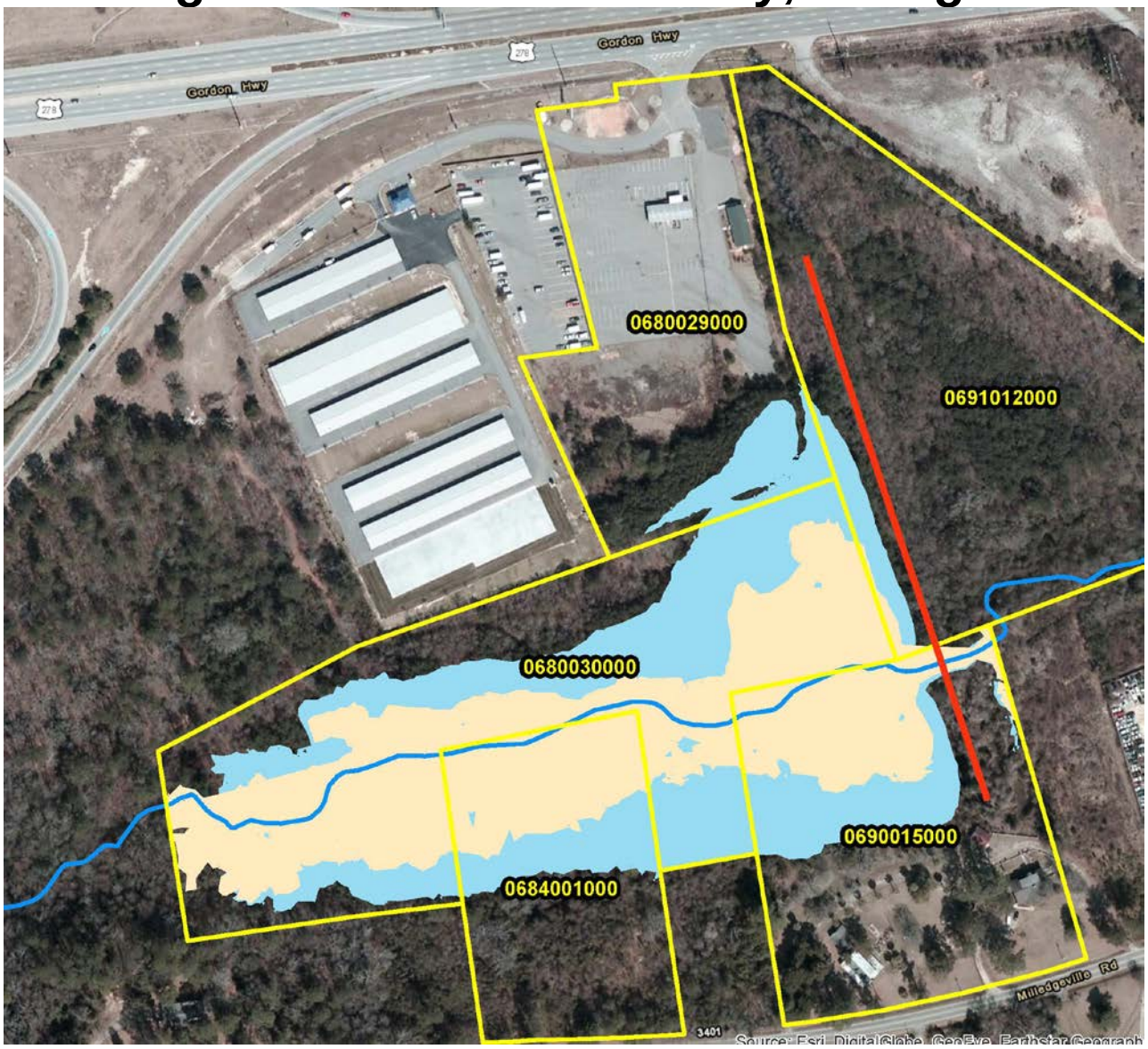
FINAL Environmental Assessment
Augusta Rocky Creek Georgia Flood Risk Management
Section 205 Feasibility Study
Augusta-Richmond County, Georgia



US Army Corps of Engineers
Savannah District
South Atlantic Division

June 2017

FINDING OF NO SIGNIFICANT IMPACT (FONSI)
Augusta Rocky Creek Georgia Flood Risk Management
Section 205 Feasibility Study
Richmond County, Georgia

Description of Selected Plan: The U.S. Army Corps of Engineers (USACE), Savannah District (CESAS), proposes to reduce flood risk in the Augusta Rocky Creek basin. The Selected Plan includes:

1) Rosedale Dam Detention Area: The proposed renovations to the Rosedale Dam include placing a 5 by 6-foot (150-foot long) concrete box culvert through the breached dam in the creek bed for normal creek flow. The breach would then be filled to elevation 232.0 feet North Atlantic Vertical Datum 1988 (NAVD 88) to form a notch for all flows up to the 25-year flood event. The box culvert would be sunk 1 foot below grade (per 2005 U.S. Fish and Wildlife Coordination Act Report) to allow development of a natural stream channel through the culvert and facilitate passage of wildlife. The detention area created by the renovated dam would not require excavation and is designed to use the natural flood storage capacity of the existing flood plain/wetland areas for floodwater detention. Rock revetments would be used at the face and outlet of the detention structure to reduce potential erosion and scouring at the structure; with a subsequent reduction in sedimentation and turbidity further downstream.

2) Creation of Recreational Park: The non-structural portion of the Selected Plan is located north of Gordon Highway on Kissingbower Road and Haynie Street, across from the Regency Mall. This park would encompass approximately 1.32 acres within the flood plain. The proposed recreational park would require acquisition of five residential properties; two are vacant and three contain residential homes. After the non-Federal sponsor (NFS) purchases all five properties in fee, the three homes would be demolished and the owners relocated. By eliminating these developments within the flood plain and converting the site to greenspace, the flood plain would be restored to function normally.

Factors Considered in Determination: The Savannah District assessed the impacts of the proposed action on important resources, including wetlands and aquatic resources/fisheries, terrestrial resources, wildlife, threatened, endangered and protected species, cultural resources, air quality, and water quality. No significant adverse impacts were identified for any of the important resources within the area of impact.

Land use throughout this portion of the Rocky Creek basin is typical of urban streams and was developed primarily for residential subdivisions. Some portions of the basin are commercial and industrial property. This development primarily occurred decades ago and involved much fill material that destroyed most of the natural flood storage of the original flood plain and wetland ecosystems. The Selected Plan would restore some of this lost natural flood storage capacity and reduce economic damages from flooding in some developed areas in this drainage basin. The non-structural feature would reduce flood damages in the Kissingbower area, convert some residential properties to greenspace, and provide recreational opportunities to community residents.

Most of the impacts to the environment from implementation of the Selected Plan would be beneficial. The only adverse impacts identified to natural resources were negligible short term impacts. As designed, the Rosedale Dam Detention Area would limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of storm water discharges to the receiving stream. Reduction of downstream erosion may benefit wetlands, flood plains, riparian vegetation, and bottomland hardwoods. The conversion of residential property in the flood plain to greenspace/recreational use would also benefit flood plain management.

The sunken box culvert at the Rosedale Dam Detention Area would prevent the potential for scouring of the channel bottom at the end of the culvert, which would create a barrier to wildlife passage through the culvert. This barrier would have created hazards by forcing wildlife to go around the culvert instead of using the safety of the creek for movement/migration through this area. A summary of the overall impacts of the Selected Plan is contained in Table 2 of the attached EA. Since only negligible adverse impacts have been identified in this study, environmental mitigation is not required.

Environmental Design Commitments: The following commitments are an integral part of the proposed action:

- If the proposed action is changed significantly or its construction is not started within one year, Savanah District will reassess potential impacts to Federally-listed threatened or endangered species, and their critical habitat to ensure no adverse impacts would occur.

- The box culvert at the Rosedale Dam Detention Area will be sunk one foot below grade to prevent the potential for scouring of the channel bottom at the end of the culvert.

- The structures affected by the Kissingbower Buyout will be recorded and evaluated for the National Register during the Design/Implementation (D/I) phase of this project. Should the structures be determined eligible for the National Register, a Memorandum of Agreement will be executed to mitigate adverse effects. If the structures are determined not eligible, no further cultural resources investigations or agreements are required.

- If any unrecorded cultural resources are found to exist within the proposed project boundaries and ground disturbance is required, no excavation would occur at the site containing the cultural resource until a Savanah District staff archeologist has been notified and additional coordination with the State Historic Preservation Officer has been completed.

Alternatives: Four alternatives to the Selected Plan were considered. These alternatives were:

- No-Action
- Rosedale Dam Detention Area (Stand Alone)
- Kissingbower Buyout (Stand Alone)
- Kissingbower Buyout with Recreation Park

Public Involvement: Copies of the Draft EA and Draft Finding of No Significant Impact (FONSI) were distributed on August 17, 2016, to all appropriate parties that may have an interest in the project. In addition, the documents were posted on the USACE Savannah District website. Seven comments were received during the comment period and none were in opposition to the project.

One letter from a landowner (J. Martin Milton) questioned why USACE was building a dam on property where he had not been allowed to build a dam. Mr. Milton also conveyed some questions and concerns with the design of the detention basin, which are answered and explained in Appendix C of the attached EA.

Conclusion: CESAS has assessed the environmental impacts of the proposed action and has not identified any significant adverse impacts on the quality of the human environment. Therefore, an Environmental Impact Statement is not required.

22 Aug 17
Date

Marvin L. Griffin, P.E.
Colonel, U.S. Army
Commanding

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List of Acronyms and Abbreviations

CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CWA	Clean Water Act
D/I	Design/Implementation Phase
EA	Environmental Assessment
EJ	Environmental Justice
EO	Executive Order
EPA	United States Environmental Protection Agency
EPD	Georgia Department of Natural Resources, Environmental Protection Division
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
FWCAR	Fish and Wildlife Coordination Act Report
HTRW	Hazardous, Toxic, and Radioactive Waste
NAVD 88	North Atlantic Vertical Datum 1988
NED	National Economic Development
NEPA	National Environmental Policy Act
NER	National Ecosystem Restoration
NFS	non-Federal sponsor
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
NOA	Notice of Availability
NRCS	Natural Resources Conservation Service
O&M	Operations and Maintenance
PDT	Project Delivery Team
SCS	Soil Conservation Service
SHPO	State Historic Preservation Office

SOP	Standard Operation Procedure
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey

Augusta Rocky Creek
Section 205 Feasibility Study
Final Environmental Assessment

1 Introduction

The U.S. Army Corps of Engineers (USACE), Savannah District (CESAS), prepared this Environmental Assessment (EA) for the Augusta Rocky Creek Flood Risk Management Section 205 of the Flood Control Act of 1948 (FCA) Study to evaluate the potential for reducing flood risk along the Rocky Creek basin. This EA follows the guidelines and regulations established by the National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality (CEQ)'s Regulations (40 CFR 1500-1508), as reflected in the USACE Engineer Regulation ER 200-2-2. This EA was prepared in conjunction with the Augusta Rocky Creek Flood Risk Management, Augusta-Richmond County, Georgia, Section 205 Feasibility Study Report, which is herein incorporated by reference into this EA. This EA also contains discussions of any mitigation and environmental approvals, and findings and conclusions in accordance with NEPA. Such information provides the basis for the U.S. Army Corps of Engineers to determine whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI). The use of the term "significant" (and derivations thereof) in this EA is consistent with the definition and guidelines provided in the CEQ regulations [40 Code of Federal Regulations (CFR) 1508.27], which require consideration of both the context and intensity of impacts.

