

Draft

Environmental Impact Statement

Jackson County Lake Project

Jackson County, Kentucky

May 2000



United States Department of Agriculture
Lead Agency: Rural Utilities Service
Cooperating Agency: United States Forest Service

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EXECUTIVE SUMMARY

PROPOSED ACTION

The action proposed by the Jackson County Empowerment Zone Community, Incorporated (EZ), Jackson County Fiscal Court, and the Jackson County Water Association (JCWA) consists of the construction of a roller-compacted concrete dam to create a reservoir within Jackson County, Kentucky, and the construction of a raw water transmission main from the proposed reservoir to the existing JCWA Treatment Plant. A 300-foot buffer zone surrounding the reservoir horizontally from the normal pool level has been proposed to protect the water quality of the reservoir by restricting development and certain land uses in this area. Along with the dam, a water intake structure and a pump house would be constructed to pump water out of the reservoir. Proposed recreational development around the reservoir may include a boat ramp, boat dock, public beach, hiking trails, picnic areas, and a primitive campground.

The EZ has applied for Federal funds from the U.S. Department of Agriculture (USDA), Rural Utilities Service (RUS) and from the Department of Housing and Urban Development (HUD) to fund the Jackson County Lake Project. The table below lists potential sources of funding for this project, along with the amount of funding obtained or requested.

Proposed Funding for the Jackson County Lake Project			
	Funding Source	Date of Submittal or Obtainment	Amount Requested or Obtained
Federal	Appalachian Regional Commission	To be submitted August/September 2000	\$500,000
	USDA, Rural Utilities Service	Preapplication submitted July 10, 1997	\$3,500,000
	U.S. Department of Commerce, Economic Development Administration	N/A	\$1,500,000
	HUD, Community Development Block Grant	To be submitted April 2000	\$1,000,000
State	Tobacco Settlement Money	N/A	\$1,000,000
Local	Empowerment Zone Funding	Obtained December 23, 1994	\$5,000,000
Total:			\$12,500,000

This EIS is developed and written in accordance with the National Environmental Policy Act (NEPA) (42 United States Code (USC) 4321-4346), Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations (CFR) 1500-1508), and RUS NEPA policies and procedures (7 CFR part 1794).

PURPOSE AND NEED

As documented in the *Water Needs Analysis* prepared for Jackson County by Commonwealth Technologies, Incorporated, Jackson County has a need to obtain additional water supplies for its continued population growth, as well as for its commercial and industrial economic development. Jackson County’s projected water needs were determined by estimating current levels of water use within the County and the demands of the surrounding region and factoring in various scenarios for projected population growth. The *Water Needs Analysis* was conducted in coordination and consultation with Kentucky Division of Water and utilized demographic information and projections from the University of Kentucky, Kentucky Population Research program. The analysis determined that Jackson County, under a moderate growth projection, would need a total of 3.5 million gallons of water a day (mgd) by 2050.

Jackson County also has a documented recreational need. According to the *Recreational Needs Analysis for the Proposed Jackson County Lake Project*, prepared by The Mangi Environmental Group, Incorporated, Jackson County has a need for additional camping, picnicking, hiking, and swimming facilities, and this need is projected to increase in the future.

The purpose of the proposed Jackson County Lake Project is to provide adequate water supplies for the projected residential, commercial, and industrial needs of Jackson County, and parts of some neighboring counties, over the next 50 years, and to provide recreational opportunities to meet the present and future needs of Jackson County and the surrounding region.

ALTERNATIVES

In preparing this EIS, the study team considered several alternative ways to meet the purpose and need of the proposed action. However, many of these alternatives were considered unreasonable, insufficient, or impracticable. The following table lists the alternatives evaluated and eliminated from further study, and the rationale for their elimination.

Alternatives Eliminated from Further Study	
Alternative	Rationale for Elimination
Non-Reservoir Alternatives	
Groundwater Development	<ul style="list-style-type: none"> • Insufficient yield to meet the projected needs of Jackson County due to the geology of the County • Potential for groundwater contamination
Expansion of Tyner Lake and/or McKee Reservoir	<ul style="list-style-type: none"> • Insufficient yields to meet the projected needs of Jackson County due to the sizes of the watersheds
Importing Water From Surrounding Counties	<ul style="list-style-type: none"> • Not cost-effective**
Water Conservation	<ul style="list-style-type: none"> • Insufficient quantity of water able to be conserved to meet the projected needs of Jackson County
Reservoir Alternatives	
Laurel Fork and Buzzard Branch	<ul style="list-style-type: none"> • Presence of Threatened or Endangered species

	<ul style="list-style-type: none"> (Cumberland Bean Pearly Mussel) Outstanding Resource Water (ORW) designation
Laurel Fork and McCammon Branch	<ul style="list-style-type: none"> Presence of Threatened or Endangered species (Cumberland Bean Pearly Mussel) ORW designation
Horse Lick Creek	<ul style="list-style-type: none"> Presence of Threatened or Endangered species (Cumberland Bean Pearly Mussel) ORW designation
South Fork of Station Camp Creek and Rock Lick	<ul style="list-style-type: none"> Wild and Scenic Study River designation of South Fork
South Fork of Station Camp Creek and Cavanaugh Creek #2	<ul style="list-style-type: none"> Wild and Scenic Study River designation of South Fork
South Fork of Station Camp Creek and Cavanaugh Creek	<ul style="list-style-type: none"> Wild and Scenic Study River designation of South Fork
McCammon Branch	<ul style="list-style-type: none"> Presence of Threatened or Endangered species (Cumberland Bean Pearly Mussel) downstream Downstream feeds into waters with ORW designation Insufficient yield during worst drought conditions
Mill Creek	<ul style="list-style-type: none"> Presence of Threatened or Endangered species (Cumberland Bean Pearly Mussel) downstream Stream waters feed into waters with ORW designation Insufficient yield
War Fork and Alcorn Branch	<ul style="list-style-type: none"> Wild and Scenic Study River designation of included portion of War Fork
South Fork of Station Camp Creek and War Fork	<ul style="list-style-type: none"> Wild and Scenic Study River designation of South Fork
Travis Creek	<ul style="list-style-type: none"> Insufficient yield
<p>**The closest of the existing surface water resources to the JCWA Treatment Plant is Wood Creek Lake in northern Laurel County, located about 119,500 linear feet, or 22.6 miles, from the treatment plant. Construction and operation costs for raw water transmission facilities sized to transport 3.5 million gallons of water per day from Wood Creek Lake have been estimated. According to these estimates, the total cost of construction and 20-year operation of this water main would be about \$13,804,000. These costs suggest that this option would not be a cost-effective alternative. Since the distance from all other existing surface water resources in surrounding counties to the JCWA Treatment Plant are greater than the distance of Wood Creek Lake from the treatment plant, it can be reasonably assumed that construction and operation costs for their associated water transmission facilities would be greater.</p>	

Three alternative sites for the proposed dam and reservoir were determined to be reasonable for further consideration, and are evaluated in this EIS along with the No Action alternative. These include the: War Fork and Steer Fork site; Sturgeon Creek, 8.5 mgd site; and Sturgeon Creek, 3.5 mgd site. These alternatives are described below.

