



US Army Corps of Engineers
Louisville District

DRAFT PROGRAMMATIC ENVIRONMENTAL ASSESSMENT & FINDING OF NO SIGNIFICANT IMPACT

REAL ESTATE ACQUISITION OF FLOWAGE EASEMENTS RIGHTS TO OCCASIONALLY FLOOD UP TO THE 534.0 MEAN SEA LEVEL UPPER GUIDANCE LINE

ROUGH RIVER LAKE FLOOD RISK MANAGEMENT PROJECT
Breckinridge, Hardin, and Grayson Counties, Kentucky

November 2018

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EXECUTIVE SUMMARY

Real Estate Acquisition of Flowage Easement Rights to Occasionally Flood up to the 534.0 Mean Sea Level Upper Guidance Line at Rough River Lake Flood Risk Management Project Breckinridge, Hardin, and Grayson Counties, Kentucky

This Programmatic Environmental Assessment (PEA) was prepared as part of the overall strategy of the U.S. Army Corps of Engineers (USACE) to resolve encroachment problems outlined in the *Rough River Lake Flowage Easement Encroachment Resolution Plan*. As part of that plan, USACE is required to develop a *Real Estate Acquisition Plan* that prioritizes lands for government acquisition that are perpetually inundated by the Rough River Lake ordinary pool elevation or lands otherwise considered to be of particularly high risk of flooding.

The purpose of the federal action is to acquire permanent easements and rights that allow USACE to occasionally inundate land up to the 534.0 Mean Sea Level (m.s.l.) contour on multiple real estate tracts that are within the boundaries of the Rough River Lake Flood Risk Management Project (Project). Congressional authorization for the Project includes authority to operate the project so as to inundate lands up to an upper guidance line of 534.0 m.s.l.

More than five decades ago, the U.S. Army Corps of Engineers surveyed land at Rough River Lake for flood control purposes. It was recently discovered that there were errors during its initial survey. The federal action was implemented following USACE's review of the accuracy of existing contour levels as determined in the long-standing real estate tract maps for the Project. The acquisitions will be completed as needed by USACE and driven by the field surveys that reflect a more accurate 534.0 m.s.l. contour behind the Rough River Lake Dam. The surveys were initiated following the 2011 record flood levels at Rough River Lake that resulted in a number of structures being inundated that were considered outside of the USACE flowage easement areas. The surveys are confirming whether the existing real estate flowage easement rights were accurate with respect to the 534.0' m.s.l. contour as was originally authorized for construction and operation of the Project.

Two alternatives were considered for the PEA: Alternative 1 (Acquisition of Real Estate Interests) and Alternative 2 (No Action Alternative). USACE's preferred alternative is Alternative 1. Only two viable alternatives were available since the decision would be to either continue allowing habitable structures to be inundated during flood operations or, in contrast, for USACE to obtain permanent easements and rights that include the right to occasionally flood up to the 534.0 m.s.l. contour; and thereby be able to enforce habitable structure restrictions on those lands, where warranted. A third alternative considered but rejected from consideration is the de-authorization of and removal of the dam at Rough River Lake, which would eliminate the need for USACE to obtain flood flowage easements.

To use this PEA to demonstrate compliance with NEPA and all other applicable federal environmental regulations in support of the *Rough River Lake Real Estate Acquisition Plan*, a review of the Tracts or Sections thereof to be acquired will need to be completed. This will

involve completion of the memorandum (See Appendix C) documenting NEPA compliance after USACE has reviewed the proposed action (acquisition), alternatives, and potential direct, indirect and cumulative impacts and ensures the potential environmental effects of the acquisition are found to be accurately described by this PEA and associated FONSI as signed by the District Commander. If the review falls within the scope of the NEPA document, and documented in the memorandum, no further documentation would be required to comply with NEPA. Because USACE would be required to implement the mitigation measures contained in the PEA, the memorandum would summarize the mitigation measures, if any, to be undertaken.

Table ES-1 summarizes the expected consequences of the Preferred Alternative and the No Action Alternative to resources in this PEA. Descriptions of the potential consequences are further outlined following the table.

Table ES-1 Summary of Potential Environmental and Socioeconomic Consequences		
	Alternative 1 Real Estate Acquisition (flowage easements)	Alternative 2 No Action
Land Use	Landowner loss of use for habitable structures. Habitable structures if present may be removed. Owner retains ownership and use of lands, but certain restrictions on use. Government acquires lands to temporarily flood tracts to fulfill authorized project purposes.	No change in baseline conditions. Structures in areas inundated will continue
Topography, Geology and Soils	No impact	No changes from baseline conditions
Biological Resources (Vegetation)	No significant adverse impact.	No changes from baseline conditions
Biological Resources (Wildlife and Fish)	No significant adverse impact.	No changes from baseline conditions
Biological Resources (Endangered and Threatened Species)	No significant adverse impact, pending USFWS confirmation.	No changes from baseline conditions
Water Resources (Surface Water)	No significant adverse impact.	No changes from baseline conditions

Water Resources (Groundwater)	No impact.	No changes from baseline conditions
Water Resources (Water Quality)	No significant impact	No changes from baseline conditions
Floodplain Management	Long-term beneficial impact.	No changes from baseline conditions
Wetlands	No significant adverse impact.	No changes from baseline conditions
Historic and Archaeological Resources	Develop a Memorandum of Understanding with KY State Historic Preservation Office to determine procedures for enforcement of human habitation restrictions on eligible structures. Required mitigations will be implemented at the time the structures are identified in accordance with the MOU. No significant adverse impact.	No changes from baseline conditions
Socioeconomic Resources	No significant adverse impact.	No changes from baseline conditions
Air Quality and Noise	No significant adverse impact.	No changes from baseline conditions
Climate Change	No significant adverse impact.	No changes from baseline conditions
Cumulative Effects	Long-term restriction on limited number of land tracts subject to temporary flooding.	No significant impact

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DRAFT FINDING OF NO SIGNIFICANT IMPACT
REAL ESTATE ACQUISITION OF FLOWAGE EASEMENTS RIGHTS TO
OCCASIONALLY FLOOD TO THE 534.0 MEAN SEA LEVEL UPPER GUIDANCE LINE

ROUGH RIVER LAKE FLOOD RISK MANAGEMENT PROJECT
Breckinridge, Hardin, and Grayson Counties, Kentucky

A Programmatic Environmental Assessment (PEA) of the potential environmental effects associated with acquisition of new flood flowage easement rights for the purpose of flood risk management operations at the Rough River Lake (RRL) Flood Risk Management Project (Project) has been conducted by the U.S. Army Corps of Engineers (USACE). USACE has Congressional authority to operate so as to flood up to the 534.0 Mean Sea Level (m.s.l.) contour behind the dam. In May 2011 water levels reached the 527.4 m.s.l.elevation that resulted in a number of structures being inundated that were considered outside of the USACE flowage easement areas. As a result, surveys were initiated to determine if existing real estate flowage easement elevations for the tracts of land around RRL were accurate up to the 534.0' m.s.l. authorization. This federal action was implemented following the review of the accuracy of existing contour levels of the long-standing real estate tract maps for the Project.

Proposed Action. USACE is proposing to acquire flowage easements with the right to occasionally inundate to the 534.0' m.s.l. contour as intended in the project authorization. The acquisitions will include multiple individual tracts of land or portions thereof, as identified through surveys that are affected directly by flood storage operations of the Rough River Lake Flood Risk Management Project. This is part of the overall effort for USACE to resolve encroachments and to aid in the prevention of future encroachments, particularly habitable structures that could be damaged or destroyed by inundation if the Project stores water in accordance with its authorized purposes.

Alternatives. Two alternatives were considered for this PEA: Alternative 1 (Acquisition of Real Estate Interests) and Alternative 2 (No Action Alternative). USACE's preferred alternative is Alternative 1. Only two viable alternatives were available since the decision would be to either continue allowing habitable structures to be present in areas subject to inundation during flood operations or, in contrast, USACE obtain the legal rights for flowage easements and thereby have the legal authority to enforce habitable structure restrictions, where warranted, on those lands.

Affected Resources. The environmental assessment outlines the expected effects of implementing the Proposed Action. Based on the analysis in the PEA, the impacts to resources by implementing Alternative 1 are not expected to have significant adverse effects.

Under the Council on Environmental Quality ("CEQ") NEPA regulations, "NEPA significance" is a concept dependent on context and intensity (40 C.F.R. § 1508.27). Significance is measured by the impacts felt at a local scale, as opposed to a regional or nationwide context. The CEQ regulations identify a number of factors to measure the intensity of impact. Review of the NEPA "intensity" factors reveals that the proposed action would not result in a significant impact to the human environment:

Impacts on public health or safety: The project is expected to result in a benefit to public health and safety by allowing USACE to enforce restrictions on habitable structures and other sources of potential contamination that could affect waterbodies during flood operations at Rough River Lake. The action would reduce the number of human habitation structures in areas that can be flooded.

Unique characteristics: There are no unique natural resource characteristics that would be adversely affected from acquiring flowage easement rights to occasionally flood privately owned lands that are located within the Rough River Lake inundation upper limits.

Controversy: On conclusion of the 30-day public review period, and after the public comments and resource agency comments have been evaluated, the District Commander will make a determination whether to prepare an Environmental Impact Statement for the proposed action.

Uncertain impacts: The impacts of the proposed action to acquire new flowage rights to occasionally flood certain areas below the 534.0 m.s.l contour are not uncertain; the effects to natural resources as a result of temporarily inundating waters to elevation 534.0 m.s.l as a result of operating the flood risk management projects are not unknown.

Precedent for future actions: The proposed project addresses the discrepancies in flowage easement areas at Rough River Lake as identified through updated elevation surveys. It will not establish a precedent for future actions.

Cumulative significance: The federal action is expected to adequately fulfill the USACE requirement for the Congressionally-authorized purpose.

Historic resources: The proposed action will have no known negative impacts on any pre-contact archaeological sites recorded by the Commonwealth of Kentucky. Acquisition actions will comply with an agreed on process with the State of Kentucky.

Endangered species: USACE has determined that the federal acquisition process for new flowage easement with the right to occasionally flood will have "no effect" to listed or proposed resources. USACE has also determined that if the right to inundate waters at Rough River Lake is ever utilized to elevation 534.0 m.s.l. the inundation period would be short lived and "may affect, but not likely to adversely affect" meaning that the effects include those that cannot be evaluated, are discountable, and are extremely unlikely to occur on the species and/or critical habitat that are under jurisdiction of the US Fish and Wildlife Service. A final determination will be made following the conclusion of the 30-day public review period.

Potential violation of state or federal law: This action will not violate state or federal laws.

Measures to minimize adverse environmental effects of the action are discussed within the Environmental Assessment.

It is my finding, based on the PEA that the proposed federal action will not have a significant adverse impacts on the environment and is not a major federal action significantly affecting the quality of the human environment. This federal action, therefore, is exempt from requirements to prepare an Environmental Impact Statement.

Date

Antoinette R. Gant
Colonel, U.S. Army Commanding

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PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

REAL ESTATE ACQUISITION OF FLOWAGE EASEMENTS RIGHTS TO OCCASIONALLY FLOOD UP TO THE 534.0 MEAN SEA LEVEL UPPER GUIDANCE LINE

ROUGH RIVER LAKE FLOOD RISK MANAGEMENT PROJECT Breckinridge, Hardin, and Grayson counties, Kentucky November 2018

1. INTRODUCTION

This Programmatic Environmental Assessment (PEA) is being prepared to evaluate the general environmental effects of the US Army Corps of Engineers Louisville District (USACE) acquisition of new flood flowage easement rights for the purpose of flood risk management operations at the Rough River Lake (RRL) Flood Risk Management Project (Project). The Project is located in Breckinridge, Hardin, and Grayson Counties, Kentucky. Figures 1-1, 1-2, and 1-3 show the location of Rough River Lake.

This PEA will satisfy the National Environmental Policy Act (NEPA) compliance associated with the implementation of a long-term real estate acquisition strategy at Rough

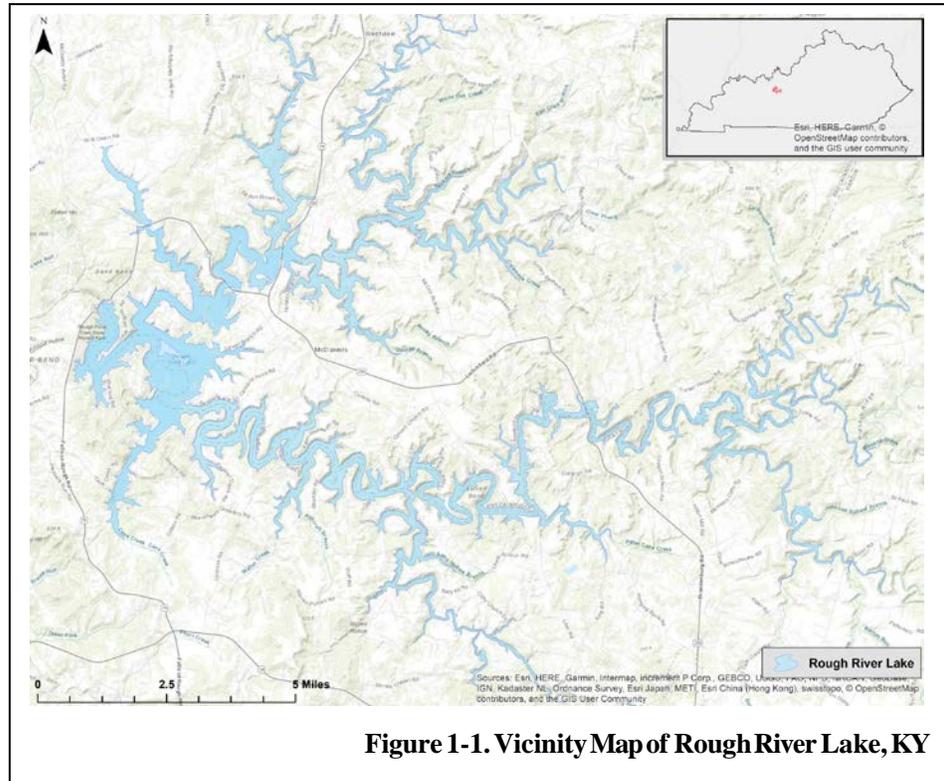


Figure 1-1. Vicinity Map of Rough River Lake, KY

River Lake. It assists USACE in project planning by evaluating the overall purpose and need of the real estate actions, and the potential direct and indirect environmental effects and their significance resulting from multiple tracts of real estate that will need to be acquired to resolve elevation discrepancies in flowage easement rights to occasionally flood.

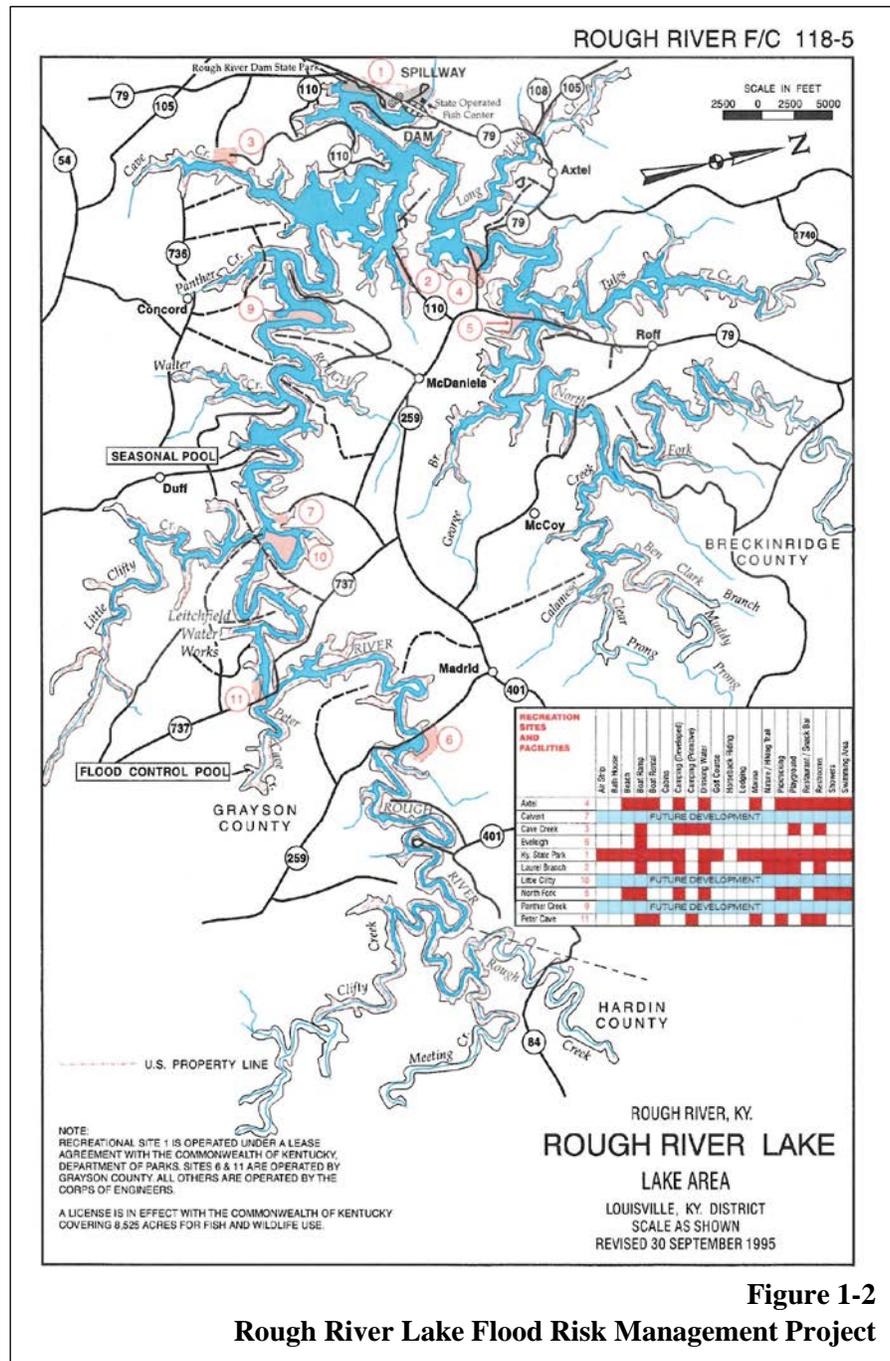
1.1 Background

Project Information

The RRL was completed by USACE in 1959 and became operational in 1961. The authorized purposes are flood control, low flow augmentation for water quality, water supply, general recreation, and fish and wildlife management.

Project lands consist of about 9,211 acres in fee simple (owned by the Federal Government) and 4,555 acres with flowage easements. Fee-simple lands are permanent Government-owned tracts, and flowage easements grant USACE the perpetual right, power, privilege and easement to occasionally overflow, flood and submerge the land. Flowage easement rights are acquired with the provision that no structure for human habitation is to be constructed on the lands and further that no structures of other types except farm fences are to be constructed or maintained on the lands except as may be approved by USACE. The landowners reserve the rights and privileges to the property for their use and enjoyment as long as the use does not interfere with or abridge the rights and easements conveyed to the Government.

The water areas at RRL include a minimum 2,180 acres (elevation 470' m.s.l.), a seasonal or recreational pool 4,860 acres in size (elevation 495' m.s.l.), and flood control pool of 10,180



**Figure 1-2
Rough River Lake Flood Risk Management Project**

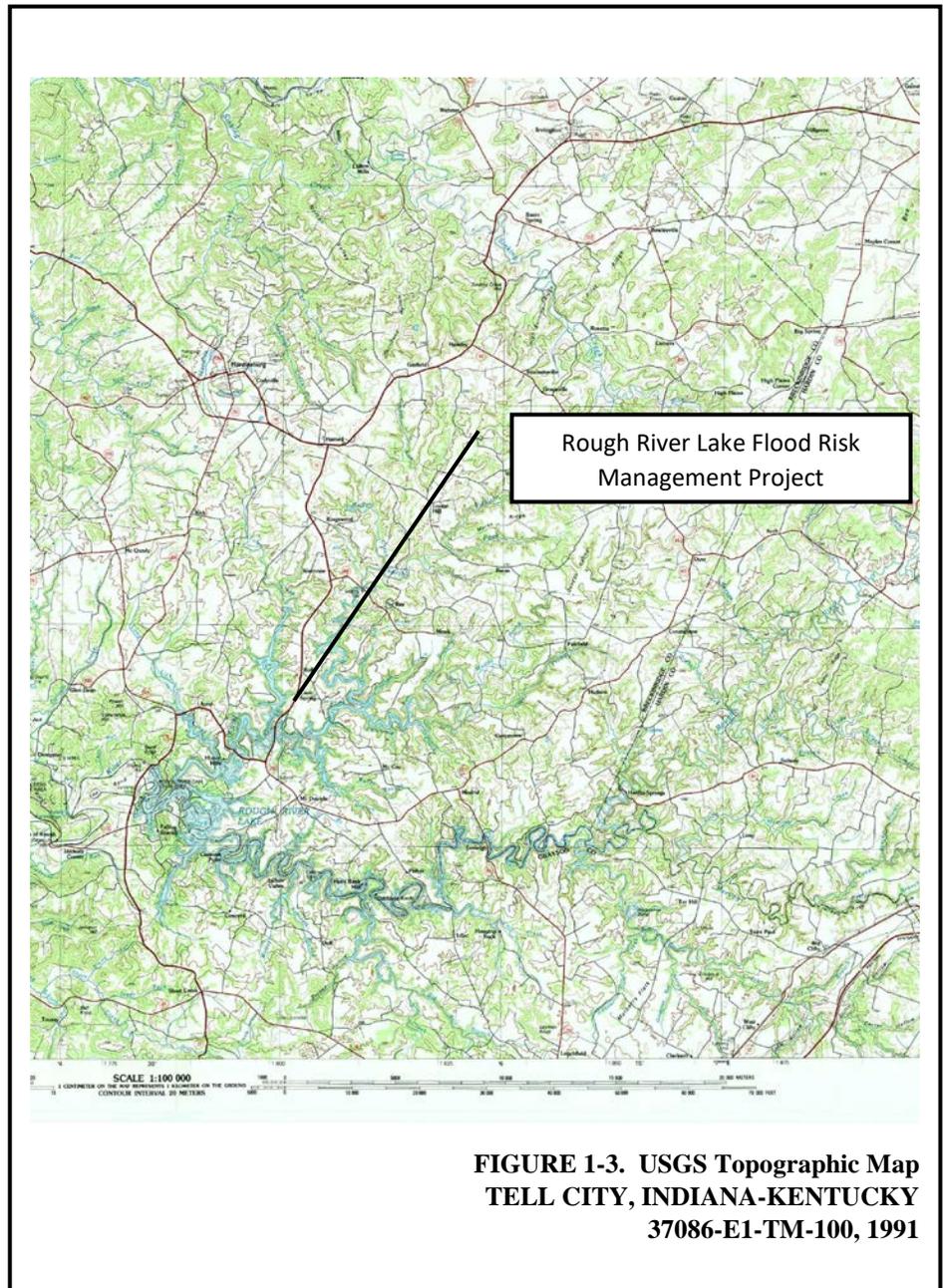
acres (elevation 524' m.s.l). Included in the fee area purchases are 524 acres acquired for recreation. USACE is authorized to impound water to the seasonal elevation of 495.0' m.s.l. The dam spillway crest is at 524 m.s.l.