Rosedale Dam is an existing earth dam that was breached at the creek channel more than 30 years ago. The dam is located between Milledgeville Road and Gordon Highway upstream of North Leg Road. Rosedale Dam was originally constructed in the 1930's. In October 1980, a Phase I Inspection by the Savannah District determined the dam was unsafe due to an inadequate spillway. Because the dam was privately owned, the owner chose to breach the structure rather than modify it to comply with Dam Safety requirements. The dam crest elevation is approximately 240 feet North Atlantic Vertical Datum 1988 (NAVD 88) with the approximate maximum (1 Vertical on 2 Horizontal) upstream and downstream slopes. Currently, the remaining portions of the dam are overgrown with large trees and shrubs.

In a memorandum dated September 25, 2013, USACE South Atlantic Division approved the conversion of the Rocky Creek portion of the Augusta Flood Risk Management Study to a Section 205 of the FCA Feasibility Study. Section 205 authorizes the Corps of Engineers to study, design, and construct small flood control projects in partnership with non-Federal government agencies, such as cities, counties, special authorities, or units of state government. The purpose of this Section 205 study is to partner with the City of Augusta, Georgia, to assess and recommend solutions to current flooding problems along the Rocky Creek basin.

1.1 Purpose and Need

The non-Federal sponsor (NFS) has requested that the USACE study the flooding problems in the area drained by Rocky Creek, with particular attention to the needs of the Augusta community. The purpose of this Section 205 study is to assess and recommend solutions to current flooding problems along the Rocky Creek basin.

Land use throughout this portion of the Rocky Creek basin is typical of urban streams and has been developed primarily for residential subdivisions; while some is occupied by commercial and industrial property. This development involved much fill material that destroyed most of the natural flood storage of the original flood plain and wetland ecosystems. This study focused on development of a plan that would restore some of this lost natural flood storage capacity; and consequently, reduce economic damages from flooding in some of the developed areas of this drainage basin. The Rocky Creek drainage basin is illustrated in Figure 1 of Appendix A.

1.2 Authority for the Feasibility Study

This study is authorized under Section 205, 1948 FCA (P.L. 80-858), as amended. Section 105 of the Water Resources Development Act of 1986 (Public Law 99-662, as amended) specifies that cost sharing requirements are applicable to the study.

1.3 Prior Reports

- Draft EA/FONSI for Augusta Flood Control Study. Savannah District USACE. April 2005 (which is incorporated herein by reference). Savannah District USACE. April 2005 (which is incorporated herein by reference).

- Final Hazardous, Toxic, and Radioactive Waste (HTRW) Site Investigation Report. Engineering Division, Savannah District USACE; October 2003 (which is incorporated herein by reference).

- Draft Interim Feasibility Report, Flood Reduction Study, Augusta-Richmond County, Georgia. September 2005 (which is incorporated herein by reference).

A Feasibility Study was concluded in 2005 with a proposed project that recommended the improvements discussed below. The 2005 EA/FONSI (herein incorporated by reference) was coordinated with the public and agencies and the proposed project received all of the required permits and approvals, including Section 401 of the CWA Water Quality Certification. However, due to subsequent funding obstacles, the project was not implemented at that time.

Table 1 below summarizes the changes in scope from the 2005 EA/FONSI to currently proposed project.

Table 1: Changes in Project from 2005 EA

Project Feature/Environmental Issue	2005 EA/FONSI	2015 EA/FONSI
Kissingbower Road Park	Kissingbower Road Park non-structural alternative (Buyout of 3 to 5 homes) and develop park space	Conceptually unchanged from 2005 project. Buyout of 5 parcels and demolition of 3 homes; recreational park/greenspace is still included
Rosedale Dam Detention Area (NED Plan)	Description below in Section 1.5	Unchanged from 2005 project; still includes features as described below
Project Purpose	Authority Combined Flood Control (NED plan) and Ecosystem Restoration (NER Plan). NER Plan (stream restoration features) was a separable element to proposed NED Plan and subject to funding constraints and delayed implementation	Flood Control (NED Plan) only under Section 205 Authority. NER portions of 2005 project may be implemented under separate authorities in the future (e.g. 206 ecosystem restoration)
Nixon Levee	Nixon Levee was part of project as proposed in 2005 EA/FONSI; however, became infeasible after 2005 due to HTRW liability issues related to industrial contamination in project area	Eliminated due to HTRW liability issues related to industrial contamination in project area and jurisdictional wetlands
Wheeless Detention Area	The sheet pile detention structure designed for storm detention as in Rosedale Dam above	Increased nuisance flooding to new housing; possible HTRW issues related buyout of commercial structures
Peach Orchard Stream Restoration (NER Plan)	8220 linear feet of Priority 3 stream restoration	Not authorized under Section 205 authority
Wheeless Stream Restoration (NER Plan)	2500 linear feet of Priority 2 stream restoration	Not authorized under Section 205 authority
Recreation trail (NER Plan)*	10-foot wide 2.6-mile long trail on top of Nixon Levee	Eliminated due to its association with Nixon Levee that was eliminated (discussed above)

Other Planning and related reports may be found in the Augusta Rocky Creek Georgia, Flood Risk Management, Section 205 Feasibility Study (which is incorporated herein by reference).

1.4 Public Concerns

- Damage to existing homes and commercial developments from storm events within flood plain
- Erosion, sedimentation, and subsequent impacts to wetlands and aquatic habitat from implementation of the proposed action
- Access thru private property in performance of maintenance on culvert/weir

1.5 Description of the Selected Plan

1) Rosedale Dam Detention Area:
The proposed renovations include placing a 5 by 6-foot (150-foot long) concrete box culvert through the breached dam in the creek bed for normal creek flow (Drawings 1 and 2; Appendix B). The breach would then be filled to elevation 232.0 feet NAVD 88 to form a notch for all flows up to the 25-year flood event. At flows larger than the 25-year event, the overflow weir will be engaged and pass water in addition to the culvert flow. The dam structure will still provide a reduction in peak flows and water surface elevations downstream at flows greater than the 25-year event. However, the incremental water surface elevation reduction will decrease as flow increases.

The entire dam structure would require clearing, grubbing, and reconstruction of the dam. Reconstruction of the dam would require removal of 40,000 cubic yards (approximately 20,000 cubic yards may be suitable for reuse in the re-built dam). Earthwork operations will require the use of an off-site borrow source for the newly constructed dam and an off-site disposal area for soils at the existing dam not suitable for re-use in the new dam. The construction contractor will be responsible for ensuring the borrow material comes from a source that is free of cultural resources, wetlands, and hazardous materials.

The box culvert would be sunk one foot below grade [per 2005 U.S. Fish and Wildlife Coordination Act Report (FWCAR)] to allow development of a natural stream channel through the culvert and facilitate passage of wildlife (see Drawings 1 & 2; Appendix B). Approximately 55 cubic yards of fill in waters of the US would be required to repair the Rosedale Dam culvert. Another benefit of the sunken box culvert would result from avoiding the potential for scouring of the channel bottom along the edge of the culvert, which would create a barrier to wildlife passage through the culvert. This barrier would create hazards by forcing wildlife to go around the culvert instead of utilizing the safety of the creek for movement/migration through this area. In addition to improving the conditions for wildlife passage along the canal greenway, this culvert modification would provide a more suitable substrate for wildlife that may inhabit or pass through the culvert.

The box culvert has been designed to approximate the existing channel width, to allow normal low flow and sediment load to pass unimpeded. This design would allow the upstream detention area to remain dry under normal weather conditions, with only normal creek flows passing through. The culvert is designed to maintain bank full width and allowing proper shear stress for proper sediment load transport. In the Design/Implementation (D/I) Phase, the size of the culvert may be modified, as needed to achieve these goals.

The detention area created by the re-built dam would not involve any excavation or fill and is designed to utilize the natural existing flood storage capacity of the existing flood plain/wetland areas for floodwater detention. The detention area as designed is

expected to hold water 3-4 hours during an average summer rain event; approximately 12 hours during typical flood events; and approximately 21 hours (no more than 36 hours) during the 25-year flood event (USACE 2015b). The detention of water for longer periods in the detention area may create or enhance some wetland functions and values, including the filtering of excessive nutrients and other pollutants from runoff, decreasing sedimentation/erosion, and enhancing wetland vegetation. Due to the recommendation of the USFWS (USFWS 2015), the rock cross vane in the original 2005 design (per 2005 FWCAR design suggestion) was excluded in this design. Water Quality (WQ) Certification was obtained from Georgia Department of Natural Resources on August 31, 2005 (Appendix C) for the Rosedale Dam Detention Area along with the additional features as proposed in the 2005 EA and associated FONSI (see Table 1 above for additional features). Since the current proposed action is contained in the 2005 proposed action, USACE coordinated with the GA EPD to determine if USACE should reapply for WQ certification. GA EPD re-issued Water Quality Certification for this project on January 18, 2017 (page 22 of Appendix C).

Rock revetments would be used at the face and outlet of the dam structure (along with the establishment of grass cover) to reduce potential erosion and scouring at the structure; with a subsequent reduction in sedimentation and turbidity further downstream. Operations and Maintenance (O&M) of the area would include removal of sedimentation before accumulation is excessive enough to impact existing vegetation. The accumulation of sediment is expected to be small; and therefore, the potential for adverse impacts to existing vegetation would be expected to be less than the baseline condition. This project would not be expected to result in increased sediment loads for the creek. Furthermore, the detention area would be expected to decrease the amount of sediment discharged further downstream during flood events by slowing down the floodwaters and detaining some of the sediments.

2) Non-Structural Improvements: Section 73 of the 1974 Water Resources Development Act (P.L. 93-251) requires consideration of non-structural alternatives in flood damage risk reduction studies. They can be considered independently or in combination with structural measures. Non-structural measures reduce flood damages without significantly altering the nature or extent of flooding. These measures accomplish this by changing the use made of the flood plains, or by accommodating existing uses to the flood hazard. The Kissingbower Road buyout with recreational park described below is the only improvement that meets the USACE policy requirements for non-structural plans.

Creation of Recreational Park: The non-structural portion of the Selected Plan is located north of Gordon Highway on Kissingbower Road and Haynie Street, across from the Regency Mall. The proposed recreational park would require acquisition of five residential properties; two are vacant and three contain residential structures (refer to the Feasibility Report Section 5.4 “Real Estate Requirements” for more detail regarding real estate issues). By eliminating these developments within the flood plain and conversion to greenspace, the flood plain would be allowed to be restored to function normally.

This park would consist of approximately 1.32 acres (Appendix A; Figure 6) within the flood plain from the acquisition of 5 parcels (two are vacant and three contain residential homes), which includes the bottom vacant triangular lot (0.3 of an acre) on Haynie Street. Two of the homes were inundated with 4 to 5.5 feet of water during the 100-year flood; the third home received 2.5 feet of flooding. These three homes would be demolished and the owners relocated after the NFS purchases all five properties in fee.