War Fork and Steer Fork

The proposed War Fork and Steer Fork dam site is located approximately 0.5 miles southwest of Turkey Foot in eastern Jackson County. The dam would be situated on War Fork, 0.75 miles north of the confluence with Steer Fork. The dam at this site would have an approximate height range of 87 to 107 feet, a length range of 760 to 790 feet, and a width range of 102 to 122 feet. At a normal pool elevation of approximately 980 feet above mean sea level (MSL), the surface area of the impoundment would be approximately 116 acres, with a storage capacity of 4,414 acre-feet (1.438 billion gallons (BG)). The drainage area for this reservoir would be 10.85 square miles. This reservoir would provide an average yield of 3.5 mgd of raw water.

At a potential maximum flood elevation of 1,000 feet above MSL, the surface area of the proposed reservoir would be approximately 162 acres. The total acreage for a reservoir at maximum flood level at this site, with a 300-foot buffer extending from normal pool level, would be approximately 337 acres of land. Much of this land is currently part of the Daniel Boone National Forest (DBNF). Land acquisition at this project site would require a land exchange with the U.S. Forest Service (USFS) for land within the DBNF.

The estimated total capital cost of the project at the War Fork and Steer Fork site would be approximately \$9,671,000. Total capital cost includes the costs of construction of the dam, reservoir, and raw water transmission main; land acquisition for the project at normal pool elevation of the reservoir; and utility relocations within the normal pool area of the reservoir. Thus, the total cost for the project at this site, including operation and maintenance costs for the raw water transmission main for 20 years, would be approximately \$10,805,000. The total capital and project costs given here do not include costs of land acquisition or utility relocations within the buffer or maximum flood areas of the project, nor do they include costs of constructing or operating the proposed recreational facilities associated with the reservoir. These costs are currently unavailable. Should the land within the buffer zone and maximum flood level of the reservoir also be obtained from the USFS, the total costs for the project would be higher.

Sturgeon Creek, 8.5 mgd

The proposed Sturgeon Creek, 8.5 mgd dam site is located near the Jackson/Owsley County boundary line in eastern Jackson County, approximately 1.5 miles northeast of the community of Mummie. The dam would be situated on Sturgeon Creek just below the confluence with Blackwater Creek. The dam at this site would have an approximate height range of 84 to 100 feet, a length range of 825 to 850 feet, and a width range of 99 to 115 feet. At a normal pool elevation of about 990 feet above MSL, the surface area of the impoundment would be approximately 467 acres, with a storage capacity of 11,007 acre-feet (3.586 BG). The drainage area for this reservoir would be 21.23 square miles. This reservoir would provide an average yield of 8.5 mgd. Due to this greater yield, a reservoir at this site might be used as a regional water supply source to serve the needs not only of Jackson County, but also of neighboring counties.

At a potential maximum flood elevation of 1,010 feet above MSL, the surface area of the reservoir would be approximately 740 acres. The total area for a reservoir at maximum flood

level at this site, with a 300-foot buffer extending from normal pool level, would be approximately 1,119 acres. All of this land is currently privately-owned. Implementation of the project at this site would require the relocation of residents currently living on the project site and the demolition or relocation of existing structures in this area, including homes, barns, and outbuildings. There would also be connected actions associated with the project at this site, such as plugging water and oil wells in the project area, closing existing septic and storage tanks, and relocating roadways, such as KY 30.

The estimated total capital cost of the project at the Sturgeon Creek, 8.5 mgd site would be approximately \$27,600,000. Total capital cost includes the costs of construction of the dam, reservoir, and raw water transmission main; land acquisition for the project at normal pool elevation of the reservoir; and utility and residential relocations within the normal pool area of the reservoir. Thus, the total cost for the project at this site, including operation and maintenance costs for the raw water transmission main for 20 years, would be approximately \$30,800,000. The total capital and project costs given here do not include costs of land acquisition or utility and residential relocations within the buffer or maximum flood areas of the project, nor do they include costs of constructing or operating the proposed recreational facilities associated with the reservoir. These costs are currently unavailable. Including these costs, however, would increase the total costs for the project at this site.

Sturgeon Creek, 3.5 mgd

The proposed Sturgeon Creek, 3.5 mgd dam site is located near the Jackson/Owsley County boundary line in eastern Jackson County, approximately 1.5 miles east-northeast of the village of Mummie. The dam would be situated on Sturgeon Creek approximately 0.6 miles above the confluence with Blackwater Creek, and approximately 0.8 miles upstream of the Sturgeon Creek 8.5 mgd dam site. The dam at this site would have an approximate height range of 64 to 67 feet, a length range of 500 to 600 feet, and a width range of 104 to 107 feet, due to the allowance for a potential road to be constructed across its top. At a normal pool elevation of 980 feet above MSL, the surface area of the impoundment would be about 264 acres, with a storage capacity of 4,446 acre-feet (1.449 BG). The drainage area for this reservoir would be 15.62 square miles. This reservoir would provide an average yield of 3.5 mgd.

At a potential maximum flood elevation of 1,000 feet above MSL, the surface area of the proposed reservoir at the Sturgeon Creek, 3.5 mgd site would be approximately 440 acres. The total acreage for a reservoir at maximum flood level at this site, with a 300-foot buffer extending from normal pool level, would be approximately 643 acres of land. All of this land is currently privately-owned. Implementation of the project at this site would require the relocation of residents currently living on the project site and the demolition or relocation of existing structures in this area, including homes, barns, and outbuildings. There would also be connected actions associated with the project at this site, such as plugging water and oil wells in the project area, closing existing septic and storage tanks, and relocating roadways, such as KY 30.

