 1961 under the same program. The East Wash Dam contributes storm water flow from an unnamed tributary of Peavine Creek into the West Wash Dam, thereby creating a linked storm water control system. The original watershed plans for these dams are based on an evaluated life of 50 years. Having exceeded 50 years in age, the dams are eligible for rehabilitation through the Natural Resources Conservation Service (NRCS) Watershed and Flood Prevention Operations Program. The goals of the program include prevention of erosion, floodwater, and sediment damage; to further the conservation, use, and disposal of water; and to further the conservation and proper use of land in authorized watersheds (United States Department of Agriculture Natural Resources Conservation Service, n.d.).

Both the East Wash and West Wash dams are currently classified as High Hazard Dams by the Nevada Division of Water Resources (NDWR) and do not meet the requirements for dam safety by the State of Nevada (the State) or NRCS. Previous studies indicate inadequate hydrologic/hydraulic capacity (MACTEC Engineering and Consulting, Inc., 2006).

The Peavine Mountain Watershed Plan of 1958 noted damaging floods impacting residential areas of the City of Reno (the City), which was solved by constructing the East Wash and West Wash Dams. Degradation of these dams has caused flooding from storm events to reoccur, causing risk to homes, businesses, and infrastructure downstream (City of Reno, 1958).

Modeling shows that the East Wash Dam would not pass the Probable Maximum (PMF) without excessive damage to the spillway and the West Wash Dam would not pass the PMP without overtopping (Farr West Engineering, 2022) (Appendix E). Addressing these deficiencies was the impetus requiring change for purpose in developing the alternatives discussed in this Supplemental Watershed Plan-Environmental Assessment (plan-EA).

2.2 PROJECT SETTING

2.2.1 Location and Context

The East Wash and West Wash Dams sit at the base of Peavine Mountain with residential development above, below, and adjacent to the dams. The East Wash Diversion Dam is located at the intersection of Keystone Avenue and North McCarran Boulevard, at the intersection of Township 20 North, Range 19 East, Sections 33 and 34 with Township 19 North, Range 19 East, Sections 3 and 4. The West Wash Detention Dam is located at the intersection of Wyoming Avenue and Putnam Drive at the intersection of Township 19 North, Range 19 East, Sections 3 and 4 (City of Reno, 2006).

2.2.2 Planning Area

This plan-EA refers to three specific zones within the planning area. See Appendix B for a project area figure, and Appendix C for a map of the downstream areas and inundation maps.

- Project area: The project area includes the East Wash and West Wash Dams, an area of approximately 53 acres.
- Affected area: The affected area includes the project areas as well as the downstream areas with potential to be impacted by flooding events (Downstream Area). The affected area encompasses portions of six (6) Census tracts; 13, 14, and 24.01 located north of Interstate 80 (I-80), and 1.03, 1.04, and 1.06 located south of I-80.

3.0 PURPOSE AND NEED FOR ACTION

The purpose of the project is to (1) preserve the flood protection function of the West Wash Dam, which is classified as a high hazard dam by NDWR, and meet the requirements of state and federal agency regulations; (2) protect lives and properties in the surrounding urban area; and (3) comply with current performance and safety standards in a cost-effective and environmentally acceptable manner. The project is needed to (1) address current deficiencies at West Wash and East Wash Dams to bring both dams into compliance with current dam safety regulations, engineering standards and performance criteria for High Hazard Dams state and federal regulations; and (2) ensure the watershed structure is properly maintained to minimize the risk to lives and property in the surrounding and downstream area which has been developed into a thriving, urban residential and commercial center since the original construction of the dams.

Compliance with current NDWR and NRCS Safety of Dams regulations, engineering standards, and performance criteria is necessary to ensure the protection of lives and the property surrounding and downstream of the dams. Challenges and opportunities were identified as part of the formulation of the purpose and need.

The following challenges were identified:

- Repairs and necessary maintenance identified in yearly dam inspection reports.
- Hydraulic inadequacy of current dam design.
- High hazard dam classification.
- Possible sediment accumulation that reduces runoff volume stored by the dams.

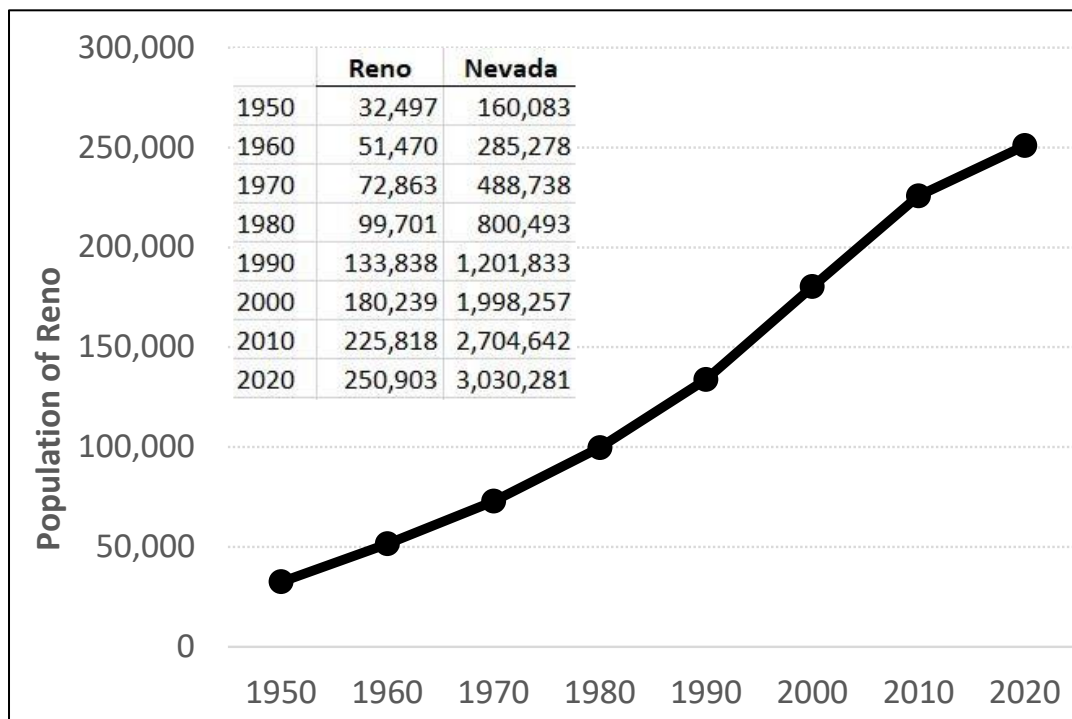
The following opportunities were identified:

- Improve public safety and reduce the number of persons at risk should the dam(s) fail.
- Avoid preventable PMP event.
- Evaluate ecosystem services within the direct vicinity of the project area.

3.1 CITY OF RENO GROWTH AND INCREASED URBANIZATION

The original Peavine Mountain Watershed Plan noted damaging floods impacting residential areas of the City, which was solved by constructing the East Wash and West Wash Dams (City of Reno, 1958). Since that time, the City has grown considerably, and dense residential areas are immediately adjacent to and downstream of both dams. Today, residential, business, and transportation infrastructure are built within the historical path of storm drainage from Peavine Mountain (Hansford Economic Consulting LLC, 2022). Figure 2 illustrates the population growth in the City and the State from 1950, the last decennial census before the West Wash Dam was constructed, to 2020, the most recent decennial census. The City has sustained an average annual population growth of 3.0% since 1950, while the State has seen average annual population growth of 4.3% during the same period.

Figure 2: City of Reno Historical Population Growth*



*Courtesy of Economic Appendix (Hansford Economic Consulting LLC, 2022)

Since the original Peavine Mountain Watershed Plan was written (1958), the City has experienced considerable development. According to the 2020 Census, the City has a population of over 246,000 and is expected to grow by more than 62,000 residents between 2015-2036, reaching a population of over 301,000 (City of Reno, 2017). The dams are estimated to provide protection against flooding to 30,000 Nevadans who live and work downstream. Additionally, the dams protect downstream city roads, State Route 647, U.S. Route 395, and I-80. With the considerable development in the City, the health and safety of the residents and infrastructure of the City is critical to the project. Challenges related to the City's urbanization are summarized below.

- Change to urban land use around and below the project area since project inception in 1958,
- Continuing growth in the City,
- Reliance on the project area as an informal recreation area,
- Infrastructure encroachment across facility features.

3.2 WATERSHED AND RESOURCE OPPORTUNITIES

The project presents opportunities for NRCS and the City to meet safety standards and to provide flood protection for the City. Opportunities that the project provides include:

- Maintain downstream flood protection and reduce risk of loss of life and damage to property,
- Reduce probability of dam failure and protect downstream communities, real estate, and infrastructure,
- Full compliance with NDWR and NRCS criteria,
- Removing existing sediment accumulation within the East Wash and West Wash Dam impoundment areas

4.0 SCOPE OF PLAN-EA

The scoping process for the project followed general procedures per NRCS guidance and PL-566 requirements. Both NRCS procedures and National Environmental Policy Act (NEPA) require that the NRCS begin scoping early in the planning process. The purpose of scoping is to identify issues and concerns that are used to formulate and evaluate alternatives. Scoping also helps identify potential effects that require detailed analysis in the Plan-EA. Using the input obtained during the scoping process, the project was refined to focus on relevant resource concerns and issues, and to eliminate minor or irrelevant issues from further detailed study. Relevant resource concerns were carried forward for further detailed study and discussion.

Prior to the public and agency scoping, the project team reviewed the project, project vicinity, and drew from prior experience to identify the following issues to be considered and focused on during the scoping process:

- Public Safety – Public safety is the primary purpose of the project. Initial review of the East and Wash Dams indicate potential for failure, which could lead to death, structural damage, and a depletion in ecosystem services in the watershed.
- Regulatory Compliance – Any project alternative developed must be able to meet and comply with federal, state, and local regulatory requirements and guidelines.
- Ecosystem Services – Ecosystem services of the Peavine Creek – Truckee River Watershed must be considered during project scoping, ecosystem services in the watershed include, provisioning (crops, livestock, freshwater), regulating (water, air quality, erosion, pollution), and cultural (aesthetic, recreational, religious value).
- Public Support – As a federally sponsored action, public comments, input, and project support are crucial to the success of the project and should be taken under consideration.
- Facility Performance – The facility that is constructed must perform at a suitable level to support the project purpose and be maintainable by the owner (City).
- Cost – The project must be within available funding limits, evaluating the project against cost would include review of project timeline and complexity, among other factors.

The scope of the entire watershed plan update effort was governed by these issues and concerns. Alternatives were developed, evaluated, and screened based on their ability to meet and/or support these criteria. Alternatives that failed to meet one or more of these goals were screened while remaining alternatives were developed until they could be compared and the best alternative was apparent, as further discussed in Section 6.0.

4.1 SCOPING MEETING

The purpose of the scoping meeting was to inform the public about the planning effort underway to rehabilitate the East Wash and West Wash Dams and to solicit considerations for development of the Supplemental Plan and Plan-EA. A public scoping meeting for the project was held virtually due to ongoing public health and safety concerns associated with the Covid-19 pandemic (State of Nevada, 2020). The virtual meeting was held via the City's Zoom platform on Tuesday, October 19, 2021, 6pm – 8pm. The scoping meeting included a power point presentation and live discussion covering the project background, project location, project purpose and need, preliminary project alternatives, schedule, website, and contact information for submitting comments (Appendix A).

4.2 SCOPING COMMENTS

Due to the Covid-19 pandemic and the difficulties of public gatherings, the public comment period was extended from 30 to 60 days to allow the public enough notice and time to review information on the project and submit comments. Scoping comments were invited to be submitted to the City through December 19,

2021. Copies of the comment log and all agency and public comments are included in the Public Participation Summary in Appendix A.

4.2.1 Agency Comments

One (1) agency comment was received for the project. Environmental Protection Agency (EPA) Region 9 provided scoping comments relating to procedural requirements pursuant to NEPA, Council on Environmental Quality (CEQ) regulations (CFR Parts 1500-1508) and Section 309 of the Clean Air Act (CAA, Appendix A).

4.2.2 Public Comments

A total of thirty-nine (39) individual public comments were received for the project during the scoping process. Twenty (20) public comments were received between September 21, 2021, and December 19, 2021. Nineteen (19) public comments were received during the scoping meeting. Written comments were replied to individually by the City, and comments submitted virtually were answered during the scoping meeting.

All Comments were reviewed and categorized by topic. Topic categories were based on requirements of NEPA and NRCS. Some individual public comments included more than one topic, so comments by topic totaled forty-three (43). Thirteen (13) of the forty-three (43) public comments were focused on requests for more information and IT assistance to access the virtual meeting. Other topics with more than two comments in the category included enhancements to the project area, land use (open space/zoning/public access), questions about the alternatives analysis, and biological resources related to plants: native habitats, weed abatement, and herbicide use. A summary of comments is found in Table 1 and Table 2 (Appendix F). A copy of written comments submitted are included in Appendix A.

4.3 PLAN-EA FOCUS AREA

Table 3 (Appendix F) provides a summary of resource concerns identified through the scoping process and their relevancy to the project. Resources determined not relevant were eliminated from detailed study. Resources determined to be relevant have been carried forward for analysis

5.0 AFFECTED ENVIRONMENT

This chapter provides a description of environmental resources that could be affected by, or could affect, the project. Information provided comes primarily from federal or state data or reports, scientific literature, or information provided by the City. Current conditions and characteristics of identified environmental, cultural, and socioeconomic resources are described and this information is used in the assessment of potential impacts from the project.

Per federal guidance, this Plan-EA assesses ecosystem services based on all four federally identified ecosystem service categories (USDA, n.d.)

1. Provisioning services: tangible goods provided for direct human use and consumption, such as food, fiber, water, timber, or biomass.
2. Regulating services: services that 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 filtration, climate stabilization, or crop pollination.
3. Cultural services: services that make the world a place in which people want to live— examples include spiritual, aesthetic viewsheds, or tribal values; and
4. Supporting services: services that refer to the underlying processes maintaining conditions for life on Earth, including nutrient cycling, soil formation, and primary production.

5.1 CURRENT STATUS OF THE DAMS

5.1.1 Status of Operation and Maintenance

The City has completed operation and maintenance (O&M) of the East Wash and West Wash Dams, as outlined in the 1987 revised O&M Agreement with the Soil Conservation Service, USDA (Appendix E). Regular O&M activities include sediment removal, vegetation removal on dam structures, and erosion restoration

5.1.2 Sedimentation Rates

The 1958 Watershed Work Plan for the Peavine Mountain Watershed estimated sediment yields of 1.5- and 0.1-acre-feet per year for the East Wash and West Wash Dams, respectively. Given a 50-year lifespan, it was determined that by 2071, the East Wash Dam would lose about 5 acre-feet of total storage volume and the West Wash Dam would lose about 50 acre-feet of total storage volume due to sediment accumulation. Sediment deposition was analyzed for both the East Wash and West Wash dams. Since construction, the East Wash Dam saw an average sediment deposition rate of 0.098 acre-feet per year, and the West Wash Dam saw 0.836 acre-feet per year (Farr West Engineering, 2022). A sediment survey and analysis on West Wash Dam was completed in 2025 which concluded that a reasonably significant reduction (7.23 ac-ft, or 26.7%) in storage volume below the principal spillway crest occurred between 1959 and 2025. Further, through review of the elevation-storage values most of the volume reduction (~60%) is below elevation 4,745 feet, which is the bottom of the storage area. From inspection of the imagery, mapping, and terrestrial survey, it's likely the reduction in storage is largely attributed to inaccurate post-construction contours, but sediment deposition in the area surrounding the base of the trickle tube is also a likely cause of reduced storage capacity. Regardless, the volume difference of 7.23 ac-ft over the 65+ years of service leads to a conservatively high average annual sediment deposition rate of 0.1 ac-ft per year, which implies the detention pool has many (i.e., 100+) additional years of service (DOWLa, 2025).

5.1.3 Breach Analysis and Hazard Classification

Modeling for the current East Wash and West Wash Dams determined the East Wash Dam had freeboard for all storm events and the auxiliary spillway (AS) was activated at the 100-year storm event and above.

West Wash Dam overtopped for the $\frac{3}{4}$ local PMP and full local PMP, and the AS activated at the 200-year storm event and above (Appendix E).

Both the East Wash and West Wash Dams are currently classified as high hazard dams by NDWR and do not meet the requirements for dam safety by the State or NRCS. Neither dam has had the ASs activated during a storm event.