USACE acquired land under federal ownership (fee simple lands) for flood water storage to the 514.m.s.l. contour. This is the typical pool level of the reservoir. USACE further obtain flowage rights to occasionally flood up to the 534.0 m.s.l. contour with appropriate allowance for backwater effects above the dam's spillway.

Problem Description

In 2011, record flood levels reached 524.7 m.s.l at RRL that resulted in an estimated 226 structures to be partially

for completely inundated. Based on the elevation lines established in the real estate tract deeds, these structures were believed to be above the 534.0 m.s.l contour, which is outside the area believed to be the upper limits of the right to occasionally flood. USACE needed to identify the reason for the discrepancy. While USACE actively manages simple fee-owned lands and lands subject to occasional flooding for encroachments the number habitable of structures inundated during authorized flood management operations prompted USACE to discuss and further review the accuracy of existing contour levels as outlined in the long-standing real estate tract maps for the Project.



**FIGURE 1-3. USGS Topographic Map
TELL CITY, INDIANA-KENTUCKY
37086-E1-TM-100, 1991**

Prior to the record flood event, the upper boundary of acquired flowage easements on all individual tracts was assumed to be at or on the 534.0' m.s.l., as authorized by the Design Memorandum for RRL. In that context, USACE has historically utilized Geographic Information System (GIS) data, aerial imagery and LIDAR (Light Detection and Radar, a remote survey technology used to measure elevation) data to estimate whether habitable structures were located on the Government's flowage easements. After the record flood event, and information provided by property owners whose property was subject to existing flowage easements across their property, USACE determined that a new series of updated elevation surveys for the upper contour level of 534.0 m.s.l. needed to be completed.

Surveys were completed in 2014, 2015, and 2016 using updated methods and processes, covering about 51 miles of flowage easement boundaries. The surveys revealed discrepancies between the actual 534.0 m.s.l. contour line and the flowage easement line that USACE has recorded on the deeds for individual tracts. Approximately 416 habitable structures were identified to be located within the acquired flowage easements. Many of these homes flooded during the 2011 record flood event. As a result of these survey efforts, USACE identified that in several instances (1) flowage easements were not acquired up to the 534.0' m.s.l. throughout the entire project as intended during original land acquisition (2) in many areas, flowage easements were acquired above the 534.0' m.s.l. and not necessary for maintaining flowage rights, and (3) fee simple lands were not always acquired up to 514.0' m.s.l., as was originally authorized. RRL contains about 319.8 miles of project boundary.

USACE will continue to complete surveys to accurately depict the 534.0 m.s.l. level and to identify habitable structures that exist at RRL. This EA addresses the acquisition of flowage rights to occasionally flood up to the 534.0 m.s.l. contour.

1.2 Proposed Action

USACE proposes to acquire flowage easements for occasional flooding up to elevation 534.0' m.s.l., as intended in the project authorization. Acquisitions of flowage easements will occur on multiple tracks of lands and are linked to the results of completed and ongoing surveys within the boundaries of the RRL to accurately determine the authorized upper guidance line of 534.0 m.s.l. This effort implements the *Real Estate Acquisition Plan* as part of the overall effort for USACE to resolve encroachments and aids in prevention of future encroachments.

Flowage easement land is privately owned land on which the U.S. Army Corps of Engineers has acquired certain perpetual rights. This includes the right to flood it in connection with the operation of the reservoir; the right to prohibit construction or maintenance of any structure for human habitation; the right to approve all other structures constructed on flowage easement land, except fencing. This is typically based on elevation and is done to protect individual property during a flood event and allow hydrologists to better predict the changes in elevation a lake will undergo during high inflow.

1.3 Purpose and Need for the Proposed Action

Purpose – The purpose of the proposed action is to acquire flowage easements with the right to occasionally flood up to elevation 534.0’ m.s.l., as intended in the project authorization.

USACE has adopted a *Rough River Lake Flowage Easement Encroachment Resolution Plan* (Plan) to alleviate the discrepancies in flowage easement contours and the locations of habitable structures. As part of that plan, USACE has developed a *Real Estate Acquisition Plan* (Acquisition Plan) (see requirements in Section 11 of the *Rough River Lake Flowage Easement Encroachment Resolution Plan*) that prioritizes lands for government acquisition that are perpetually inundated by the Rough River Lake ordinary pool elevations or otherwise considered to be of particularly high risk of flooding. Appendix A contains the *Rough River Lake Flowage Easement Encroachment Resolution Plan*.

Need - USACE needs to correct the inaccurate survey lines and align the Federal Government’s property rights to occasionally flood to be consistent with full flood water storage capacity for the Rough River Lake flood risk management project. Where some of the areas proposed to be acquired may be already experiencing periodic inundation, USACE’s acquisition of rights to occasionally flood will primarily affect the presence of human habitable structures. The acquisitions of rights with the ability to occasionally flood would alleviate the discrepancies in the existing contour levels that may be utilized during operations and maintenance activities. The acquisitions will more accurately establish elevation contours for occasional flowage easements that USACE holds on privately owned lands within the potential temporary water storage areas to elevation 534.0 m.s.l. This allows USACE to establish and maintain flowage easement rights and minimizes, to the extent practical, the likelihood that the underlying landowners would experience economic loss; and it aids in mitigating the potential for loss of life and property in the event USACE exercises its flood storage capacity from a major flood event.

Structures existing below the 534.0 m.s.l. upper limit are subject to occasional inundation during flood risk management operations when water levels rise during periods of outflow reduction from the Project. Under the current conditions, there are multiple structures that exist and are currently being identified that are below this line because of incorrect survey lines that were recorded on the individual tract deeds. USACE’s ability to manage the presence of structures within potential inundation areas is critical to implement flood risk management authorized by the U.S. Congress. Having obtained these rights USACE can enforce limitations on structures within areas that have flowage easements.

1.4 Scope

The scope of this PEA covers the lands surrounding Rough River Lake that are subject to occasional flooding during flood risk management operations. It includes lands and properties adjacent to or identified from revised boundary line surveys up to elevation 534.0 m.s.l. that are recommended for new or changes to the existing lines for flowage easement rights. RRL is surrounded by approximately 144 residential developments. These developments were built

between the 1970s to present and range from trailers to upscale lake homes. The properties proposed for flowage easement acquisition are agriculture and residential, including primary and secondary residences surrounding RRL. Residential properties are defined by USACE to be five acres or less in size and the agricultural properties are considered to be five acres or larger.

Programmatic NEPA documentation is warranted because USACE will conduct multiple real estate acquisitions on a regular basis and simultaneously until the areas subject to inundation have all be identified through the survey efforts. A PEA also provides the public and decision makers with the information required to understand and evaluate the potential environmental consequences of these types of similar actions.

This PEA will be used by USACE to determine the level of environmental analysis and documentation required under NEPA for any proposed acquisition. If site-specific information for a tract of land or property meets the standards described in this PEA, a memorandum documenting NEPA compliance based on the Finding of No Significant Impact as signed by the District Commander will be prepared. This memorandum would state that USACE has reviewed the proposed action (acquisition), alternatives, and potential direct, indirect and cumulative impacts and found them to be accurately described by this PEA and its associated FONSI. No further documentation would be required to comply with NEPA. Because USACE would be required to implement the mitigation measures contained in the PEA, the memorandum would summarize the mitigation measures, if any, to be undertaken.

If the specific action is expected to (1) create impacts not described in the PEA; (2) create impacts greater in magnitude, extent, or duration than those described in the PEA; or (3) require mitigation measures to keep impacts below significant levels that are not described in the PEA; then a Supplemental Environmental Assessment (SEA) and corresponding FONSI (where appropriate) would be prepared to address the specific action. The SEA would be tiered from this PEA, in accordance with 40 CFR Part 1508.28. Actions that are determined, during the preparation of the SEA, to require a more detailed or broader environmental review will be subject to the stand-alone EA process.

1.5 Authority

Engineering Regulation 405-1-11 outlines the procedures for the acquisition of real property and interests in real property for USACE Civil Works projects. It requires that prior to the initiation of negotiations for the acquisition of interests in land, compliance with the National Environmental Policies Act (NEPA) and the National Historical Preservation Act (NHPA) are required.

This PEA is being completed as required under the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S. Code [USC] 4321 *et. seq.*), the President's Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] 1500 – 1508)

(CEQ, 1992, and U.S. Army Corps of Engineers (USACE) regulations for implementing NEPA for Civil Works projects, 33 C.F.R. §§ 230.1-230.26.

This PEA assesses the overall environmental effects of proposed real estate actions involving multiple individual tracts or parcels of land as part of ongoing, proposed or reasonably foreseeable real estate acquisitions in Rough River Lake as described in the CEQ (2014) guidelines for *Effective Use of Programmatic National Environmental Policy Act (NEPA) Reviews*. If it is determined that a proposed real estate acquisition would have more than a minor to negligible adverse effect, the alteration would not fall under the scope of this PEA. In this case, a separate EA or Environmental Impact Statement (EIS) would need to be prepared.

1.6 Regulatory Framework

The National Environmental Policy Act of 1969 requires agencies to consider the environmental effects of proposed actions prior to making decisions. All agency actions are subject to NEPA, but some types of agency actions have been determined by the agency, through regulation, not to have, individually or cumulatively, a significant effect on the quality of the human environment (40 C.F.R. § 1508.4); these kinds of actions are considered “Categorical Exclusions” (CATEXs). If a particular agency action qualifies for a CATEX, and there are no extraordinary circumstances that dictate a need to prepare an Environmental Assessment (EA) or an Environmental Impact Statement (EIS), it is excluded from the requirements of NEPA documentation but is not exempt from compliance with any other Federal law (33 C.F.R. § 230.9). Other Federal laws include, for example, the Federal Endangered Species Act (16 U.S.C. § 1531 et seq.), the Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.), the National Historic Preservation Act (54 U.S.C. § 300101 et seq.), the Clean Water Act (33 U.S.C. § 1251 et seq.), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. § 9601 et seq.) (CERCLA).

1.7 Public Involvement

USACE invites public participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision making. All agencies, organizations, and members of the public having a potential interest in the proposed action, including minority, low-income, disadvantaged, and Native American groups, are urged to participate in the decision making process. Public participation opportunities with respect to this PEA and decision making on the proposed action are guided by 33 Code of Federal Regulations Part 230. Upon completion, the draft PEA will be made available to the public for 30 days, along with a draft Finding of No Significant Impact (FONSI). At the end of the 30-day public review period, the U.S. Army Corps of Engineers will consider any comments submitted by individuals, agencies, or organizations on the proposed action, the EA, or draft FONSI. As appropriate, USACE may then execute the FONSI and proceed with implementation of the proposed action. If it is determined prior to issuance of a final FONSI that implementation of the proposed action would result in significant impacts, the USACE will publish in the Federal

Register a notice of intent to prepare an Environmental Impact Statement, commit to mitigation actions sufficient to reduce impacts below significance levels and sign the FONSI, or not take the action.

2.0 FLOWAGE EASEMENT (OCCAISIONAL) ACQUISITION

As a result of the surveys, tracts of lands will be identified that require USACE to obtain flowage easement rights up to the 534.0 m.s.l. contour. The PEA evaluates the expected environmental effects of the flowage easement acquisitions of necessary flowage rights consistent with the Real Estate Acquisition Plan. Following acquisitions, USACE would work directly with individual land owners to resolve encroachments onto these lands. The time estimated to address encroachments is estimated to be approximately two to four years from the time the encroachment is identified. As future surveys are completed and additional encroachments identified within already surveyed areas, it is estimated to take 10 to 20 years to fully resolve the habitable structure encroachments at RRL. Implementing these recommendations is subject to the availability of funds.

2.1 Real Estate Acquisition Instruments

USACE will use two type of methods for acquisition of flowage easement.

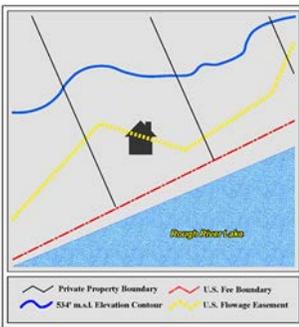
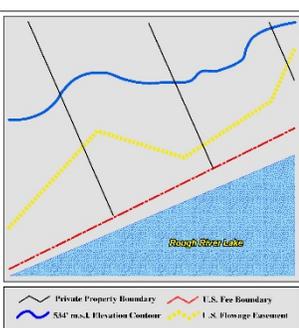
A *standard estate for flowage easement (Occasional Flooding)* is one that has been preapproved by the Government and describes the rights that the government is acquiring on privately owned land for occasional flooding. It prevents habitable structures and allows the government to approve other structures on that flowage easement. The standard estate for flowage easement (Occasional Flooding) will be used to acquire easement on vacant land in accordance with the approved guide taking contours for flowage easement at elevation 534.0' m.s.l. It will also be used to acquire occasional flowage easement on properties with a habitable structure that cannot or will not be able to meet certain established release requirements, with the stipulation that the habitable structure will be removed.

A *non-standard estate for flowage easement (Occasional Flooding)* is one that allows a habitable structure to remain in place on land where USACE has the right to occasionally flood as part of project operations. For a structure to be allowed to remain in place, this requires approval through the USACE chain of command and is site specific to the property. A non- standard estate will be used to acquire easement on properties with a habitable structure that meets or can meet release requirements previously approved by HQUSACE to resolve encroachments on Government owned flowage easement.

2.2 Categories

Table 3-1 shows the three categories of flowage easement acquisitions for tracts identified through surveys are subject to a revised 534.0 m.s.l. elevation:

**Table 2-1
Categories of Flowage Easement Acquisitions**

Category	Acquisition Strategy	
<p>Habitable structure is located partially on existing Government flowage easement and below elevation 534' m.s.l., identified as Scenario D-1 and D-2.</p>	<p>If requirements for the release of the human habitation restriction can be met, acquire non-standard estate for acquisition of occasional flowage easement rights;</p> <p>or</p> <p>If requirements for release of the human habitation restriction cannot be met, acquire standard occasional flowage easement and remove habitable structure.</p>	
<p>Habitable structure not located on Government flowage easement and below 534' m.s.l.</p>	<p>If requirements for the release of the human habitation restriction can be met, acquire non-standard estate for acquisition of occasional flowage easement rights;</p> <p>or</p> <p>If requirements for release of the human habitation restriction cannot be met, acquire standard occasional flowage easement and remove habitable structure.</p>	
<p>Land below 534.0' m.s.l. with no habitable structure and unencumbered by government flowage easement.</p>	<p>Standard occasional flowage easement estate.</p>	

3.0 PROPOSED ACTION AND ALTERNATIVES

NEPA requires the inclusion of an alternatives analysis in comparative form to allow the decision maker a framework for determining the significance of resource impacts to allow for an informed decision in choosing the Government's Proposed Action. These alternatives include the Preferred Alternative, the No-Action Alternative, and any reasonable alternatives. For this PEA, the alternatives that are analyzed are the Preferred Alternative and No-Action Alternatives.

Alternative 1 – Acquisition of Real Estate Interests (Proposed Action and Preferred Alternative). USACE would acquire any and all real estate interest as identified from existing and future surveys for all of Rough River Lake, as determined appropriate, for lands up to elevation 534.0 m.s.l. for flowage easement rights, including lands necessary to address backwater effects.

Alternative 2 - No Action Alternative. There would be no federal action. This alternative would not resolve the discrepancies or deficiencies in the Federal Government flowage easement rights on tracts where flowage easements were not acquired, or inaccurately acquired, up to the 534.0' m.s.l. It would mean that the number of habitable encroachments would remain, continue to grow, and contribute to an increase in habitable structures within the flood water storage areas that may eventually interfere with project operations. This alternative would subject any structure (habitable or non-habitable) or property improvements to temporary flooding, increase the potential risk of flooding and damage to personal property (depending on the location of the property) and potentially increase the risk to human health and safety. Without government interest in lands below the authorized impoundment stage, USACE would continue to lack authority to enforce deed restrictions that are needed on those lands. This is the baseline condition at RRL.

A third alternative considered, but rejected from consideration, is the operation of the Rough River Lake Flood Risk Management Project in a manner that avoids the potential for backwater levels from reaching habitable structures that may exist below the existing 534.0 m.s.l. contour. While the full utilization of the reservoir area up to the 534.0 m.s.l. contour has not yet occurred, releasing waters downstream to ensure that structures that may currently be present within the upper guidance contour of 534.0 m.s.l. will not be inundated carries a greater risk of consequences to communities downstream and would be contrary to the purposes for which Congress authorized the Rough River Lake Flood Risk Management Project. The Rough River Lake operates as a unit of the general plan for the Ohio River Basin to effect reduction in flood stages at all points downstream from the lake. The area receiving the greatest protection consists of about 36,000 acres in the Rough River Valley, between the dam site and the upstream limit of the backwater from the Green River. Waters may be held and released as directed by USACE water management to protect downstream losses. The moderate to severe elevation changes around the lake make it difficult to identify areas that lie above and below the 534.0' m.s.l. contour; and an accurate 534.0 m.s.l. contour is necessary. While some of the lands lying between the existing easement upper bounds and a more accurate 534.0 m.s.l. are not known to have been inundated to date, there is no reasonable alternative related to operational avoidance of inundating these lands in the event of major precipitation episodes in future. Therefore the acquisition of the right to flood up to the 534.0 m.s.l. contour, and subsequent enforcement of real estate restrictions is necessary. The potential impacts of operational avoidance of inundating these properties are not further addressed in this PEA.

4.0 AFFECTED ENVIRONMENT

4.1 General

The 5,100-acre Rough River Lake is located in west central Kentucky within the Green River Basin on the Rough River, upstream of its confluence with the Green River. It is approximately 60 air miles southwest of Louisville. The dam site is 89.3 miles above the mouth of Rough River which enters Green River at Livermore. Green River Lock 2 at Calhoun is 8.1 miles below Livermore.

It is a federally-owned and operated flood risk management project in parts of Breckenridge, Hardin and Grayson Counties, Kentucky. Completed in December 1961, Rough River Lake operates as a unit of the general plan for the Ohio River Basin to effect reduction in flood stages at all points downstream from the lake. The area receiving the greatest protection consists of about 36,000 acres in the Rough River Valley, between the dam site and the upstream limit of the backwater from the Green River. Other project purposes include water supply, recreation, and fish and wildlife enhancement. It features five USACE recreational sites and one state park.

4.2 Land Use

Land uses in the Green River Watershed consist of primarily forests, agriculture, residential development, and coal production. The watershed is characterized by developed areas, forested wetlands, deciduous forests, coniferous forests, other grasses and agriculture, barren/open areas, turf and grass, and utility rights of way.

Project lands consist of 9,211 acres in fee and 4,555 acres with flowage easements. Included in the fee area purchases are 524 acres acquired for recreation. Water areas include a range from a minimum 2,180 acres, to the seasonal or recreational pool of 4,860 acres, to the flood control pool of 10,180 acres.

The Commonwealth of Kentucky has a license for 8,525 acres for fish and wildlife management, and includes all lands and waters. The state is responsible for implementation of an approved management plan for the enhancement of fish and wildlife. The Kentucky Department of Parks leases an area of about 173 acres for the operation of the Rough River State Resort Park and Marina. Grayson County has a real estate lease for 3.9 acres that is at the Eveleigh Recreation Area (boat launching ramp and parking area), Grayson County also has a lease at Peter Cave Recreation Area (boat launching ramp, primitive campsites and parking area) which is subleased for maintenance and for operation of a marina.

