



United States
Department of
Agriculture



Supplemental Watershed Plan No. 2 and Environmental Assessment

for

The Rehabilitation of Floodwater Retarding
Structure No. 12

Little Wewoka-Graves Creek Watershed

Hughes County, Oklahoma



FINAL PLAN

July 2025

Oklahoma
Natural
Resources
Conservation
Service



nrcs.usda.gov

Prepared by

USDA Natural Resources Conservation Service

IN COOPERATION WITH

Hughes County Conservation District

Finding of No Significant Impact

for

Rehabilitation of Floodwater Retarding Structure No. 12 of the Little Wewoka Creek Watershed Hughes County, Oklahoma

I. AGENCY ROLE AND RESPONSIBILITY – United States Department of Agriculture (USDA) – Natural Resources Conservation Service (NRCS).

In accordance with the NRCS regulations (7 CFR Part 650) implementing the National Environmental Policy Act (NEPA), NRCS has completed an Environmental Assessment (EA) of the following proposed action:

Dam rehabilitation of Floodwater Retarding Structure (FWRS) Little Wewoka Creek No. 12 in Hughes County, Oklahoma.

II. NRCS DECISION TO BE MADE

To determine if the preferred alternative (Alternative 3 – New Auxiliary Spillway) will or will not be a major Federal Action significantly affecting the quality of the human environment. The EA accompanying this finding has provided the analysis needed to assess the significance of the potential impacts from the selected alternative.

III. PURPOSE AND NEED FOR ACTION

The project purpose is to reduce the risk of loss of life due to catastrophic dam failure; maintain the level of flood protection for property upstream and downstream of the dam up to 100-year, 24-hour storm event that is currently provided by the dam's ability to attenuate flood and reduce flooding by bringing the dam into compliance with current NRCS and Oklahoma safety performance standards to extend the service life of the dam another 100 years through the proposed action.

FWRS No. 12 was constructed as a low-hazard dam for the purpose of flood control. It has since been re-classified as a high-hazard (class C) dam. However, the vegetated earthen spillway and dam embankment do not meet NRCS or Oklahoma Water Resources Board (OWRB) dam safety program standards for a Class C high-hazard dam. The proposed action is needed to address public health and safety concerns that FWRS No. 12 does not meet NRCS or State of Oklahoma dam safety criteria because of downstream development within the breach inundation area. No immediate need for action associated with flood protection was identified beyond rehabilitation of the structure to high-hazard potential standards.

IV. ALTERNATIVES CONSIDERED IN THE EA

Four alternatives were analyzed in the EA and are characterized as follows:

Alternative 1 – No Action: Under the No Action Alternative, the dam would remain in the existing unsafe condition with no action to improve the dam from its original design or to correct safety deficiencies beyond maintenance or replacements performed in accordance with its

operation and maintenance plan. The dam is assumed to eventually fail and not be subsequently rebuilt or rehabilitated.

Alternative 2 – Decommissioning: Decommissioning is a mandatory alternative that must be considered under the NRCS policy for dam rehabilitation. Decommissioning FWRS Little Wewoka No. 12 would require removing the flood detention capacity of the dam by cutting a 100-foot-wide trapezoidal notch in the existing embankment down to the valley floor. This alternative would eliminate all storage capacity and reconnect and stabilize the historic stream channel and floodplain alignment. All principal and auxiliary spillway components would be removed, and the historic channel would be restored and connected to the existing downstream channel. There is one habitable structure and four roads within the 100-year floodplain. If the dam was removed, five locations identified in the hydrologic and static breach zones would be at risk from flooding during the 100-year storm. Water surface elevations would increase approximately 3 feet near West 130 Road and would also increase water surface elevations downstream. The downstream bridges and roads would have to be protected. Mitigation of induced damages to the buildings includes relocation or floodproofing the impacted structures, home buyouts, or purchasing easements.

Notching the dam embankment would require the removal of about 12,000 cubic yards of material, which equates to about 30 percent of the embankment. Removal of the principal spillway, bridge, concrete chute, and water supply/lake drain structures would also be necessary. The submerged sediment would be stabilized or removed. The function and stability of the stream channel would be restored. About 4 acres of grass would be planted over the dam site. Stabilizing the reservoir footprint once the dam was breached would require hydro-mulching/hydro-seeding approximately 42.5 acres, as well as establishing a wooded riparian corridor extending 100 feet along both sides of the proposed stream channel. The cost for decommissioning the dam is \$41,350,00, which makes this alternative unfeasible.

Alternative 3 – Widen Existing Auxiliary Spillway: This alternative focuses on structural upgrades to the dam to increase capacity by widening the auxiliary spillway, and raising both the auxiliary spillway and the top of the dam. The principal spillway conduit and inlet tower would be replaced, and the auxiliary spillway would be modified. This modification would increase the discharge through the dam to convey the principal spillway hydrograph and the freeboard hydrograph to meet the applicable dam safety criteria established by NRCS and TR-60. These modifications are designed to match the existing 100-year water surface elevation to not increase the discharge of the 100-year storm.

This alternative proposes replacing the existing principal spillway with a larger, 30-inch conduit to bring the dam into compliance with TR-60. The inlet tower must also be replaced with a new 3-foot x 15-foot x 12-foot reinforced concrete inlet tower. This new inlet tower increases the weir length for the principal spillway from 4 feet to 15 feet, to meet TR-60 requirements. The principal spillway crest will remain unchanged at 764.2 feet. The auxiliary spillway would be raised by 1.5 feet, to an elevation of 776.8 feet, to meet principal spillway hydrograph requirements. The auxiliary spillway will also need to be hardened with roller-compacted

concrete. Under this alternative, the access drive across the top of the dam would be preserved. An estimated 21 acres of easements would need to be purchased around the flood pool. The total cost to rehabilitate the dam would be \$11,355,200, which makes this alternative unfeasible.

Alternative 4 – New Auxiliary Spillway (Preferred Alternative): This alternative proposes installing a new widened stepped roller compacted concrete (RCC) auxiliary spillway and raising the top of dam 2.9 feet. The principal spillway and inlet tower would be replaced, and a new auxiliary spillway would be installed. These modifications are designed to match the existing 100-year water surface elevation, to not increase the discharge of the 100-year storm.

This alternative proposes replacing the existing principal spillway with a larger, 30-inch conduit to bring the dam into compliance with TR-60. The inlet tower would also be replaced with a new 3-foot x 15-foot x 12-foot reinforced concrete inlet tower. The principal spillway crest will remain unchanged. The auxiliary spillway must be raised by 1.5 feet, to an elevation of 776.8 feet, to meet principal spillway hydrograph requirements. The existing auxiliary spillway would be abandoned, and a new stepped roller compacted concrete (RCC) auxiliary spillway with a width of 150 feet would be cut into the dam embankment. The total cost to rehabilitate the dam would be \$5,480,700, which makes this alternative feasible.

V. NRCS' DECISION AND FACTORS CONSIDERED IN THE DECISION

Based on the evaluation in the EA, NRCS and the Sponsor selected Alternative 4 (New Auxiliary Spillway) as the preferred alternative. NRCS has taken into consideration all of the potential impacts of the proposed action, incorporated herein by reference from the EA and balanced those impacts with consideration of the agency's purpose and need for action.

NRCS acknowledges that based on the EA, potential impacts to soil, water, air, plants, animals, energy and humans were considered in account of a public need. As a result, the agency's preferred alternative (Alternative 4) would result in benign short-term and long-term negative impacts while addressing the need for rehabilitation to high hazard to reduce risk of loss of life.

VI. FINDING OF NO SIGNIFICANT IMPACT

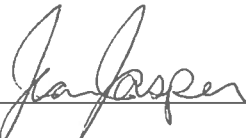
To determine the significance of the action analyzed in the EA, the agency is required by NEPA regulations at 40 CFR Section 1501 and NRCS regulations at 7 CFR Part 650 to consider the context and intensity of the proposed action. In response to the analysis of the EA, NRCS finds that neither the proposed action nor any of the alternatives is a major Federal Action significantly affecting the quality of the human environment. Therefore, preparation of an Environmental Impact Statement (EIS) on the final action is not required under the NEPA and Council on Environmental Quality (CEQ) implementing regulations (40 CFR Part 1500-1508), or NRCS environmental review procedures (7 CFR Part 650). This finding is based on the following factors:

- 1) Temporary short-term impacts to streams and the conservation pool, due to sedimentation, may occur during construction activities. Environmental consequences of the construction activities will be insignificant due to proposed mitigation, avoidance, and minimization put in place by a required Storm Water Pollution

Prevention Plan (SWPPP). The SWPPP will be in place prior to and during all construction activities.

- 2) An additional Aquatic Resources Protection Plan, required by 404 permitting due to impacts to jurisdictional waters, will be in place prior to and during all construction activities. This plan will outline strategies to conserve and manage aquatic ecosystem specific areas, including rivers, lakes, streams, wetlands, and marine ecosystems adjacent to the action area of the project.
- 3) No compensatory mitigation is anticipated with the rehabilitation of the dam. The preferred alternative will keep the permanent conservation pool elevation the same as the existing pool elevation.
- 4) Consultation with USFWS has resulted in a “may affect, not likely to adversely affect” conclusion for the Piping plover, Red knot, Monarch butterfly, American burying beetle, Tri-colored bat, and Alligator snapping turtle. Consultation with USFWS will be ongoing.
- 5) There will be temporary, short-term adverse impacts to vegetation (trees/shrubs) within the action area. Trees will be felled prior to construction activities and will occur outside of the primary nesting season for migratory birds, and during local bat species inactive period (Nov 15 – Mar 15). Post construction completion, vegetation will be allowed to be reestablished within the action area.
- 6) Permanent impacts are associated with the 150-foot-wide permanent RCC auxiliary spillway cut into the embankment. Approximately 1.0 acre will be converted to a RCC spillway. This action will not have any long-term negative effects on threatened or endangered species that may be located within the action area and will not impact critical habitat for any species.
- 7) The proposed alternative does not significantly impact public health. Dam rehabilitation will reduce the risk associated with a potential catastrophic dam failure, reducing the risk of loss of life.
- 8) NRCS regulations (7 CFR Part 650) and policy (Title 420, GM Part 401) require that NRCS identify, assess, and avoid effects to historic or cultural resources, park lands, prime farmlands, wetlands, or ecologically critical areas (Title 190 National Compliance Handbook). NRCS made the determination of “no historic properties (including archaeological sites) affected” by the proposed Alternative 4. The Oklahoma Archaeological Survey, the Oklahoma State Historic Preservation Office, the Caddo Nation, and Quapaw Nation have concurred with this determination.

- 9) The proposed action does not violate Federal, State, or local law requirements imposed for protection of the environment. The major laws identified with the selection of Alternative 4 include the Clean Water Act, Clean Air Act, Endangered Species Act, National Historic Preservation Act, and Migratory Bird Treaty Act. Alternative 4 is consistent with the requirements of these laws. Based on the information presented in the attached EA, NRCS finds, in accordance with 40 CFR Section 1508.13, that the selection of the agency preferred alternative (Alternative 4 – new auxiliary spillway) is not a major Federal Action significantly affecting the quality of the human environment; therefore, not requiring preparation of an EIS.



JEANNE JASPER
Oklahoma State Conservationist
Natural Resources Conservation Service

5/21/25

Date

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DRAFT Supplemental Watershed Plan No. 2 and Environmental Assessment for the Rehabilitation of Floodwater Retarding Structure No. 12 in the Little Wewoka Creek-Graves Creek Watershed in Hughes County, Oklahoma

Prepared By:

USDA Natural Resources Conservation Service

In Cooperation With:

Hughes County Conservation Districts

Hughes County, Oklahoma

Congressional District No. 2

AUTHORITY

The original work plan was prepared, and the works of improvement installed, under the authority of the Watershed Protection and Flood Prevention Act (Public Law 83-566), as amended (16 U.S.C. Section 1001 et. seq.), 1965. The rehabilitation of Structure No. 12 is authorized under Public Law 83-566 (as amended), and as further amended by Section 313 of Public Law 106-472.

ABSTRACT

The Little Wewoka Creek – Graves Creek Watershed Floodwater Retarding Structure No. 12 (LW12) is currently classified as a high-hazard dam that does not meet current United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) and State of Oklahoma dam safety and performance standards. The Hughes County Conservation District (Sponsor) has chosen to rehabilitate the dam to address identified safety deficiencies.

The proposed action (selected alternative) involves structural upgrades to the dam to increase capacity by replacing the existing auxiliary spillway with a new stepped roller-compacted concrete (RCC) spillway. The new spillway would be widened from 70 feet to 150 feet and would be moved to the center of the dam embankment due to land constraints with the existing auxiliary spillway. The spillway crest would be raised 1.5 feet, to an elevation of 776.8 feet. Additionally, the existing principal spillway, which is a 33-inch reinforced concrete pipe conduit, would be reinforced with a 3-foot x 15-foot x 12-foot reinforced concrete inlet tower. The existing principal spillway conduit would be slip lined with a 30-inch high-density polyethylene pipe. The top of dam would be raised 2.9 feet to an elevation of 783.0 feet. These modifications are designed to match the existing 100-year water surface elevation, to not increase the discharge of the 100-year storm.

The total cost for the proposed action would be \$5,480,700, of which the Federal cost share would be \$3,878,680, and the sponsor cost share would be \$1,602,020. The cost of the preparation of the supplemental watershed plan and environmental assessment totaled \$701,174 and was covered entirely with Federal funding.

COMMENTS and INQUIRIES

Comments and inquiries must be received by July 10, 2025. Submit comments and inquiries by mail or email to: Valerie Glasgow, Acting ASTC Water Resources; USDA/NRCS, 100 USDA, Suite 206, Stillwater, Oklahoma 74074; (405) 742-1112; Valerie.Glasgow@usda.gov.

Non-Discrimination Statement:

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by the USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

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Ancestral Land Acknowledgement

Hughes County, Oklahoma, formerly part of Indian Country as set forth in the 1834 Indian Intercourse Act, is in central Oklahoma. Indian Country included the current central United States and was described in 1834 as “all that part of the United States west of the Mississippi (River) and not within the states of Missouri and Louisiana or the Territory of Arkansas.” Indian Country was later reduced with the organization of Wisconsin, Iowa, Minnesota, and Dakota territories, as well as by the Kansas-Nebraska Act of 1854. After the Civil War, the Southern Treaty Commission reduced Indian Country even further to what is now the State of Oklahoma (minus the Panhandle and Old Greer County) and designated it as Indian Territory. Indian Territory was reduced by the Oklahoma Organic Act of 1890, whereby the western part of Indian Territory became Oklahoma Territory, while modern eastern Oklahoma was all that remained of the original Indian Country described in 1834. The Twin Territories were eventually merged and became the State of Oklahoma in 1907.

The precontact Agricultural Villagers period (roughly 750 and 1000 years ago) of the plains and plains-prairie marks the first time when prehistoric groups can be linked to historically known Native societies (or "Tribes"). Based on a continuity of dwelling architecture, habitation patterns, and ceramic styles and varieties, the Agricultural Villagers became those known today as the Caddo Nation and the Wichita and Affiliated Tribes. Through time, the Wichita became associated primarily with the plains, while the Caddo appear to have lived on the prairie-plains edge; Hughes County is part of the former. Eventually, the Osage Nation and Quapaw Nation, amongst others, made their way into eastern Oklahoma through direct or indirect contact with Europeans.

The first documented land cession in what is now Hughes County was by the Osage Nation in 1818. This land was later assigned to the Muscogee (Creek) Nation in 1833, as specified by an 1826 treaty by which the Muscogee (Creek) Nation surrendered all lands east of the Mississippi River. In 1856, the Muscogee (Creek) Nation ceded a portion of its western reserve to the Seminole Nation for settlement. FWRS No. 12 is not within this western section. In 1866, the Muscogee (Creek) Nation was forced to renegotiate its treaty with the United States, having "ignored their allegiance to the United States" by signing a treaty with the Confederate States in 1861. In the new treaty, the Muscogee (Creek) Nation had to provide amnesty to all who clashed with the Confederate States, as well as disavow slavery and provide tribal citizenship to those of African descent who were settled in their jurisdiction. As noted previously, the Muscogee (Creek) Nation lands were eventually incorporated into the State of Oklahoma in 1907. However, in 2020, the United States Supreme Court's *McGirt v. Oklahoma* decision held that specific reservations within Indian Country/Territory were never disestablished, as it relates to the Major Crimes Act (i.e. crimes committed by Indians on Indian land). Since the decision only relates to the Major Crimes Act, there may be further need to review the bounds of *McGirt v. Oklahoma* as it relates to other jurisdictional matters, per the Supreme Court's post-decision comments.

LITTLE WEWOKA-GRAVES CREEK WATERSHED

Supplemental Watershed Plan Agreement No. 2

between the

Hughes County Conservation District,

State of Oklahoma

(Referred to herein as the sponsor)

and the

UNITED STATES DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

(Referred to herein as NRCS)

Whereas, the watershed plan for the Little Wewoka-Graves Creek Watershed, a sub-watershed of the Northern Canadian River watershed, executed by the sponsor named therein and the Soil Conservation Service (now NRCS), became effective on June 21, 1956; and

Whereas, an amendment to the original Watershed Agreement for Little Wewoka-Graves Creek Watershed, State of Oklahoma, was executed by the Sponsor and NRCS on August 1, 1960; and

Whereas, a Supplemental Watershed Agreement No. 1 for the Little Wewoka-Graves Creek Watershed, State of Oklahoma, executed by the Sponsor and NRCS, became effective on June 15, 1972; and

Whereas, in order to extend the watershed plan for said Floodwater Retarding Structure (FWRS) No. 12 beyond its original evaluated life and to meet current safety and performance standards, it has become necessary to modify said supplemental watershed agreement no.1; and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act has been assigned by the Secretary of Agriculture to NRCS; and

Whereas, application has heretofore been made to the Secretary of Agriculture by the Sponsor for assistance in preparing a plan for works of improvement for the rehabilitation of FWRS No. 12 in the Little Wewoka Creek-Graves Creek Watershed, State of Oklahoma, under the authority of Section 14 of Public Law 83-566 (as amended), the Watershed Protection and Flood Prevention Act of 1954; and

Whereas, there has been developed through cooperative efforts of the Sponsor and NRCS a supplemental plan for works of improvement for FWRS No. 12 of the Little Wewoka Creek-Graves Creek Watershed, State of Oklahoma, which plan is annexed to and made part of this agreement; and

Whereas, the Wewoka Creek Water and Soil Conservancy District No. 2 is no longer intact and will be removed as sponsor, along with the Seminole County and Okfuskee County Conservation Districts for the rehabilitation of FWRS No. 12 and will have no responsibilities

for this new project, conferring the role of sponsor for this project to the Hughes County Conservation District;

Now, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through NRCS, and the sponsor hereby agree on this supplemental watershed plan and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in this supplemental watershed agreement and including the following:

1. **Term.** The term of this agreement is for the installation period (2 years) plus the evaluated life of the project (100 years) and does not commit the NRCS to assistance of any kind beyond that point unless agreed to by all parties.
2. **Costs.** The costs shown in this agreement are preliminary estimates. The final costs to be borne by the parties hereto will be the actual costs incurred in the installation of works of improvement.
3. **Real Property.** The sponsor will acquire such real property as will be needed in connection with the works of improvement. The amounts and percentages of the real property acquisition cost to be borne by the sponsor and NRCS are as shown in the cost-share table in item 5 hereof.

The sponsor agrees that all land acquired for measures, other than land treatment practices, with financial or credit assistance under this agreement will not be sold or otherwise disposed of for the evaluated life of the project except to a public agency, which will continue to maintain and operate the development in accordance with the operation and maintenance agreement.

4. **Uniform Relocation Assistance and Real Property Acquisition Policies Act.** The sponsor hereby agrees to comply with all of the policies and procedures of the Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 U.S.C. 4601 et seq. as further implemented through regulations in 49 CFR Part 24 and 7 CFR Part 21) when acquiring real property interests for this Federally assisted project. If the sponsor is legally unable to comply with the real property acquisition requirements, it agrees that, before any Federal financial assistance is furnished, it will provide a statement to that effect, supported by an opinion of the chief legal officer of the state, containing a full discussion of the facts and law involved. This statement may be accepted as constituting compliance.
5. **Cost-share for Watershed Project Plan.** The percentages of total rehabilitation project costs to be paid by the sponsor and by NRCS are as follows:

TABLE 1. COST-SHARE BREAKDOWN

Little Wewoka Creek-Graves Creek Watershed, Oklahoma (Dollars)^{1/}

Works of Improvement	NRCS	Sponsor	Total
Cost Sharable Items			
Rehabilitation of Dam (Construction Costs)	\$2,975,180	\$1,199,020	\$4,174,200
Relocation, Replacement in-kind	\$0	\$190,000	\$190,000
Relocation, Required Decent, Safe, Sanitary	\$0	\$0	\$0
Sponsor's Planning Costs	NA	\$0	\$0
Sponsor's Engineering Costs	NA	\$135,000	\$135,000
Sponsor's Project Administration	NA	\$15,000	\$15,000
Land Rights Acquisition Cost	NA	\$63,000	\$63,000
Subtotal: Cost-Share Costs	\$2,975,180	\$1,602,020	\$4,577,200
Cost -Share Percentages ^{2/}	65%	35%	100%
Non Cost-Sharable Items^{3/}			
NRCS Engineering & Project Administration	\$903,500	NA	\$903,500
Natural Resource Rights	NA	\$0	\$0
Federal, State, and Local Permits	NA	\$0	\$0
Relocation, Beyond Required decent, safe, sanitary	NA	\$0	\$0
Subtotal: Non Cost-Share Costs	\$903,500	\$0	\$903,500
Total Project Costs	\$3,878,680	\$1,602,020	\$5,480,700

1/ Price base 2024. Prepared February 2025.

2/ Maximum NRCS cos-share is 65% of Cost-Sharable items not to exceed 100% of construction cost

3/ If actual Cost-Sharable item expenditures vary from these figures, the responsible party will bear the change.

6. **Land Treatment Agreements.** The sponsor will obtain agreements from owners of not less than 50 percent of the land above each multiple-purpose and floodwater-retarding structure. These agreements must provide that the owners will carry out farm or ranch conservation plans on their land. The sponsors will ensure that 50 percent of the land upstream of any retention reservoir site is adequately protected before construction of the dam. The sponsors will provide assistance to landowners and operators to ensure the installation of the land treatment measures shown in the watershed project plan. The sponsors will encourage landowners and operators to continue to operate and maintain the land treatment measures after the long-term contracts expire, for the protection and improvement of the watershed.
7. **Floodplain Management.** Before construction of any project for flood prevention, the sponsor must agree to participate in and comply with applicable Federal floodplain management and flood insurance programs. The sponsor is required to have development controls in place below low and significant hazard dams prior to NRCS or the sponsor entering into a construction contract.
8. **Water and Mineral Rights.** The sponsor will acquire or provide assurance that landowners or resource users have acquired such water, mineral, or other natural resources rights pursuant to

State law as may be needed in the installation and operation of the works of improvement. Any costs incurred must be borne by the sponsors, and these costs are not eligible as part of the sponsors' cost-share.

9. **Permits.** The sponsors will obtain and bear the cost for all necessary Federal, State, and local permits required by law, ordinance, or regulation for installation of the works of improvement. These costs are not eligible as part of the sponsor's cost-share.
10. **NRCS Assistance.** This agreement is not a fund obligating document. Financial and other assistance to be furnished by NRCS in carrying out the rehabilitation plan is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose.
11. **Additional Agreements.** A separate agreement will be entered into between NRCS and the sponsor before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.
12. **Amendments.** This rehabilitation plan may be amended or revised only by mutual agreement of the parties hereto, except that NRCS may de-authorize or terminate funding at any time it determines that the sponsor has failed to comply with the conditions of this agreement or when the program funding or authority expires. In this case, NRCS must promptly notify the sponsor in writing of the determination and the reasons for the de-authorization of project funding, together with the effective date. Payments made to the sponsor or recoveries by NRCS must be in accordance with the legal rights and liabilities of the parties when project funding has been de-authorized. An amendment to incorporate changes affecting a specific measure may be made by mutual agreement between NRCS and the sponsor having specific responsibilities for the measure involved.
13. **Prohibitions.** No member of or delegate to Congress, or resident commissioner, may be admitted to any share or part of this plan or to any benefit that may arise therefrom, but this provision may not be construed to extend to this agreement if made with a corporation for its general benefit.
14. **Operation and Maintenance (O&M).** The sponsor will be responsible for the operation, maintenance, and any needed replacement of the works of improvement by actually performing the work or arranging for such work, in accordance with the O&M. An O&M agreement will be entered into before Federal funds are obligated and will continue for the project life (100 years). Although the sponsor's responsibility to the Federal Government for O&M ends when the O&M agreement expires upon completion of the evaluated life of measures covered by the agreement, the sponsor acknowledges that continued liabilities and responsibilities associated with works of improvement may exist beyond the evaluated life. A specific O&M plan will be prepared for FWRS No. 12 before issuing invitations to bid for construction, using the NRCS National Operation and Maintenance Manual.
15. **Emergency Action Plan.** Prior to construction, the sponsor must prepare an emergency action plan (EAP) for each dam or similar structure where failure may cause loss of life or as required by state and local regulations. The EAP must meet the minimum content specified in

the NRCS Title 180, National Operation and Maintenance Manual (NOMM), Part 500, Subpart F, Section 500.52, and meet applicable State agency dam safety requirements. The NRCS will determine that an EAP is prepared prior to the execution of fund obligating documents for construction of the structure. EAPs must be reviewed and updated by the sponsor annually.

- 16. Nondiscrimination Provisions.** In accordance with Federal civil rights law and USDA civil rights regulations and policies, the USDA, its agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

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By signing this agreement, the recipient assures the Department of Agriculture that the program or activities provided for under this agreement will be conducted in compliance with all applicable Federal civil rights laws, rules, regulations, and policies.

- 17. Certification Regarding Drug-Free Workplace Requirements.** (7 CFR Part 3021). By signing this watershed agreement, the sponsor is providing the certification set out below. If it is later determined that the sponsor knowingly rendered a false certification or otherwise violated the requirements of the Drug-Free Workplace Act, the NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

Controlled substance means a controlled substance in Schedules I through V of the Controlled Substances Act (21 U.S.C. Section 812) and as further defined by regulation (21 CFR Sections 1308.11 through 1308.15).

Conviction means a finding of guilt (including a plea of *nolo contendere*) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.

Criminal drug statute means a Federal or non-Federal criminal statute involving the manufacturing, distribution, dispensing, use, or possession of any controlled substance.

Employee means the employee of a grantee directly engaged in the performance of work under a grant, including: (i) all direct charge employees; (ii) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant; and (iii) temporary personnel and consultants who are directly engaged in the performance of work under the grant and who are on the grantee's payroll. This definition does not include workers not on the payroll of the grantee (e.g., volunteers, even if used to meet a matching requirement; consultants or independent contractors not on the grantees' payroll; or employees of sub-recipients or subcontractors in covered workplaces).

18. Certification

A. The sponsor certifies that it will continue to provide a drug-free workplace by:

- (1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition.
- (2) Establishing an ongoing drug-free awareness program to inform employees about:
 - (a) The danger of drug abuse in the workplace;
 - (b) The grantee's policy of maintaining a drug-free workplace;
 - (c) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (d) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.
- (3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1).
- (4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee will:
 - (a) Abide by the terms of the statement; and
 - (b) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction.
- (5) Notifying the NRCS in writing, within 10 calendar days after receiving notice under paragraph (4) (b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the

receipt of such notices. Notice shall include the identification number(s) of each affected grant.

(6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4) (b), with respect to any employee who is so convicted:

(a) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

(b) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

(7) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (1), (2), (3), (4), (5), and (6).

B. The sponsor may provide a list of the site(s) for the performance or work done in connection with a specific project or other agreement.

C. Agencies shall keep the original of all disclosure reports in the official files of the agency.

19. Certification Regarding Lobbying (7 CFR Part 3018)

(applicable if this agreement exceeds \$100,000)

A. The sponsor certifies to the best of its knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the sponsors, to any person for influencing or attempting to influence an officer or employee of an agency, Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The sponsors shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

B. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title

31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

20. Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions (7 CFR Part 3017)

A. The sponsor certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(2) Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (A)(2) of this certification; and

(4) Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause of default.

B. Where the primary sponsor is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this agreement.

21. Clean Air and Water Certification. (Applicable if this agreement exceeds \$100,000, or a facility to be used has been subject of a conviction under the Clean Air Act (42 U.S.C. Section 7413(c)) or the Federal Water Pollution Control Act (33 U.S.C. Section 1319(c) and is listed by EPA or is not otherwise exempt).

A. The project sponsoring organization signatory to this agreement certify as follows:

(1) Any facility to be utilized in the performance of this proposed agreement is (), is not (x) listed on the Environmental Protection Agency List of Violating Facilities.