5.1.4 Potential Modes and Consequences of Dam Failure

Modeling shows that the current conditions for the East Wash Dam would not pass the PMP without excessive damage to the spillway and the West Wash Dam would not pass the PMP without overtopping (Appendix E). An erodibility analysis of the auxiliary spillway using the NRCS SITES program was conducted and the model predicts that the conceptual auxiliary spillway (without armoring) would experience head cut erosion approximately 0.7 feet deep during the 200-year flood. The model predicts that this headcutting would be localized near the downstream end of the auxiliary spillway and would not advance to the crest. Conversely, the erodibility model for the probable maximum flood (PMF) predicts headcut erosion will progress through the spillway crest. Progression through the crest is predicted to take about 4.8 hours (DOWL, 2025).

The dams provide protection to approximately 30,000 Nevadans who live and work downstream. During a local PMP event, 7,900 housing units would be affected, with 664 properties that would suffer greater than one (1) foot of inundation during a PMP event.

5.2 RELEVANT RESOURCE CONCERNS

5.2.1 Soils & Geology

5.2.1.1 Geological Resources and Erosion and Sedimentation

The original Peavine Mountain Watershed Workplan characterized soils in the watershed as shallow and of medium texture with underlying dense clay or igneous rock. Soil permeability is low and results in considerable run-off from storm events. At the time of the 1958 watershed work plan, all the area above the Highland Ditch was rangeland of varying sub-optimal conditions (City of Reno, 1958). The NRCS Soil Report, completed in 2021, shows the same soil characteristics. See Appendix E for the NRCS Soil Report.

According to the Peavine Mountain Watershed Workplan, the channels in the upper watershed pass principally through erosion-resistant volcanic bedrock, lack notable alluvial deposits, and do not appear to be actively incising or widening. Because of this, streambank erosion is reasonably assumed not to be a considerable source of sediment delivered to and deposited behind the East Wash and West Wash Dams. Rather, sheet and rill erosion likely contribute the greatest proportion of sediment yield to the dams; the most severe erosion has occurred at the steep headwater areas of the watershed where vegetative cover is extremely sparse or non-existent (City of Reno, 1958). The trap efficiencies of the dams are not known, but a portion of the sediment passes through the structures and is transported through Downtown to the Truckee River.

The geotechnical investigation in 1958, found that the dam sites are underlain by compact but poorly lithified lake sediments, which includes layers of shale, siltstones, sandstone, impure diatomite, and ash. The spillways for both the East Wash and West Wash Dams were cut into poorly lithified lake sediments, which are resistant to normal erosion but can be expected to rapidly erode during high flow stages (City of Reno, 1958).

A U.S. Army Corp of Engineers (USACE) Phase I Report for the West Wash Dam completed in 1978 includes a seismic analysis. USACE reported that Dames and Moore determined the pseudo static Factor of Safety (FOS) to be 1.2 for the 0.1g seismic coefficient (U.S. Army Corps of Engineers, 1978). Ground

water is very deep (>100') and the "dry" condition of the dams precludes wetting of the entire embankment and formation of pore pressures in the downstream portion of the embankment fill.

Based on the geotechnical evaluation conducted in 2025 (DOWL, 2025), the design seismic event may lead to small deformations of the dam; however, these slope deformations would not impact geological resources nor cause additional erosion or sedimentation.

5.2.1.2 Ecosystem Services of Soils & Geology

Soils and geology provide regulating services including global climate regulation through carbon sequestration, temperature regulation, and composition.

5.2.2 Land Use

Land uses within the project area include Washoe County (the County) designated land use code 170: Other, unbuildable, roads, restrictions, terrain (49.51 acres), 120: Vacant, single-family (0.83 acres), and rights-of-way (ROW) (2.86 acres, Appendix C). North of the project area, and outside the area of direct effect, are undeveloped lands owned by the Federal Government (U.S Forest Service) and the County. These lands make up the open space of Peavine Mountain and contain the subbasins which flow into the East Wash and West Wash Dams. The US Forest Service, are managed for multiple uses, and are subject to extractive (e.g., mining or logging) or off-highway vehicle use (EPA, 2022).

5.2.2.1 Ecosystem Services of Land Use

Land use can provide many regulating ecosystem services depending on the type of land use. Parks, greenways, and open space provide cultural services (aesthetic, recreational). Residential land use provides provisioning services (housing).

5.2.3 Water Resources

5.2.3.1 Surface & Groundwater Quality and Quantity

Surface Water

An analysis of the City storm drain system was performed as part of Farr West Engineering's (FWE's) Hydrology, Hydraulics, and Sediment Analysis (HH&S) Technical Memoranda (TM) (Farr West Engineering, 2022). A stormwater culvert runs under N McCarran Boulevard and carries stormwater into the drainage structures. Stormwaters from the surrounding developed residential neighborhood discharge to the project area through the City's stormwater drainage structures. The East Wash Primary Spillway is directly connected to the storm drain system, and the West Wash Primary Spillway directs flow to a downstream open channel that is connected to the storm drain system. The storm drain system downstream of the East Wash and West Wash Dams consists of individual catch basins that feed lateral pipes. The lateral pipes then feed into the storm drain mains. The mains flow in a southeasterly fashion until they reach their ultimate outfall at the Truckee River (Farr West Engineering, 2022).

The Water Quality Standards Program is responsible for developing and reviewing surface water quality standards, administering the Total Maximum Daily Load (TMDL) program, and generating the Nevada Water Quality Integrated Report. Nevada's water quality standards are promulgated in Nevada Administrative Code (NAC) 445A.11704 through 445A.2234. Every two years, the NDEP is required by the Clean Water Act to conduct a comprehensive analysis of water quality data associated with Nevada's surface waters to determine whether state surface water quality standards are being met and designated uses are being supported. The EPA uses the following system to rank waterbodies:

- 1 – Attaining all designated uses
- 2 – Attaining some designated uses, and insufficient or no data information to determine if remaining uses are attained
- 3 – Insufficient or no data and information to determine if any use is attained
- 4 – impaired or threatened for one or more uses but not needing a TMDL because
 - a) TMDL has been completed,
 - b) Expected to meet standards,
 - c) Not impaired by a pollutant.
- 5 – Impaired or threatened by pollutant(s) for one or more designated uses and required a TMDL. These are the waters on the 303(d) list.

According to the Nevada 2020-2022 Water Quality Integrated Report, Peavine Creek is rated a 3, and portion of the Truckee River are rated anywhere from a 1 to a 5, with 5 being severe. The portions of the Truckee River that would be flooded during an overtopping event are rated at 5.

Ground Water

The USACE Phase I Report for the West Wash Dam, completed in 1978, reported that ground water is very deep (>100') and the "dry" condition of the dams precludes wetting of the entire embankment and formation of pore pressures in the downstream portion of the embankment fill. (U.S. Army Corps of Engineers, 1978). The Truckee River flows eastward through this region from the Sierra Nevada, providing water for recreation, drinking water, agriculture, and urban development.

5.2.3.2 Regional Water Management Plan

Chapter 531, Statutes of Nevada, 2007, created a regional water planning entity in the County named The Western Regional Water Commission (WRWC). The act, effective April 1, 2008, also created The Northern Nevada Water Planning Commission (NNWPC). The NNWPC is a technical advisory panel that reports to the WRWC. The NNWPC is responsible for developing and updating a Comprehensive RWMP and recommending it to the WRWC for adoption. The 2021-2040 Comprehensive RWMP covers municipal and industrial water supply, water quality, sanitary sewerage, sewage treatment, stormwater drainage and flood control. The RWMP Goals include:

- **Goal 1:** Plan for the development of sustainable water supplies,
- **Goal 2:** Plan for regional wastewater treatment and disposal requirement,
- **Goal 3:** Plan for the protection of human health, property, water quality, and the environment through regional floodplain and stormwater management,
- **Goal 4:** Support the implementation of the Truckee Meadows Regional Plan
 - Provide Coordinated infrastructure planning,
 - Clarify the role of the WRWC and NNWPC.

5.2.3.3 Floodplain Management

FEMA provides flood insurance rate mapping (FIRM) for most areas of the County including the project area. FIRM Panel 32031C3036G (March 16, 2009) includes the majority of the East Wash and West Wash Dam areas. The southeastern corner of the project area can be seen on panel 32031C3037G. The second panel has not been printed by FEMA and is not available as a FIRM map. FEMA's National Flood Hazard Layer was accessed to view this part of the project area (Federal Emergency Management Agency, 2022). While this portion is within the project area, it is outside of potential construction disturbance.

The downstream flood areas can be found on FIRM Panel's 32031C3036G (March 16, 2009), 32031C3037G, 32031C303039G (March 16, 2009), and 32031C303043G (March 16, 2009).

The project area lies within FEMA FIRM Zone X (other areas). The downstream areas lie within FEMA FIRM Zones X (other areas), X (other flood areas) and AE. Definitions for these zones are described below.

Zone X (other areas): Areas determined to be outside the 0.2% annual chance floodplain.

Zone X (other flood areas): Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

Zone AE: Special flood hazard areas subject to inundation by the 1% annual chance flood.

FIRMette's were created for the project area using the National Flood Hazard Layer and are included in Appendix C (Federal Emergency Management Agency, 2009).

The project area is not identified as being within a regulatory flood zone, a floodplain, or in a flood hazard area. However, the function of the East Wash and West Wash Dams is to detain and direct storm water flows that may lead to flooding. FEMA's Flood Insurance Study for the County notes the following:

Summer thunderstorms occur from July through October. Thunderstorm floods are characterized by high peak, short-duration, very high velocity flows and can carry and deposit large volumes of boulders, rocks, sand, silt, and other flood detritus. They possess great destructive force and create extremely high hazards. These are local phenomena that affect only small, isolated areas at a time, such as single canyons, and cause flash floods, such as those that occurred in the Peavine Creek area in northwest Reno in July 1956 (Federal Emergency Management Agency, June 18, 2013 Reprinted with corrections July 9, 2021).

Flood Control

Flood control, flood disturbance regulation, and stormwater storage are the major ecosystem services provided by the dams related to flooding. The dams are designed to help regulate flooding downstream due to stormwater and snowmelt run-off events. See section 7.1 for flood frequency and recurrence intervals and consequences of a dam breach on downstream residents.

5.2.3.4 Ecosystem Services of Water Resources

Stormwater runoff provides ecosystem services including soil moisture, interflow, baseflow, groundwater recharge, and filtration of water through the environment (Prudencio & Null , 2018). Watershed restoration and protection are key objectives of connecting hydrological processes and urban design. An integrated approach to water management recognizes the connection between the watersheds, drinking water provision, and stormwater and wastewater treatment (U.S. Department of the Interior & U.S. Geological Survey, 2014). The East Wash and West Wash Dams provide regulation services including flood disturbance regulation, water regulation, water purification, climate regulation, flood control, and carbon sequestration. The West Wash Dam may provide some measure of primary recharge of storm water and secondary recharge from urban runoff. Stormwater flows diverted in the East Wash Dam and stored in the West Wash Dam contribute runoff to the City's stormwater drainage system which empties into the Truckee River.

Water quality related ecosystem services are the most important ecosystem service that the East Wash and West Wash Dams provide. Ecosystem services provided by stormwater dams include water purification, water infiltration, and groundwater storage. These are impaired in the urban environment from impervious surfaces, exposure to urban pollutants, and gray stormwater infrastructure. Very wet water years are likely to increase urban runoff. Other ecosystem services include flood control, water supply, water storage, climate regulation, recreation, biodiversity, and habitat (Prudencio & Null , 2018).

5.2.4 Air Quality

5.2.4.1 Clean Air Act / National Ambient Air Quality Standards

The CAA requires the EPA to establish National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The EPA has set NAAQS for seven (7) principal pollutants, which are called “criteria” pollutants (Code of Federal Regulations). The County Air Quality Management Division (AQMD) implements clean air solutions that protect the quality of life for the citizens of the City, the City of Sparks, and the County including air monitoring, permitting and compliance, planning, and public education. AQMD is required by federal and state law to monitor ambient air quality data in the County for pollutants deemed harmful by the EPA. Data is monitored and collected to determine compliance with the NAAQS.

Particulate matter (PM), also known as particle pollution, is a complex mixture of extremely small particles and liquid droplets. PM is made up of several components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Major contributors of PM₁₀ are residential wood burning, street sanding and sweeping, and fugitive dust.

Carbon Monoxide (CO) is a colorless, odorless gas that can be harmful when inhaled in large amounts. CO is released when something is burned. The greatest sources of CO to outdoor air are cars, trucks, and other vehicles or machinery that burn fossil fuels (EPA, 2022).

The County, which includes the project area, is in a maintenance area for PM₁₀ and CO. The County and the project area are in attainment for all other pollutants identified under the Federal CAA (40 CFR 93.153 (b) (2)). All federal projects are required to show general conformity with the CAA. General conformity ensures that actions by the federal government would not cause or contribute to violations of the NAAQS and would not delay timely attainment of the NAAQS. General Conformity also ensures that the actions taken by federal agencies do not interfere with a state’s plans to attain and maintain national standards for air quality (EPA, 2022). Table 4 (Appendix F) shows the applicable *de minimis* thresholds for each pollutant. A general conformity determination would not be required if an applicability analysis shows the emissions during construction and operation would not exceed the *de minimis* thresholds (40 CFR 93.153(b)(2)).

5.2.4.2 Ecosystem Services of Air Quality

Air quality can directly impact ecosystem services including regulating services such as climate stabilization, cultural services such as aesthetic viewsheds, and supporting services such as nutrient cycling.

5.2.5 Vegetation

5.2.5.1 Special Status Plant Species

U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC), a project planning tool that streamlines the USFWS environmental review process for compliance with the Endangered Species Act (ESA), was queried for potential special status plant species. A Formal Species List (Consultation Code 08ENV00-2021-E-00791) (EM Strategies, 2021) was obtained for the project area. The IPaC list indicated that there are no critical habitats within the project area. Species lists are considered valid for 90 days, so a second IPaC list (Project Code 2023-0044108) was queried on 1/24/2026 (Project Code 2026-0040549). The second species list identified one (1) additional threatened species, the Webber’s Ivesia (*Ivesia webberi*), for the project area. This additional species was not evaluated in the Baseline Biological Survey Report; however, it was analyzed in the 2026 Biological Report Addendum. There are still no critical habitats within the project area. Table 5 (Appendix F) lists the ESA vegetation

species identified by FWS. Both IPaC reports and the Baseline Biological Survey Report and Biological Report Addendum are included in Appendix E.

Webber's ivesia are listed in Washoe County due to the designation of critical habitat in 2014 in portions of the county between Lake Tahoe and Pyramid Lake. The critical habitat is several miles away from the project area. There is no suitable habitat within the project area, and Webber's ivesia are not anticipated to be located within the area. The Project would not result in any effects (i.e., ***No Effect***) on Webber's ivesia or modify designated critical habitat for this species.

Desktop and field surveys were conducted to document baseline biological conditions for the project in 2021. The project encompasses 53.2 acres on land owned by the City (EM Strategies, 2021). Existing literature, United States Geological Survey (USGS) topographic maps, aerial imagery, NRCS soils data, NRCS ecological site data, and USGS Southwest Regional Gap Analysis Project (SWReGAP) vegetation community data were used to determine the vegetation communities, wildlife associations, and soils that are expected to occur within the project area. Portions of the project area (23 acres) were largely unvegetated and moderately disturbed due to several walking trails in the area and use by the public, as well as construction activities and the earthen dams. Table 6 (Appendix F) shows the SWReGAP Vegetation communities within the project area and field verified communities are summarized in Table 7 (Appendix F).

No protected plant species were observed or recorded during the field survey (EM Strategies, 2021).

5.2.5.2 Noxious Weeds and Invasive Species

A noxious weed is a plant that has been defined as a pest by law or regulation. Nevada Department of Agriculture's (NDA) policy regarding noxious weed abatement is that if a plant is found likely to be "detrimental or destructive and difficult to control or eradicate" (Nevada Revised Statute § 555.005, 2021), the NDA, with approval of the Board of Agriculture, would designate the plant as a noxious weed. It is the NDA's policy to use the "Noxious Weed Tier System" to determine what action is to be taken consistent with existing statutes which include authority for: the promulgation of quarantine, abatement for eradication and/or control; holding and inspecting; establishing weed control districts; and for other regulatory activities. At the time, the NDA lists a species, it would also give a rating of A, B, or C. These ratings reflect the NDA's view of the statewide importance of the noxious weed, the likelihood that eradication or control efforts would be successful, and the present distribution of noxious weeds within the State. These lists would be in the NAC (Nevada Administrative Code § 555.010, 2018).