The estimated total capital cost of the project at the Sturgeon Creek, 3.5 mgd site would be approximately \$10,700,000. Total capital cost includes the costs of construction of the dam, reservoir, and raw water transmission main; land acquisition for the project at normal pool

elevation of the reservoir; and utility and residential relocations within the normal pool area of the reservoir. Thus, the total cost for the project at this site, including operation and maintenance costs for the raw water transmission main for 20 years, would be approximately \$11,600,000. The total capital and project costs given here do not include costs of land acquisition or utility and residential relocations within the buffer or maximum flood areas of the project, nor do they include costs of constructing or operating the proposed recreational facilities associated with the reservoir. These costs are currently unavailable. Including these costs, however, would increase the total costs for the project at this site.

No Action

For the purposes of this EIS, two definitions of the No Action alternative were analyzed. The first definition, identified as the No Change alternative in this EIS, describes a situation in which nothing is done to meet the projected water and recreation needs of Jackson County. As the No Change alternative was determined to be unreasonable due to the documented need for water in Jackson County, a second definition, identified as in this EIS as the No Action alternative, was also analyzed. The No Action alternative assumes that, although a dam and reservoir would not be constructed to meet the projected needs of Jackson County, other activities would occur to increase the current water supply, although in insufficient amounts to meet the projected needs. These activities may include drilling additional water wells throughout Jackson County, constructing water transmission lines from existing resources, such as intermittent streams, within the County, to the JCWA Treatment Plant, or water conservation.

Preferred Alternative

The preferred alternative, as identified by the lead agency, United States Department of Agriculture (USDA), Rural Utilities Service (RUS), is the proposed action at the War Fork and Steer Fork site. Support for the War Fork and Steer Fork site as the preferred alternative has been expressed by the Jackson County Empowerment Zone Community, Incorporated, the Jackson County Lake Committee, and the Jackson County Water Association (JCWA).

MAJOR CONCLUSIONS

The potential environmental and human health and safety impacts resulting from the proposed action at each of the alternative project sites are summarized in the table on the following pages. In addition, this table compares the potential impacts at each alternative project site to those that would result from the No Action alternative. Potential impacts are grouped according to environmental resource area or component. In addition, a short list of differences among alternatives is provided under each resource area, where differences exist. The criteria used to determine the significance of impacts are provided in Appendix C of this EIS.

Comparison of Potential Impacts of Alternatives

Environmental Resource/ Component	ALTERNATIVES			
	War Fork and Steer Fork	Sturgeon Creek, 8.5 mgd	Sturgeon Creek, 3.5 mgd	No Action
Geology/Soils	<ul style="list-style-type: none"> • Adverse, moderately significant increase in soil erosion, both short-term during construction and long-term during operations at the reservoir • Adverse, but insignificant, degradation of soil quality from the risk of a chemical/POL spill during construction • Adverse, moderately significant loss of Prime Farmland • Insignificant risk of fracturing bedrock during potential blasting or due to the weight of the dam • Adverse, but insignificant, degradation of wetlands 	<ul style="list-style-type: none"> • Adverse, moderately significant increase in soil erosion, both short-term during construction and long-term during operations at the reservoir • Adverse, but insignificant, degradation of soil quality from the risk of a chemical/POL spill during construction • Adverse, very significant loss of Prime Farmland • Insignificant risk of fracturing bedrock during potential blasting or due to the weight of the dam • Adverse, but insignificant, degradation of wetlands 	<ul style="list-style-type: none"> • Adverse, moderately significant increase in soil erosion, both short-term during construction and long-term during operations at the reservoir • Adverse, but insignificant, degradation of soil quality from the risk of a chemical/POL spill during construction • Adverse, very significant loss of Prime Farmland • Insignificant risk of fracturing bedrock during potential blasting or due to the weight of the dam • Adverse, but insignificant, degradation of wetlands 	<ul style="list-style-type: none"> • Insignificant adverse increase in soil erosion from construction activities • Adverse, but insignificant, degradation of soil quality from the risk of a chemical/POL spill during construction activities • Adverse, but insignificant, loss of Prime Farmland
Differences Among Alternatives	<ul style="list-style-type: none"> • Larger amount of Prime Farmland lost at the Sturgeon Creek sites than at the War Fork and Steer Fork site • Larger amount of wetlands affected at both of the Sturgeon Creek sites, but impacts would be insignificant at all sites • Slightly greater soil erosion at the Sturgeon Creek, 8.5 mgd site due to the larger area affected by the project 			
Surface and Groundwater Resources	<ul style="list-style-type: none"> • Adverse, moderately significant temporary degradation of downstream water quality from sedimentation and turbidity during construction 	<ul style="list-style-type: none"> • Adverse, insignificant temporary degradation of downstream water quality from sedimentation, turbidity, and POL/chemical spills during construction 	<ul style="list-style-type: none"> • Adverse, insignificant temporary degradation of downstream water quality from sedimentation, turbidity, and POL/chemical spills during construction 	<ul style="list-style-type: none"> • Adverse, insignificant temporary degradation of downstream water quality from turbidity, sedimentation, and POL/chemical spills during construction of