Table 4-1 lists the common land cover types and uses found at Rough River Lake.

Table 4-1 Land Uses/Cover Types Rough River Lake, KY			
Developed, Open Space	Shrub	Oak-Pine Mixed Forest	Oak/Deciduous Floodplain Forest
Developed, Low Intensity	Oak Forest	Other Mixed Forest	Riparian Forest
Developed, Medium	Yellow Poplar Forest	Deciduous Woodland	Floodplain Forest
Cropland	Mixed Deciduous	Coniferous Woodland	Woodland Wetland
Pasture/Hay	Pine Forest	Mixed Woodland	Mixed Shrub Wetland
Herbaceous	Red Cedar Forest	Water	Barren
<i>Source: Kentucky Department of Fish & Wildlife, Rough River Lake Wildlife Management Area 5-year Plan</i>			

Prime Agricultural Land – Tracts that are classified as prime agricultural lands may be targeted for acquisition, depending on the survey results. A determination of the level of impact to prime and unique farmland or farmland of statewide and local importance is done by the lead federal agency, which inventories farmlands affected by the proposed action and scores part of an AD 1006 Form, Farmland Conversion Impact Rating. USACE would be required to complete an AD 1006 Form and determine the level of consideration for protection of farmlands that needs to occur under the Federal Farmland Protection Policy Act (FPPA).

4.3 Topography, Geology and Soils

Topography

The Project is in the Green River Basin, of gently rolling to hilly topography, consisting of 8,840 square miles in west central and southern Kentucky and 380 square miles in adjacent Tennessee. The basin includes the Mammoth Cave area, a karst region of pronounced underground drainage, numerous sinks, and few creeks. The Green River enters the Ohio River near Henderson, Kentucky.

The typical topography of the area consists of uplands, forested bottomland and steep slopes, low rolling hills, open farmland fields, and recreational and residential subdivisions with lawns.

Geology

Rough River Lake is within the “Clifty” area of the Pennyroyal Region of Kentucky. This comprises the western edge of the Pennyroyal region that was carved by streams through alternating layers of sandstone, shale and limestone. The Pennyroyal plain, extending from northern Tennessee through Kentucky to central Indiana, is an outstanding example of “Karst” (sinkhole) topography and is the most widespread topographic feature of this type in the United

States. The lake is bounded on the east by this plain, a very extensive, and nearly flat topographic feature formed on very thick limestone beds. An abundance of surface and groundwater has caused suctioning in the limestone resulting in a myriad of sinks and caverns. The most important cavern in the area is Mammoth Cave.

Soils

The Project is in the Pennyroyal physiographic region of the Mississippi Plateau. These include, but are not limited to: Caneyville silt loam, 12 to 20 percent slopes, eroded; Caneyville Rock outcrop complex, 12 to 30 percent slopes; Crider silt loam, 2 to 6 percent slopes, eroded; Crider silt loam, 6 to 12 percent slopes, eroded; Crider silt loam, 12 to 20 percent slopes, eroded; Crider silty clay loam, 6 to 12 percent slopes, severely eroded; Crider silty clay loam, 12 to 20 percent slopes, severely eroded; Dam, large; Gilpin silt loam, 6 to 12 percent slopes, eroded; Gilpin silt loam, 6 to 12 percent slopes, severely eroded; Gilpin-Dekalb-Rock outcrop complex, 30 to 60 percent slopes; Rosine silt loam, 6 to 12 percent slopes, eroded; Rosine silty clay loam, 6 to 12 percent slopes, severely eroded; Rosine-Gilpin-Lenberg complex, 12 to 20 percent slopes, eroded; Rosine-Gilpin-Lenberg complex, 12 to 20 percent slopes, severely eroded; Rosine-Gilpin-Lenberg complex, very rocky, 20 to 30 percent slopes; Sadler silt loam, 0 to 2 percent slopes; Sadler silt loam, 2 to 6 percent slopes, eroded; Stendal silt loam, 0 to 2 percent slopes, occasionally flooded; Varilla-Gilpin-Rock outcrop complex, very bouldery, 20 to 65 percent slopes; Open Water; Zanesville silt loam, 2 to 6 percent slopes, eroded; Zanesville silt loam, 6 to 12 percent slopes, eroded; Zanesville silt loam, 6 to 12 percent slopes, severely eroded (NRCS, 2018).

4.4 Biological Resources Vegetation

Vegetation in the area has been altered over time by agriculture, urbanization, and operation of the Project. Vegetation consists of an oak-hickory forest type with few wet-depressions. In the floodplain of the waterways, vegetation composition is determined by the frequency and duration of flooding. Plant species of the forested areas in and around the project area are sugar and red maple, hickory, post oak, white oak, swamp white oak, bur oak, American beech, swamp privet and cane bamboo. Wetlands in the area include forested, shrub-covered, or herbaceous communities, generally as mixtures of the three. Forested wetland species include swamp rose, buttonbush, hibiscus and lizard's tail, along with other numerous species.

Wildlife and Fish

Wildlife species inhabiting the RRL project area are those characteristic of forest, early successional, wetland, agricultural, and riparian habitats in Kentucky. Avian species common to the riverine area are red-wing blackbird, kingfisher, common flicker, pileated woodpecker, eastern kingbird, house wren, brown thrasher, robin and grackle. Mammals most commonly found include deer, squirrels, bats, rabbit, opossum, raccoon, fox, coyote, muskrat, rodents and skunk.

Migratory birds can be found to be present during various times of year within the RRL project area habitats. There include, but are not limited to: Bald Eagle, Blue-winged Warbler, Eastern Whip-poor-will, Henslow's Sparrow, Kentucky Warbler, Prairie Warbler, Red-headed Woodpecker, Wood Thrush, Belted Kingfisher, killdeer, Canada goose, Common Tern, Great Blue Heron, Least Bittern, and Marsh wren.

The Rough River Lake fishery consists of species typically found in a warm water impoundments of the upper Southern United States region. Common fish species in the lake are bass, crappie, catfish, sunfish, carp and a number of minnow species. The lake waters are a popular fishing destination for largemouth bass, hybrid striped bass, crappie and catfish.

Endangered and Threatened Species

The Endangered Species Act of 1973 (ESA), as amended, provides for the conservation of species listed as endangered and threatened throughout all or a significant portion of their range, and provides for the conservation of the ecosystems on which they depend. The ESA allows for the designation of critical habitat areas since habitat loss is a major threat to the most endangered species.

To comply with the requirements of Section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service IPaC (Information for Planning and Consultation) was accessed to aid in the development of the PEA regarding the potential presence of federally listed species that may be found on the Project area and possibly present on the Tracts of land proposed for acquisition now and in the future. Table 4-2 lists the four federally-listed and candidate species that may be present in the Project area.

The Commonwealth of Kentucky lists 91 species in its State Wildlife Action Plan (SWAP) for Rough River Lake that are considered endangered, threatened, or special concern. The Kentucky State Nature Preserves Commission rare plant database was accessed to determine the potential species that may be present in the Rough River Lake project area, specifically Breckinridge, Hardin, and Grayson Counties. Breckinridge County listed three state-listed species, Hardin County listed 34 species, and Grayson County listed 10 species.

Common Name	Federal Status
Bats	
Gray Bat	Endangered
Indiana Bat	Endangered
Northern Long-eared Bat	Threatened
Insects	
Rattlesnake-master Borer Moth	Candidate
<i>Source: USFWS IPac, 2018</i>	

4.5 Water Resources Surface Water

Surface waters are generally classified/designated by the state according to the most beneficial existing and potential future uses of the waterbody. The Kentucky Department for Environmental Protection has assigned the following Surface Water Use Designations to a portion of Rough River Lake near the dam: Cold Water Aquatic Habitat (CAH), Warm Water Aquatic Habitat (WAH), Primary Contact Recreation (PCR), and Secondary Contact Recreation (SCR). A PCR designation indicates that the water body is safe for swimming and an SCR designation indicates that fishing, wading, and boating are supported by the water body. Additionally, the Kentucky Water Health Portal indicates that the lake fully supports aquatic life and serves or can serve as a domestic water supply (KY DOW).

Rough River is the second largest tributary of the Green River and drains 1,081 square miles. Major tributaries that drain into the lake include the North Fork Rough River, Rough Creek, and Clifty Creek. Adams Fork, Halla Creek and Caney Creek enter the Rough River downstream from the lake. The Rough River watershed is rural in nature, with the major land use being agriculture (USACE, 2011).

Several tributaries to Rough River Lake and Rough River are designated as Outstanding State Resource Waters (OSRW). A water body is automatically designated as an OSRW if it serves as habitat for federally listed threatened or endangered species. Additionally, water bodies are automatically designated as OSRWs if they are within registered natural areas in accordance with 400 KAR 2:080. Water bodies can also qualify as OSRWs under permissible consideration in Section 8(1) (b) 2 of the Clean Water Act (CWA). Portions of Meeting and Linders Creeks, which are upstream tributaries of the lake, are designated as OSRWs. Portions of Rough River itself, upstream of the reservoir, are OSRWs. Portions of Little Short Creek, Pond Run, and Clifty Creek are designated as OSRWs; these water bodies feed directly into the lake. Downstream of the lake and dam, the North Fork Rough River and Fiddlers Creek have portions designated as OSRWs (KY DOW).

Groundwater

Groundwater occurs throughout the project area. It is influenced by the type and geometry of bedrock in the area. Surface and groundwater flows are controlled by the nature of these rocks and the associated surface features. The headwaters of the Green River Basin are in the Eastern Pennyroyal region. This area is characterized by flat lying limestones, sandstones, and shales that underlie flat to gently rolling terrain. The limestone areas have well-developed karst topography, characterized by vast sinkhole plains that take virtually all surface water that comes to them and channel it through caves and smaller underground passages below the ground surface. Several springs in this region, discharging from major underground passages, are large enough to support municipal water systems. In soluble limestone terrain or karst regions, the underground drainage may differ from the boundary of its surface watershed and flow through

caves and cracks in the rocks beneath the surface ridges. This is sometimes called “misbehaved” karst drainage (Commonwealth of Kentucky, 2001).

Water Quality

The reservoir is listed as an impaired waterbody. Section 303(d) of the Clean Water Act requires States to list all waters that are not expected to achieve their designated use goals even after all appropriate and required water pollution control technologies have been applied. Criteria for inclusion in this list include waterbodies that do not or are not expected to meet water quality standards after all point-source discharges are achieving appropriate treatment must be included on the 303(d) list of impaired waters. The 303(d) list includes the reason for impairment, which may be one or more point sources such as industrial or sewage discharges, or non-point sources such as urban or agricultural runoff. The Commonwealth of Kentucky lists Rough River Lake impaired for its designated use for SCR, specifically fish consumption, because of elevated levels of mercury in fish tissue. The source of this contamination is unknown (KY EEC, 2016).

Rough River Lake has historically had blue-green algae blooms prompting USACE to notify users of RRL to use caution because of potentially harmful contact with this algae. These blooms are capable of producing toxins that can be harmful to small children, those with illness and animals.

Floodplain Management

The waters and immediate project lands of RRL are designated Zone A and Zone AE by the Federal Emergency Management Agency (FEMA). These flood hazard areas on the Flood Insurance Rate Map are identified as Special Flood Hazard Areas (SFHA). SFHA are areas that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year; which is also referred to as the base flood or 100-year flood (FEMA, 2018).

USACE protects the floodplains within its project boundaries for flood storage. The flood storage area of the project covers about 10,260 acres and the backwater length of the main stem can extend 29 to 45 miles. The drainage area above the Rough River Lake Dam is 454 square miles.

4.6 Wetlands

Wetlands at Rough River Lake have not been mapped. The USFWS National Wetland Inventory mapping tool was accessed to identify the basic wetland types present that would be found on tracts of land acquired at Rough River Lake. These include freshwater emergent, freshwater forested/shrub, freshwater pond, open water/lake, other, riverine, and riparian wetlands (USFWS, 2018).

4.7 Historic and Archaeological Resources

Archaeologists have developed a general chronology for the Eastern United States that provides a useful framework for organizing and describing archaeological data (Dragoo 1976; Griffin 1967; Jennings 1974). The prehistoric cultural sequence developed for the region is PaleoIndian (9,500-8,000 BC), Archaic (8,000-6,000 BC), Middle Archaic (6,000-3,000 BC), Late Archaic (3,000-1,000 BC), Early Woodland (1,000-200 BC), and Middle Woodland (200 BC- A.D. 500), Late Woodland (AD 500-900), and Mississippian (AD 900-1600). These periods represent culturally distinct segments of more than 14,000 years of human adaptation and re-adaptation to a changing environment.

The prehistoric cultural sequence in Kentucky reflects a general trend toward increasing socio-cultural and technological complexity beginning with small mobile bands that later developed into more sedentary, complex societies. The subsistence activities of the earliest New World societies focused on hunting and gathering wild plant and animal foods. By late prehistoric times, however, agricultural economies based on three major tropical cultigens corn, beans and squash were characteristic of many societies in the eastern United States. Increases in the size and density of the human population and a trend toward increasing sedentism were also evident and reached their highest levels during the late prehistoric times. In all, these cultural trends are marked by stylistic differences in artifacts and correspond to major technological innovations or important shifts in adaptational patterns (Ford 1977; Pollack 1990). However, there was considerable regional variation in the timing and extent to which these trends were expressed. The historical context for these periods covering the Rough River Lake Project are found in the Appendix to this NEPA document.

4.8 Socioeconomic Resources

Socioeconomic factors include economic development, demographics, housing, quality of life, environmental justice, and protection of children.

Environmental justice is the fair treatment for people of all races, cultures, and incomes, regarding the development and implementation (or lack thereof) of environmental laws, regulations, and policies. Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, directs Federal agencies to address environmental and human health conditions in minority and low-income communities. EO 12898 states that Federal agencies would collect and analyze information concerning a project's effects on minorities or low-income groups when required by NEPA. If such investigations find that minority or low-income groups experience a disproportionate adverse effect, then avoidance or mitigation measures are necessary.

Executive Order 13045, *Protection of Children from Environmental Health and Safety Risks*, requires Federal agencies, to the extent permitted by law and mission, to identify and

assess environmental health and safety risks that might disproportionately affect children. The Army takes special precautions for the safety of children, including the use of fencing and signage.

4.9 Air Quality and Noise

The air quality index for RRL, which takes into account ozone and fine particulate matter, is usually good, occasionally moderate, and rarely “Unhealthy for Sensitive Groups.” It is almost never unhealthy (Kentucky Department of Environmental Protection, 2018). Additionally, the Environmental Protection Agency’s (EPA) website that lists Kentucky nonattainment/ maintenance status for each county by year for all criteria pollutants indicates that Grayson, Breckenridge, and Hardin Counties are in attainment for all of the EPA’s standards for air quality.

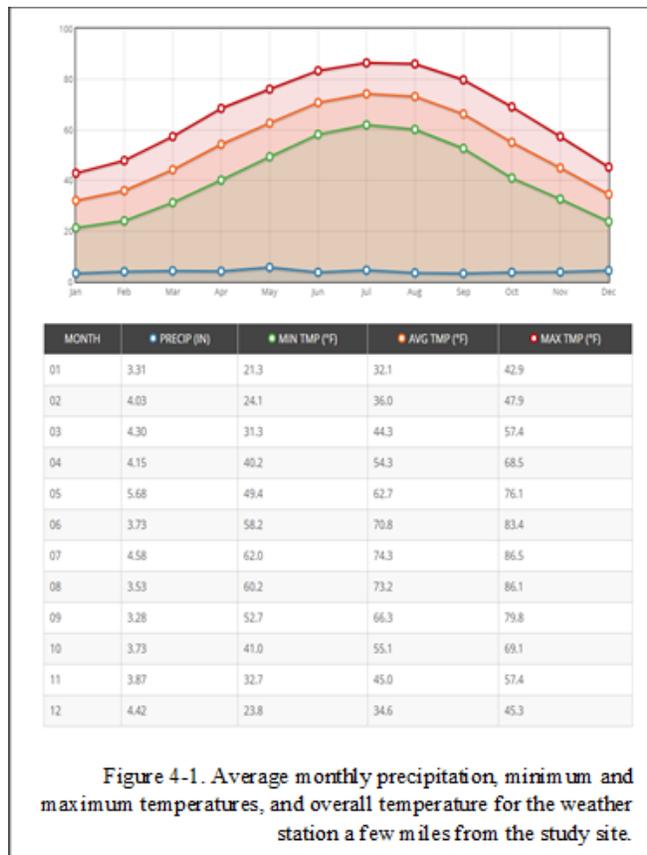
The major sources of noise around the Rough River Lake are associated with rural agricultural operations, and residential suburban areas and other human sources such as vehicles, industry, air traffic, and from boats and watercraft along the major waterways.

4.10 Climate Change

Figures 4-1 shows the average monthly precipitation, minimum and maximum temperatures, and overall temperature for the weather station a few miles from the study site.

Weather at the study sites is moderate, with warm summers and cool winters. Weather patterns are influenced by the Gulf of Mexico, and the site is located in the path of several storm systems. While storms occur year-round, most are between March and September (NPS, 2016).

Average annual rainfall precipitation for Leitchfield, KY, which is between 5 and 15 miles from the study sites, is 48.55 inches, the average annual snowfall precipitation is 9 inches, the annual average high temperature is 66.7°F, the annual average low temperature is 41.3°F, and the overall average annual temperature is 54.0°F (U.S. Climate Data). Figure 5.10-2 depicts monthly averages for temperature and precipitation using data from National Oceanic and Atmospheric



Administration (NOAA) Leitchfield 2 N, KY weather station (Network: ID GHCND: USC00154703) (NOAA, 2010).

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 General

This section presents the expected environmental effects of the Proposed Action/Preferred Alternative (Alternative 1) and the No Action Alternative (Alternative 2). The impact analysis in this PEA was developed based on implementing a real estate acquisition strategy for flowage easements for occasional flooding that take into consideration revised elevation contours or revised elevations.

With approval of this PEA and signed Finding of No Significant Impact, all future encroachment issues that require real estate acquisitions at the Rough River Lake flood risk management project will undergo a review to ensure the acquisition complies with applicable environmental laws and that the acquisitions are within the scope of the PEA. If it is determined that the acquisitions would result in impacts greater than minor to negligible as described in this EA, a stand-alone decision document (EA/Finding of No Significant Impact or EIS/Record of Decision) would be prepared. Appendix C contains the form, *Applicability Review Rough River Lake Real Estate Acquisition Plan*, to be completed to document, whenever appropriate, that the potential impacts to resources from the flowage easement rights to be obtained are within the limits of this PEA.

In compliance with NEPA, CEQ guidelines, and USACE regulations and guidance, this Programmatic Environment Assessment outlines the affected environment and the expected environmental consequences. In accordance with these guidelines the NEPA analysis is to focus on those resources and conditions potentially subject to impacts. Typically, these include land use and recreation areas, geology and soils, aesthetics and visual resources, noise, biological resources (fisheries, wildlife, threatened and endangered species), wetlands and vernal pools, water resources, historic and cultural resources, air quality, socioeconomic resources or related environmental justice considerations.

Most real estate acquisitions of the nature described in the Proposed Action for flood risk management operations have similar characteristics by nature and generally will not result in significant environmental effects. Since, in many instances, the proposed acquisitions of new occasional flowage easement rights will not result in any change to the resource as a result of USACE's actions, the discussions and presentation of potential effects on resources will be brief.

An impact is defined as a consequence that could occur from modifying the existing environment following acquisition of the occasional flowage rights occurring from operation and maintenance activities. Unless noted, the potential environmental effects associated with the acquisition and use of flowage easement rights up to the 534.0 m.s.l. contour are considered to be

within the authorized project purposes and typically are routine, short-lived, and are not considered significant. In this case, the federal action would result in establishing protection from future development on the lands up to the 534.0 m.s.l. contour that USACE may temporarily inundate as part of its authorized flood risk management authority for RRL. It would also allow USACE to enforce development restrictions where the right to occasionally flood privately held lands are obtained to fulfill the operating requirements of the flood risk management project. The real estate acquisitions targets lands primarily already subject to flooding and that are or will be identified in ongoing elevation surveys.

This section presents the effects of each of the alternatives on the existing resource. Impacts are quantified whenever possible.

Direct and Indirect Impact

Impacts can be beneficial or adverse, can be a primary result of an action (direct) or a secondary result (indirect), and can be permanent/long-term or temporary/short term. Secondary impacts are impacts that occur later in time or farther removed in distance, but are still reasonably foreseeable. Impacts can vary in degree from a slightly noticeable change to a total change in the environment. For this EA, there are few direct impacts, and the identified impacts are primarily indirect, temporary, and short-term resulting from the acquisition of flowage rights to occasionally flood tracts or portions thereof where USACE does not currently possess the right to do so at the Rough River Lake Project.

“Significance” has been analyzed in this document in terms of both context (sensitivity) and intensity (magnitude and duration):

Magnitude (discussed as appropriate):

- No Impact – there is no effect to the resource.
- Negligible – there is no discernible impact to the resource in the project area, but the resource is likely affected due to human presence or use limitations.
- Minor – there are noticeable impacts to the resource in the project area, but the resource is still mostly functional.