The following defines the NDA weed ratings:

- "A" Weeds normally limited in distribution throughout the State; actively excluded from the State and actively eradicated wherever found; actively eradicated from nursery stock dealer premises; control required by the State.
- "B" Weeds more widespread throughout the State; actively excluded where possible, actively eradicated from nursery stock dealer premises; control required by the State in areas where populations are not well established or previously unknown to occur.
- "C" Weeds generally widespread throughout the State; actively eradicated from nursery stock dealer premises; abatement at the discretion of the State quarantine officer.

Noxious weed species were distributed throughout the project area, with heavier concentrations in the northern disturbed area and along the streambanks (EM Strategies, 2021) (Appendix E). Noxious weeds can threaten native plant species and may be established because of ground disturbing activities. Four (4) noxious weed species and one North American Species Management Association (NAISMA) prohibited weed were observed and mapped within the project area during the noxious weed survey:

1. Perennial pepperweed (*Lepidium latifolium*) – Category C noxious weed
2. Musk thistle (*Carduus nutans*) – Category B noxious weed
3. Hoary cress (*Cardaria draba*) – Category C noxious weed
4. Medusahead grass (*Taeniatherum caput-medusae*) – Category B noxious weed
5. Jointed goat grass (*Aegilops cylindrica*) – NAISMA prohibited weed.

5.2.5.3 Natural Areas

The project area is found within the Sierra Nevada-Influenced Semiarid Hills and Basins ecoregion. This ecoregion includes the basins and lower mountain slopes immediately east of the Sierra Nevada that are affected by its climate or that have its characteristic granitic substrate. Refer to Table 7 (Appendix F) for details on ecoregion coverage in the project area. Plants in this ecoregion generally have slightly higher moisture requirements. (Bryce & eld, 2003)

The SWReGAP vegetation communities within the project area were field-verified and re-mapped when adjustments were needed. Field verification identified two (2) vegetation communities, the Inter-Mountain Basins Big Sagebrush Shrubland and the Great Basin Lowland Riparian communities. The Inter-Mountain Basins Big Sagebrush Shrubland vegetation community makes up most of the project area, covering 45.2 acres. The shrub layer consists of several co-dominant species including fourwing saltbush (*Atriplex canescens*), rubber rabbitbrush (*Ericameria nauseosa*), basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*), and broom snakeweed (*Gutierrezia sarothrae*). The herbaceous layer in this vegetation community was sparse, with large areas nearly devoid of vegetation (EM Strategies, 2021).

5.2.5.4 Riparian Areas

The Great Basin Lowland Riparian vegetation community occurs along the flowing stream in the central portion of the project area, covering eight (8) acres. A sub-type within this community is a wetland lacking a mature tree canopy located in the southeastern corner of the project area. This area is dominated almost exclusively by a dense stand of narrowleaf willow (*Salix exigua*) with some cattail (*Typha angustifolia*) and Arctic rush (*Juncus arcticus*) along the edges. A small stand of tree of heaven (*Ailanthus altissima*) occurs on the north side of the wetland (EM Strategies, 2021).

The corridor enters the project area from the west and then curves south to the West Wash embankment dam and includes thick, mature mixed willows, along with cottonwood trees. A wetland adjacent to Highland Ditch also possesses mature willows, cottonwood trees, and tree of heaven. These willows and trees provide potential nesting habitat for migratory birds.

Although these areas appear to be wetlands or contain riparian type vegetative communities, they do not contain hydric soils and do not meet the definition of wetland for USACE jurisdictional purposes (Wood Rodgers, 2022).

5.2.5.5 Ecosystem Services of Vegetation

Vegetation provides regulating services (local and global climate regulation, pest regulation, erosion regulation, water purification, pollination, visual buffering), and cultural services (cultural heritage, recreation, aesthetic value, social relations, sense of place). Vegetation also provides many supporting services (primary production, nutrient and water cycling, production of atmospheric oxygen, and provisioning of habitat).

5.2.6 Wildlife

5.2.6.1 Wildlife and Wildlife Habitat

Baseline biological desktop and field surveys were conducted for the project in 2021 (EM Strategies, 2021). A total of fifteen (15) bird, three (3) mammal, and one (1) reptile species were directly observed or detected by sign (e.g., tracks, burrows, scat, skeletal remains) in the project area.

Wildlife habitat exists for migratory birds, raptors, and bats within the riparian corridor. Milkweed (*Asclepias sp.*), an important plant for the monarch butterfly, is present mainly in the central riparian corridor, but also occurred occasionally throughout the project area. Two species of milkweed were seen: Narrowleaf milkweed (*Asclepias fascicularis*) and showy milkweed (*A. speciosa*).

5.2.6.2 Special Status Animal Species

USFWS IPaC was queried for potential special status animal species in the project area. An IPaC list (Consultation Code 08ENV00-2021-E-00791) (EM Strategies, 2021) was obtained for the project area. The IPaC List indicated that there are no critical habitats within the project area. Species lists are considered valid for 90 days, so a second IPaC list (Project Code 2026-0040549) was queried on 1/24/2026. The second species list identified one (1) additional proposed threatened species, the northwestern pond turtle (*Antinemys marmorata*) for the project area. This additional species was not evaluated in the Baseline Biological Survey Report; however, it was analyzed as part of the 2026 Biological Report Addendum. There are still no critical habitats within the project area. Table 8 (Appendix F) lists the ESA Species identified by FWS. In addition to IPaC and the State Sensitive Species database, coordination letters were sent to both the US Fish and Wildlife Service and Nevada Department of Wildlife requesting the opportunity to provide additional surveys, investigations or reports (Appendix A). No additional information was provided regarding species presence or distribution in the project area. Conservation recommendations for the Monarch and Northwestern Pond Turtle were provided and incorporated into the Best Management Practices (Appendix E).

NDOW was consulted for the project. Table 9 (Appendix F) lists the Nevada State Protected or WAP Species of Conservation Priority (SoCP) species that have been directly observed within four miles of the project area. Most of these species are migratory birds protected under the Migratory Bird Treaty Act (MBTA).

Both IPaC reports and the Baseline Biological Survey Report are included in Appendix E.

SNYLF

The SNYLF is found at high elevations in wet mountain meadows of the Sierra Nevada mountains. The SNYLF is considered highly aquatic and requires water of sufficient depth or flow to avoid freezing. There is no possibility of occurrence of SNYLF in the project area; therefore, SNYLF would not be considered further in this Plan-EA (EM Strategies, 2021).

Cui-ui

Cui-ui are found only in Pyramid Lake and the mouth of the Truckee River. Historically, this species was also present in Winnemucca Lake, which is now dry. Therefore, there is no possibility of Cui-ui occurring in the project area, and it would not be considered further in this Plan-EA (EM Strategies, 2021).

LCT

LCT is listed as threatened under the ESA. This native fish historically inhabited the Truckee River drainage from Lake Tahoe to Pyramid Lake but was extirpated from the Tahoe Basin by the early to mid-1900s. Restocking efforts by the NDOW and other agencies (i.e., California Department of Fish and Wildlife) have reintroduced LCT into Lake Tahoe and the headwaters of the Truckee River. Now a popular game fish,

LCT were historically a valuable food source for the Pyramid Lake Paiute Tribe, the Washoe Tribe, and early explorers. LCT require specific habitat for spawning, characterized mainly by cool water, pools with nearby cover, stream banks that are stable and well vegetated, and riffle-run areas with rocky substrate. Outside of spawning season, LCT occupy both lakes and streams. Non-native salmonid fish are generally considered to be the greatest threat to LCT populations. These non-native salmonids threaten LCT persistence through hybridization and by increasing competition for habitat and resources. LCT are also threatened by altered watersheds that may have increased turbidity and high flows, which reduce the spawning habitat quality. Warmer water temperatures and drought can affect the survival rate of young LCT (EM Strategies, 2021).

There is no possibility of occurrence of LCT in the project area; therefore, LCT would not be considered further in this Plan-EA (EM Strategies, 2021).

Carson Wandering Skipper

The Carson Wandering Skipper is listed as Endangered under the ESA. Carson Wandering Skipper relies on Desert Saltgrass (*Distichlis spicata*) to complete its life cycle. Their known habitat is characterized by lowland grassland habitats on alkaline substrates generally at elevation of less than 1,524 meters (5,000 feet). Other habitat characteristics may include geothermal activity and open areas near springs or water. Adults require nectar for food during the spring/summer season. Plant species known to be used by the Carson Wandering Skipper include Thelypody (*Thelypodium crispum*), Racemose golden-weed (*Pyrrocoma racemosus*), Birds Foot Trefoil (*Lotus Corniculatus*), Slender cleomella (*Cleomella parviflora*), small-flowered cleomella (*Cleomella plocasperma*), Heliotrope (*Heliotrope curassavicum*), cinquefoil (*Potentilla sp.*), Western sea purslane (*Sesuvium verrucosum*), and Alkali Weed (*Cressa truxillensis*) (USFWS, n.d.) (USFWS, n.d.). None of these habitats exist within the project area.

There is no possibility of occurrence of the Carson Wandering Skipper in the project area; therefore, the Carson Wandering Skipper would not be considered further in this Plan-EA.

Monarch Butterfly

The monarch butterfly is listed as a proposed threatened species under the ESA. The monarch butterfly is a distinctively colored orange, black, and white butterfly. Monarch butterflies in the State lay eggs during spring and summer. Larvae feed on plants in the subfamily *Asclepiadoideae* which contain toxins that monarch butterflies can sequester as an anti-predation defense. Adult monarch butterflies utilize a wide variety of plant species for nectar (EM Strategies, 2021).

The main threat to monarch butterflies is disturbance (i.e., logging, land conversion) to their overwintering sites. Monarch butterfly populations breeding in the State are likely to overwinter on the Pacific coast of California. No known overwintering sites occur in the State. Additional threats include the use of herbicides (i.e., glyphosates) in agricultural areas and effects of climate change (e.g., extreme weather conditions) (EM Strategies, 2021).

The potential for occurrence of Monarch butterflies is relatively high because they are assumed to use the project area for breeding due to the presence of milkweed. Citizen science records exist for monarch butterflies in the vicinity of the project area. The timeframe for monarch butterflies to arrive and breed in the City is likely to extend from May through August (EM Strategies, 2021).

There is potential habitat for monarch butterfly in proximity to the survey area; however, no critical habitat has been designated.

Northwestern Pond Turtle

The northwestern pond turtle is a proposed threatened species under the ESA. The northwestern pond turtle is a small to medium sized turtle endemic to the western coast of the United States and Mexico. Northwestern pond turtles are primarily associated with aquatic habitats with muddy bottoms and basking

sites. The main threat to northwestern pond turtles is loss or alteration of habitat, increased predation of nests and hatchlings, invasive species and road mortality.

The Project is *not likely to jeopardize the continued existence* of the northwestern pond turtle. Within the project area, there is minimal suitable aquatic habitat for the species. Long-term impacts to northwestern pond turtles are not anticipated as a result of the Project.

5.2.6.3 Migratory Birds, Bald Eagles, and Golden Eagles

Potential nesting habitat for migratory birds and raptors is present in the project area. Additional nesting habitat is present in the form of powerlines and other tall artificial structures within the project area. Adjacent homes with landscaped backyards provide attractive foraging habitat for many migratory birds (EM Strategies, 2021). No raptor nests were recorded in the project area. Fifteen (15) avian species protected by the MBTA were observed in the project area. Please see the Baseline Biological Survey Report included in Appendix E for a list of these species.

5.2.6.4 Ecosystem Services of Wildlife

Wildlife provides regulating services (local and global climate regulation, pest regulation, erosion regulation, water purification, pollination, visual buffering), and cultural services (cultural heritage, recreation, aesthetic value, social relations, sense of place).

5.2.7 Human

5.2.7.1 Socioeconomics

Data from the 2015 5-year American Community Survey was used to analyze socioeconomic information. The affected area encompasses six (6) Census tracts; 13, 14, and 24.01 located north of I-80, and 1.03, 1.04, and 1.06 located south of I-80. The project area is almost entirely within Census tract 24.01. A small section of the south end of the project area is within Census Tract 13. Additional tracts are included in the inundation maps and are considered in the impacts calculated by the Benefit Cost Analysis (BCA) (Hansford Economic Consulting LLC, 2022). Table 10 (Appendix F) shows the Census Tracts in the affected area. A map of the County Census Tracts within the affected area is included in Appendix C.

An estimated 16,200 residents (6% of the City's total population) live in the area directly impacted by a potential flooding event at the East Wash and West Wash Dams. The dams are estimated to provide protection against flooding to about 30,000 Nevadans who live and work downstream. The median age of residents in the City is 38.5 years, about the same as in the United States and the State. In the affected area, the median age is much greater in three (3) of the census tracts (48.6 years, 49.4 years, and 56.2 years). These three (3) census tracts lie south of I-80 and are Tracts 1.03, 1.04 and 1.06. Table 11 (Appendix F) shows variables in population and housing for the project area.

Census Tract 24 includes the area around the dams and has a population of approximately 4,190 with a median age of 32.2 years. The median household income is 122% of the State median household income. However, 9% of the population in this area is below the poverty level and 11% are disabled. The residences surrounding the project area are mostly single-family homes built in the late 1960's, 1970's, or later. The area is 32% minority.

The City's labor force works primarily in educational services, health care, social assistance, arts, entertainment, recreation, accommodation and food services, and retail trade. The BCA shows that the primary employment industry for residents in the affected area is arts, entertainment, and recreation, and accommodation and food services (Hansford Economic Consulting LLC, 2022). In the census tracts north of I-80, a high proportion of residents are employed in educational services, and health care and social assistance. The labor force in the affected area works in industries that reflect the overall City employment.

The percentage of workers working from home is similar in the affected area as in the City. For those who travel to work, driving alone is the main form of transportation in all census tracts, except 1.06. Only 40% of workers drive alone in census tract 1.06, 59% of workers drive alone in census tract 1.04, and 60% drive alone in census tract 14. In two (2) of these census tracts, a high proportion (20%-25%) of workers walk to work. In the area south of I-80, a much higher proportion of workers use public transit than in the City.

The employment figures also point to a lower-income, more transitory population living in or near the Downtown core working in lower-paying service industry jobs (at the casinos, hotels, and restaurants for example).

Compared with the City, the State, and the US, there is a much larger percentage of persons living below the poverty level in three (3) of the census tracts, including two (2) of the tracts south of I-80, and census tract 14. There is also a much higher proportion of people living with a disability in two (2) of the census tracts south of I-80 (32% and 26% compared with 12% in the City, the State, and the US). Median household income varies widely between the census tracts; from 53% to 122% of the City's median household income. Generally, household income is higher in the mostly residential areas north of I-80. Conversely, there is a high proportion of residents receiving food stamps/SNAP benefits in Downtown.

The unemployment rate is comparable to the State and the US in most of the census tracts (5% to 7%), but it is much higher in Downtown (at least 15%). The percentage of households without a vehicle is much greater in Downtown (18% to 45%) compared with the State and the US (8%); the same as the City in census tract 14, and lower than the State average of 7% in census tract 13 (5%) and census tract 24.01 (2%). Table 12 (Appendix F) lists unemployment and income statistics in the project area census tracts. A map of the County Census Tracts within the vicinity of the project area is included in Appendix C.

5.2.7.2 Cultural and Historic Resources

The Peavine Creek Watershed Flood Control Project, including the construction for the East Wash and Wash Dams, is significant in that it was the first to be undertaken in the State using the federal funding offered through the Watershed Protection and Flood Prevention Act of 1954 and was the first in the nation to be undertaken by the SCS to exclusively protect a city. Because the construction of these dams substantially decreased the flood risk to northwest Reno, the Veterans Administration and Federal Housing Authority were able to back loans and loan guarantees for home construction in the area, allowing for the continued expansion and development of the City (Broadbent and Associates, 2021).

In consultation with the Nevada SHPO, NRCS, and the City, a direct and indirect Area of Potential Effect (APE) was determined for the project, in accordance with Section 106. The direct APE includes the area that would be directly affected by the project, an area of approximately 53.23 acres. The indirect APE includes the areas that may be impacted directly or indirectly by the project, an area of approximately 133.49 acres. Letters were also mailed to the Tribes (Appendix A) depicting the proposed APE; no responses to the proposed APE were received (see Section 9.5 for a summary of consultation). See Appendix B for a direct and indirect APE Figure. A Cultural Resource Inventory (CRI) was completed for the direct and indirect APE under the supervision of a state certified archeologist (Broadbent and Associates, 2021).