(2) To promptly notify the NRCS-State administrative officer prior to the signing of this agreement by NRCS, of the receipt of any communication from the Director, Office of Federal Activities, U.S. Environmental Protection Agency, indicating that any facility which is proposed for use under this agreement is under consideration to be listed on the Environmental Protection Agency List of Violating Facilities.

(3) To include substantially this certification, including this subparagraph, in every nonexempt sub-agreement.

B. The project sponsoring organization signatory to this agreement agrees as follows:

- (1) To comply with all the requirements of section 114 of the Clean Air Act as amended (42 U.S.C. Section 7414) and section 308 of the Federal Water Pollution Control Act (33 U.S.C. Section 1318), respectively, relating to inspection, monitoring, entry, reports, and information, as well as other requirements specified in section 114 and section 308 of the Air Act and the Water Act, issued there under before the signing of this agreement by NRCS.
- (2) That no portion of the work required by this agreement will be performed in facilities listed on the EPA List of Violating Facilities on the date when this agreement was signed by NRCS unless and until the EPA eliminates the name of such facility or facilities from such listing.
- (3) To use its best efforts to comply with clean air standards and clean water standards at the facilities in which the agreement is being performed.
- (4) To insert the substance of the provisions of this clause in any nonexempt subagreement.

C. The terms used in this clause have the following meanings:

- (1) The term “Air Act” means the Clean Air Act, as amended (42 U.S.C. Section 7401 et seq.).
- (2) The term “Water Act” means Federal Water Pollution Control Act, as amended (33 U.S.C. Section 1251 et seq.).
- (3) The term “clean air standards” means any enforceable rules, regulations, guidelines, standards, limitations, orders, controls, prohibitions, or other requirements which are contained in, issued under, or otherwise adopted pursuant to the Air Act or Executive Order 11738, an applicable implementation plan as described in section 110 of the Air Act (42 U.S.C. Section 7414) or an approved implementation procedure under section 112 of the Air Act (42 U.S.C. Section 7412).
- (4) The term “clean water standards” means any enforceable limitation, control condition, prohibition, standards, or other requirement which is promulgated pursuant to the Water Act or contained in a permit issued to a discharger by the Environmental Protection Agency or by a State under an approved program, as authorized by section 402 of the Water Act (33 U.S.C. Section 1342), or by a local government to assure compliance with pretreatment regulations as required by section 307 of the Water Act (33 U.S.C. Section 1317).
- (5) The term “facility” means any building, plant, installation, structure, mine, vessel, or other floating craft, location or site of operations, owned, leased, or supervised by a sponsor, to be utilized in the performance of an agreement or sub-agreement. Where a location or site of operations contains or includes more than one building, plant, installation, or structure, the entire location shall be deemed to be a facility except where the Director, Office of Federal Activities, Environmental Protection Agency, determines that independent facilities are collocated in one geographical area.

22. Assurances and Compliance. As a condition of the grant of cooperative agreement, the

sponsor assures and certifies that it is in compliance with and will comply in the course of the agreement with all applicable laws, regulations, Executive orders and other generally applicable requirements, including those set out below which are hereby incorporated in this agreement by reference, and such other statutory provisions as specifically set forth herein.

State, local, and Indian Tribal Governments: OMB Circular Nos. A-87, A-102, A-129, and A-133; and 7 C.F.R. Parts 3015, 3016, 3017, 3018, 3021, 3052.

Nonprofit organizations, hospitals, institutions of higher learning: OMB Circular Nos. A-110, A-122, A-129, and A-133; and 7 C.F.R. Parts 3015, 3017, 3018, 3019, 3021, and 3052.

23. Examination of Records. The sponsors must give the NRCS or the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to this agreement, and retain all records related to this agreement for a period of three years after completion of the terms of this agreement in accordance with the applicable OMB Circular.

24. Signatures

Hughes County Conservation District
419 E Hwy St.
Holdenville, OK 74848

BY _____
Title Chairman
Date 08/14/2025

The signing of this supplemental agreement was authorized by a resolution of the governing body of the Hughes County Conservation District adopted at a meeting held on Aug 14, 2025, in Holdenville, Oklahoma.

Sam McElwee
(name)
District Board Chair

Date: 8/14/2025

Seminole County Conservation District
1400 Indian Rd.
Wewoka, OK 74884

BY [Signature]
Title Chair
Date 8-28-25

The signing of this supplemental agreement was authorized by a resolution of the governing body of the Seminole County Conservation District adopted at a meeting held on Aug. 28, 2025.

Secretary _____ Address _____

Okfuskee County Conservation District
417 Sertco Road, Suite B
Okemah, OK 74859

BY [Signature]
Title Chairman
Date 8-21-25

The signing of this supplemental agreement was authorized by a resolution of the governing body of the Okfuskee County Conservation District adopted at a meeting held on Aug 21, 2025.

Secretary _____ Address _____

United States Department of Agriculture
Natural Resources Conservation Service
100 USDA, Suite 206
Stillwater, OK 74074

BY Jeanne Jasper
Title State Conservationist
Date 9/18/25

Digitally signed by JEANNE JASPER
Date: 2025.09.18 08:51:44 -05'00'

SUMMARY OMB FACT SHEET

SUPPLEMENTAL WATERSHED PLAN NO. 2 AND ENVIRONMENTAL ASSESSMENT DOCUMENT FOR THE REHABILITATION OF FLOODWATER RETARDING STRUCTURE NO. 12, LITTLE WEWOKA CREEK - GRAVES CREEK WATERSHED HUGHES COUNTY, OKLAHOMA

2ND CONGRESSIONAL DISTRICT

Prepared by: United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS).

Authorization: The original Little Wewoka-Graves Creek Watershed Work Plan was prepared, and the works of improvement installed in 1956, under the authority of Sections 3 and 4 of the Watershed Protection and Flood Prevention Act (Public Law (PL) 83-566). The Work Plan was amended in 1960 and supplemented in June 1972. The rehabilitation is authorized under PL 83-566 (as amended) and as further amended by Section 313 of Public Law 106-472.

Sponsor: Hughes County Conservation District

Proposed Action: Alternative 3 - Dam Rehabilitation with New Auxiliary Spillway. The Proposed Action (Preferred Alternative) includes the following planned measures:

- Replace principal spillway with a larger, 30-inch conduit and replace the inlet tower with a 3-foot x 15-foot x 12-foot reinforced concrete inlet tower, which will increase the weir length for the principal spillway from 4 feet to 15 feet. The principal spillway crest will remain unchanged, at an elevation of 764.2 feet.
- Abandon the existing auxiliary spillway and cut a new stepped roller compacted concrete (RCC) spillway with a width of 150 feet into the dam embankment. The auxiliary spillway would be raised 1.5 feet, to an elevation of 776.8 feet.
- Raise the top of dam 2.9 feet, to an elevation of 783.0 feet.
- Provide alternative route for landowner access.

Federal Objective: Investments in this proposed action reflect national priorities, encourage economic development, and protect the environment by:

1. Seeking to maximize sustainable economic development;
2. Seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which these areas must be used; and
3. Protecting and restoring the function of natural systems and mitigating any unavoidable damages to these systems.

Purpose and Need for Action

Purpose: To reduce the risk of loss of life due to catastrophic dam failure, maintain the level of flood protection for life and property upstream and downstream of the dam that is currently

provided by the dam’s ability to attenuate flood, and reduce flooding by bringing the dam into compliance with current NRCS and Oklahoma safety performance standards to extend the service life of the dam another 100 years through the project action.

Need: Floodwater Retarding Structure (FWRS) No. 12 was originally constructed as a Class A low hazard dam. Development downstream of the dam has resulted in the reclassification of the dam to Class C high hazard. The proposed action is needed to address public health and safety concern that FWRS No. 12 does not meet NRCS or State of Oklahoma dam safety criteria because of downstream development within the breach inundation area. No immediate need for action associated with flood protection was identified beyond rehabilitation of the structure to high-hazard potential standards.

Description of the Proposed Action: The proposed action is Alternative 3. Under this alternative, FWRS No. 12 would be rehabilitated to meet NRCS and State of Oklahoma dam safety and performance standards by replacing the principal spillway, raising the auxiliary spillway, and raising the top of dam to accommodate the 6- and 24-hour freeboard hydrographs.

Resource Information:

Location: Latitude: 35.1266 Longitude: -96.2665

8-Digit Hydrologic Unit Number: 11100302

Climate and Topography: Hughes County has a humid, subtropical climate with hot summers and mild winters. Average summer temperatures are near 80°F and are near 40°F in winter. Precipitation is abundant throughout the year, with an approximate yearly average of 40 inches. Topography is mostly plains broken by sandstone hills and broad, gentle valleys.

	<u>Watershed</u>	<u>FWRS No. 12</u>
<u>Watershed Size (acres):</u>	125,859	1,368
<u>Land Use (acres):</u>		
Agriculture (Cultivated Crops)	469	-
Pasture/Rangeland	27,401	600
Forested	61,657	363
Herbaceous (Grassland)	29,791	329
Developed	4,620	40
Open Water	1,537	32
Wetlands	384	4

Land Ownership: County = 0%; State = 0%; Federal = N/A; Private = 100%

FWRS No. 12 is located on private land as recognized by the State of Oklahoma. To reiterate, the land is not held in trust by the Department of Interior for a Muscogee (Creek) Nation tribal member, Muscogee (Creek) Nation Freedman on the tribal rolls, or descendants of either, nor is it fee-land, owned by the Muscogee (Creek) Nation tribal council, or trust land held by the Department of Interior for the benefit of the tribal council. Despite the United States Supreme Court’s 2020 *McGirt v. Oklahoma* decision,

determining that the Muscogee (Creek) Nation reservation of the 19th century was never disestablished, the FWRS No. 12 land is not “controlled” by the Muscogee (Creek) Nation. In effect, the Muscogee (Creek) Nation and the State of Oklahoma both maintain jurisdiction in the Muscogee (Creek) Nation reservation. The shared jurisdiction arrangement was summarized in a joint statement from the Muscogee (Creek) Nation and the State of Oklahoma. The joint statement proclaims that each entity is committed to affirming private property rights despite the Supreme Court’s confirmation that almost the entirety of eastern Oklahoma remains Indian Country.

Number of Farms (Hughes County): 928

Minority Farmers: 256
 Average Farm Size (acres): 446
 Limited Resource Farmers: 182

Population and Demographics:

TABLE S-1. POPULATION AND DEMOGRAPHIC DATA FOR HUGHES COUNTY, OKLAHOMA

	Hughes County ^{1/}	Oklahoma ^{1/}	Nation ^{1/}
Population	13, 411	3,995,260	329,725,481
Households	4,003	1,542,780	127,482,865
Median Per Capita Income	\$22,026	\$30,976	\$37,638
Median Household Income	\$42,425	\$56,956	\$69,021
Median value owner-occupied housing units	\$77,400	\$150,800	\$244,900
Families living at or below the poverty level	18.4%	14.6%	12.4%
Native American Population	22%	7%	1%
Black Population	4%	7%	12%
Asian Population	N/A	2%	6%
Hispanic population	6%	11%	18%

^{1/} U.S. Census American Community Survey-5 year Estimate (2019-2023).

Resource Concerns: The scoping process reviewed a broad range of resource concerns to be evaluated during the watershed planning process. Resource concerns are included in Table S-3 in the Environmental Effects/Impacts section of this summary.

Alternative Plans Considered: In addition to the no-action alternative, four alternative plans were considered, and three were evaluated in detail.

No-Action – This plan is also considered the future without Federal investment (FWOFI), in which no Federal funds are expended on the project. This is a true no-action alternative, in which no rehabilitation measures take place. The dam would remain in its current configuration with regular maintenance continuing. The dam would not be in compliance with the NRCS or Oklahoma Water Resources Board criteria for a high-hazard dam, and the embankment would remain in place with elevated breach risk. There would be no mitigation measures implemented.

Alternative No. 1: Decommissioning – This alternative would remove a portion of the existing dam embankment to eliminate all storage capacity and reconnect and stabilize the historic stream channel and floodplain alignment. Mitigation measures would focus on restoration of the stream channel and floodplain, removal of the one residence and floodproofing of the four roads within the downstream breach zone.

Alternative No. 2: Widen Existing Auxiliary Spillway – This alternative focuses on structural upgrades to the dam to increase capacity by widening the auxiliary spillway and raising both the auxiliary spillway and the top of the dam. Mitigation measures would focus on minimizing impacts by limiting disturbance to the dam and areas immediately adjacent.

Alternative No. 3: New Auxiliary Spillway – This alternative focuses on structural upgrades to the dam to increase capacity by installing a new, widened stepped roller compacted concrete auxiliary spillway and raising the top of the dam. Mitigation measures would focus on minimizing impacts by limiting disturbance to the dam and areas immediately adjacent.

Project Costs: The proposed action (Alternative No. 3) maximizes the benefits, with a benefit-cost ratio of 0.0:1.0. The proposed action is the sponsor-preferred alternative. Table S-2 illustrates the cost breakdown for NRCS and the Sponsor.

TABLE S-2. ESTIMATED PROJECT COSTS

Little Wewoka Creek and Graves Creek Watershed, Oklahoma (Dollars)^{1/}

Works of Improvement	NRCS	Sponsor	Total
Cost Sharable Items			
Rehabilitation of Dam (Construction Costs)	\$2,975,180	\$1,199,020	\$4,174,200
Relocation, Replacement in-kind	\$0	\$190,000	\$190,000
Relocation, Required Decent, Safe, Sanitary	\$0	\$0	\$0
Sponsor's Planning Costs	NA	\$0	\$0
Sponsor's Engineering Costs	NA	\$135,000	\$135,000
Sponsor's Project Administration	NA	\$15,000	\$15,000
Land Rights Acquisition Cost	NA	\$63,000	\$63,000
Subtotal: Cost-Share Costs	\$2,975,180	\$1,602,020	\$4,577,200
Cost -Share Percentages ^{1/}	65%	35%	100%
Non Cost-Sharable Items^{2/}			
NRCS Engineering & Project Administration	\$903,500	NA	\$903,500
Natural Resource Rights	NA	\$0	\$0
Federal, State, and Local Permits	NA	\$0	\$0
Relocation, Beyond Required decent, safe, sanitary	NA	\$0	\$0
Subtotal: Non Cost-Share Costs	\$903,500	\$0	\$903,500
Total Project Costs	\$3,878,680	\$1,602,020	\$5,480,700

1/ Price base 2024. Prepared February 2025.

2/ Maximum NRCS cos-share is 65% of Cost-Sharable items not to exceed 100% of construction cost

3/ If actual Cost-Sharable item expenditures vary from these figures, the responsible party will bear the change.

Project Benefits: The proposed action would allow the sponsor to comply with applicable State and NRCS dam safety and performance standards, reduce the potential for loss of life due to catastrophic failure of the dam, and continue to protect existing property and infrastructure downstream of the dam. The proposed measures maximize public benefit. Average annual monetary benefits are estimated to be **(\$1,700)**. Average annual cost is estimated to be \$166,800, resulting in average annual benefits of **(\$168,200)**.

Net Beneficial Effects (Non-Monetary): Maintains existing protection of streams, wetlands, riparian and upland landscapes, and fish and wildlife habitats.

Number of Direct Beneficiaries: One residence and four roads are at direct risk from a catastrophic failure of the dam.

Population at Risk (PAR): 11

Benefit to Cost Ratio (Current Rate): 0.0:1.0

Net Beneficial Monetary Effects: **(\$168,200)**

Funding Schedule:	Year 2025	Year 2026	Year 2027	Year 2028
Federal Funds:	\$208,400	\$208,300	\$2,080,000	\$1,120,000
Non-Federal Funds:	\$0	\$388,000	\$962,500	\$519,200

Period of Analysis: 102 years (including 2 years for project implementation)

Environmental Effects/Impacts: Table S-3 lists the resources of concern and environmental consequences associated with the proposed action. Resources that would not be affected by the project are not listed in this table.

TABLE S-3: SUMMARY OF RESOURCE CONCERNS AND IMPACTS

No-Action Alternative	Alternative 1 - Decommission Dam	Alternative 2 – Widen Auxiliary Spillway	Alternative 3 – New Auxiliary Spillway
Soils			
Negligible effects with dam. Minor, long-term, and adverse with dam failure.	Minor short-term due to construction disturbance mitigated by best management practices (BMPs). Negligible long-term effects due to stream channel stabilization and riparian corridor restoration.	Minor short-term due to construction disturbance mitigated by BMPs. Negligible long-term.	Minor short-term due to construction disturbance mitigated by BMPs. Negligible long-term.

No-Action Alternative	Alternative 1 - Decommission Dam	Alternative 2 – Widen Auxiliary Spillway	Alternative 3 – New Auxiliary Spillway
Water Resources			
Water Quality			
No effect with the dam in place. Long-term adverse with dam failure due to additional sediment and pollutant loading in streams.	Minor, short-term effects with construction activities mitigated by use of BMPs. Long-term benefits with stream stabilization and riparian restoration.	Minor, short-term effects with construction activities mitigated by use of BMPs. Long-term benefits would be the same as existing, with the dam trapping sediment and pollutants.	Minor, short-term effects with construction activities mitigated by use of BMPs. Long-term benefits would be the same as existing, with the dam trapping sediment and pollutants.
Waters of the U.S. (WOTUS), Wetlands, and Special Aquatic Sites			
No effect with dam in place. Long-term adverse effects without the dam due to increased flooding.	Minor, short-term adverse effects during construction that would be mitigated by use of BMPs. Long-term benefits with newly established stream channel, flow regime, and riparian corridor restoration.	Minor, short-term adverse effects during construction that would be mitigated by use of BMPs. No long-term effects, as conditions would revert to existing conditions after construction.	Minor, short-term adverse effects during construction that would be mitigated by use of BMPs. No long-term effects, as conditions would revert to existing conditions after construction.
Floodplain Management			
No effect.	Long-term adverse effects due to increased flooding and enlargement of the 100-year floodplain.	No effect, as structures would continue to be protected.	No effect, as structures would continue to be protected.
Air Resources			
Climate			
No short-term effects. Minor, long-term, adverse effects without dam due to increased flooding.	Negligible effect on atmospheric CO ₂ levels.	Negligible effect on atmospheric CO ₂ levels.	Negligible effect on atmospheric CO ₂ levels.

No-Action Alternative	Alternative 1 - Decommission Dam	Alternative 2 – Widen Auxiliary Spillway	Alternative 3 – New Auxiliary Spillway
Plants and Animals			
Fish and Wildlife			
No effect with the dam in place. Long-term, adverse without the dam due to increased flooding impacting habitats.	Construction activities would have minor short-term, adverse effects, mitigated with BMPs. Long-term benefits with the addition of stream and riparian corridor habitats.	Minor short- and long-term effects due to construction activities, which would be mitigated with BMPs.	Minor short- and long-term effects due to construction activities, which would be mitigated with BMPs.
Threatened and Endangered Species			
No effect with dam in place. Potential long-term adverse without dam due to increased flooding.	Negligible, short-term adverse effects during construction mitigated with BMPs. Long-term benefits with increased habitat due to stream and riparian restoration.	Negligible, short-term adverse effects during construction mitigated with BMPs.	Negligible, short-term adverse effects during construction mitigated with BMPs.
Migratory Birds			
No effect with dam in place. Dam failure could result in minor, long-term adverse impacts due to increased flooding impacts on habitats.	Minor, short-term effects during construction would be mitigated with BMPs. Long-term benefits resulting from stream and riparian restoration providing additional habitat.	Minor, short-term effects during construction would be mitigated with BMPs. No effect long-term as birds would resume using existing habitats.	Minor, short-term effects during construction would be mitigated with BMPs. No effect long-term as birds would resume using existing habitats.
Invasive Species			
Negligible effects.	Negligible effects.	Negligible effects.	Negligible effects.
Riparian Areas			
No effect with dam in place. Dam failure would result in minor, long-term adverse effects due to increased flooding.	Minor short-term adverse effects during construction due to clearing of vegetation. Long-term benefits due to riparian corridor restoration of 100 feet on each side of the stream.	Minor short-term adverse effects during construction due to clearing of vegetation. No long-term effects due to establishment of native vegetation.	Minor short-term adverse effects during construction due to clearing of vegetation. No long-term effects due to establishment of native vegetation.

No-Action Alternative	Alternative 1 - Decommission Dam	Alternative 2 – Widen Auxiliary Spillway	Alternative 3 – New Auxiliary Spillway
Humans			
Land Use			
No effect with dam in place. Dam failure would result in minor, long-term adverse effects with increased flooding.	Minor long-term effects with change from open water to stream and riparian woodland.	No effect.	No effect.
Cultural Resources			
Potential to adversely affect historic properties due to prolonged exposure to increased flooding after dam failure.	No effects. No historic properties or cultural resources are present within the project area. OKSHPO provided concurrence.	No effects. No historic properties or cultural resources are present within the project area. OKSHPO provided concurrence.	No effects. No historic properties or cultural resources are present within the project area. OKSHPO provided concurrence.
Public Health and Safety			
No effect with dam in place. Long-term adverse effects with dam failure due to increased flooding.	No effect due to floodproofing of one residence and modifications to four roads.	No effect.	No effect.
Socioeconomics			
No effect.	Minor short-term benefits with construction on local economy.	Minor short-term benefits with construction on local economy.	Minor short-term benefits with construction on local economy.
Scenic Beauty			
No effect with dam in place. Long-term adverse effects with dam failure due to increased flooding.	Short-term adverse effects during construction. Negligible long-term effects, as open water would be replaced with stream and riparian woodland.	Short-term adverse effects during construction. Negligible long-term effects.	Short-term adverse effects during construction. Negligible long-term effects.

No-Action Alternative	Alternative 1 - Decommission Dam	Alternative 2 – Widen Auxiliary Spillway	Alternative 3 – New Auxiliary Spillway
Recreation			
No effect with dam in place. Long-term adverse effects to water related recreation with dam failure.	Long-term adverse effects to water-related recreation with dam removal.	Negligible short-term adverse effects to incidental recreation during construction. No long-term effects.	Negligible short-term adverse effects to incidental recreation during construction. No long-term effects.
Provisioning Services			
Grassland/Pasture (non-monetized)			
Dam would continue to protect grassland and pasture in the project area. Dam failure could have minor, long-term adverse effects due to increased flooding.	Removal of dam would result in an increase in flooding, which would have long-term adverse effects on grassland and pasture upstream and downstream of the dam.	No effect, as grassland and pasture would continue to be protected from flooding.	No effect, as grassland and pasture would continue to be protected from flooding.
Regulating Services			
Direct Flood Risk Management (monetized)			
Average annual flood damages of \$770,400, including damages attributable to dam failure.	Average annual benefits compared to FWOFI, \$740,900.	Average annual benefits compared to FWOFI, (\$1,700).	Average annual benefits compared to FWOFI, (\$1,700).
Water Filtration (non-monetized)			
Water quality would be the same as existing with the dam. There would be long-term adverse effects with dam failure due to increased flooding resulting in additional sediment and pollutants entering streams.	Construction activities could have short-term adverse effects that would be mitigated by the use of BMPs. There would be long-term benefits provided by riparian corridor restoration with woodland plantings stabilizing soils.	Construction activities could have short-term adverse effects that would be mitigated by the use of BMPs. Long-term there would be no effect as the impoundment would continue to trap sediment and pollutants.	Construction activities could have short-term adverse effects that would be mitigated by the use of BMPs. Long-term there would be no effect as the impoundment would continue to trap sediment and pollutants.
Cultural Services			
Aesthetic Value of Scenic Resources (non-monetized)			
Aesthetics would remain with the dam in place. Long-term adverse effects to aesthetics with dam failure and increased flooding.	Short-term adverse effects during construction. Long-term benefits with stream and riparian corridor restoration.	Short-term adverse effects during construction. Long-term benefits with stream and riparian corridor restoration.	Short-term adverse effects during construction. Long-term benefits with stream and riparian corridor restoration.

Major Conclusions: The rehabilitation of FWRS No. 12 meets the purpose and need of the project to upgrade the dam to meet current NRCS and Oklahoma safety and performance standards for a high-hazard dam, thereby reducing the risk to loss of life due to dam failure. Additionally, the service life of the dam would be extended for 100 years.

Areas of Controversy: None

Issues to Be Resolved: The following issues will need to be addressed for this project to move forward:

- Funding for initial sponsor cost-share amounts and estimated annual operations and maintenance (O&M).
- Sponsor obtaining all necessary state and federal permits.
- NRCS obtaining Federal funding for project design and construction.

Evidence of Unusual Congressional or Local Interest: No

Compliance Certification: This report complies with Executive orders, public laws, and other statutes governing the formulation of water resource projects.

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APPENDICES

- Appendix A: Comments and Responses
- Appendix B: Project Maps
- Appendix C: Support Maps
- Appendix D: Investigations and Analyses Report
- Appendix E: Other Supporting Information

1.0 CHANGES REQUIRING PREPARATION OF A SUPPLEMENT

This supplemental watershed plan addresses only Floodwater Retarding Structure (FWRS) No. 12, located in Hughes County, Oklahoma (Figure 1 and Appendix B). FWRS No. 12 was completed in 1959 as a low hazard dam, and is currently classified as a class C, high-hazard dam. This classification is given to dams that pose a threat to loss of life. As a result of changes in dam safety criteria and development in the downstream breach inundation areas, this dam does not have sufficient spillway and freeboard capacity to meet NRCS and State of Oklahoma dam safety criteria for a high-hazard dam. Rehabilitation is considered a change to a major feature and therefore requires a supplement to the original plan and supplement No. 1.

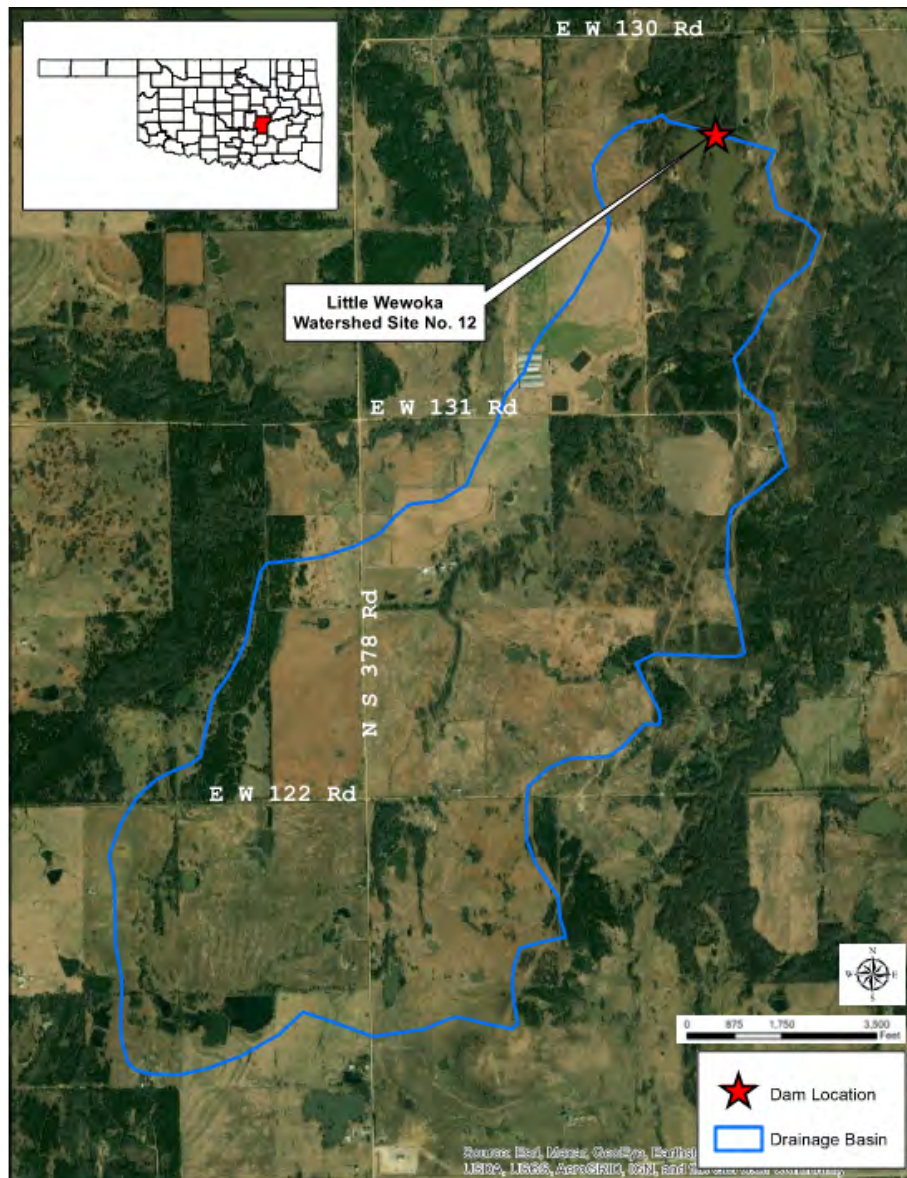


Figure 1. Location of FWRS No. 12 in Hughes County, Oklahoma.

The supplemental watershed plan-environmental assessment (Plan-EA) describes the existing conditions; develops alternatives; evaluates those alternatives' economic, social, and environmental impacts; and recommends a proposed action (the preferred alternative). The Plan-EA documents the process by which the NRCS provided technical assistance to the sponsor and the public in addressing resource issues and concerns within the Little Wewoka Creek watershed. It also documents how the process complied with the requirements of the National Environmental Policy Act (NEPA).

2.0 PURPOSE AND NEED FOR ACTION

2.1.1.1 PURPOSE

The project purpose is to reduce the risk of loss of life due to catastrophic dam failure; maintain the level of flood protection for property upstream and downstream of the dam up to the 100-year, 24-hour storm event that is currently provided by the dam's ability to attenuate flood; and reduce flooding by bringing the dam into compliance with current NRCS and Oklahoma safety performance standards to extend the service life of the dam another 100 years through the proposed action.

2.1.1.2 NEED

FWRS No. 12 was constructed as a low-hazard dam for the purpose of flood control. It has since been re-classified as a high-hazard (class C) dam. However, the vegetated earthen spillway and dam embankment do not meet NRCS or Oklahoma Water Resources Board (OWRB) dam safety program standards for a Class C high-hazard dam. The proposed action is needed to address public health and safety concerns that FWRS No. 12 does not meet NRCS or State of Oklahoma dam safety criteria because of downstream development within the breach inundation area. No immediate need for action associated with flood protection was identified beyond rehabilitation of the structure to high-hazard potential standards.

2.1.2 PROBLEMS

FWRS No. 12 was designed in 1958, as a low-hazard potential dam, as defined by both NRCS and the State of Oklahoma. Dams in Oklahoma are classified according to NRCS definitions in the National Engineering Manual Part 520, Subpart C – Dams (NEM 520), and according to the Oklahoma dam safety program, coordinated by the OWRB, as defined in O.S 785:25. It is currently classified as a high-hazard potential dam by both standards and is out of compliance with NRCS TR-60 design criteria (TR-60) and performance standards for principal spillway capacity and freeboard capacity. Because this dam was constructed prior to June 13, 1973, it is in compliance with §785:3-6(e)(1) of the Oklahoma state dam safety criteria, which states that the dam must pass a minimum design flood of 25 percent of the probable maximum flood with one foot of freeboard (O.S. 785:25).

There is potential for loss of life from a catastrophic dam failure due to potential significant flooding impacts to one residential structure. Additionally, dam failure could impact four roads downstream of FWRS No. 12, impeding emergency access during flood events.

2.1.3 OPPORTUNITIES

There are goals and benefits that can be achieved by a given project ancillary to its authorized purpose. The following opportunities may be realized while addressing the problem of breach hazards in the watershed:

- Enhance community resilience to flooding risks through the best fit of project measures,
- Incorporate nature-based solutions, and
- Enhance outdoor recreational opportunities.

3.0 SCOPE OF THE PLAN

A scoping process was conducted early in the planning process to determine the sponsor’s objectives and primary concerns and to identify other relevant issues and concerns related to FWRS No. 12. Issues of economic, environmental, cultural, and social importance within the watershed were discussed in planning and public meetings. Factors affecting soil, water, air, plants, animals, and human resources were identified by an interdisciplinary team with expertise in engineering, resource conservation, biology, archeology, soils, and geology. Table 1 shows the resource concerns discussed during the agency and public scoping meetings, along with their relevance to the proposed action.

TABLE 1. SUMMARY OF RESOURCE CONCERNS

Resource Concern	Relevant to Proposed Action		Rationale for relevance vs. non-relevance
	Yes	No	
SOILS			
Soils	X		Increase of 396 tons/year (0.91 acre-ft) of sediment to the stream system with some alternatives. Potential for soil disturbance is present for all alternatives. Best management practices (BMPs) should be used to minimize soil loss, erosion and sedimentation during construction.
Prime & Unique Farmland		X	Soils rated as prime farmland within the watershed are predominantly used for grassland/hay and pasture/rangeland with almost no crop land present. Consistent vegetative cover assists in protecting these soils from erosion. These land uses are not likely to change in the future. See map E-1 in Appendix E.

Resource Concern	Relevant to Proposed Action		Rationale for relevance vs. non-relevance
	Yes	No	
WATER RESOURCES			
Sole Source Aquifer		X	No sole source aquifers are present within the project area or the greater Little Wewoka Creek-Graves Creek Watershed. See resource map E-2 in Appendix E.
Water Quality	X		The project area is subject to total maximum daily load (TMDL) requirements for the Lower Canadian River subbasin. Potential decrease in water quality in the stream below the dam due to turbidity with some alternatives.
Waters of the U.S., Wetlands & Special Aquatic Sites	X		Potential loss of 29.37 acres of potential jurisdictional waters of the United States (streams, lakes, and wetlands) and 1.39 acres of emergent, shrub, and forested wetlands with some alternatives.
Floodplain Management	X		The project area is within a regulatory floodplain. See FEMA Firmette map E-3 in Appendix E. One residential structure and four roads would have increased flooding with some alternatives.
Coastal Zone Management Areas (CZMA)		X	The state of Oklahoma does not have a Coastal Zone Management Program and is not subject to coastal policies under the CZMA. See Program website: https://coast.noaa.gov/czm/mystate/
Coral Reefs		X	According to the U.S. Geological Survey (USGS) National Map, Hughes County is land locked with no waterways draining into marine environments. See USGS National Map E-4 in Appendix E.
Regional Water Resource Plans		X	No regional water resource plans have been developed for the region.
AIR RESOURCES			
Wild & Scenic Rivers		X	According to the National Park Service (NPS) geographic information system (GIS), there are no Wild and Scenic Rivers designated within the state of Oklahoma. See resource map E-5 in Appendix E.
Air Quality		X	The project area is in an attainment area for all criteria pollutants. Construction activities related to any of the alternatives are expected to result in no more than a <i>de minimis</i> impact on air quality. See resource map E-6 in Appendix E.
Climate	X		The contribution of greenhouse gas (GHG) emissions from any of the alternatives to aggregate state and national global GHG emissions would be negligible. Anthropogenic climate change could potentially impact local resources like hydrology.

Resource Concern	Relevant to Proposed Action		Rationale for relevance vs. non-relevance
	Yes	No	
PLANT AND ANIMAL RESOURCES			
Fish and Wildlife Habitat	X		There are many common species of fish and wildlife present within the project area. While there are no commercial fisheries within the area, there may be recreational fishing.
Threatened and Endangered Species	X		The U.S. Fish and Wildlife Service (USFWS) lists five threatened and endangered wildlife species that may be present within the project area. A “may affect, not likely to adversely affect” determination by USFW is necessary for species other than American burying beetle for which incidental take that may occur may be covered by the 4(d) rule within the South Plains Analysis Area outside of conservation lands.
Migratory Birds	X		Some migratory bird species were observed in the project area. While no migratory bird nests were observed, migratory birds are likely to nest in the area. Short-term adverse impacts can be minimized by implementing best management practices (BMPs) like removing trees and conducting project construction outside of the primary nesting season.
Bald and Golden Eagles		X	No eagles or their nests were observed during the pedestrian survey. Eagles are unlikely to use the project area due to the absence of large trees and agricultural land use surrounding the reservoir.
Essential Fish Habitat		X	Essential fish habitat is not present within the Little Wewoka-Graves Creek watershed. See USGS National Map E-4 in Appendix E.
Invasive Species	X		While invasive plant species were observed during the pedestrian survey, no state listed noxious weed species were observed. No evidence of invasive animals, fungi, or microbial organisms were observed within the project area during the pedestrian survey. Implementing BMPs, including contractor requirements to clean equipment prior to arriving on site and before leaving the site, will minimize potential spread and introduction of invasive species to and from the site.
Riparian Areas	X		There could be changes to riparian areas with some alternatives. However, no change in the conservation pool elevation would result in no impacts to riparian resources on the upstream portion of the project area. Impacts to riparian resources downstream of the dam would be minimized to what is necessary for rehabilitation with some alternatives.

Resource Concern	Relevant to Proposed Action		Rationale for relevance vs. non-relevance
	Yes	No	
Forest Resources		X	Forests make up 49 percent of the resources within the HUC 8 watershed and 26 percent of the FWRS No. 12 drainage basin. These forest resources are located in uplands and not likely to be impacted by any of the alternatives.
Natural Areas		X	There are no records of designated natural areas within the project area.
Ecologically Critical Areas		X	According to USFWS, there are no critical habitats present within the project area. See IPAC report in the Ecological Resources Inventory and Analysis memo in Appendix E.
HUMANS			
Land Use	X		Potential change of 26 acres of water area to riparian habitat or grassland with some alternatives. Flooding could impact land use with some alternatives.
Cultural Resources and Historic Properties	X		Through consultation or background research, no National Register of Historic Places (NRHP) properties, Oklahoma landmarks inventory properties, traditional cultural properties, properties of religious and cultural significance, or cultural landscapes are documented in the area of potential effect (APE). Section 106 consultation was conducted with the Oklahoma State Historic Preservation Office (OKSHPO), Oklahoma Archaeological Survey (OAS), Caddo Nation, Choctaw Nation, Muscogee Nation, Osage Nation, Quapaw Nation, and the Wichita and Affiliated Tribes. The FWRS No. 12 dam was evaluated for NRHP eligibility and determined not eligible for listing under Criteria A, B, C, or D. No archaeological sites were identified within the APE.
Public Health and Safety	X		Potential loss of protection to roads and structures downstream of the dam resulting in disruption of emergency vehicle access, school bus routes, and access to town with some alternatives.
Potable Water Supply		X	The reservoir at FWRS No. 12 is not used as a source of potable water.
Social Issues		X	There were no social issues or controversy identified with any of the alternatives beyond public safety.
Socioeconomics	X		Potential loss of flood protection with some alternatives and increased costs for flood damages.

Resource Concern	Relevant to Proposed Action		Rationale for relevance vs. non-relevance
	Yes	No	
Hazardous Materials		X	There is one tier II hazardous materials site located 0.5 miles west of the southern end of the reservoir, which would not be affected by any of the alternatives. See resource maps E-7 and E-8 in Appendix E.
Recreation	X		Potential loss of opportunities for incidental recreation like fishing, with some alternatives.
Scenic Beauty	X		Temporary or permanent loss of water feature from landscape with some alternatives.
Parklands		X	There are no local, State, or Federal parklands within the project area. Land ownership is 100 percent private.
Significant Scientific Resources		X	According to USGS and NPS, there are no significant scientific resources present in the project area.
Ecosystem Services			
Provisioning	X		Grassland production and pasture for livestock production are the primary land uses of interest to landowners.
Regulating	X		Flood attenuation of dam; water quality filtration of reservoir and wetlands.
Cultural	X		Public safety and scenic beauty of resources.

The project team evaluated alternatives with and without Federal assistance. The alternatives without Federal assistance included the no Federal action, which is the action that the sponsor would take if no Federal funds were provided. The alternatives with Federal assistance included decommissioning the dam and two structural rehabilitation alternatives. The alternatives are discussed in detail in Section 5.

4.0 AFFECTED ENVIRONMENT

4.1 PROJECT SETTING

FWRS No. 12 was planned and implemented under Public Law 83-566 (as amended), the Watershed Protection and Flood Prevention Act of 1954. Little Wewoka Creek rises in the northeastern part of Seminole County, approximately 9 miles north of Wewoka, and flows in a southeasterly direction through the southwestern part of Okfuskee County and the northwestern portion of Hughes County. The Little Wewoka Creek-Graves Creek watershed is approximately 125,859 acres (196.65 square miles) in size. The original workplan was authorized in 1955 and called for construction of 18 floodwater retarding structures (Figure 2 and Appendix B).

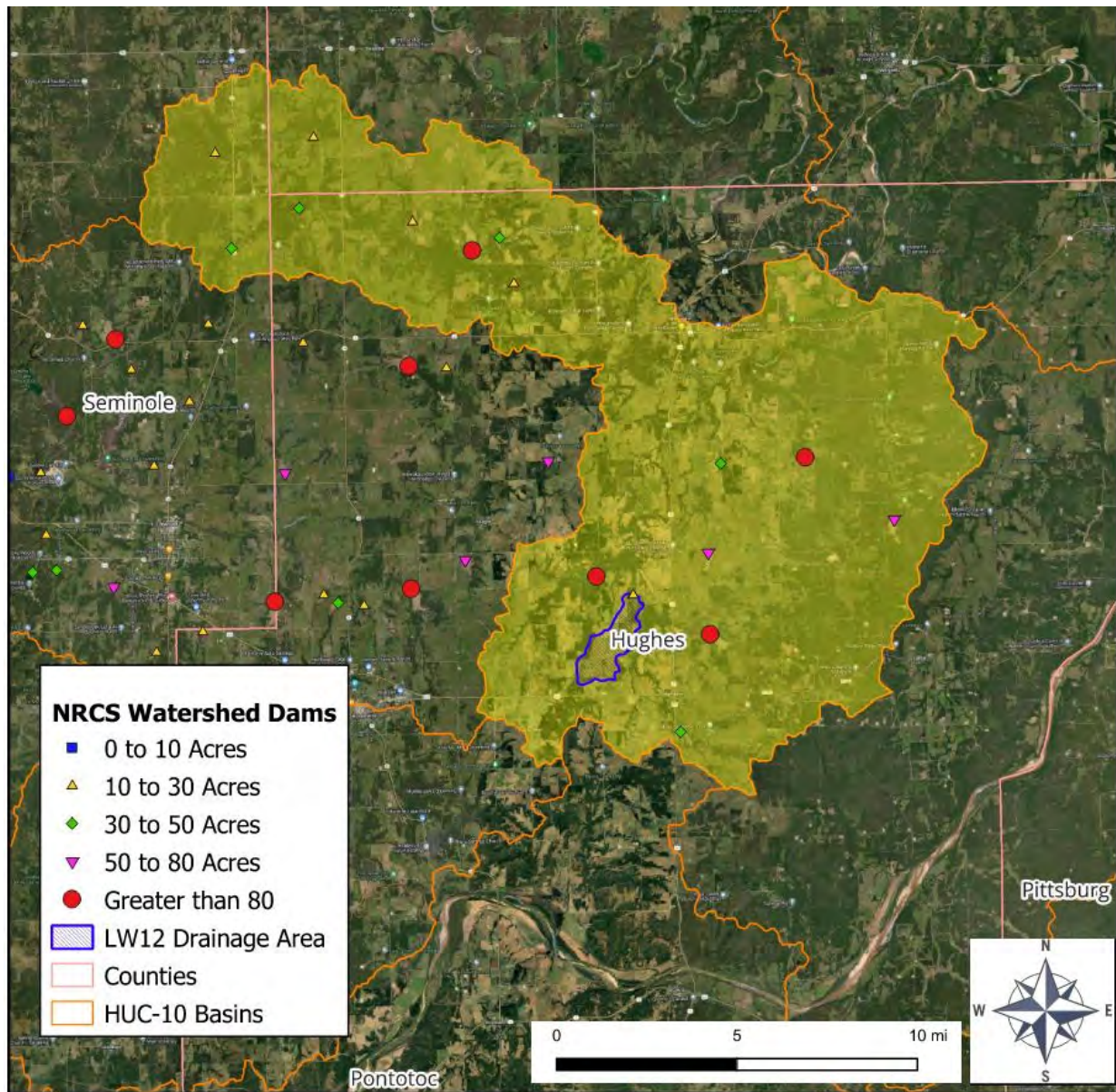


Figure 2. Works of improvement constructed in the Little Wewoka Creek-Graves Creek watershed.

FWRS No. 12 is approximately 2.9 miles north of Horntown and is located near the intersection of US Highway 75 and EW 130 Road. It is a single-purpose FWRS, designed and constructed in 1959 as a Class A low-hazard dam, a hazard classification given to dams that do not pose a threat to loss of life but could cause damage to agricultural lands and county roads and bridges if they fail. The dam was reclassified as Class C high-hazard dam, where failure may cause loss of life or serious damage to homes, buildings, public utilities, highways, or railroads due to a catastrophic dam failure. The change in classification is due to development within the breach zone downstream of the dam. The original drainage area for FWRS No. 12 was 1,414 acres (2.21 square miles). It was re-delineated for this study and found to be 1,366 acres (2.14 square miles).

4.2 CURRENT STATUS OF RESOURCES

The Little Wewoka Creek and Graves Creek watershed lies within the Cross Timbers ecoregion, which historically was a mosaic of oak savanna, scrubby oak forest, eastern red cedar, and tallgrass prairie. Topography is mostly plains broken by sandstone hills and broad, gentle valleys. Today, the landscape is dominated by pasture/hay for livestock and cropland agriculture. Vegetation is consistent with the surrounding area and includes rangeland and pasture grasslands and mixed deciduous/evergreen forests. Wetlands are generally small and associated with streams and the adjacent riparian corridors.

4.2.1 SOILS

Soils are the only resource considered in this plan, as prime farmland was dismissed during scoping.

Soil series present within the FWRS No. 12 drainage basin include: Bates fine sandy loam, 1 to 3 percent slopes; Bates fine sandy loam, 3 to 5 percent slopes, eroded; Bates-Coweta complex, 3 to 5 percent slopes; Clearview-Hector complex, 3 to 5 percent slopes; Dennis loam, 1 to 3 percent slopes; Dennis loam, 3 to 5 percent slopes, eroded; Dennis loam, 2 to 8 percent slopes, severely eroded; Eram-Verdigris complex, 0 to 20 percent slopes; Hector-Endsaw complex, 5 to 30 percent slopes, stony; Talihina-Coweta complex, 5 to 20 percent slopes, very stony; Verdigris silt loam, 0 to 1 percent slopes, occasionally flooded; Verdigris silt loam, 0 to 2 percent slopes, frequently flooded; and Water. According to the NRCS list of hydric soils, two of the soil series within the (Eram-Verdigris complex, 0 to 20 percent slopes and Verdigris silt loam, 0 to 1 percent slopes, occasionally flooded) are classified as hydric. See Appendix E for the soil survey report on hydric ratings.

4.2.2 WATER RESOURCES

Resources evaluated under existing conditions include water quality, waters of the United States (WOTUS), wetlands, and floodplain management. Sole source aquifers, special aquatic sites, coastal zone management areas, coral reefs, wild and scenic rivers, and regional water resource plans were dismissed during scoping.

4.2.2.1 WATER QUALITY

The Oklahoma Department of Environmental Quality maintains a list of impaired water through the National Pollutant Discharge Elimination System. The 303(d) and 305(b) lists were used to identify surface water quality concerns to public health and safety. The lists identified impaired surface waters within the Lower North Canadian Watershed (HUC 11100302), but not within FWRS No. 12 project limits; however, FWRS No. 12 project limits are hydraulically connected to the identified impaired surface waters and TMDLs. For this evaluation, hydraulically connected is defined as the flow path to the first classified segment, directly or indirectly, that first receives the

construction site's discharges. Discharges from FWRS No. 12 project site eventually reach the following classified segments by way of unnamed tributaries:

- Graves Creek (OK520500020060_00)
- Wewoka Creek (OK520500020010_00)
- North Canadian River (OK520500010110_00)

If construction activities discharge stormwater directly to an impaired segment or discharge stormwater indirectly to a segment with a TMDL, the entire watershed is subject to the TMDL requirements. The Lower North Canadian Subbasin (HUC 11100302) is subject to TMDL requirements, and as such all waterbodies within the watershed of the project area are subject to these TMDL requirements. Figure 3 shows the location of FWRS No. 12 in relation to the Lower North Canadian, which is listed as an impaired water in the state.



Figure 3. Map of impaired waters in central Oklahoma.

4.2.2.2 WATERS OF THE U.S., WETLANDS, AND SPECIAL AQUATIC SITES

Waters of the U.S.

The U. S. Army Corps of Engineers (USACE) regulates the discharge of dredged and fill material into WOTUS, including wetlands, under Section 404 of the Clean Water Act. Results of desktop mapping and a pedestrian survey indicated the presence of three open water body features and

seven streams within the project area (Figure 4). A tributary to Wewoka Creek (Stream 1) is a perennial tributary of the North Canadian River, which is listed as a traditional navigable water by the USACE. Therefore, due to the presence of a downstream surface hydrologic connection to a traditional navigable water, Stream 1, its tributaries, and any adjacent wetlands or impoundments would be considered WOTUS by the USACE, and subject to Section 404 jurisdiction. Detailed information can be found in the Ecological Resources Inventory and Analysis report in Appendix E.

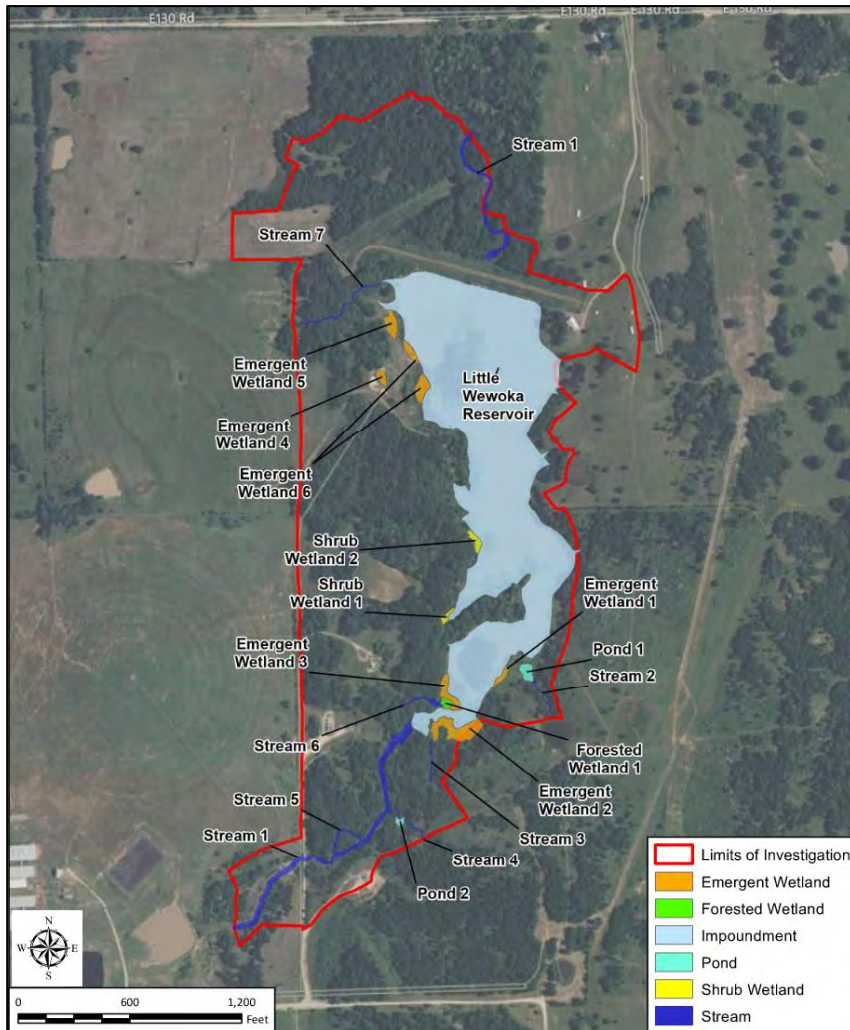


Figure 4. Map of WOTUS and wetlands within the project area for FWRS No. 12.

Wetlands

Nine wetlands (one forested, two shrub, and six emergent) were identified within the project area through desktop mapping and a pedestrian survey. Figure 4 shows wetlands within the project area. The wetlands range in size from 0.05 acres to 0.28 acres. Only one wetland (Emergent Wetland 4), a depressional wetland located on a hill slope west of the reservoir, was noted as

potentially non-jurisdictional due to location and lack of apparent connectivity to any streams. The remaining wetlands are adjacent to streams and potentially jurisdictional WOTUS, and subject to Section 404 permitting regulations.

4.2.2.3 FLOODPLAIN MANAGEMENT

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) 40063C0175C and 40063C0300C, the proposed project site would be constructed within the floodplain of Stream 1 (Figure 5). As such, the local floodplain administrator should be contacted prior to construction for the proposed project to acquire floodplain-related authorizations, if needed. See FEMA Firmette map E-2 in Appendix E.

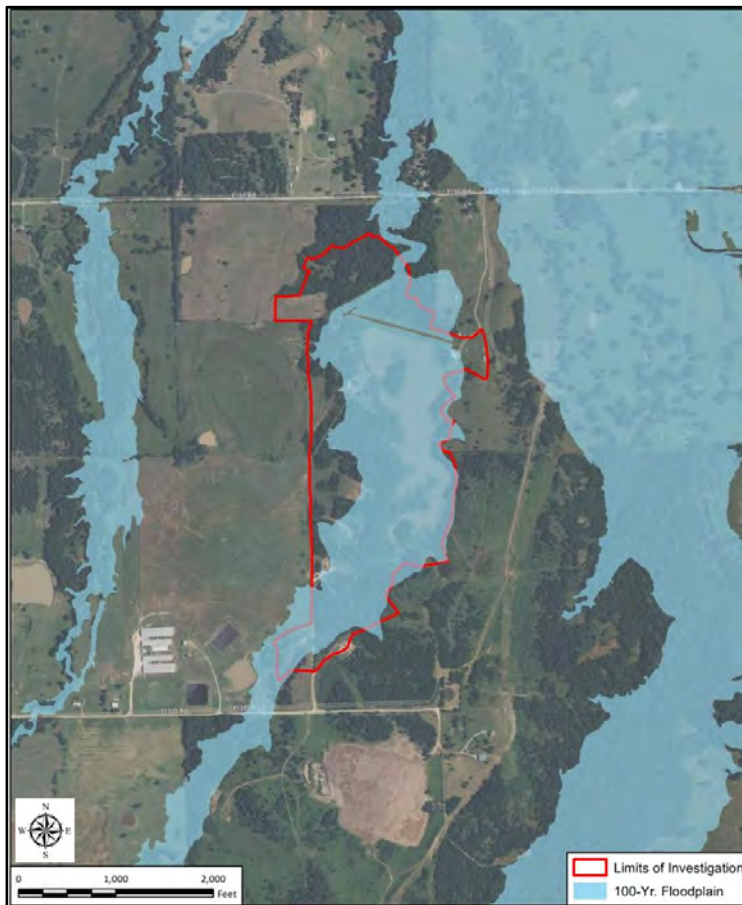


Figure 5. Map of 100-year floodplain within the project area for FWRS No. 12.

4.2.3 AIR RESOURCES

Climate is the only resource considered in this plan, as air quality was dismissed in scoping.

The state of Oklahoma lies within the Great Plains, straddling the transition from relatively abundant precipitation (more than 50 inches per year) in the southeast to semiarid conditions (less

than 20 inches per year) in the west. Due to its location in the interior of the United States and its distance from the moderating effects of any oceans, the state experiences a wide range of average daily temperatures, averaging from the upper 30s to low 40s in the winter and the upper 70s to low 80s in the summer (National Oceanic and Atmospheric Administration 2022).

According to the National Oceanic and Atmospheric Administration's 2022 state climate summary for the state of Oklahoma, temperatures have risen by about 0.6°F since the beginning of the 20th century. Future climate conditions within the state are predicted to include historically unprecedented warming; higher temperatures that will increase the rate of soil moisture loss, leading to an increase in the intensity of future naturally occurring droughts; and an increase in extreme precipitation events, which may increase the risk of flooding and associated soil erosion and nonpoint source runoff into streams and lakes.

Hughes County has a humid, subtropical climate with hot summers and mild winters. Average summer temperatures are near 80°F and near 40°F in winter. August is the hottest month, with average high temperatures of 94°F, and January has the coldest temperatures of 28°F. Precipitation is abundant throughout the year (80 days per year), with an approximate yearly average of 40 inches of rain and 4 inches of snow. May is the wettest month, with 5.6 inches of rain, and January is the driest, with 2.2 inches.

4.2.4 PLANT AND ANIMAL RESOURCES

The following resource concerns were dismissed during scoping: bald and golden eagles, essential fish habitat, forests, natural areas, and ecologically critical areas.

4.2.4.1 FISH AND WILDLIFE HABITAT

According to the Oklahoma Department of Wildlife Conservation (ODWC), a variety of mammals, reptiles and amphibians, birds, and fish species are commonly found within this part of Oklahoma.

Common terrestrial vertebrates include: American badger (*Taxidea taxus*), American beaver (*Castor canadensis*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), coyote (*Canis latrans*), eastern cottontail (*Sylvilagus floridanus*), eastern gray squirrel (*Sciurus carolinensis*), eastern mole (*Scalopus aquaticus*), eastern woodrat (*Neotoma floridana*), gray fox (*Urocyon cinereoargenteus*), nine-banded armadillo (*Dasypus novemcinctus*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), and white-tailed deer (*Odocoileus virginianus*).

Common amphibians and reptiles include: American bullfrog (*Lithobates catesbeianus*), Blanchard's cricket frog (*Acris blanchardi*), cottonmouth (*Agkistrodon piscivorus*), diamondback watersnake (*Nerodia rhombifer*), plains leopard frog (*Lithobates blairi*), and red-eared slider

(*Trachemys scripta elegans*), American toad (*Anaxyrus americanus*), eastern narrow-mouthed toad (*Gastrophryne carolinensis*), gray tree frog (*Hyla versicolor*), small-mouthed salamander (*Ambystoma texanum*), Strecker's chorus frog (*Pseudacris streckeri*), western narrow-mouthed toad (*Gastrophryne olivacea*), Woodhouse's toad (*Anaxyrus woodhousii*), common box turtle (*Terrapene carolina*), common snapping turtle (*Chelydra serpentina*), common five-lined skink (*Plestiodon fasciatus*), Dekay's brownsnake (*Storeria dekayi*), eastern hog-nosed snake (*Heterodon platirhinos*), eastern racer (*Coluber constrictor*), little brown skink (*Scincella lateralis*), ornate box turtle (*Terrapene ornate*), plain-bellied watersnake (*Nerodia erythrogaster*), prairie kingsnake (*Lampropeltis calligaster*), prairie lizard (*Sceloporus consobrinus*), ring-necked snake (*Diadophis punctatus*), river cooter (*Pseudemys concinna*), rough greensnake (*Opheodrys aestivus*), six-lined racerunner (*Aspidoscelis sexlineatus*), speckled kingsnake (*Lampropeltis holbrooki*), timber rattlesnake (*Crotalus horridus*), western diamondback rattlesnake (*Crotalus atrox*), and western ribbonsnake (*Thamnophis Proximus*).

Common fish include: black crappie (*Pomoxis nigromaculatus*), blue catfish (*Ictalurus furcatus*), bluegill (*Lepomis macrochirus*), channel catfish (*Ictalurus punctatus*), flathead catfish (*Pylodictis olivaris*), golden shiner (*Notemigonus crysoleucas*), green sunfish (*Lepomis cyanellus*), largemouth bass (*Micropterus salmoides*), longear sunfish (*Lepomis megalotis*), redear sunfish (*Lepomis microlophus*), spotted bass (*Micropterus punctulatus*), western mosquitofish (*Gambusia affinis*), white bass (*Morone chrysops*), and white crappie (*Pomoxis annularis*). The project area is inland and not located in or adjacent to areas designated as essential fish habitat.

4.2.4.2 THREATENED AND ENDANGERED SPECIES

According to the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPAC) resource list (Jan 2025), there are five wildlife species listed as threatened, endangered, potentially threatened, or candidate species that may potentially occur within Hughes County, Oklahoma. Figure 6 shows habitat areas for species that may occur within the project area.

Piping plover (*Charadrius melodus*) nest on the unvegetated shorelines of alkaline lakes, reservoirs, or river sandbars. No shorelines/sandbars, which may serve as nesting habitat were identified within the project area.

Rufa red knot (*Calidris canutus rufa*) uses saline lakes, and possibly large wetlands and riverine sandbars as stopover habitat. No potential stopover habitats were identified within the project area.

American burying beetle (*Nicrophorus americanus*) utilize and move between several vegetation types, including riparian zones, coniferous forest, mature forest, oak-hickory forest, as well as native grassland and grazed pasture with vegetation at a height over eight inches. While no individuals were identified during the pedestrian survey, preferred habitats for this species were identified within the project area. According to the American Burying Beetle 4(d) Rule for Federal and Non-Federal Activities, the project area would be located within the South Plains Analysis

Area for the American burying beetle but would be located outside of “conservation lands” described in the 4(d) Rule. Therefore, in accordance with the determination key to the American Burying Beetle 4(d) Rule for Federal and Non-Federal Activities, the proposed project actions may affect the American burying beetle. However, according to the 4(d) determination key, any incidental take of the American burying beetle that may occur as a result of an action covered by the 4(d) Rule within the South Plains Analysis Area that is not part of conservation lands is not prohibited under the ESA.

Alligator snapping turtle (*Macrochelys temminckii*) is a bottom dweller, which generally occupy the deeper waters of large rivers and major tributaries but are also found in fresh waterbodies with high canopy cover and aquatic structures (tree root masses, stumps, submerged trees, etc.). While no individuals were identified during the pedestrian survey, freshwater areas within upstream segments of Stream 1 and FWRS No. 12 reservoir, which may serve as habitat for alligator snapping turtles, were identified within the project area.

Monarch butterfly (*Danaus plexippus*) undergo long-distance migrations throughout North America and lay their eggs on obligate milkweed host plants in a variety of forested and grassland habitats. While no individuals were identified during the pedestrian survey, grassland and forested habitats that are not regularly mowed or maintained, which may serve as habitat for the monarch butterfly, were identified within the project area.

According to the ODWC list of state threatened and endangered species, no strictly State-listed threatened or endangered species occur within Hughes County, Oklahoma. Table 2 below summarizes the status of threatened and endangered species that may occur within the project area.

TABLE 2. STATE AND FEDERAL LISTED T& E SPECIES^{1/}

Common Name	Scientific Name	Federal Status ^{2/}	State Status ^{2/}
Piping plover	<i>Charadus melodus</i>	T	T
Rufa red knot	<i>Calidris canutus rufa</i>	T	T
Alligator snapping turtle	<i>Macrochelys temminckii</i>	PT	-
American burying beetle	<i>Nicrophorus americanus</i>	T	T
Monarch butterfly	<i>Danaus plexippus</i>	PT	-

1/ According to ODWC (2025) and USFWS (2025).

2/ T = Threatened; PT = Proposed Threatened

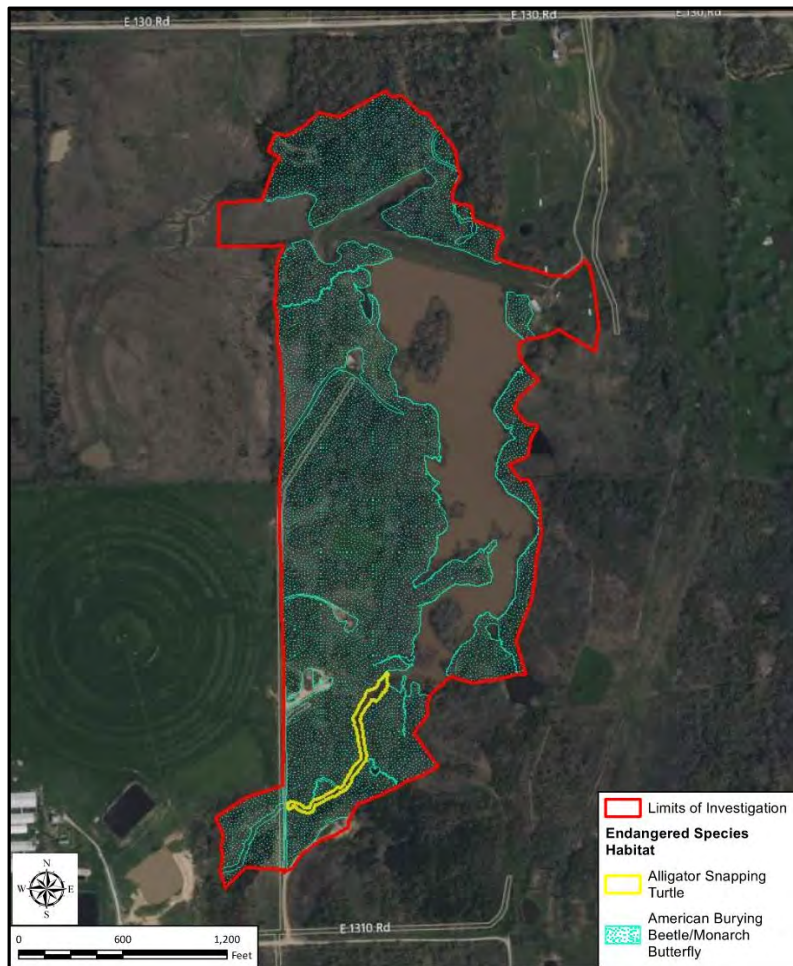


Figure 6. Map of threatened and endangered species' habitats within the project area.

4.2.4.3 MIGRATORY BIRDS

The Migratory Bird Treaty Act of 1918, prohibits the “take” (e.g., pursue, hunt, shoot, wound, kill, trap, capture, or collect) or possession of migratory birds, as well as the parts, nest, or eggs of migratory birds. According to the U.S. Department of the Interior Director’s Order No. 225, “incidental take,” which includes the take or kill of migratory birds that results from, but is not the purpose of, an activity is included as “take” under the act.

The following migratory birds were observed during the site visit: Bewick’s wren (*Thryomanes bewickii*), black-and-white warbler (*Mniotilta varia*), blue-gray gnatcatcher (*Poliioptila caerulea*) Carolina chickadee (*Poecile carolinensis*), dickcissel (*Spiza americana*), indigo bunting (*Passerina cyanea*), northern cardinal (*Cardinalis cardinalis*), northern flicker (*Colaptes auratus*), northern parula (*Setophaga americana*), painted bunting (*Passerina ciris*), red-shouldered hawk (*Buteo lineatus*), red-winged blackbird (*Agelaius phoeniceus*), tufted titmouse (*Baeolophus bicolor*), yellow-billed cuckoo (*Coccyzus americanus*), and white-eyed vireo (*Vireo griseus*).

The prairie loggerhead shrike (*Lanius ludovicianus excubitorides*), a migratory bird species found in grasslands, is the only bird of conservation concern that has a relative probability of presence in the project area in early November.

No migratory bird nests were observed during the survey; however, migratory birds are likely to nest within the project area or the immediate vicinity. Thus, the project may impact migratory birds.

4.2.4.4 INVASIVE SPECIES (FLORA AND FAUNA)

Vegetative invasive species observed during the site visit include Japanese brome (*Bromus japonicus*) and perennial rye (*Lolium perenne*) throughout uplands in the project area, while Japanese stiltgrass (*Microstegium vimineum*) was identified within wetlands adjacent to the reservoir.

No evidence of invasive animals, fungi, or microbial organisms was observed during the site visit, and no areas at risk for future invasions were identified.

4.2.4.5 RIPARIAN AREAS

Riparian areas adjacent to streams and the FWRS No. 12 reservoir are located within the project area. These areas contribute to floodplain function, streambank stability and integrity, nutrient cycling, pollutant filtering, sediment retention, and biological diversity of these habitats. NRCS policy requires project alternatives to maintain or improve water quality benefits of riparian areas as a result of project construction. If preferred alternatives do not maintain or improve water quality benefits, the NRCS must discontinue assistance on those portions of the plan impacting riparian areas.

4.2.5 HUMAN ENVIRONMENT

The human environment relates to concerns defined by human interactions with the environment, and includes land use/landcover, cultural resources, public health and safety, socioeconomics, scenic beauty, and recreation. The following concerns were dismissed during scoping: potable water supply, social issues, hazardous materials, parklands, and significant scientific resources.

4.2.5.1 LAND USE

Landcover within the Little Wewoka Creek-Graves Creek watershed and FWRS No. 12 drainage basin are dominated by three main cover types: forest (61,657 acres/49 percent, and 363 acres/27 percent, respectively), herbaceous grassland (29,791 acres/24 percent, and 329 acres/24 percent), and pasture/rangeland (27,401 acres/22 percent, and 600 acres/44 percent). Figure 7 illustrates landcover types within the HUC-8 watershed and the project area within the FWRS No. 12 drainage basin.

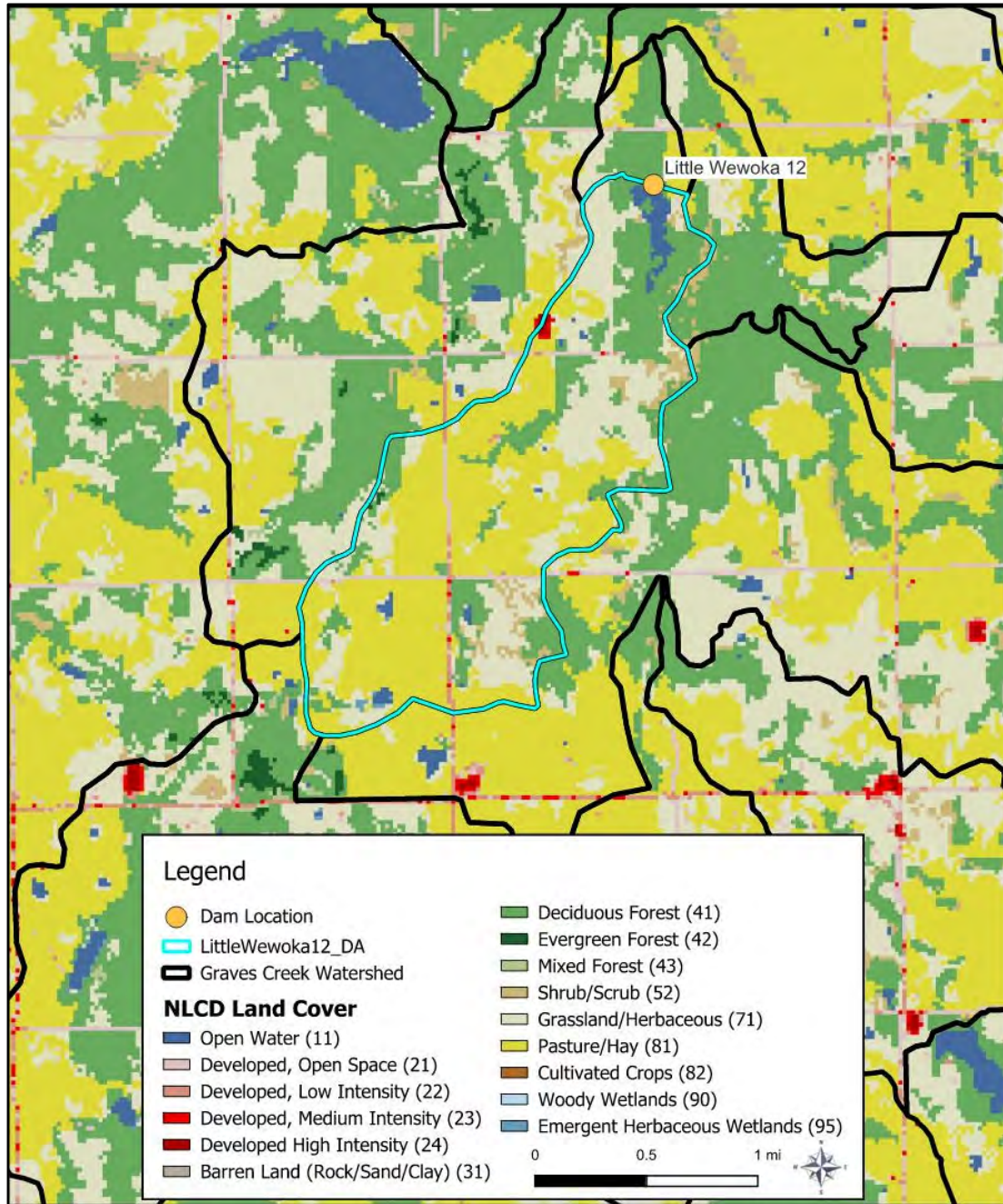


Figure 7. Landcover classification within the watershed and project area.

4.2.5.2 CULTURAL RESOURCES, HISTORIC PROPERTIES, AND TRIBAL CONSULTATION

In August 2023, an intensive cultural resources survey and a reconnaissance-level survey were conducted by Stantec within the APE for this project. Because the project will receive funding from NRCS, it is subject to the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA), as amended.

The APE, as defined by the NRCS, includes the flood pool based on the top of dam elevation and the auxiliary spillway, and therefore, has an irregular shape (Figure 8). In total, the APE encompasses approximately 106 acres. It has a total length, north to south, of approximately 0.97 miles (1.55 kilometers). At its widest, it extends 0.30 miles (0.48 kilometers) east to west. The APE gradually becomes narrower from north to south, with the most southern section extending only 22 feet (7 meters) east to west.

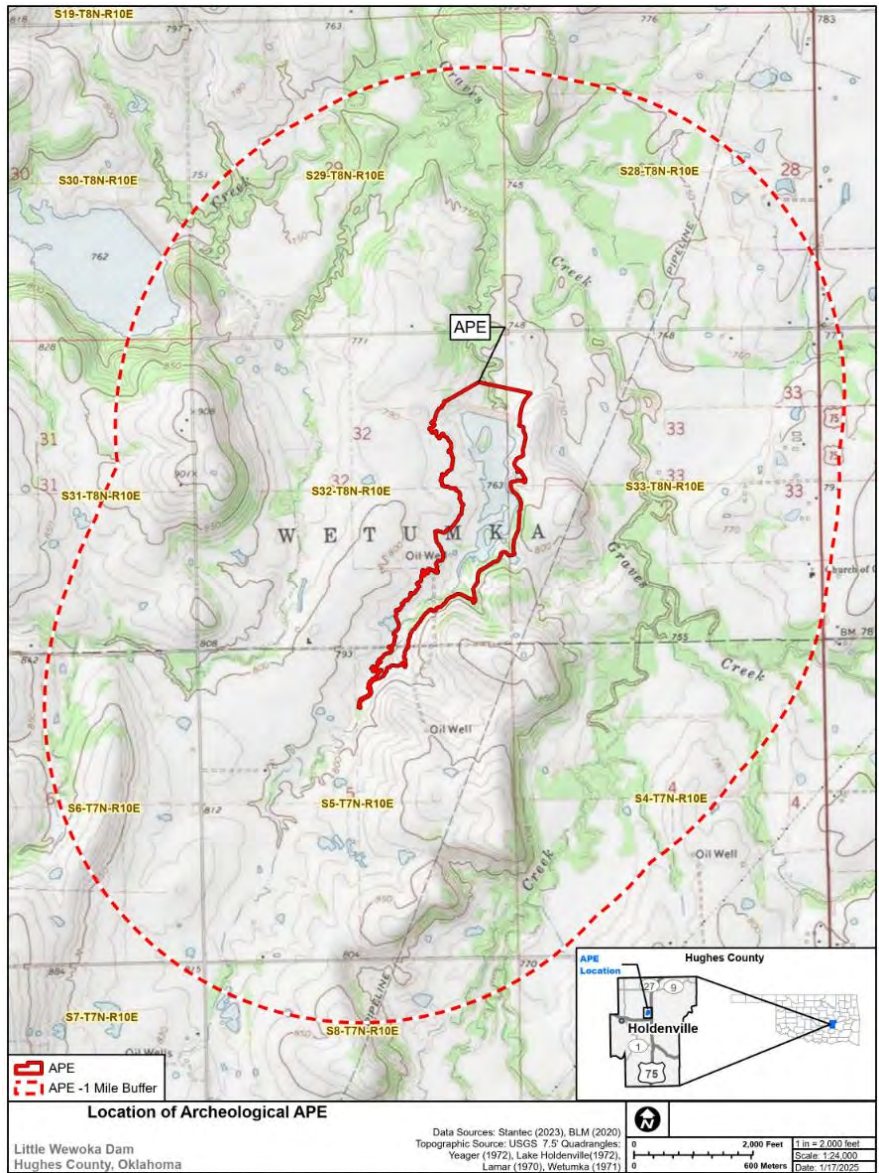


Figure 8. Map of the APE for Section 106 consultation.

No previously recorded archeological sites were reported within the APE, nor within its study buffer (1 mile or 1.6 kilometers) based on OAS data. Also based on OAS data, no previous surveys have been conducted within the APE. The Determinations of Eligibility in Oklahoma list, the

National Register of Historic Places (NRHP) in Oklahoma, and the Oklahoma Landmarks Inventory Database, available from the Oklahoma Historical Society (OHS) were reviewed, to determine if any NRHP, NRHP-eligible, or previously recorded resources are located within the APE of the surrounding area. No NRHP or NRHP-eligible resources have been recorded within or adjacent to the APE and no other historic-age resources have been listed on the Oklahoma Landmarks Inventory.

No recorded cemeteries were present within the APE, nor within the 1-mile (1.6 kilometer) study buffer.

Additionally, the Oklahoma Department of Transportation (ODOT) Bridge and Roadway Viewer was examined. There were no recorded known historic-era bridges or culverts within the APE, nor within the 1-mile (1.6 kilometer) study buffer.

No archaeological resources were observed during the archeological survey. The survey included a pedestrian survey augmented with the excavation of 230 shovel test units at 98-foot (30-meter) intervals along transects that were spaced no more than 98 feet (30 meters) apart. Some areas were steeply sloped, and extremely disturbed by previous dam construction; these areas were just subject to pedestrian surveys. No further archaeological work is recommended within the APE prior to construction.

An architectural survey of the FWRS No. 12 dam was conducted as part of the proposed rehabilitation improvements to the structure. The dam and complex are part of the mid-twentieth century development of soil conservation and water impoundment projects to control flooding and provide potential irrigation and recreation opportunities to rural areas (Figure 9). Additionally, a stock pond (Structure 2) unrelated to the dam was surveyed because it was in the APE. The resources of the reservoir and dam complex, the dam and reservoir (Structure 1A), auxiliary spillway (Structure 1B), and plaque marker (Object 1C) retain their integrity of setting, location, feeling, association, materials, workmanship, and design. The stock pond (Structure 2) retains its integrity of location, feeling, association, materials, workmanship, and design. Based on fieldwork and subsequent research, the resources surveyed as part of this project are recommended as not eligible for the National Register of Historic Places (NRHP) listing under Criterion A, B, C, or D.

Section 106 consultation was conducted with the OKSHPO, OAS, Caddo Nation, Choctaw Nation, Muscogee Nation, Osage Nation, Quapaw Nation, and the Wichita and Affiliated Tribes. The negotiated APE was defined. No traditional cultural properties, properties of religious and cultural significance, or cultural landscapes were noted through consultation. NRCS determined that due to the construction date of 1959, FWRS No. 12 and accoutrements warranted historic property documentation. FWRS No. 12 and its fixtures were evaluated using the NRHP criteria. NRCS determined that FWRS No. 12 did not meet the threshold for significance under NRHP Criteria A, B, C, or D to warrant listing on the NRHP. As stipulated by the OKSHPO, a historic property

resource inventory form was completed. The preferred alternative involves a structural upgrade (rehabilitation). As for direct effects, NRCS determined that rehabilitation would have “no adverse effect” on the identified historic property—will not diminish integrity. As to indirect effects (visual elements) with rehabilitation, a “no adverse effect” determination was made because the existing agricultural landscape will remain the same—will not diminish integrity. The OKSHPO, OAS, and two of the six consulted tribes (Caddo Nation and Quapaw Nation) concurred with the determination. The remaining four tribes (Choctaw Nation, Muscogee Nation, Osage Nation, and the Wichita and Affiliated Tribes) did not respond.

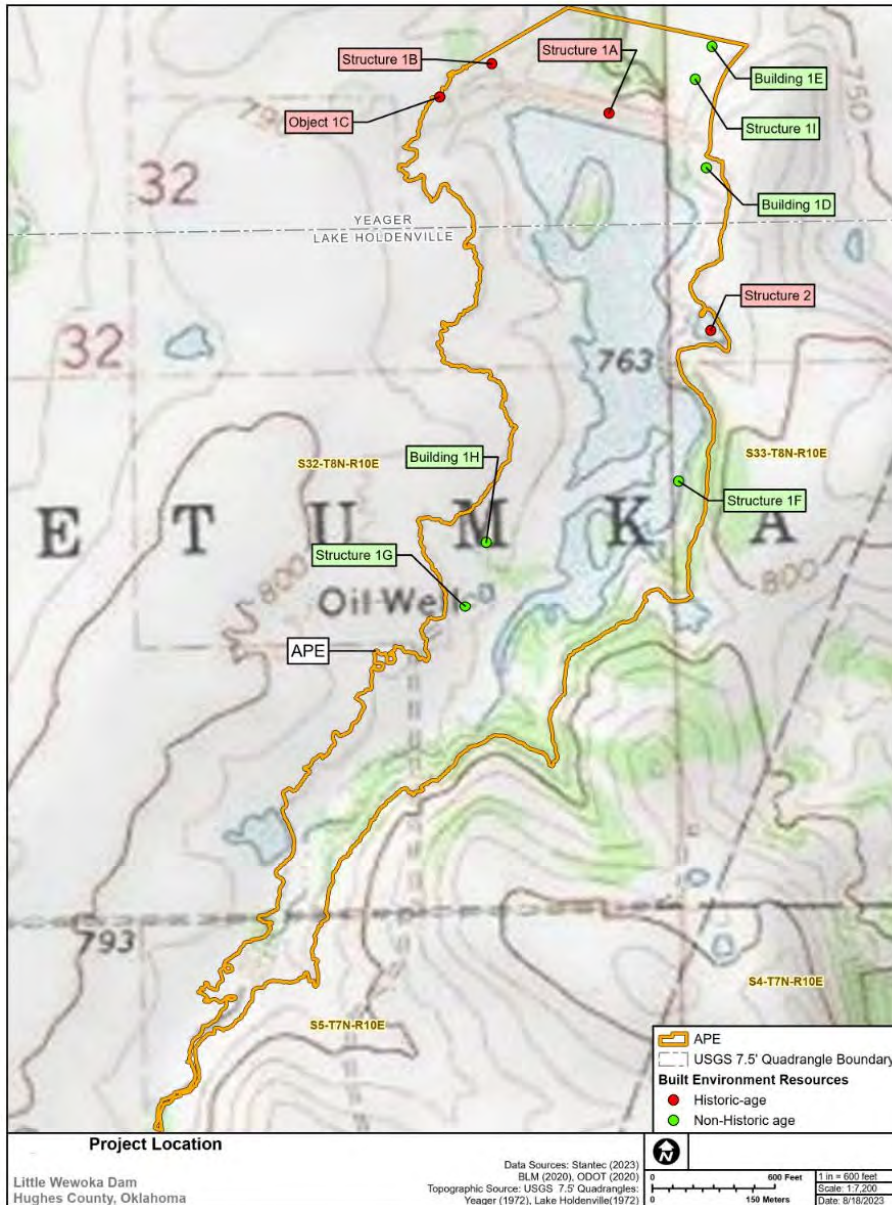


Figure 9. Map of built environment structures identified in the architectural survey.

4.2.5.3 PUBLIC HEALTH AND SAFETY

One residence, four roads, five bridges, and one culvert are located within the breach inundation zone and would be at risk from a catastrophic failure of the dam. The roadways serve as primary school and emergency access routes for rural residents. Flooding currently does not overtop these roads, barring failure of the dam.

4.2.5.4 SOCIOECONOMICS

Socioeconomic factors describe the local demographics, income characteristics, and employment in the region that could be affected by the proposed project. Table 3 compares demographic and economic data for the county to data for the State and the Nation.

TABLE 3. POPULATION AND DEMOGRAPHIC DATA FOR HUGHES COUNTY, OKLAHOMA

	Hughes County ^{1/}	Oklahoma ^{1/}	Nation ^{1/}
Population	13, 411	3,995,260	329,725,481
Households	4,003	1,542,780	127,482,865
Median Per Capita Income	\$22,026	\$30,976	\$37,638
Median Household Income	\$42,425	\$56,956	\$69,021
Median value owner-occupied housing units	\$77,400	\$150,800	\$244,900
Families living at or below the poverty level	18.4%	14.6%	12.4%
Native American Population	22%	7%	1%
Black Population	4%	7%	12%
Asian Population	N/A	2%	6%
Hispanic population	6%	11%	18%

^{1/} U.S. Census American Census Survey-5 year Estimate (2019-2023).

Total Population and Households: Based on data from the U.S. Census American Community Survey 5-Year Estimate (2019-2023), approximately 13,411 people reside in 4,003 households in Hughes County. There are 3,995,260 residents and 1,542,780 households in Oklahoma. Hughes County residents make up 0.3 percent of the State’s population. The greatest concentration of Hughes County residents lives west of US-75 and north of the Canadian River. Overall, the population in Hughes County is projected to increase less than 1 percent by 2032. Oklahoma’s population is anticipated to grow nearly 8 percent over the same period.

People of Color (POC): Census estimates indicate about 39.1 percent of the total population in Hughes County consists of POC. More POC live in Hughes County than Oklahoma, at 39.1 percent and 37.2 percent, respectively. POC are projected to grow by almost the same percentages in the county (15.3 percent) and State (15.4 percent) by 2032. Today, their concentrations are greatest in the Holdenville and Wetumka areas (Figure 10). Holdenville is 10.2 miles southwest and Wetumka is 11.9 miles north of FWRS No. 12.

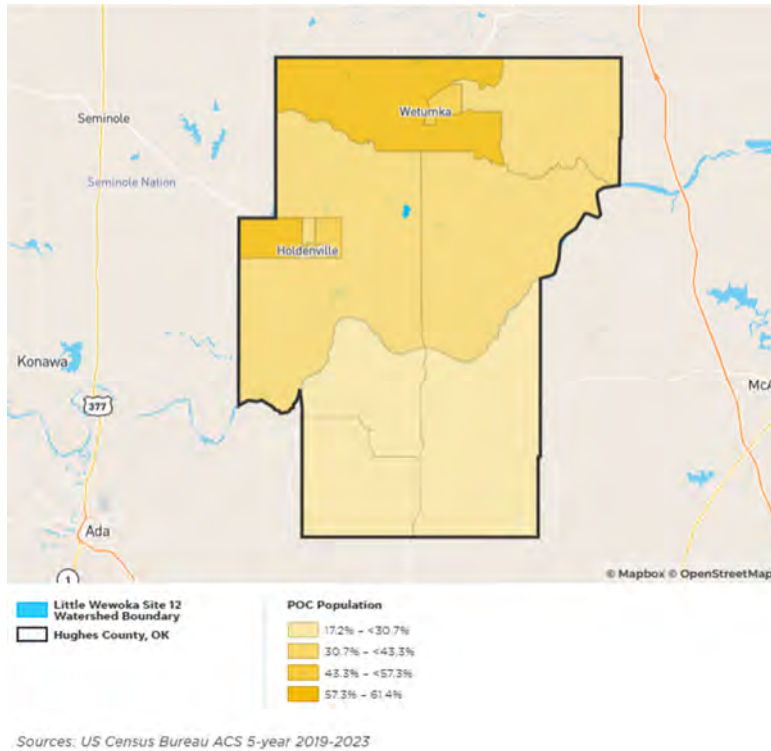


Figure 10. Concentrations of POC populations in Hughes County.

Languages Spoken: The two most common languages spoken in Hughes County are English and Spanish. Approximately 91.7 percent of residents speak English at home and 4.0 percent (507 people) speak Spanish. English (88.7 percent) and Spanish (7.9 percent) are also the two most common languages spoken in Oklahoma overall. Half as many (1.05 percent) Hughes County households speak limited English as compared to those in the state as a whole (2.06 percent). The USDA’s Rural Development Limited English Proficiency Implementation Strategy for Federally Assisted Programs indicates that if the size of the language group is smaller than 5 percent of the eligible beneficiaries or population and fewer than 1,000 in number, written translation of project materials is not required (USDA 2025). The average household size in Hughes County is three people, which is greater than the state average (2.5 people). An estimated 126 Hughes County residents live in limited English-speaking households.

Households Below Poverty: When compared to Oklahoma, more Hughes County households are in poverty at 18.8 percent and 15 percent, respectively. The greatest concentrations live east of Wetumka (Figure 11). Approximately 30.6 percent live in the Holdenville area and 21.5 percent in the southeast portion of the county. Information from the census indicates management; office administrative support; production; sales; education, training, and library; and production are the top five occupations in which Hughes County residents are employed.

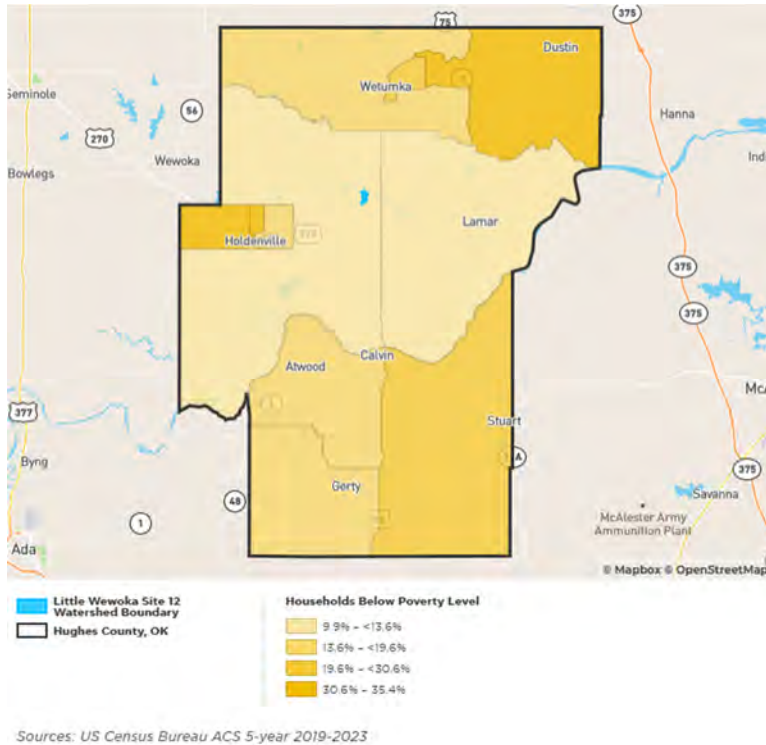


Figure 11. Concentration of households below poverty in Hughes County.

Persons without a High School Diploma: There are more people over the age of 25 in Hughes County (15.91 percent) who lack a high school diploma than in Oklahoma (10.87 percent) as a whole. Generally, both the county and State’s percentages of residents without a high school diploma are anticipated to decrease by 2032.

4.2.5.5 RECREATION

FWRS No. 12 is located on and surrounded by private land. Information gathered during scoping indicated that incidental recreation includes fishing, swimming, and youth skills education and deer hunting.

4.2.5.6 SCENIC BEAUTY

Hughes County is a relatively rural county. The primary landcover types are forest, pasture, and grassland, which provide a natural and relatively undisturbed look to the viewshed in the county. During scoping, rural nature and scenic beauty were resources of importance valued by landowners.

4.2.6 ECOSYSTEM SERVICES

Within the Little Wewoka Creek-Graves Creek Watershed and the project area, ecosystem service benefits are largely derived from grasslands, hay and livestock pasture, and natural stream systems. The benefits from these resources are derived by their direct consumption or use, regulation of natural and human processes, and the cultural value of their existence.

The provisioning services result from the pasture and hay fields and direct use of the water for livestock and incidental recreation. Hay fields and livestock pasture are the predominant agricultural uses. Thus, these areas produce direct benefits from harvested values, while indirectly contributing to the production of meat products. Water in the reservoir is utilized for watering livestock and for recreation (swimming and fishing).

The natural stream system present is the predominant driver of ecosystem service benefits. Wetlands and aquatic vegetation filter water, attenuate floods, and remove pollutants and sediment, which in turn improves water quality and aquatic habitat for fish and wildlife. The societal benefits include recreational use, aesthetic condition, and direct provisioning of water for use for livestock. It is important to note that FWRS No. 12 reservoir is not used for potable water for the public and only provides incidental recreation; therefore, the regulatory benefits are considered to be marginal.

Cultural ecosystem services within the project area are primarily provided by the aesthetic value of the natural systems and the grasslands used for hay and pasture. Residents within the project area value the natural and rural character of the watershed.

4.2.7 FORECAST FUTURE CONDITIONS

Forecasting future resource conditions within the Little Wewoka Creek-Graves Creek watershed will focus on the impacts of climate change. Long-term changes in climate will substantially alter ecological and physical conditions within the watershed, resulting in changes throughout both the natural and human environment.

As noted in Section 4.2.3, climate conditions within the State are predicted to include historically unprecedented warming and an increase in extreme precipitation events, which will lead to an increase in the intensity of future droughts and may increase the risk of flooding. Environmental resources including aquatic and terrestrial habitats are likely to be stressed by these changing conditions, which may result in species changes favoring those that are more capable of exploiting these conditions. Increased droughts and flooding are likely to increase soil erosion. The presence of highly vegetated systems including forests, grasslands, and pastures within this watershed will help to alleviate issues with erosion. Changes in weather patterns, sedimentation, and water quality due to climate change will also likely affect WOTUS and other aquatic resources.

Climate change will also affect human health and safety, with the potential for increased flooding due to extreme precipitation events, which is anticipated to expand floodplain areas and render existing floodplains even more prone to floods. These changes are likely to result in greater flood risk in local communities and levels of flood damage to infrastructure and structures. Increased flooding will also have an economic impact, as expenditures for recovery are expected to increase, which may have adverse economic effects within communities.

4.3 PHYSICAL FEATURES OF FWRS NO. 12

The as-built drawings for FWRS No. 12 show a dam height of 35 feet and an embankment length of 1,220 feet, with approximately 94,670 cubic yards of fill. The principal spillway consists of an 18-inch diameter reinforced concrete conduit. The auxiliary spillway has a width of 70 feet, with a planned minimum discharge of 90 cubic ft per second. Maximum storage at top of dam is 1,063 acre-feet, of which 671.89 acre-feet are detention storage and 152.5 acre-feet are sediment storage.

4.3.1 STATUS OF OPERATIONS AND MAINTENANCE

Operation and maintenance (O&M) of the dam is the responsibility of the sponsor. A watershed operation and maintenance agreement was entered into by NRCS and Hughes, Okfuskee, and Seminole Counties in October 1958. The O&M plan defines the sponsor's responsibilities for operating and inspecting the structure. The 2021 Dam Assessment Report (Freese and Nichols 2021) stated, "Operation and maintenance is considered to be adequate. There are items including minor erosion, wood vegetation, and animal trails/burrows that need to be brought up to date during routine O&M activities. Leakage of the conduit, missing outlet gate stem, and corrosion of the intake orifice plate need to be addressed."

The sponsor has been maintaining the dam and conducting annual inspections, with the last inspection on October 25, 2024. The inspection noted small trees on the embankment slope; minor drift debris, minor wave damage, and gopher holes present on the front slope; normal rust on the inlet structure and gate valves; no erosion but some small trees within the auxiliary spillway. Action needed was noted as low (within the next 12 months) and included mowing the site, monitoring erosion at the plunge basin, and cutting the small trees in the auxiliary spillway.

4.3.2 ANALYSIS OF SEDIMENT ACCUMULATION

A bathymetric survey was conducted in February 2023, to determine the existing available sediment storage and the sedimentation rate. The sedimentation rate was calculated by comparing the sediment storage volume (at sediment pool elevation) provided on the as-built drawings (November 1958) to the calculated storage volume using the bathymetric survey data at the same sediment pool elevation. The difference in storage volumes over the number of days between the as-built drawings and the bathymetric survey provided the daily sedimentation rate. The daily sedimentation rate was then used to determine the annual sedimentation rate. The projected 100-

year sediment capacity was calculated using the annual sedimentation rate over 100 years. The projected 100-year sediment volume capacity was then compared to the design 100-year sediment volume capacity to complete the sedimentation analysis.

FWRS No. 12 was originally designed with a 100-year sediment volume capacity of 152.5 acre-feet (66,211 tons), at an elevation of 764.2 feet. The calculated annual sedimentation rate is 0.91 acre-feet per year. The existing dam has a projected 100-year sediment capacity of 90.6 acre-feet (39,465 tons), at an elevation of 761.23 feet. Given that the projected 100-year sediment capacity volume is below the current sediment pool elevation of 764.2 feet, this shows that the sedimentation rate over the project lifespan is less than the original design, and there is still 100-year storage capacity remaining within this facility.

4.3.3 EVALUATION OF POTENTIAL FAILURE MODES

FWRS No. 12 was built for conditions that existed or could be reasonably anticipated at the time of its original design. These conditions can change over time, which can increase the risk of dam failure. Several modes of failure were evaluated for FWRS No. 12.

4.3.3.1 SEDIMENTATION

The sediment analysis shows that FWRS No. 12 is capturing sediment at a lower rate than forecasted in the original work plan, as noted in Section 4.3.2. Decreased detention storage due to excessive sediment accumulation would result in more frequent auxiliary spillway function and increase the risk of failure due to increased use of the auxiliary spillway. Sedimentation presents a low risk of failure.

4.3.3.2 HYDROLOGIC CAPACITY

There are several identified deficiencies with FWRS NO. 12 involving the hydraulic capacity of the dam and the integrity and stability of the auxiliary spillway. These deficiencies are discussed in detail below.

4.3.3.3 HYDRAULIC CAPACITY

The existing dam does not meet the current NRCS hydraulic capacity criteria, as defined in TR-60. The following items are out of compliance:

- Dam must pass the 6-hour freeboard hydrograph without overtopping.
- Dam must pass the 24-hour freeboard hydrograph without overtopping.
- Principal spillway must pass the 100-year, 24-hour storm without activating the auxiliary spillway.
- Principal spillway conduit minimum diameter must be 30 inches (TR-60 criteria). The current principal spillway conduit diameter is 18 inches.

- Principal spillway capacity must empty at least 85 percent of the principal spillway hydrograph routed through the retarding pool within 10 days or less.

4.3.3.4 INTEGRITY AND STABILITY

Integrity and stability issues were identified with the current earthen auxiliary spillway. Integrity analyses were performed using the 6-hour and 24-hour freeboard design hydrograph in the updated SITES model. The flow depth for the 6-hour freeboard hydrograph was 5.37 feet with an existing velocity of 17.02 feet per second. Both hydrographs showed significant erosion throughout the auxiliary spillway, making it out of compliance with TR-60.

The stability analysis was performed with the 6-hour stability design hydrograph. The maximum allowable soil and vegetal stress values are 0.048 pounds per square foot (psf) and 4.80 psf, respectively. The computed stresses were 0.78 psf for the soil and 5.13 psf for the vegetal stress, making the auxiliary spillway out of compliance with TR-60.

The overall potential risk for hydrological failure of the dam is considered to be high.

4.3.3.5 SEEPAGE

FWRS No. 12 does not have a foundation drainage system. Seepage was observed at the toe of the dam during the 2021 assessment but didn't show signs of flow. Seepage presents a low risk for failure.

4.3.3.6 SEISMIC

The Little Wewoka Creek-Graves Creek Watershed is located in an area of low potential seismic activity; therefore, seismic activity presents a low potential risk of failure for FWRS No. 12.

4.3.3.7 MATERIAL DETERIORATION

A field inspection completed in March 2021 for the dam assessment (NRCS 2021), noted the following conditions:

- The intake structure exhibited concrete deterioration near the waterline. In addition, corrosion of metal components included complete corrosion of the orifice plate and the gate stem.

A video inspection of the outfall pipe revealed pitting of the concrete and three leaks along the pipe. Two of the leaks were slow seeps with iron bacteria buildup, but one leak at about mid-dam was heavily dripping. Significant iron bacteria buildup was present at this leak, but no soil infiltration was observed. No displacement or joint damage was observed.

Material deterioration presents a moderate risk for failure.

4.3.4 BREACH ANALYSIS

A breach analysis was conducted to determine the potential risk to loss of life if the dam suddenly failed under “sunny day conditions,” defined as the water surface elevation at top of dam and no inflow. The breach analysis was terminated at the location where the breach inundation water surface was contained in the channel and not impacting structures. The hydrologic breach extended approximately 6.2 miles downstream along Graves Creek, to before the confluence at Wewoka Creek, just north of East 1260 Road. A total of four roads and one residential structure would be impacted if the modeled hydrologic breach or static breach occurred. The depth of inundation for the residential structure ranges from 3.7 to 6.4 feet. Inundation of East 130 Road would be the greatest, ranging from 7.6 to 10.4 feet. Breach inundation and flood frequency maps (Figure C-1 in Appendix C) show the location and extent of potential breach inundation areas and flood damage locations.

4.3.5 HAZARD CLASSIFICATION

The results of the breach inundation analysis provide the information needed to complete the hazard classification evaluation. The analysis included evaluating the existing downstream area for potential hazards caused by a dam breach. Based on the inundation mapping (Figure C-2 in Appendix C), it is recommended that the dam remains classified as a high-hazard potential, because a dam failure may cause loss of life or serious damage to homes, industrial or commercial buildings, important public utilities, main highways, or railroads located within the downstream breach zone.

4.3.6 CONSEQUENCES OF DAM FAILURE

The most likely source of a potential dam failure is the inadequate hydraulic capacity of the earthen auxiliary spillway to safely pass hydrologic loadings for this high-hazard dam classification, and the inadequate size of the principal spillway conduit.

A sudden failure of the dam could potentially cause loss of life to residents of one home downstream of the dam, as well as motorists traveling the four roads also located within the breach zone. Additionally, large amounts of fill material present within the existing embankment of the dam would be released into the stream system, impairing water quality, decreasing aquatic habitat, and increasing downstream flooding. Sedimentation would completely destroy the productivity of pastureland and hay meadows located downstream. From the risk assessment, the population at risk downstream of FWRS No. 12 is 11. Reducing the loss of human life and meeting the current dam safety and performance criteria are the primary reasons for proposing the rehabilitation of FWRS No. 12.

5.0 PLAN FORMULATION

Multiple flood control structures are located within the Little Wewoka Creek-Graves Creek Watershed. These structures may be modified or removed in the future, which would impact flood control for the entire watershed. As it is unknown what modifications may be completed for these structures in the future, this plan was completed assuming that the structures would remain in place as-is and continue to provide flood protection for the watershed.

The hydraulic analysis used the SITES software to perform the routing of the dam and stability analysis per TR-60. The rating curves for the existing principal spillway, the existing auxiliary spillway, the proposed principal spillway, and the proposed auxiliary spillway were developed using the SITES software. The hydrology for the hydraulic assessment was provided from the existing SITES model and from a hydrologic model developed using the USACE's Hydrologic Engineering Center Hydrologic Modeling System software for evaluation of the existing hydrologic conditions of the dam watershed.

5.1 FORMULATION OF ALTERNATIVES

5.1.1 FORMULATION PROCESS

Formulation of the alternative rehabilitation plan for FWRS No. 12 followed procedures outlined in the NRCS National Watershed Program Manual (NWPM). Other guidance incorporated into the formulation process included O.S. 785:25. Several alternatives were considered, including two rehabilitation options that were carried through in a detailed study. The purpose and need for FWRS No. 12 shall comply with the safety criteria in the NWPM and O.S. 785:25.

5.1.1.1 GUIDING PRINCIPLES

Principles, Requirements, and Guidelines were used to guide the identification of measures and formulation and evaluation of alternatives. The guiding principles include:

- Healthy and resilient ecosystems
- Sustainable economic development
- Floodplains
- Public safety
- Watershed approach

5.1.1.2 PLAN CRITERIA

Planning criteria include completeness, effectiveness, efficiency, and acceptability, which are used as targets during plan formulation but, are not used as screening criteria during evaluation of

environmental impacts. The full definitions of these criteria and the results of this initial screening process are presented in Section 6.1.

5.1.1.3 RISK AND UNCERTAINTY

Analyzed benefits under the proposed alternatives were limited to flood damage reduction, including damages to structures, crops, pastures, bridges, culverts, and railroads, as well as erosion and sedimentation damages. Data from the Hughes County appraisal district was used to determine the 2023 value of affected structures. Data from the USDA's National Agricultural Statistics Service was used in the analysis of agricultural damages (USDA 2021). Data on replacement unit costs for bridge and culvert projects, from the U.S. Department of Transportation Federal Highway Administration, was adjusted to 2023 dollars and used to determine costs associated with damages to bridges and culverts. Erosion and sedimentation damages, including damages associated with agricultural production, were not independently estimated for this study, to maintain consistency with the original watershed plan. These damages were included by taking the proportion of the damages from the original work plan for the dam based on contribution to the total Little Wewoka Creek and Graves Creek Watershed and adjusting the prices to 2023 dollars using the gross domestic product implicit price deflator.

Federal agencies are required by the Water Resources Development Act of 1974 to use a specified discount rate in the formulation and evaluation of water and related land resource plans for the purpose of discounting future benefits and computing costs. The discount rate is established by Section 80 of the act and is tied to yields on government securities with more than 15 years to maturity. The fiscal 2024 discount rate is 2.75 percent. It was assumed that the project lifespan would be 102 years.

The objective of this project is to meet applicable NRCS and State of Oklahoma safety and performance standards for a high-hazard potential dam.

Based on the evaluation of existing conditions and the anticipated structural measures to be installed, it is the judgement of the team that conducted the environmental evaluation that the rehabilitation of Little Wewoka Creek and Graves Creek FWRS No. 12 will not result in significant effects on the human environment that have not been identified in the 2002 rehabilitation EIS written for this type of action in this location. No compensatory mitigation of resources would be warranted or required. Should project plans change, or should the project be implemented in such a way that impacts to resources not considered during this evaluation could occur, mitigation requirements would need to be reconsidered.

5.2 ALTERNATIVES

The formulation process began with formal discussions between the sponsor and NRCS. The alternative plans that were considered include:

- No-Action Alternative (FWOFI)
- Alternative No. 1 – Decommissioning
- Alternative No. 2 – Widen Existing Spillway
- Alternative No. 3 – New Auxiliary Spillway - roller-compacted concrete (RCC)
- Alternative No. 4 – 48-inch Principal Spillway
- Alternative No. 5 – Non-structural Flood Protection

5.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Additional measures considered, but not studied in depth, included bringing the dam into compliance as a low-hazard dam through right-of-way and inundated building buy-out. Purchasing of inundated right-of-way and buildings was determined unfeasible and unacceptable to the sponsor due to lack of interest by property owners and concern that it would likely increase flood risk.

5.3.1 ALTERNATIVE NO. 4 – 48-INCH PRINCIPAL SPILLWAY

The project team was directed not to study Alternative No. 4 due to its similarity to Alternatives No. 2 and No. 3. The larger principal spillway conduit of 48 inches includes a larger intake tower, which would require additional construction costs when compared to Alternatives No. 2 and No. 3. This alternative was dropped from detailed analysis due to concern about induced downstream flooding from the increased principal spillway flow and for its general similarity to Alternatives No. 2 and No. 3.

5.3.2 ALTERNATIVE NO. 5 – NON-STRUCTURAL FLOOD PROTECTION

This alternative is similar to the decommission alternative in that it provides downstream flood protection by removing properties from the floodplain and raising roads to prevent flooding during the 100-year storm. This alternative assumes the dam is left in place. A cost estimate was completed during the assessment of the decommission alternative and was used for estimating the approximate cost of this alternative. The cost for this alternative would be \$27,886,700 with an annual cost of \$824,000.

Under this alternative, the property located downstream of the structure would be bought out and the four roads impacted by the 100-year floodplain would be raised to prevent overtopping. A concept cost estimate was developed to determine how feasible this alternative would be. Raising the four roads is a significant construction cost of approximately \$15.3 million. The high construction cost is due to the significant increase in height needed for many of these roads, which increases the amount of fill needed to raise the roads. Also included in this cost is the price of new bridges and culverts for the impacted roads. While this alternative would alleviate flooding

concerns and potential loss of life in the breach zone downstream of the dam, it would not meet the purpose and need for maintaining flood protection in the greater watershed.

5.4 DESCRIPTION OF ALTERNATIVES CONSIDERED FOR DETAILED STUDY

The following section describes the alternatives that were studied in detail. See Appendix C for the action alternatives plan details.

5.4.1 NO ACTION ALTERNATIVE (FWOFI)

One of the alternatives that must be included in the plan is the “no-action” alternative, also referred to as the future without project (FWOP) or future without Federal investment (FWOFI). For the rehabilitation program, the no-action alternative is “an estimation of the most probable future condition expected to occur in the absence of the study’s alternative plans” (NWPM Part 506, Section 506.50 Glossary). For the purposes of this plan, it is assumed that no action would be taken to address current safety concerns and hazards. The sponsor would continue to operate and maintain the dam as it always has. The dam is assumed to eventually fail and not be subsequently rebuilt or rehabilitated.

As noted in Section 4.3.3, the no-action alternative considers two modes of failure: failure of the auxiliary spillway and overtopping of the dam. A frequency analysis was performed to determine the return periods of these two modes of failure. The annual exceedance probabilities of the auxiliary spillway failing and of the dam overtopping are both less frequent than 0.1 percent, or the 1,000-year storm. Therefore, this dam falls under Case 2 of Part 303.

If a dam is in an area of forecasted low-damage potential (rural and sparsely developed) and it is judged that an increment of damage for an annual probability less frequent than 0.1% (more than a 1,000-year recurrence) is inconsequential to the plan decision, then use the 0.1% annual probability.

The no-action alternative does not meet the sponsor’s goal of maintaining the existing level of flood protection for downstream properties.

5.4.2 ALTERNATIVE NO. 1 - DECOMMISSIONING

Decommissioning is a mandatory alternative that must be considered under the NRCS policy for dam rehabilitation. This alternative must be brought into the final array of alternatives and cannot be eliminated simply because of sponsor preferences of the subjective determination that it may be too costly.

Decommissioning FWRS No. 12 would require removing the flood detention capacity of the dam by cutting a 100-foot-wide trapezoidal notch in the existing embankment down to the valley floor. A trapezoidal channel with a bottom width of 18 feet would be established in this notch, with 2-

to-1 side slopes and the valley floor at a slope of 0.0038 feet/feet to reconnect the existing channels. This alternative would eliminate all storage capacity and reconnect and stabilize the historic stream channel and floodplain alignment. The amount of dam embankment removed would allow the 100-year, 24-hour flood event to safely pass through the embankment area. All principal and auxiliary spillway components would be removed, and the historic channel would be restored and connected to the existing downstream channel.

Federal policy requires that the decommissioning alternative address the purpose and need for flood protection. There is one habitable structure and four roads within the 100-year floodplain. If the dam were removed, the five locations identified in the hydrologic and static breach zones would be at risk from flooding during the 100-year storm. Water surface elevations would increase approximately 3 feet near West 130 Road and would also increase water surface elevations downstream. The downstream bridges and roads would have to be protected. Mitigation of induced damages to the buildings includes relocation or floodproofing the impacted structures, home buyouts, or purchasing easements.

The residence located just downstream of the dam would have to be bought out or floodproofed. Modeling shows that the property would be inundated by approximately 2 feet of water without the dam during the 100-year storm. In addition, approximately 6 additional acres of land downstream of the dam would be inundated. This area would need to be regulated to prevent future development in the area.

Four local roads would also be inundated during the 100-year storm without the dam. These roads need to be modified, either by raising the road, upsizing the existing culvert, or a combination of these, to prevent overtopping.

Notching the dam embankment would require the removal of about 12,000 cubic yards of material, which equates to about 30 percent of the embankment. Removal of the principal spillway, bridge, concrete chute, and water supply/lake drain structures would also be necessary. Some of these unneeded materials could be buried on-site or hauled to an appropriate disposal site. The remaining fill material would be stabilized and vegetated. The submerged sediment would be stabilized or removed. The function and stability of the stream channel would be restored. About 4 acres of grass would be planted over the dam site. Stabilizing the reservoir footprint once the dam was breached would require hydro-mulching/hydro-seeding approximately 42.5 acres, as well as establishing a wooded riparian corridor extending 100 feet along both sides of the proposed stream channel (Figure 14).

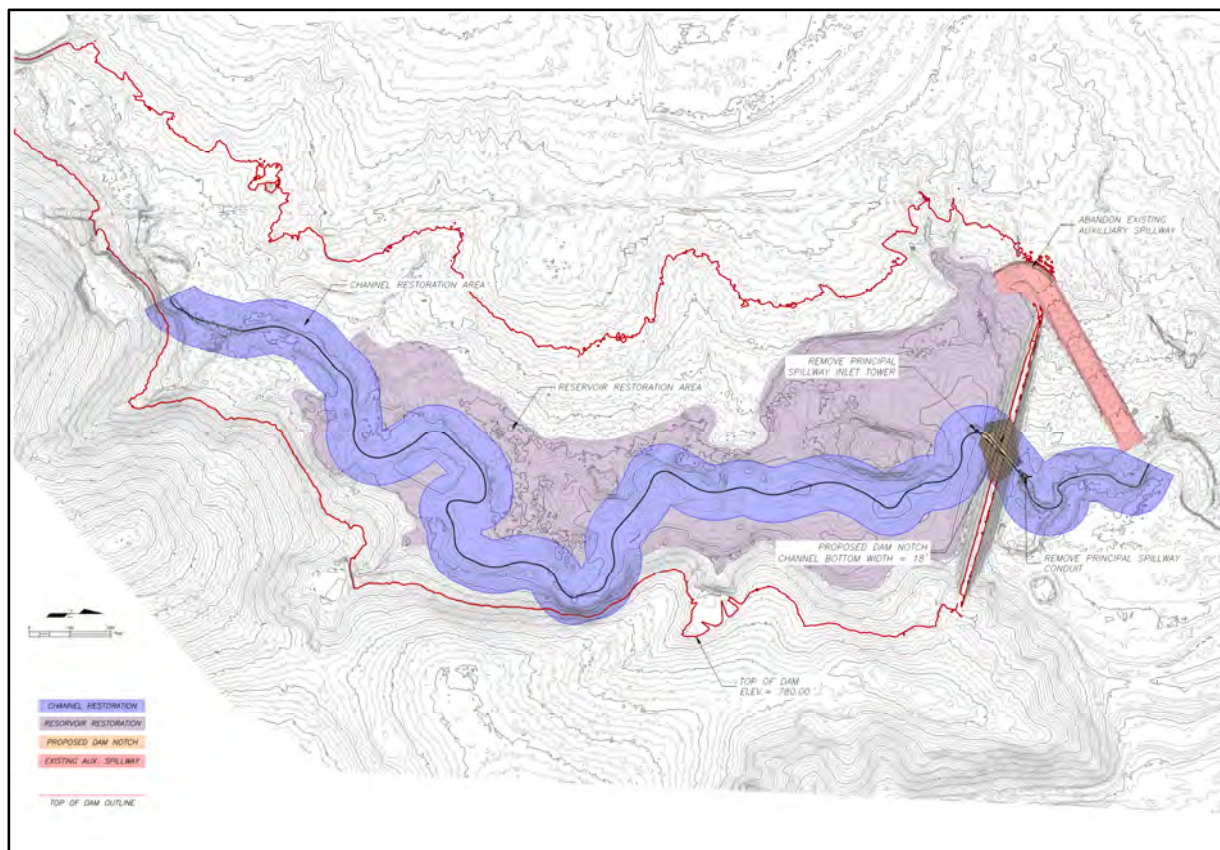


Figure 14. Plan view of decommission and restoration extents within Alternative 1.

The cost for decommissioning the dam is \$41,350,00 which makes this alternative unfeasible. The high cost is due to the road raises needed (\$15,290,000) and the excavation and restoration needed to restore the stream channel (\$6,263,900). Decommissioning the dam would also result in the loss of flood damage benefits and would not meet the project purpose and need.

5.4.3 ALTERNATIVE NO. 2 – WIDEN EXISTING AUXILIARY SPILLWAY

This alternative focuses on structural upgrades to the dam, to increase capacity by widening the auxiliary spillway, and raising both the auxiliary spillway and the top of the dam (Figure 15). The principal spillway conduit and inlet tower must be replaced, and the auxiliary spillway must be modified in this scenario. This modification would increase the discharge through the dam to convey the principal spillway hydrograph and the freeboard hydrograph to meet the applicable dam safety criteria established by NRCS and TR-60. These modifications are designed to match the existing 100-year water surface elevation to not increase the discharge of the 100-year storm.

This alternative proposes replacing the existing principal spillway with a larger, 30-inch conduit to bring the dam into compliance with TR-60. The inlet tower must also be replaced with a new 3-foot x 15-foot x 12-foot reinforced concrete inlet tower. This new inlet tower increases the weir

length for the principal spillway from 4 feet to 15 feet, to meet TR-60 requirements. The principal spillway crest will remain unchanged at 764.2 feet.

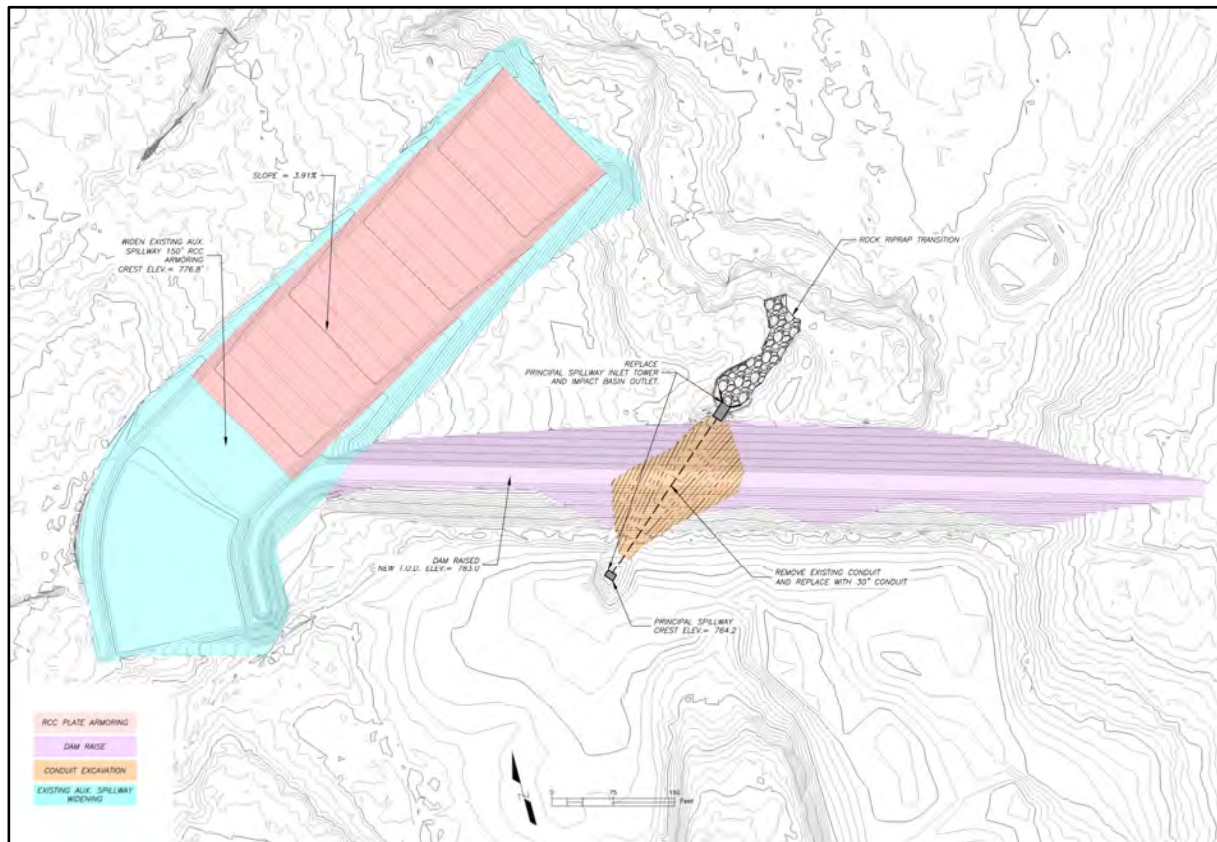


Figure 15. Plan view of a widened auxiliary spillway in Alternative 2.

With the adjustments to the principal spillway, the auxiliary spillway must be raised by 1.5 feet, to an elevation of 776.8 feet, to meet principal spillway hydrograph requirements. The stability analysis showed erosion throughout the auxiliary spillway, so in addition to widening the spillway from a width of 70 feet to 150 feet, the auxiliary spillway will also need to be hardened with roller-compacted concrete.

The results of the hydrologic analysis show that the top of dam would need to be raised 2.9 feet, to an elevation of 783.00 feet, to accommodate the 6-hour and 24-hour freeboard hydrographs. Under this alternative, the access drive across the top of the dam would be preserved. An estimated 21 acres of easements would need to be purchased around the flood pool.

The total cost to rehabilitate the dam would be \$11,355,200, which makes this alternative unfeasible.

5.4.4 ALTERNATIVE NO. 3 – NEW AUXILIARY SPILLWAY

This alternative focuses on structural upgrades to the dam to increase capacity by installing a new, widened stepped RCC auxiliary spillway and raising the top of the dam (Figure 16). The principal spillway and inlet tower must be replaced, and a new auxiliary spillway will be installed. This modification will increase the discharge through the dam to convey the principal spillway hydrograph and the freeboard hydrograph and to lower the water surface elevation during major storm events to meet the applicable dam safety criteria established by NRCS and TR-60. These modifications are designed to match the existing 100-year water surface elevation, to not increase the discharge of the 100-year storm. This option is the sponsor's preferred alternative, as it will limit the impacts to locations downstream of the dam.

This alternative proposes replacing the existing principal spillway with a larger, 30-inch conduit to bring the dam into compliance with TR-60. The inlet tower must also be replaced with a new 3-foot x 15-foot x 12-foot reinforced concrete inlet tower. This new inlet tower increases the weir length for the principal spillway from 4 feet to 15 feet, to meet TR-60 requirements. The principal spillway crest will remain unchanged, at 764.2 feet.

With the adjustments to the principal spillway, the auxiliary spillway must be raised by 1.5 feet, to an elevation of 776.8 feet, to meet principal spillway hydrograph requirements. The existing auxiliary spillway would be abandoned, and a new stepped RCC auxiliary spillway with a width of 150 feet would be cut into the dam embankment. The spillway would be constructed of roller compacted concrete.

The results of the hydrologic analysis show that the top of dam would need to be raised 2.9 feet, to an elevation of 783.00 feet, to accommodate the 6-hour and 24-hour freeboard hydrographs. Under this alternative, drive access across the top of the dam would be eliminated, requiring an alternate route for landowner access to be determined in future study.

The total cost to rehabilitate the dam would be \$5,480,700, which makes this alternative feasible.

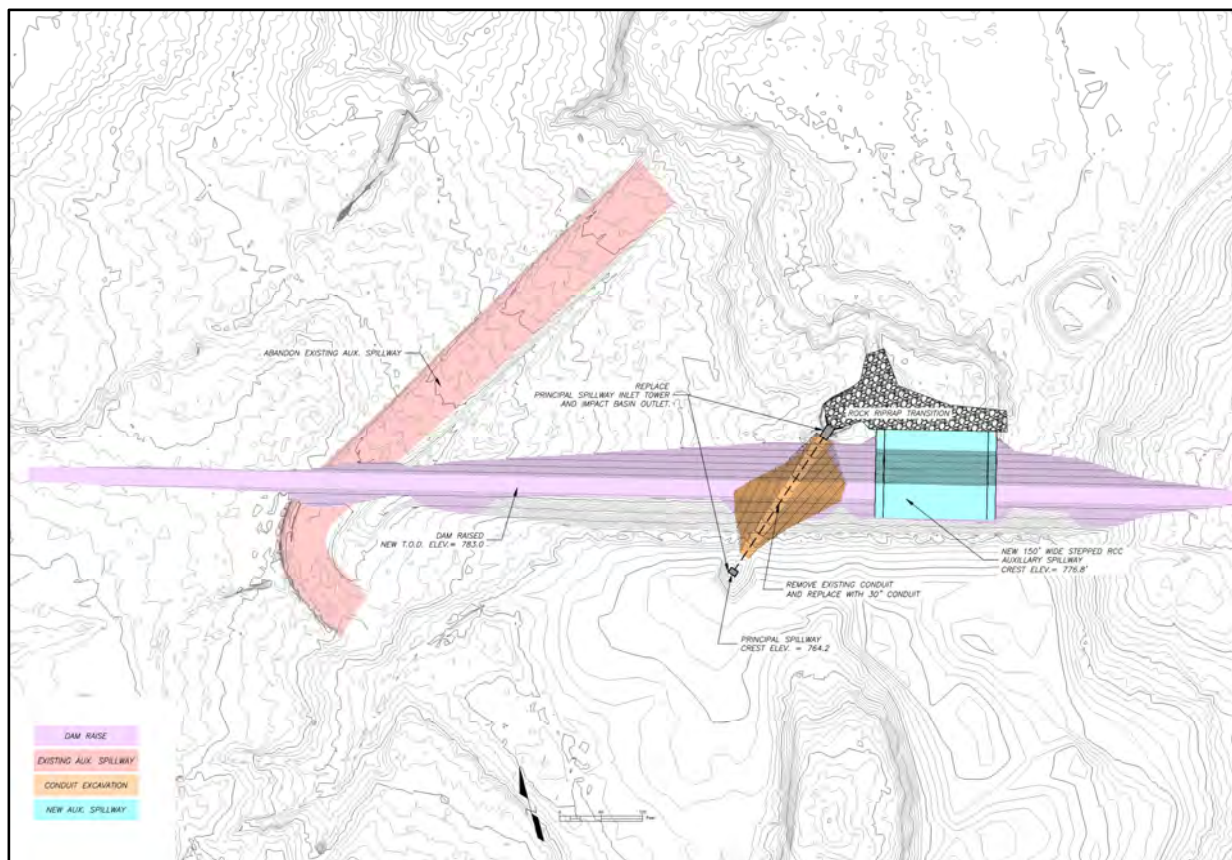


Figure 16. Plan view of new auxiliary spillway in Alternative 3.

5.4.5 NATIONAL ECONOMIC DEVELOPMENT (NED) ALTERNATIVE

The national economic development (NED) alternative is the Federally assisted alternative that maximizes net economic benefits consistent with protecting the Nation’s environment. The no action or FWOFI alternative is removed as an NED plan option where human life is at risk in the event of catastrophic failure of an existing dam. Alternative 3 described above is the NED plan. This rehabilitation alternative with Federal assistance is the most locally acceptable and best serves the sponsor in achieving the purpose and need for this rehabilitation.

6.0 ENVIRONMENTAL CONSEQUENCES

This section of the Plan-EA evaluates and compares alternatives based on their performance against planning criteria, environmental impacts, and ecosystem services.

6.1 PLANNING CRITERIA

A mandatory comparison of alternatives evaluates how well the alternatives resolve the identified problems, as well as meeting the evaluation criteria of completeness, acceptability, efficiency, and

effectiveness (Table 4). These criteria are defined by the Principles, Requirements, and Guidelines comprehensive policy and guidance for Federal investments in water resources:

- Completeness is the extent to which an alternative provides and accounts for all features, investments, and/or other actions necessary to realize the planned effects, including any necessary actions by others. It does not necessarily mean that alternative actions need to be large in scope or scale.
- Effectiveness is the extent to which an alternative alleviates the specified problems and achieves the specified opportunities.
- Efficiency is the extent to which an alternative alleviates the specified problems and realizes the specified opportunities at the least cost.
- Acceptability is the viability and appropriateness of an alternative from the perspective of the Nation’s general public and consistency with existing Federal laws, authorities, and public policies. It does not include local or regional preferences for particular solutions or expediency.

TABLE 4. SUMMARY AND COMPARISON OF ALTERNATIVES – PLANNING PROCESS

Evaluation Criteria	No Action Alternative	Alt. 1 Decommission	Alt. 2 Widen Aux. Spillway	Alt. 3 New Aux. Spillway
Completeness	Incomplete – doesn’t account for the features, investments, or other actions necessary to realize the planned effect of addressing the watershed problems.	Incomplete – doesn’t account for the features, investments, or other actions necessary to realize the planned effect of addressing the watershed problems.	Complete – rehabilitating the dam to high-hazard standards would address the compliance problem while protecting downstream infrastructure.	Complete – rehabilitating the dam to high-hazard standards would address the compliance problem while protecting downstream infrastructure.
Effectiveness	Ineffective – doesn’t address problems or realize opportunities.	Ineffective – doesn’t address problems or realize opportunities.	Effective – addresses problems and opportunities.	Effective – addresses problems and opportunities.
Efficiency	Efficiency does not exist in the absence of effectiveness.	Inefficient - A benefit cost ratio (BCR) of 0.6 and monetized net average annual benefits of \$740,900.	A BCR of 0.0 and monetized net average annual benefits of (\$1,700) . Although not monetarily efficient, it does address other elements.	A BCR of 0.0 and monetized net average annual benefits of (\$1,700) . While not monetarily efficient it does address other elements and does maximize net public benefits.

Evaluation Criteria	No Action Alternative	Alt. 1 Decommission	Alt. 2 Widen Aux. Spillway	Alt. 3 New Aux. Spillway
Acceptability	Doing nothing is a viable alternative from a National perspective and is consistent with Federal laws, policies, and authorities. However, doing nothing is not an appropriate alternative as it leaves considerable risk to life and property and is a violation of State law.	Acceptable.	Acceptable.	Acceptable.

6.2 ENVIRONMENTAL EVALUATION FOR WATERSHED PLANNING AND COMPARISON OF ALTERNATIVES

Table 5 provides a summary and comparison of the benefits, costs, and ecosystem services framework for each alternative evaluated in detail in this study.

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TABLE 5. ENVIRONMENTAL EVALUATION COMPARISON OF ALTERNATIVES

U.S. Department of Agriculture Natural Resources Conservation Service		Watershed: Little Wewoka Creek – Graves Creek County/State: Hughes County, Oklahoma ID Number: OK02215		Watershed Project Number: FWRS Number: 12
Purpose: This table documents existing resource conditions and concerns and summarizes the effects and impacts of proposed watershed alternatives and activities on provisioning, regulating, and cultural services. This table is required to be completed for all supplemental watershed plans.				
Alternatives	No Action Alternative (FWOFI)	Alt 1 Decommission	Alt 2 Widen Auxiliary Spillway	Alt 3 New Auxiliary Spillway
Major Features	No action taken. Potential for catastrophic breach resulting in property damage and loss of life.	Decommission the dam and restore the stream channel.	Raise the dam; raise, widen, and armor the existing auxiliary spillway; and replace the principal spillway. Preserves road access across the dam.	Raise the dam, abandon the existing auxiliary spillway, install new auxiliary spillway, and replace the principal spillway. Loses road access across the dam.
Alternatives				
Non-Structural		✓		
Locally Preferred				✓
Environmentally Preferred			✓	✓
National Economic Development (NED)				✓
Socially Preferred				✓
Total Investment	\$0	\$41,349,100	\$11,355,700	\$5,480,700
Monetized Net Benefits	N/A	(\$474,000)	(\$340,600)	(\$168,200)

Alternatives	No Action Alternative (FWOFI)	Alt 1 Decommission	Alt 2 Widen Auxiliary Spillway	Alt 3 New Auxiliary Spillway
Guiding Principles				
Healthy and Resilient Ecosystems	Doesn't meet guiding principle of protecting and restoring ecosystem functions impacted by the dam.	Meets guidance by restoring aquatic and riparian habitats.	Meets guidance by protecting existing aquatic and terrestrial habitats.	Meets guidance by protecting existing aquatic and terrestrial habitats.
Sustainable Economic Development	Doesn't address the risk of economic damage under a potential dam failure event. Therefore, it doesn't meet guiding principles.	Minimally meets guiding principles as short-term socioeconomic spending would increase during construction. However, decommissioning of the dam would result in increased flood damage downstream.	Meets guiding principle as short-term socioeconomic spending would increase during construction, and the rehabilitated dam would provide downstream flood protection to roads and the one residence.	Meets guiding principle as short-term socioeconomic spending would increase during construction, and the rehabilitated dam would provide downstream flood protection to roads and the one residence.
Floodplains	Meets guiding principle in the short-term as there would be no change to the current levels of flooding or floodplain function. Upon dam failure, would not meet guiding principle as one residence and 4 roads are located within the floodplain downstream of the dam.	Meets guiding principle. No structures would be located within the 100-year floodplain. One residence would be removed, and four roads would be raised out of the floodplain.	Meets guiding principle as there would be no changes to the current levels of flooding or floodplain function.	Meets guiding principle as there would be no changes to the current levels of flooding or floodplain function.
Public Safety	Doesn't meet guiding principle as it leaves deficiencies in place.	Meets guiding principle as it removes the breach risk of the dam and removes infrastructure from flooding.	Meets guiding principle by addressing deficiency at the dam.	Meets guiding principle by addressing deficiency at the dam.

Alternatives	No Action Alternative (FWOFI)	Alt 1 Decommission	Alt 2 Widen Auxiliary Spillway	Alt 3 New Auxiliary Spillway
Watershed Approach	Doesn't meet guiding principle as it does not address upstream and downstream impacts.	Meets guiding principle as it addresses upstream and downstream impacts.	Meets guiding principle as it addresses upstream and downstream impacts.	Meets guiding principle as it addresses upstream and downstream impacts.
Provisioning – Food, fiber, freshwater, timber, genetic resources, etc. (Mostly market values)				
Soils	Maintains existing protection short-term. Long-term increased soil loss due to flooding.	Reduces protection due to increased flooding.	Maintains existing protection	Maintains existing protection
Water Quality	Maintains existing protection	Decreases in stream below dam due to increased sediment loading.	Maintains existing protection	Maintains existing protection
Upland/Riparian habitat created or enhanced (acres)	Maintains existing resources short-term. Long-term adverse impacts to riparian habitat.	Restores 26 acres of riparian habitat within the area of the sediment pool.	Short-term and minimal. Disturbed areas to be revegetated with native riparian vegetation.	Short-term and minimal. Disturbed areas to be revegetated with native riparian vegetation.
Stream/corridors Enhanced/protected	Maintains existing protection short-term. Long-term adverse impacts	Re-establishes stream and riparian corridor.	Maintains existing protection	Maintains existing protection
Lakes/reservoirs enhanced/protected (acres)	Maintains existing protection short-term. Long-term, the lake would be removed due to dam failure.	Loses 26 acres of impounded water.	Short-term reduction in surface acres during construction. Long-term protection of reservoir.	Short-term reduction in surface acres during construction. Long-term protection of reservoir.
Wetlands	Maintains existing resources	Loses 1.53 acres of emergent, forested, and shrub wetlands	Maintains existing resources	Maintains existing resources
Mitigation Costs	\$0	\$114,800	\$0	\$0

Alternatives	No Action Alternative (FWOFI)	Alt 1 Decommission	Alt 2 Widen Auxiliary Spillway	Alt 3 New Auxiliary Spillway
Regulating – air, climate, disease, erosion, natural hazards & pests, water purification (Market values)				
Flood Prevention	3.33 percent Flood	N/A	1.0 percent Flood	1.0 percent Flood
Flooding – remaining damage	\$ 70,500	\$1,154,500	\$37,500	\$37,500
Floodplain acres	Maintains existing	Increases by 11 acres	Maintains existing	Maintains existing
Clean Water Act (WOTUS)	A 404 permit may be required after dam fails	Nationwide Permit 27 applicable	Nationwide Permit 43 applicable	Nationwide Permit 43 applicable
Clean Air Act	Permits may be required	Permits may be required	Permits may be required	Permits may be required
Threatened and Endangered Species	May affect but not likely to adversely affect any of the listed species.	May affect alligator snapping turtle, monarch butterfly, and American burying beetle. USFWS concurrence needed.	May affect but not likely to adversely affect turtle, monarch butterfly, or American burying beetle. USFWS concurrence needed.	May affect but not likely to adversely affect monarch butterfly and American burying beetle. USFWS concurrence needed.
Migratory Birds	May affect but not likely to adversely affect.	May affect but not likely to adversely affect.	May affect but not likely to adversely affect.	May affect but not likely to adversely affect.
Invasive Species	No effect	No effect	No effect	No effect
Cultural – Aesthetics, recreation and ecotourism, personal values (Non-use values – option or existence value)				
Public Health and Safety	See comments	See comments	See comments	See comments
Impact to Rural Development	Maintains flood protection for the life of the structure	Loss of flood protection	Maintains existing flood protection	Maintains existing flood protection
Risk of Loss of Life	Moderate	Low	Low	Low
Roads and Bridges Benefitted	4 roads, 5 bridges, 1 culvert with dam in place.	4 roads, 5 bridges, 1 culvert would be raised to remove them from future flooding.	Maintains existing protection of 4 roads, 5 bridges, and 1 culvert.	Maintains existing protection of 4 roads, 5 bridges, and 1 culvert.

Alternatives	No Action Alternative (FWOFI)	Alt 1 Decommission	Alt 2 Widen Auxiliary Spillway	Alt 3 New Auxiliary Spillway
Businesses/Homes/ Public Facilities Benefitted	1 residence with dam in place.	1 residential structure would be bought out and removed.	Maintains existing protection of 1 residential structure.	Maintains existing protection of 1 residential structure.
Recreation	Maintains existing incidental recreation with dam. Upon dam failure, incidental recreation related to the reservoir would be adversely impacted.	Loss of incidental water related recreation.	Maintains existing incidental water related recreation.	Maintains existing incidental water related recreation.
Scenic Beauty	Loss of aesthetics due to flooding.	Aesthetics are maintained through restoration of stream corridor but impacted by flood events.	Maintains existing rural and natural character of the project area.	Maintains existing rural and natural character.
Cultural Resources/Tribal Interests	Consultation will need to be revisited to discuss direct, indirect, or cumulative effects, and possible development of a MOA.	Consultation will need to be revisited to discuss a mitigation plan, and possible development of a MOA.	No concerns/conditions, effects, or impacts. Concurrence received from consultation partners.	No concerns/conditions, effects, or impacts. Concurrence received from consultation partners.

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6.3 ENVIRONMENTAL CONCERNS

The potential effects of the alternatives on the following resources were evaluated in detail in this section. Resources eliminated from detailed evaluation were noted in Table 1.

6.3.1 SOILS

No-Action Alternative: Would result in no substantial repairs or rehabilitation. Limited effects from soil erosion and sedimentation would continue with current dam operation and then be exacerbated by flooding after dam failure. In the short term, this alternative would have negligible effects from ongoing operation and maintenance of the current dam. In the long-term, there would be direct adverse effects due to an increase in streambank erosion and sedimentation resulting from increased flooding.

Alternative 1 – Decommission Dam: Soil disturbance would be related to notching the dam to remove storage function and capacity. Soils excavated from the dam embankment to create the notch would be redistributed on site, and disturbed areas would be stabilized using BMPs common to construction projects, especially those consistent with NRCS practices and policies. In the short term, adverse effects would be minimized by use of BMPs. In the long term, streambank erosion would be reduced by channel restoration to pre-dam conditions, resulting in effects that would be negligible.

Alternative 2 – Widen Auxiliary Spillway: Soil disturbance would be related to construction activities for rehabilitation and subsequent operation and maintenance of the dam. Soils excavated from the dam embankment to widen the auxiliary spillway would be redistributed on site, and disturbed areas would be stabilized using BMPs common to construction projects, especially those consistent with NRCS practices and policies. In the short term, adverse effects would be minimized by use of BMPs. In the long term, effects from ongoing operation and maintenance of the dam would be negligible.

Alternative 3 – New Auxiliary Spillway/Proposed Action: Soil disturbance would be related to construction activities for rehabilitation and subsequent operation and maintenance of the dam. The soil excavated to construct the new auxiliary spillway in the dam embankment would be used to fill in the abandoned spillway. Disturbed areas would be stabilized using BMPs common to construction projects, especially those consistent with NRCS practices and policies. In the short term, adverse effects would be minimized by use of BMPs. In the long-term effects from ongoing operation and maintenance of the dam would be negligible.

6.3.2 WATER QUALITY

No-Action Alternative: The impoundment would not release sediment or pollutants into Little Wewoka Creek that would change the designation of the stream, which is currently under TMDL requirements for the Lower Northern Canadian River. Upon catastrophic failure of the dam, additional sediments and pollutants could be discharged to Little Wewoka Creek and would need

to be addressed to meet TMDL requirements. In the short term, there would be no effects. Long-term effects from dam failure would be direct and adverse due to increased sediment and pollutants entering the streams.

Alternative 1 – Decommission Dam: Implementation of BMPs is important to minimize impacts to water quality during construction and stabilization of disturbed areas, and to ensure future flooding doesn't result in impacts to water quality due to additional sediment loading and pollutants from stormwater runoff. In the short term, adverse effects will be negligible. In the long-term, effects would be beneficial due to stabilization of disturbed sites and revegetation of the riparian corridor.

Alternative 2 – Widen Auxiliary Spillway: The impoundment would experience temporary disturbances from construction activities at the area of the dam embankment and in the upstream area from drawdown of the reservoir. Downstream erosion that could happen due to sediment starved water leaving the impoundment should be minimized by maintaining the vegetated riparian corridor adjacent to the stream during construction. Effects would be short-term, adverse, and negligible. Retention of the impoundment would have long-term benefits, with the impoundment continuing to trap sediment and pollutants.

Alternative 3 – New Auxiliary Spillway/Proposed Action: This alternative would have the same effects as Alternative 2.

6.3.3 WOTUS, WETLANDS, AND SPECIAL AQUATIC SITES

No-Action Alternative: This alternative would have no new effect on WOTUS and wetlands under continued operation and maintenance of the dam. There would be long-term direct adverse impacts to these resources upon catastrophic failure of the dam due to the disconnect between the streams and the wetlands and increased flooding.

Alternative 1 – Decommission Dam: Construction to decommission the dam and restore the stream channel and adjoining riparian corridor would have short-term, adverse impacts due to construction. There would be long-term adverse impacts to existing wetlands adjacent to the reservoir due to loss of connectivity to the main water body and benefits due to the newly established stream channel that had been previously inundated, and increased habitat due to riparian corridor restoration.

Alternative 2 – Widen Auxiliary Spillway: There would be minor, short-term, adverse impacts during construction due to drawdown of the conservation pool, equipment access to the spillway and dam, and removal of vegetation necessary to widen the spillway and raise the dam. Widening the spillway from 70 feet to 150 feet would require removal of trees and other vegetation adjacent to the existing spillway, as well as native prairie vegetation currently on the dam. Impacts to the vegetation adjacent to the spillway would be minor, long-term, and adverse, as stabilization will be with roller compacted concrete. Impacts to vegetation on the dam will be minor, short-term,

and adverse. Implementation of construction BMPs and revegetation of the dam and areas adjacent to the auxiliary spillway with native species would minimize these impacts.

Alternative 3 – New Auxiliary Spillway: This alternative would result in abandonment of the existing auxiliary spillway and placement of the new, stepped RCC spillway into the earthen embankment of the dam. Construction activities and drawdown of the conservation pool would have minor, short-term, adverse effects on WOTUS and wetlands. Rehabilitation of the dam would have long-term benefits on WOTUS and wetlands through retention of the impoundment.

6.3.4 FLOODPLAIN MANAGEMENT

No-Action Alternative: Under this alternative there would be no changes to the floodplain function. According to the FEMA FIRM panels, there are no structures within the 100-year flood zone downstream of the dam within the area of analysis.

Alternative 1 – Decommission Dam: The hydraulic modeling indicates that if this alternative were implemented, one residence and four roads located within the breach inundation zone would be inundated during the 100-year storm. Floodproofing or buyout and modifications to the roads would provide minor, short-term benefits. The increase in flooding without the dam would have long-term adverse impacts on properties and infrastructure in the watershed due to increased flooding and an enlarged floodplain.

Alternative 2 – Widen Auxiliary Spillway: There would be no change in effects on floodplain management resulting from rehabilitation. Flood protection in the overall watershed would be maintained, and the residence and roads within the downstream breach zone would continue to experience flooding during certain storm events.

Alternative 3 – New Auxiliary Spillway/Proposed Action: This alternative would have the same effects as Alternative 2.

6.3.5 CLIMATE

No-Action Alternative: This alternative would not contribute additional GHGs. However, climate change could have potential impacts due to increased frequency and the severity of storms and flooding. Climate change would have no short-term effects, but could have minor, long-term, adverse effects after dam failure due to increased flooding.

Alternative 1 – Decommission Dam: Construction activities would result in the generation of GHGs. However, the level of activity would be minimal and the total GHG emissions would be undetectable in comparison to emissions of the State and the Nation. The long-term effects would be similar to the no action, with increased flooding having minor, long-term, adverse effects.

Alternative 2 – Widen Auxiliary Spillway: Construction activities would have similar effects as Alternative 1 prior to dam failure. Rehabilitation of the dam would retain the protective function

within the watershed against increased flooding due to climate change. The residence and roads within the downstream breach zone could experience greater flood depths with certain storm events.

Alternative 3 – New Auxiliary Spillway/Proposed Action: This alternative would have the same effects as Alternative 2.

6.3.6 FISH AND WILDLIFE HABITAT

No-Action Alternative: Ongoing operation and maintenance of the dam would have no effect on fish and wildlife, as aquatic and terrestrial habitats would remain relatively undisturbed. Fish and wildlife in the area would continue to exist under current conditions. Upon dam failure, this alternative would have a long-term adverse effect on wildlife species if flooding in the area increases and results in adverse impacts to aquatic and terrestrial habitats present within the floodplain.

Alternative 1 – Decommission Dam: Construction activities could disrupt wildlife behavior in the area for 1 to 2 years. Aquatic and terrestrial habitats would be disturbed during and immediately after construction, with changes to vegetation and topography. Little to no mortality of wildlife should occur, as most species can move out of the way. Implementation of BMPs, including the restriction of earth-moving activities during nesting seasons and replanting native species in disturbed areas to the greatest possible extent, would be required. Habitat structure would shift towards riparian with restoration of the stream corridor. This alternative would result in minor, long-term benefits as the natural flow regime of the creek was restored and riparian habitat was established.

Alternative 2 – Widen Auxiliary Spillway: Construction activities would result in similar effects as in Alternative 1 prior to dam failure. There would be minor, short-term, adverse effects during and immediately after construction. In the long term, effects would be minimal, as fish and wildlife would use the habitat areas they likely had prior to rehabilitation of the dam. Permanent removal of woodland vegetation for the auxiliary spillway would change the availability of a small portion of upland habitat. However, the small quantity of woodland would not be expected to noticeably increase resource competition or decrease habitat availability for terrestrial species outside of natural variation.

Alternative 3 – New Auxiliary Spillway: Construction activities would result in similar effects as in Alternative 1 prior to dam failure. They would have minor, short-term, adverse effects during and immediately after construction. In the long term, effects would be minimal, as fish and wildlife would use the habitat areas they likely had used prior to rehabilitation of the dam. The shift of the auxiliary spillway to the dam would allow vegetation within the abandoned spillway to transition to grassland or woodland habitat. There would be minor, long-term benefits with this alternative.

6.3.7 THREATENED AND ENDANGERED SPECIES

No-Action Alternative: Ongoing operation and maintenance of the dam would have no effect on threatened and endangered species. This alternative could have long-term adverse impacts on threatened and endangered species if flooding in the area increases upon catastrophic failure of the dam.

Alternative 1 – Decommission Dam: Construction activities related to rehabilitation of the dam will be limited to the area immediately surrounding the existing dam and associated accoutrements. Activities are unlikely to adversely impact the alligator snapping turtle, as its habitat areas are located at the southern end of the project area. Construction activities may have a short-term adverse impact on habitat for the American burying beetle and the monarch butterfly. See comment below regarding the American burying beetle. Stream channel restoration and riparian corridor vegetation would have long-term benefits by providing additional habitat.

Alternative 2 – Widen Auxiliary Spillway: Construction activities for dam rehabilitation are not likely to have an adverse effect on threatened and endangered species. As noted in the IPAC Consultation Packet included in Appendix A (December 11, 2024), the USFWS concurs with this determination. Retention of the impoundment would provide long-term benefits by maintaining existing habitats.

Alternative 3 – New Auxiliary Spillway: This alternative would have the same effects as Alternative 2.

Comment:

According to the American Burying Beetle 4(d) Rule for Federal and Non-Federal Activities, the project area would be located within the South Plains analysis area for the American burying beetle but would be located outside of “conservation lands” described in the 4(d) Rule. Therefore, in accordance with the Determination Key to the American Burying Beetle 4(d) Rule for Federal and Non-Federal Activities, the proposed project actions may affect the American burying beetle. However, according to the 4(d) determination key, any incidental take of the American burying beetle that may occur as a result of an action covered by the 4(d) Rule within the South Plains Analysis Area that is not part of conservation lands is not prohibited under the ESA. If the USFWS determines that the proposed project action is included under the 4(d) Rule, mitigation for adverse impacts to the American burying beetle at the project site may not be required.

6.3.8 MIGRATORY BIRDS

No-Action Alternative: Ongoing operation and maintenance of the dam would not have an effect on migratory birds and their use of the project area for breeding and nesting. Dam failure could result in minor adverse impacts due to increased flooding and loss of habitat. It is likely most birds would simply move to other areas with suitable habitat.

Alternative 1 – Decommission Dam: Migratory birds are likely to nest within the project area. Implementation of BMPs to reduce the potential for the incidental take of migratory birds can include (1) clearing or grading of the site during the non-breeding season, or (2) conducting migratory bird nest surveys shortly before project construction to confirm the absence of nesting birds. While migratory birds are likely to avoid active construction areas, regular monitoring of areas within the project site should be done given that construction activities may take up to 2 years to complete. Restoration of the stream channel and revegetation of the corridor with native riparian woodland species would provide long-term benefits in increased habitat suitable for many migratory bird species.

Alternative 2 – Widen Auxiliary Spillway: This alternative would have the same effects as Alternative 1 for construction activities. Long term, this alternative would maintain much of the existing habitat that is suitable for use by migratory birds.

Alternative 3 – New Auxiliary Spillway: This alternative would have the same effects as Alternative 1 for construction activities. The shift of the auxiliary spillway to the dam would allow vegetation within the abandoned spillway to transition to grassland or woodland habitat. There would be minor, long-term benefits with this alternative.

6.3.9 INVASIVE SPECIES

No-Action Alternative: Invasive species present will continue to be present and will need to be managed by landowners to prevent their spread to other sites. Land disturbances should be monitored for the potential to spread invasives within the project area and to adjoining landscapes. This alternative would have a negligible effect.

Alternative 1 – Decommission Dam: Because the species noted are ubiquitous within the project area, if excavated fill from the project area is not removed but is used on-site for project related earthwork, construction of the proposed project would not contribute to the spread of vegetative invasive species within or outside the project area. However, BMPs, including inspection and washing of equipment on-site, should be implemented to avoid the potential for spreading invasive plant materials off site during construction. This alternative would have a negligible effect.

Alternative 2 – Widen Auxiliary Spillway: Implementation of construction BMPs to minimize the spread of existing invasive species would have negligible effects. Existing conditions present with the dam would continue in the long term.

Alternative 3 – New Auxiliary Spillway: This alternative would have the same effects as Alternative 2.

6.3.10 RIPARIAN AREAS

No-Action Alternative: Operation and maintenance of the dam would result in no effect. Under this alternative, catastrophic failure of the dam and increased flooding within the drainage area would have long-term adverse impacts on riparian areas.

Alternative 1 – Decommission Dam: Construction activities to decommission the dam would have minor, short-term, adverse effects on riparian resources. Restoration of the stream channel and the addition of 100 feet of riparian corridor on each side of the restored stream would have long-term benefits by increasing riparian habitat.

Alternative 2 – Widen Auxiliary Spillway: Construction activities related to rehabilitation would be limited to the area surrounding the existing dam and auxiliary spillway. Clearing riparian vegetation below the dam may be necessary to implement construction of the new auxiliary spillway and slip lining the principal spillway pipe. BMPs should be implemented to protect trees and other riparian vegetation from construction equipment and project implementation. Construction activities and drawing down of the reservoir would have short-term adverse effects. The existing conditions would be maintained in the long term, resulting in no effects.

Alternative 3 – New Auxiliary Spillway: This alternative would have the same effects as Alternative 2.

6.3.11 LAND USE

No-Action Alternative: Ongoing operation and maintenance of the dam would have no effect on land use. Catastrophic dam failure could have minor, long-term, adverse effects on land use upstream and downstream of the dam site due to increased flooding increasing the width of the floodplain.

Alternative 1 – Decommission Dam: Increased flooding in the absence of the dam could have minor, short-term, adverse effects on land use but is not likely to have an effect in the long term given the rural and natural character of the landscape.

Alternative 2 – Widen Auxiliary Spillway: There would be no changes in land use within the project area due to rehabilitation of the dam.

Alternative 3 – New Auxiliary Spillway/Proposed Action: This alternative would have the same effects as Alternative 2.

6.3.12 CULTURAL RESOURCES AND HISTORIC PROPERTIES

No-Action Alternative: The no action alternative would have the potential to adversely affect historic properties. Potential direct effects resulting from the no action alternative would include the potential for physical damage to both known and unknown archaeological sites and above-ground historic properties within the APE and potential changes in viewshed that would directly

impact a historic property's significance. The potential for indirect effects could include long term effects to currently unknown archaeological sites or historic architectural resources through prolonged exposure to flooding, changes in the overall landscape, and potential destruction within an area that has not been previously inventoried for historic properties. Through the consultation process, no known traditional cultural properties or properties of religious and cultural significance have been identified, however under the no action alternative the potential for effects could be far reaching and therefore affect currently unidentified resources. Past, present, or reasonably foreseeable actions, such as continued flooding, occasional dam repairs, or no repair to the dam structure at all, could result in a cumulative effect to historic properties resulting in changes to the physical structure, environment, or nature of identified historic properties.

Alternative 1 – Decommission Dam: Within this APE, a historic architectural survey, including an assessment of the dam structure and its accoutrements, and an archaeological survey were undertaken. Through coordination efforts, it was also found that there were no traditional cultural properties or properties of religious and cultural significance within the APE. As determined through consultation, there are no historic properties meeting NRHP criteria within the APE. Therefore, there would be no effect to historic properties or cultural resources resulting from this alternative.

Alternative 2 – Widen Auxiliary Spillway: This alternative would have the same effects as Alternative 1 with the dam in place.

Alternative 3 – New Auxiliary Spillway/Proposed Action: This alternative would have the same effects as Alternative 2.

Comment:

Section 106 consultation was conducted with the OKSHPO, OAS, Caddo Nation, Choctaw Nation, Muscogee Nation, Osage Nation, Quapaw Nation, and the Wichita and Affiliated Tribes. The negotiated APE was defined, and a methodology for the completion of cultural resources survey was developed. No traditional cultural properties, properties of religious and cultural significance, or cultural landscapes were noted through consultation. NRCS determined that due to the construction date of 1959, FWRS No. 12 and accoutrements warranted historic property documentation. FWRS No. 12 and its fixtures were evaluated using NRHP criteria. NRCS determined that FWRS No. 12 did not meet the threshold for significance under NRHP Criteria A, B, C, or D to warrant listing on the NRHP. As stipulated by the OKSHPO, a Historic Property Resource Inventory form was completed. The preferred alternative involves a structural upgrade (rehabilitation). As for direct effects, NRCS determined that rehabilitation would have “no adverse effect” on the identified historic property—will not diminish integrity. As to indirect effects (visual elements) with rehabilitation, a “no adverse effect” determination was made because the existing agricultural landscape will remain the same—will not diminish integrity. The OKSHPO, OAS, and two of the six consulted tribes (Caddo Nation and Quapaw Nation) concurred with the

determination. The remaining four tribes (Choctaw Nation, Muscogee Nation, Osage Nation, and the Wichita and Affiliated Tribes) did not respond.

If cultural resources are discovered during implementation, then policies and procedures found in NRCS General Manual 420 part 401, and the National Cultural Resources Procedures Handbook (H_190_601) will be initiated.

6.3.13 PUBLIC HEALTH AND SAFETY

No-Action Alternative: The four roads located below the dam within the breach zone serve as primary routes for residents, school attendees, and emergency services. Flood protection would be maintained for these facilities during flood events with the ongoing operation and maintenance of the dam. Catastrophic dam failure resulting in loss of flood protection for infrastructure and structures located downstream of the dam would have long-term adverse effects.

Alternative 1 – Decommission Dam: Removal of the dam would result in the five locations identified in the breach zones being at risk from flooding during the 100-year storm. Floodproofing or buyout of the residential structure and modifications to the four roads downstream of the dam would provide short-term benefits. Long-term adverse impacts could incur due to increased flooding and the expansion of the floodplain, which could result in impacts to structures and roads not previously in a flood zone.

Alternative 2 – Widen Auxiliary Spillway: There would be no new effects as the same level of protection from a breach would be provided as it is under existing conditions. The residence and roads present within the breach zone would continue to experience flooding during some storm events.

Alternative 3- New Auxiliary Spillway/Proposed Action: This alternative would have the same effects as Alternative 2.

6.3.14 SOCIOECONOMICS

No-Action Alternative: Operation and maintenance of the dam would continue and may generate limited short-term employment, resulting in minimal effects on the local economy. Upon dam failure, the recurring, short-term employment opportunities related to the dam would cease but could potentially occur related to flood damage clean up.

Alternative 1 – Decommission Dam: Decommissioning the dam could create short-term, local employment opportunities and demand for supplies that would likely be sourced from local suppliers. Construction would have minor, short-term benefits to the socioeconomics of the area.

Alternative 2 – Widen Auxiliary Spillway: Rehabilitation of the dam could create short-term, local employment opportunities and demand for supplies that would likely be sourced from local suppliers. Construction would have minor, short-term benefits to the socioeconomics of the area.

Rehabilitation of the dam would provide flood protection, which would have long-term, beneficial impacts to downstream structures and roads.

Alternative 3 – New Auxiliary Spillway/Proposed Action: This alternative would have the same effects as Alternative 2.

6.3.15 SCENIC BEAUTY

No-Action Alternative: The ongoing operation and maintenance of the dam would have no effect on the aesthetics of the area. Dam failure would result in long-term, adverse effects due to the loss of the reservoir and the impacts resulting from increased flooding.

Alternative 1 – Decommission Dam: Removal of the dam and restoration of the stream channel and adjoining riparian vegetation would change the aesthetics from open water to stream and woodland, resulting in no net change in the overall scenic beauty of the area.

Alternative 2 – Widen Auxiliary Spillway: Construction activities and drawdown of the conservation pool would have minor, short-term, adverse effects on aesthetics. Rehabilitation of the dam would preserve existing aesthetics and views within the project area and, therefore, would have no effect.

Alternative 3 – New Auxiliary Spillway/Proposed Action: This alternative would have the same effects as the Alternative 2.

6.3.16 RECREATION

No-Action Alternative: Continued operation and maintenance of the dam would have no effect on the existing incidental recreation. Dam failure would result in long-term, adverse effects on recreation by removing the reservoir, which is used for swimming and fishing.

Alternative 1 – Decommission Dam: Removal of the dam and the reservoir would have long-term adverse effects on incidental, water-related recreation.

Alternative 2 – Widen Auxiliary Spillway: Construction activities and drawdown of the impoundment would have minor, short-term, adverse effects on recreational activities dependent upon timing of construction. There would be no long-term effects on recreation with rehabilitation of the dam.

Alternative 3 – New Auxiliary Spillway/Proposed Action: This alternative would have the same effects as the Alternative 2.

6.4 CUMULATIVE EFFECTS

Cumulative impacts are the combined incremental effects of human activities (the proposed action) on the environment when added to the effects of other past, present, and reasonably foreseeable

actions. Cumulative effects can result from individually minor but collectively significant actions taking place over time. Cumulative effects must be addressed because their environmental impacts may combine with the impacts of the alternatives. Section 4.2 provides an inventory of existing resources potentially impacted, and Section 6.3 analyzes the potential environmental impacts to those resources by each alternative.

6.4.1 PAST ACTIONS

Throughout history, natural and manmade events have altered aquatic and terrestrial habitats within the Little Wewoka Creek-Graves Creek Watershed. Prior to construction of FWRS No. 12, Little Wewoka Creek was a natural, free-flowing stream with associated riparian habitats, which sustained terrestrial wildlife commonly found within the watershed. As a result of the construction of FWRS No. 12, riverine habitat was converted to an open water reservoir maintained by the dam. Implementation of the dam and changes in land use to support agriculture had effects on the Little Wewoka Creek-Graves Creek Watershed, resulting in modification of flow, habitat loss, and introduction of invasive species.

6.4.2 ONGOING AND PRESENT ACTIONS

Section 4.2 describes the current condition of the Little Wewoka Creek-Graves Creek watershed. Conditions noted in this section capture past cumulative effects given that these actions and their effects have contributed to the current conditions of the resources.

6.4.3 FUTURE ACTIONS UNDER CURRENT O&M

FWRS No. 12 does not meet current State and NRCS high-hazard dam safety criteria, and there is potential for dam failure under current O&M conditions. There are identified deficiencies involving the hydraulic capacity of the dam and integrity and stability of the auxiliary spillway. The existing dam cannot pass the 6-hour and the 24-hour freeboard hydrograph without overtopping, and the principal spillway cannot pass the 24-hour, 100-year storm without activating the auxiliary spillway.

The auxiliary spillway capacity is out of compliance with State and NRCS design criteria. The flow depth for the 6-hour freeboard hydrograph is 5.37 feet with an existing velocity of 17.02 feet per second. Both hydrographs showed significant erosion throughout the auxiliary spillway, making it out of compliance with TR-60.

6.4.4 CUMULATIVE IMPACTS ANALYSIS

The following section provides an assessment of cumulative impacts related to the alternatives being considered, as required by NEPA.

6.4.4.1 SOILS

Under the no action alternative, there would be no cumulative effects with the dam in place. Catastrophic failure of the dam would result in deposition of sediment in areas of the creek downstream of the dam where it had not previously occurred. This would result in cumulative effects that are long-term, direct, adverse, and major in intensity.

There would be no cumulative effects under alternative 1 (decommissioning), alternative 2 (widen auxiliary spillway), and alternative 3 (proposed action).

6.4.4.2 WATER QUALITY

Under the no action alternative, there would be no cumulative effects with the dam in place. Dam failure could result in impairment to water quality of downstream reaches, as sediment from the breach of the earthen dam would be released and would migrate downstream. Additional sediment could occur during storm events, which would result in increased flooding. This could potentially contribute cumulative adverse effects to water quality. Alternative 1 (decommissioning) would benefit water quality through restoration of riparian buffers adjacent to the restored reach of stream.

For alternative 2 (widen auxiliary spillway) and alternative 3 (proposed action), the cumulative effects would be the same as the no action alternative with the dam present, as these would not contribute to the release of additional sediment or pollutants into Little Wewoka Creek that could cause impairment to downstream waters with the dam and reservoir in place.

The overall net cumulative effects on water quality by all of the alternatives would likely be long-term, direct, adverse, and minor.

6.4.4.3 WOTUS, WETLANDS, AND SPECIAL AQUATIC SITES

Under the no action alternative, there would be no change in cumulative effects with the dam in place. Upon dam failure, the cumulative effects would be long-term, direct, and major, with loss of connectivity to water and increased flooding.

The cumulative effects of alternative 1 (decommissioning) would be long-term, direct, and beneficial, with the restoration of the stream channel and adjacent riparian habitat.

Cumulative effects of alternative 2 (widen auxiliary spillway) and alternative 3 (proposed action) would be the same as the no action alternative with the dam in place. There would be no change to cumulative effects than what has happened with construction of the dam.

6.4.4.4 FLOODPLAIN MANAGEMENT

The no action alternative and alternative 1 (decommissioning) would potentially contribute cumulative adverse effects to floodplain management due to extreme storm events and increased

flooding resulting in an enlarged floodplain. Cumulative impacts would be long-term, direct, adverse, and major.

Under alternative 2 (widen auxiliary spillway) and alternative 3 (proposed action), cumulative effects would be direct, long-term, minor, and localized to the downstream floodplain, as the long-term risk of flood damages to the downstream residence and roads would be reduced in the absence of a breach.

6.4.4.5 CLIMATE

None of the alternatives would contribute directly to cumulative GHG emissions. Over the 100-year lifespan of the project, the increasing accumulation of GHGs and associated global warming are projected to have pronounced effects on regional climate and hydrology. While cumulative effects related to climate change are anticipated to be moderate to major in the long term, none of these alternatives would make detectable contributions to these projected climate change impacts.

6.4.4.6 FISH AND WILDLIFE HABITAT

Under the no action alternative with the dam in place, there would be no cumulative effects, as existing habitats would remain. Dam failure would result in adverse cumulative impacts due to degradation of downstream aquatic and riparian habitats from the breach event, as well as increased flooding and climate change. Cumulative impacts from climate change could affect fish and wildlife in a variety of ways, including habitat destruction due to more intense and frequent storm events, droughts and heat stress, invasive species, pathogens and diseases, and shifts in habitat ranges due to changing climate conditions. However, the overall reduction in suitable habitat is likely to be small in comparison to the available habitats present within the project area and the watershed.

Restoration of the stream and associated riparian habitat in alternative 1 (decommissioning) would have long-term beneficial cumulative impacts with the increased diversity of habitat created. Cumulative impacts related to climate change would be the same as the no action alternative.

Alternative 2 (widen auxiliary spillway) and alternative 3 (proposed action) would protect existing habitats and, therefore, would not contribute cumulative effects to fish and wildlife. As with the no action alternative, climate change could adversely impact habitats and species. Both of these alternatives would contribute minor cumulative impacts to fish and wildlife.

6.4.4.7 THREATENED AND ENDANGERED SPECIES

Cumulative effects for all alternatives would be similar to those described above for fish and wildlife habitats. The alternatives in tandem with other cumulative actions would contribute negligible cumulative impacts to threatened and endangered species.

6.4.4.8 MIGRATORY BIRDS

Cumulative effects for all alternatives would be similar to those described above for fish and wildlife habitats. The alternatives in tandem with other cumulative actions would contribute negligible cumulative impacts to migratory birds.

6.4.4.9 INVASIVE SPECIES

The no action alternative with the dam in place would not contribute to cumulative effects related to invasive species. BMPs and actions that would discourage the spread of invasive species and support native vegetation and wildlife would potentially contribute cumulative beneficial effects. Other actions like changes in land use, loss of habitat due to flooding, and climate change would potentially contribute cumulative adverse effects. Climate change could contribute to invasives by potentially fostering the arrival of new and exotic species in the region. Dam failure could contribute to the presence of invasives by presenting opportunities for invasive species to colonize new areas damaged by the breach and increased flooding. However, the amount of disturbed space would likely be relatively small, and the chance of invasive species being introduced is low.

As with the no action alternative, alternative 1 (decommissioning), alternative 2 (widen auxiliary spillway), and alternative 3 (proposed action) in tandem with other cumulative actions would contribute negligible cumulative effects to invasive species.

6.4.4.10 RIPARIAN AREAS

The no action alternative with the dam in place, alternative 2 (widen auxiliary spillway), and alternative 3 (proposed action) would not contribute to cumulative effects, as impacts to riparian areas due to the original placement of the dam and reservoir would remain.

Dam failure under the no action alternative would adversely impact established riparian areas.

Alternative 1 (decommissioning) would remove impacts from construction of the original dam and be complemented by restoration of the stream and associated riparian habitat.

Climate change could likely adversely impact riparian habitats regardless of the actions of any of these alternatives.

6.4.4.11 LAND USE

The no action alternative with the dam in place, alternative 2 (widen auxiliary spillway), and alternative 3 (proposed action) would not contribute to cumulative effects, as they would continue past impacts related to conversion of pasture, grasslands, and forests to the dam and its associated accoutrements and the reservoir.

Dam failure under the no action alternative would adversely impact areas in the downstream breach inundation area, which are primarily grassland, pasture, and forest.

Alternative 1 (decommissioning) would have a cumulative beneficial effect, as it would reverse the landcover and use from the initial dam and reservoir and convert it to woody riparian vegetation. Existing grasslands and pastures would remain.

6.4.4.12 CULTURAL RESOURCES AND HISTORIC PROPERTIES

Through the consultation process, no known traditional cultural properties or properties of religious and cultural significance have been identified; however, under the no action alternative the potential for effects could be far reaching and, therefore, affect currently unidentified resources. Past, present, or reasonably foreseeable actions, such as continued flooding, occasional dam repairs, or no repair to the dam structure at all, could result in a cumulative effect to historic properties resulting in changes to the physical structure, environment, or nature of identified historic properties.

Through coordination efforts, it was also found that there were no traditional cultural properties or properties of religious and cultural significance within the APE. As determined through consultation, there are no historic properties meeting NRHP criteria within the APE. Therefore, there would be no effect to historic properties or cultural resources resulting from alternative 1 (decommissioning).

Alternative 2 (widen auxiliary spillway) and alternative 3 (proposed action) would have the same cumulative effects as the no action alternative with the dam in place.

6.4.4.13 PUBLIC HEALTH AND SAFETY

The no action alternative with the dam in place, alternative 2 (widen auxiliary spillway), and alternative 3 (proposed action) would potentially contribute to adverse cumulative impacts related to public health and safety due to past, present, or reasonably foreseeable activities within the watershed. However, the dam would contribute minor to moderate effects by continuing to provide existing flood protection to the residence and roads within the downstream breach inundation area.

Dam failure under the no action alternative would adversely affect public health and safety due to breach flooding. Breach flows would inundate one residence and four roads within the breach zone, resulting in substantial damage to the home and preventing emergency responder access along the roads until floodwaters had receded. These cumulative effects would be adverse and additive.

Alternative 1 (decommissioning) would provide short-term benefits through buyout of the residence and floodproofing of the roads, but it would have long-term cumulative adverse impacts due to increased flooding and an enlarged floodplain, which could adversely affect other structures and roads not currently in the breach zone.

6.4.4.14 SOCIOECONOMICS

The no action alternative with the dam would have no cumulative effects on local or regional socioeconomics. Dam failure would result in minor cumulative adverse effects due to costs incurred for cleaning and repair after failure.

Alternative 1 (decommissioning), alternative 2 (widen auxiliary spillway), and alternative 3 (proposed action) would contribute negligible cumulative beneficial effects to the local economy. These projects would result in capital expenditures and would most likely benefit local labor sources and material suppliers with the increased demand for goods and services. Local businesses (retail, restaurant, etc.) would experience a temporary increase in demand from construction workers. However, given the scale of this project, cumulatively it would not noticeably influence immigration, housing availability, or earnings. Beneficial effects experienced would not persist beyond the construction of the project and would not be significant.

6.4.4.15 SCENIC BEAUTY

The no action alternative with the dam, alternative 2 (widen auxiliary spillway), and alternative 3 (proposed action) would not contribute to cumulative effects on scenic beauty. Actions taken to preserve the rural and natural character of the project area would potentially contribute cumulative beneficial effects, while other actions that alter the landscape for agricultural development or community development would potentially contribute negligible cumulative adverse effects.

Dam failure under the no action alternative would result in a breach wave that could damage downstream areas and alter the existing viewshed. The extent of damage would depend on the severity of the dam failure. In the long term, downstream vegetation and habitats would grow back resembling the rural, natural character that is present. As noted above, this alternative would contribute negligible cumulative impacts to scenic beauty.

Alternative 1 (decommissioning) would change the character of the landscape by removing the dam and reservoir and replacing it with stream and riparian woodland habitats. There would be no cumulative effects, as the rural and natural character of the area would be maintained.

6.4.4.16 RECREATION

The no action alternative with the dam, alternative 2 (widen auxiliary spillway), and alternative 3 (proposed action) would have no cumulative effects on recreation, as opportunities for incidental recreational activities would continue as they are under existing conditions.

Dam failure under the no action alternative and alternative 1 (decommissioning) would have long-term cumulative adverse effects on water-related incidental recreation with the loss of the dam and the reservoir.

7.0 CONSULTATION, COORDINATION, AND PUBLIC PARTICIPATION

The local sponsor held all agency and public meetings throughout the planning process, with assistance from NRCS. Public engagement efforts will continue throughout the engineering detailed design and land rights phase of this project, to ensure all individuals are informed and treated fairly.

7.1 AGENCY COORDINATION AND CONSULTATION

An agency scoping meeting and site visit was held on May 31, 2023, with a total of 14 people attending. Meeting participants provided additional information on the history and function of the dams within the watershed, as well as current uses of the reservoir for livestock watering and incidental recreation (swimming, fishing, and duck and youth deer hunting). Participants also expressed a desire to maintain the structure for continued function of flood reduction and to protect downstream roads, bus routes, and future development.

The following is a list of agencies with which the team conducted project coordination and consultation. Consultation correspondence is in Appendix A.

7.1.1 ENVIRONMENTAL/WILDLIFE CONSULTATION

US Fish and Wildlife Service Section 7 T&E Species Consultation is an ongoing process that NRCS staff initiated early in the planning process. NRCS sent a letter to USFWS on May 11, 2023, inviting staff to participate in an agency scoping meeting during the initial planning stage of this project. No USFWS staff attended the agency scoping meeting held on May 31, 2023, at the Hughes County Conservation District office.

Agency input and consultation was initiated by NRCS staff with a letter dated July 3, 2024. Staff initiated an online project review through USFWS IPAC on the same date. The USFWS responded on July 11, 2024, with an online project review concurrence letter. The conclusions resulted in “not likely to adversely affect/modify” determinations for listed species and critical habitat in relation to potential effects of the proposed project. The USFWS concurred with the determinations of “not likely to adversely affect” for listed species and critical habitat reached by proper use of this process. See Appendix A for the USFWS project review package. NRCS staff will continue to consult with USFWS staff as needed throughout project design.

US Army Corps of Engineers consultation is also an ongoing process. NRCS sent a letter to USACE on May 11, 2023, inviting staff to participate in an agency scoping meeting during the initial planning stage of this project. No USACE staff attended the agency scoping meeting held on May 31, 2023, at the Hughes County Conservation District office. See Appendix A for USACE correspondence. NRCS staff will continue to consult with USACE staff as needed throughout project design to ensure regulatory compliance and permit requirements are met.

In addition to the Federal agencies noted above, NRCS and the district regularly corresponded with the following State agencies.

- Oklahoma Conservation Commission. A member of the Oklahoma Conservation Commission regularly attends project meetings.
- Oklahoma Department of Wildlife Conservation

7.1.2 CULTURAL RESOURCES CONSULTATION

Section 106 consultation was conducted with the OKSHPO, OAS, Caddo Nation, Choctaw Nation, Muscogee Nation, Osage Nation, Quapaw Nation, and the Wichita and Affiliated Tribes. Section 106 consultation was initiated by the NRCS on March 8, 2023. Initial consultation letters were sent to the following agencies and Tribes (Appendix A):

- Oklahoma State Historic Preservation Office
- Oklahoma Archaeological Survey
- Caddo Nation
- Choctaw Nation
- Muscogee Nation
- Osage Nation
- Quapaw Nation
- Wichita and Affiliated Tribes

The initiation letters included a description of the project and documented the proposed methodology for complying with field survey needs to identify, evaluate, and assess effects to potential historic properties. As identified in the initiation of consultation letter, the NRCS defined a proposed scope of work to include historic architectural survey of the dam and a pedestrian survey with shovel testing using 30 meter transect-spacing with shovel test pits every 30 meters, to address the potential for archaeological deposits. The APE was defined as the maximum extent of the pool (using the top of dam elevation) and potential breach area (to the NRCS easement limits).

A second consultation package was submitted to the above-documented parties on February 27, 2024, requesting input and information regarding the Section 106 consultation process and potential historic properties. A final (third) notification package was sent to the above parties on March 20, 2024, and included the historic architectural and archaeological survey reports. In this notification, the NRCS made a determination that the Little Wewoka Watershed FWRS No. 12 is not eligible for listing in the NRHP and that there would be no effect to historic properties if the project moved forward with the proposed action.

On March 28, 2024, the SHPO concurred with the finding of no adverse effect to historic properties within the APE. Concurrence was also received from the Caddo Nation on March 14, 2024, and the Quapaw Nation on March 19, 2024. No additional Tribal correspondence has been received.

7.2 PUBLIC MEETINGS

A public participation plan was developed and approved at the initiation of this project and has been followed throughout the planning process. The goal of the plan was to integrate public involvement and input throughout the planning process.

A public scoping meeting was held on May 31, 2023, following the agency scoping meeting and site visit. A total of 13 people participated in the open house meeting, in which participants were provided information on the project purpose and need, planning process and schedule, and existing conditions. Meeting participants expressed an interest in the specific project location, the planning process and funding, impacts to agriculture, and impacts to confined animal feeding operations.

The second public meeting was held on December 6, 2023, to present the results of the dam rehabilitation alternatives analysis and to obtain input on potential issues or concerns. A total of 13 people attended the open house meeting. Participants expressed concerns about flooding downstream of the reservoir and the necessity of maintaining access for landowners to property on both sides of the dam.

A third public meeting was held on June 17, 2025, to present the Draft Plan-EA document for the 30-day agency and public review and comment period. A total of seven people attended the meeting representing NRCS, OK Conservation Commission, OK Department of Transportation, Hughes County Conservation District, and one landowner from the project area. No comments were received from the public or agencies during the meeting or the comment period.

8.0 PROPOSED ACTION (PREFERRED ALTERNATIVE)

8.1 RATIONALE FOR PLAN SELECTION

Alternative No. 3 is the proposed action or selected plan, which is to rehabilitate the dam to meet current NRCS and State of Oklahoma safety and performance standards for a high-hazard potential dam. The selected plan meets the identified purpose and need for the project and significantly reduces the potential risk to human life. The project sponsor prefers the selected plan for the following reasons:

- Provides downstream flood protection for agricultural producers and landowners for an additional 100 years.
- Reduces the threat to loss of life and property damage to one residence and four roads identified within the static breach zone.

- Provides a structure that is manageable by the Hughes County Conservation District in regard to maintenance capacity and cost.
- Retains the existing aquatic and terrestrial habitats in and around the reservoir.
- Leverages Federal resources to implement the planned works of improvement.

8.2 FEATURES OF THE PROPOSED ACTION (PREFERRED ALTERNATIVE)

The proposed action (preferred alternative), which is the NED plan, consists of structural rehabilitation of Little Wewoka Creek FWRS No. 12 to meet current NRCS and State of Oklahoma safety criteria and performance standards for a high-hazard dam. The designed life of the dam will be 100 years. Structural features and costs for the proposed action are presented in Economic and Structural Tables 1 through 6.

8.2.1 PRINCIPAL SPILLWAY

The principal spillway is an 18-inch conduit with a 2-foot x 4-foot x 12-foot inlet tower. Under TR-60 requirements for high-hazard dams, the minimum diameter permitted for the principal spillway conduit is 30 inches. This alternative proposes replacing the principal spillway with a larger, 30-inch conduit to bring the dam into compliance with TR-60. The inlet tower must also be replaced with a new 3-foot x 15-foot x 12-foot reinforced concrete inlet tower. This new inlet tower increases the weir length for the principal spillway from 4 feet to 15 feet, to meet TR-60 requirements. The principal spillway crest will remain unchanged, at 764.2 feet.

8.2.2 AUXILIARY SPILLWAY

The existing auxiliary spillway is composed of an earthen spillway near the left dam abutment. With the adjustments to the principal spillway, the auxiliary spillway must be raised by 1.5 feet to an elevation of 776.8 feet, to meet principal spillway hydrograph requirements. The existing auxiliary spillway would be abandoned and a new stepped auxiliary spillway with a width of 150 feet would be cut into the dam embankment. The spillway would be constructed of roller compacted concrete.

8.2.3 EMBANKMENT – DAM RAISE

Hydrologic analyses in SITES showed that the top of the dam would need to be raised 2.9 feet, to an elevation of 783.0 feet, to accommodate the 6-hour and 24-hour freeboard hydrographs. Under this alternative, driveway access across the top of the dam would be eliminated. Access to the landowner's property would need to be preserved, so an alternative route would need to be determined in future study.

Geotechnical and structural analyses were not performed as part of this analysis.

8.2.4 MITIGATION

Mitigation measures include erosion control measures and revegetation of all disturbed areas and reduction of the conservation pool elevation during construction to the minimum level necessary to complete the project. Implementation of the preferred alternative would require the following permits:

- Section 404 of the CWA permit;
- Section 401 State Water Quality Certification;
- Section 402 NPDES permit;
- Land disturbance permit with stormwater pollution prevention plan and/or erosion and sedimentation control plan; and
- All required local and state construction permits.

If the project is authorized by nationwide permit or an individual permit and would result in over 0.1 acre of loss to jurisdictional wetlands or open waters, or over 0.03 acre of loss to streams, compensatory mitigation would generally be required for unavoidable impacts to WOTUS. Acceptable forms of mitigation would include the purchase of mitigation bank credits from a private mitigation bank or in-lieu fee bank that services the Lower North Canadian HUC-8 Watershed (11100302) with sufficient stream and wetland bank credits. The USACE Tulsa District uses the Oklahoma stream mitigation method to calculate the required number of mitigation credits to offset losses to jurisdictional streams.

As required by NEPA and NRCS planning policy, Section 7 Endangered Species Act consultation and Section 106 of the National Historic Preservation Act have been completed for the planning phase of this project and documented throughout the Plan-EA. Ongoing consultation would be carried out as required, such as for updating Section 7 ESA consultation at specific time intervals or Section 106 in the event of inadvertent discoveries.

8.2.5 INSTALLATION SEQUENCE

The sequence of installation will include a 2-year design period and a 1-year land right acquisition period in conjunction with obtaining necessary permits. Construction is estimated to be one year.

Installation/construction sequence of the proposed dam improvements following the completion of the design and construction documents is anticipated as follows:

- Advertise project for bid (4 weeks)
- Select construction contractor and get under contract (4 weeks)
- Mobilize construction equipment (2 weeks)
- Install temporary erosion and sediment control measures (4 days)

- Lower reservoir level (2 weeks)
- Install new principal spillway inlet tower (7 weeks)
- Raise dam and construct new auxiliary spillway (12 weeks)
- Install permanent erosion control measures and restore project site (1 week)

8.2.6 COSTS

NRCS will be responsible for technical assistance for engineering design and 65 percent of project costs, with an estimated total of \$3,878,680. The sponsor will be responsible for 35 percent of the project costs, which includes all necessary land rights, for an estimated total of \$1,602,020. Economic Table 2 provides a detailed breakout of the estimated costs to be incurred by NRCS and the sponsor.

8.2.7 METHOD OF CONTRACTING

Projects are normally locally awarded contracts.

8.2.8 FINANCING OF THE PROJECT

Federal funding for providing technical and financial assistance for implementation of this project is dependent upon appropriation of funds for this purpose. The sponsor has the needed authority from the State to carry out the plan.

8.3 ACTIONS REQUIRED PRIOR TO PROJECT IMPLEMENTATION

There are a number of actions that the sponsor will need to take prior to project implementation, including:

- Enter into a memorandum of understanding with the NRCS, which establishes a maximum value for non-Federal in-kind contributions.
- Enter into an O&M agreement with the NRCS for the life of the project.
- Develop an emergency action plan for the dam, which designates responsible parties and appropriate actions to be taken in the event of a potential dam failure. The plan shall meet the minimum content specified in the NRCS National Operation and Maintenance Manual Part 500, Subpart F, and meet applicable Oklahoma dam safety requirements. The emergency action plan will be prepared prior to execution of fund-obligating documents for construction and shall be reviewed and updated by the sponsor annually.
- Acquire all land rights, easements, or rights-of-way needed in connection with the works of improvement. The minimum land rights area upstream of the dam must be for all areas below the elevation of the top of dam. If the sponsor is unable to obtain the land rights to the top of dam elevation, it will assume the potential risk of flood damage to the real property between the flowage rights and the top of dam elevation.

- Obtain all necessary water, mineral, and other resource rights, and all necessary local, State and Federal permits that may be required for installation and operation of the dam.
- Relocate the dam road to provide landowner access for agricultural purposes and to provide dam maintenance.

Develop a post review discovery and monitoring plan that follows the Oklahoma NRCS' post-review discovery and monitoring plan. The plan should describe the process that NRCS and its representatives will implement to address potential adverse effects if cultural resources are encountered during construction (even though adequate identification efforts were made before construction began). The post-review discoveries instructions will be relayed to the contractor when the contract is awarded. NRCS contracting officer's representative and NRCS construction inspectors have been trained in Oklahoma cultural resources procedures, which includes provisions for the discovery of cultural materials and human remains. In accordance with 36 CFR 800.13, the NRCS cultural resources coordinator will be contacted, and all construction will cease in a 50-foot radius of the discovery upon detection. The coordinator will examine the discovery location to determine if the discovery requires further assessment. Simultaneously, the Advisory Council on Historic Preservation, OKSHPO, Oklahoma State Archaeologist, and appropriate Tribal entities will be contacted within 48 hours of the discovery. With these partners, NRCS will determine the actions to resolve the adverse effects. If the finding of the effect for the project is likely to be "no adverse effect," a finding of "no adverse effect" document will be prepared and shared with the consultation partners. If the effects are unknown, NRCS will enter into an agreement document with the consultation partners for identification, evaluation, and assessment of the effects. The agency official will provide the ACHP/SHPO/State Archaeologist/Tribes a report of the remedial actions when they are completed.

8.4 OPERATION, MAINTENANCE, REPAIR, AND/OR REPLACEMENT

Operation, maintenance, and repair of the works of improvement are the responsibility of the sponsor. Work will be performed in accordance with the O&M agreement. An O&M plan will be prepared using the NRCS's National Operation and Maintenance Manual prior to issuing invitations to bid for construction. The term of the O&M agreement will be for 100 years, the life of the project. The annual O&M cost is estimated to be \$5,700.

TABLE 4. COMPARISON OF STRUCTURAL PHYSICAL DATA

Item	As-Built ^{1/}	Existing ^{2/}	Proposed Plan
FWRS No. 12			
Top-of-dam Elevation	780.1	780.1	783.0
Auxiliary Spillway Crest Elevation	775.3	775.3	776.8
Detention Pool Surface Area (ac)	69.5	70.5	77.4
Principal Spillway Crest Elevation	764.2	764.2	764.2
Principal Spillway Crest Surface Area (ac)	26.0	24.3	24.3
Storage (acre-feet)^{3/}			
Sediment Submerged	137.3	84.8	84.8
Aerated Sediment	15.2	9.4	9.4
Total Sediment Storage	152.5	94.2	94.2
Detention Storage ^{4/}	519.5	594.2	705.2
Total Storage (Auxiliary Spillway Crest) ^{5/}	672.0	688.4	799.4
Total Storage (Effective top-of-dam)	1672	1095	1394
Principal Spillway Diameter (in)	18	18	30
Principal Spillway Capacity (cfs)	14.8	14.8	93.2
Auxiliary Spillway Width (Feet)	70	70	150

^{1/} Values from 1958 as-built plans, elevations assumed to be NGVD 29, datum adjusted by +0.4’.

^{2/} Surface area and storage volume based on survey data obtained February 2023 (NAVD 1988).

^{3/} Aerated sediment volumes were not included in the 1955 workplan or as-builts. 10 percent aerated sediment assumed.

^{4/} Flood storage at auxiliary spillway crest elevation.

^{5/} Flood and sediment storage at auxiliary spillway crest elevation

^{6/} Top of dam elevation based on OWRB criteria

8.5 ECONOMIC AND STRUCTURAL TABLES

The following economic and structural tables summarize the watershed project information for the proposed action (Alternative 3).

ECONOMIC TABLE 1: ESTIMATED INSTALLATION COST

Little Wewoka Creek and Graves Creek Watershed, Oklahoma (Dollars)^{1/}

Works of Improvement	Estimated Costs
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Alt. 3 FWRS No. 12	PL 83-566 Funds	Other Funds	Total
Project Cost	\$3,619,100	\$1,870,900	\$5,486,400
Total Project	\$3,616,700	\$1,869,700	\$5,490,000

^{1/}Price base: 2024. Prepared February 2025.

ECONOMIC TABLE 2: ESTIMATED COST DISTRIBUTION – WATER RESOURCE PROJECT MEASURES

Little Wewoka Creek and Graves Creek Watershed, Oklahoma (Dollars)¹

Works of Improvement	NRCS	Sponsor	Total
Cost Sharable Items			
Rehabilitation of Dam (Construction Costs)	\$2,975,180	\$1,199,020	\$4,174,200
Relocation, Replacement in-kind	\$0	\$190,000	\$190,000
Relocation, Required Decent, Safe, Sanitary	\$0	\$0	\$0
Sponsor's Planning Costs	NA	\$0	\$0
Sponsor's Engineering Costs	NA	\$135,000	\$135,000
Sponsor's Project Administration	NA	\$15,000	\$15,000
Land Rights Acquisition Cost	NA	\$63,000	\$63,000
Subtotal: Cost-Share Costs	\$2,975,180	\$1,602,020	\$4,577,200
Cost -Share Percentages ^{1/}	65%	35%	100%
Non Cost-Sharable Items^{2/}			
NRCS Engineering & Project Administration	\$903,500	NA	\$903,500
Natural Resource Rights	NA	\$0	\$0
Federal, State, and Local Permits	NA	\$0	\$0
Relocation, Beyond Required decent, safe, sanitary	NA	\$0	\$0
Subtotal: Non Cost-Share Costs	\$903,500	\$0	\$903,500
Total Project Costs	\$3,878,680	\$1,602,020	\$5,480,700

^{1/} Price base 2024. Prepared February 2025.

^{2/} Maximum NRCS cos-share is 65% of Cost-Sharable items not to exceed 100% of construction cost

^{3/} If actual Cost-Sharable item expenditures vary from these figures, the responsible party will bear the change.

STRUCTURAL TABLE 3: DAMS WITH PLANNED STORAGE CAPACITY

Little Wewoka Creek and Graves Creek Watershed, Oklahoma

Item	Unit	FWRS No. 12
Class of structure		High
Seismic zone / Peak ground acceleration	Gravities (g)	0.069
Uncontrolled drainage area	mi ²	2.13
Controlled drainage area	mi ²	0
Total drainage area	mi ²	2.13
Runoff curve No. (1-day) (AMC II)		79
Time of concentration (T _c)	hrs	2.42
Elevation top dam	ft (NAVD88)	783.0
Elevation crest auxiliary spillway	ft (NAVD88)	776.8
Elevation crest high stage inlet	ft (NAVD88)	764.2
Elevation crest low stage inlet	ft	N/A
Auxiliary spillway type		Roller compacted concrete
Auxiliary spillway bottom width	ft	150
Auxiliary spillway exit slope	percent	3.2
Maximum height of dam	ft	30.3
Volume of fill ¹	yd ³	17,600
Total capacity ²	acre ft	799.4
Sediment submerged	acre ft	84.8
Sediment aerated	acre ft	9.4
Beneficial use (identify use)	acre ft	N/A
Floodwater retarding	acre ft	705.2
Between high and low stage	acre ft	N/A
Surface area		
Sediment pool ³	acres	24.3
Beneficial use pool	acres	N/A
Floodwater retarding pool ²	acres	77.4

Item	Unit	FWRS No. 12
Principal spillway design		
Rainfall volume (1-day)	in	9.30
Rainfall volume (10-day)	in	14.40
Runoff volume (10-day)	in	9.32
Capacity of low stage (max.)	ft ³ /s	N/A
Capacity of high stage (max.)	ft ³ /s	93.2
Dimensions of conduit	ft/in	30
Type of conduit		Single stage circular
Frequency operation-auxiliary spillway	percent chance	1
Auxiliary spillway hydrograph		
Rainfall volume	in	12.01
Runoff volume	in	9.32
Storm duration	hrs	6
Velocity of flow (Ve)	ft/s	11.7
Max. reservoir water surface elevation	ft (NAVD88)	780.67
Freeboard hydrograph		
Rainfall volume	in	27.10
Runoff volume	in	24.15
Storm duration	hrs	6
Max. reservoir water surface elevation	ft (NAVD88)	785.26
Capacity equivalents		
Sediment volume	in	0.84
Floodwater retarding volume	in	6.2
Beneficial volume	in	N/A

Prepared February 2024.

ECONOMIC TABLE 4: AVERAGE ANNUAL NED COSTS

Little Wewoka Creek and Graves Creek Watershed, Oklahoma (Dollars)^{1/}

Evaluation Unit	Project Outlays		
	Amortization of Installation Cost ^{2/}	Operation, Maintenance and Replacement Cost	Total
FWRS No. 12	\$ 160,800	\$ 5,700	\$166,500
Grand Total^{3/}	\$ 160,800	\$5,700	\$166,500

^{1/} Price base: 2024. Prepared February 2025.

^{2/} Amortized over 102 years at a 2024 discount rate of 2.75 percent.

ECONOMIC TABLE 5: ESTIMATED AVERAGE ANNUAL FLOOD DAMAGE REDUCTION BENEFITS

Little Wewoka Creek and Graves Creek Watershed, Oklahoma (Dollars)^{1/,2/,3/}

Damage Category	Estimated Average Annual Damages without Project ^{3/}	Estimated Average Annual Damages with the Project ^{3/}	Estimated Average Annual Benefits
Structures	\$300	\$200	\$100
Crops and Pastureland	\$600	\$600	\$0
Road Crossings	\$604,200	\$608,300	(\$4,200)
Roads	\$155,000	\$158,300	(\$3,400)
Erosion and Sedimentation	\$10,300	\$4,500	\$5,800
Total^{4/}	\$770,400	\$771,900	(\$1,700)

^{1/} Price base: 2024. Prepared February 2025.

^{2/} All figures reflect agriculture-related damages and benefits, including damages and benefits to rural communities.

^{3/} Damages and benefits will accrue from floods of greater magnitude than the 1,000-year frequency event, but these were not evaluated.

ECONOMIC TABLE 6: COMPARISON OF BENEFITS AND COSTS

Little Wewoka Creek and Graves Creek Watershed, Oklahoma (Dollars)^{1/}

Works of Improvement	Average Annual Benefits ^{2/}	Average Annual Cost ^{3/}	Benefit/Cost Ratio	Net Benefit
Alternative 3, FWRS No. 12	(\$1,700)	\$166,500	0.0	(\$168,200)

^{1/} Price base: 2024. Prepared February 2025.

^{2/} From Table 5

^{3/} From Table 4

9.0 REFERENCES

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10.0 LIST OF PREPARERS

The table below identifies the individuals who were directly responsible for providing significant input into the preparation of the Plan-EA, along with their experience. Appreciation is extended to the many individuals, agencies, and organizations for their input, assistance, and consultation, without which this document would not have been possible.

Name	Present Title	Education	Years of Exp.	Licenses & Registrations
USDA Staff				
Valerie Glasgow	Planning Engineer	B.S. Bioenvironmental Science, M.S. Agricultural Engineer	20	
Roderick Dukes	District Conservationist			
Ted Kersten	Hydraulic Engineer	B.S. Agricultural Engineer, M.S. Agricultural Engineer	21	
Jessica Nichols	Geologist	B.S. & M.S. Geology	6	
Paige Hauk	Economist	B.S. AG Economics	6	
KC Kraft	State Archeologist	BA, MA, Ph.D. Anthropology	37	Register of Professional Archaeologists #11458.
Melissa Jones	Biologist	B.S. Zoology, M.S. Wildlife Ecology, PhD. Aquatic Resources	18	
Ad Astra				
Laurie Brown	Conservation Ecologist	Master of Community & Regional Planning, B.S. Zoology	31	
Triveece Penelton	City Planner, Public Engagement Specialist	Master of Urban Planning, B.S. Architectural Studies	19	Am. Institute of Certified Planners (AICP)
Matt Harper	Water Resources Engineer, Proj. Mgr.	B.S. Civil Engineering, B.S. Mathematics	21	PE: OK (34637), TX, KS, IL, and MO
Don Baker	Water Resources Engineer, Principal & Owner	M.S. Civil Engineering, B.S. Engineering Physics, B.S. Agricultural Engineering	32	PE: CA, CO, IL, IN, KS, MO, MT, ND, NE, OH, OR, and WY; AAWRE, BC. WRE, EnviroCert, CPESC, SAVE, VMA
Mike Smith	Director of Business Development	B.S. Agriculture	41	
Aaron Sprague	Project Engineer	B.S. Civil Engineering	5	EI: MO
Tyler Benschoter	Project Engineer	B.S. Architectural Engineering	6	PE:KS
Jason Davis	Affinis Engineer, Principal	B.S. Civil Engineering, M.S. Geological Engineering	24	PE Licences: IL, KS, MO, OK, NE, TX, and SD

Name	Present Title	Education	Years of Exp.	Licenses & Registrations
Ad Astra				
Kendall Rees	Project Engineer	B.S. Civil Engineering	4	EI: MO
Ellen Brady	Principal, Technical Discipline Leader, Cultural Resources	BS Anthropology, MA Anthropology, RPA	26	Register of Professional Archeologists #15581
Kory Van Hemert	Architectural Historian	BA History, MSc Architectural Conservation	10	
Candace Parker	Staff Archaeologist	BS Anthropology, MA Anthropology	6	
Amanda Temple	Staff Archaeologist	BA History and Anthropology	8	
Haley Rush	Principal, Senior Archaeologist	BA Anthropology, MA Anthropology, RPA	18	Register of Professional Archaeologists #989965
Colin Young	Senior Water Resources Engineer	M.S. Civil Engineering and B.S. Geological Engineering	27	PE: OK, TX, KS, MO, AR, IN, OH, TN, GA, NC, CO, SC, WY
Kyle Jacobs	Project Engineer	B.S. and M.S. Biological Systems Engineering	6	PE: NC, VA
Chris Stoner	Senior Agricultural Engineer	B.S. Agricultural Engineering	38	PE: OK, TX
Patrick Garnett	Environmental Scientist	B.A. Wildlife Biology	28	ISA Certified Arborist, Certified Wildlife Biologist, CPESC, Professional Wetland Scientist
Wes Wiegreffe	Environmental Scientist	M.S. and B.S. Biology	7	Certified Wildlife Biologist
The draft supplemental watershed plan and environmental assessment were reviewed and concurred by State staff specialists having responsibility in agronomy, soils, biology, forestry, geology, and engineering. This review was followed by review of the document by the National Watershed Management Center.				

11.0 DISTRIBUTION LIST

Comments were requested on the Draft Supplemental Plan-EA from the following agencies and organizations.

Federal Agencies

Response Received

U.S. Army Corps of Engineers – Tulsa Regulatory Office

U.D. Bureau of Reclamation

U.S. Department of Agriculture

U.S. Department of the Interior, Fish and Wildlife Service

U.S. Environmental Protection Agency Region 6

Federal Emergency Management Agency

Native American Tribes

Alabama Quassarte Tribal Town

Caddo Nation

Chickasaw Nation

Choctaw Nation of Oklahoma

Kialegee Tribal Town

Muscogee Nation

Osage Nation

Quapaw Tribe of Indians

Seminole Nation of Oklahoma

Thlopthlocco Tribal Town

Quapaw Nation

Wichita and Affiliated Tribes

State Agencies

Oklahoma Archeological Survey

Oklahoma Archeological Society – Central Chapter

Oklahoma Conservation Commission

Oklahoma Department of Agriculture, Food, and Forestry

Oklahoma Department of Emergency Management
Oklahoma Department of Environmental Quality
Oklahoma Department of Transportation
Oklahoma Department of Wildlife Conservation
Oklahoma Environmental Protection Agency
Oklahoma Groundwater Association
Oklahoma Historical Society
Oklahoma State Historic Preservation Office (SHPO)
Oklahoma Water Resources Board

Public Officials

Office of Governor J. Kevin Stitt
U.S. Senator James Lankford
U.S. Senator Markwayne Mullin
U.S. Representative Frank Lucas
State Senator Jonathon Wingard
State Representative David Smith

City/Local Contacts

City of Holdenville
Hughes County
Department of Transportation Hughes County Maintenance
Oklahoma Emergency Management Hughes County
Hughes County Rural Water District 6
Hughes County Farm Bureau

Landowners

Robinson Family
Dwayne Snyder
Fred Raschen

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