5.2 Land Use

Changes to land use as a result of the proposed action are site-specific to the tracts of land USACE will acquire. Acquiring new flowage rights to allow USACE to temporarily inundate lands allows the property owners to maintain ownership and the use of the land (such as forest, agriculture, or residential) to continue in its existing capacity. The use may, however, be subject to new restrictions, for example it may require removal of structures or septic systems. In many instances there will be no change in use as is currently being realized. In some instances, USACE may have to compensate the underlying owners for loss of use in accordance with USACE real estate protocols.

Alternative 1 – Acquisition of Real Estate Interests. The greatest potential impact from the Preferred Alternative is the limitation on future residential or other potential permanent structures and septic systems or leach fields. USACE has identified to date approximately 306 acres over multiple tracts that may be subject to acquisition, including 227.1 acres in Breckinridge County and 78.9 acres in Grayson County. More acreages on tracts of land are expected to be identified. The sizes of tracts of lands can be minimal (< 0.1 acres) or more substantial. The owners would retain title to the lands along with all remaining usage rights. The land for which easement will be acquired contains an unknown number of existing structures that may become subject to exercise of restrictions under the flowage easements, including human habitation restrictions.

Acquisition of flowage easement rights on forest or agricultural lands would not alter the land use categorizations for these tracts. The land use would remain the same, therefore the environmental effects on land use would be negligible and would not represent a short or long-term adverse effect on use of the lands.

Implementation of a just compensation package to the underlying fee owners for the acquisition of USACE flowage easement rights would ensure that the potential permanent impacts from deed restrictions that prevent development is mitigated. With the payments for the flowage easement right to occasionally flood, the impacts are not considered to be significant.

Alternative 2 - No Action Alternative. Taking no action to acquire necessary flowage easement rights allows the current land uses to continue, including construction of structures. Under this alternative, USACE would have no right to enforce restrictions that would come with flowage easements. The Project would continue to have problems with structures that currently exist below 534.0', and would face a likely increase in structures or damage to agriculture operations that could potentially be inundated during flood operations. This could interfere with project operations and increase economic losses.

5.3 Topography, Geology and Soils

This section describes the expected short- and long-term effects to topography, geology, and soils on lands acquired for occasional flowage easement rights in response to updated surveys at Rough River Lake.

Topography

No impact is expected to topographical features. The proposed action to acquire real estate interest for the purpose of temporary flood storage across privately owned lands or from the acquisition of lands to fee-simple lands would not have long-term impacts to the topography, geology or soils associated with the Preferred Alternative.

Alternative 1 Acquisition of Real Estate Interests. The lands would have restrictions placed on development. This includes ensuring the protection of the existing elevations to maintain the flood storage capacity. No changes to topography would occur with this alternative and acquisitions of multiple tracts are negligible and not considered significant.

Alternative 2 No Action Alternative. USACE would take no action. Though topography is expected to remain, there are no restrictions to prevent future development that could alter the topography in a way to future adverse effects to the Rough River Lake Project's ability to store flood waters. USACE would not have authority to enforce land protection from fill or loss of flood storage capacity.

Geology and Soils

Alternative 1 Acquisition of Real Estate Interests. Under the Preferred Alternative, the occasional storage of flood waters on flowage easement land is not expected to realize significant adverse effects to geology or soils. Flood storage waters that may reach flowage easement elevations at Rough River Lake are short-lived and have not historically shown alterations of underlying geologic conditions. Impacts to geology and soils from implementing either alternative would maintain existing conditions. No long-term impacts to geology are expected with the alternative.

If prime agricultural lands are taken out of use as part of changes in land management practices required by the USACE acquisition of flowage easement rights, a minor long term impact could be considered. The removal of lands from agricultural use is not expected to occur in the short-term or long-term operational functions of RRL. USACE would be required to complete the AD 1006 Form and determine the level of consideration for protection of farmlands that needs to occur under the Act. This potential impact is not able to be quantified, and is expected to have negligible adverse effects to existing prime agricultural lands.

Alternative 2 No Action Alternative. Under the No Action Alternative, there is no USACE acquisition to address properties and structures at or below 534.0'm.s.l. Therefore, USACE would not oversee implementation of land use protections afforded to geologic resources or soils in accordance with existing policy, and USACE would not be required to comply with the FPPA.

5.4 Biological Resources

This section describes the expected impacts to vegetation and biological resources in the areas identified for acquisition and the overall project area. The potential impacts to biological resources are considered significant if the Preferred Alternative or Alternative would:

- Substantially diminish habitat for a plant or animal species;
- Substantially diminish a regionally or locally important plant or animal species;
- Interfere substantially with wildlife movement or reproductive behavior;
- Result in substantial loss of fisheries populations or habitats;
- Result in a substantial infusion of exotic plant or animal species.

Vegetation

Changes in vegetation productivity in uplands or riparian zones could occur as a result of increases in the frequency and duration of inundation by flood waters by USACE flood risk management operations. There is the remote potential for this to occur on any frequent basis at RRL. Plant communities vary in their tolerance to changes in the hydrologic regime. For example, it depends on the time of year, the type of flood event, and the sensitivity of the individual species to temporary inundation. USACE flood storage to elevation 534.0 m.s.l. is rare, and may not ever occur. If so, the inundation that would be experienced by individual tracts where USACE has flood storage rights up to elevation 534.0 m.s.l. would be short-lived. Most plants are able to experience temporary inundation for two to three days without significant adverse effects in the growing and dormant seasons. Longer durations can result in loss or changes in species and could ultimately alter vegetation communities.

Alternative 1 – Acquisition of Real Estate Interests. The 534.0 m.s.l. contour is considered to be the upper limits of USACE flood storage. The impacts to vegetation, if it were to occur to this elevation because of flood storage operations, would be of short duration. It is considered to be minor and is not expected to significantly alter vegetation communities. For flowage easement tracts, the landowners would maintain rights over vegetation on the lands. USACE would not have authority over impacts to vegetation made by the owners.

Alternative 2 – No Action Alternative. Under the No Action Alternative, there are no USACE real estate acquisitions and there will be no change from the current baseline conditions. The impacts to vegetation, if it were to occur to this elevation because of flood storage operations, would be of short duration. It is considered to be minor and is not expected to significantly alter vegetation communities

Wildlife and Fish

This section describes expected impacts to wildlife and fish resources from acquisition of flowage easement rights (occasional) to elevation 534.0 m.s.l. throughout the entirety of the Rough River Lake project.

Wildlife

Alternative 1 – Acquisition of Real Estate Interests. Under this alternative wildlife species would not incur direct impacts to cover, nesting, and foraging habitat under normal project operations. During flood operations the more mobile species would be temporarily displaced to similar habitats. Some displaced wildlife would return to the habitats when flood waters recede. Where waters encroached into flood easement areas the less mobile species, such as small mammals, reptiles, and amphibians, and bird nests located at/near ground levels where flood waters would

rise could be lost. The overall impact, however, to general wildlife would not be significant because of the short duration of disturbance.

Alternative 2 – No Action Alternative. This alternative does not involve USACE acquisitions. Impacts to wildlife will still occur as outlined in Alternative 1, however, USACE would not be required to consult with USFWS or Kentucky Department of Fish and Wildlife Resources (KDFWR) to comply with the Endangered Species Act, Migratory Bird Treaty Act, or Fish and Wildlife Coordination Act or take action on recommended mitigations.

Fish

Alternative 1 – Acquisition of Real Estate Interests. Under this alternative, fisheries would not be affected. During routine project operations, the lands targeted for flowage rights are not typically inundated by water and therefore, have no fisheries present. During flood control operations, fisheries would temporarily inhabit areas subject to temporary impoundments but would leave the areas as waters recede. If waters receded too quickly, some species may be left stranded. This impact is considered negligible. Overall, the impacts would not be significant.

Alternative 2 – No Action Alternative. This alternative would not involve USACE acquisitions, and would not result in significant adverse impacts by maintaining the baseline conditions for fish.

Endangered and Threatened Species

The USFWS lists three species of bats and one insect species that could potentially be present on the tracts of land surrounding RRL.

The tracts of land targeted for flowage easements (for occasional flowage/flooding) that are identified from existing and future boundary surveys are tracts where USACE does not currently have flowage easement rights. Most of the areas to be acquired are at locations where human-induced disturbances occur on a continual basis, such as agricultural producing lands or suburban developments. These areas are typically already experiencing temporary inundation or are areas where the risk of flood waters reaching higher contours is minimal. The likelihood of encountering an endangered or threatened species in these locations is low. For more remote areas that experience less human-induced disturbances, the likelihood of encountering endangered or threatened species increases.

Alternative 1 – Acquisition of Real Estate Interests. For the federally-listed candidate Rattlesnake-master Borer Moth, they feed exclusively on the prairie plant, rattlesnake-master. Rattlesnake-master borer moths are obligate residents of undisturbed prairie and woodland openings that contain their only food plant, rattlesnake-master. In Kentucky the rattlesnake-master borer moth is known from two sites, one each in Christian and Hardin Counties. The Hardin County site is thought to be extant based on larval counts dating back to 2003, with

researchers finding between 100 and 500 feeding larvae during the survey years. A comprehensive survey in 2008 indicated the largest number of feeding larvae found at the single site was approximately 500. The site has a wide distribution of rattlesnake-master, although the moth showed clumped distribution. This site is secure and its population considered extant, although its site is undisclosed due to concern of collection of the species (USFWS, 1994). USACE would obtain only the rights to occasionally flood areas up to 534.0 m.s.l. and makes no proposal to remove vegetation. The land will remain in private ownership and USACE has no vegetation management authority over lands. The rare frequency of inundation to the upper limits is not expected to have alterations to the existing species composition in the acquisition areas. The greatest potential threat is from private land owner use. The acquisition of new flowage easement rights to occasionally flood on individual tracts is not expected to have an impact to existing habitat where these species typically could be found.

Where some of the areas to be acquired may be already experiencing periodic inundation, USACE's right to occasionally flood will primarily affect the presence of human habitable structures and thereby not have a direct or indirect impact to habitats of these species. The flowage easement rights will be obtained on privately owned lands where USACE would have no habitat management authority.

For bats, riparian areas and adjacent forested areas provide foraging, roosting, and mating habitat for bats. Rising flood waters could trap individuals underneath bridges, and could temporarily affect insect populations. Prior to the implementation of this PEA, a final course of action for real estate acquisitions will be finalized with the U.S. Fish and Wildlife Service and the Kentucky Department of Fish and Wildlife Resources to satisfy the requirements of the Federal Endangered Species Act (16 U.S.C. § 1536) and the Fish and Wildlife Coordination Act (16 U.S.C. § 661). USACE has determined that the federal acquisition process for new flowage easement with the right to occasional flood will have "no effect" to listed or proposed resources. USACE has also determined that if the right to inundate waters at Rough River Lake is ever utilized to elevation 534.0 m.s.l. the inundation period is typically short lived and "may affect, but not likely to adversely affect" meaning that the effects include those that cannot be evaluated are discountable and are extremely unlikely to occur on the species and/or critical habitat that are under jurisdiction of the US Fish and Wildlife Service. A final determination will be made upon concurrence from USFWS following the conclusion of the 30-day public review period.

Alternative 2 – No Action Alternative. Under the No Action Alternative, there is no USACE action. Therefore, USACE would not be required to consult with federal or state agencies to comply with the ESA, MBTA, FWCA, or the Sustainable Fisheries Act, if applicable. Similarly, compliance with EO 13112 is not required.

5.5 Water Resources

Potential impacts to water resources, including surface water and groundwater, are considered significant if the Proposed Action would:

- Irreversibly diminish water resource availability, quality, and beneficial uses;
- Reduce water availability or interfere with a potable supply or water habitat;
- Result in an adverse effect on water quality or an endangerment to public health by creating or worsening adverse health hazard conditions;
- Result in a threat or damage to unique hydrological characteristics;
- Violate an established law or regulation that has been adopted to protect or manage water resources of an area;
- Degrade fisheries habitat; or
- Adversely impact Wild and Scenic Rivers, American Heritage Rivers, or a designated Outstanding Water Resource.

Surface Water and Groundwater Resources

Alternative 1 – Acquisition of Real Estate Interests. Short or long-term impacts to surface and groundwater from this alternative would not be significant and are negligible. This alternative would acquire occasional flowage easement rights to support the authorized functions of the Rough River Lake Flood Risk Management Project, and allow USACE to enforce habitable structure limitations. The result of this alternative is expected to have an overall positive effect to surface waters and groundwater resources by removing structures and septic systems that when inundated during flood operations could increase overall contaminants into the waterbody.

Alternative 2 - No Action Alternative. This alternative does not include a USACE action.

Either alternative will not affect Wild and Scenic Rivers, American Heritage Rivers, or designated Outstanding Water Resources.

Water Quality

Rough River Lake is listed as an impaired waterbody and targeted for management to improve the water quality conditions of the watershed. Rough River Lake has occasional problems blue-green algae blooms prompting USACE to notify users of RRL to use caution because of potentially harmful contact with this algae.

Alternative 1, Acquisition of Real Estate Interests. There are no expected adverse effects to water quality. Algae blooms that have occurred within Rough River Lake would continue, and these are located in the permanent pool area.

Alternative 2, No Action Alternative. There are no identified potential effects on existing water quality. Algae blooms that have occurred within Rough River Lake would continue, and these are found within the permanent pool area.

Floodplain Management

Alternative 1 – Acquisition of Real Estate Interests. Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. USACE does not propose floodplain development. Implementing this alternative would have an overall positive effect on floodplains by eliminating direct and indirect development of lands subject to temporary inundation. This alternative allows USACE to review structures that are present within the floodplain and apply the applicable components of the Rough River Lake Flowage Easement Encroachment Resolution Plan. It would allow USACE to enforce removal of development in floodplains and remove possible sources of contamination.

Alternative 2 - No Action Alternative. This alternative does not include any USACE action. Therefore, USACE would not be required to apply EO 11988 to the areas subject to temporary inundation.

5.6 Wetlands

Alternative 1 – Acquisition of Real Estate Interests. This alternative would have no direct or indirect impacts to wetland resources. Temporary inundation of wetlands may occur if flood operations were to encroach into existing wetland habitats. Wetlands are typically used to periodic inundation and therefore impacts would be negligible.

Alternative 2 - No Action Alternative. This alternative does not include a USACE action. Therefore, USACE would not be required to apply the requirements for protection of wetland resources. If lands retained for flowage easement has private ownership that proposes wetland alterations they would be required to coordinate with the USACE Regulatory Division for a Section 404 permit review and the KDOW for appropriate permits.

5.7 Historic and Archaeological Resources

Alternative 1 – Acquisition of Real Estate Interests. The National Historic Preservation Act (NHPA) declares federal policy to protect historic sites and values in cooperation with other nations, states, and local governments. Subsequent amendments designated the State Historic Preservation Officer (SHPO) as the individual responsible for administering state-level programs. Section 106 of the NHPA and implementing regulations (36 CFR 800) outline the procedures to be followed in the documentation, evaluation, and mitigation of impacts for cultural resources. The Section 106 process applies to any federal undertaking that has the

potential to affect cultural resources. The Section 106 process includes identifying significant historic properties and districts that may be affected by an action and mitigating adverse effects to properties listed, or eligible for listing, in the National Register of Historic Places (NRHP) (36 CFR 60.4) (FEMA, 2005).

If a structure that is over 50 years old exists on a tract that is proposed to be newly acquired, USACE will determine if it is eligible using the Secretary of the Interior standards. If eligible, a determination on the appropriate mitigation will be coordinated with the Kentucky Heritage Council prior to taking action to remove or mitigate the potential for flood inundation damage.

Alternative 2 - No Action Alternative. This alternative does not involve a federal action. USACE would have no obligations to ensure the federal action is in compliance with 36 CFR 800.

5.8 Socioeconomic Resources

Potential socioeconomic impacts are considered significant if the Proposed Action would cause:

- Substantial gains or losses in population and/or employment; or
- Disequilibrium in the housing market, such as severe housing shortages or surpluses, resulting in substantial property value changes.

Potential environmental justice impacts are considered significant if the Proposed Action would cause disproportionate effects on low-income and/or minority populations.

Potential impacts to protection of children are considered significant if the Preferred Alternative would cause disproportionate effects on children.

Implementing *Alternative 1 - Acquisition of Real Estate Interests*, could result in the loss of habitable structures that exist below the 534.0 m.s.l. contour, and prevent the future development for habitable structures on individual tracts, or portions thereof, that are acquired to the 534.0 m.s.l. contour because of restrictions on newly acquired easements. These restrictions will be implemented based on tract location and regardless of income or minority group; whereas the owners to be affected have not been identified in a manner to be disproportionately low-income or minority. Loss of property values for the current owner would be minimized with compensation by USACE in accordance with real estate regulations. With compensation, impacts to individual property owners from loss of use or future habitable use are not considered significant. There have been no adverse impacts identified with acquisitions that would cause disproportionate effects on children.

Implementing *Alternative 2 - No Action Alternative*, is not expected to adversely affect the region or local economic development, demographics, housing, quality of life, environmental justice, and protection of children. USACE will continue to operate the project in accordance

with the Congressionally-authorized purposes by providing flood protection, water supply, and recreational opportunities. If USACE does not acquire flowage rights on sections of the tracts below the 534.0 m.s.l. level surrounding the RRL, the individual owners could experience loss of property that could temporarily affect quality of life. There are no expected changes that would affect low-income and/or minority populations or the protection of children.

5.9 Air Quality and Noise

Impact to air resources would be identical regardless of the alternative selected. If the total of direct and indirect emissions for any individual pollutant will equal or exceed the National Ambient Air Quality Standard (NAAQS) nonattainment area pollutants and general conformity thresholds, a full general conformity determination is required, and must include an evaluation of direct and indirect air emissions associated with the Preferred Alternative. If projected emissions will be below the individual pollutant threshold levels, the action is exempt from further conformity analysis if, also it is determined that the emissions are not considered regionally significant. For activities that do not exceed the thresholds or are exempt from a general conformity determination, a Record of Non-Applicability is prepared. There are no new emissions associated with the action, therefore acquisition of flowage easement rights at Rough River Lake will not result in a change to air quality. The properties will continue to be used as residential areas, agricultural fields, or remain in natural forested habitats.

There are no impacts to noise from the Preferred Alternative or No Action Alternative.

5.10 Climate Change

There are no identified or associated adverse effects to the climate with the acquisition of occasional flowage easements, or with implementing no action.

6.0 CUMULATIVE EFFECTS

NEPA defines cumulative effects as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR § 1508.7)”. The CEQ developed guidance (42 U.S.C. § 4321 et seq.)” to provide a framework for addressing cumulative environmental impacts in either an EA or an EIS. The handbook provides methods for addressing coincident effects on specific resources, ecosystems, and human communities for all related activities including all relevant activities not just the actions of the proposed project or alternatives. Determining the cumulative environmental consequences of an action requires delineating the cause-and-effect relationships between the multiple actions and the resources, ecosystems, and human communities of concern. CEQ issued guidance in 2010 concerning establishing, applying, and revising categorical exclusions under NEPA. The guidance recommends that agencies consider the frequency with which the categorically-excluded actions are applied.

The primary consideration associated with the proposed action are the limitations placed on the individual tracts adjacent to the RRL for construction of structures, primarily for human habitation, that could be subject to periodic inundation as a result of flood risk management operations from Rough River Lake up to elevation 534.0 m.s.l. The number of tracts are finite, meaning the number of tracts adjacent to RRL will be identified and there will be no additional properties where construction of habitable structures by any agency (Federal or non-Federal) or person can be undertaken below elevation 534.0 m.s.l. There will be no additional cumulative impacts from development into the potential flood inundation areas following the conclusion of the elevation surveys. A moratorium on new construction and elimination of existing structures and or below this elevation serves as a net benefit to natural resources as the action prevents future loss of habitat that could be realized with human development. The federal action does not encourage new development, commercial or residential, and there has not yet been any planned developments identified, pending the completion of the 30-day public review. Placing limits on habitable structures at or below elevation 534.0 m.s.l could prohibit land owners whom have owned lakefront tracts from developing the land, in some cases into building lots that would allow construction below elevation 534.0 m.s.l. In most cases FEMA flood mapping will need to be adjusted and may have an increase costs associated with the FEMA requirement for flood insurance. USACE records 144 current and planned subdivisions surrounding Rough River Lake. For existing subdivisions where habitable structures currently exist below the 534.0 m.s.l. elevation, the individual tracts within these subdivision and any associated structures are accounted for in this EA. Of the proposed new subdivisions, the habitable structures that are proposed for construction are above the newly established 534.0 m.s.l. elevation. There are no other reasonably foreseeable future actions. Based on the information available, the acquisitions are not expected to significantly adversely affect specific resources, ecosystems, and human communities on tracts adjacent to RRL.

7.0 MITIGATION

This PEA outlines the environmental analysis of the potential effects of acquiring flowage easement rights in accordance with USACE efforts to resolve habitable structure encroachments on lands subject to flood operations at Rough River Lake, Kentucky. These are to be acquired based on the ongoing surveys being completed by USACE to accurately determine the real estate interests to be acquired. If site-specific information for a tract of land or property meets the standards described in this PEA, a memorandum documenting NEPA compliance based on the Finding of No significant Impact as signed by the District Commander will be prepared. This memorandum would state that USACE has reviewed the proposed action (acquisition), alternatives, and potential direct, indirect and cumulative impacts and found them to be accurately described by this PEA and its associated FONSI. No further documentation would be required to comply with NEPA. Because USACE would be required to implement the mitigation measures contained in the PEA, the memorandum would summarize the mitigation measures, if any, to be undertaken.