A literature review was conducted, which summarized existing surveys near the direct and indirect APE. The CRI noted that 16 archaeological sites and 139 architectural resources have been previously identified within one (1) mile of the direct APE. None of these sites are located within the direct APE; only one (1) is located within the indirect APE. The 139 architectural resources within one (1) mile of the direct APE include structures and buildings, none of which are located within the direct APE.

Based on the Nevada CRI System search results, there are seven (7) eligible resources for NRHP listing within one (1) mile of the direct APE, none of which are within the direct APE; only one (1) is located within the indirect APE, but is presumed destroyed by the construction of McCarren Avenue (Broadbent

and Associates, 2021). According to the list maintained by SHPO, there are no resources that have been listed on the Nevada State Register of Historic Places within one (1) mile of the indirect APE.

The indirect APE encompasses 141 parcels, most of which contain residences constructed between 1964 and 2015; 46 of the parcels contain structures that are historic in age (at least 50 years old). All the structures within the Indirect APE were constructed after the East Wash and West Wash Dams were completed. The historic aged resources within the Indirect APE have not been evaluated for their eligibility for inclusion in the NRHP. The NRCS has determined, and SHPO has concurred, that raising the projected height of the dam and changing the slope will not have an effect on the viewshed of the historic sites or structures that are within the indirect APE.

The survey of the direct APE resulted in the identification of three (3) architectural resources of historic age including the West Wash Dam and associated structures, the East Wash Dam and associated structures, and a segment of the Highland Ditch. The East Wash and West Wash Dams were recorded as individual structures and as elements of the East Wash and West Wash Dam Historic District. Broadbent recommended, and the NRCS has determined, that the East Wash and West Wash Dams as eligible for NRHP listing, both separately and together as a historic district. Broadbent also recommended, and the NRCS has determined, that the segment of the Highland Ditch (S808) recorded for the project is not eligible for NRHP inclusion and should be considered a non-contributing segment to the NRHP-eligibility of the whole resource. The Nevada SHPO has concurred with all NRCS determinations of eligibility. The NRCS has further determined that there will be no indirect effects to historic properties from the project and SHPO has concurred with this determination. Refer to Section 9.5 for a timeline of Consultation with SHPO, American Indian Tribes and other concerned parties for The Project.

In consultation with SHPO, the NRCS has determined that there will be adverse effects to the West Wash Dam from the proposed project activities of changing the slope of the dam and raising the height of the dam. The Advisory Council on Historic Preservation was notified of the determination of adverse effects and declined to participate. The NRCS in consultation with SHPO has developed a Memorandum of Agreement (Attachment A) to mitigate the project adverse effects to historic properties.

EAST WASH DAM (S2872)

The East Wash Dam (S2872) is an earthen embankment dam constructed from local materials across the East Wash in northwestern Reno. The dam is oriented northeast-southwest (60-240°), with the northeastern end near the intersection of Keystone Avenue and Ives Avenue. The dam is approximately 460 ft. long, with the crest between 15 and 50 ft. wide. The north slope of the dam is topped with angular cobble to boulder-sized rocks. There is a small, 1 ft.-diameter concrete culvert extending under Keystone Avenue at the east end of the detention basin/reservoir. The dam serves to divert water from the East Wash towards the West Wash and away from the downstream subdivisions.

WEST WASH DAM (S2873)

The West Wash Dam (S2873) structure is an earthen embankment dam constructed from local materials across the West Wash in northwestern Reno. The dam is oriented northeast-southwest (60-240°), with the northeastern end near the intersection of Polk Street and O'Farrell Street; the southwestern end terminates at the eastern end of Gulling Road. The dam is approximately 780 feet long, with the crest approximately 12 feet wide; the embankment is at least 70 feet tall. It is partially vegetated on both the north and south slopes.

East Wash and West Wash Dam Historic District (D390)

The proposed East Wash and West Wash Dam Historic District (D390) is defined primarily by the edges of the City-owned parcels that contain the East Wash and West Wash Dams and a portion of the West Wash below the West Wash Dam, but also include some private property at the southern end. The boundaries include the extant features that were constructed as part of the Peavine Creek Watershed Flood Control

Project along with the remaining course of the West Wash above and below the dams. The historic district encompasses a flood control system that was constructed between 1960 and 1961 as part of the Peavine Creek Watershed Flood Control Project. This project was designed in 1958 under the auspices of the newly adopted Watershed Protection and Flood Prevention Act, and included dams on the East Wash, the West Wash, Upper Peavine Creek, and Lower Peavine Creek (HDR, 2011). The East Wash and West Wash Dams are located northwest of Downtown and work in conjunction with each other, with the East Wash Dam diverting water through a spillway into the reservoir of the West Wash Dam. The Upper and Lower Peavine Creek Dams are located to the west of the East Wash and West Wash Dams and work in tandem; they are located outside of the boundaries of the proposed historic district.

American Indian Tribes Consulted

Five American Indian Tribes (Washoe Tribe of Nevada and California, Summit Lake Paiute, Reno Sparks Indian Colony, Fallon Paiute Tribe, and Pyramid Lake Paiute) were asked for comments on the cultural resource report that was completed for the project and any concerns that they might have with the proposed project in a letter dated 10/06/2022. The Pyramid Lake Paiute Tribal Historic Preservation Officer responded on 11/15/2022 that they had no concerns but reminded the NRCS that the Tribe considers the Peavine Mountains to be a Traditional Cultural Place (TCP). No other tribes have responded with comments. Additionally, the same five tribes were asked in separate letters on 01/16/2024 to the tribal chairs for any other comments concerning the project with no responses.

5.2.7.3 Public Health and Safety

The East Wash Diversion Dam and West Wash Detention Dam protect tens of thousands of citizens and billions of dollars of property in the City, including nearby residents and large-scale Downtown development. There are about 16,200 residents (6% of the City's total population) living in the area that would be impacted by a potential PMP flooding event at the East Wash and West Wash Dams in their current condition. Table 13 (Appendix F) shows properties that would be affected during each storm event with the current condition of the dams.

An in-depth discussion about the hydraulics/hydrology associated with the East Wash and West Wash Dams is in TM #2 produced by FWE (Farr West Engineering, 2022) (Appendix E).

Emergency Action Plans

Emergency Action Plans (EAPs) are tools for city personnel and public safety agencies to maximize public safety while minimizing property damage in the unlikely event of an emergency spillway discharge or failure of the Dams. The City has EAPs in place for both dams to protect citizens and property in the event of flooding. The EAPs include flood modeling, mitigation actions, flood maps, and evacuation plans. The EAPs recommend emergency actions, which may become necessary at or downstream from the facility. The plans are intended to serve as an appendix, and supplement agency responsibilities and actions set forth in the City Emergency Operations Plan and meets the State requirements (NAC 535.320). The plan identifies actions to be taken in case of a dam breach or dam failure and includes classification as either a Red Alert Condition or a Yellow Alert Condition (City of Reno , 2006).

5.2.7.4 Visual Resources and Scenic Beauty

The project area is in the northwest Truckee Meadows, which is bound to the east by the Virginia Range, to the south by the Huffaker Hills and Steamboat Hills, to the west by the Carson Range, and to the north by Peavine Mountain. The project is located near the base of Peavine Mountain, which is an open space and recreation area, mostly owned and managed by the Bureau of Land Management.

The construction of the East Wash and West Wash Dams have altered the natural topography and vegetation of the project area. The topography within the project area ranges in elevation from 4,560 to 4,640 feet

above mean sea level. The contributing watersheds for the dams extend north underneath McCarran Boulevard into the south slopes of Peavine Mountain (Broadbent and Associates, 2021).

Most of the landscape within and surrounding the project area has been disturbed by construction and development or has been burned by wildfire (Broadbent and Associates, 2021). The biological survey conducted for the project area included the observation that “The outer edges of the project area are extremely disturbed, with heavily utilized walking trails present. Trash and debris were commonly found along the fence lines that border the project area and near the culvert located at the extreme northwest corner of the project area” (EM Strategies, 2021).

5.2.7.5 Parklands and Recreational Uses

There are no official parklands within the project area, however, informal recreational activity often occurs. Several public comments suggested adding a formal park or incorporating recreational facilities, including benches, marked trails, or trash cans, in the project design. The City's O&M Agreement for the East Wash and West Wash Dam prohibits the installation of any structure or facilities that will interfere with the O&M of the Dam's project measures. While no formal recreational facilities are proposed, the area would not be closed to the public outside of construction areas, and informal recreation may still occur.

5.2.7.6 Noise

The project area is surrounded by residential and commercial development, and bounded by McCarran Boulevard, a major 4-lane throughfare circumventing the City. Normal street and traffic noise is ongoing.

5.2.7.7 Ecosystem services of Human Environment

Human Environment in the project area impacts cultural services and regulating services, mainly through aesthetic, recreation, and flood control.

6.0 ALTERNATIVES

This section describes the development and comparison of alternatives and the reasoning which led to the identification of the Preferred Alternative. All reasonable alternatives identified were developed and analyzed.

6.1 FORMULATION PROCESS

Initial Preliminary Alternatives were formulated based on the requirements of NRCS National Watershed Program Manual; results of the Data Collection and Analysis Report; the Hydrology, Hydraulics, and Sediment Analysis (HH&S) Technical Memoranda; preliminary modeling and existing reports. Scoping comments were incorporated into the formulation of alternatives. Unique requirements of the P&G were addressed including full consideration and reporting on nonstructural alternatives or plans (U.S. Water Resources Counsel, 1983, p. 12). Alternative plans, strategies, or actions preferred by the City were also addressed. Per PL-566 policy and guidelines, project sponsors must have the legal authority and resources to carry out, operate, and maintain works of improvement (PL 83-566, Section 2, and Section 4(3)). Alternatives that are not within the scope of actions that the City can entertain as the project sponsor or consistent with PL 83-566 authorities under which this plan was prepared, were eliminated from further study.

Preliminary alternatives were formulated based on the requirements of NRCS National Watershed Program Manual (NWPM), NRCS Watershed program policies, the City's planning priorities, the HH&S TM, modeling, and existing reports. Preliminary alternatives were assessed during the Preliminary Alternatives Workshop held August 12, 2021. Due to the COVID-19 pandemic the workshop was held virtually. Workshop attendees included NRCS staff and the City administrative, management, and maintenance staff. Workshop attendees included various staff from the USDA – NRCS, the lead Federal Agency, and administrative, management and maintenance staff from the City of Reno, the project Sponsor. NRCS extended invitations to other agencies potentially interested in the project to participate in the workshop.

Alternative formulation also included identification of the problems and challenges with the current state of the structures, the upstream watershed, and the urban development downstream. Meeting existing safety requirements for high hazard dams and providing protection for the City of Reno, including its increase in urbanization, were identified as the major project challenges and opportunities.

6.2 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Thirteen (13) alternatives were considered in the preliminary alternative analysis. Ten (10) of the preliminary alternatives considered did not meet the formulation criteria, purpose and/or need of the project, or project objectives and were eliminated from further analysis, and were not analyzed in detail. These ten (10) preliminary alternatives are briefly discussed below. Detailed discussion of the alternatives eliminated and reasons for elimination can be found in the Preliminary Alternatives Memo completed by FWE (Farr West Engineering, 2022).

Downstream Flood Improvements

Downstream improvements include efforts to allow potential auxiliary spillway flow and overtopping flow of the West Wash Dam embankment to pass through the downstream community to the receiving waters of the Truckee River with minimal damage. Implementation of this alternative would involve establishment of a flood corridor from West Wash Dam down to the receiving waters of the Truckee River.

This alternative was eliminated from further consideration due to the high cost of the alternative.

Rehabilitate the East Wash Dam Only

Rehabilitation of East Wash Dam would include reestablishing the design elevation of the west dike of the principal spillway approach and an overall increase of impoundment capacity by excavating material from within the impoundment area.

The West Wash Dam provides the majority floodwater-retarding capacity that prevents flooding of the downstream urban area for flood magnitudes up to the 200-year recurrence event and not addressing deficiencies at the West Wash Dam leaves a risk to life and property in the event of a dam failure. Therefore, this alternative was eliminated as it does not achieve the purpose and need of the project.

Rehabilitate only the East Wash Dam with Downstream Improvements from the West Wash Dam

This alternative is a combination of the previously described *Rehabilitate the East Wash Dam Only* and *Downstream Improvements from the West Wash Dam* alternatives.

This alternative was eliminated from further consideration because it became redundant after a slight alteration to other alternatives.

Rehabilitate the West Wash Dam Only

Rehabilitation of West Wash Dam would include raising the embankment, widening the auxiliary spillway to at least the design width, and repairing the auxiliary spillway walls.

The East Wash dam serves as a sediment trap to allow for convenient sediment removal and reduce sediment accumulation in the West Wash reservoir. The East Wash and West Wash dams are a linked system. If the spillway were to erode at the East Wash dam, the function of the West Wash Dam would also be lost. Therefore, this alternative does not meet the purpose and need for the project.

Upstream Solutions

An upstream solution could reduce or eliminate the necessity of large, or potentially any, improvements at East or West Wash Dams. Upstream solutions include land treatment to reduce runoff, diversion of runoff to adjacent drainages, additional detention structure(s) or some combination of activities.

This alternative was eliminated from further consideration as unreasonable due to the high cost of the project, and the expansion of environmental impacts onto federal lands.

Remove Both Dams

Implementation of this alternative would involve the existing embankments either being breached or completely removed. Earth derived from the removal process would be either disposed of on-site or transported to an off-site disposal area. Collection structures would be constructed to direct flow to the existing storm water conveyance facilities. The existing detention basins and embankment areas would be contoured to a natural-appearing wash finish and armored to a degree to minimize erosion under most circumstances and return the areas to an approximation of predevelopment condition.

This alternative was eliminated as no flood protection would be afforded to properties downstream from the dam sites. Therefore, this alternative does not meet the purpose and need for the project.

Remove the East Wash Dam Only

This alternative would remove only the East Wash Dam as previously described in the *Remove Both Dams* alternative.

This alternative was eliminated as it does not meet the requirements of PL 566 to protect the downstream properties from flood flow up to the 1% flood and exposes additional properties to damage from flow up to the 1% flood (United States Congress, 1954) and thus does not meet the purpose and need of the project. This alternative does not meet the objectives of the NRCS to prevent flooding, erosion, and sediment

damage, and does not meet the Federal Guiding Principles to increase the public safety or to use a watershed approach.

Remove the West Wash Dam Only

This alternative would remove only the West Wash Dam as previously described in the *Remove Both Dams* alternative.

This alternative was eliminated as it does not meet the requirements of the purpose and need for a cost-efficient level of flood protection to protect lives and property in the surrounding urban area, as well as to comply with current performance and safety standards. This alternative does not meet the objectives of the NRCS to prevent flooding, erosion, and sediment damage, and does not meet the federal guiding principles to increase the public safety or to use a watershed approach.

Remove the East Wash Dam with Downstream Improvements from the East Wash Dam

This alternative would remove only the East Wash Dam as previously described in the *Remove Both Dams* alternative. Flood proofing would be implemented downstream to eliminate hazards to remaining properties downstream, similar to the previously described *Downstream Flood Improvements* alternative.

This alternative was eliminated as it does not meet the Federal Guiding Principles of increasing public safety and ensuring environmental justice using a watershed approach to analysis and decision making. This alternative would effectively sacrifice one (1) neighborhood to benefit another.

Remove the West Wash Dam with Downstream Improvements from the West Wash Dam

This alternative would remove only the West Wash Dam as previously described in the *Remove Both Dams* alternative. Flood proofing would be implemented downstream to eliminate hazards to remaining properties downstream, similar to the previously described *Downstream Flood Improvements* alternative.

This alternative was eliminated as it does not meet the Federal Guiding Principles of increasing public safety and ensuring environmental justice using a watershed approach to analysis and decision making. This alternative would effectively sacrifice one (1) neighborhood to benefit another.

6.3 ALTERNATIVES STUDIED IN DETAIL

During the Preliminary Alternatives Workshop, 12 alternatives were considered, and five (5) Alternatives were selected for further detailed analysis. After further consideration, one of the five was eliminated due to its high cost (Downstream flood improvements). NRCS requires consideration and analysis of certain project alternatives, including the No Action Alternative and removal of the dams.

A Detailed Alternatives Workshop was held virtually on April 29, 2022, and was attended by NRCS, the City, NDWR Division of Dam Safety, NDEP, and DOWL project staff and consultants. The workshop began with a presentation of the five (5) alternatives including discussion of the capital costs, preliminary environmental impacts, and storm event modeling scenarios. An overview and summary of the preliminary economic analysis was also presented during the workshop including identification of the National Economic Development (NED) alternative. Workshop discussion of the alternatives included the challenges raised by differing storm events, potential downstream impacts of alternatives, proposed dam rehabilitation actions, and viability and reasonableness of the alternatives. Existing EAPs and procedures in place for the East Wash and West Dams were also discussed. Materials from the Detailed Alternatives workshop are included in Appendix E (Farr West Engineering, 2022).