	<ul style="list-style-type: none"> • Adverse, but insignificant, temporary degradation of downstream water quality due to POL/chemical spills during storage and handling • Adverse, moderately significant reduction of dissolved oxygen (DO) and elevation of summer water temperatures downstream • Positive, moderately significant creation of surface water • Positive, but insignificant, creation of new wetlands along shorelines and inflowing streams • Adverse, moderately significant short-term reduction in downstream flows on Wild and Scenic Study River segment downstream during impoundment • Insignificant long-term reductions in downstream flows due to withdrawals from reservoir • Adverse, but insignificant, long-term effects of surrounding land uses and lake-based recreation on reservoir water quality 	<ul style="list-style-type: none"> • Adverse, but insignificant, reduction of DO and elevation of summer water temperatures downstream • Positive, moderately significant creation of surface water • Positive, but insignificant, creation of new wetlands along shorelines and inflowing streams • Insignificant short-term reductions in downstream flows • Adverse, but insignificant, long-term effects of surrounding land uses and lake-based recreation on reservoir water quality 	<ul style="list-style-type: none"> • Adverse, but insignificant, reduction of DO and elevation of summer water temperatures downstream • Positive, moderately significant creation of surface water • Positive, but insignificant, creation of new wetlands along shorelines and inflowing streams • Insignificant short-term reductions in downstream flows • Adverse, but insignificant, long-term effects of surrounding land uses and lake-based recreation on reservoir water quality 	<p>water transmission lines</p> <ul style="list-style-type: none"> • Moderately significant adverse impact on groundwater supplies and/or aquifers due to drilling new water wells
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Differences Among Alternatives	<ul style="list-style-type: none"> • Greater adverse impacts (due to sedimentation, turbidity, and reduced DO) downstream of the War Fork and Steer Fork site than at either of the Sturgeon Creek sites due to the Wild and Scenic Study River status of the segment downstream of the proposed dam site • Amount of surface water created at each site would be incremental, with the greatest amount created at the Sturgeon Creek, 8.5 mgd site • Slightly greater long-term adverse impacts on water quality due to surrounding land uses at the Sturgeon Creek sites than at the War Fork and Steer Fork site due to greater pesticide usage and residential uses, but still insignificant at all sites 			
Air Quality	<ul style="list-style-type: none"> • Adverse, but insignificant, degradation of air quality from fugitive dust, clearing and grading, vehicle maintenance and operation, debris burning, and potential chemical/ POL spills 	<ul style="list-style-type: none"> • Adverse, but insignificant, degradation of air quality from fugitive dust, clearing and grading, vehicle maintenance and operation, debris burning, and potential chemical/ POL spills 	<ul style="list-style-type: none"> • Adverse, but insignificant, degradation of air quality from fugitive dust, clearing and grading, vehicle maintenance and operation, debris burning, and potential chemical/ POL spills 	<ul style="list-style-type: none"> • Adverse, but insignificant, degradation of air quality from construction activities
Biological Resources	<ul style="list-style-type: none"> • Adverse, but insignificant, temporary wildlife displacement during construction • Adverse, but insignificant elimination of potential habitats for Federally-listed Threatened and Endangered species from permanent removal of vegetation • Adverse, but insignificant, short-term harm to wildlife and vegetation from degraded air quality and risk of POL/chemical spills • Moderately significant short-term harm to downstream aquatic biota 	<ul style="list-style-type: none"> • Adverse, but insignificant, temporary wildlife displacement during construction • Adverse, but insignificant elimination of potential habitats for Federally-listed Threatened and Endangered species from permanent removal of vegetation • Adverse, but insignificant, short-term harm to wildlife and vegetation from degraded air quality and risk of POL/chemical spills • Moderately significant short-term harm to downstream aquatic biota 	<ul style="list-style-type: none"> • Adverse, but insignificant, temporary wildlife displacement during construction • Adverse, but insignificant elimination of potential habitats for Federally-listed Threatened and Endangered species from permanent removal of vegetation • Adverse, but insignificant, short-term harm to wildlife and vegetation from degraded air quality and risk of POL/chemical spills • Moderately significant short-term harm to downstream aquatic biota 	<ul style="list-style-type: none"> • Insignificant damage to habitats due to construction activities • Insignificant damage to aquatic habitat from sedimentation and turbidity during construction activities

	<p>from degraded water quality and reduced flow</p> <ul style="list-style-type: none"> • Moderately significant adverse impact to terrestrial plants and wildlife due to permanent elimination of habitat • Positive increase in reservoir fish species and waterfowl • Moderately significant long-term effects on downstream aquatic biota and riparian vegetation from reduced DO and water flows, and changes in water temperature • Moderately significant adverse impact on small terrestrial and aquatic mammals, amphibians, and reptiles from permanent blockage of migration by the reservoir 	<p>from degraded water quality and reduced flow</p> <ul style="list-style-type: none"> • Insignificant adverse impact to terrestrial plants and wildlife due to permanent elimination of habitat • Positive increase in reservoir fish species and waterfowl • Moderately significant long-term effects on downstream aquatic biota and riparian vegetation from reduced DO and water flows, and changes in water temperature • Moderately significant adverse impact on small terrestrial and aquatic mammals, amphibians, and reptiles from permanent blockage of migration by the reservoir 	<p>from degraded water quality and reduced flow</p> <ul style="list-style-type: none"> • Insignificant adverse impact to terrestrial plants and wildlife due to permanent elimination of habitat • Positive increase in reservoir fish species and waterfowl • Moderately significant long-term effects on downstream aquatic biota and riparian vegetation from reduced DO and water flows, and changes in water temperature • Moderately significant adverse impact on small terrestrial and aquatic mammals, amphibians, and reptiles from permanent blockage of migration by the reservoir 	
Differences Among Alternatives	<ul style="list-style-type: none"> • Less harm to terrestrial plants and wildlife from permanent elimination of habitat at either of the Sturgeon Creek sites due to the fragmented nature of forests and the large amount of farmland at these sites 			
Noise	<ul style="list-style-type: none"> • Adverse, but insignificant, displacement/disturbance of wildlife during construction, potential blasting, and operations • Adverse, but insignificant disruption of nearby residents due to noise 	<ul style="list-style-type: none"> • Adverse, but insignificant, displacement/disturbance of wildlife during construction, potential blasting, and operations • Adverse, but insignificant disruption of nearby residents due to noise 	<ul style="list-style-type: none"> • Adverse, but insignificant, displacement/disturbance of wildlife during construction, potential blasting, and operations • Adverse, but insignificant disruption of nearby residents due to noise 	<ul style="list-style-type: none"> • Insignificant, adverse displacement/disturbance of wildlife due to noise created during construction activities • Insignificant, adverse disruption of nearby

	during construction, potential blasting, and operations	during construction, potential blasting, and operations	during construction, potential blasting, and operations	residents due to noise created during construction activities
Recreation	<ul style="list-style-type: none"> • Adverse, moderately significant short- and long-term reduction of recreational opportunities within the project area and downstream • Positive, very significant increase in recreational opportunities provided by the reservoir 	<ul style="list-style-type: none"> • Adverse, but insignificant, short- and long-term reduction of recreational opportunities within the project area and downstream • Positive, very significant increase in recreational opportunities provided by the reservoir 	<ul style="list-style-type: none"> • Adverse, but insignificant, short- and long-term reduction of recreational opportunities within the project area and downstream • Positive, very significant increase in recreational opportunities provided by the reservoir 	<ul style="list-style-type: none"> • Adverse, but insignificant, reduction in recreational opportunities due to construction activities • Very significant continued recreation needs within Jackson County and the surrounding region
Differences Among Alternatives	<ul style="list-style-type: none"> • Greater short- and long-term reductions of recreational opportunities within and around the War Fork and Steer Fork project area due to the presence of Turkey Foot Campground downstream 			
Cultural Resources	<ul style="list-style-type: none"> • Potential to adversely affect cultural resources would be insignificant 	<ul style="list-style-type: none"> • Potential to adversely affect cultural resources would be moderately significant to very significant 	<ul style="list-style-type: none"> • Potential to adversely affect cultural resources would be moderately significant to very significant 	<ul style="list-style-type: none"> • Potential to adversely affect cultural resources would be insignificant during construction activities
Differences Among Alternatives	<ul style="list-style-type: none"> • Greater potential to adversely affect cultural resources at either of the Sturgeon Creek sites than at the War Fork and Steer Fork site due to the presence of a potentially significant archaeological site discovered and due to the potential for historic sites and undisturbed, intact cultural deposits at the Sturgeon Creek sites 			
Land Use	<ul style="list-style-type: none"> • Moderately significant permanent alteration of existing land uses in the project area • Insignificant permanent changes in land use from socioeconomic forces • Adverse, but insignificant, effects of current land uses on environmental 	<ul style="list-style-type: none"> • Moderately significant permanent alteration of existing land uses in the project area • Moderately significant permanent changes in land use from socioeconomic forces • Adverse, moderately significant, effects of 	<ul style="list-style-type: none"> • Moderately significant permanent alteration of existing land uses in the project area • Moderately significant permanent changes in land use from socioeconomic forces • Adverse, moderately significant, effects of 	<ul style="list-style-type: none"> • Moderately significant impact due to continued unplanned development

	<p>conditions in and around the proposed reservoir</p> <ul style="list-style-type: none"> • Adverse, moderately significant impact due to conflicts involving land ownership or easements 	<p>current land uses on environmental conditions in and around the proposed reservoir</p> <ul style="list-style-type: none"> • Adverse, moderately significant impact due to conflicts involving land ownership or easements 	<p>current land uses on environmental conditions in and around the proposed reservoir</p> <ul style="list-style-type: none"> • Adverse, moderately significant impact due to conflicts involving land ownership or easements 	
Differences Among Alternatives	<ul style="list-style-type: none"> • Greater permanent changes of existing land uses from socioeconomic forces due to the project at the Sturgeon Creek sites than at the War Fork and Steer Fork site due to the private ownership of the land in and around the Sturgeon Creek sites; much of the land in and around the War Fork and Steer Fork site is publicly-owned 			
Transportation	<ul style="list-style-type: none"> • Adverse, but insignificant, changes to levels of service (LOS) ratings of existing roads • Adverse, but insignificant, traffic congestion due to construction vehicles and construction zones • Insignificant increased risk of vehicular accidents due to construction- or recreation-related traffic • Insignificant changes to roadway structure due to road relocations 	<ul style="list-style-type: none"> • Adverse, but insignificant, changes to LOS ratings of existing roads • Adverse, but insignificant, traffic congestion due to construction vehicles and construction zones • Insignificant increased risk of vehicular accidents due to construction- or recreation-related traffic • Moderately significant changes to roadway structure due to road relocations 	<ul style="list-style-type: none"> • Adverse, but insignificant, changes to LOS ratings of existing roads • Adverse, but insignificant, traffic congestion due to construction vehicles and construction zones • Insignificant increased risk of vehicular accidents due to construction- or recreation-related traffic • Moderately significant changes to roadway structure due to road relocations 	<ul style="list-style-type: none"> • Insignificant adverse slowing of traffic around construction sites
Differences Among Alternatives	<ul style="list-style-type: none"> • Slightly greater traffic congestion due to construction vehicles at the Sturgeon Creek, 8.5 mgd site due to a larger amount of truck trips needed to bring materials to this site • Greater changes to roadway structure if either of the Sturgeon Creek sites are chosen due to the necessary relocation of KY 30 and other flooded roads 			
Waste Management	<ul style="list-style-type: none"> • Adverse, but insignificant, increase in solid and sanitary waste, and construction/demolition debris 	<ul style="list-style-type: none"> • Adverse, but insignificant, increase in solid and sanitary waste, and construction/demolition debris 	<ul style="list-style-type: none"> • Adverse, but insignificant, increase in solid and sanitary waste, and construction/demolition debris 	<ul style="list-style-type: none"> • Adverse, but insignificant increase in solid, sanitary, and construction/demolition waste from

	<ul style="list-style-type: none"> • Adverse, but insignificant, increase in the risk of POL/chemical spills during project construction and during operations at the JCWA Treatment Plant • Insignificant impact from the increase in sludge waste during operations at the JCWA Treatment Plant 	<ul style="list-style-type: none"> • Adverse, but insignificant, increase in the risk of POL/chemical spills during project construction and during operations at the JCWA Treatment Plant • Insignificant impact from the increase in sludge waste during operations at the JCWA Treatment Plant 	<ul style="list-style-type: none"> • Adverse, but insignificant, increase in the risk of POL/chemical spills during project construction and during operations at the JCWA Treatment Plant • Insignificant impact from the increase in sludge waste during operations at the JCWA Treatment Plant 	<ul style="list-style-type: none"> • construction activities • Adverse, but insignificant, increase in the risk of chemical/POL spills during construction activities
Differences Among Alternatives	<ul style="list-style-type: none"> • Greater amount of waste generated from the Sturgeon Creek project sites due to the demolition of existing structures in the project areas; impacts due to the greater amount of waste would still be rated as insignificant 			
Human Health and Safety	<ul style="list-style-type: none"> • Adverse, but insignificant, harm to human health and safety from potential POL/chemical spills during storage and handling • Adverse, but insignificant, impact to public health from construction activities • Adverse, but insignificant, impact on human health and safety due to removal and/or capping of septic tanks, storage tanks, and oil wells • Adverse, but insignificant, temporary degradation of air quality and water quality during 	<ul style="list-style-type: none"> • Adverse, but insignificant, harm to human health and safety from potential POL/chemical spills during storage and handling • Adverse, but insignificant, impact to public health from construction activities • Adverse, but insignificant, impact on human health and safety due to removal and/or capping of septic tanks, storage tanks, and oil wells • Adverse, but insignificant, temporary degradation of air quality and water quality during 	<ul style="list-style-type: none"> • Adverse, but insignificant, harm to human health and safety from potential POL/chemical spills during storage and handling • Adverse, but insignificant, impact to public health from construction activities • Adverse, but insignificant, impact on human health and safety due to removal and/or capping of septic tanks, storage tanks, and oil wells • Adverse, but insignificant, temporary degradation of air quality and water quality during 	<ul style="list-style-type: none"> • Moderately significant adverse impact on human health and safety due to an insufficient water supply

	<p>construction</p> <ul style="list-style-type: none"> • Insignificant potential harm to recreational users of the proposed reservoir • Adverse, but insignificant, impact on human health and safety in the event of a dam failure 	<p>construction</p> <ul style="list-style-type: none"> • Insignificant potential harm to recreational users of the proposed reservoir • Adverse, moderately significant impact on human health and safety in the event of a dam failure 	<p>construction</p> <ul style="list-style-type: none"> • Insignificant potential harm to recreational users of the proposed reservoir • Adverse, moderately significant impact on human health and safety in the event of a dam failure 	
Differences Among Alternatives	<ul style="list-style-type: none"> • Although the potential for dam failure would be extremely low at all project sites, impacts due to a dam failure would be greater at either of the Sturgeon Creek sites than at the War Fork and Steer Fork site due to potential loss of human life downstream 			
Socioeconomics	<ul style="list-style-type: none"> • Positive, but insignificant, increase in income and employment in the region due to the project • Insignificant physical alteration of the community from changes in demographic structure and land use due to the project • Insignificant change in the character of the community adjacent to the proposed reservoir • Insignificant impact on the economy due to removal of private land from the County tax base • Moderately significant increase in property assessments on new lakefront land • Insignificant increase in 	<ul style="list-style-type: none"> • Positive, but insignificant, increase in income and employment in the region due to the project • Very significant physical alteration of the community from changes in demographic structure and land use due to the project • Adverse, very significant disruption of community structure and social relations due to residential relocations from the project area • Insignificant impact on the economy due to removal of private land from the County tax base • Moderately significant increase in property assessments on new 	<ul style="list-style-type: none"> • Positive, but insignificant, increase in income and employment in the region due to the project • Moderately significant physical alteration of the community from changes in demographic structure and land use due to the project • Adverse, moderately significant disruption of community structure and social relations due to residential relocations from the project area • Insignificant impact on the economy due to removal of private land from the County tax base • Moderately significant increase in property assessments on new 	<ul style="list-style-type: none"> • Adverse, very significant continued impediment to growth of industry, residential development, and employment in Jackson County • Adverse, moderately significant impediment to other development goals of the EZ/EC

	<p>County tax base from increased industrial and commercial development</p> <ul style="list-style-type: none"> • Moderately significant increase in business development induced by the proposed reservoir • Moderately significant change in property values in the vicinity of the proposed reservoir • Insignificant increase in the need for community services to support increased population growth and business activity 	<p>lakefront land</p> <ul style="list-style-type: none"> • Insignificant increase in County tax base from increased industrial and commercial development • Moderately significant increase in business development induced by the proposed reservoir • Moderately significant change in property values in the vicinity of the proposed reservoir • Insignificant increase in the need for community services to support increased population growth and business activity 	<p>lakefront land</p> <ul style="list-style-type: none"> • Insignificant increase in County tax base from increased industrial and commercial development • Moderately significant increase in business development induced by the proposed reservoir • Moderately significant change in property values in the vicinity of the proposed reservoir • Insignificant increase in the need for community services to support increased population growth and business activity 	
Differences Among Alternatives	<ul style="list-style-type: none"> • Greater disruption of the community structure and social relations at the Sturgeon Creek, 8.5 mgd site than at the Sturgeon Creek, 3.5 mgd site due to a greater number of residential relocations; no residential relocations would occur at the War Fork and Steer Fork site • Greater physical alteration of the community from changes in land use and demographics at the Sturgeon Creek, 8.5 mgd site due to a greater amount of land required for the project and a larger amount of resulting reservoir shoreline area available for development • Greater impact from removal of private land from the County's tax base at the Sturgeon Creek, 8.5 mgd site due to more private land withdrawn, but still rated as insignificant • Changes in property values in the vicinity of the Sturgeon Creek sites would have a greater impact than at the War Fork and Steer Fork site due to a larger amount of privately-owned land that would surround the proposed reservoir 			
Environmental Justice	<ul style="list-style-type: none"> • Insignificant potential to disproportionately affect minority or low-income groups from adverse impacts associated with the proposed action 	<ul style="list-style-type: none"> • Insignificant potential to disproportionately affect minority or low-income groups from adverse impacts associated with the proposed action 	<ul style="list-style-type: none"> • Insignificant potential to disproportionately affect minority or low-income groups from adverse impacts associated with the proposed action 	<ul style="list-style-type: none"> • Very significant potential to adversely and disproportionately affect minority or low-income groups from further economic

	<ul style="list-style-type: none"> • Very significant benefit to residents from improving health and economic conditions 	<ul style="list-style-type: none"> • Very significant benefit to residents from improving health and economic conditions 	<ul style="list-style-type: none"> • Very significant benefit to residents from improving health and economic conditions 	<p>degradation</p> <ul style="list-style-type: none"> • Very significant potential to adversely and disproportionately affect minority or low-income groups from adverse health impacts associated with an insufficient water supply
Aesthetics	<ul style="list-style-type: none"> • Adverse, very significant temporary degradation of the visual quality of the area during construction • Adverse, moderately significant long-term impact on visual quality of the area due to the appearance of the proposed dam • Positive, moderately significant long-term impact on visual quality due to the appearance of the proposed reservoir 	<ul style="list-style-type: none"> • Adverse, very significant temporary degradation of the visual quality of the area during construction • Adverse, insignificant long-term impact on visual quality of the area due to the appearance of the proposed dam • Positive, very significant long-term impact on visual quality due to the appearance of the proposed reservoir 	<ul style="list-style-type: none"> • Adverse, very significant temporary degradation of the visual quality of the area during construction • Adverse, insignificant long-term impact on visual quality of the area due to the appearance of the proposed dam • Positive, very significant long-term impact on visual quality due to the appearance of the proposed reservoir 	<ul style="list-style-type: none"> • Adverse, insignificant temporary degradation of visual quality due to construction activities

Many of the adverse impacts on environmental resources or human health and safety resulting from the proposed action at each alternative site could be minimized or avoided using recommended mitigation measures during certain phases of the project. These recommended mitigation measures are presented in the table on the following pages, along with the associated resource area and potential impact to be minimized.

ISSUES TO BE RESOLVED

Certain issues regarding the Jackson County Lake Project are still unresolved. Exact locations, sizes, and design details of the proposed dam and reservoir have not yet been determined, and would not be determined until a final location for the project is chosen. Although some of the proposed recreational facilities to be developed around the proposed reservoir are known, others remain speculative, and exact locations and sizes of these facilities are still unresolved.

The Phase I archaeological survey conducted by Cultural Resources, Inc. for this EIS resulted in the discovery of one potentially significant archaeological site located on both of the Sturgeon Creek project areas. The site cannot be considered eligible for inclusion in the National Register of Historic Places until the nature, extent, and integrity of the cultural remains can be assessed. Further archaeological surveys would definitely be needed at both Sturgeon Creek sites, if either is chosen as the final project location. Because the Phase I survey indicated fewer cultural resources on the War Fork and Steer Fork project area, this alternative would likely entail less additional archaeological work.

As mentioned previously, if the War Fork and Steer Fork site is chosen as the final project location, a land exchange with the USFS would be required. Although this exchange would be necessary for the land up to the normal pool level of the proposed reservoir, it is still undecided whether land would need to be exchanged for land within the buffer and maximum flood affected areas. The USFS may choose not to exchange these areas and continue to manage them to protect water quality and aesthetics.

In addition to these unresolved issues, several aspects of the project may prove somewhat controversial. Certain regulatory officials have expressed concern over alternative means to meet the purpose and need stated above, citing, for example, groundwater as an alternative deserving further investigation. In Kentucky, as throughout the United States, some environmental advocacy groups and resource managers believe that the nation has moved beyond the era of dam-building. These groups and individuals argue that the U.S. has entered a new era of utilizing existing water supplies more efficiently, exercising prudent management of existing dams and reservoirs, and preserving what free-flowing rivers and streams remain in the country.

In this regard, the War Fork and Steer Fork site, in particular, may be controversial because of the proximity of documented populations and hibernacula of the Federally-listed Endangered Indiana bat (*Myotis sodalis*) and Virginia big-eared bat (*Corynorhinus townsendii virginianus*), the location of a Wild and Scenic Study River segment immediately downstream, and the permanent flooding of approximately 116 acres of publicly-owned forestland. Representatives

of both the USFS and the U.S. Fish and Wildlife Service believe Indiana bats utilize forests at the War Fork and Steer Fork project site as foraging habitat.

However, no specimens of either Endangered bat species were netted at any of the proposed project sites in the preliminary mist-netting survey conducted for this EIS in August, 1999, by Eco-Tech, Inc. While no hibernacula on the War Fork and Steer Fork site have been found, and their occurrence there is considered highly unlikely, it is still possible that Indiana bats utilize suitable trees on-site for summer roosting and maternity colonies. Additional surveys for both species are underway and will be completed in June, 2000. The only other Federally-listed Endangered species that may be present at each of the proposed sites is the running buffalo clover (*Trifolium stoloniferum*). Surveys will be conducted to determine its presence in the spring of 2000.

While geologic maps of the War Fork area indicate that outcrops of the Newman Limestone formation associated with karst topography are restricted to areas downstream of Turkey Foot, representatives of the USFS report also having observed limestone in the vicinity of the proposed War Fork and Steer Fork dam site, located several hundred yards upstream. These representatives have expressed some concern over whether a reservoir upstream may lead to seepage; dissolving of limestone; underground channel formation, utilization, or enlargement; and the eventual flooding of caves used for roosting and hibernacula by Indiana and Virginia big-eared bats. These problems may arise by impounding water to create the proposed reservoir, by creating hydrostatic pressure within the reservoir, or by placing certain rock strata into constant contact with standing water. While most geologists consulted to date believe that any such problems are highly unlikely, further geotechnical investigation will be carried out to address this concern.

Implementation of the proposed project at either of the Sturgeon Creek sites is anticipated to generate concern over residential relocations from the project area. Some residents may have special attachments to their land and/or homes, and may not wish to relocate. Many Jackson County residents, including some of those currently living on the Sturgeon Creek project sites, have expressed concern over the permanent loss of Prime Farmland and other important agricultural land that would result from implementation of the project either of those sites. Such land has particular significance for counties like Jackson that have a predominance of hilly terrain.

Recommended Mitigation Measures By Resource Area and Potential Environmental Impact		
Resource Area	Impact	Mitigation Measure
Geology/Soils	<ul style="list-style-type: none"> • Increased soil erosion during construction activities • Increased soil compaction and surface water runoff due to heavy construction equipment • Increased surface water runoff due to construction activities • Potential to fracture bedrock during potential blasting activities or due to the weight of the dam 	<ul style="list-style-type: none"> • Limit the amount of time soil is exposed without revegetation; minimize the size of the disturbed area; Revegetate exposed areas as soon as possible following construction activities • Conduct as many construction activities as possible within the proposed impoundment area, which would not need to be revegetated • Revegetate exposed areas as soon as possible following construction activities; Use gravel parking lots during construction and operation • Ensure that proper geotechnical investigations are conducted at the site chosen as the final project location; Application of any foundation treatments determined necessary
Surface and Groundwater Resources	<ul style="list-style-type: none"> • Changes in the water quality of the reservoir during its lifetime • Changes in downstream flows and water quality due to the dam and reservoir (especially an issue at the War Fork and Steer Fork site) • Degrade the water quality of the reservoir from eutrophication due to upstream land uses 	<ul style="list-style-type: none"> • Regular monitoring of reservoir water quality for drinking and public health purposes • Installation of a multi-level intake structure to allow mixing of released water from different depths of the reservoir; Allow outflow from the dam to exceed the 7Q10* and pass-through rates during low-flow months, as long as excessive drawdown in the reservoir does not occur • Preparation and implementation of a non-point source pollutant control plan for the upstream watershed of the reservoir site selected <p>* 7Q10 is the minimum average flow of water over a seven-day period, with a recurrence interval of ten years. 401 KAR 4:200 specifies the 7Q10 as the minimum flow needed to maintain water quality and aquatic life.</p>

<p>Biological Resources</p>	<ul style="list-style-type: none"> • Harm downstream aquatic biota due to changes in downstream flows and water quality due to the dam and reservoir • Degrade the water quality and harm aquatic biota of the reservoir from eutrophication due to upstream land uses • Potential harm to Threatened and Endangered species due to the proposed action 	<ul style="list-style-type: none"> • Installation of a multi-level intake structure to allow mixing of released water from different depths of the reservoir; Allow outflow from dam to exceed the 7Q10 and pass-through rates during low-flow months, as long as excessive drawdown in the reservoir does not occur • Preparation and implementation of a non-point source pollutant control plan for the upstream watershed of the final reservoir site • Complete surveys for the Virginia big-eared bat and the Indiana bat and, depending on the results of the surveys, continue informal consultation, or undertake formal consultation, with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act; Restrict clearing of the project area to winter months, when bats are hibernating in caves and not using tree trunks; Conduct surveys to determine the presence of the running buffalo clover at each of the proposed project sites
<p>Recreation</p>	<ul style="list-style-type: none"> • Affect downstream recreation during construction activities (especially an issue at the War Fork and Steer Fork site) • Affect downstream recreation due to the appearance of construction zones • Affect downstream recreation due to changes in dissolved oxygen (DO) content and temperature of the dam outflow 	<ul style="list-style-type: none"> • Minimize or eliminate construction on days in which downstream recreation is heavily-used (i.e., weekends and holidays) • Retain a buffer strip of trees of maximum width possible between construction zones and adjacent recreational uses during construction • Outflow from the dam could be taken from multiple depths within the reservoir and be aerated to increase DO content
<p>Cultural Resources</p>	<ul style="list-style-type: none"> • Affect a potentially-significant archaeological site discovered on both Sturgeon Creek project areas 	<ul style="list-style-type: none"> • Complete Phase II testing at this site, consisting of excavation of one-meter-square units, prior to the onset of construction to determine the presence of intact, subsurface deposits and/or features; If necessary, perform additional work, consisting of hand excavation of one-meter-square units and/or excavation of features to retrieve the artifacts

	<ul style="list-style-type: none"> • Potentially affect buried deposits in both of the Sturgeon Creek project areas • Potential for cultural resources to exist along the chosen route of the raw water transmission main and to be affected by construction along that route 	<ul style="list-style-type: none"> • Conduct sub-surface reconnaissance surveys to identify such deposits prior to the onset of construction • Survey the chosen route for cultural resources and avoid construction through any located sites
Land Use	<ul style="list-style-type: none"> • Affect the water quality of the proposed reservoir from current land uses in the project area • Affect the water quality of the proposed reservoir from existing residential septic systems in the project area 	<ul style="list-style-type: none"> • Allow any agricultural land in the project area to lie fallow for one to two years prior to impoundment of the reservoir • Ensure proper closure and/or removal of existing residential septic systems
Transportation	<ul style="list-style-type: none"> • Decrease the level of service (LOS) ratings on roads affected during construction • Create traffic congestion due to construction activities and vehicles • Affect transportation due to road relocations • Risk to public safety due to increased traffic and construction activities 	<ul style="list-style-type: none"> • Improve the standard of local roads to act as alternate routes for increased volumes of traffic during construction • Detour traffic onto local roads around the construction zones; Suspend construction during peak traffic hours on selected roads; Publicize alternate transportation routes in tourism literature and public outreach in Jackson County and the surrounding region • Construct replacement roads or road segments prior to the completion of reservoir impoundment • Increase signage along roadways to alert drivers of difficult driving conditions or inadequate infrastructure for loads
Waste Management	<ul style="list-style-type: none"> • Risk of an accidental chemical or POL (petroleum, oil, and/or lubricant) spill during construction • Risk of an accidental release and environmental contamination during removal of unregulated petroleum storage tanks in the project area 	<ul style="list-style-type: none"> • Develop Spill Prevention, Control, and Countermeasure (SPCC) plans for those areas in which chemicals or POL products would be stored or handled • Close all unregulated storage tanks according to the instructions outlined in the Closure Application for Petroleum Releases and Exempt Petroleum Tank Systems (Form 7097C) set forth by the Kentucky Division of Waste Management

<p>Human Health and Safety</p>	<ul style="list-style-type: none"> • Harm to human health and safety due to chemical or POL spills during construction • Degrade human health and safety from the risk of dam failure • Risk to public safety due to retained vegetation in the reservoir • Harm human health and safety from oil or fuel spills in the reservoir 	<ul style="list-style-type: none"> • Develop SPCC plans for those areas in which chemicals or POL products would be stored or handled • Use of nuclear density testing equipment during dam construction to ensure proper compaction in the structure; Use of electrical detectors to ensure absence of holes in the PVC membrane of the dam • Locate retained vegetation as to maximize the safety of recreational users (e.g., by retaining vegetation at a depth of water that would not impact boating or swimming, by placing buoys in the reservoir around the vegetation, or by retaining vegetation in areas of low water level to allow for clear visual detection of the vegetation) • Use of a multi-level water intake structure to allow for water to be withdrawn from deeper in the reservoir; Position boat ramps and/or docks far away from the intake structure
<p>Socioeconomics</p>	<ul style="list-style-type: none"> • Potential for community conflict and disruption of community structure due to the consequences of the project, including development pressure around the project sites • Disruption of community structure and social relations associated with the relocation of residents from the project area 	<ul style="list-style-type: none"> • Include local resident in an extensive public information program about the proposed project; Allow local residents to participate in the decision-making process associated with the project; Introduction of an extensive planning and zoning process for land in Jackson County and allow public participation in this process • Provide extensive assistance programs for these residents, both financial and socially-supportive; Relocate residents and structures to nearby land outside the project areas
<p>Aesthetics</p>	<ul style="list-style-type: none"> • Degrade visual quality of the area during construction 	<ul style="list-style-type: none"> • Retain a buffer strip of trees of maximum width possible between construction zones and adjacent land uses

JACKSON COUNTY LAKE PROJECT ENVIRONMENTAL IMPACT STATEMENT

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