Appendix C contains the recommended memorandum to be reviewed and completed for each acquisition to document compliance with NEPA and all other federal environmental laws, regulations, Executive Orders and Executive Orders.

The tracts, or sections thereof, to be identified for acquisition of new flowage rights to occasionally flood will need to meet the standards of Engineering Regulation (ER) 200-2-3 that requires USACE to perform certain actions to assess the environmental condition of property prior to entering into designated real property transactions. To support the real estate action, the preparation of an ECP report is required and must comply with applicable standards for performing either a Phase I or Phase II Environmental Site Assessment as defined in American Society for Testing and Materials (“ASTM”) Standard E 1527–05 entitled, “*Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*,” or ASTM E 1903 (*Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process*), as appropriate.

The acquisitions will need to fulfill USACE obligations to document compliance with Section 106 of the NHPA and implementing regulations (36 CFR 800).

8.0 DISTRIBUTION LIST AND PERSONS CONSULTED

The following federal, state, and local agencies have been requested to provide comment on this Programmatic Environmental Assessment.

U.S Environmental Protection Agency, Region 4
U.S. Fish and Wildlife Service, Kentucky Ecological Services Field Office
Kentucky Department for Natural Resources
Kentucky Department of Fish and Wildlife Resources
Kentucky Department for Environmental Protection
Rough River Dam State Resort Park
Breckinridge County, Kentucky Judge Executive
Grayson County, Kentucky Judge/Executive
Hardin County, Kentucky Judge/Executive

9.0 REFERENCES

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McGrain, P., and Currens, J.C., 1978, *Topography of Kentucky*: Kentucky Geological Survey, ser. 11, Special Publication 25, 76 p. Web. 20 March 2018. <http://www.uky.edu/KGS/water/library/gwatlas/Grayson/Geology.htm>

10.0 COMPLIANCE WITH FEDERAL ENVIRONMENTAL STATUTES, EXECUTIVE ORDERS AND EXECUTIVE MEMORANDA

FEDERAL STATUTES

Archaeological Resources Protection Act of 1979, as amended, 16 USC 470 et seq.

Compliance: For actions on acquisitions, the issuance of a permit from the Federal land manager to excavate or remove archaeological resources located on public or Indian lands signifies compliance.

Preservation of Historic and Archeological Data Act of 1974, as amended, 16 U.S.C. 469 et seq. Compliance: The proposed federal action will be coordinated with the Kentucky State Historic Preservation Officer.

American Indian Religious Freedom Act of 1978, 42 U.S.C. 1996.

Compliance: Must ensure access by Native Americans to sacred sites, possession of sacred objects, and the freedom to worship through ceremonials and traditional rites, if identified.

Clean Air Act, as amended, 42 U.S.C. 7401 e t seq.

Compliance: Public notice of the availability of this report to the Environmental Protection Agency is required for compliance pursuant to Sections 176c and 309 of the Clean Air Act.

Clean Water Act of 1977 (Federal Water Pollution Control Act Amendments of 1972) 33 U.S.C. 1251 e t s eq.

Compliance: The EA addresses, where applicable, compliance with the Clean Water Action for real estate acquisitions for occasional flowage easements to meet the authorized project purposes and to resolve encroachments at Rough Rive Lake.

Coastal Zone Management Act of 1982, as amended, 16 U.S.C. 1451 et s eq.

Compliance: Not Applicable. The project does not occur in the coastal zone.

Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 e t seq.

Compliance: Coordination with the U.S. Fish and Wildlife Service (USFWS) will ensure acquisitions will meet the stands for consultation requirements pursuant to Section 7 of the Endangered Species Act have been met. Coordination with the National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act is not required.

Estuarine Areas Act, 16 U.S.C. 1221 e t seq.

Compliance: Not Applicable. This report is not being submitted to Congress.

Federal Water Project Recreation Act, as amended, 16 U.S.C. 4601-12 e t seq.

Compliance: Public notice of availability to the project report to the National Park Service (NPS) and Office of Statewide Planning relative to the Federal and State comprehensive outdoor recreation plans signifies compliance with this Act.

Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 e t s eq.

Compliance: Coordination and full consideration of comments from the FWS and Kentucky fish and wildlife agencies signifies compliance with the Fish and Wildlife Coordination Act.

Land and Water Conservation Fund Act of 1965, as amended, 16 U.S.C. 4601-4 e t seq.

Compliance: Public notice of the availability of this report to the National Park Service (NPS) and the Office of Statewide Planning relative to the Federal and State comprehensive outdoor recreation plans signifies compliance with this Act.

Marine Protection, Research, and Sanctuaries Act of 1971, as amended, 33 U.S.C. 1401 e t seq.

Compliance: Not Applicable. The operation of the project does involve the transportation or disposal of dredged material in ocean waters pursuant to Sections 102 and 103 of the Act, respectively.

National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq.

Compliance: This proposed action requires coordination with the State Historic Preservation Office. Full compliance with this requirement will be obtained when the SHPO determines the PEA standards are sufficient to meet compliance with this Act.

Native American Grave s Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3000-3013, 18 U.S.C. 1170

Compliance: Regulations implementing NAGPRA will be followed if discovery of human remains and/or funerary items occur during implementation of this project.

National Environmental Policy Act of 1969, as amended, 42 U.S.C 4321 et s eq.

Compliance: Preparation of the Environmental Assessment signifies partial compliance with NEPA. Full compliance shall be noted at the time the Finding of No Significant Impact is signed by the District Commander.

Rivers and Harbors Act of 1899, as amended, 33 U.S.C. 401 e t seq.

Compliance: Not Applicable. No requirements for projects or programs authorized by Congress. The project is operated pursuant to the Congressionally-approved authority.

Watershed Protection and Flood Prevention Act as amended, 16 U.S.C 1001 e t seq.

Compliance: Floodplain impacts have been considered in project planning. The project will not result in the loss of floodplain.

Wild and Scenic Rivers Act, as amended, 16 U.S.C 1271 e t seq.

Compliance: Not applicable. The Rough River is not designated as a Wild and Scenic River. Additional coordination with the Department of the Interior is not required for the activity.

Magnuson-Stevens Act, as amended, 16 U.S.C. 1801 e t seq.

Compliance: Not applicable. The project does not require coordination with the National Marine Fisheries Service for an Essential Fish Habitat (EFH) Assessment.

EXECUTIVE ORDERS

Executive Order 11593, Protection and Enhancement of the Cultural Environment, 13 May 1971

Compliance: Coordination with the Kentucky Historic Preservation Officer in the process of implementing the consultation requirements of the PEA signifies compliance.

Executive Order 11988, Floodplain Management, 24 May 1977 amended by Executive Order 12148, 20 July 1979.

Compliance: Public notice of the availability of this report or public review fulfills the requirements of Executive Order 11988, Section 2(a) (2).

Executive Order 11990, Protection of Wetlands, 24 May 1977.

Compliance: Public notice of the availability of this report for public review fulfills the requirements of Executive Order 11990, Section 2 (b).

Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, 4 January 1979.

Compliance: Not applicable to projects located in the United States geographical boundaries.

Executive Order 12898, Environmental Justice, 11 February 1994.

Compliance: The project will not have a significant impact on minority or low-income population, or any other population in the United States.

Executive Order 13007, Accommodation of Sacred Sites, 24 May 1996

Compliance: Consultation with Federally Recognized Indian Tribes, where appropriate, signifies compliance. Coordination with Tribal Nations will be completed for the proposed action. A final determination will be made on accommodations necessary for sacred sites at the signing of a FONSI for the proposed action.

Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. 21 April, 1997.

Compliance: Not applicable. The project would not create a disproportionate environmental health or safety risk for children.

Executive Order 13061, and Amendments – Federal Support of Community Efforts along American Heritage Rivers

Compliance: Not Applicable. The Rough River is not designated as an American Heritage River. **Executive Order 13112, Invasive Species, 3 February 1999**

Compliance: The acquisition of occasional flowage real estate interest would not violate this EO.

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, 6 November 2000.

Compliance: Consultation with Indian Tribal Governments, where applicable, and consistent with executive memoranda, DoD Indian policy, and USACE Tribal Policy Principles signifies compliance.

EXECUTIVE MEMORANDUM

Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing NEPA, 11 August 1980.

Compliance: USACE is required to determine the level of consideration for protection of farmlands that needs to occur under the Act. AD 1006 Form may need to be completed if USACE determines that the acquisition of any particular tract of land that is prime agricultural lands will be affected by the proposed acquisition.

White House Memorandum, Government-to-Government Relations with Indian Tribes, 29 April 1994.

Compliance: Consultation with Federally Recognized Indian Tribes, where appropriate, signifies compliance.

APPENDIX A

Rough River Lake Flowage Easement Encroachment Resolution Plan

Rough River Lake Flowage Easement Encroachment Resolution Plan



Grayson, Breckinridge and Hardin Counties, Kentucky

January 2017



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Appendices

Appendix 1:	Hydrology and Hydraulics – Impacts of Structures within the Flowage Easement
Appendix 2:	GIS vs. Surveys to Identify Flowage Easement Encroachments at Rough River Lake

1 Intent

This report is designed to define the habitable structure encroachment problem at Rough River Lake (RRL) and set forth proposed resolutions. The scenarios discussed in this plan will be applied to all structures currently identified through proper surveys and those identified after the completion of proper surveys. The Assistant Secretary of the Army for Civil Works' (ASA(CW)) approval of the plan allows the United States Army Corps of Engineers (USACE) to execute the recommendation for each scenario without additional coordination with the ASA(CW) in most cases. If a structure is identified that does not meet any of the scenarios, Headquarters USACE (HQUSACE) will coordinate with the ASA(CW) to determine appropriate resolution in accordance with applicable USACE regulations.

Upon the one year anniversary of this plan's approval, the delegation from the ASA(CW) to the USACE Director of Real Estate for waiver of the human habitation restriction may be revisited and possibly re-delegated.

2 Preface

The Rough River Lake project is one in a series of four lake projects that provide flood control for the Green River Basin and, collectively, is operated as a comprehensive unit of flood control in the Ohio River Basin. The authorized purposes for RRL are: flood control, low flow augmentation for water quality, water supply, general recreation, and fish and wildlife management.

Construction of the lake began in November 1955 and was completed in September 1959. During the active years of real estate acquisition for this project, the "Eisenhower Acquisition Policy" for civil works projects was in effect. This policy restricted the taking of land in fee to lands only below the 5-year flood frequency elevation. The 5-year flood frequency elevation for RRL was computed to be elevation 514.0' m.s.l.¹, and the fee acquisition guide was established at this elevation. Additional lands needed for such purposes as project operations and public access areas were also acquired in fee. The flowage easement acquisition guide elevation was originally established at the 48-year flood frequency elevation of 534.0' m.s.l. An updated pool elevation frequency analysis was compiled after the record high pool event of 2011 by the Louisville District. This analysis includes approximately 50-years of observed data. As a result of the larger dataset, elevation 534.0' m.s.l. is now considered to be a 220-year flood frequency pool elevation. The frequency elevations, converted to m.s.l., are: 100-year - 530.6'; 500-year - 537.6'; and 1,000-year - 540.4'.

RRL is located in rural Breckinridge, Grayson, and Hardin Counties in South Central Kentucky. The principal surface characteristic of the Rough River Basin is, in general, a rugged topography with well-defined drainage. The project is in an irregular limestone region, and many of the hills bordering the lake contain outcroppings of rock which provide scenic enhancement to the area. The moderate to

¹ See Section 4. Definitions and Section 5.5 Vertical Datums for explanation of Mean Sea Level (m.s.l.)

severe elevation changes around the lake make it difficult to identify areas that lie above and below the 534.0' m.s.l. contour. In many areas, adjacent properties and structures may have greatly differing elevations.

Currently, RRL is surrounded by over 140 residential developments and, in the absence of encroachment resolution, continued growth and building modifications are expected. At RRL there are 319.8 miles of flowage easement boundary, 260 miles of shoreline and 266 miles of fee boundary to monitor. In addition, there are 4 campgrounds with 367 campsites, water patrol, shoreline management, and nearly 5,000 minor shoreline licenses and permits to manage. RRL welcomes approximately 1.5 million visitors each year.

3 References

Real Estate Design Memorandum No. 7, RRL, dated January 1958, "2. References. D. OCE 6th Indorsement, ENGWE letter dated 10 September 1956 on letter from LEDO, OVLGH to Ohio River Division dated 29 March 1956, subject: Guide Contours for Taking, Rough River Reservoir, which approved the guide taking contours for fee taking at elevation 514.0' m.s.l. and for flowage easement at 534.0' m.s.l. at the dam with appropriate allowance for backwater effects."

Army Regulation 405-80 Management of Title and Granting Use of Real Property

Engineer Regulation 405-1-11, Real Estate Acquisition

Engineer Regulation 405-1-12, Real Estate Handbook

Federal Management Regulation – Subchapter C. Real Property

Engineer Pamphlet 1165-2-1, Digest of Water Resources Policies and Authorities

Engineer Regulation 1165-2-119, Modifications to Completed Projects, Paragraph 8.a.

2015 Shoreline Management Plan for Barren, Nolin and Rough River Lakes

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601 et seq.)

The National Environmental Policy Act of 1969 (42 U.S.C. § 4321 et seq.)

The Federal Endangered Species Act (16 U.S.C. § 1531 et seq.)

The Fish and Wildlife Coordination Act (16 U.S.C § 661 et seq.)

The National Historic Preservation Act (54 U.S.C. § 300101 et seq.)

The Clean Water Act (33 U.S.C. § 1251 et seq.)

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. § 9601 et seq.) (CERCLA).

4 Definitions

a. Encroachment is a structure or improvement built, installed or established which interferes with a real estate interest of the United States, either a fee interest or an easement, if such is prohibited by the deed. An encroachment has occurred where an unapproved structure or improvement extends over, across, in or upon lands in which the Government owns a real estate interest.

b. Flowage Easement – Warranty deeds of flowage easement at RRL grant the United States the perpetual right, power, privilege and easement to occasionally overflow, flood and submerge the land and provide that no structure for human habitation shall be constructed on the lands and further that no structures of other types except farm fences shall be constructed or maintained on the lands except as may be approved in writing by the representative of the United States. The deeds reserve for the owners of the lands all such rights and privileges as may be used and enjoyed without interfering with or abridging the rights and easements conveyed. (See Exhibits A-1, B-1, and C-1)

c. Release of the Human Habitation Restriction, in accordance with ER 405-1-12 and Policy Guidance Letter No. 32, Use of Corps Reservoir Lands, dated 28 April 1993 (See Exhibit G), is a request that must be approved by the ASA(CW) unless the ASA(CW) delegates this authority. The release of the human habitation restriction in the flowage easement estate must be by deed. Certain minimum conditions must be met for a release of the human habitation restriction to be granted (see Section 7(d)), however, meeting these minimum conditions does not ensure that a release will be granted.

d. Structure or improvement, as defined by ER 405-1-12 and used in reference to encroachments, means a permanent or semi-permanent facility, such as a habitable dwelling, building, fence, deck, porch, barn, outhouse, permanent storage building, road, pond, leach field and septic tank, utility line, levee, excavation, placement of fill material, oil and gas well, mine entrance and tunnel.

e. Consent to Easement – consent to structures within flowage easements is generally granted for improvements that will not be damaged by temporary flooding, will not interfere with project operations, will not risk human health or safety, and are not prohibited by the flowage easement deed.

f. Fee Simple Acquisition – fee simple is absolute title to land, free of any conditions, limitations, restrictions, or other claims against the title.

g. Mean Sea Level (m.s.l.) – vertical distance above sea level as valued by data and modeling by the National Geodetic Survey.

5 Background

5.1 Existing Conditions

Based on the Design Memorandum for the project, RRL was designed to impound water to the seasonal elevation of 495.0' m.s.l., with a spillway crest of 524.0' m.s.l. The upper guide contour for acquiring fee simple lands was set at 514.0' m.s.l. The upper guide contour for acquiring flowage easements was set at 534.0' m.s.l, with appropriate allowance for backwater effects. However, it is important to note that the flowage easement boundary at RRL is not defined by a specific elevation but rather by metes and bounds legal descriptions that are set forth in the individual easement deeds.

During the original acquisition in the mid 1950's, the Louisville District hired a contractor to mark angle points along the 514.0' m.s.l. and 534.0' m.s.l. contours around the lake perimeter. The contractor surveyed and marked the intended flowage easement line; however, it was marked with temporary wooden stakes, and the lines were located and plotted with imprecisions, including closure imprecisions. Further, the 534.0' m.s.l. flowage easement elevation was described using tangent lines (straight-line approximations) instead of following the actual contour elevations of the land. The legal descriptions were prepared based on this information and then recorded as part of the acquisition deed. These recorded tangent line descriptions of flowage easements are difficult to accurately locate in the field. In addition, as a result of using the tangent lines for the legal descriptions, flowage easements were not acquired up to the 534.0' m.s.l. throughout the entire project as intended; and in many areas, flowage easements were acquired above the 534.0' m.s.l. Furthermore, fee simple was not always acquired up to 514.0' m.s.l. as was originally authorized. In managing the flowage easement encroachments at RRL, the Government can only enforce the rights obtained through the acquired flowage easements. The deeds for all acquired flowage easements at RRL, regardless of their elevation, prohibit habitable structures. (See Exhibits A, B, and C for 2013 flowage easement survey plats; see Exhibits A-1, B-1 and C-1 for corresponding recorded flowage easement deeds.) As detailed in Section 11, within one year of this Plan's approval, USACE will submit a comprehensive acquisition plan for ASA(CW) approval that addresses any necessary project acquisitions below 534.0' m.s.l.

Prior to the record flood event, the upper guideline for acquired flowage easements was assumed to be at or on the 534.0' m.s.l., as authorized by the referenced Design Memorandum. After the record flood event, 32 habitable structures (mobile homes) that were located below the 534.0' m.s.l. and were completely inundated were required to be removed and replaced with recreational vehicle style campers. One landowner provided a survey identifying the flowage easement line as being located significantly below the 534.0' m.s.l. The District acquired a survey to verify the findings at this location. The results further defined the magnitude of the flowage easement problem at RRL.

Prior to the actual surveys, the District utilized Geographic Information System (GIS) data, aerial imagery and recently obtained LIDAR (Light Detection and Radar, a remote survey technology used to measure elevation) data to estimate that a handful of habitable structures were located on the Government's

flowage easements. After completion of the surveys in 2013, 2014, and 2015, approximately 416 habitable structures were identified to be located within the acquired flowage easements. Many of these homes flooded during the 2011 record flood event.

Although the District actively manages encroachments (See Section 5.2. Project Management of Flowage Easement), before the Government can reasonably initiate an enforcement action against future and/or existing encroachers, the Government must first adequately survey the affected areas to prove the location of the Government's flowage easement rights. To date, approximately 51.05 miles of flowage easement boundary have been surveyed. Within the 51.05 miles, approximately 416 encroaching habitable structures have been identified. As encroachments are identified, the ongoing question is "How do we resolve them?".

In November 2014, a Louisville District Project Delivery Team (PDT) was established to develop recommendations for a comprehensive plan to resolve the encroachments of habitable structures on flowage easement lands at RRL. The purpose of the PDT is to deliver a long term strategic plan for the resolution of these flowage easement encroachments at RRL and for prevention of future encroachments.

In the interim, the ASA(CW) issued a Memorandum for the Director of Real Estate dated April 24, 2015 "placing a moratorium on the forced removal of all encroaching habitable structures at Rough River that completed construction prior to January 01, 2013, and are wholly above the elevation of 527.4' mean sea level, the record flood event level at this project." As part of the moratorium, "the District [was] directed to provide owners of habitable structures that are believed to be in a flowage easement a notice of this memorandum." These moratorium letters dated May 18, 2015 were sent to land owners with habitable structure encroachments identified by the 2013 and 2014 surveys. The project received funding in 2016 to complete an additional 85 miles of flowage easement surveys, focused primarily on densely developed areas.

5.2 Project Management of Flowage Easement

Enforcement of the Government's real estate interests at RRL has been difficult because of the uncertainty of the location of the fee and easement boundary lines. Regardless, the District has engaged in several activities to manage encroachments. In those situations where development is occurring and the planned development is within the Government's legally acquired flowage easement area, as determined by survey, the terms of the easement are enforced. In addition, the RRL Project Manager meets annually with land developers and real estate agencies conducting business at RRL to make them aware of the constraints of the flowage easement. As the flowage easement is surveyed, encroachments are identified, and the owners of encroaching structures are sent a moratorium letter signed by the District Commander (See Exhibit F). The RRL Project Manager meets with each encroaching landowner, identified in a USACE survey with the encroaching structures, to explain the flowage easement, identify the landowner's responsibilities, and discuss options for resolution of the encroachment. The RRL Project Manager and staff diligently monitor the areas surveyed in an effort to

prohibit any new construction before it begins. The RRL Project Manager and staff also monitor the entire 319.8 miles of the project boundary on an annual basis for any new developments. Upon observation of new construction, project staff make contact with the landowners to explain the flowage easement, identify the flowage easement and address the landowners' responsibilities in regard to compliance with the easement. The RRL Project Manager provides copies of the USACE surveys and works with the local health departments and utilities in an effort to ensure no new utilities are installed below elevation 534' m.s.l. and any system that poses a risk to human health or safety is removed.