Three (3) alternatives, including The No Action Alternative, are considered for detailed analysis include:

1. Alternative 1: No Action
2. Alternative 3: Rehabilitate Both the East Wash and West Wash Dams (Preferred Alternative)
3. Alternative 5: Remove Both the East Wash and West Wash Dams with Downstream Flood Improvements

6.3.1 Alternative 1: No Action

The East Wash and West Wash Dams provide stormwater detention and attenuation for the Peavine Watershed. The two (2) dams work in conjunction to protect downstream developments and convey storm flows into the City's storm drain system. Stormwater is routed from the north into the East Wash Dam through a culvert under N. McCarran Boulevard. The East Wash principal spillway has two (2) separate diversion paths for flows. The first stage of principal flow is conveyed from the upstream toe of the East Wash Dam into the City storm drain system by direct connection under Keystone Avenue. The second stage of flow is diverted into the West Wash Dam basin by an open concrete channel located to the west of the East Wash Dam. The AS of the East Wash Dam consists of an earthen berm that is located to the west of the East Wash Dam's open concrete channel. Once the water surface elevation reaches 4,858 feet, the west berm would overtop and push flows into the West Wash basin (Farr West Engineering, 2022).

The West Wash Dam receives storm runoff from a culvert under N. McCarran Boulevard, from several storm drain outfalls from the adjacent neighborhoods, and from flows diverted from the East Wash Dam in larger storm events. The West Wash Dam has a small sediment drain for extremely low flows that is connected to the principal spillway. The principal spillway outfalls to an open drainage ditch just below the Highland Ditch. The downstream end of the ditch has a storm drain inlet connected to the City storm drain system. The West Wash AS is an open channel that diverts flows around the western edge of the dam and onto the adjacent streets when the water surface elevation reaches 4,784.9 feet (Farr West Engineering, 2022).

If the No Action Alternative is selected, substantial rehabilitation of the East Wash and West Wash Dams would not occur. The City would continue on-going general maintenance of the structures and rely on the existing EAP as the source for public safety. If a PMP event were predicted, the City would evacuate the residences that would be impacted by a dam breach. The EAP uses a Yellow Alert and Red Alert. Yellow alert provides warning up to 5 days in advance of the anticipated flood event, and Red Alert evacuation approximately 24 to 48 hours in advance (Washoe County Emergency Management and Homeland Security, 2018).

No Action poses a significant risk to the community in terms of population at risk (PAR) and damages to infrastructure expressed in dollars. In this alternative, the probable maximum storm flow does overtop the dam and causes a breach of the structure while the reservoir is full. This scenario generates flood water depths of approximately 40 feet at its peak and reaches into the downtown area of the City of Reno. Using the NRCS PAR spreadsheet to quantify persons in residential, commercial, and transportation settings, 3,896 persons are at risk from this flood. The economic analysis completed for the project estimates \$192,527,000 in damage to structures.

The No Action Alternative has the greatest net economic benefits; however, it continues to put downstream residents at risk and is therefore only used as a basis for comparison.

The City would work to improve the condition of the dams and conduct maintenance as funding allows. Actions identified in NDWR's annual dam inspections would be prioritized. However, repairs would not improve the dams to retain the PMP.

Under The No Action Alternative, O&M activities would continue and include:

- Sediment removal
- Vegetation removal on dam structures, and
- Erosion restoration

6.3.2 Alternative 3: Rehabilitate Both the East Wash and West Wash Dams (Preferred Alternative)

This alternative includes rehabilitation of both the East Wash and West Wash Dams to meet the dam safety requirements of the NRCS and the NDWR Division of Dams. Both Dams have been identified as High

Hazard Dams by the NDWR Division of Dams. The West Wash Dam does not meet NRCS criteria and modeling has shown it would overtop in a PMP event (USDA NRCS, 2019) (Farr West Engineering, 2022). Rehabilitation of both dams would be confined to the already disturbed areas of the structures.

Under this alternative, the East Wash Dam would have the west dike of the principal spillway approach restored to the original design elevation. Additionally, armoring of the AS of the East Wash dam would occur to avoid future damage to the East Wash Dam structure due to head cutting and degradation. Stripping of vegetation, debris, and weathered fill from crest and both faces of the East Wash Dam's AS would also occur.

The rehabilitation of the West Wash Dam under this alternative would include the following:

- Raise the embankment crest 5 feet from elevation 4,793.0 feet to 4,798.0 feet. The embankment will be extended and warped along the left abutment to protect the low area at the left abutment from potential spillage during the PMF.
- The auxiliary spillway crest elevation will be lowered 2.6 feet from elevation 4,785.1 feet to elevation 4,782.5 feet, and the crest width will be widened from approximately 50 ft to 100 feet.
- The principal spillway crest will be lowered approximately 13.4 feet from elevation 4,757.94 feet to elevation 4,744.50 feet.
- The principal spillway conduit and impact basin will be removed and replaced.
- The 3-foot filter drain will be removed and replaced with filter material that satisfies modern filter compatibility criteria, and the filter will be extended upstream to the foundation keyway to protect against internal erosion from the embankment into the foundation.
- A chimney filter/drain will be constructed near the dam center line to protect against internal erosion through the embankment. The filter will be keyed into the abutments to also protect against internal erosion along the embankment-abutment contacts.
- A seepage cutoff wall will be constructed along the bottom of the cutoff trench.

Based on the geotechnical evaluation (DOWL, 2025) the proposed modification meets the required factors of safety for slope stability. However, neither the existing dam nor the proposed modification meet the required pseudo-static factor of safety for the design earthquake, which has a peak ground acceleration of 1.036g (10,000-year return interval). Considering that the reservoir is almost always empty, a seismic event would not lead to dam-related life loss. DOWL also performed Swaisood, Pells & Fell, Newmark Block, and Bray & Travarasou deformation analyses to estimate how much the dam could deform during the design earthquake. Estimates ranged from four to 12 inches, except the Swaisgood method, which resulted in about four feet of deformation. The anticipated accelerations are slightly outside the bounds of the Swaisgood model, and four feet is likely an overestimate of the deformation of a dry dam. However, even four feet of potential seismic deformation would not preclude the repair/reconstruction of the dam.

In addition to the slope and seismic analysis, DOWL also performed an erodibility analysis of the auxiliary spillway using the NRCS SITES software (DOWL, 2025). The analysis was based on guidance in Technical Release 210-60 (NRCS, 2019) and National Engineering Handbook Part 628 (NRCS, 2014). DOWL calculated head-cut indices and other model parameters from the 2025 geotechnical data. Based on the analysis results, the spillway would erode and breach during the design flood. Therefore, spillway armoring is included in the Alternative 3 modifications.

Project construction is anticipated to begin from 2028 to 2032 and last approximately 3 years. Staging areas will be determined during final design but will take place in pre-disturbed areas. Cut and fill will be required for the project. The cut material will be used to construct the new dam embankment, and all excess material would be wasted on-site.

6.3.3 Alternative 5: Remove Both the East Wash and West Wash Dams with Downstream Flood Improvements

Under Alternative 5, the existing East Wash and West Wash Dam embankments would be completely removed, including primary and ASs, and the area would be returned to pre-development conditions. In addition to the removal of both dams, trapezoidal concrete channels would be constructed to relay stormwater runoff up to the 100-year storm event. The channels would start at the location of the removed dams, combine into a single channel at the intersection of Keystone Ave. and Kings Row, and discharge all storm runoff into the Truckee River.

To construct this alternative, all houses along the channel alignment would be purchased and demolished. Additionally, culvert crossings would need to be constructed at all road and other transportation crossings, including I-80 and the railroad in Downtown. Since both dams are removed in this alternative, flood protection would only be required up to the 100-year storm event. This alternative exceeds the current NRCS authorization for funding for the project. If this alternative is selected, then a request to modify or amend the agreement may be necessary.

6.4 NED ALTERNATIVE OR MOST COST-EFFECTIVE ALTERNATIVE

The NED Alternative is the alternative or combination of alternatives that reasonably maximizes the net economic benefit of the project consistent with protecting the nation's environment. The net economic benefit is the benefit minus the cost. According to the NWPM Sections 502.2 and 505.35.B(1)(iv), when human life is potentially at risk, the NED alternative is defined as the federally assisted alternative with the greatest net economic benefits. Based on the comparison of alternatives, Alternative 3 (Rehabilitate Both the East Wash and West Wash Dams) meets the dam safety requirements of the NRCS and the NDWR Division of Dams and is the NED.

6.5 SUMMARY AND COMPARISON OF ALTERNATIVE PLANS

This section includes summary tables for the detailed alternatives analysis. Table 14 includes a qualitative summary of the environmental resource impacts. Table 15 is a cost comparison summary table. Table 16 is a summary comparison of the equivalent annual net benefit and benefit cost ratio by alternative. Tables are located in Appendix F.

6.5.1 Alternative Evaluation Criteria

Alternatives 1, 3, and 5 were evaluated using a matrix comparison. The criteria and sub-criteria used for the non-economic evaluation were developed by carefully considering the goals of the project and the needs of the City. The six (6) main evaluation criteria that were used to compare the project alternatives are:

1. O&M
2. Engineering
3. Public/Regional Impacts
4. Environmental
5. ROW Requirements
6. Level of Flood Protection

The total score for each alternative is included in Table 17 (Appendix F). For more information on how the alternatives were evaluated, see Appendix E. The Alternative with the highest total score was one indication of The Preferred Alternative based on non-monetary considerations.

7.0 ENVIRONMENTAL CONSEQUENCES

The NRCS has the responsibility under NEPA to identify and address effects on the human environment that would occur because of the alternative plans. The types of effects and impacts analysis discussed in this section include (NRCS 2014a):

- Direct Effect: Impacts caused by a Preferred Alternative 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 undertakes such other action (NRCS, 2016).

Direct and indirect effects to environmental resources are discussed for each alternative. Cumulative impacts, flooding impacts and potential impacts due to risk and uncertainty are discussed for each alternative as well. Risk and uncertainty in these alternatives include upstream development contributing to stormwater runoff, climate change, and flooding impacts downstream of the dams including Downtown and the Truckee River.

The project area (approximately 53 acres) for The Preferred Alternative (Alternative 3) is used to evaluate impacts from most resources for each alternative. Socioeconomic and flooding resources were evaluated using the entire Affected Area. Cultural resources were evaluated using the indirect and direct APE. Some alternatives will have additional impacts outside of the project area that were not evaluated for this EA and would require additional evaluation if selected.

Resources were evaluated using a rating of impact intensity, context, and duration. Unless otherwise stated, the standard definitions for these terms are as follows:

- Negligible: The impact would be at the lower level of detection, and there would be a small change.
- Minor: The impact would be slight but detectable, and there would be a small change.
- Moderate: The impact would be apparent, and there would be a permanent measurable change.
- Major: The impact would be highly noticeable, and there would be a permanent measurable change.

Cumulative Impacts

A cumulative impact is the impact on the environment resulting 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 undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time (40 CFR 93.153(b)(2)). Past, present, and future actions that contributed to the cumulative impacts analysis for each alternative include the original development of the dams in 1960 and 1961, the housing development in and around the floodway, and the growth and expansion of the City.

7.1 ALTERNATIVE 1: NO ACTION

7.1.1 Environmental Effects

7.1.1.1 Soils & Geology

Geologic Resources and Erosion and Sedimentation

No ground disturbance and no temporary construction effects would occur, therefore no direct or indirect impacts to geologic resources and erosion and sedimentation are anticipated. Under regular O&M for the existing dams, brush removal would occur.

7.1.1.2 Land Use

No changes to existing land uses would occur, therefore no direct or indirect impacts are anticipated.

7.1.1.3 Water Resources

Surface and Groundwater Quality and Quantity

No direct impacts to surface water quality are anticipated. Sediment in the dams would continue to increase, causing moderate indirect impacts to water quality impacts during flooding events.

Regional Water Management Plan

Moderate direct impacts would occur to compliance with the RWMP as The No Action Alternative does not plan for the protection of human health, property, water quality, or the environment.

Floodplain Management

Major direct impacts to floodplain management would occur, as this alternative would continue to provide inadequate flood protection for storm events that exceed 0.5% annual chance. Major indirect impacts include damage to property and risk of lives related to flooding events.

7.1.1.4 Air Quality

Clean Air Act / National Ambient Air Quality Standards

Under this alternative there would be no construction disturbance or emissions, and no structural changes to the dam structures; therefore, no direct or indirect impacts to air quality are anticipated.

7.1.1.5 Vegetation

Special Status Plant Species

No direct or indirect impacts to Special Status Plant Species are anticipated as construction and ground disturbance would not take place.

Noxious Weeds and Invasive Species

No direct or indirect impacts to noxious Weeds and Invasive Species are anticipated as construction and ground disturbance would not take place.

Natural Areas

No direct or indirect impacts to natural areas are anticipated as construction and ground disturbance would not take place. Under regular O&M for the existing dams, brush removal would still occur.

Riparian Areas

No direct or indirect impacts to riparian areas are anticipated as construction and ground disturbance would not take place.

7.1.1.6 Wildlife

Wildlife and Wildlife Habitat

No direct impacts to wildlife or wildlife habitat are anticipated. Indirect impacts would occur during certain flooding events that would affect the turbidity and temperatures of the Truckee River, if storm flows reach the river in unexpected and unpredictable manners.

Special Status Animal Species

No direct impacts to Special Status Animal species are anticipated. Indirect impacts would occur during certain flooding events that would affect the turbidity and temperatures of the Truckee River, if storm flows reach the river in unexpected and unpredictable manners.

Migratory Birds, Bald Eagles, and Golden Eagles

No direct or indirect impacts to migratory birds are anticipated, as vegetation removal would be limited to some brush removal under regular O&M at the dams.

7.1.1.7 Human

Socioeconomics

No direct impacts to Socioeconomics would occur as no changes to the economic character of the City would occur. Moderate indirect impacts to socioeconomics would occur during a major flooding event, causing temporary impacts to approximately 2,500 jobs in the downstream area.

Cultural and Historic Resources

Adverse direct and indirect impacts to cultural and historic resources would occur during a major flooding event, as deterioration of the East Wash dam could occur. Without improvements, both the East Wash and West Wash dams would continue to deteriorate, causing adverse direct impacts.

Public Health and Safety

Moderate direct and indirect impacts would include sustained existing flooding risks and impacts to downstream residents and property during a high flooding event. These risks are discussed in more detail in Section 6.1.2.

Visual Resources and Scenic Beauty

No changes would be made to the existing visual landscape or regular dam operations, and no direct or indirect impacts are anticipated.

Noise

No direct or indirect impacts to noise, or the auditory landscape are anticipated, as no construction or construction related noise would occur.

7.1.2 Flooding Impacts

Under Alternative 1, all the runoff from a 100-year storm would be contained within the East Wash and West Wash Dams and would not activate the West Wash Dam's AS. Therefore, there are no anticipated damages or flooding downstream of either dam during the 100-year storm event.

The worst-case scenario for Alternative 1 is a Local PMP event, which would cause an overtop of the West Wash Dam and likely cause a breach. If the West Wash Dam were to breach, it is estimated that the breach would last approximately 36 minutes and reach a maximum depth of approximately 40 feet, which would occur immediately downstream of the dams. The flood flows would follow residential roads until it reached I-80, where most of it would be contained and stop at the low point near the N Virginia St. overpass. Existing storm drains within the freeway would then drain the water into the storm drain system. Some overflow from I-80 would flood Downtown, albeit at a much shallower depth, until the water reaches the railroad to the north of 2nd Street. Since the railroad is lower than the surrounding streets, the flood water would collect and pool there and not go any further south (Farr West Engineering, 2022). The total area flooded for a breach event caused by the Local PMP is approximately 271 acres. An inundation map for the Local PMP breach event for Alternative 1 can be found in Appendix C.

The BCA estimates no costs associated with damages for a 100-year storm event and \$192,527,004 of damages with a breach caused by a Local PMP event under The No Action Alternative. Under this alternative, no structures would be damaged in a 100-year event and 1,218 structures would be damaged and approximately 3,896 persons would be at risk in a breach event (Hansford Economic Consulting LLC, 2022).