The concept design includes playgrounds, swing sets, benches, a picnic shelter (provided by the city), trash container, a multi-purpose trail, and a bike rack. A picnic area would be provided with 16 picnic tables, each set on a concrete pad, with a grill and trash container. Landscaping would consist of preserving the existing trees on site adding shade and ornamental trees; and a shrub hedge along the fence to screen and buffer the park from neighboring residences. Fencing would be provided around the park to protect visitors using the area.

1.6 Location of the Proposed Action

Richmond County is located at the fall line created where the rocky edge of the Appalachian plateau transforms into the Atlantic coastal plains. Richmond County lies on the Savannah River, which separates it from Aiken, South Carolina. Richmond County is otherwise bounded by Columbia, McDuffie, Jefferson, and Burke Counties on the north, northwest, southwest, and south, respectively.

The Rocky Creek drainage basin lies in the southern part of the county and flows toward the Savannah River. The downstream portion of the creek enters the Phinizy Swamp and exits into the Savannah River through Butler Creek. Topography of the basin is typical of the piedmont region, with surface elevations ranging between 700 and 1,000 feet NAVD 88. The project location is illustrated in Figure 1 of Appendix A.

2 Description of the Alternative Actions

In the initial evaluation of these alternatives, the Department of the Army took into consideration minimum selection criteria. Only those alternatives that met these criteria were considered suitable for detailed analysis. The selection criteria were: conformity to all Federal and State laws and regulations; technical feasibility; Federal interest; and economic efficiency [Benefit/Cost (B/C) ratio greater than 1.0 required for Federal interest]. Federal interest is established by the National Economic Development (NED) Plan. The NED is a policy that guides federal water resource planners in their choice of solutions to problems. The objective of NED is to maximize increases in the net value of the national output of goods and services. Within the Corps, this is done by comparing the difference in the value (benefits) produced by the project to the value of the resources (costs) required to produce those goods and services or construct the project.

The alternatives were considered both individually and in various combinations in preliminary studies. This analysis reduced the various alternatives to the NED plan that maximizes net benefits (when average annual benefits exceed average annual costs by

the greatest amount). During the course of this feasibility study hydrologic, hydraulic, and economic computer models were used to evaluate numerous combinations of the alternatives. More detail regarding the analysis of alternatives can be found in the Feasibility Report.

2.1 Alternative Analyzed in 2005 EA But Eliminated From Consideration in the Present Analysis.

This alternative was proposed as part of the proposed action in the 2005 EA/FONSI but has since been eliminated due to various reasons discussed below.

2.1.1 Nixon Levee

This levee started at Old Savannah Road and extends to New Savannah Highway 56 Loop (Doug Barnard Parkway). The levee would have a maximum height of approximately 9.5 feet. The length of the levee would be approximately 5100 feet and the footprint would encompass 3.96 acres. The levee would cross several dirt roads and two railroads (Appendix A; Figure 5). The levee would tie into the railroad embankment(s) or, if the railroad embankments do not have the necessary elevation, the levee would have openings at the railroad crossing(s).

In 2005, the B/C ratio for this feature was determined to be 6.0. However, the Nixon levee was sited on land that is extremely disturbed from past development activities. Nixon Levee was part of project as proposed in 2005 EA/FONSI; however, became infeasible after 2005 due to HTRW liability issues related to industrial contamination within the project impact area.

In addition to the HTRW liability concerns, major additional costs for wetland surveys and subsequent mitigation would be required, as well as a Phase I Cultural Resource Survey (and potential mitigation), prior to development of this property. Therefore, this alternative was eliminated from further consideration.

2.2 ALTERNATIVES TO THE PROPOSED ACTION

Four alternatives to the proposed action were considered. These alternatives were:

- No-Action
- Rosedale Dam Detention Area (Stand Alone)
- Kissingbower Buyout (Stand Alone)
- Kissingbower Buyout with Recreation Park

2.2.1 No Action Alternative (Alternative A)

Under the No Action alternative, the proposed action would not be constructed by USACE. The CEQ regulations prescribe inclusion of the No Action Alternative as the benchmark against which proposed Federal actions are evaluated. Under the No

Action alternative, there would not be a buyout and development of the recreational park at Kissingbower Road or the construction of a detention area at Rosedale Dam. Without any action, the Rocky Creek drainage basin would continue to be subjected to frequent flooding resulting in substantial losses to property. Subsequently, property values would be expected to decrease in the vicinity. Additional information quantifying property losses are in the economic analysis (Appendix A) of the Feasibility Report.

Properties on Kissingbower Road that have been subjected to past damage from flooding would continue to deteriorate with future storm events. These homes located within the flood plain would continue to occupy the flood plain, resulting in an incompatible land use.

2.2.2 Rosedale Dam Detention Area (Stand Alone) (Alternative B):

This detention area would involve renovating Rosedale Dam and include placing a 5- by 6-foot (150-foot long) concrete box culvert through the breach in the dam for normal creek flow (Drawings 1 and 2; Appendix B). The breach would then be filled to elevation 232.0 feet NAVD 88 to form a notch for all flows over the 25-year flood events. The entire structure would require clearing, grubbing and grassing (5 acres) to protect the structural integrity of the existing earthen dam. A box culvert would be sunk 1 foot below grade [per 2005 U.S. FWCAR] to allow development of a natural stream channel through the culvert and facilitate passage of wildlife (see Drawings 1 & 2; Appendix B). Approximately 55 cubic yards of fill in waters of the US would be required to repair the Rosedale Dam culvert.

The box culvert has been designed to approximate the existing channel width to allow normal low flow and bed load sediment to pass unimpeded. This design would allow the upstream detention area to remain dry under normal weather conditions, with only normal creek flows passing through.

This detention area does not involve excavation and is designed to utilize the natural existing flood storage capacity of the existing flood plain/wetland areas for floodwater detention. The detention area as designed is expected to hold water 3-4 hours during an average summer rain event; approximately 12 hours during typical flood events; and approximately 21 hours (no more than 36 hours) during the 25-year flood event (USACE 2015b). The detention of water for longer periods in the detention area may create or enhance some wetland functions and values like the filtering of excessive nutrients and other pollutants from runoff, and decreasing sedimentation/erosion, and enhancing wetland vegetation.

2.2.3 Kissingbower Buyout (Stand Alone) (Alternative C):

This non-structural measure would require acquisition of five residential properties; two are vacant and three are residential homes (refer to the Feasibility Report Section 5.4 “Real Estate Requirements” for more detail regarding real estate issues). By eliminating these developments within the flood plain and conversion to greenspace, the flood plain would be allowed to be restored to function normally. The families occupying homes on

Kissingbower Road may be entitled to relocation benefits and assistance under Public Law 91-646 for relocating to another area.

2.2.4 Kissingbower Buyout with Park (Alternative D):

This alternative would be similar in scope as Alternative C with the added feature of a recreation park that would provide benefits to the area. The proposed recreational park would require acquisition of five residential properties; two are vacant and three are residential homes (refer to the Feasibility Report Section 5.4 "Real Estate Requirements" for more detail regarding real estate issues). By eliminating these developments within the flood plain and conversion to greenspace, the flood plain would be allowed to be restored to function normally.

This park would consist of approximately 1.32 acres (Appendix A; Figure 6) within the flood plain from the acquisition of these 5 parcels, which includes the bottom vacant triangular lot (0.3 of an acre) on Haynie Street. The purchase of this lot also provides more protection to the root system of the large existing Red Oak to be preserved for the recreational park. Two of the homes are inundated with 4 to 5.5 feet of water during the 100-year flood; the third home receives 2.5 feet of flooding. These homes would be demolished and the owners relocated. The site's mature trees would left for the park. The properties would be purchased by the NFS in fee.

The concept design includes the following items; 2 playgrounds, 2 swing sets, 4 benches, 1 picnic shelter (provided by the city) with 4 picnic tables, one trash container, and a bike rack. A picnic area is provided with 16 picnic tables, each set on a concrete pad, with a grill and trash container. Landscaping would consist of preserving the existing trees on site and adding where needed shade trees, ornamental trees, a shrub hedge along the fence to screen and buffer the park from neighboring residences. Fencing would be provided around the park to protect youth using the area.

2.2.5 Rosedale Dam Detention Area and Kissingbower Buyout with Park (Selected Plan/Alternative E):

The Selected Plan would consist of a combination of Alternatives B and D and includes both the structural improvements at Rosedale Dam and the non-structural improvements in the recreational park. This alternative would be the NED Plan, which is the plan that maximizes net annual benefits (when average annual benefits exceed average annual costs by the greatest amount) and determines Federal interest in the project. The Selected Plan would comply with all applicable laws and regulations and would be expected to result in numerous beneficial impacts without having any significant adverse impacts.

3 Affected Environment

This chapter describes the surrounding area associated with the alternative actions, and the condition of the existing environment at the location of the proposed action. The characterization of existing conditions provides a baseline for assessing the potential environmental impacts from activities associated with the proposed action. A general overall description is followed by information concerning significant resources that would

be affected by implementation of any of the alternatives. This discussion does not include information on all significant resources of the study area since many of these would not be impacted by alternatives under consideration.

Analysis of the possible effects of climate change is included in the Engineering Appendix (Appendix B) of the Main Report. That analysis concludes that this watershed as a whole is at low risk for climate change effects on flooding. Potential changes in future condition flows from increased rainfall as a result of climate changes were not included because they are not expected to change the study recommendations or the design of the recommended plan. More detail on this issue may be found in the Main Report (Section 4.2.2) and the Engineering Appendix (Section C-2.5).

3.1 Physiographic Setting

Richmond County is located at the fall line created where the rocky edge of the Appalachian plateau transforms into the Atlantic coastal plains. Richmond County lies on the Savannah River, which separates it from Aiken, South Carolina. Richmond County is otherwise bounded by Columbia, McDuffie, Jefferson, and Burke Counties on the north, northwest, southwest, and south respectively. Richmond County covers a physical area of 324 square miles with the main population area being the City of Augusta. The study areas experience mild winters and hot summers. Temperatures drop below freezing on an average for 55 days per year, but rarely drop to zero degrees Fahrenheit. Temperatures reach 90 degrees Fahrenheit on an average of 68 days per year. The area receives approximately 45 inches of precipitation per year.

Rocky Creek - Rocky Creek is found in the southern part of the county and flows toward the Savannah River. The downstream portion of the creek enters the Phinizy Swamp and exits into the Savannah River through Butler Creek. Topography of the basin is typical of the piedmont region, with surface elevations ranging between 700 and 1,000 feet NAVD 88.

Three of the structures at the site of the non-structural park at Kissingbower Road had 4 to 5.5 feet of water during the 100-year flood. The third home received 2.5 feet of flooding. The site has some mature trees that would be kept for the proposed park. There has been much filling and alteration of wetlands and flood plain from development activities over several decades. Environmental resources in the areas of the proposed improvements have been significantly degraded.

3.2 Land Use

Land use throughout this portion of the Rocky Creek Basin is typical of urban streams and has been primarily developed for residential use. This development involved much fill material that destroyed most of the original flood plain and wetland ecosystems. This creek is located at the southern edge of the city limits of Augusta, the central part of Richmond County. The downstream portion of the creek enters the Phinizy Swamp and exits into the Savannah River through Butler Creek. Most of this basin has been developed into residential subdivisions; while some is occupied by commercial and industrial property.

The site of the proposed Rosedale Dam Detention Area is undeveloped and heavily wooded. The adjacent areas are largely undeveloped and heavily wooded. A church and two residential homes lie approximately 300 feet south of Rocky Creek. A self-storage facility is located 250 feet to the north of Rocky Creek.

On the site of the proposed recreational park at Kissingbower Road, there are 5 existing structures, which are currently subjected to flooding during high water events. The street addresses of these buildings are listed below and are illustrated in Figure 6 of Appendix A.

1956 Kissingbower Road
1958 Kissingbower Road
1960 Kissingbower Road
1957 Haynie Street
1956 ½ Kissingbower Road

3.3 Hazardous Materials

During the 2005 Feasibility Study, a historical database search was conducted (USACE 2003) to determine whether the potential for contamination existed for the planned construction areas of the Augusta Flood Control Project. The database search showed no major historical factors, but several possible minor contamination issues in the areas downstream of Regency Mall, which is 2.5 miles downstream from the subject site. Based on these issues as well as a site visit, USACE determined that extensive sampling along the Rosedale Dam Detention Area should be conducted. Subsequent analytical results (sampling) indicated that no contamination exists that would interfere with any future construction activities (USACE 2003) within this study.

There are many businesses, and retail vendors, etc. within a short distance of creek in the area below Regency Mall, which is 2.5 miles downstream and southeast from the subject site. Rocky Creek also travels through many residential areas within the basin. Most of the industrial and commercial businesses (and properties with environmental issues) within the Rocky Creek Basin are far downstream from the project site.

Rocky Creek flows from the western part of the county through wooded and residential areas. There is property used for commercial interests along the western end of Rocky Creek, but as Rocky Creek crosses Wheeless Road (1.3 miles downstream of subject site), property used for commercial businesses increases. Some of those businesses along that stretch have a history of poor environmental practices. However, as Rocky Creek passes Peach Orchard Road, it moves through some heavily industrialized areas. These areas offer significant cause for concern. A few of these industrial sites have been and are currently under environmental cleanup requirements. The Nixon Levee alternative was eliminated due to issues related to soil contamination. Below this area, Rocky Creek drains into Phinizy Swamp.

A site investigation of the subject property was conducted on January 14, 2015, by the Savannah District (USACE 2015a). There has been very little change to the site vicinity since the 2003 HTRW investigation (USACE 2003). One land use change was the addition in 2005 of six buildings used for self-storage units located north of the proposed Rosedale Dam Detention Area (Appendix A; Figure 2). The subject property (Appendix A; Figure 2) was inspected for any signs of releases of petroleum or hazardous materials and for any signs of potential for environmental liabilities for both the subject property and adjacent areas that may have potential for migration onto the subject property. There were no signs of environmental issues in the vicinity of the project impact area.

Available records and maps do not indicate any history of monitoring wells on this property. Due to the historical use of this site and the lack of development activities near the site, there have been no documented activities that have the potential for the release of hazardous substances. In addition, there is no evidence of a release or threatened release in the site vicinity.

3.4 Soils

The specific soil type associated with the creek and flood plain, which contain most of the potential improvements in this study, is classified as Bibb and Osier (BO) soil (USDA 1981). This undifferentiated group consists of nearly level, poorly drained soils on the flood plains of major streams on the Southern Coastal Plain. It is frequently flooded for brief periods, mostly in late winter and in early spring. The slope range is 0 to 2 percent and the areas are typically 50 to 300 acres in size.

Typically, the Bibb soils have a fine sandy loam surface layer 16 inches thick that is dark grayish brown in the upper part and grayish brown mottled with gray and yellowish brown in the lower part. To a depth of 40 inches are layers of gray silt loam mottled with strong brown. Layers between 40 and 62 inches are grayish brown and light gray loamy fine sand mottled with dark yellowish brown and white. Permeability is moderate, and the available water capacity is medium. The water table is within 0.5 to 1.5 feet of the surface in winter and spring, respectively.

Typically, the Osier soils have a brownish surface layer 13 inches thick that is loamy fine sand in the upper few inches and sand in the lower part. To a depth of 65 inches or more are layers of grayish sand or loamy fine sand. Permeability is rapid, and the available water capacity is low. The water table is within 1 foot of the surface in winter and spring.

3.5 Jurisdictional Wetlands/Streams

Most of the wetlands in the study area are alluvial wetland communities. Alluvial wetland system dynamics and structure depend on the river flow regime; flooding and beaver dams in the area disrupt this natural flow.

The condition and function of the Rocky Creek stream channel has been extremely degraded throughout the last few decades by extensive development of the flood plain

associated with Rocky Creek. There has been extensive filling, paving, and deforestation of the vegetation within the flood plain and associated wetlands. Most of the existing wetlands within the basin are very degraded and of low value. A large stretch of the stream at Regency Mall has been reduced to a ditch.

There are no significant amounts of wetlands in the vicinity of the project impact area. There are no CWA Section 404 jurisdictional wetlands within the impact area of construction for the proposed action. There is one small wetland (0.4 of an acre) within the area of detention for flood events (Appendix A; Figure 4). However, this wetland area is not near the stream channel, construction areas (Rosedale Dam renovations), or within areas receiving sedimentation. There are large amounts of sedimentation in some of the areas downstream of Rosedale Dam but sedimentation is very is low at the site of Rosedale Dam Detention Area (USFWS 2002a & b; and USACE 2015a).

3.6 Flood Plains

In the Rocky Creek watershed, extensive areas of flood plains have been filled in from decades of development activities as discussed above in section 3.5. The site of the proposed action is located within the 100-year flood plain.

3.7 Flora and Fauna

Rocky Creek is an intermittent stream throughout much of the project vicinity. Debris and rocks block water flow forming isolated pools as water levels drop at the end of rain events. Urban runoff can also create rapidly fluctuating conditions that affect the streams aquatic habitat. Many insects and amphibians prefer these conditions. In some reaches of the creek, streamside hardwood vegetation offer cover for wildlife, such as small animals, song birds, and other species that move along the creek corridor from the headwaters to its junction with Phinizy Swamp. The Rocky Creek Basin offers limited cover for large species (e.g. deer) due to the adjacent developed areas that include residences and commercial activities. Fish species characteristic of urban, sandy streams such as Rocky Branch Creek include shiners, mosquitofish, sunfish, and largemouth bass.

Tree species in this basin include yellow poplar, black gum, willow, red bay, red maple, black willow, sweet gum, ironwood, river birch, black cherry, pine, sweet bay, white oak, pear, and water oak. Understory species include blackberry, netted chain fern, and peltandra. The site of the proposed detention area is a degraded stretch of the stream, without significant environmental resources due to past development in the area. The site is heavily wooded with typical upland vegetation (Appendix A; Figure 2).

3.8 Protected Species

Appendix F lists Federal and State listed endangered, and threatened species potentially occurring in Richmond County (obtained from USFWS in January 2014 and updated February 2016). Within the project impact area, there is both a lack of suitable habitat and substantial disturbance to existing habitat from development activities. The project impact area has been investigated for protected species and none were found in the area.

The USFWS has updated the Richmond County list to remove the bald eagle due to its recovery from its previous "threatened" status; and add the gopher tortoise, which is now a Federal candidate species. The USFWS does not expect Federally listed endangered or threatened species to occur in the specific project area; nor did they note any State listed species occurring in the project area in their review of GIS data (USFWS 2016).

3.9 Air Quality

Air quality at any given location is a function of several factors, including quantity and dispersion rates of pollutants, local climate, topographic and geographic features, and also windblown dust and wildfires. Air pollution can threaten the health of humans, animals, plants, lakes; as well as damage the ozone layer and buildings, and cause haze that reduces visibility.

The Clean Air Act of 1970, as amended, has established air quality standards for the U.S. The Environmental Protection Agency (EPA) has set six National Ambient Air Quality Standards (NAAQS) that regulate six pollutants: carbon monoxide (CO), lead (Pb), nitrogen oxide (NO_x), ozone (O_3), sulfur dioxide (SO_2), and particulate matter ($PM_{2.5}$ and PM_{10}). Geographic areas have been officially designated by EPA as being in attainment or non-attainment for air quality based on an area's compliance with the NAAQS. Richmond County is currently in attainment for the NAAQS for all criteria pollutants (GA EPD 2015). Therefore the project area is under no Federal or State restrictions for the purpose of improving air quality to meet any air quality standard.

3.10 Cultural Resources

No properties eligible for protection under the National Register of Historic Places (NRHP) pursuant to Section 106 of the National Historic Preservation Act of 1966 (NHPA) (P.L. 88-665), as amended, are located within or near the 100-year flood plain. Cultural resources surveys were conducted of selected areas along Rocky Creek in 2005, including the 22 acre Rosedale Tract. Six cultural resources sites were identified during the survey. One of the historic sites, Rosedale Dam (9RI1099), is located within the area of potential effect of the Selected Plan. The dam was constructed between 1928 and 1950 and consists of the earthen dam and concrete and metal water control features. Coordination with the Georgia State Historic Preservation Office has determined the site is not eligible for the NRHP.

The structures located along Kissingbower Road and Haynie Drive have not been recorded or formally evaluated for the NRHP. These structures would be affected by the Kissingbower Buyout alternative. Based on an initial review of tax records, all structures are over 50 years old and have undergone some degree of modification. A historic building inventory will be conducted during the D/I phase of this project to record and evaluate the structures. No archaeological sites are known to exist within the parcels.

3.11 Safety and Health

There have been no safety and public health issues identified in this study other than those associated with flood related drowning and flood related contamination from sewage systems impacted by flood events (USACE & USFWS 2002b).

3.12 Enviromental Jusice

Appendix A includes a detailed demographic and economic assessment of the existing condition in the study area. Environmental justice communities are present.

3.13 Climate Change

Analysis of the possible effects of climate change is included in the Engineering Appendix (Appendix B) of the Main Report. That analysis concludes that this watershed as a whole is at low risk for climate change effects on flooding. Potential changes in future condition flows from increased rainfall as a result of climate changes were not included because they are not expected to change the study recommendations or the design of the recommended plan. More detail on this issue may be found in the Main Report and the Engineering Appendix.

The analysis of future condition flows incorporated increased runoff due to land development expected through year 2030. Historic precipitation-frequency data used in this Section 205 Study were based on TP40 rainfall distributions. Since that time, new rainfall distributions have been published in TP14. The 2, 5,10, 25, and 50-year rainfall estimates decreased from TP40 to TP14. The 100 and 500-year rainfall estimates increased from 8.00” to 8.18” and from 9.7” to 10.7”, respectively. All of the TP40 data used in this study’s analysis are within the 90% confidence intervals for the new TP14 estimates. There is no value in using the new rainfall distribution in the hydrologic analysis since it would result in no change in the study recommendations or the design of the recommended plan.
The USACE screening level climate change vulnerability assessment (VA) tool was used to assess the potential impacts and likelihood of climate change impacts to this region. The tool indicted that the Savannah-Ogeechee Basin was at relatively low risk for climate change to cause a substantial negative impact on flood risk reduction type projects. More information regarding climate change may be found in Appendix B of the Main Report.

4 Environmental Impacts

This chapter discusses the potential environmental impacts of all the alternatives including potential direct, indirect, short-term or long-term impacts. A foreseeable effect is defined as possible modification in the existing environment brought about by some activity. It is also important to note that impacts may be beneficial or adverse.

4.1 Land Use

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, homes and commercial properties within the Rocky Creek Basin would be subjected to recurring damage during flood events**.** Private insurance companies or other Federal agencies (e.g. FEMA) may be involved with repairing or compensating land owners for future property damage.

Properties on Kissingbower Road that have been subjected to past damage from flooding would continue to deteriorate with future storm events. Since development activities are not compatible with flood plain land use, the continued flood plain occupation of these homes would constitute an incompatible land use.

Future Conditions with Rosedale Dam Detention Area (Alternative B): Implementation of this alternative, would allow the existing flood plains/wetlands to function more naturally by retaining floodwater longer within the watershed and lowering flow velocities. The detention area would restore some of the lost natural flood plain storage capacity (from decades of flood plain development) and reduce economic damages from flooding in some of the downstream developed areas of this drainage basin.

This alternative would not obtain the benefits from converting residential use of the flood plain to greenspace and recreational use in the area of the proposed recreational park. This action would also not have the benefits to land use occurring from home owners on Kissingbower Road relocated out of the flood plain, which would result in a more compatible land use for this area.

Flowage easements would be required for the storm water impacts from flood events in excess of the 5-year event, as illustrated in Figure 3 of Appendix A.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, residential use of the flood plain would be converted to greenspace in the area of the proposed buyout. Therefore, this alternative would provide a beneficial impact to flood plain management but would not provide the benefits of a recreation park in the area of the homes on Kissingbower Road. Benefits to flood plain management would occur from removing homes from the flood plain and providing opportunities for homeowners to relocate to a safer area. This action would not provide the economic benefits from flood risk in the Rosedale Dam Detention Area.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): Implementation of this alternative would result in the same benefits to land use as

Alternative C above with the exception of the additional benefits of a recreation park. The recreation park would add significant long term benefits to the residents in the area and would also be a land use compatible with flood plain management by converting residential use of the flood plain to greenspace/recreational use.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): Implementation of this alternative would combine all the land use benefits from Alternatives B, C, and D. At the site of the recreational park at Kissingbower Road, the exsiting homes would be demolished and their owners would have an opportunity to relocate. The site's mature trees would be kept for the park. Under the Selected Plan, land use would be improved by converting residential use to a recreational park within a flood plain, which is more appropriate utilization of a flood plain. The acquisition of the property for a recreation park by the city would prohibit further development of the flood plain in the future. This alternative would provide the greatest compliance with Executive Order (EO) 11988 (Appendix G), which regulates development activities within the flood plain. Therefore, land use would be significantly improved by the Selected Plan.

4.2 Hazardous Materials

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, there would be no anticipated impacts in regard to this issue.

Future Conditions with Rosedale Dam Detention Area (Alternative B): With implementation of this alternative, there would be no anticipated impacts in regard to this issue. Construction from the Rosedale Dam Detention Area is not expected to result in significant short term sedimentation or any subsequent release of metals into Rocky Creek, and therefore is not expected to adversely impact Phinizy Swamp downstream (USACE 2003). The long term impact of the detention area would reduce erosion and sedimentation. Construction of the basin does not involve any excavation within the detention area. Construction would be limited to insertion of a culvert within the area of the former Rosedale Dam. Standard SOPs would be used for project construction to prevent adverse short term impacts.

Operation and maintenance of this project would not involve the production or use of hazardous materials. Also, the background investigation discussed in Chapter 3 indicates very low risk of encountering existing hazardous conditions during project implementation. Therefore, no significant impacts from hazardous waste are expected from the implementation of this proposed project.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, there would be no anticipated impacts in regard to this issue. All appropriate surveys for hazardous materials (e.g. lead paint, asbestos) will be conducted during the D/I phase to ensure that demolition activities do not result in any release of hazardous materials into the environment.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): With implementation of this alternative, there would be no anticipated impacts in regard to this issue.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): Implementation of the Selected Plan would not be expected to result in any anticipated impacts with regard to this issue, as discussed above in Alternatives B and C.

4.3 Soils

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, there would be no anticipated impacts to this resource.

Future Conditions with Rosedale Dam Detention Area (Alternative B): The natural stream design features in the proposed Rosedale Dam Detention Area would be expected to result in a decrease in sedimentation and erosion. Sediment from upland erosion can be trapped and retained in the riparian vegetation in the flood plain, preventing it from reaching local waterways where it is detrimental to stream habitat, fish, and downstream drinking water supplies. These impacts would result in beneficial impacts on soil conservation within the drainage basin.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, there would be no anticipated impacts to this resource.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): With implementation of this alternative, there would be no anticipated impacts to this resource.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): With implementation of this alternative, the same benefits would be expected to this resource as discussed in Alternative B above.

4.4 Jurisdictional Wetlands and Streams

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, there would be no anticipated impacts to these resources.

Future Conditions with Rosedale Dam Detention Area (Alternative B): The natural stream design features in the proposed Rosedale Dam Detention Area would be expected to result in a decrease in sedimentation and erosion. Sediment from upland erosion can be trapped and retained in the riparian vegetation in the flood plain, preventing it from reaching local waterways where it is detrimental to aquatic habitat, fish, and downstream drinking water supplies.

Most of the impacts to the environment from implementation of the detention area would be beneficial; and there have not been any significant adverse impacts identified to

natural resources. As designed, the Rosedale Dam Detention Area would limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of storm water discharges to the receiving stream (USEPA 1999). Subsequent to this reduction to downstream erosion, benefits may occur to wetlands, flood plains, riparian vegetation, and bottomland hardwoods.

The detention area created by the renovated dam would not involve excavation and is designed to utilize the natural existing flood storage capacity of the flood plain areas for floodwater detention. A jurisdictional wetland delineation for the alternatives in the study was conducted (Buck Engineering 2004; and USACE 2015a). There would be no discharge of fill material into jurisdictional wetlands from construction of the detention area or any other elements of the Selected Plan. The Rosedale Dam Detention Area would not adversely impact any jurisdictional wetlands or flood plains, which have been degraded in the past by the extensive development of the flood plain. The detention area on Rocky Creek as designed is expected to hold water 3-4 hours during an average summer rain event; and approximately 12 hours during typical flood events. The detention area impacted by floodwater detention includes a jurisdictional wetland approximately 0.4 of an acre in size (USACE 2015a) and is illustrated in Figure 4 of Appendix A.

The renovation of Rosedale Dam includes 55 cubic yards of fill for renovating Rosedale Dam within the stream channel (150 linear feet), which are waters of the US (but are not jurisdictional wetlands). This area of renovation of Rosedale Dam is located a significant distance from the 0.4 acre wetland (as illustrated in Figure 4; Appendix A); and therefore, would not impact the wetland. The fill material includes placing a 5 by 6-foot (150-foot long) concrete box culvert through the breach for normal creek flow (Drawings 1 and 2; Appendix B). The box culvert would be sunk 1 foot below grade [per 2005 U.S. Fish and Wildlife Coordination Act Report (FWCAR)] to allow development of a natural stream channel through the culvert and facilitate passage of wildlife (see Drawings 1 & 2; Appendix B). The box culvert has been designed to approximate the existing channel width, to allow normal low flow and bed load sediment to pass unimpeded (Able 2003; USFWS 2005 and 2014a). This design would allow the upstream detention area to remain dry under normal weather conditions, with only normal creek flows passing through.

The vast majority of the sedimentation would be expected to occur in the channel (within waters of the US), as unchanged from the baseline condition. If during flood events, sediment accumulates in specific areas, maintenance would be conducted to restore the flood plain area as close as possible to its original condition. Removal of sediment (estimated that it may be needed once every 6 to 10 years) would be expected to be part of the O&M manual. Sediment that is thinly spread over a large area would be impractical to excavate and its removal would likely not be required; this sedimentation is part of a natural process and should not be in excess of what is presently occurring. Therefore, the potential for secondary adverse impacts from the detention structure would be expected to be negligible.

The detention of water for longer periods in the detention area may create some wetland functions and values like the filtering of excessive nutrients and other pollutants from runoff, and decreasing sedimentation/erosion, and enhancing wetland vegetation.

Sedimentation and Erosion Impacts
As designed, the detention area should limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of storm water discharges to the receiving stream (USEPA 1999). In 2015, the USFWS recommended that the rock cross vane in the original 2005 design (per 2005 FWCAR design suggestion) be excluded in this design (USFWS 2015). The USFWS conveyed this opinion: "it doesn't look like that part of the stream is eroding and ....a cross vane is not necessary if the culvert is sized to maintain the bankfull width. If the culvert is properly designed to do that and is sunk below the stream bottom, the stream should remain fairly stable." Since the current design meets the USFWS criteria above, USACE concurred with removal of the cross vane.

If the project is approved and funded, USACE will implement Best Management Practices (BMPs) to minimize stormwater impacts during the DI phase of this project. The BMPs will include measures to prevent erosion and sediment runoff from the project.

Retaining floodwaters within the detention area will allow settling of suspended solids and nutrients, thereby improving the quality of the water leaving the detention area. The treatment efficiency of detention basins is usually limited to removal of suspended solids and associated contaminants due to gravity settling (USEPA 1999). Vegetation in the detention area would be expected to absorb some nutrients and contaminants through natural physiological processes.

If any sediment accumulates in the detention area, it would be removed before accumulation is excessive enough to impact existing vegetation. The accumulation of sediment is expected to be small and below the baseline condition. Therefore, the potential for adverse impacts to existing vegetation would be expected to be negligible. The accumulation of sediment within the stream channel immediately downstream of Rosedale Dam is expected to be small; the detention area is not expected to result in sedimentation increases; the overall sedimentation impacts to the basin would be expected to improve.

Removal of sediment may be needed once every 6 to 10 years and would be a part of standard O&M procedure but is not due to any anticipated increased sedimentation from project implementation. O&M would also serve the purpose of correcting unrelated accidental events upstream. Standard O&M would incrementally improve sedimentation levels from the baseline since the baseline condition does not include any O&M.

Stream Buffer Variance: A determination was made by the GA Environmental Protection Division (EPD) that the project lies within the jurisdiction of State Waters (GA EPD 2015). Therefore, a GA EPD stream buffer variance permit from the Coastal

District Office is required for this proposed action (GA EPD 2015). A draft application has been completed for a Stream Buffer Variance Permit. The application will be finalized and coordinated with GA EPD during the D/I phase of the project when plans and specs are closer to final; this will ensure the impacts of the project within the stream buffer are more accurate. The design is not detailed at this time and may change before construction and nullify any permits obtained; therefore, GA EPD was in agreement with this approach (GA EPD 2015).

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, there would be no anticipated impacts to these resources.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): With implementation of this alternative, there would be no anticipated impacts to these resources.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): With implementation of this alternative, the same benefits would be expected to this resource as discussed in Alternative B above.

4.5 Flood Plains

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, residential and commercial properties within the Rocky Creek Basin would be subjected to recurring damage during flood events. Private insurance companies or other Federal agencies (e.g. FEMA) may be involved with repairing or compensating land owners for future property damage, particularly in the Kissingbower buyout area. Property values in the vicinity would be expected to decrease under this alternative.

Properties on Kissingbower Road that have been subjected to past damage from flooding would continue to deteriorate with future storm events. Existing residential development in the flood plain limits the options for management of floods.

Future Conditions with Rosedale Dam Detention Area (Alternative B): Implementation of this alternative would allow the existing flood plain to function more naturally by retaining floodwater longer within the watershed and lowering flow velocities. The detention area would restore some of the lost natural flood plain storage capacity (from decades of flood plain development) and reduce economic damages from flooding in some of the developed areas of this drainage basin.

This alternative would not obtain the benefits from converting residential use of the flood plain to greenspace and recreational use in the area of the proposed buyout/recreational park (Alternatives D and E). This action would also not have the benefits occurring from home owners on Kissingbower Road relocated out of the flood plain, which would result in a more compatible land use for the flood plain.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, many residential and commercial properties (outside of the five home on Kissingbower Road) within the Rocky Creek Basin would continue to be damaged during flood events. Private insurance companies or other Federal agencies (e.g. FEMA) may be involved with repairing or compensating land owners for future property damage.

Residential use of the flood plain would be converted to greenspace in the area of the proposed buyout. This would have a beneficial impact on flood plain management and would be in compliance with EO 11988. Benefits to flood plain management include removing homes from the flood plain and relocating homeowners to a safer area.

This action would not provide the flood plain benefits from the Rosedale Dam Detention Area discussed in Alternative B above. Some property values in the vicinity would be expected to decrease under this alternative. In addition, this alternative would not have the additional benefits from the recreation park in Alternative D.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): Implementation of this alternative would result in the same impacts to the flood plain as Alternative C above with the exception of the additional benefits of a recreation park. The acquisition of the property for a recreation park would prohibit further development of the flood plain in the future.

This action would not provide the flood plain benefits from the Rosedale Dam Detention Area discussed in Alternatives B and E.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): With implementation of this alternative, the Rosedale Dam Detention Area would naturally slow floodwaters within the existing flood plain and would not adversely impact the flood plain. The Selected Plan would restore some of the lost natural flood plain storage capacity (from decades of flood plain development) and reduce economic damages from flooding in some of the developed areas of this drainage basin.

Converting residential use of the flood plain to greenspace and recreational use in the area of the proposed buyout would have a beneficial impact to flood plain management. The acquisition of the property for a recreation park would prohibit further development of the flood plain in the future. By combining the benefits of Alternatives B and D, this alternative would provide the most flood plain benefits and would be in compliance with EO 11988, which regulates development activities within the flood plain. In addition, the Rosedale Dam Detention Area would involve perpetual easements that would prohibit further development of the flood plain in the future.

4.6 Flora and Fauna

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, there would be no anticipated impacts to these resources.

Future Conditions with Rosedale Dam Detention Area (Alternative B): The natural stream design features in the Rosedale Dam Detention Area would be expected to result in a decrease in sedimentation and erosion and would be expected to result in minor improvements in habitat for aquatic life. Sediment from upland erosion can be trapped and retained in the riparian vegetation in the flood plain, preventing it from reaching local waterways where it is detrimental to aquatic habitat, fish, and downstream drinking water supplies.

Most of the impacts to the environment from implementation of the detention area would be beneficial. As designed, the Rosedale Dam Detention Area would limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of storm water discharges to the receiving stream (USEPA 1999). Short term temporary impacts would occur to wildlife in the area during construction. Subsequent to this reduction to downstream erosion, benefits may occur to wetlands, flood plains, riparian vegetation, and bottomland hardwoods.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, there would be no anticipated impacts to these resources.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): With implementation of this alternative, there would be no anticipated impacts to these resources.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): Implementation of this alternative would result in nearly identical impacts to flora and fauna as discussed in Alternative B above. The box culvert at Rosedale Dam would be buried 1 foot below grade to avoid the potential for scouring of the channel bottom along the edge of the culvert that would create a barrier to wildlife passage through the culvert. This barrier would have created hazards by forcing wildlife to go around the culvert instead of utilizing the safety of the creek for movement/migration through this area. In addition to improving the conditions for wildlife passage along the canal greenway, this culvert modification would provide a more suitable substrate for wildlife that may inhabit or pass through the culvert.

The proposed detention area design should not impede fish passage and is not expected to interfere with transport of sediment under normal conditions. At the site of the recreational park at Kissingbower Road, the homes would be demolished and their owners would have an opportunity to relocate. The site's mature trees would be kept for the recreational park, resulting in improved habitat for local wildlife.

Habitat for many animals would be improved from the impact of the detention area as well as habitat diversity for the area. Secondary beneficial effects on water quality may

occur in Phinizy Swamp, which is downstream of Rocky Creek. Additionally, indirect benefits to protected species habitat and fisheries in Phinizy Swamp may result from implementing the Selected Plan due to the improvements to aquatic habitat and WQ.

4.7 Protected Species

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, there would be no anticipated impact to protected species.

Future Conditions with Rosedale Dam Detention Area (Alternative B): With implementation of this alternative, there would be no anticipated impacts to this resource.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, there would be no anticipated impacts to this resource.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): With implementation of this alternative, there would be no anticipated impacts to this resource.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): Due to the lack of suitable habitat for listed species, as previously discussed, no impacts to protected species is expected to occur from implementation of the Selected Plan. The USFWS does not expect Federally-listed endangered or threatened species to occur in the specific project area; nor did they note any state-listed species occurring in the project area in their review of GIS data (USFWS 2016). Therefore, a determination of no effect to any listed species or their critical habitat has been made.

None of the state listed species or their habitat has been identified within the project impact area during site investigations; therefore no significant impact to these resources is expected. Of the listed species (Appendix F), only the Southeastern American kestrel (*Falco sparvenius paulus*) has been known to visit the area during migration.

4.8 Air Quality

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, there would be no anticipated impact to air quality.

Future Conditions with Rosedale Dam Detention Area (Alternative B): With implementation of this alternative, there would be only minor short term impacts to this resource, discussed in more detail below in Alternative E.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, anticipated impacts to this resource would be negligible short term impacts from demolition of existing homes.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): With implementation of this alternative, anticipated impacts to this resource would be negligible short term impacts from demolition of existing homes.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): With implementation of this alternative, impacts would be nearly identical to those discussed above for Alternative B. There would be minor temporary dust generation from vehicles driving over unpaved areas during construction of the Rosedale Dam Detention Area and there would also be minimal temporary impacts from vehicle emissions during the construction activities. However, there are no more than minor impacts anticipated from these activities. Construction activities of the proposed action would follow all Federal, state, local regulations and applicable policies. Operation and maintenance is not expected to result in any adverse air quality impacts.

There would not be any new point sources of air pollution created and no additional non-point sources would be expected from operation of the proposed action. Since Richmond County is currently in attainment for the NAAQS for all criteria pollutants, the construction and operation of the project would not be expected to contribute to a change in this designation.

4.9 Cultural Resources

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, there would be no anticipated impact to cultural resources.

Future Conditions with Rosedale Dam Detention Area (Alternative B): With implementation of this alternative, one cultural resource site, Rosedale Dam (9RI1099), is within the area of potential effect. The Rosedale Dam is the location and subject of the main feature of the Selected Plan. The site is not eligible for the NRHP. While the cultural resource would be adversely impacted, no mitigation or other cultural resources investigations would be necessary as the site is not a historic property as defined in the National Historic Preservation Act (NHPA).

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, the structures affected by the Kissingbower Buyout Alternative will be recorded and evaluated for the National Register during the D/I phase of this project. Should the structures be determined eligible for the National Register, a MOA will be executed to mitigate adverse effects. If the structures are determined not eligible, no further cultural resources investigations or agreements will be required. No impacts to archaeological resources are anticipated. The area has been in residential use for many years and construction of the existing structures would have impacted any buried archaeological sites. Should archaeological deposits be encountered during the construction of the recreation park, work will cease until an archaeologist has evaluated the discovery.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): With implementation of this alternative, the impact to the structures would be as stated in Alternative C above.

Recreation Park (Alternative E and Selected Plan): With implementation of this alternative, one known cultural resource site, Rosedale Dam (9RI1099), is within the area of potential effect. Rosedale Dam is the location and subject of the main feature of the Selected Plan. The site has been determined not eligible for the National Register. While the cultural resource would be adversely impacted, no mitigation or other cultural resources investigations would be necessary as the site is not a historic property as defined in the NHPA.

The structures affected by the Kissingbower Buyout will be recorded and evaluated for the National Register during the D/I phase of this project. Should the structures be determined eligible for the National Register, a Memorandum of Agreement will be executed to mitigate adverse effects. If the structures are determined not eligible, no further cultural resources investigations or agreements will be required. The recreation park would have no impact on cultural resources. The area has been in residential use for many years and construction of the existing structures would have already impacted any buried archaeological sites. Based on the information obtained from the database search, the PDT has determined there would be minimal risk to project cost and schedule in delaying the field assessment for the Kissingbower buildings until the next phase as the buildings will most likely be determined not eligible for the NHRP due to extensive modifications.

4.10 Water Quality

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, there would be no anticipated impact to water quality.

Future Conditions with Rosedale Dam Detention Area (Alternative B): With implementation of this alternative, minor beneficial impacts are anticipated to this resource, and are identical to those discussed in more detail below in Alternative E.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, there would be no anticipated impacts to this resource.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): With implementation of this alternative, there would be no anticipated impacts to this resource.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): With implementation of this alternative, the earth detention structure will be a staged design such that the larger the storm event, the more water that will be detained. The center portion will be a sunken culvert allowing an opening in the existing creek bed and normal creek flows pass

through without being detained or altered. The structure is designed so that storms up to the approximate 25-year event will pass through the smaller opening in the culvert. The structure would be notched to a wider opening at an elevation where the 25- to 100-year return interval flood would pass through the wider notch without overtopping the structure (Appendix B; Drawing 1).

The box culvert was designed to be approximately the existing channel width, to allow low flow and bed load sediment to pass unimpeded. In the D/I Phase, the design may be modified as needed. As designed, the detention area should limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of storm water discharges to the receiving stream (USEPA 1999). Subsequent to the protection of wetlands, riparian vegetation, and bottomland hardwoods from erosion and scouring, benefits to wildlife habitat and aquatic habitat would be expected to occur.

Sections 401 and 404 of the Clean Water Act

Final assessment on wetland impacts from the proposed action indicates there are no adverse impacts from the proposed action or alternatives in this Feasibility Study. Therefore, compensatory mitigation is not necessary and no adverse impacts to waters of the US (as defined by Section 404) would occur due to this activity. An evaluation for compliance with the guidelines pursuant to Section 404(b) (1) of the Clean Water Act was conducted (Appendix E) and concluded that the proposed action would comply with these guidelines.

Water Quality Certification was obtained from Georgia Department of Natural Resources on August 31, 2005, for this feature along with the additional features as proposed in the 2005 EA and associated FONSI (see Table 1 section 1.3 for more detail). Since the current proposed action is contained in the 2005 proposed action, USACE coordinated with the GA EPD to determine if USACE should reapply for WQ Certification. GA EPD re-issued Water Quality Certification for this project on January 18, 2017 (page 22 of Appendix C).

Surface Water Quality

The detention structure in this proposed action is designed to allow water to pass in and out of the stream with the frequency and duration of present conditions. Retaining floodwaters within the detention area will allow settling of suspended solids and nutrients, thereby improving of quality of the water leaving the detention area. The treatment efficiency of detention areas is usually limited to removal of suspended solids and associated contaminants due to gravity settling. Their removal of pollutants of potential water quality concern may be limited (USEPA 1999).

Sedimentation and Erosion Control

The box culvert has been designed to approximate the existing channel width, to allow normal low flow and bed load sediment to pass unimpeded. This design would allow the upstream detention area to remain dry under normal weather conditions, with only normal creek flows passing through. The culvert is designed to maintain bank full width

and allowing proper shear stress for proper sediment load transport. In the D/I Phase, the size of the culvert may be modified, as needed to achieve these goals.

There is very little current sedimentation at the site of the Selected Plan; however, some areas downstream have been impacted considerably by sedimentation (USFWS 2002a & b; and USACE 2015). As designed, the detention area should limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of storm water discharges to the receiving stream (USEPA 1999). Retaining floodwaters within the detention area is not expected to result in increased sediment loads for the creek. Furthermore, the detention area would be expected to decrease the amount of sediment discharged further downstream during flood events by slowing down the floodwaters and detaining some of the sediments.

Rock revetments would be used at the face and outlet of the detention structure to reduce potential erosion and scouring at the structure; with a subsequent reduction in sedimentation and turbidity further downstream. O&M of the area would include removal of sedimentation, if needed, before accumulation is excessive enough to impact existing vegetation. The accumulation of sediment is expected to be small; and therefore, the potential for adverse impacts to existing vegetation would be expected to be less than the baseline condition. More detail on impacts to this resource are discussed in Section 4.4.

4.11 Safety and Health

Future Conditions with No Action (Alternative A): Without implementation of the Selected Plan, homes and commercial properties within the Rocky Creek Basin would be subjected to greater risk of damages during flood events. The risk includes hazards from drowning, since this alternative would result in the continuation of high flood stages and water velocities during flood events.

In addition to flood damage on private property, individuals in the vicinity are at risk of adverse health and aesthetic impacts from receiving extensive flood water in their homes. Furthermore, the floodwater is likely to be contaminated from sewage systems during flood events (USACE & USFWS 2002b).

Future Conditions with Rosedale Dam Detention Area (Alternative B): With implementation of this detention area, beneficial impacts are anticipated to safety and health. The benefits would include reducing the risk of flood damage to residential and commercial property; and subsequent impacts to individuals in the vicinity from adverse health and aesthetic impacts from receiving extensive flood water in their homes. Furthermore, the floodwater is likely to be contaminated from sewage systems during flood events (USACE & USFWS 2002b). Additional benefits associated with the detention area are detailed in Alternative E below.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, benefits would result in reduced risk of the flooding associated

hazards discussed in Alternatives A and B above. However, these benefits to safety and health would be limited to the Kissingbower Road area.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): With implementation of this alternative, the impacts to health and safety would be identical to those for Alternative C above.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): Implementation of this alternative would result in the most benefits to human health and safety. These benefits result by combining the benefits of both the detention area and the Kissingbower Buyout discussed above in Alternatives B and C.

In addition to flood damage on private property, individuals in the vicinity would benefit from reduced risk of adverse health and aesthetic impacts from receiving extensive flood water in their homes. The floodwater is likely to be contaminated from sewage systems during flood events (USACE & USFWS 2002b); subsequently, an additional beneficial impact is expected by decreasing flooding during flood events in this basin that have impacted sewage systems resulting in health hazards to the local population. Therefore, there would be less likelihood of contamination from this source in post-project conditions.

The Selected Plan would result in a lower risk of drowning during flood events from both lowered flood stages and from slowing the velocity of water movement during flood events. There is no potential for increasing mosquito populations from the creation of the detention area, as the detention area would not retain water long enough to complete the mosquito life cycle.

4.12 Noise

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, there would be no anticipated impact on noise levels in the vicinity.

Future Conditions with Rosedale Dam Detention Area (Alternative B): With implementation of this alternative, there would be only minor short term impacts to this resource, discussed in more detail below in Alternative E.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, there would be only negligible short term impacts to this resource from demolition of the existing homes on Kissingbower Road.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): With implementation of this alternative, there would be only negligible short term impacts to this resource from demolition of the existing homes on Kissingbower Road and construction of a recreation park.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): With implementation of this alternative, the project would generate a minimal short term amount of noise during construction. Increases in noise would predominately be caused during the temporary use of heavy equipment during construction. There would be minimal noise generated during maintenance of the detention area and this impact would only be expected to occur once every several years. Therefore, no significant impacts are expected from the short term increase in noise levels generated by the Selected Plan.

4.13 Social and Economic Issues

Future Conditions with No Action (Alternative A): Without implementation of the Selected Plan, homes and commercial properties within the Rocky Creek Basin would continue to be subjected to greater risk of damages during flood events and subsequent economic losses. Private insurance companies or other Federal agencies (e.g. FEMA) may be involved with repairing or compensating land owners for future property damage. Additional information quantifying property losses are in the economic analysis (Appendix A) of the Section 205 Feasibility Report.

Properties on Kissingbower Road that have been subjected to past damage from flooding would continue to deteriorate with future storm events and subsequent economic losses to property value. Since development activities are not compatible with flood plain land use, the continued occupation of the flood plain by these homes would constitute an incompatible land use.

In addition to the flood damage to their property, individuals in the vicinity are at risk of adverse health and aesthetic impacts from receiving extensive flood water in their homes. Furthermore, the floodwater is likely to be contaminated from sewage systems during flood events (USACE & USFWS 2002b).

Future Conditions with Rosedale Dam Detention Area (Alternative B): With implementation of this alternative, there would be substantial economic benefits from flood risk reduction to residential and commercial properties within the impact area. Beneficial impacts from the detention area are discussed in additional detail below in Alternative E.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, there would be substantial economic benefits to the residents on Kissingbower Road would have an opportunity to relocate to a safer area. These residents would not be financially impacted by future flood events and private insurance companies or other Federal agencies would not be involved in compensating for the future property damage.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): Implementation of this alternative would provide the same benefits as Alternative C

above with the addition of a recreation park. The recreation park would provide non-monetary benefits as part of the non-structural plan.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): By combining all of the benefits of Alternatives B and D, this alternative is the most economically justified and effective in reducing flood damage risk in the area. Detailed discussion and analysis of project design and cost comparisons are provided in the Section 205 Feasibility Report and the Economics Appendix. Discussion of the various economic impacts to homeowners within the flood impact areas is provided below in Section 4.14 (Environmental Justice).

Under current conditions, the impacted individuals that would be relocated under the non-structural plan are subject to flood damage in both monetary and non-monetary means. The flooding causes extensive financial damage to their property as well as the adverse health, and aesthetic impacts from receiving extensive floodwater in their homes. Furthermore, the floodwater may be contaminated from sewage systems during flood events (USACE & USFWS 2002b).

The Proposed Action also provides non-monetary benefits in the form of a recreational park as part of the non-structural plan.

4.14 Environmental Justice (EJ) - Executive Order 12898

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in minority and low-income populations, was issued on February 11, 1994. This EO requires that Federal agencies take into consideration disproportionately high and adverse environmental effects of governmental decisions, policies, projects, and programs, on minority and low-income populations. A presidential memorandum accompanying the EO specifies that information and opportunities to provide input on Federal decisions will be available to minority and low-income populations.

Future Conditions with No Action (Alternative A): Without implementation of the proposed action, homes and commercial properties within the Rocky Creek Basin would be subjected to recurring damage during flood events. Properties on Kissingbower Road that have been subjected to past damage from flooding would continue to deteriorate with future storm events.

Future Conditions with Rosedale Dam Detention Area (Alternative B): With implementation of this alternative, adverse impacts to minority or low-income populations would be prevented by eliminating damage from future flood events resulting in decreased property value. There would be no disproportionate adverse impacts to EJ communities.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, there would be no disproportionate adverse impacts to EJ communities since no adverse impacts have been identified to any populations.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): Implementation of this alternative would not result in any disproportionate adverse impacts to EJ communities.

Future Conditions with Rosedale Dam Detention Area, Kissingbower Buyout, Recreation Park (Alternative E and Selected Plan): The Selected Plan combines the impacts from both alternatives B and D, and therefore, would not result in any disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

4.15 Cumulative Impacts

CEQ regulations stipulate that the cumulative effects analysis consider the potential environmental impacts resulting from "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result for individually minor but collectively significant actions taking place over a period of time." (40 CFR 1508.7). CEQ guidance (CEQ, 1997) in considering cumulative effects involves defining the scope of the other actions and their interrelationships with the preferred alternative.

Future Conditions with No Action (Alternative A): Without implementation of the Rosedale Dam Detention Area, residential and commercial properties within the Rocky Creek Basin that have been damaged in the past during flood events, would be at risk of sustaining additional damage. The predicted new development in the area would increase storm water discharge and potentially increase the rate of flooding of these low lying structures. Private insurance companies or other Federal agencies (e.g. FEMA) may be involved with repairing or compensating land owners for future property damage, particularly in the Kissingbower Road area. Property values in the vicinity would be expected to continue to decrease under this alternative, but not to a point where significant abandonment of properties would occur.

Augusta-Richmond County currently participates in a very active acquisition program (Augusta-Richmond County Flood Reduction Program). This program has purchased 30 homes and properties, and is in the process of acquiring another 13 homes and properties. Once acquired, the homes on these flood damaged properties are demolished and the property is restored to "greenspace", and the property is allowed to function as natural flood plain storage, in perpetuity. It is the plan that these areas will one day revert to a natural riparian buffer along the watercourses they surround and will be habitat for birds, reptiles, plants, and mammals. This program is in its 12th year and is strictly voluntary and is changing the land use of frequently flooded areas.

The three structures on Kissingbower Road proposed for acquisition and demolition under this study authority are not likely to be acquired and demolished as part of the Augusta-Richmond County Flood Reduction Program.

Additionally, properties proposed for buyout on Kissingbower Road that have been subjected to past damage from flooding would continue to be at risk of additional damage from future storm events. The potential for cumulative adverse impacts would include health, property damage, and economic impacts. By not permanently removing these homes, additional adverse impacts to the flood plain would occur over time, since development within the flood plain is an incompatible land use. These homes and businesses and others that are flooded will continue to be a source of non-point source pollution during flood events

Future Conditions with Rosedale Dam Detention Area (Alternative B):
With implementation of the Rosedale Dam Detention Area, residential and commercial properties within the Rocky Creek Basin that have been damaged in the past during flood events, would be at a decreased risk of sustaining additional damage. Subsequently, property values in the vicinity would not be expected to continue to decrease over time due to flood damages.

Private insurance companies or other Federal agencies (e.g. FEMA) would continue to be involved with repairing or compensating land owners for future property damage but the payout for losses would be reduced. The buyout program would continue but with few homes requiring buyouts.

Future Conditions with Kissingbower Buyout (Alternative C): With implementation of this alternative, further adverse cumulative impacts to residents (and their homes) on Kissingbower Road would be eliminated when they are relocated to a safer area. These residents would not be financially impacted by future flood events by avoiding the extensive financial damage to their property as well as the adverse health and aesthetic impacts associated with impacts of flood water in their homes. The buyout program would continue but in other areas of town.

Future Conditions with Kissingbower Buyout with Recreation Park (Alternative D): Implementation of this alternative would provide the same cumulative benefits as Alternative C above with the addition of a recreation park. The recreation park would provide cumulative benefits through prevention of further development (and additional adverse impacts) of the flood plain in the future after acquisition of the property by the city. The recreation park would also provide cumulative benefits of recreation for the local community over an indefinite time. This recreational benefit would be a trade-off when compared to the loss ecosystem benefits if the area was bought out under the buyout program; but at this time Augusta-Richmond County has no plans or funds to buyout the property in the Kissingbower area.

Rosedale Dam Detention Area; Kissingbower Buyout with Park (Selected Plan/Alternative E):

Implementation of this alternative would result in the most benefits to cumulative impacts by combining the cumulative benefits of both the detention area and the Kissingbower Buyout/Recreation Area discussed above in Alternatives B and D.

The previously discussed beneficial impacts from the detention area would be expected to offset to a minor degree the many past adverse impacts to the stream ecosystem and flood plain from many decades of development activities. In addition, the large increases in flooding of this area from development activities over the last few decades would be offset to some degree from the proposed improvements.

No other significant cumulative impacts associated with the proposed action and other past, present, and foreseeable actions have been identified during this assessment. Coordination with appropriate resource agencies will continue to ensure future actions do not result in direct or indirect impacts to natural resources in the vicinity.

Table 2: Summary of Impacts of Alternatives

	FACTORS	ALT. A NO ACTION	ALT. B DETENTION AREA	ALT. C BUYOUT	ALT. D BUYOUT/ PARK	ALT. E SELECTED PLAN
1.	Economics/Social	A	B	b	b	B
2.	Recreation	--	--	--	b	b
3.	Historical/Archaeological/ Architectural	--	a	U	U	U
4.	Land Use	--	b	b	B	B
5.	HTRW	--	--	--	--	--
6.	Soil Conservation	--	B	--	--	B
7.	Stream/Wetlands Ecosystem	--	b	--	--	b
8.	Water Quality	--	b	--	--	b
9.	Air Quality	--	--	--	--	--
10.	Noise Levels	--	--	--	--	--
11.	Public Safety/Health	--	b	b	b	b
12.	Flood plain	--	b	b	b	b
13.	Flora/Fauna	--	b	--	--	b
14.	Threatened & Endangered Species	--	--	--	--	--
15.	Environmental Justice	--	b	b	b	b
16.	Cumulative Impacts	a	b	--	--	b

(A – Significant adverse impact) (a – Minor adverse impact) (B – Significant beneficial impact) (b – Minor beneficial impact) (--- None or negligible) (U - Undetermined)

5 Compliance with State/Federal Authorities

The table below summarizes compliance of proposed action with applicable Federal/State laws.

Table 3: Relationship of Project to Environmental Requirements

Federal Policy	Selected Alternative
Anadromous Fish Conservation Act, 16 U.S.C. 757, et seq.	In compliance
Archaeological and Historic Preservation Act, as amended, 15 U.S.C. 312501, et seq.	In compliance, pending SHPO concurrence during D/I Phase
Clean Air Act, as amended, 42 U.S.C. 7401-7671q, et seq.	In compliance
Clean Water Act, as amended (Federal Water Pollution Control Act) 33 U.S.C. 1251, et seq.	In compliance
Coastal Barrier Resources Act, as amended, 16 U.S.C. 3501, et seq.	Not applicable
Coastal Zone Management Act, as amended, 16 U.S.C. 1451 et seq.	Not applicable
Endangered Species Act, as amended, 16 U.S.C. 1531, et seq.	In compliance
Environmental Health and Safety of Children; E.O. 13045	In compliance
Environmental Justice; E.O. 12898	In compliance
Estuary Protection Act, 16 U.S.C. 1221, et. seq.	Not applicable
Federal Water Project Recreation Act, as amended, 16 U.S.C. 4601-12, et seq.	Not applicable
Fishery Conservation and Management Act of 1976, Public Law 99-659.	In compliance
Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661, et seq.	In compliance
Floodplain Management; E.O. 11988	In compliance
Georgia Hazardous Waste Management Act (OCGA 12-8-60)	In compliance
Georgia Rules for Hazardous Waste Management; (391-3-11)	In compliance
Magnuson-Stevens Act, as amended, Public Law 104-297.	Not applicable
Marine Mammal Protection Act, 15 U.S.C. 1361 et seq.	Not applicable
Marine Protection, Research, and Sanctuaries Act of 1972, 33 U.S.C. 1401, et. seq.	Not applicable
Migratory Bird Conservation Act of 1929, 16 U.S.C. 715	In compliance
Migratory Bird Treaty Act of July 3, 1918 as amended.	In compliance
National Environmental Policy Act of 1969 (NEPA), as amended, 42 U.S.C. 4321, et seq.	In compliance

Federal Policy	Selected Alternative
National Historic Preservation Act of 1966, as amended, 15 U.S.C. 300101, et seq.	In compliance, pending SHPO concurrence during D/I Phase
Protection of Wetlands; E.O. 11990	In compliance
Rivers and Harbors Act, 33 U.S.C. 401 et seq.	Not applicable

Environmental compliance for the proposed action has been achieved by: coordination of this EA and FONSI with Federal and State resource agencies, organizations, and individuals for their review and comments; U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) confirmation that the proposed action would not be likely to adversely affect any endangered or threatened species; concurrance from GA EPD that the 2005 WQ Certification is still valid, or receipt of a new Certification; and public review of the CWA Section 404(b)(1) Public Notice; and receipt and acceptance or resolution of all USFWS Fish and Wildlife Coordination Act recommendations.

6 Consultation and Coordination

The individuals/agencies listed below were consulted during this study:

Name	Organization
Jeff Darley	Georgia DNR
Anna Yellin	Georgia DNR-WRD
Brian Moore	Savannah District, Regulatory Division
David Crosby	Savannah District, Regulatory Division
Tony Able	USEPA
Dave Crass	GA SHPO
Sherry McCumber	Savannah District, Engineering Division, Geotechnical Branch
Hameed U. Malik	Augusta-Richmond County Public Works and Engineering Department
Debbie Harris	USFWS
Gene Eidson, Ph.D.	President of Pit Lake Biological Research Station
Adam Spiller	KCI Technologies, Inc.

Georgia State Historic Preservation Office (GA SHPO): Section 106 of the NHPA coordination was initiated with the GA SHPO in December 2014. Rosedale Dam site (9RI1099) was determined not eligible for the NRHP in March 2016. The results of the Kissingbower Road historic building inventory will be coordinated separately during the D/I phase of this project.

NEPA regulations require that Federal, state, and local agencies with jurisdiction or special expertise regarding environmental impacts be consulted and involved in the

NEPA process. The Draft EA was made available for review by the general public and environmental resource agencies. A Joint Public Notice announcing the availability of the Draft EA/FONSI and applying for Water Quality Certification was sent to all the parties on the USACE Regulatory mailing list in Georgia in compliance with the National Environmental Policy Act (NEPA). The District has also sent copies of the Draft EA to all appropriate parties including Federal, state, and local agencies.

The individuals/agencies listed below responded with letters or emails regarding the draft EA/FONSI during the 30-day comment period:

Organization	Name
EPA Region 4 - NEPA Program Office	Dan Holliman
US Fish and Wildlife Service	Donald Imm Coastal Georgia Supervisor
National Marine Fisheries Service	Virginia Fay Assistant Regional Administrator
Mr. J. Milton Martin, Jr	Homeowner Rosedale Dam Area
Georgia DNR-EPD	Jeffrey Larson Assistant Branch Chief Watershed Protection Branch
Georgia DNR-Wildlife Resources Division	Anna Yellin Environmental Review Coordinator
Georgia SHPO	Jennifer Dixon Program Manager

All comments, letters of concurrence, and permits received regarding the proposed action are located in Appendix C. After signature of the Final EA, these commenters will receive a separate email with a link to the Final EA & FONSI and referrals where they can see how their comments were addressed.

EPA Comment 5: EPA suggested placing a footnote at the bottom of Table 4 in the Feasibility Report describing the source of estimates for the Benefit Cost ratios. USACE concurred with comment and added a footnote to Table 4 in Feasibility Report.

GA DNR-HPD Comment 2 (Letter dated January 6, 2017): HPD request**s** Section 106 documentation regarding Phase II of the project, once available. USACE agrees to provide the additional information requested during the D/I Phase to complete Section 106 consultation.

Letter from J. Milton Martin: Mr. Milton conveyed some concerns with the design of the detention basin. Appendix C contains the USACE responses to his comments.

The other regulatory agencies supported the Selected Plan.

7 Mitigation

The appropriate application of mitigation is to formulate an alternative that first avoids adverse impacts, then minimizes adverse impacts, and lastly, compensates for unavoidable impacts. No impacts have been identified that would require compensatory mitigation.

The sunken box culvert at the Rosedale Dam Detention Area would prevent the potential for scouring of the channel bottom along the edge of the culvert, which would create a barrier to wildlife passage through the culvert. This barrier would have created hazards by forcing wildlife to go around the culvert instead of utilizing the safety of the creek for movement/migration through this area. In addition to improving the conditions for wildlife passage along the canal greenway, this culvert modification would provide a more suitable substrate for wildlife that may inhabit or pass through the culvert.

8 Conclusion

The proposed action consists of the 1) Rosedale Dam Detention Area and:
2) Non-Structural Improvements (buyout of properties on Kissingbower Road and development of a recreation park. The proposed park at Kissingbower Road would consist of 0.83 acres from the acquisition of five parcels.

The Rosedale Dam Detention Area would restore some of the lost natural flood plain storage capacity from decades of development within the flood plain and thereby reduce economic damages from flooding in some of the developed areas of this drainage basin. As designed, the Rosedale Dam Detention Area would limit downstream scour and loss of aquatic habitat by reducing the peak flow rate and energy of storm water discharges to the receiving stream. Subsequent to this reduction of downstream erosion, benefits may occur to wetlands, flood plains, riparian vegetation, and bottomland hardwoods.

The non-structural feature would result in benefits to the flood plain by converting residential use of the flood plain to greenspace/recreational use in the area; resulting in beneficial impacts to flood plain management.

The U.S. Corps of Engineers Savannah District office has assessed the environmental impacts of the proposed action and has not identified any significant adverse impacts on the quality of the human environment. However, this assessment has identified some beneficial impacts from the proposed action to various resources, as detailed in Section 4.0 herein.

The impacts to cultural resources are not completely identified at this time and coordination is on-going with the Georgia SHPO. Site 9RI1099, Rosedale Dam, has been determined not eligible for the NRHP. If any of the buildings included in the Kissingbower Buyout are determined eligible for the National Register and the implementation of the Selected Plan is determined to have an adverse effect on the resource(s), an adverse effect in the Section 106 process would not necessarily mean the district will be unable to reach a FONSI. Neither NEPA nor Section 106 requires the preparation of an EIS solely because the proposed undertaking has the potential to adversely affect a historic property. USACE would follow procedures identified in 36 CFR 800 to mitigate adverse effects to the historic property. The environmental effects of the Selected Plan on the historic property would not be significant within the meaning of 40 CFR 1508.27.

9 List of Preparers

The agency responsible for preparing this EA is as follows:

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Savannah District, Planning Division
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The following individuals contributed to the preparation of this EA:

Name	Role	Project Responsibility
Bob Sirard	Project Manager	Project/Fiscal Management
William Bailey	Planning Division Chief	Quality Control
Nathan Dayan	Environmental Team Leader	Quality Control
David Walker	NEPA Biologist	NEPA document preparation/coordination.
Monica Dodd	Plan Formulation	Plan Formulator
Julie Morgan	Archeologist; Section 106 Specialist	Cultural Resources; SHPO Coordination
Jeff Morris	Team Leader, Plan Formulation and Economics	Supervisory Review

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