5.3 Flowage Easement Timeline (2011 to Nov 2014)

April – June 2011: Record flood reached elevation 527.4' m.s.l. The District estimated that over 226 habitable structures were completely or partially flooded.

May 2011: The District sent letters to all electric utility companies and health department officials in Breckinridge and Grayson Counties to advise them of the Government's flowage easement rights in regard to construction within the boundary of the respective flowage easements.

June 2011: Flowage Easement Encroachment Overview at RRL was presented by the RRL Project Manager to the District Real Estate and Operations Chiefs and the District Commander.

June 2011: A meeting was conducted at the District Office between the Real Estate (RE), Operations (OP), and Green River Area (GRA) Managers, the RRL Project Manager and the Nolin River Lake (NRL) Project Manager to discuss the development of a policy to address flowage easement encroachments. At this meeting, it was agreed that RRL personnel would lead policy development working with RE, OP and GRA Managers to develop a guide and begin implementation. It was also agreed that in accordance with ER 405-1-12, Chapter 8, Section III, Real Estate Management Programs - Encroachment and Trespass, Paragraph 8-27, Special Considerations for Structures at Civil Works Projects, subparagraph a., and Policy Guidance Letter No. 32, "Use of Corps Reservoir Flowage Easement Lands," existing encroaching structures would be removed or the human habitation restriction would be released on existing structures meeting the criteria.

June 2011: RRL Project Manager began development of a Flowage Easement Encroachment Resolution Guide.

May – Aug 2011: RRL Project Manager briefed congressional interests on the issues involving flowage easements at RRL, specifically the residences that flooded during the 2011 flood event.

November 2011: The Guide to Flowage Easement Encroachment Resolution was finalized, and implementation began at RRL upon concurrence from the District. (See Exhibit D)

November 2011: RRL Project Manager met with local realtors to inform them of flowage easements and how they apply to properties they list for sale.

January 2012: Congressional Flowage Easement Fact Sheet was developed to prepare for future congressional interest in flowage easement encroachment issues at RRL.

Sept – Oct 2013: An initial survey utilizing the Division IDIQ (Indefinite-Delivery Indefinite- Quantity) contract was conducted on five (5) miles of flowage easements, encompassing four (4) subdivisions. This survey identified numerous issues. Some portions of the flowage easements were found to be well above 534.0' m.s.l. and some well below. Upon completion of the survey, the RRL Project Manager identified habitable structures located in the surveyed portion of the flowage easements.

2014: The District IDIQ contract was utilized to complete an additional 18.3 miles of flowage easement survey encompassing 26 subdivisions. Findings of this survey were consistent with the findings of the Sept-Oct 2013 survey.

June 2011 to Present: A total of 32 permanent habitable structures (mobile homes) have been removed from flowage easements at RRL.

November 2014: Representatives of the U.S. Attorney's Office for the Western District of Kentucky were briefed on the situation at RRL by the District PDT. The U.S. Attorney's office may assist USACE in enforcing the acquired flowage easement rights, as necessary, to be determined on a case-by-case basis.

5.4 Survey Results

The 2013, 2014, and 2015 flowage easement surveys were completed by SEAS, Inc. and GRW, Inc. through the use of an existing IDIQ contract. The contract scopes of work, methods and deliverables have been and will be consistent for all future task orders. This will ensure there is uniformity throughout the project in the process of identifying the flowage easement boundary and existing habitable structure encroachments.

As of July 2016, approximately 51.05 miles of flowage easement had been surveyed. Surveyed areas included flowage easements associated with 75 of 143 residential developments and identified approximately 416 habitable structures within acquired flowage easements, which are identified as follows:

- 209 habitable structures on easement above 534.0' m.s.l. (See Section 9, Scenario A)
- 138 habitable structures on easement partially below 534.0' m.s.l. (See Section 9, Scenarios B & D)
- 69 habitable structures on easement completely below 534.0' m.s.l. (See Section 9, Scenario C)

Based on average encroachments per mile of previous surveys completed, the District estimates the 2016 survey could identify an additional 700 possible habitable structure encroachments within the additional 85 miles of surveyed flowage easement.

5.5 Vertical Datums

The vertical datum of Mean Sea Level (m.s.l.) was utilized in the original design, construction, and real estate acquisitions of the RRL project and is used throughout this report unless otherwise noted. Mean Sea Level has been deemed unacceptable and is no longer used, however the following illustrates how m.s.l. still applies to RRL.

The historical elevation values of the RRL control monuments come from the original design drawings. Elevations on the design drawing say they are referenced to Mean Sea Level. Specifically, the elevation of control monument "T-1", which is a point just inside the door of the control tower, is 551.06'. Since the origin and vertical datum of this elevation value are not documented, we refer to it as the Corps of Engineers (COE) datum. The COE elevation of control monument "CM-1" was established by differential leveling from "T-1". The NAVD 1988 elevation of control monument "CM-1" was established by averaging multiple GNSS solutions derived from the Online Positioning User Service (OPUS).

Construction of the RRL dam began in November of 1955. At that time, the National Geodetic Vertical Datum of 1929 (NGVD1929) was widely used and was the only national vertical datum. NGVD1929 was also widely referred to as the "Mean Sea Level Datum". In 1973 it was determined by the National Oceanic and Atmospheric Administration (NOAA) that the term "Mean Sea Level" was ambiguous and should not be used. Although documentation and survey notes have not been located, it is likely that the elevations at the Rough River dam originate from a NGVD1929 bench mark. This is evidenced by the fact that the difference between NGVD1929 and NAVD1988, as determined by Corpscon/Vertcon, is 0.5' (rounded from 0.47'), and the difference between the COE datum and NAVD1988, by comparing differential leveling to the OPUS derived elevation, is 0.43'. Therefore the difference between COE datum and NGVD1929 at CM-1 is 0.04'. This difference is within the rounding error and therefore considered negligible. The elevation values for CM-1 on all three vertical datums are as follows:

- COE-554.89' (By differential leveling from control monument "T-1")
- NAVD88-554.46' (Average of multiple OPUS solutions)
- NGVD29-554.9' (Computed by Corpscon/Vertcon and rounded from 554.93')

6 Environmental Considerations and Compliance

The National Environmental Policy Act of 1969, 42 U.S.C. § 4321 et seq., commonly referred to as NEPA, requires agencies to consider the environmental effects of proposed actions prior to making decisions. The Council on Environmental Quality (CEQ) promulgates regulations for the implementation of NEPA

(40 C.F.R. §§ 1500-1508). In accordance with 40 C.F.R. § 1507.3, USACE has promulgated supplemental regulations for implementation of NEPA for Civil Works projects, 33 C.F.R. §§ 230.1-230.26. All agency actions are subject to NEPA, but some agency actions do not individually or cumulatively have a significant effect on the quality of the human environment (40 C.F.R. § 1508.4); these kinds of actions are considered “Categorical Exclusions” (CATEXs). If a particular agency action qualifies as a CATEX, and there are no extraordinary circumstances that dictate a need to prepare an Environmental Assessment (EA) or an Environmental Impact Statement (EIS), it is excluded from the requirements of NEPA documentation but is not exempt from compliance with any other Federal law (33 C.F.R. § 230.9). Other Federal laws include the Federal Endangered Species Act (16 U.S.C. § 1531 et seq.), the Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.), the National Historic Preservation Act (54 U.S.C. § 300101 et seq.), the Clean Water Act (33 U.S.C. § 1251 et seq.), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S.C. § 9601 et seq.) (CERCLA).

The recommendations of the RRL Encroachment Resolution Plan include a number of potential agency actions that may qualify as CATEXs. Specifically, “[b]oundary line agreements and disposal of lands or release of deed restrictions to cure encroachments,” (33 C.F.R. § 230.9(n)) and “[d]isposal of excess easement interest to the underlying fee owner” (33 C.F.R. § 230.9(o)) are considered CATEXs. Actions and proposed resolutions in Section 9 of the Encroachment Resolution Plan would qualify for these CATEXs unless a particular case presents extraordinary circumstances that, in the opinion of the District Commander, would warrant preparation of an EA or an EIS. As the recommendations of the Encroachment Resolution Plan are implemented, the applicability of CATEXs will be determined for each encroachment.

The action and proposed resolution for the encroachments that do not satisfy the requirements for a CATEX may require an EA or an EIS. Preparation of either of these documents requires a cumulative effects analysis. NEPA defines cumulative effects as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR § 1508.7)”. The CEQ developed a Handbook in 1997 entitled “Considering Cumulative Effects Under the National Environmental Policy Act (NEPA) as amended (42 U.S.C. § 4321 et seq.)”, to provide a framework for addressing cumulative environmental impacts in either an EA or an EIS. The handbook provides methods for addressing coincident effects on specific resources, ecosystems, and human communities for all related activities including all relevant activities not just the actions of the proposed project or alternatives. Determining the cumulative environmental consequences of an action requires delineating the cause-and-effect relationships between the multiple actions and the resources, ecosystems, and human communities of concern. CEQ issued guidance in 2010 concerning establishing, applying, and revising categorical exclusions under NEPA. The guidance recommends that agencies consider the frequency with which the categorically-excluded actions are applied. In accordance with the guidance, as the encroachment resolution plan is implemented at RRL, the District will track and periodically assess the use of the categorical exclusions to ensure that cumulative impacts do not rise to a level that would warrant further NEPA analysis and documentation, if appropriate.

Initial coordination with the U.S. Fish and Wildlife Service and the Kentucky Department of Fish and Wildlife Resources indicates that a brief letter to the U.S. Fish and Wildlife Service describing the location and habitat characteristics of the proposed action is likely to satisfy the requirements of the Federal Endangered Species Act (16 U.S.C. § 1536) and the Fish and Wildlife Coordination Act (16 U.S.C. § 661) when the encroachment resolution entails the disposal of an existing flowage easement to the underlying fee owner. As each encroachment is resolved, the applicability and requirements of all Federal laws will be determined, and any necessary actions for compliance will be accomplished.

Works of the United States built for harbor or river improvements, such as RRL, are protected against alteration, occupancy, and use (whether permanent or temporary) by individuals without prior authorization by USACE (33 U.S.C § 408). Specifically, “[n]o encroachment or trespass which will adversely affect the efficient operation of maintenance of the project works shall be permitted,” (33 C.F.R. § 208.10(a)(4)). Individuals, such as landowners at RRL, can request permission for such alterations through the process established in Engineer Circular 1165-2-216 (July 31, 2014), and the USACE may approve such a request when the activity will not be injurious to the public interest and will not impair the usefulness of the project. In the future, landowners may desire to alter the habitable structures that are otherwise addressed through implementation of the RRL Encroachment Resolution Plan and will need to follow the process established by USACE for granting such permission.

Executive Orders 11988 (Floodplain Management) 42 Fed. Reg. 26951 (May 24, 1977) and 13690 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input) 80 Fed. Reg. 6425 (February 4, 2014) establish the policy of the United States to improve the resilience of communities and Federal Assets against the impacts of flooding and to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid the direct or indirect support of floodplain development whenever there is a practicable alternative. Executive Order 11988 provides that when property in a floodplain is proposed for lease, easement, right-of-way, or disposal, the Federal agency shall accomplish the objectives of the policy by ensuring conveyances include the uses restricted by floodplain regulation, attach other appropriate restrictions to the uses of properties, or withhold the properties from conveyance (Exec. Ord. 11988 § 3(d)). The policy of Executive Order 11988 is incorporated into the requirements of Policy Guidance Letter No. 32, Use of Corps Reservoir Flowage Easement Lands, April 28, 1993 (See Exhibit G) and when assessing requests for the release of the human habitation restriction. The RRL Encroachment Resolution Plan includes the critical assumption that releases of the human habitation restriction will only be allowed where no practical alternative is available.

7 Resolution Framework

Scenarios to address the problems discussed in Section 5 above were designed based upon existing situations and regulatory guidance in an effort to develop an encroachment resolution plan. Currently,

there is no established template for an encroachment resolution plan. The Real Estate Resolution Framework for this encroachment plan includes all of the factors that could potentially limit the encroachment resolution process. Factors identified for this resolution plan include the following:

- Resolutions cannot place or suggest restrictions on the operation of the RRL project for flood risk management and other authorized purposes.
- Resolutions must be economically and environmentally feasible.
- Resolutions are limited by the availability of sufficient real property interests above 534' m.s.l. for property owners to relocate structures and septic systems.
- Resolutions cannot create a significant threat to human life, health, or safety.
- Resolutions must eliminate existing encroachments below 534' m.s.l. to the greatest extent practicable and in a timely and cost-effective manner, and reduce the likelihood of future encroachments.
- Resolutions are subject to all Federal policies, guidelines and regulations governing real estate encroachment resolution actions.

The below Real Estate Resolution Framework was developed by the USACE, incorporating the above six factors. For a recommendation to be advanced within an encroachment scenario, it must meet each of the below criteria of the Resolution Framework. The Real Estate criteria for this encroachment plan are:

- a. Recommendations cannot place or suggest any restriction on the operation of RRL for flood risk management and other authorized purposes, in accordance with ER 405-1-12. (See Appendix 1: Hydrology and Hydraulics – Impact of Structures within the Flowage Easement)
- b. Recommendations to release a Human Habitation Restriction, which will allow certain structures to remain in place, cannot appreciably affect the water storage capacity. (See Appendix 1: Hydrology and Hydraulics – Impact of Structures within the Flowage Easement)
- c. Recommendations cannot create appreciable negative impacts on the RRL Shoreline Management Plan, the Operations Management Plan or the Master Plan. These three plans are for management of the government owned fee lands at RRL. The Encroachment Resolution Plan addresses the U.S. acquired occasional flowage easements that grant the U.S. the right to occasionally place water on the properties and prohibit structures for human habitation. The RRL Shoreline Management Plan only addresses property owned in fee simple title by the U.S., and as a result, no appreciable impact to the Shoreline Management Plan is anticipated. The Operations Management Plan and the Master Plan, which do take into account project easement lands, will not be significantly impacted by the implementation of the Encroachment Resolution Plan. In the past, the flowage easement lands have been identified by the upper guide being of 534.0' m.s.l. The Encroachment Resolution Plan does not change the original intent. Any acquisition or disposal action taken in accordance with the Rough River Lake Encroachment Resolution Plan cannot significantly impact the total acres of flowage easement at RRL.

- d. Recommendations to release a Human Habitation Restriction can be made only under certain conditions: it can be demonstrated that the continued occupation of the site will not result in a significant threat to human life, health or safety; the continued occupation of the site will not place or suggest any restriction on the operation of the project; there is no practical alternative to removal of the habitable structure; there would be adequate warning time to evacuate the structure in the event of a flood event projected to flood inundate the site; and non-flooded access out of the area would be available for evacuation, including non-flooded egress out of the project area.
- e. In making recommendations, the level of risk in reference to habitable structures is determined by the relationship of the property location to the 527.4' m.s.l. reached during the 2011 record flood event and the upper guide of 534' m.s.l.
- f. Consistent with 32 C.F.R. § 204.3, OMB Circular A-25 (Revised), 31 U.S.C. § 9701, and Policy Guidance Letter No. 32 (See Exhibit G), USACE will charge administrative fees to grantees, to include the cost of deed drafting and surveying. These fees will be estimated by USACE and paid by the grantee prior to initiation of the real estate transaction. The grantee will only be responsible for administrative costs actually incurred by USACE for the transaction covering the grantee. Any remaining balance of estimated fees will be returned to the grantee.
- g. Using a "before-and-after" appraisal methodology, the value of the real estate interests conveyed to affected homeowners is anticipated to be low, with the cost of valuing the interests with an appraisal likely exceeding the value of the estate conveyed. Payment of Fair Market Value for the real estate interest is therefore waived. See 41 C.F.R. §102-75.937. This action will eliminate the need for an appraisal, thus substantially reducing the cost of the administrative fees charged to the grantee.
- h. All recommended resolutions will be executed in compliance with appropriate environmental laws and regulations. (See Section 6. Environmental Consideration and Compliance)
- i. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 U.S.C. § 4601 et seq.), commonly referred to as the Uniform Act, establishes the policy of fair and equitable treatment of persons displaced as a direct result of Federal programs or projects; the primary purpose is to ensure that displaced persons don't suffer disproportionate injuries as a result of programs and projects designed for the benefit of the public as a whole and to minimize the hardship of displacement (42 U.S.C. § 4621(b)). The Federal Highway Administration, a component agency of the U.S. Department of Transportation, has been identified as the lead Federal agency for implementation of the Uniform Act (50 Fed. Reg. 8953 (February 27, 1985); See also, 42 U.S.C. § 4633). The Federal Highway Administration has issued regulations implementing and interpreting the Uniform Act (49 C.F.R. §§ 24.1-24.603), which are available from their website at: http://www.fhwa.dot.gov/real_estate/uniform_act/. Some scenarios contemplated by the RRL Encroachment Resolution Plan could result in USACE undertaking actions pursuant to the Uniform Act. USACE policy and practice conform to the requirements of the Uniform Act, as implemented by regulation, and any potential benefits or advisory services provided at

RRL will be determined by whether the criteria outlined in the Uniform Act are satisfied. If the criteria for the Uniform Act are satisfied, USACE will notify impacted landowners.

j. Any efforts to resolve the flowage easement encroachments will be addressed concurrently with an approved Real Estate Acquisition Plan, detailed below.

8 Resolution Options and Possible Outcomes

The following Resolution Options were considered and rejected as unacceptable:

a. Do-nothing approaches for scenarios B through D were considered unacceptable. The outcomes for the do-nothing approaches are: 1) does not resolve currently problematic encroachments, 2) the number of encroachments will continue to grow, 3) a continuing increase in habitable structures in the flowage easement may eventually interfere with project operations, 4) risk of flooding and damage to personal property, depending on the location of the property, and 5) possible increase in risk to human health and safety. Due to the 2011 record flood, many property owners are now aware that their homes are located on Government-acquired flowage easements and are aware of the deed restriction.

b. Waivers for Consent to Easements were considered unacceptable. The outcomes for granting Consents are: 1) the habitable structures remain in the flowage easement, 2) may encourage additional encroachments, 3) monitoring would be difficult and an ongoing expense, requiring additional project staffing to monitor and maintain, 4) a continuing increase in habitable structures in the flowage easement may eventually interfere with project operations and, 5) risk of flooding and damage to personal property, depending on location of the property. In order for the District to issue Consents to Easement for habitable structures, a request through the chain of command would be required. In addition, consent will not be given and removal will be required for any structure or improvements that will be damaged by temporary flooding, will interfere with project operations, risk human health or safety, and are prohibited by the flowage easement deed.

c. Focusing on future encroachments only was considered and determined unacceptable. The outcomes for focusing on future encroachments only are: 1) does not resolve encroachments, 2) the habitable structures remain in the flowage easement, 3) may encourage additional encroachments, 4) risk of flooding and damage to personal property, 5) monitoring for new encroachments would be difficult and an ongoing expense and may require legal enforcement action.

The following Resolution Options were considered acceptable:

a. Disposal of Government's flowage easement rights was considered and determined acceptable under appropriate conditions. This approach is being implemented for habitable structures on flowage easements located completely above 534.0' m.s.l and not otherwise required to address backwater

effects should the affected landowners request a release of the flowage easement and pay the associated administrative fees to cover the costs of the release.

- b. Acquiring a real estate interest was considered and determined acceptable under appropriate conditions.
- c. Releasing the human habitation restriction for encroachments that meet specified criteria was considered and determined acceptable under appropriate conditions. This approach requires compliance with ER 405-1-12, Policy Guidance Letter No. 32 (See Exhibit G), and any other applicable Department of the Army policy.
- d. Requiring removal of encroachments infringing on Government fee property or flowage easements was considered and determined acceptable under appropriate conditions. This approach may require legal enforcement action.

9 Scenarios

To ensure that landowners are treated consistently throughout the flowage easement encroachment resolution process, the encroachments identified in the 2013, 2014, and 2015 surveys were analyzed utilizing the resolution criteria provided in Section 7. to develop resolution options and outcomes. As a result of this analysis, the flowage easement encroachments consistently fell into four scenarios, which are categorized as Scenarios A, B, C, and D. To facilitate understanding, each scenario includes an illustration of the type of encroachment to be addressed. The scenario descriptions, resolution options, recommendations and implementation steps are listed below.

9.1 Scenario A

Scenario A Description:

Habitable structure is on flowage easement and entire structure is above 534.0' m.s.l. (Approximately 209 encroachments of this type were identified by the 2013, 2014, and 2015 surveys.)

Recommendation:

Dispose of flowage easement rights above 534.0' m.s.l. to the underlying fee owner if requested by the individual landowner and the property is not required to address backwater effects.

Implementation: Scenario A concerns flowage easement areas above 534.0' m.s.l. where the flowage easement is not required to address backwater effects. Although current project operations only require easements up to 534.0' m.s.l., it is possible that during a historic flood event areas above 534.0 m.s.l. may flood. However, considering that RRL has not had a flood reach elevation 534.0' m.s.l., which amounts to a 220-year flood, the extinguishment of flowage easement rights carries low risk of adverse impacts, and creates a low risk to human life, health, and safety due to historical flood levels of less than 534.0' m.s.l.