7.1.3 Cumulative Impacts

The No Action Alternative would not contribute to changes created by past and present development in the project area. However, erosion of both dams, failure to meet dam safety requirements, and major flooding impacts during local PMP events would continue to occur, and therefore indirect major impacts could occur to cultural and historic resources, health and human safety, and water resources. The City has sustained an average annual population growth of 3.0% since 1950 and is expected to continue to increase at a similar rate (Hansford Economic Consulting LLC, 2022). The No Action Alternative would put more residents at risk as the population continues to grow.

Future flooding impacts would affect the turbidity and temperatures of the Truckee River for larger storm events, if storm flows reach the river in unexpected and unpredictable manners contributing to existing water quality issues within the watershed. This impact would contribute to past and current effects to water quality,

7.1.4 Environmental Risk Management (Risk and Uncertainty)

The strengths of The No Action Alternative in cost savings and disturbance avoidance come at the expense of a failure to plan for long-term resilience to flooding events for the City, impacts to flooding events for surrounding residents, and health and safety risks that would remain at these High Hazard Dams.

7.1.5 Mitigation

Mitigation actions would be required by the City in the case of a dam failure or flooding event, including clean up and repair. Mitigation actions would be required to minimize turbidity and water quality impacts if storm flows reach the river in unexpected and unpredictable manners.

7.1.6 Summary

This alternative does not meet the purpose and need for the project and would leave both High Hazard Dams out of compliance with current NRCS and NDWR standard. Therefore, The No Action Alternative is not reasonable and is an unacceptable solution. Analysis of The No Action Alternative would be carried forward only as a reference for impacts of the project, not as a viable project alternative.

7.2 ALTERNATIVE 3: REHABILITATE BOTH THE EAST WASH AND WEST WASH DAMS (PREFERRED ALTERNATIVE)

7.2.1 Environmental Effects

Environmental effects of Alternative 3 are focused on the project area, which includes the area of the existing dams, and area of indirect impacts, which includes possible downstream effects. Direct impacts are primarily related to ground disturbance and construction activities within the existing area of the dams and the residents directly adjacent and within 1,000 feet of the project area. Indirect effects include impacts of flooding due to storm events of differing recurrence intervals of varying intensity and duration. Impacts from a 100-year recurrence event would be limited to the direct area of the dams because the entire storm water event would be contained by the dams and the City storm water infrastructure. A PMP event, however, would see indirect downstream flooding impacts due to controlled AS activation.

Under Alternative 3, removal of vegetation, soil disturbance, and disturbance of existing drainage patterns would all occur in the existing area of the dams as part of the rehabilitation work. Total soil disturbance within the dam area for rehabilitation is 200,000 cubic yards. This work would also impact the existing City Storm drain inlets. Two (2) of the inlets are within the excavation area for Alternative 3.

During project construction there is potential inadvertent erosion and runoff impacts downstream. However, these temporary impacts are anticipated to have no considerable effect on land use and would be controlled by best management practices (BMPs) during construction. See Appendix E for a list of all BMPs for the project.

7.2.1.1 Soils & Geology

Geologic Resources and Erosion and Sedimentation

Approximately 421,683 cubic yards of soil disturbance, over approximately 11 acres, would be required for the construction of Alternative 3. This soil disturbance would be considered a moderate direct impact to ground disturbance. Direct impacts to ground disturbance are increased when compared to The No Action Alternative.

As part of the conceptual design, about 10,000 cubic yards may be borrowed from within the impoundment area, upstream of the auxiliary spillway. Based on the geotechnical report (DOWL, 2025), the borrow material is generally suitable that would be used for constructing the new dam embankment. Any material that cannot be incorporated into the dam embankment would be wasted on site within the project area.

Based on the geotechnical evaluation (DOWL, 2025), the design seismic event may lead to small deformations of the dam; however, these slope deformations would not impact geological resources nor cause additional erosion or sedimentation.

7.2.1.2 Water Resources

Surface and Groundwater Quality and Quantity

Under this alternative, the direct impacts to Water Resources would be the similar to the No Action Alternative, as the existing condition of a flood control structure with a low-level outlet would be perpetuated. Upstream and downstream surface water hydrology would not be affected. Groundwater may potentially be impacted by the proposed new foundation cutoff, which would restrict the flow of groundwater under the dam. Moderate temporary indirect impacts to surface water quality may occur during construction due to stormwater runoff. It is important to note that of the inventoried water resources, Highland Ditch, was found to be jurisdictional to USACE. Therefore, any surface water impacts to Highland Ditch would have the potential to require a Section 404 of the Clean Water Act Permit and Section 401 Water Quality Certification permit.

Regional Water Management Plan

Alternative 3 meets the goals of the RWMP and therefore no impacts would occur.

Floodplain Management

The direct and indirect impacts to floodplains would be the same as The No Action Alternative. There are no regulatory floodplains within the project area. Downstream impacts from flooding would occur under Alternative 3. However, when modeled, flooding events are not anticipated to impact identified flood zones. Figures of Inundation Maps are included in Appendix C.

7.2.1.3 Air Quality

Clean Air Act / National Ambient Air Quality Standards

The direct and indirect impacts to air quality would be increased when compared to The No Action Alternative. Moderate Direct impacts to air quality from soil disturbance and equipment emissions during the construction phase are anticipated. The total soil area that would be disturbed during construction would vary but is likely to be a substantial part of the rehabilitation area of the East Wash and West Wash Dams (approximately 421,683 cubic yards) (Farr West, 2022b).

Two types of emissions PM₁₀ and CO were reviewed. PM₁₀ emissions are associated with the dust created from demolition, land clearing, ground excavation, cut-and-fill operations, and road construction. Fugitive dust can also be produced by winds blowing through the construction site and by trucks carrying uncovered loads. Additionally, mud tracked out onto paved roads leading to and from the construction site creates a source of fugitive dust (i.e., road dust) after it dries. CO emissions are associated with fossil fuel powered engines including motor vehicles and construction equipment.

Emissions from trucks and construction equipment powered by heavy-duty diesel engines would be temporary and concentrated around the demolition and construction site. The project does not include any stationary emission sources.

Construction activities would result in short-term emissions of criteria pollutants from off-road, heavy-duty construction equipment (e.g., excavators, water trucks, tract bulldozers, and sheepsfoot compactors), haul trucks, construction worker commutes, and fugitive dust. Based on the attainment status of the project area, a general conformity emissions analysis was prepared for PM₁₀ and CO.

PM₁₀ Emissions:

PM₁₀ emissions were quantified using the EPA's 'AP-42: Compilation of Air Emissions Factors' and various excel models provided by the EPA. Based on general field measurements, the approximate dust emission factors for construction activity operations are:

$$E = 1.2 \text{ tons/acre/month}$$

This value is most useful for development estimates of overall emissions from construction scattered throughout a geographical area. The value is most applicable to construction operations with:

1. Medium activity level
2. Moderate silt contents, and
3. Semiarid climate

Test data were not sufficient to derive the specific dependence of dust emissions on correction parameters. Because the above emission factor is referenced to TSP, use of this factor to estimate greater than PM₁₀ emissions will result in conservatively high estimates. Also, because derivation of the factor assumes that

construction activity occurs 30 days per month, the above estimate is somewhat conservatively high for TSP as well (EPA, 1995).

The excel models provided by the EPA quantified emissions from storage piles, unpaved roads, and construction site travel. These models took into account construction equipment, number of trips, quantity and quality of soils, average weather conditions, and mitigation methods to calculate PM₁₀ emissions for the project.

CO Emissions:

CO emissions were quantified using the EPA's Motor Vehicle Emission Simulator (MOVES3) nonroad model for offroad equipment. MOVES3 is a state-of-the-science emission modeling system that estimates emissions for mobile sources at the national, county, and project level for criteria air pollutants, GHGs, and air toxics. The model used assumptions for the County, the project equipment, and duration of the project to quantify CO emissions. Table 18 (Appendix F) summarizes the construction emission analysis results and Table 19 (Appendix F) summarizes air quality impacts.

All actions proposed by the project are in conformity with the *de minimis* threshold for PM₁₀ and CO and therefore, meet General Conformity requirements of the Federal CAA (source EPA 1972).

7.2.1.4 Vegetation

Special Status Plant Species

The direct impacts to Special Status Plant Species within the project area are the same as The No Action Alternative.

A review of USFWS species within the project area was completed using the Information Planning and Consultation (IPaC) tool. One Special Status Plant Species, the Webber's Ivesia (*Ivesia webberi*). The project was determined to have **No Effect** on the species due to lack of habitat (DOWL, 2026).

Noxious Weeds and Invasive Species

The direct impacts to vegetation within the project area increase when compared to The No Action Alternative. Moderate direct impacts to noxious weeds are anticipated when vegetation within the dam area would be excavated (approximately 11 acres). Minor indirect impacts through accidental loss of vegetation may occur. The use of construction equipment and movement of soils has the potential to introduce invasive species or spread invasive species.

Natural Areas

The direct impacts to vegetation within the project area increase when compared to The No Action Alternative. Moderate direct impacts to natural areas are anticipated through the disturbance of the Inter-Mountain Basins Big Sagebrush Shrubland and the Great Basin Lowland Riparian vegetation communities. Minor indirect impacts through accidental Loss of Inter-Mountain Basins Big Sagebrush Shrubland and The Great Basin Lowland Riparian vegetation communities may occur.

Riparian Areas

Minor direct impacts to the riparian corridor are not anticipated but may occur. Excavation plans show riparian vegetation would be largely avoided as the regrading activities are focused on the west side of the West Wash impoundment area. Indirect impacts to the Highland Ditch and the surrounding wildlife habitat would occur during certain flood flows. As stated in Section 7.2.1.2, should impacts to Highland Ditch and surrounding vegetation occur, proper permitting would need to be completed in compliance with Sections 404 and 401 of the Clean Water Act.

7.2.1.5 Wildlife

Wildlife and Wildlife Habitat

Direct and indirect impacts to wildlife habitat would increase when compared to The No Action Alternative

Moderate direct impacts to wildlife habitat within the project area would occur. Most wildlife habitat exists within the Riparian Corridor and would be largely avoided, however, habitat for monarch butterflies exists throughout the project area and would be disturbed.

Moderate indirect impacts to the Highland Ditch and the surrounding wildlife habitat would occur during certain flood flows.

Special Status Animal Species

Table 20 (Appendix F) lists potential Sensitive Species within the project area. Direct impacts to special status animal species would be the same as The No Action Alternative. Indirect Impacts to special status animal species would be increased when compared to The No Action Alternative.

A review of USFWS species within the project area was completed using the IPaC tool. Five federally protected threatened, endangered, or proposed threatened animal species were identified within the project area. These species included the northwestern pond turtle (*Actinomyces marmorata*), cui-ui (*Chasmistes Cuijo*), Lahontan Cutthroat trout (*Oncorhynchus clarkii Henshaw*), Carson wandering skipper (*Pseudomonades eunus obscurus*), and the monarch butterfly (*Danaus plexippus*). These species were reviewed as part of the 2026 Biological Report addendum. The project was determined to have **No Effect** or **Not Likely to Jeopardize the Continued Existence** of these species due to lack of habitat and/or species range (DOWL, 2026).

Moderate Indirect impacts through loss of habitat for monarch butterflies may occur. Moderate indirect impacts through construction disturbance for all species in the project area may also occur. See Best Management Practices for the incorporated conservation measures and survey requirements for Special Status Species (Appendix E).

Migratory Birds, Bald Eagles, and Golden Eagles

Direct and indirect impacts to Migratory Birds would be the same as The No Action Alternative. Minor Direct impacts to Migratory Birds are not anticipated but may occur. Ground disturbance activities are limited to previously disturbed ground and existing roads and road shoulders. Minor indirect impacts may occur through noise disturbance.

Analysis of the migratory birds with potential to occur in the project area are grouped by focal habitats found in the project area as defined by the State's Bird Conservation Plan. This does not consider the small size of the project area or the heavily developed urban surroundings (EM Strategies, 2021). A migratory bird clearance survey would be required during migratory bird breeding season (April 1 through July 31), or prior to any activity that could affect a Migratory Bird nest. If ground disturbance must occur within this time, a migratory bird nesting clearance survey would be conducted within a 3-day period prior to the

disturbance followed by a 14-day period to complete the disturbance. If a nest is found, a species-appropriate no-disturbance buffer would be placed around the nest until the young have fledged, or until the nest fails.

7.2.1.6 Human

Socioeconomics

The Direct and indirect impacts related to socioeconomics would be the same as The No Action Alternative.

Cultural and Historic Resources

The direct and indirect impacts to cultural and historic resources increase when compared to The No Action Alternative. This alternative would have an adverse effect to Cultural and Historic resources. As previously discussed, NRCS, in consultation with SHPO, developed a MOA to mitigate the project adverse effects to historic properties, refer to Section 5.2.7.2 for details. Indirect impacts to unidentified cultural or historic resources could occur during project excavation. If unidentified resources are discovered, all work would stop and NRCS and cultural experts would be consulted before work resumes.

Public Health and Safety

Direct and indirect impacts to Public Health and Safety improve when compared to The No Action Alternative. Both Dams would be rehabilitated to meet federal, state and community design and safety standards for High Hazard Dams. Risk of flooding would remain for extreme flooding events at the local PMP event when a controlled release would occur through the AS. However, the dams would not breach during the Local PMP under Alternative 3. Risks to life and safety would be lessened due to anticipated activation of AS and less total inundation depths downstream.

Visual Resources and Scenic Beauty

Direct impacts to visual resources would be increased when compared to The No Action Alternative. Negligible aesthetic changes would occur within the area of the dams. The West Wash embankment would be raised approximately 5-feet, and a 2-foot-tall parapet wall would be built on the eastern berm near the dam. Regrading of the western slope of impoundment would be completed to allow the project area to store more water. The AS would be widened to 80', and the AS crest height would be lowered by 2.4-feet. The general feeling and character of the dams would remain.

Noise

The primary source of ambient noise is road traffic from residential areas. Direct impacts to noise would increase when compared to The No Action Alternative. Under this alternative, some short-term, minor, localized noise impacts associated with the proposed improvements would be anticipated. Construction noise impacts would likely occur during any earthwork phase. These noise impacts would be intermittent and cease once construction was completed. No indirect impacts to noise are anticipated.

7.2.2 Flooding Impacts

The stability of the embankment's upstream slope during the probable maximum flood (PMF) was analyzed to simulate an event where the structure is subject to sudden increase and decrease in water level. The PMF is expected to fill the pool to an elevation of 4,794.6 feet over approximately three hours. Following the flood, the pool elevation would draw down over approximately 42 hours. Based on the analysis, the embankment would remain stable as the water level rises and falls during the PMF. Furthermore, factors of safety increase as the pool rises due to the added support of the water on the embankment's upstream slope. The pool rise and drawdown occur too quickly for pore water pressure to develop in the embankment and therefore a decrease in effective stresses is not expected (DOWL, 2025)

7.2.3 Cumulative Impacts

Development which has occurred upstream and surrounding the dams has caused an increase in impermeable surfaces in the watershed. Maintaining existing development and infrastructure and allowing plans to process as developed would only be possible through this alternative.

While flooding impacts are still possible, Alternative 3 provides the most protection for residents and property in the City during a PMP event without considerable property acquisition and allows the City to manage unpredictable storm flows that would arise in the future.

In the event of a dam breach additional direct, minor impacts would occur downstream. However, Alternative 3 is designed so that the West Wash Dam would not breach during a PMP event. Impacts would be due to a controlled release of the spillways.

Temporal changes would contribute to cumulative impacts as residential and commercial development increase in the area overtime and could reduce permeable surfaces and increase reliance on storm drain infrastructure, thereby increasing the risks from flooding events and dam failure to a larger geographic area of the City than currently modeled.

Plans for development in the area and the City are planned to continue. The City and the Truckee Meadows region created development goals for long term planning which include protection of the natural environment and resources and mitigating the impacts of development on these resources (City of Reno, 2017) (Truckee Meadows Regional Planning Agency, 2019).

7.2.4 Environmental Risk Management

Strengths of Alternative 3 include the minimal impact to environmental resources within the project area, particularly when mitigation is incorporated to maximize avoidance of sensitive resources. In addition, this alternative provides the most protection of property and lives downstream of the dams without acquisitions and allows the City the potential to manage extreme events that would occur but are unpredictable due to climate change uncertainty. This alternative also provides additional flood protection for more severe storm events than other alternatives, provides storm flow capacity for potential additional development upstream and minimizes encroachment into the dam area by neighboring uses. The alternative provides opportunities to meet the project challenges including maintaining downstream flood protection and reducing risk of loss of life and damage to property, reducing the possibility of dam failure, and obtaining full compliance with NDWR and NRCS dam safety criteria. Alternative 3 meets the purpose and need for the project.