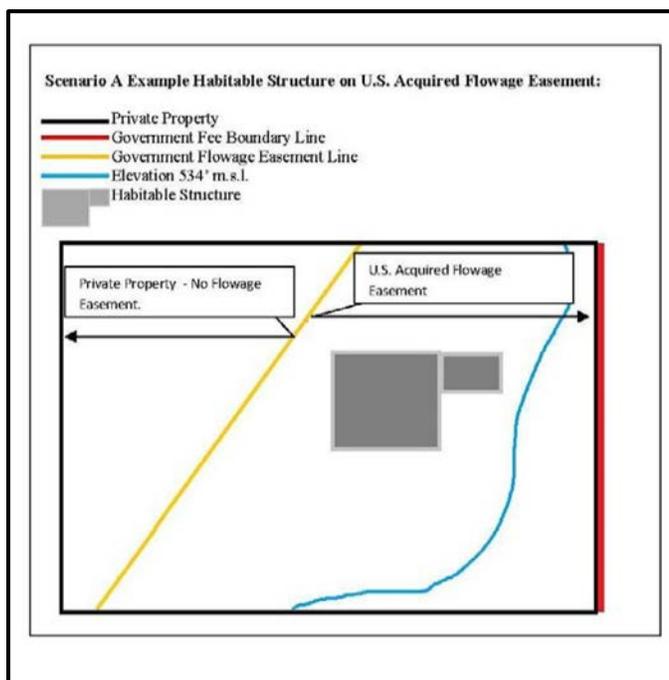


Figure 1 - Scenario A

As surveys are completed at RRL, the District will identify properties on government flowage easements and notify the landowners that they are on a flowage easement that is above the 220-year flood level and provide information on how to request the easement be extinguished for the area covering their property. Property owners who wish to have the flowage easement rights extinguished must pay the associated administrative fees for the District to process their request. The USACE Director of Real Estate will review any instruments extinguishing easement rights and will ensure that all necessary and appropriate requirements are addressed. Should an individual landowner choose not to pursue easement extinguishment, then the District will not take further action in the immediate future to enforce the flowage easement right through a removal action so long as the structure is entirely above 534' m.s.l.

Note: Flowage easements will not be disposed of above the 534.0' m.s.l. if property is required to address backwater effects, which are the rise in surface elevation of flowing water upstream from and

as a result of the presence of the project. In these areas, flowage easements may be disposed of above the 539.0' m.s.l. only.

9.2 Scenario B

Scenario B Descriptions:

Scenario B-1: Habitable structure is wholly on flowage easement with a portion of that structure below 534.0' m.s.l., and it appears all of the requirements for release of the human habitation restriction either are or could be met. (Approximately 90 encroachments of this type were identified by the 2013, 2014, and 2015 surveys.)

Scenario B-2: Habitable structure is wholly on flowage easement with a portion of that structure below 534.0' m.s.l., and it appears the requirements for release of the human habitation restriction cannot be met. (Approximately 4 encroachments of this type were identified in the 2013, 2014, and 2015 surveys.)

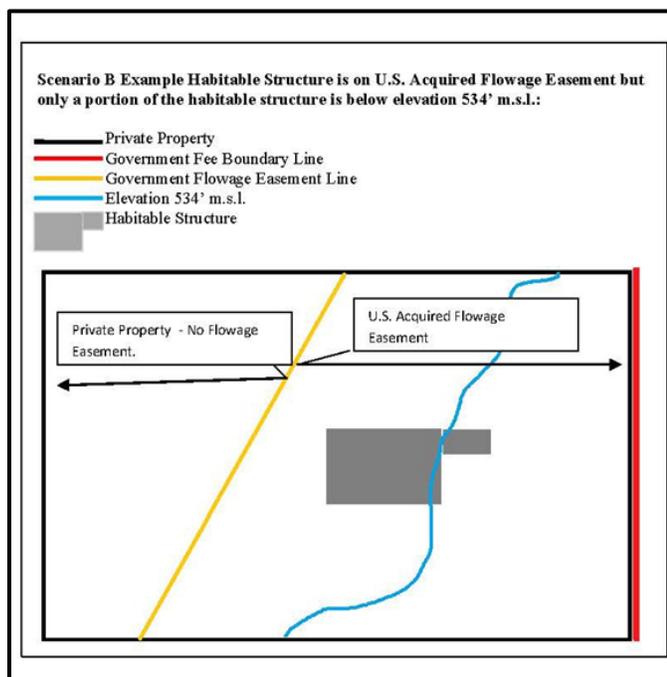


Figure 2 - Scenario B

Options:

1. Release the human habitation restriction for the portion of the structure below the 534.0' m.s.l. if all the requirements for release are met.
2. Enforce the terms of the easement by requiring removal of the entire structure or the portion of the structure below 534' m.s.l. where practical.
3. The Headquarters USACE Director of Real Estate exercises discretion not to remove the structure based on a conclusion that despite not meeting all human habitation release requirements, there is not a substantial risk to human life, health, or safety and will send an encroachment warning letter.

Recommendations:

Scenario B-1: Obtain a release through the chain of command of the human habitation restriction after a formal request from the landowner and confirmation of satisfaction of criteria for the release.

Scenario B-2: Enforce the terms of the easement by requiring removal of the entire structure or the portion of the structure below 534' m.s.l. where practical; or the Headquarters USACE Director of Real Estate may exercise discretion not to remove the structure based on a conclusion that despite not

meeting all human habitation release requirements, there is not a substantial risk to human life, health, or safety and will send an encroachment warning letter.

Implementation: As surveys are completed at RRL, the District will identify properties where a habitable structure is wholly on government easement lands and where a portion of that structure is below 534.0' m.s.l. When those properties are identified, the District will notify the landowner and provide information on how to request a release of the human habitation restriction and the criteria for such a release. After a receipt of a formal request for release of the human habitation restriction from landowners, and confirmation of satisfaction by the Headquarters (in consultation with the Division and District), the request will be processed for release of human habitation restriction.

Implementation of the option to release the human habitation restriction must meet the criteria of Policy Guidance Letter No. 32 (See Exhibit G). Additionally, compliance with all applicable laws and regulations, to include Executive Orders 11988 (Floodplain Management) and 13690 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input) is required.

Consistent with 32 C.F.R. § 204.3, OMB Circular A-25 (Revised), 31 U.S.C. § 9701, and Policy Guidance Letter No. 32 (See Exhibit G), USACE will charge administrative fees to grantees, to include the cost of deed drafting and surveying. These fees will be estimated by USACE and paid by the grantee prior to initiation of the real estate transaction. The grantee will only be responsible for administrative costs actually incurred by USACE for the transaction covering the grantee. Any remaining balance of estimated fees will be returned to the grantee.

Meeting the specified criteria is not a guarantee that the Government will release the human habitation restriction for any particular landowner. To obtain a release of the human habitation restriction, the request by the landowner must, at a minimum, demonstrate that:

- Continued occupation of the site will not result in a significant threat to human life, health or safety.
- Granting the release will not place or suggest any restriction on the operation of the project.
- Any request for non-removal of a human habitation structure in a floodplain or project pool must also demonstrate that there is no practical alternative to removal of the habitable structure.
- There would be adequate warning time to evacuate the structure in the event of a flood event projected to flood the site.
- Non-flooded access out of the area would be available for evacuation, including non-flooded egress out of the project area.

Any granted human habitation release will, at a minimum, contain the following restrictions:

- An indemnification and hold harmless clause releasing the Government of any and all liability associated with the flooding of the property.
- No modification of the structure outside the current building footprint is permissible, meaning that no modifications to the habitable structure are permitted that add any livable square footage.
- If the home is not reparable after a flood event, rebuilding of the structure is not permitted.
- Any other restriction considered appropriate by the District Commander.

If the property does not meet the requirements for a release of the human habitation restriction, and the voluntary removal of the residential structure is not possible, the Government may seek to enforce the rights provided to it under the flowage easement it acquired. The flowage easements at RRL provide the United States the right to periodically flood the property and prohibit habitable structures, among other rights. Through the United States Attorney's Office, the Government may avail itself of this option on a case-by-case basis. Implementation would not place or suggest any restriction on the operation of RRL for flood risk management and other authorized purposes.

Any homeowner that does not affirmatively request the partial release of the human habitation restriction within one year of receiving an encroachment notification letter or purchasing an impacted property may not be considered for relief, at the Headquarters USACE Director of Real Estate's discretion. A homeowner's unwillingness to pay the administrative fees will not affect this time limitation.

If, in the discretion of the Headquarters USACE Director of Real Estate, it is determined that the portion of the structure below 534.0' m.s.l. does not meet all the requirements for the release of a human habitation restriction, but nonetheless, does not pose a substantial risk to human life, health, or safety, the District will send an encroachment warning letter to the landowner, provided that the main floor elevation level of the home is at or above the elevation of 527.4' m.s.l., which is an approximately 50-year flood event, based on historic flood data. The letter will include the determination of the Headquarters USACE Director of Real Estate, the risks, and indicate that the landowner should cure any defects; the letter will also notify the landowner that if the portion of the structure below 534.0' m.s.l. is destroyed or seriously damaged, repair and rebuilding are not authorized. The letter will also remind the landowner continued use of the house is at his/her sole risk, and the Government assumes no liability of any nature for losses or damages which may occur through or by the operation of the Rough River Lake Project. The letter will inform landowners that if circumstances change or the District determines it necessary, future removal may be pursued, and any attempted reconstruction or expansion of the structure without prior written approval from USACE may necessitate prompt removal.

The recommended approach is estimated to resolve approximately 94 of the encroachments identified in the 2013, 2014, and 2015 surveys.

9.3 Scenario C

Scenario C Descriptions:

Scenario C-1: Habitable structure is wholly on flowage easement and wholly below 534.0' m.s.l., and it appears all of the requirements for release of the human habitation restriction either are or could be met. (Approximately 42 encroachments of this type were identified by the 2013, 2014, and 2015 surveys.)

Scenario C-2: Habitable structure is wholly on flowage easement and wholly below 534.0' m.s.l., and it appears the requirements for release of the human habitation restriction cannot be met. (Approximately 27 encroachments of this type identified by the 2013, 2014, and 2015 surveys.)

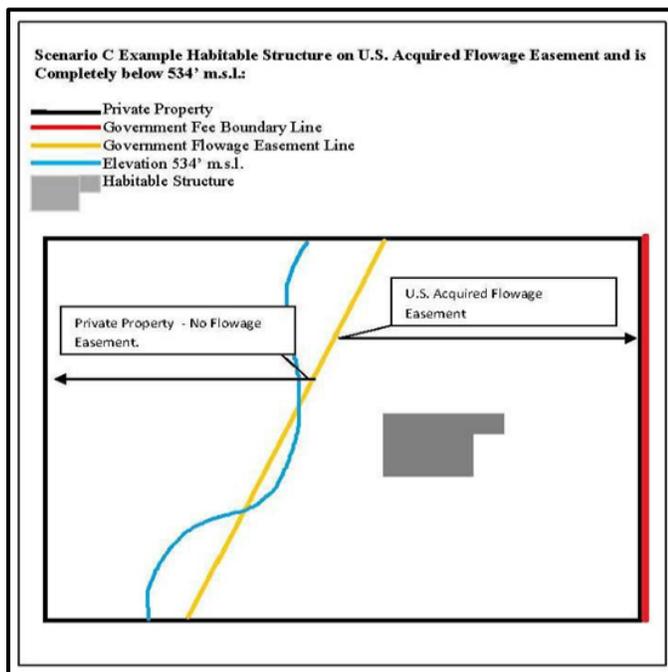


Figure 3 - Scenario C

Options:

1. Release the human habitation restriction if all requirements are met.
2. Enforce the terms of the easement by requiring removal of the entire structure.
3. The Headquarters USACE Director of Real Estate exercises discretion not to remove the structure based on a conclusion that despite not meeting all human habitation release requirements, there is not a substantial risk to human life, health, or safety and will send an encroachment warning letter.

Recommendations:

Scenario C-1: Release through the chain of command of the human habitation restriction after a formal request from the landowner and confirmation of satisfaction of criteria for the release.

Scenario C-2: Enforce the terms of the easement by requiring removal of the entire structure; or the Headquarters USACE Director of Real Estate may exercise discretion not to remove the structure based on a conclusion that despite not meeting all human habitation release requirements, there is not a substantial risk to human life, health, or safety and will send an encroachment warning letter.

Implementation: As surveys are completed at RRL, the District will identify properties where a habitable structure is wholly on government easement lands and wholly below 534.0' m.s.l. When those properties are identified, the District will notify the landowner and provide information on how to request a release of the human habitation restriction and the criteria for such a release. After a receipt

of a formal request for release of the human habitation restriction from landowners, and confirmation of satisfaction of the criteria by the Headquarters (in consultation with the Division and District), the request will be processed for release of human habitation restriction.

Implementation of the option to release the human habitation restriction must meet the criteria of Policy Guidance Letter No. 32 (See Exhibit G). Additionally, compliance with all applicable laws and regulations, to include Executive Orders 11988 (Floodplain Management) and 13690 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input) is required.

Consistent with 32 C.F.R. § 204.3, OMB Circular A-25 (Revised), 31 U.S.C. § 9701, and Policy Guidance Letter No. 32 (See Exhibit G), USACE will charge administrative fees to grantees, to include the cost of deed drafting and surveying. These fees will be estimated by USACE and paid by the grantee prior to initiation of the real estate transaction. The grantee will only be responsible for administrative costs actually incurred by USACE for the transaction covering the grantee. Any remaining balance of estimated fees will be returned to the grantee.

Meeting the specified criteria is not a guarantee that the Government will release the human habitation restriction for any particular landowner. To obtain a release of the human habitation restriction, the request by the landowner must, at a minimum, demonstrate that:

- Continued occupation of the site will not result in a significant threat to human life, health or safety.
- Granting the release will not place or suggest any restriction on the operation of the project.
- Any request for non-removal of a human habitation structure in a floodplain or project pool must also demonstrate that there is no practical alternative to removal of the habitable structure.
- There would be adequate warning time to evacuate the structure in the event of a flood event projected to flood the site
- Non-flooded access out of the area would be available for evacuation, including non-flooded egress out of the project area.

Any granted human habitation release will, at a minimum, contain the following restrictions:

- An indemnification and hold harmless clause releasing the Government of any and all liability associated with the flooding of the property.
- No modification of the structure outside the current building footprint is permissible.
- If the home is not reparable after a flood event, rebuilding of the structure is not permitted.

- Any other restriction considered appropriate by the District Commander.

Any homeowner that does not initiate the request for release of the human habitation restriction within one year of receiving an encroachment notification letter or purchasing an impacted property may no longer request this relief, at the Headquarters USACE Director of Real Estate's discretion. A homeowner's unwillingness to pay the administrative fees will not affect this time limitation.

If the property does not meet the requirements for a release of the human habitation restriction, and the voluntary removal of the residential structure is not possible, the Government may seek to enforce the rights provided to it under the flowage easement it acquired. The flowage easements at RRL provide the United States the right to periodically flood the property and prohibit habitable structures, among other rights. Through the United States Attorney's Office, the Government may avail itself of this option on a case-by-case basis. Implementation would not place or suggest any restriction on the operation of RRL for flood risk management and other authorized purposes.

If, in the discretion of the Headquarters USACE Director of Real Estate, it is determined that the structure does not meet all the requirements for the release of a human habitation restriction, but nonetheless, does not pose a substantial risk to human life, health, or safety, the District may send an encroachment warning letter to the landowner, provided that the main floor elevation level of the home is at or above the elevation of 527.4 m.s.l., which is an approximately 50-year flood event, based on historic flood data. The letter will include the determination of the Headquarters USACE Director of Real Estate, the risks, and indicate that the landowner should cure any defects; the letter will also notify the landowner that if the structure is destroyed or seriously damaged, repair and rebuilding are not authorized. The letter will also remind the landowner continued use of the house is at his/her sole risk, and the Government assumes no liability of any nature for losses or damages which may occur through or by the operation of the Rough River Lake Project. The letter will inform landowners that if circumstances change or the District determines it necessary, future removal may be pursued, and any attempted reconstruction or expansion of the structure without prior written approval from USACE may necessitate prompt removal.

The recommended approach is estimated to resolve approximately 69 of the encroachments identified in the 2013, 2014, and 2015 surveys.

9.4 Scenario D

Scenario D Descriptions:

Scenario D-1: Habitable structure is partially on flowage easement and wholly below 534.0' m.s.l., and it appears all of the requirements for release of the human habitation restriction either are or could be met. (Approximately 40 encroachments of this type were identified by the 2013, 2014, and 2015 surveys.)

Scenario D-2: Habitable structure is partially on flowage easement and wholly below 534.0' m.s.l., and it appears the requirements for release of the human habitation restriction cannot be met. (Approximately 4 encroachments of this type were identified by the 2013, 2014, and 2015 surveys.)

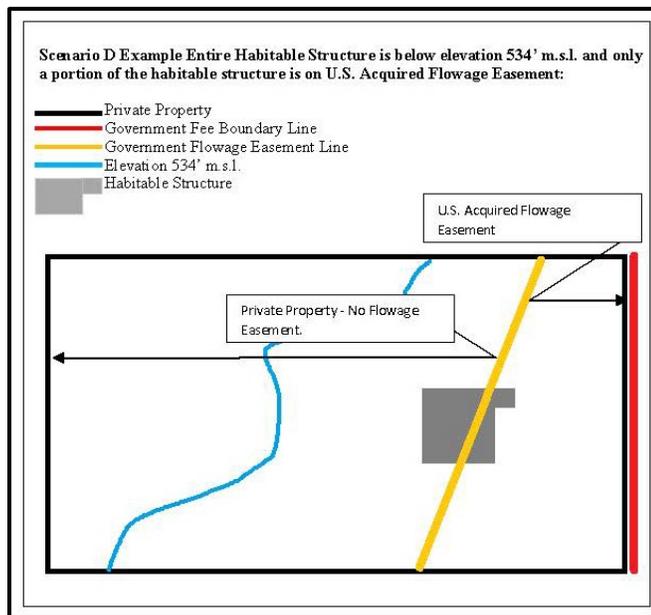


Figure 4 - Scenario D

Options:

1. Release the human habitation restriction on the portion of the structure on Government easement lands if all requirements are met. Concurrently, acquire any necessary real estate rights for Federal project operations, consistent with the Real Estate Acquisition Plan (See Section 11).
2. Enforce the terms of the easement by requiring removal of the portion of the structure on Government easement and paying any additional just compensation for the portion of the structure remaining as may be appropriate.
3. The Headquarters USACE Director of Real Estate exercises discretion not to remove the structure based on a conclusion that despite not meeting all human habitation release requirements, there is not a substantial risk to human life, health, or safety and will send an encroachment warning letter. Concurrently, acquire any necessary real estate rights for Federal project operations, consistent with the Real Estate Acquisition Plan (See Section 11).
4. The District acquires additional real estate interest.

Recommendations:

Scenario D-1: Release through the chain of command of the human habitation restriction of the portion of the structure on a Government easement after a formal request from the landowner and confirmation of satisfaction of criteria for the release. Concurrently, acquire any necessary real estate rights for Federal project operations, consistent with the Real Estate Acquisition Plan (See Section 11).

Scenario D-2: Upon approval by the ASA(CW), enforce the terms of the easement by requiring removal of the portion of the structure on the Government easement where practical and paying any additional just compensation for the portion of the structure remaining, as may be appropriate; or the Headquarters USACE Director of Real Estate may exercise discretion not to remove the structure based on a conclusion that despite not meeting all human habitation release requirements, there is not a substantial risk to human life, health, or safety and will send an encroachment warning letter. Concurrently, acquire any necessary real estate rights for Federal project operations, consistent with the Real Estate Acquisition Plan (See Section 11).

Implementation: As surveys are completed at RRL, the District will identify properties where a habitable structure is partially on government easement lands and wholly below 534.0' m.s.l. When those properties are identified, the District will notify the landowner and provide information on how to request a release of the human habitation restriction and the criteria for such a release. After a receipt of a formal request for release of the human habitation restriction from landowners, and confirmation of satisfaction of the criteria by the District, the request will reported to the chain-of-command for release of human habitation restriction.

Implementation of the option to release the human habitation restriction must meet the criteria of Policy Guidance Letter No. 32 (See Exhibit G). Additionally, compliance with all applicable laws and regulations, to include Executive Orders 11988 (Floodplain Management) and 13690 (Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input) is required.

Meeting the specified criteria is not a guarantee that the Government will release the human habitation restriction for any particular landowner. To obtain a release of the human habitation restriction, the request by the landowner must, at a minimum, demonstrate that:

- Continued occupation of the site will not result in a significant threat to human life, health or safety.
- Granting the release will not place or suggest any restriction on the operation of the project.
- Any request for non-removal of a human habitation structure in a floodplain or project pool must also demonstrate that there is no practical alternative to removal of the habitable structure.
- There would be adequate warning time to evacuate the structure in the event of a flood event projected to flood the site
- Non-flooded access out of the area would be available for evacuation, including non-flooded egress out of the project area.

Any granted human habitation release will, at a minimum, contain the following restrictions:

- An indemnification and hold harmless clause releasing the Government of any and all liability associated with the flooding of the property.
- No modification of the structure outside the current building footprint is permissible.
- If the home is not reparable after a flood event, rebuilding of the structure is not permitted.
- Any other restriction considered appropriate by the District Commander.

Any homeowner that does not initiate the request for release of the human habitation restriction within one year of receiving an encroachment notification letter or purchasing an impacted property may no longer request this relief, at the Headquarters USACE Director of Real Estate's discretion. The unwillingness of a homeowner to pay administrative fees will not affect this time limitation.