The primary weakness of this alternative is the associated cost of construction. Although capital costs, maintenance costs, and additional planning costs have been determined using a basis of cost estimate, inflation and other economic uncertainty can still affect the project cost in unanticipated ways. The Economic Appendix (Appendix D) has worked to account for future uncertainty and has identified this alternative as the NED plan.

7.2.5 Mitigation

Direct impacts of Alternative 3 would include: vegetation, wildlife, wetlands/riparian areas, air quality, and cultural resources. Mitigation actions for these impacts are summarized in Table 21 (Appendix F) and BMPs for these and other impacts of the project are summarized below.

7.2.1 Summary

Preferred Alternatives of Alternative 3 are anticipated to have no significant impact on the environment. Alternative 3 avoids potential impacts to the Truckee River that would occur under Alternative 5 and avoids destruction of cultural and historic resources that would occur with demolition of the dams. Alternative 3 minimizes environmental impacts and provides flood protection while avoiding the unreasonable costs and impacts of property acquisition and relocation. Risks to life and safety would be lessened due to anticipated

activation of AS and less total inundation depths downstream. Disadvantaged persons would not be as severely impacted under Alternative 3. Alternative 3 meets the stated purposes and needs of the project.

7.3 ALTERNATIVE 5: REMOVE BOTH THE EAST WASH AND WEST WASH DAMS WITH DOWNSTREAM FLOOD IMPROVEMENTS

7.3.1 Environmental Effects

Impacts were identified within the project area of The Preferred Alternative only. Alternative 5 is the only alternative that involves modeled flood flows impacting the Truckee River. Impacts to the Truckee River from storm flows would be temporary and delivered through a channel system. Storm flow impacts to the Truckee River would include increased turbidity, and changes to flows which would affect fish and aquatic resources, including the LCT.

7.3.1.1 Soils & Geology

Geologic Resources and Erosion and Sedimentation

Impacts on geological resources are unknown currently. Ground excavating would return the area to predevelopment contours, and a detailed study would be needed to confirm seismic and/or geologic impacts of dam removal and construction of a channelized flood conveyance structure. Direct and indirect impacts to Erosion and Sedimentation would increase when compared with No Action Alternative. Total soil disturbance within the project area is 421,683 yd³. Additional disturbance is required downstream to construct 18,245 linear feet of stormwater infrastructure to convey storm flows, including channels and culverts. The conveyance structures would be constructed on current residential properties and would require the acquisition and demolition of 160 residential homes and properties.

7.3.1.2 Land Use

Direct and indirect impacts to Land Use would increase when compared with The No Action Alternative. Major Direct impacts to land use would occur where downstream properties are purchased, and residents are relocated to design and construct a flood channel. Acquisition of properties, displacement, and relocation of residents of 160 homes and residential structures is required under this alternative. Zoning changes would be necessary and property values and/or flood insurance rates would change.

7.3.1.3 Water Resources

Surface and Groundwater Quality and Quantity

Direct and indirect impacts to water resources would increase when compared to The No Action Alternative. Under Alternative 5, Moderate direct impacts to water quality in the Truckee River would occur during storm events due to increased turbidity and other contaminants. Modeling shows Storm flows draining directly into the river.

Regional Water Management Plan

Alternative 5 meets the goals of the RWMP and therefore no impacts would occur.

Floodplain Management

Direct impacts to Floodplains would increase when compared to The No Action Alternative. Flood zones north of, and including, the Truckee River would be impacted by storm flows draining to the Truckee River. Moderate direct impacts to existing flood zones downstream of downtown would also occur under Alternative 5. Changes to existing FEMA mapping would likely be required. A special flood way or other regulatory changes under FEMA are anticipated. When modeled, the flooding does not impact identified existing flood zones outside of the Truckee River (City of Reno, 2017).

7.3.1.4 Air Quality

Clean Air Act / National Ambient Air Quality Standards

Direct and indirect impacts for air quality would increase when compared to The No Action Alternative. Construction activities for dam removal and downstream flood improvements would temporarily emit several air pollutants, therefore moderate direct impacts to NAAQS are anticipated. PM₁₀ emissions are associated with the dust created from demolition, land clearing, ground excavation, cut-and-fill operations, and road construction. Fugitive dust can also be produced by winds blowing through the construction site and by trucks carrying uncovered loads. Additionally, mud tracked out onto paved roads leading to and from the construction site creates a source of fugitive dust (i.e., road dust) after it dries. CO emissions are associated with fossil fuel powered engines including motor vehicles and construction equipment.

Emissions from trucks and construction equipment powered by heavy-duty diesel engines would be temporary and concentrated around the demolition and construction site. A full air quality analysis for PM₁₀ and CO was not completed for this alternative because it was eliminated from further detailed consideration. If this alternative were to be selected, an air quality analysis would be completed. Table 22 (Appendix F) summarizes air quality impacts associated with this alternative.

7.3.1.5 Vegetation

Special Status Plant Species

The direct impacts to Special Status Plant Species within the project area are the same as The No Action Alternative.

A review of USFWS species within the project area was completed using the IPaC tool. One Special Status Plant Species, the Webber's Ivesia (*Ivesia webberi*) was identified as potentially occurring within the project area. However, due to the species preferred range and lack of known habitat within the project area, it is unlikely that this alternative would have direct or indirect impacts to the Webber's Ivesia.

Noxious Weeds and Invasive Species

The direct impacts to vegetation within the project area would increase when compared to The No Action Alternative. Major direct impacts to vegetation when all vegetation within the dam area would be excavated would occur. Disturbed areas could increase colonization of invasive species. Minor Indirect impacts through accidental loss of vegetation would occur. The use of construction equipment and movement of soils has the potential to introduce invasive species or spread invasive species.

Natural Areas

The direct impacts to vegetation within the project area would increase when compared to The No Action Alternative. Moderate direct impacts include removal of vegetation identified within the dam area (80.87 acre-feet). The Inter-Mountain Basins Big Sagebrush Shrubland and The Great Basin Lowland Riparian vegetation communities including wetland vegetation would be disturbed.

Downstream impacts to vegetation for flood channel construction are unknown and would require additional detailed studies.

Riparian Areas

The direct impacts to vegetation within the project area are the same as The No Action Alternative. The riparian corridors identified would be largely undisturbed during removal of the dam structures. Indirect impacts to the Highland Ditch and surrounding wildlife habitat would occur during flood flows with removal of the dams.

7.3.1.6 Wildlife

Wildlife and Wildlife Habitat

The direct and indirect impacts to wildlife and wildlife habitat within the project area would increase when compared to The No Action Alternative. Moderate direct impacts of Alternative 5 excavation to remove the dams includes disturbance of wildlife habitat. Most wildlife habitat exists within the Riparian Corridor and would be largely avoided, however, habitat for Monarch Butterflies exists throughout the project area and would be disturbed.

Minor indirect impacts include unidentified wildlife disturbance and loss of wildlife habitat. Decrease in wildlife and biodiversity would occur.

Downstream impacts to wildlife for flood channel construction are unknown and would require additional detailed studies.

Special Status Animal Species

The direct and indirect impacts to Special Status Animal Species would increase when compared to The No Action Alternative. Under Alternative 5, storm floodwater would empty directly into the Truckee River. These changes in flows and turbidity could impact fish and aquatic life in the Truckee River including LCT, which is an endangered species. LCT are also threatened by altered watersheds that would have increased turbidity and high flows, which reduce the spawning habitat quality. Warmer water temperatures and drought can affect the survival rate of young LCT (USFWS, 1995).

Migratory Birds, Bald Eagles, and Golden Eagles

The direct and indirect impacts to Migratory Birds would increase when compared to The No Action Alternative. The non-jurisdictional wetland adjacent to Highland Ditch possesses mature willows, cottonwood trees, and tree of heaven. These willows and trees provide potential nesting habitat for migratory birds. Additional nesting habitat is present in the form of powerlines and other tall artificial structures within the project area. These would be disturbed under this alternative.

7.3.1.7 Human

Socioeconomics

The Direct impacts related to socioeconomics would increase when compared to The No Action Alternative. Moderate indirect impacts to job security would occur due to creation of the downstream flood improvements. There is an estimated loss of approximately 170 jobs.

Cultural and Historic Resources

Direct and indirect impacts would be increased compared to The No Action Alternative. This alternative would have an adverse effect to Cultural and Historic resources. Indirect impacts to unidentified cultural or historic resources could occur during project excavation. If unidentified resources are discovered, all work would stop and NRCS and cultural experts would be consulted before work resumes. Complete studies for cultural and historic resources potentially impacted by Alternative 5 were not completed. However, it is anticipated that additional downstream resources would be impacted by the new stormwater conveyance structures to the Truckee River.

Public Health and Safety

The direct and indirect impacts to Public Health and Safety would increase when compared to The No Action Alternative. Because there would be no dams under this alternative, the safety standard that would be met is the community safety standard of the 100-year storm flood protections and requirements. A channel system would be constructed to convey the entire 100-year storm flows from the former East Wash and West Wash Dam areas directly to the Truckee River at Riverside Drive in Downtown.

Stormwater flows from the channel would contribute to flooding risks in the Downtown area depending on the flows in the Truckee River at the time of peak discharge. Impacts in Downtown could include damage to the flood walls through Downtown, and the surrounding businesses and infrastructure, impacts to the kayak park and other recreational amenities. The flood walls are USACE structures and impacts to those structures would require additional USACE consultation.

Visual Resources and Scenic Beauty

Direct and indirect impacts to Visual Resource would increase when compared to The No Action Alternative. Major Aesthetic changes to the dam areas would occur to restore them to natural contours. Changes to the neighborhoods would occur due to demolition of homes and construction of an open, channelized flood flow system.

Noise

Direct impacts to noise would increase when compared to The No Action Alternative. Minor Direct impacts include temporary construction noise during the excavation and removal of the dams. These noise impacts would be intermittent and cease once construction was completed. No indirect impacts to noise are expected. Minor Indirect impacts through a reduction in traffic noise from the downstream flood improvements would occur.

7.3.2 Flooding Impacts

A PMP event is only taken into consideration when a dam is impounding water, to ensure that the dams would either pass or contain the PMP and limit flooding potential caused by a breach downstream of the dams. When there are no dams along a drainage, the applicable design criteria changes, as dictated by local storm water ordinances. For this reason, flood damages were only considered up to the 100-year event in the BCA for Alternative 5. Table 23 (Appendix F) summarizes peak flows and volumes associated with this alternative.

Under Alternative 5, runoff from a 100-year storm would flow through the previous impoundment areas for the removed East Wash and West Wash dams and into concrete channels that would route the flow through residential neighborhoods, under I-80 and the railroad, and through Downtown to the Truckee River. Flow would enter two (2) separate channels and the location of the removed East Wash and West Wash Dams, which would join to become one (1) channel at the intersection of Keystone Ave. and Kings Row. The channel would be designed to fully contain storms up to and including the 100-year storm, so there is no anticipated flooding under this alternative for the evaluated storm events. Anticipated peak flows and total runoff volumes that would reach the Truckee River for the East Wash Channel, the West Wash Channel, and Combined Channel are listed in the detailed alternatives analysis, found in Appendix E. It is estimated that a 100-year storm event would cause runoff to flow through the concrete channels for approximately 7 hours (Farr West Engineering, 2022).

The BCA had no costs associated with damage and no structure damage under Alternative 5. (Hansford Economic Consulting LLC, 2022). The Local PMP was not evaluated under the BCA for Alternative 5 since there are no dams in place under this alternative.

7.3.3 Cumulative Impacts

Plans for development in the area and around the City would continue. The City and the Truckee Meadows region created development goals for long-term planning which include protection of the natural environment and mitigating the impacts of development on these resources (City of Reno, 2017) (Truckee Meadows Regional Planning Agency, 2019). Alternative 5 would have direct and minor impacts to water resources because it conflicts with the existing City's Master Plan regarding sustainable development due to channelization of drainage (City of Reno, 2017). The City has sustained an average annual population

growth of 3.0% since 1950 and is expected to continue to increase at a similar rate (Hansford Economic Consulting LLC, 2022). This alternative would not accommodate for this growth.

Changes to non-jurisdictional wetlands and wildlife habitat within the existing dam areas would occur causing direct major impacts. Large storm flows into the Truckee River could impact Truckee River wildlife as well as increase the risk of flooding related hazards in Downtown. Channelization is designed to contain the 100-year storm event flows and is not designed to allow for excess storm flow. Therefore, the City would not be equipped to manage unpredictable storm flows that would occur due to climate change. Changes to the visual and aesthetic nature of the area would occur by removing residences and a naturally contoured drainage and installing channelized drainage, which is also counter to the policies of the City's Master Plan (City of Reno, 2017).

Additional aquatic, biological, and cultural resource studies would be necessary in areas impacted by the new stormwater infrastructure. Any resources identified could be impacted by the proposed construction under Alternative 5.

7.3.4 Environmental Risk Management

The strengths of this alternative include the elimination of dam maintenance and risk of dam failure. Under this alternative the dams are removed, and no dam breach or spillway activation would occur, and those flood impacts are removed. However, the risk of flooding is contained only up to a 100-year exceedance storm event. A larger event, such as 500-year or PMP event would not be contained by the flood channels. Alternative 5 has high costs and a long timeframe to acquire land, move residents, and construct a storm conveyance channel. The channelized drainage would cause adverse impacts to the Truckee River due to increased flows during storm events which could in turn impact endangered and sensitive species and downstream development.

7.3.5 Mitigation

Direct impacts of Alternative 5 would include: geology, land use, water resources, air quality, vegetation, and wildlife impacts. Mitigation actions for these impacts are summarized in Table 24 (Appendix F) and BMPs for these and other impacts of the project are summarized below.

7.3.6 Summary

Alternative 5 conflicts with the City's existing Master Plan regarding sustainable development due to channelization of drainage (City of Reno, 2017). Large storm flows into the Truckee River could impact threatened and endangered wildlife including the LCT as well as increase the risk of flooding related hazards in Downtown Reno. Under this alternative, the City would not be equipped to manage unpredictable storm flows that would occur in the future due to storm events larger than the 100-year storm, or due to climate change. This alternative was not found to be the NED Plan through the BCA, nor was it found to be the selected alternative through the decision matrix tool. This alternative includes displacing hundreds of residents while, in the meantime, residents and businesses would remain at risk during extreme flooding events above the 100-year storm event. For these reasons, this alternative is not The Preferred Alternative.

8.0 CONSULTATION, COORDINATION, AND PUBLIC PARTICIPATION

Concerned parties including federal agencies, stakeholders, American Indian Tribal groups, County groups and elected officials were invited to participate in the West and East Wash Dam Watershed Project scoping process and public meetings concerning the project.

The NRCS has made a good faith effort to seek and consider the views of the public in a manner that reflects the nature and complexity of the undertaking and its effect on historic properties, the likely interest of the public or other entities in the effects on historic properties, and the confidentiality concerns of private individuals.

Draft Plan-EA Public Comment

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

Final Plan-EA Public Comment

When this Final Plan-EA and FONSI are issued, a Notice of Availability would be published locally to notify the public of the finding and copies made available on the project website.

8.1 PUBLIC PARTICIPATION

Public participation is an integral part of planning and decision making which provides opportunities for the public to be involved in the project. Individuals, permanent or ad hoc groups, and officials at all levels of government who have an interest in, or would be affected by, the West Wash Dam Rehabilitation Project are invited to participate. Residents within 1,000 ft of the project area would be mailed notices and invited to participate by direct mail. Residential and business located within the potential inundation areas, Community groups and stakeholders are invited to participate.

The Public Participation Plan dated January 2021 (Farr West Engineering, 2021) was prepared to provide effective procedures that define outreach to the public, stakeholders, affected landowners, 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. The Public Participation Scoping Summary Report Dated May 2022 (see Appendix A) outlined the scoping efforts and comments received from the agencies and public during the scoping process.

A Public Progress Meeting (Public Meeting No. 2) was held on January 31, 2023, to provide an update on the planning effort and issues considered during the development of the Plan-EA. The meeting was hybrid and participants could attend either virtually or in-person. Although verbal comments were received and addressed, this was not an official public comment meeting, and the comments are not included in the Plan-EA.

A detailed alternatives public meeting would be held following this Plan-EA and following drafts would incorporate public comments.

The USDA-NRCS and the City welcomes public input at any time during the NEPA planning process, the next official public comment period would begin when the Draft PLAN-EA is published. The Draft Plan-EA is expected to be published in 2026. At that time, the Draft PLAN-EA would be released for a 30-day public review period. The Draft PLAN-EA would be available on the project website and from the City. It would also be distributed to elected officials, regulatory agencies, and members of the public and notice would be published through the Nevada State Clearinghouse. One (1) public meeting would be held during the next public review period.

This Draft Plan-EA would be published, and the public would be invited to comment when available. This Section would be updated in later drafts of this EA.

8.2 AGENCY CONSULTATION

Officials of local, regional, State, and Federal Government entities are invited to fully participate. People who have governmental decision making, planning, or administrative responsibilities that relate to the NRCS-assisted activity under consideration. Specific entities would include but are not limited to:

- The County Representatives
- The City Representatives
- Local representatives

Local, regional, State, and Federal Government Agencies are invited to participate. For a full listing of agencies consulted, see the Public Participation Summary Report in Appendix A. Listed in Table 25 (Appendix F) are agencies that accepted NRCS invitation to be cooperating or participating agencies in this planning effort.

Agency Plan-EA Reviews

Prior to the Draft Plan-EA issuance to the public, the EPA and NDWR and NDEP would be provided copies of the preliminary report for review. Notice of the Draft EA would be provided to all agencies consulted in the scoping process, or who have expressed interest. Notice of the Plan-EA would be published in the Nevada State Clearinghouse. Any report comments or concerns provided by the agencies were addressed and/or corrected prior to issuance of the Draft Plan-EA to the public.

8.3 TRIBES

USDA-NRCS, as the lead Federal Agency for the project, has a non-delegable duty to consult with Tribes that would be interested or affected by The Preferred Alternative. See Section 9.5 for a list of Tribes consulted by USDA-NRCS. Consultation letters are included in Appendix A.

9.0 PREFERRED ALTERNATIVE

Both the City and the NRCS have identified Alternative 3 as The Preferred Alternative. However, this alternative exceeds the current NRCS authorization for funding this project and a request to modify or amend the agreement would be necessary.

9.1 SELECTION AND RATIONALE FOR THE PREFERRED ALTERNATIVE

The NED Alternative is the alternative or combination of alternatives that reasonably maximizes the net economic benefit of the project consistent with protecting the nation's environment. According to the NWPM Sections 502.2 and 505.35.B(1)(iv), when human life is potentially at risk, the NED alternative is defined as the federally assisted alternative with the greatest net economic benefits. Under the Economic analysis, Alternative 3 is the NED Plan. Alternative 3 would not have a significant impact on the environment.

The City evaluated the detailed alternatives using a decision matrix for non-monetary factors. Through project discussions and the results of the decision matrix the City's Preferred Alternative is identified as Alternative 3. Copies of the decision matrix criteria, sub-criteria and rankings are included in Appendix E.

9.2 MEASURES TO BE INSTALLED

The East Wash dam requires armoring of the AS to prevent future excessive damage. Armoring would include pre-cast blocks, mats, or the like covered with a thin layer of top-soil and seeded. Actual armoring would be hidden from view but more durable.

The West Wash Dam embankment would be raised five (5) feet to a new elevation of 4798 feet, the AS widened to the original design width of 80 feet and lowered to a crest elevation of 4782.5 feet, the impoundment area to the west of the existing flow line would be regraded to allow for more water storage, and a 2-foot-tall parapet wall would be built on the east corner of the West Wash dam. The parapet wall is intended to provide 3 feet of freeboard and meet the NDWR requirements under NAC 535.240. The final height of the wall would be determined during final design. Re-grading the impoundment area of the West Wash Dam would consist of steepening the western slope to a 2:1 slope and the total cut and fill associated with the grading would be approximately 421,683 yd³ and 28,588 yd³, respectively.

With these proposed changes, the West Wash Dam AS would not be activated until the 500-year storm event (currently it activates during a 200-year storm event). The improvements to the West Wash Dam would supply three (3) feet of freeboard during the Local PMP event, and the dams would no longer overtop or be in jeopardy of breaching.

Other minor improvements under this alternative include:

- Stripping of vegetation, debris, and weathered fill from crest and downstream face of the West Wash Dam,
- Stripping of vegetation, debris, and weathered fill from crest and both faces of the East Wash Dam's AS,
- Cleaning out Principal Spillway and sediment drain conduits,
- Replacement of sediment drain trash rack,
- Corrosion resistant coating of sediment drain riser (and potentially interior of conduit to outfall in Principal Spillway riser),
- Repair of principal spillway riser concrete spalls and damage (both the East Wash and West Wash Dams),
- Daylighting of the West Wash Dam Principal Spillway downstream invert,
- Excavation along Principal Spillway conduit for installation of seep intercept system,
- Backfill for repair of right spillway guide "wall" at crossing of Gulling Dr.

This alternative exceeds the current NRCS authorization for funding this project. A request to modify or amend the agreement would be necessary.

9.3 MINIMIZATION, AVOIDANCE AND MITIGATION MEASURES

9.3.1 Summary of Mitigation

Some mitigation or avoidance measures would be necessary to avoid potential adverse environmental impacts within the project area. Mitigation measures to ensure a FONSI for The Preferred Alternative are listed in Table 26 (Appendix F).

9.4 PERMITS AND COMPLIANCE

The permits required for the project are summarized in Table 27 (Appendix F).

Should the project determine that impacts to the USACE jurisdictional water, Highland Ditch, are unavoidable permitting under both Section 404 and Section 401 of the CWA would be required. Such permitting would need to be completed and approved by applicable federal and state agencies prior to project construction in Highland Ditch.

9.5 AGENCY, TRIBAL, AND PUBLIC OUTREACH

Agency Consultation

Federal, state, and local agency representatives and non-governmental organizations were invited to become cooperating agencies on the project and participate in the planning process for the Plan-EA. For a list of cooperating and participating agencies, see the Public Participation Summary Report in Appendix A.

Consultation with USFWS was not required for the project.

Consultation with SHPO is required for compliance with Section 106 of the National Historic Preservation Act (1966) (NHPA) and has been ongoing throughout the life of the project. Below is a timeline of consultation with SHPO:

- February 24, 2021 - Meeting between NRCS, the City, and SHPO was held to discuss the project and identify the direct and indirect APE.
- January 12, 2022 – A description of cultural resource NRHP recommendations was sent to SHPO from Broadbent. Broadbent recommended a finding of No Adverse Effect for NRHP eligibility.
- March 25, 2022 - SHPO that concurred with all determinations for finding of No Adverse Effect for NRHP Eligibility.
- October 6, 2022 – A Final Alternatives letter was sent to SHPO with the proposal of Finding of No Adverse Effects for Cultural and Historic Resources
- November 4, 2022 –SHPO cannot concur with the Finding of No Adverse Effect for Cultural and Historic Resources
- November 30, 2022 – NRCS and SHPO met to discuss Finding of Adverse effect and proposed mitigation measures.
- December 2, 2022 - NRCS restated their finding and recommended a Finding of Adverse Effects for Cultural and Historic Resources
- February 2, 2023 – SHPO concurs with the Finding of Adverse Effects for Cultural and Historic Resources

As part of the adverse effect consultation process, the Advisory Council on Historic Preservation (ACHP) and the tribes were invited to be involved with the development of the MOA resolving adverse effects. The ACHP declined involvement, and no response was received from the tribes. The MOA outlines the mitigation measures the NRCS shall follow for the project. See Appendix A for the final MOA.

Tribal Consultation

Tribal consultation was conducted in accordance with the NHPA and Executive Order 13175 to maintain a relationship between NRCS and native tribes and to ensure local tribal populations were notified of the scoping process. Per EPA's Policy on Consultation and Coordination with Indian Tribes, a four-phase consultation process was followed including identification, notification, input, and follow-up (U.S. Environmental Protection Agency, 2021).

NRCS sent a letter to the THPOs requesting Tribe delegate input and to make local tribal communities aware of the planning process. The following Tribes were consulted for the project (no responses were received):

- Reno-Sparks Indian Colony
- Fallon Paiute
- Pyramid Lake Paiute Tribe
- Summit Lake Paiute Tribe
- Washoe Tribe of Nevada and California

Additionally, these five American Indian Tribes were asked for comments on the proposed APE and the cultural resource inventory report that was completed for the project and any concerns that they might have with the proposed project. On November 15, 2022, the Pyramid Lake Paiute Tribal Historic Preservation Officer responded that they had no concerns but reminded the NRCS that the Tribe considers the Peavine Mountains to be a Traditional Cultural Place (TCP). No other tribes responded with comments. Additionally, on January 16, 2024, the same five tribes were asked in separate letters to the tribal chairs for any other comments concerning the project with no responses. One response was received from Pyramid Lake Paiute Tribe stating that they had no concerns. No response was received from the other Tribes.

Other Concerned Parties Consulted

The cultural resource report was also sent to the Reno Historical Commission, and they were asked for comments on the cultural resource report that was completed for the project along with any concerns that they might have with the proposed project. On January 12, 2023, the Reno Historical Commission stated they had no concerns but would like to know if there would be adverse effects and what the mitigation plan would look like. A letter was provided by the Reno Historical Commission on January 16, 2024, stating that the NRCS had determined there would be adverse effects to historic properties and what the mitigation plan would entail. No response was received from the Reno Historical Commission. The NRCS signed a MOA with the SHPO office to mitigate adverse effects from the proposed project to the West Wash Dam. The Advisory Council has been notified by the NRCS of the determination of adverse effects to historic properties from the project and has responded to the NRCS with a letter stating that they are declining participation in the project consultation process. The MOA was executed on February 6, 2024, and a copy was submitted to the Advisory Council

9.6 COSTS AND COST SHARING

Refer to Table 28 (Appendix F) for a summary of project costs. Refer to Table 29 for a summary of cost sharing for the East Wash and West Wash Rehabilitation.

9.7 INSTALLATION AND FINANCING

Construction activities for Alternative 3 would occur over two (2) years. The NRCS would provide 65% of the total construction rehabilitation cost for The Preferred Alternative with funding from the Watershed Rehabilitation Program. The sponsor is responsible for providing the remaining non-federally funded 35% of the rehabilitation cost of the project. NRCS would provide 100% design engineering, and both NRCS and the City would bear project administration costs that each incurs for the project.

Funding for O&M of the dams after construction would be derived from normal revenues of the City. This O&M cost would be budgeted annually so that the dams are kept in good condition and meet current NRCS and NDWR Dam Safety regulations. Refer to Table 30 (Appendix F) for estimated installation costs.

9.8 OPERATION AND MAINTENANCE

Operation of the dams includes the administration, management, and performance of non-maintenance actions needed to keep the dam structures safe and functioning as designed. Maintenance includes performing work, measuring the recording instrumentation data, preventing deterioration of structures, and repairing damage or replacing the structure as needed to prevent failure. Damages to completed structures caused by normal deterioration, droughts, flooding, or vandalism are considered maintenance. The City would continue to be responsible for the operation, maintenance, rehabilitation, and future modifications to the dams, and the estimated annual O&M cost is \$20,000.

9.9 ECONOMIC TABLES

Alternative 3 has the greatest net benefit apart from the no action alternative. While the no action alternative has the greatest net economic benefits, it continues to put downstream residents at risk and is therefore only used as a basis for comparison. Under Alternative 3, all existing properties are protected as they are currently in the 100-year flood event, and better in the 200-year, 500-year, and Local PMP events. Furthermore, in a local PMP event, Alternative 3 would allow a controlled release through the AS instead of overtopping the dams with a potential breach, resulting in less property damage compared to the No Action Alternative. Additionally, both East and Wash dams would be in compliance with NDWR high hazard dam safety requirements. OSE and RED accounts further decrease the net benefits of Alternatives 5 and reaffirms that Alternative 3 is the most appropriate project alternative (Hansford Economic Consulting LLC, 2022). See the Economic Appendix in Appendix D for a detailed discussion of the analysis and NED.

Under Alternative 3 the benefits are maximized in the local PMP flood event. There is a positive benefit-cost ratio of 0.11 to 1 for the Local PMP event, meaning there is a eleven-cent (11) return for every dollar spent on the project. This result is typical for dam rehabilitation projects because there is not any cost associated with the No Action Alternative and the project is being driven by dam safety that impacts threat to human lives. The economic tables (Table 31 through 34) are provided in Appendix F.

9.10 STRUCTURAL TABLE

The Structural Data table (Table 35, (Appendix F)) shows important physical characteristics for the East Wash and West Wash Dams after The Preferred Alternative has been constructed.

10.0 REFERENCES

- 40 CFR 93.153(b)(2). (n.d.). *US Code of Federal Regulations*.
- AMEC Environment and Infrastructure, Inc. (2012). *City of Reno - East Wash Flood Diversion Dam Permit Compliance Report*.
- Autodesk. (2021, September 8). AutoCAD Civil 3D 2020.6 Update.
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11.0 LIST OF PREPARERS

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Mark Martini	Project Engineer/Watershed Coordinator	B.S. Civil Engineering	13
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Dennis “Adam” Porath	Geologist	M.S. Geology	16
City of Reno			
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Emily Paris	Environmental Specialist	B.S. Environmental Science	2
Jessica Dugan	Regulatory & Environmental Specialist	M.S., Geography; J.D.	10
Kasey Jones, P.E.	Senior Geotechnical Engineer	PhD, Geotechnology, M.S., Civil Engineering B.S., Civil Engineering	19
Wood Rodgers			
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EM Strategies			
Kris Kuyper	Biology Program Manager	M.S. Resources Management B.S. Wildlife Biology	19
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Hansford Economic Consulting, LLC			
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Distribution list

A list of the agencies, organizations, and persons to whom notice of the Plan-EA was sent is included in Appendix A.

Certifying Statement

The Responsible Official certifies that this EA:

- Demonstrates the agency has thoroughly considered the factors mandated by NEPA;
- Represents the agency's good-faith effort to prioritize documentation of the substantive issues and most important considerations required by NEPA within the congressionally mandated page limits;
- Reflects the agency's expert judgment;
- Addressed briefly, or left unaddressed, any issues or considerations that were, in the agency's judgement, comparatively not of a substantive nature;
- Represents the agency's good-faith effort to fulfill NEPA's requirements within the Congressional timeline (or within the minimally extended timeline) and this effort is substantially complete; and
- Contains analysis that is adequate to inform and reasonably explain the responsible official's final decision regarding the proposed action or selected alternative.

12.0 INDEX

ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
AQMD	Air Quality Management Division
AS	Auxiliary Spillway
BCA	Benefit-Cost Analysis
BMPs	Best Management Practices
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH ₄	Methane
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalents
CRI	Cultural Resource Inventory
Downstream Area	Areas with potential to be impacted by flooding events
EAP	Emergency Action Plan
EI	Emissions Inventory
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Mapping
FOS	Factor of Safety
FPPA	Farmland Protection Policy Act
Ft ³	Cubic Feet
FWE	Farr West Engineering
GHG	greenhouse gas
HFC	Hydrofluorocarbons
HH&S	Hydrology, Hydraulics, and Sediment Analysis
IPaC	Information for Planning and Consultation
I-80	Interstate 80
LCT	Lahontan Cutthroat Trout
MBTA	Migratory Bird Treaty Act
MOA	Memoranda of Agreement
MOVES3	Motor Vehicle Emission Simulator
MT	Metric Tons
NAAQS	National Ambient Air Quality Standards
NAC	Nevada Administrative Code
NAISMA	North American Species Management Association
NDA	Nevada Department of Agriculture
NDOW	Nevada Department of Wildlife
NDWR	Nevada Division of Water Resources
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NNWPC	Northern Nevada Water Planning Commission
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWPM	National Watershed Program Manual

O&M	Operations and Maintenance
PFC	Perfluorocarbons
Plan-EA	Supplemental Watershed Plan-Environmental Assessment
PL	Public Law
PM	Particulate Matter
PMP	Probable Maximum Precipitation
ROW	Right-of-Way
RWMP	Regional Water Management Plan
SF ₆	Sulfur Hexafluoride
SHPO	State Historic Preservation Office
SNYLF	Sierra Nevada Yellow-Legged Frog
SOC	Species of Conservation Priority
SWPCC	Stormwater Pollution Coordination Committee
SWPPP	Stormwater Pollution Prevention Plan
SWReGAP	Southwest Regional Gap Analysis Project
The City	The City of Reno
The County	Washoe County
The State	The State of Nevada
The Watershed	Peavine Creek-Truckee River Watershed
THPO	Tribal Historic Preservation Office
TM	Technical Memoranda
TMDL	Total Maximum Daily Load
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAP	Wildlife Action Plan
WRWC	Western Regional Water Commission

Appendix A: Consultation, Comments, and Responses

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- Economic Report

Appendix E: Other Supporting Information

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 - Tech Memo 2
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