If the property does not meet the requirements for a release of the human habitation restriction, and the voluntary removal of the residential structure is not possible, the Government may seek to enforce the rights provided to it under the flowage easement it acquired. The flowage easements at Rough River provide the United States the right to periodically flood the property and prohibit habitable structures, among other rights. Due to the structure being only partially on Government easement lands, such enforcement may also require just compensation for impacts to the portion of the structure not on Government lands. Through the United States Attorney's Office, the Government may avail itself of this option on a case-by-case basis. Implementation would not place or suggest any restriction on the operation of RRL for flood risk management and other authorized purposes.

If, in the discretion of the Headquarters USACE Director of Real Estate, it is determined that the structure does not meet all the requirements for the release of a human habitation restriction, but nonetheless, does not pose a substantial risk to human life, health, or safety, the District may send a warning encroachment letter to the landowner. The letter will include the determination of the Headquarters USACE Director of Real Estate, the risks, and indicate that the landowner should cure any defects; the letter will also notify the landowner that if the portion of the structure on Government easement is destroyed or seriously damaged, repair and rebuilding are not authorized. The letter will inform landowners that if circumstances change or the District determines it necessary, future removal may be pursued.

The District may pursue acquisition of real property interests in limited circumstances; such acquisitions would be determined and coordinated with the chain of command.

The recommended approach is estimated to resolve approximately 44 of the encroachments identified in the 2013, 2014, and 2015 surveys.

10 Summary of USACE Recommended Resolutions

No individual recommended resolution option will address all of the encroachment scenarios at RRL. Therefore, the USACE recommends appropriate combined application of the options to the various scenarios to address the encroachments based on site-specific circumstances:

Scenario A - Habitable structure is on flowage easement, the entire structure is above the 534.0' m.s.l., and easements above this elevation are not otherwise required to address backwater effects.

- Recommended action: Dispose of flowage easement rights above 534.0' m.s.l. to the underlying fee owner if requested by the individual landowner and the property is not required to address backwater effects. This is estimated to resolve approximately 209 of the 416 encroachments identified by the 2013, 2014, and 2015 surveys.

Scenario B-1 - Habitable structure is wholly on flowage easement with only a portion of that structure below 534.0' m.s.l.

- Recommended action: Release of the human habitation restriction for habitable structures that meet the requirements outlined above. This is estimated to resolve approximately 90 of the 416 encroachments identified by the 2013, 2014, and 2015 surveys.

Scenarios B-2 & C-2 - Habitable structure is wholly on flowage easement, and the habitable structure is either wholly or partially below 534.0' m.s.l. and does not meet the requirements for the release of the human habitation restriction.

- Recommended action: Enforce the terms of the easement by requiring removal of the entire structure or the portion of the structure below 534' m.s.l. where practical; or the Headquarters USACE Director of Real Estate may exercise discretion not to remove the structure based on a conclusion that despite not meeting all human habitation release requirements, there is not a substantial risk to human life, health, or safety and will send an encroachment warning letter. This is estimated to resolve approximately 31 of the 416 encroachments identified by the 2013, 2014, and 2015 surveys, depending on individual circumstances.

Scenarios C-1 & D-1 - Habitable structure is wholly or partially on flowage easement and is below 534.0' m.s.l.

- Recommended action: Release of the human habitation restriction for habitable structures that meet the requirements outlined above. Concurrently, acquire any necessary real estate rights for Federal project operations, consistent with the Real Estate Acquisition Plan (See Section 11). This is estimated to resolve approximately 82 of the 416 encroachments identified by the 2013, 2014, and 2015 surveys.

Scenario D-2 - Habitable structure is partially on flowage easement and is wholly below 534.0' m.s.l. and does not meet the requirements for release of the human habitation restriction.

- Recommended action: Enforce the terms of the easement by requiring removal of the portion of the structure on Government easement and paying any additional just compensation for the portion of the structure remaining as may be appropriate; or the Headquarters USACE Director of Real Estate may exercise discretion not to remove the structure based on a conclusion that despite not meeting all human habitation release requirements, there is not a substantial risk to human life, health, or safety and will send an encroachment warning letter. Concurrently, acquire any necessary real state rights for Federal project operations, consistent with the Real Estate Acquisition Plan (See Section 11). This is estimated to resolve approximately 4 of the 416 encroachments identified by the 2013, 2014, and 2015 surveys.

11 Real Estate Acquisition Plan

During recent surveying, USACE became aware that flowage easements were not acquired up to the 534.0' m.s.l. throughout the entire project as intended; and in many areas, flowage easements were acquired above the 534.0' m.s.l. Furthermore, fee simple was not always acquired up to 514.0' m.s.l. as was originally authorized.

No later than one year after the ASA(CW)'s approval of this plan, USACE will submit a Real Estate Acquisition Plan for ASA(CW) approval. Prior to approval of the Real Estate Acquisition Plan, USACE is only authorized to execute Scenarios A, B and C of this Plan. As part of this Acquisition Plan, USACE will propose acquisition timelines and detailed cost projections that prioritize areas that are perpetually inundated by the ordinary pool elevation or otherwise considered to be of particularly high risk of flooding.

The Real Estate Acquisition Plan will be a collaborative, vertically coordinated project document. It will include experts in planning, operations, real estate, and legal counsel as part of the project delivery team.

12 Implementation Sequence of Events

As a result of the 2013, 2014, and 2015 Rough River Lake flowage easement surveys, 416 encroachments were identified; surveying is ongoing and additional encroachments are likely to be identified as a result thereof. To resolve these encroachments and create a process to consistently resolve the encroachment problem at RRL, resolution implementation will be undertaken as follows:

Flowage easement encroachment resolution for Scenarios A, B and C will begin upon the approval of this plan. Per the Real Estate Acquisition Plan section, implementation of Scenario D will take place after the Acquisition Plan is approved.

Properties will be reviewed and compared against the scenarios for habitable structure encroachments. Resolution of each encroachment will be based upon the applicable scenario, consistently applied and processed individually, on a case-by-case basis to ensure fair treatment of all affected property owners. Actual field surveys will continue to be obtained to identify the Government boundary line, flowage easement line and to identify the encroachments. The application of GIS technologies will be used to manage the flowage easement boundary and prevent future encroachments once the flowage easement boundaries have been identified by traditional surveying methods. (See Appendix 2: GIS vs. Surveys to Identify Flowage Easement Encroachments at Rough River Lake)

Action will be initiated to resolve the habitable structure encroachments identified in the 50.01 miles already surveyed that fall into Scenarios B and C. The completed surveys were conducted in areas that had a high degree of residential development compared to the remainder of the project. In order for the survey results to be as impactful as possible, future surveys will be done in manageable increments, with priority given to those areas with active development. An additional 85 miles of flowage easement is being surveyed in 2016, which will complete the survey of areas currently developed or being developed. The remaining miles (less populated areas consisting of farms and wooded areas) of flowage easement will be surveyed with available Operation and Maintenance (O&M) funding.

Any encroachments identified by surveying will proceed to resolution in the same manner recommended for the resolution of the initial 416 habitable structure encroachments to ensure landowners are treated fairly and resolutions are applied consistently throughout the project.

The time estimated to address each individual encroachment is estimated to be approximately 2 to 4 years from the time the encroachment is identified. As future surveys are completed and additional encroachments identified within already surveyed areas, it is estimated to take 10 to 20 years to fully resolve the habitable structure encroachments at RRL.

Implementation of these recommendations is subject to the availability of funds. Nothing in this document shall constitute, or be deemed to constitute, an obligation of future appropriations by the United States or imply that Congress will appropriate funds to implement these recommendations. This plan and its recommendations do not constitute a final agency action or determination concerning any individual encroachment at RRL or any other USACE project.

13 Organizational Responsibilities

ER 405-1-12, Chapter 8, Paragraph 8-4. Organizational Responsibility for Civil Works Real Property. Within the Corps, administration of Civil Works Real property will involve consultation and coordination

among field elements. The references to Operations and Readiness Division are intended to include both the district and project elements.

Paragraph 8-4, Sub-Paragraph c. Operations and Readiness Division is responsible for on-site physical management and stewardship of all project lands and renewable natural resources. The Shoreline Management Plan is updated every 5 years. The Operations Management Plan is updated as needed in accordance with the Master Plan.

Paragraph 8-4, Sub-Paragraph h. The District Real Estate Division is responsible for resolving all land title disputes, claims involving damage to real estate or arising under outgrants, boundary disputes and actions involving encroachments, and for coordination of such actions with the Operations element and other district elements as necessary.

Office of Counsel will be the lead on all litigation and will prepare all deeds and closing documentation.

14 Communication Strategy

This resolution plan communicates to our stakeholders the encroachments identified by the 2013, 2014, and 2015 surveys and the immediate actions the District will implement and continues resolution of the identified encroachments. Audiences for this communication strategy include, but are not limited to:

- Affected and potentially affected property owners
- Division and District team members
- Congressional Interests
- State and County Government
- Local Municipalities
- Real Estate Agencies
- Media Outlets
- General Public

This resolution plan will be distributed for public release. Notice of this public release will be circulated in local print publications.

15 Procedure to Prevent Future Encroachments

The RRL Project Manager will continue to meet with land developers and local real estate agencies to make them aware of the constraints and location of the flowage easements. As the flowage easement is surveyed and encroachments are identified, the owners of encroaching structures will be sent a

moratorium letter signed by the District Commander (See Exhibit F). The RRL Project Manager will meet with each encroaching landowner with a structure located below 534.0' m.s.l. identified in the USACE survey to explain the flowage easement, identify the land owner's responsibilities, and discuss options for resolution of the encroachment.

The RRL Project Manager and staff will diligently monitor the surveyed areas in an effort to identify and prevent any new construction before it begins. This task will become easier for the project to accomplish as the flowage easement line becomes established at 534.0' m.s.l. The RRL Project Manager and staff will also monitor the entire 319.8 miles of flowage easement area for any new developments, and upon observation of new construction, issue a cease and desist letter, make contact with the landowner to explain the flowage easement, identify the flowage easement, require the removal of any structure and address the landowner's responsibilities in regard to compliance with the terms of the easement. An enforcement recommendation will be sent to the District Office of Counsel for the purposes of initiating a referral to the U.S. Attorney's Office for any encroachment resolution that cannot be attained in the absence of court action.

The RRL Project Manager will provide copies of the surveys and work with the local health departments and utilities in an effort to ensure no new utilities are installed below elevation 534.0' m.s.l. and to require removal of any system that poses a risk to human health or safety.

Continued communication and surveillance will be essential to prevent future encroachments. Frequent communication with local land owners, real estate agencies, congressional representatives, developers, utilities, and county health departments will be instrumental in the prevention and resolution process. The RRL Project Manager will release quarterly news bulletins and letters that inform the community about flowage easements and associated restrictions. As frequently as practical, the RRL Project Manager will educate the public on the flowage easements and completed surveys via social media.

The RRL Project Manager and staff have existing working relationships with local utilities and health departments. As a result, currently any new potential utility customers or health department permittees in the RRL project area must obtain a statement from the RRL Project Manager that indicates the serviced structure is not located within the Government's flowage easement. This statement must be obtained prior to the service or permit being issued.

Enforcement of flowage easements will be ongoing at RRL. However, through regular communication and surveillance, USACE anticipates being able to maintain compliance after the initial surveys have been completed and resolutions have been implemented.

APPENDIX B

Cultural Resources Historical Context

Cultural Overview

Archaeologists have developed a general chronology for the Eastern United States that provides a useful framework for organizing and describing archaeological data (Dragoo 1976; Griffin 1967; Jennings 1974). The prehistoric cultural sequence developed for the region is Paleo-Indian (9,500-8,000 BC), Archaic (8,000-6,000 BC), Middle Archaic (6,000-3,000 BC), Late Archaic (3,000-1,000 BC), Early Woodland (1,000-200 BC), Middle Woodland (200 BC-A.D. 500), Late Woodland (AD 500-900), and Mississippian (AD 900-1600). These periods represent culturally distinct segments of more than 14,000 years of human adaptation and re-adaptation to a changing environment.

The prehistoric cultural sequence in Kentucky reflects a general trend toward increasing socio-cultural and technological complexity beginning with small mobile bands that later developed into more sedentary, complex societies. The subsistence activities of the earliest New World societies focused on hunting and gathering wild plant and animal foods. By late prehistoric times, however, agricultural economies based on three major tropical cultigens—corn, beans and squash were characteristic of many societies in the eastern United States. Increases in the size and density of the human population and a trend toward increasing sedentism were also evident and reached their highest levels during the late prehistoric times. In all, these cultural trends are marked by stylistic differences in artifacts and correspond to major technological innovations or important shifts in adaptational patterns (Ford 1977; Pollack 1990). However, there was considerable regional variation in the timing and extent to which these trends were expressed.

Paleoindian Period

The Paleoindian Period began in Kentucky around 9,500 B.C. and lasted until 8,000 B.C. This period was characterized by a specialized lithic technology consisting of fluted, lanceolate projectile points. Projectile points of the Clovis and Cumberland clusters are diagnostic of this period. The Clovis projectile point type represents the oldest Paleoindian form in Kentucky. Cumberland points most probably date later than the Clovis. No radiometric dates are currently available for this period in Kentucky with the exception of one assay from the Big Bone Lick Site in northern Kentucky which was derived from wood in association with the disarticulated remains of ground sloth, mastodon, mammoth, and horse (Tankersley 1990:81). Other artifacts in the Paleoindian tool kit include prismatic blades, end scrapers with graver spurs, and ground bone and ivory tools. The Paleoindians are believed to be highly nomadic hunter-gatherers who preyed upon the large herbivores of the Pleistocene period. Undoubtedly, other resources were utilized as well. Little excavated or contextual data exists in the area relative to this period.

Archaic Period

The Archaic Period is divided into three subperiods, Early (8,000-6,000 B.C.), Middle (6,000-3,000 B.C.), and Late (3,000-1,000 B.C.). In general, the Archaic period was characterized by an increasing and specialized adaptation to local resources.

The Early Archaic is defined on the basis on technological and social changes with the environment transitioning from glacial activity to coniferous forests mixed with deciduous forest associated with warmer climate. The Early Archaic peoples were high mobile, hunter and gathers. Projectile points associated with the Early Archaic are Kirk, LeCroy, and Rice Lobed clusters.

By the Middle Archaic period, there is an increase regionalization of cultures, which is reflected by settlement, technological, subsistence, and social traits. Specialized tool forms appeared at this time, along with regional variation in projectile point styles. In addition, variation of ground stone tools are seen due to the increase use of plant resources. Sites with deep middens, containing a diversified artifactual assemblage of lithic, groundstone, bone, and shell tools and ornaments, along with burials, appear to indicate at least a semi-sedentary way of life (Jefferies 1983; Muller 1986).

With the increasing regional specialization and adaptation to plant and animal resources, long distance trade networks were observed in the Late Archaic period. An example of the social complexity is the large Rough River shell mound. In addition, the association with grave goods manufactured from nonlocal raw materials with burials suggests special treatment of certain individuals. A variety of groundstone tools have been recovered, including three-quarter grooved axes. Bone and antler tools are well represented from Late Archaic sites, and include atlatl hooks, fishhooks, awls, pins, and antler projectile points. Late Archaic projectile points vary from the side-notched versions of the Middle Archaic period in that the hafting element is typically comprised of straight, expanding, and contracting stems. Diagnostic points of this period include McWhinney, Karnak, Merom, Bottleneck, and Ledbetter.

Woodland Period

The Woodland period is divided into Early (1,000-200 B.C.), Middle (200 B.C.- A.D.500), and Late (AD. 500-1000). Differences between these periods are in large part distinguished by changes in ceramic styles. In general, there is a smooth transition between the Archaic and Woodland periods.

The first appearance of pottery in the archaeological records is noted during the Early Woodland period. The Early Woodland period is characterized by ceramic vessels which are conoidal-shaped vessels with narrow flat bases and cordmarked surface treatments. Early Woodland projectile points include a variety of stemmed and notched types, including Kramer, Wade, and Turkey-tail just to name a few. Subsistence practices during this period varied little from the Late Archaic, with the emphasis remaining on hunting and gathering. Woodland houses were varied, with oval, circular, square, and rectangular examples known. The period is also noted by the appearance of social or ritual spaces aside from the domestic dwellings, including earthen enclosures and burial mounds.

Middle Woodland societies developed from those of the earlier period, and the transition between these two is difficult to distinguish. The ceramic styles change during the Middle Woodland period. While Early Woodland pottery is thick and crude, Middle Woodland times saw the development of ceramics that had thin walls and elaborate decorations designed for ritual or ceremonial use (Muller 1986:84-85). The subsistence patterns of Middle Woodland peoples continue to be based on hunting, gathering, and

gardening, with cultigens increasing in importance. Settlement patterns appear to change through time, with small, scattered settlements occurring early in the period, with a later increase in nucleation associated with large base camps. Construction of earthen enclosures and burials mounds become more popular. Many grave goods recovered from Adena burial mounds in north-central and Western Kentucky are indicative interregional exchange.

The transition between the Middle and Late Woodland periods is poorly understood. The Late Woodland period is generally perceived to be a period of decline in the importance of the ritual that characterized the Middle Woodland period, along with its associated mound building and external trade. Late Woodland societies shift from a horticulture based to an agricultural based, harvesting and domesticating seed and plants. The cultivation of maize characterized the latter portion of the period. The societies were small and dispersed, and located in a variety of environmental settings. Late Woodland artifact assemblages do not differ significantly from those of the Middle Woodland, with the exception that there is a lack of ceramics decorated with Hopewellian motifs and other ceremonial or exotic objects (Railey 1990:256). Late Woodland ceramics are generally cordmarked jars with little decoration. Projectile points initially consist of expanded stemmed and side-notched forms. With the technological development of the bow and arrow, small triangular arrow points appear.

Mississippian Period

The Mississippian period is characterized by shell tempered ceramics and hierarchical settlement system of sites ranging from farmsteads to planned towns or “ceremonial centers” that featured plazas flanked by substructure mounds (Pollack 1990). The political system during this time consisted of a chiefdom. The primary diet during this time consist of maize, beans and squash. Native cultigens and wild plants, however, continued to be exploited by Mississippi period populations.

Historic Context

The only major historical archaeology project that has conducted at Rough River Lake is the dam modification and rehabilitation to the Rough River Dam. Seattle District Center of Expertise assessed the dam and spillway to determine its eligibility for listing to the National Register of Historic Places. In addition, there are known archaeological sites with a historic component.

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APPENDIX C

Example Memorandum for Acquisition

Programmatic Environmental Assessment – Applicability Review Rough River Lake Real Estate Acquisition Plan		USACE Tracking Number:	
INSTRUCTIONS: <i>Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).</i>			
SECTION I - ACQUISITION INFORMATION			
2. FROM (Proponent organization and functional address symbol)		2a. TELEPHONE NO.	
3. TRACTS FOR ACQUISITION (<i>List Tracts, Size, Location, County</i>). Attach Maps if available			
4. TYPE OF ACQUISITION (flowage easement rights) (<i>Include short discussion on each tract. Use Page 2 or more if necessary</i>)			
5. NAME AND DATE OF NEPA DOCUMENT AND FONSI USED TO APPLY THIS ENVIRONMENTAL COMPLIANCE REVIEW Programmatic Environmental Assessment (EA) & Finding of No Significant Impact, Real Estate Acquisition of Flowage Easements up to the 534 m.s.l. Upper Guidance Lane, Rough River Lake Flood Risk Management Project, Breckinridge, Hardin, and Grayson Counties, Kentucky, November 2018			
6. PROPONENT APPROVAL (<i>Name and Grade</i>)		6a. SIGNATURE	6b. DATE
SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. (<i>Check appropriate box with short summary, if necessary. (+ = covered in Programmatic EA; - = not covered in Programmatic EA</i>			+
7. LAND USE (<i>Potential effects to existing land use, etc.</i>)			
8. TOPOGRAPHY, GEOLOGY AND SOILS (Topography, minerals, Prime Agricultural Lands present, etc.) (if Prime Agricultural Lands has an AD 1006 Form been completed (Circle Yes or No)			
9. BIOLOGICAL RESOURCES (Flora, Fauna, Fisheries, etc.): Notes:			
10. ENDANGERED AND THREATENED SPECIES			
11. WATER AND WETLAND RESOURCES (Quality, quantity, source, etc.)			
12. CULTURAL RESOURCES (Native American burials sites, archaeological, historical, etc.)			
13. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.)			
14. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.) Has an ECP been completed to document no hazardous materials? If so, when)			
15. OTHER (Potential impacts not addressed above.) (Noise, Air, Extraordinary Circumstances)			
16. CUMULATIVE EFFECTS			
17. Rational Used to determine if the Acquisition(s) meet the Compliance Standards in the Environmental Assessment and FONSI			
<input type="checkbox"/> PROPOSED ACTION MEETS THE STANDARD FOR CATEGORICAL EXCLUSION (CATEX), OR			
<input type="checkbox"/> PROPOSED ACTION HAS BEEN ADEQUATELY ASSESSED IN THE PEA AND FONSI.			
PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX or the PEA AND FONSI; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.			
18. REMARKS			
19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (<i>Name and Grade</i>)		19a. SIGNATURE	19b. DATE

CONTINUATION SHEET

USACE Tracking Number: