
Final Draft

**Shakerag WRF Discharge
Right-of-Way Request
Forsyth County, Georgia
Environmental Assessment**

**PEPC Project # 23722
Chattahoochee River National Recreation Area**

September 2010

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Executive Summary

This Environmental Assessment (EA) provides decision makers and the public with information and analysis on a proposed right-of-way (ROW) within the Chattahoochee River National Recreation Area (CRNRA) in Forsyth County, Georgia. The ROW would be used by the Forsyth County Water and Sewer Department (FCWSD) to install an underground outfall diffuser pipe system in the bank and bed of the Chattahoochee River just north of McGinnis Ferry Bridge in Forsyth County. The cascade diffuser is associated with the proposed Shakerag Water Reclamation Facility (WRF), which was permitted by the Georgia Environmental Protection Division (GA EPD) to discharge up to 6 million gallons of wastewater a day (mgd) in August of 2010. The Shakerag WRF would be constructed well outside of the river buffer. The purpose of this document is to describe which aspects of the Proposed Action have the potential to impact environmental and cultural resources within the boundaries or viewsheds of the CRNRA.

Purpose and Need for the Proposed Action

The FCWSD proposes to construct a new WRF near its existing Threatt Land Application System (LAS) in southern Forsyth County. Concurrent with this proposed facility, the FCWSD has requested a permit to place a discharge diffuser in the Chattahoochee River between river miles 340 and 341 to discharge up to 6.0 mgd of reclaimed water from the proposed Shakerag WRF and the existing Fowler WRF to the Chattahoochee River. The FCWSD has received a year-round wasteload allocation (WLA) from the GA EPD for the proposed discharge (GA EPD #23-123).

The Proposed Action is the establishment of an ROW within the CRNRA for the purpose of constructing water conduits and associated infrastructure for the FCWSD's Chattahoochee River Diffuser project. The enabling legislation for the CRNRA authorizes the Secretary of the Interior to grant easements for ROWs through, over, and under the CRNRA for various purposes, including water conduits and utility purposes incident to industrial, commercial, or agricultural use (PL 184, 1953 and PL 91-664, 1971).

The components of the proposed diffuser are described in the Shakerag WRF and Chattahoochee River Diffuser Design Development Report (CH2M HILL, 2005a) and in the Construction Design Specifications. The following facilities are proposed to be constructed and operated by FCWSD within the proposed ROW:

- An approximately 100-foot by 10-foot open trench would be cut excavated in the river bottom at the diffuser site.
- A total of 100 feet of 36-inch-diameter High Density Polyethylene (HDPE) pipe would be installed.
- The diffuser would occupy the last 77.5 feet of pipe with 10 ports (6-inch diameter) located at a spacing of 7.5 feet center to center.

- A 56-inch by 56-inch box of concrete would encase the entire length of 36-inch HDPE pipe, anchoring it and protecting it. This anchor would be constructed of concrete, rebar, and epoxy grout and would rest within a 4-foot deep trench drilled into the bedrock.
- After the diffuser is secured to the bedrock, it would be covered with 40 cubic yards of granular fill. The diffuser ports would protrude approximately 6 inches from the river bed.

Alternatives

Six alternatives to the project were considered and are summarized in Table ES-1. These alternatives were identified during the wastewater planning process for the Shakerag WRF and were evaluated in the Environmental Information Document (EID) (CH2M HILL, 2006), which is required by GA EPD as part of the wastewater National Pollutant Discharge Elimination System (NPDES) permitting process.

TABLE ES-1
Description of Alternatives Considered
Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Alternative	Description
A – No Action	The No-Action Alternative would not meet the project needs, because it would not allow for FCWSD capacity expansion and beneficial reuse of reclaimed water.
B - Land Application System	Alternative B would not meet the project needs because there is not enough suitable property for creation or expansion of a LAS with adequate capacity to accommodate the discharge from the Shakerag WRF.
C - Blended Reuse	Alternative C would not meet the project needs, because it is not economically feasible and would have high environmental impacts.
D - Direct Reuse	Alternative D would not meet the project needs because of the high cost of implementation and the lack of a regulatory framework.
E - Surface Water Discharge to Big Creek	Alternative E would not meet the project needs, because the WLA for Big Creek has already been completely allotted and any new discharge would further deteriorate water quality and would not be permitted.
F – Surface Water Discharge to Etowah River Basin	Alternative F would not meet the project needs, because it would increase Inter-Basin Transfer (IBT) and would require costly infrastructure that is not economically feasible.
G (Proposed Action) – Surface Water Discharge to the Chattahoochee River	Alternative G would meet the project needs, because it would increase FCWSD capacity and make a beneficial reuse of reclaimed water while reducing IBT.

The No-Action Alternative, Alternative A, represents the day-to-day operations of running the Threatt LAS property, as they relate to the Proposed Action and other action alternatives presented in this document. The No-Action Alternative would continue to rely on outdated LAS strategies to accommodate increased customer demands. The No-Action Alternative would not meet the long-term goals of FCWSD, which include the use of best available technologies that minimize consumptive uses and the potential for IBTs. The No-Action Alternative would, however, provide a basis for comparing present conditions in the CRNRA with the action alternatives and their anticipated environmental and cultural resource consequences.

Alternatives B through F were eliminated because either they were not cost-effective or they have high potential for impacts to one or more of the following impact topics: archaeological resources, natural resources, sensitive habitats, rare species, and visitor use. The remaining two alternatives, the No-Action Alternative (A), and the Proposed Action Alternative (G), are evaluated in this EA.

Proposed Action Alternative

The Proposed Action would discharge up to 6.0 mgd of high-quality reclaimed water to the Chattahoochee River between river miles 340 and 341. Table ES-2 summarizes the Environmental Effects of the No Action and Proposed Action alternatives. The proposed Chattahoochee River discharge would increase the capacity and operational flexibility in the Forsyth County beneficial reuse system. The State has recognized that the return of high-quality reclaimed water to waterways is preferable to non-beneficial disposal alternatives, which do not reduce consumptive use. This alternative is also preferable because it would reduce the amount of IBT of water and augment stream flows for downstream users. The discharge would result in minor elevations in water temperature in the immediate vicinity of the diffuser. Minor adverse impacts associated with water temperature would be localized (within 10 feet of the diffuser) and of short duration. Modeling for the diffuser design indicates that all temperature standards would be met in the Chattahoochee River. Little to no water resource impacts would be anticipated because of the high quality of the effluent, and would be limited to minor increases in temperature (less than 2°F) near the diffuser. Locally, only minor adverse impacts to the trout population would occur due to slight increases in water temperature in the immediate vicinity of the diffuser. Additionally, the anticipated, final NPDES permit limits for pH, 6.0 to 8.5, the one parameter for which this segment of the Chattahoochee River is listed on GA EPD's 303(d) list, are consistent with the point source controls seen in other pH Total Maximum Daily Load documents in north Georgia. This treatment technology meets the intent of Georgia's Anti-degradation Rule (391-3-6-03(2)) by protecting existing instream water uses and water quality via the "highest statutory and regulatory requirements for all new and existing point sources" Short-term moderate impacts to recreational activities in the Chattahoochee River and in the CRNRA would occur during construction due to the need to use a coffer dam; however, there would be only minor impacts from use of the ROW during operation of the project.

TABLE ES-2
 Summary of Environmental Effects
Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Impact Topics	No-Action Alternative	Surface Water Discharge to Chattahoochee River (Proposed Action)
Cultural, Historic, and Archaeological Resources		
Cultural, Historical and Archaeological Resources	NE	NE
Natural Resources		
Vegetation	NE	Short-term MAI, Long-term NAI
Wildlife	NE	NAI
Aquatic resources	NE	MAI
-Trout	NE	MAI
Special status species	NE	NAI
Wetlands and floodplains	NE	Short-term MAI, Long-term NAI
Geology and soils	NE	Short-term MAI, Long-term NAI
Water quality and flow		
Flow	NAI	NBI
pH (not supporting designated use)	NE	MAI
Fecal Coliform	NE	MAI
Dissolved Oxygen	NE	NAI
Nutrients	NE	MAI
Temperature	NE	MAI
Noise		
Recreation Area users	NE	Short-term MDA, Long-term NAI
Residents	NE	Short-term MDA, Long-term NAI
Visitor and Community Values		
Fly-Fishers	NE	Short-term MDA, Long-term MAI
Cumulative Impacts		
Water Quality	NE	NAI
Visitor and Community Values	NE	NAI

NE – No Effect, NAI – Negligible Adverse Impact, NBI – Negligible Beneficial Impact, MAI – Minor Adverse Impact, MDA - Moderate Adverse Impact, MJI – Major Adverse Impact,

Public Involvement

In addition to the public meeting held for the EID (CH2M HILL, 2006), a Notice of Availability announced the release of the Environmental Assessment (EA) for public comment. The EA is available electronically at the Planning, Environment, and Public Comment (PEPC) website: <http://parkplanning.nps.gov/parkHome.cfm?parkId=364>. The EA may also be viewed at the following locations:

- Park Headquarters - 1978 Island Ford Parkway; Atlanta, GA 30350
- Forsyth County Public Library - 585 Dahlonega Road, Cumming, GA 30040
- The NPS Planning, Environment and Public Comment (PEPC) website - <http://parkplanning.nps.gov>.

Written comments received during the official comment period will be considered as part of the National Environmental Policy Act process. If you wish to comment on the EA, you may submit comments on the document by mail (Superintendent, CRNRA; 1978 Island Ford Parkway; Sandy Springs, GA 30350), electronic mail (chat_superintendent@nps.gov), or through the PEPC website listed above. The public comment period will be open for 30 days.

Please be aware that your entire comment - including your personal identifying information - may be made publicly available. While you can ask to have your identity withheld, we cannot guarantee that we will be able to do so. We will always make submissions from organizations or businesses, and from individuals identifying themselves as representatives of organizations or businesses, available for public inspection.

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Acronyms and Abbreviations

BMP	Best Management Practice
FCWSD	Forsyth County Water and Sewer Department
FM	Force Main
cfs	cubic feet per second
CRNRA	Chattahoochee River National Recreation Area
CWA	Clean Water Act
CEQ	Council on Environmental Quality
CTM	Critical Thermal Maximum
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FTDMS	Fish and Temperature Database Matching System
FONSI	Finding of no Significant Impact
GA EPD	Georgia Environmental Protection Division
DNR WRD	Georgia Department of Natural Resources Wildlife Resources Division
mgd	Million gallons per day
MBR	Membrane Bioreactor
MRPA	Metropolitan Rivers Protection Act
NEPA	National Environmental Policy Act of 1969
NHP	National Historical Park
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	Register of Historic Places
NWI	National Wetlands Inventory
NRCS	Natural Resources Conservation Service
PEPC	Planning, Environment, and Public Comment
ROW	Right-of-way
SHPO	State Historic Preservation Office
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WRF	Water Reclamation Facility

1.0 Purpose and Need

The following sections detail the purpose and need for the Proposed Action as it relates to the Chattahoochee River National Recreation Area (CRNRA), which is under the jurisdiction of U.S. Department of the Interior, National Park Service (NPS). The location of the CRNRA as it relates to Forsyth County and the balance of north Georgia is illustrated in Figure 1-1. This Environmental Assessment (EA) is intended to document the analysis of the No-Action Alternative and 6 reasonable action alternatives and their impacts on the environment within the boundaries and the viewshed of the CRNRA. Project activities outside the boundaries or viewshed of the CRNRA are considered outside the scope of this EA. This document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, the regulations of the Council on Environmental Quality (CEQ) (40 CFR 1508.9), and the NPS's Director's Order (DO) -12 (Conservation Planning, Environmental Impact Analysis, and Decision-making) and Reference Manual (RM) #53 (Special Park Uses).

Pursuant to Executive Orders 11988 (Floodplain Management) and 11990 (Wetland Protection) and the NPS DOs #77-1 and #77-2, NPS has also evaluated the impacts of the Proposed Action on floodplains and wetlands. The statement of finding (SOF) provided as Appendix A documents the Proposed Action's compliance with these NPS floodplain management and wetland protection procedures. In addition to the SOF, the Forsyth County Water and Sewer Department (FCWSD) is coordinating with the U.S. Army Corps of Engineers (USACE) on the development of a Section 10 standard Individual Permit for the Proposed Action. Lastly, the project components are also within the 2,000-foot Chattahoochee River corridor, as identified in the Metropolitan Rivers Protection Act (MRPA) (Official Code of Georgia Annotated [O.C.G.A.] 12-5-440), which coincides with the 48-mile extent of the CRNRA. The MRPA is administered jointly by Georgia Mountains Regional Development Center (RDC) and Forsyth County to ensure that all land disturbing activity within a designated corridor of the Chattahoochee River in Forsyth County complies with development regulations, such as stream buffer and floodplain regulations and clearing and impervious cover limitations. Since all land-disturbing activity in the corridor must be reviewed, approved, and certified for consistency with the Chattahoochee Corridor Plan standards, an application for a certificate under the provisions of the MRPA was filed by FCWSD with the Georgia Mountain RDC and the certificate has been received.

1.1 Purpose of the Proposed Action

The Proposed Action is the establishment of a right-of-way (ROW) to authorize a special park use within the CRNRA for the purposes of the installation and operation of a discharge diffuser in the Chattahoochee River between river miles 340 and 341 (Figure 1-2). The diffuser would receive reclaimed water from the proposed FCWSD Shakerag Water Reclamation Facility (WRF) and existing Fowler WRF. The FCWSD proposes to construct this new WRF north of its existing Threatt Land Application System (LAS) in southern Forsyth County (Figure 1-3). FCWSD is requesting a ROW permit to place a discharge

diffuser in the Chattahoochee River that would eventually discharge up to 6.0 million gallons per day (mgd).

FCWSD has received a year-round wasteload allocation (WLA) from the Georgia Environmental Protection Division (GA EPD) for the proposed discharge (GA EPD #23-123) and was issued National Pollutant Discharge Elimination System (NPDES) permit # GA 0038954 on August 18, 2010 (Appendix B).

While the Proposed Action would not cross terrain directly managed by the NPS, the NPS claims jurisdiction over activities within the Chattahoochee River per Title 16, Chapter 1, Section 460 ii, which defines the CRNRA as “the river and its bed together with the lands, waters and interests therein.” In response to the request for a ROW permit under Title 36, Chapter 1, Part 14, the NPS notified FCWSD of the need for the additional evaluation contained in this EA.

The components of the proposed diffuser are described in detail in the Shakerag WRF and Chattahoochee River Diffuser Design Development Report (CH2M HILL, 2005a) and are illustrated in the Design Drawings provided in Attachment 3 of Appendix A, the Wetlands SOF. Attachment 3 provides the overall site plan, side plan view and other design drawings of the project components. The side plan view provides a cross section of the Chattahoochee River at the diffuser location to illustrate river depth under low flow conditions, 650 cubic feet per second (cfs), and how the diffuser ports would relate to the river bottom. Additionally, a Metes and Bounds figure (Appendix C) provides the exact location where the proposed diffuser would enter CRNRA property and where it will terminate on CRNRA property. The following facilities are proposed to be constructed and operated by FCWSD within the proposed ROW:

- An approximately 100-foot by 10-foot open trench would be cut excavated in the river bottom at the diffuser site.
- A total of 100 feet of 36-inch-diameter High Density Polyethylene (HDPE) pipe would be installed.
- The diffuser would occupy the last 77.5 feet of pipe with 10 ports (6-inch diameter) located at a spacing of 7.5 feet center to center.
- A 56-inch by 56-inch box of concrete would encase the entire length of 36-inch HDPE pipe, anchoring it and protecting it. This anchor would be constructed of concrete, rebar, and epoxy grout and would rest within a 4-foot deep trench drilled into the bedrock.
- After the diffuser is secured to the bedrock, it would be covered with 40 cubic yards of granular fill. The diffuser ports would protrude approximately 6 inches from the river bed.

Construction will be facilitated by the installation of a temporary coffer dam along the western bank of the river which will allow a safe, dry work environment for workers. There are multiple proprietary coffer dam designs currently offered each with different pros and cons regarding safety and potential impacts from use (free standing versus pile driven walls, etc.). During final design, FCWSD will screen and select the temporary dam system

that best meets the site-specific safety needs while minimizing impacts to the CRNRA to the extent practical.

1.2 Purpose and Significance of the CRNRA

The CRNRA was originally created in 1978 by Congress in acknowledgment that the “natural, scenic, recreation, historic, and other values of a forty-eight-mile segment of the Chattahoochee River and certain adjoining lands in the State of Georgia from Buford Dam downstream to Peachtree Creek are of special national significance, and that such values should be preserved and protected from developments and uses which would substantially impair or destroy them.” The current CRNRA General Management Plan (NPS, 2008) notes that:

“The purpose of Chattahoochee River National Recreation Area is to lead the preservation and protection of the 48-mile Chattahoochee River corridor from Buford Dam to Peachtree Creek, and its associated natural and cultural resources, for the benefit and enjoyment of the people (NPS, 2008).”

Subsequent authorizations have increased the boundary of the CRNRA to its current area of approximately 10,000 acres. Figure 1-1 shows the location of the CRNRA in relation to Forsyth County and the state of Georgia, while Figure 1-2 shows the location of the activities described in Section 1.1. The CRNRA constitutes an important outdoor recreation resource for several million people in the Atlanta metropolitan area and holds a broad range of cultural resources including a major Native American rock shelter, Civil War sites, and industrial mill sites (NPS, 2008).

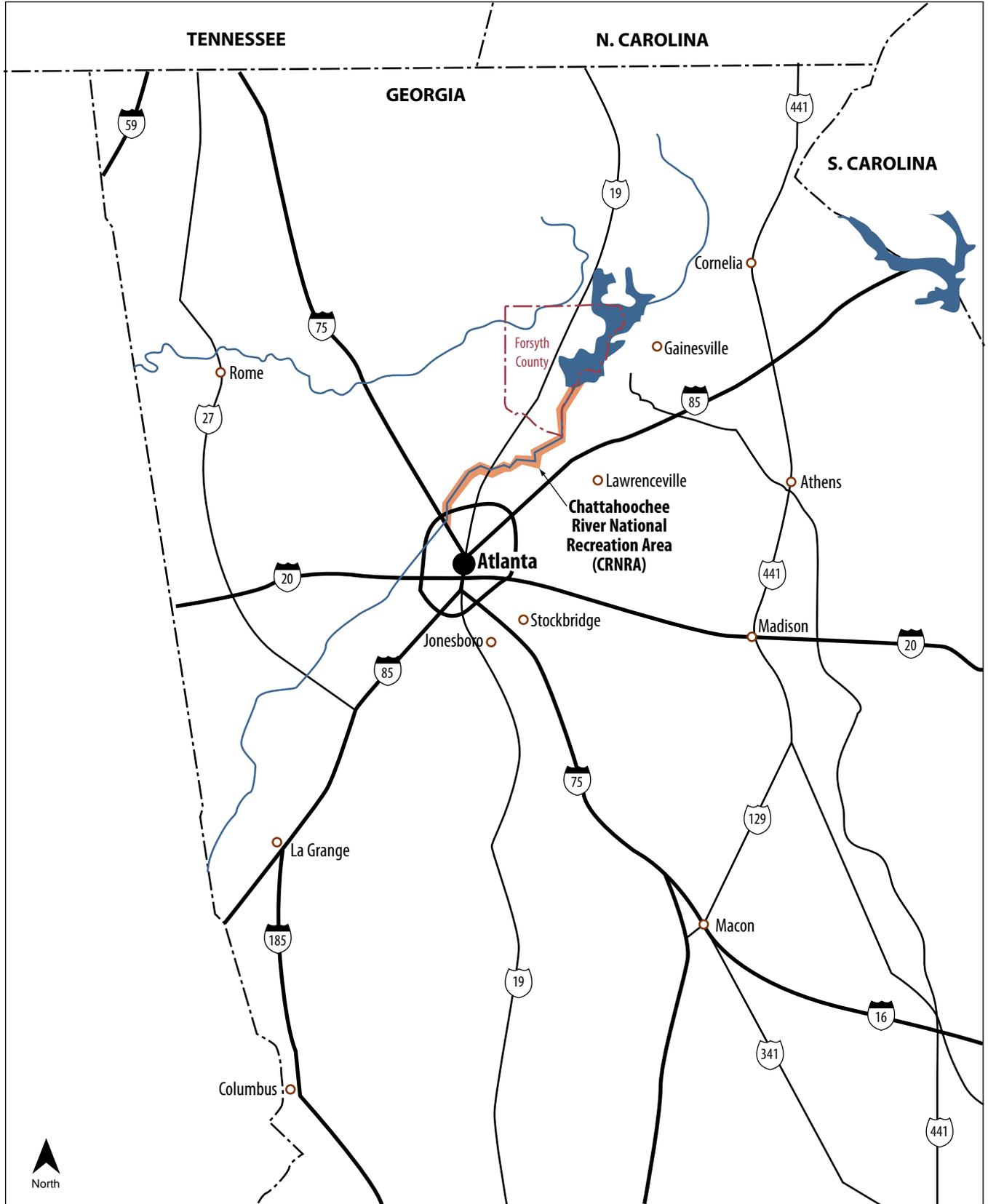
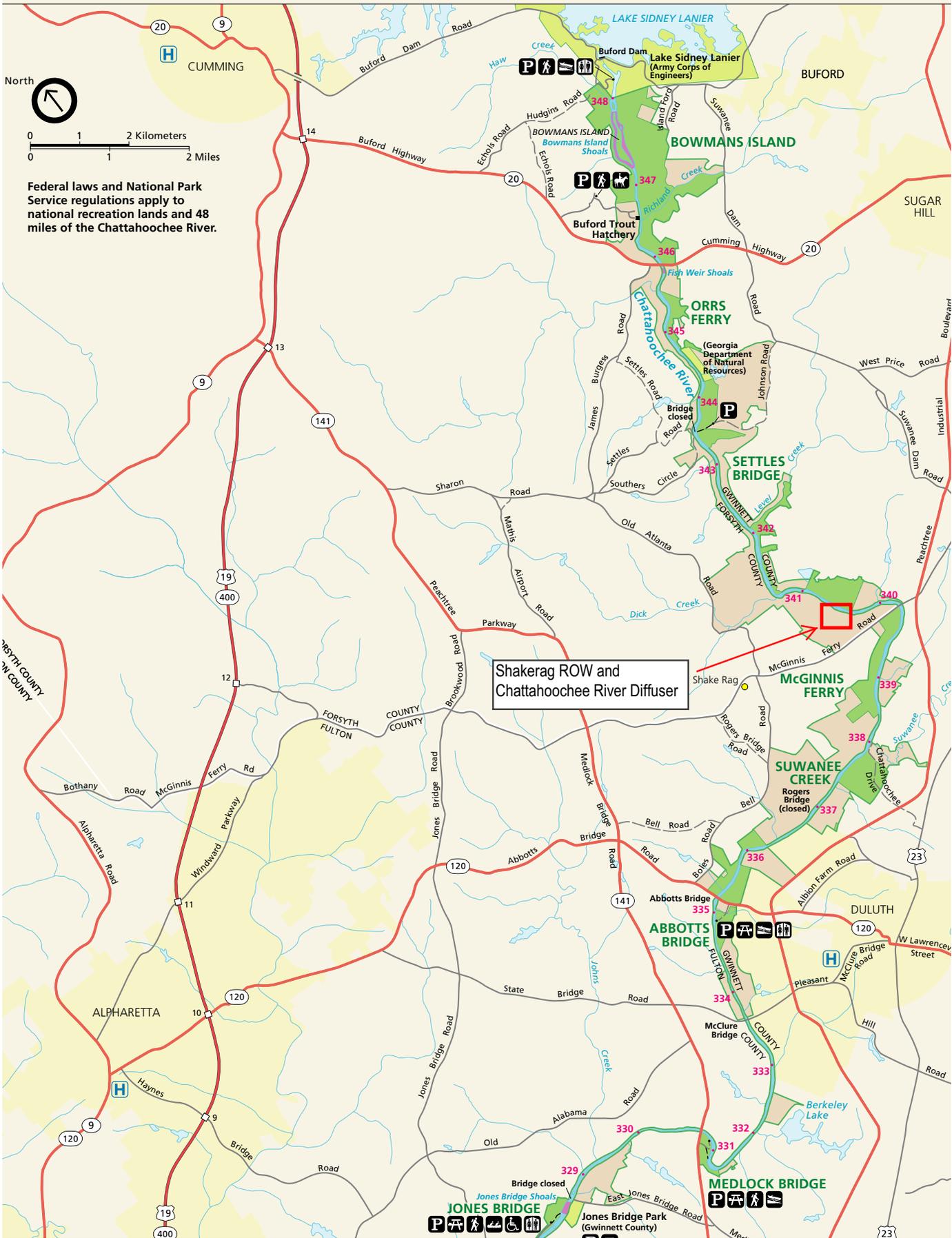


Figure 1-1
 CRRA Location Map, North Georgia
 Sharkrag WRF ROW and Discharge Environmental Assessment

Chattahoochee River National Recreation Area

- | | | | | | |
|---|----------------|-------------|----------------|------------------------------|-----------------------------|
| National Recreation Area (includes 48 miles of the Chattahoochee River) | River milepost | Shoal area | Parking | Restrooms | Hiking trail |
| Private land within authorized boundary | Hiking trail | Exit number | Ranger station | Boat, canoe, and raft launch | Wheelchair-accessible trail |
| Other public area | Unpaved road | Hospital | Picnic area | Canoe and raft launch | Horseback riding trail |



Federal laws and National Park Service regulations apply to national recreation lands and 48 miles of the Chattahoochee River.

Shakerag ROW and Chattahoochee River Diffuser

Figure 1-2

Chattahoochee River National Recreation Area (CRNA)
Shakerag WRF ROW and Discharge Environmental Assessment



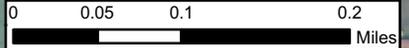
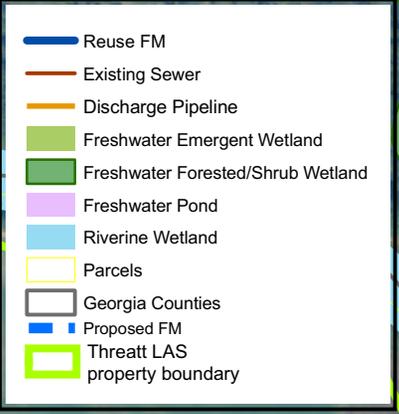
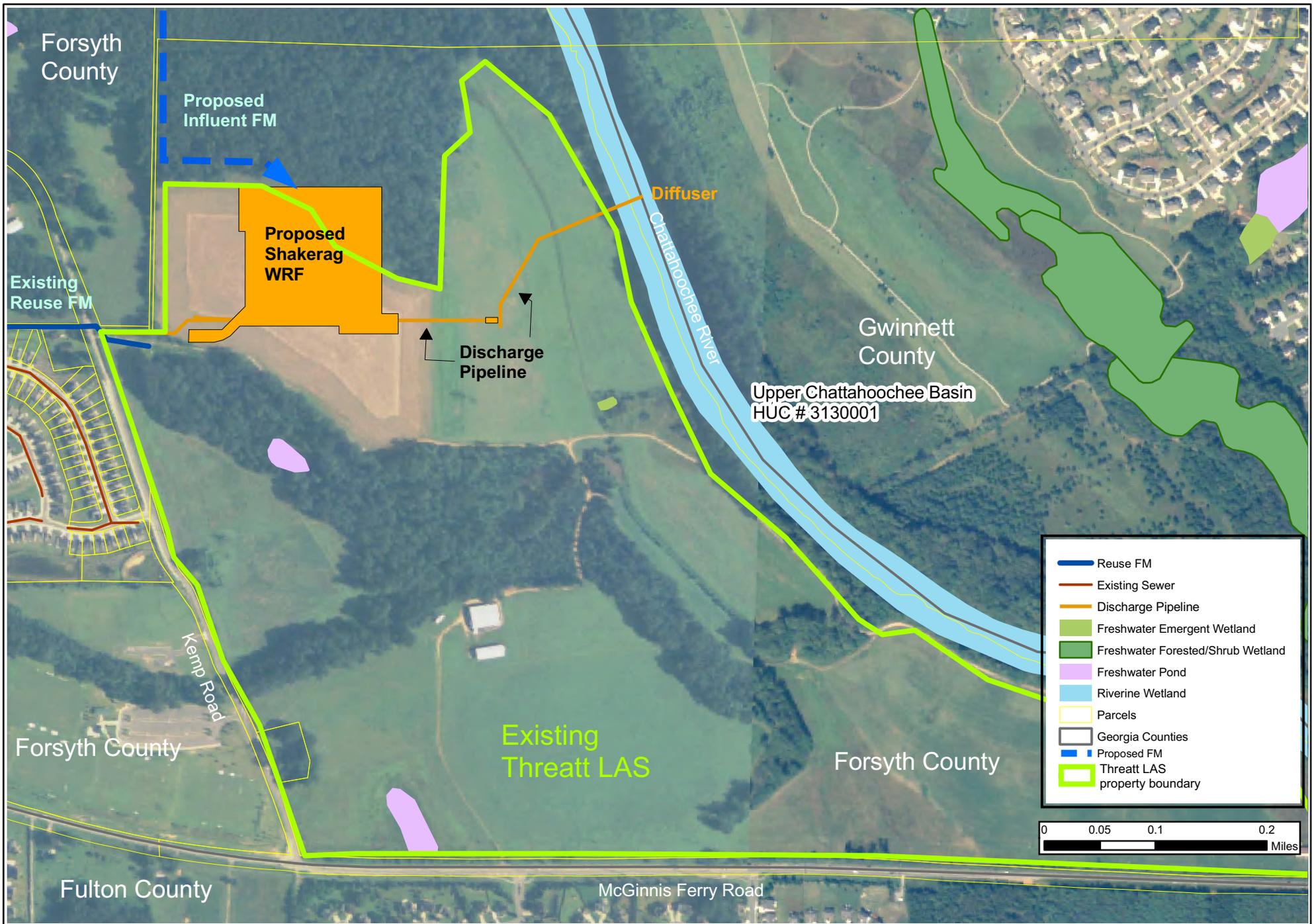
1.3 Project Background and Need

Forsyth County is a 247 square mile area located along GA 400 approximately 40 miles northeast of downtown Atlanta; its County seat is the City of Cumming (Figure 1-1). The County has experienced tremendous growth over the past two decades, illustrated by a County population which grew by 123 percent in the 1990s and by approximately 60 percent between 2000 and 2007 (Forsyth County, 2004 and 2008). The County is drained by two major river systems: the Etowah and the Chattahoochee. The Etowah River basin in the northwestern corner of the County consists of the Etowah River and Settingdown Creek hydrologic sub-basins. The Chattahoochee River basin in Forsyth County includes Lake Lanier and its tributaries upstream of Buford Dam Road in the northeastern corner of the County, which also drains the eastern third of the City of Cumming. The balance of the City of Cumming and the southwestern corner of the County drain to the Chattahoochee River via Big Creek, while the sub-basins south of Buford Dam Road drain to the Chattahoochee River via other tributaries such as Haw Creek and Dicks Creek, located just upstream of the project area (Figure 1-2). The closest CRNRA units to the project area are Settles Bridge across the Chattahoochee River in Gwinnett County and McGinnis Ferry to the south in Fulton County.

Wastewater treatment in the areas served by FCWSD currently occurs through a combination of individual septic systems, publicly owned facilities, and contracted capacity in the City of Cumming, Fulton County, and small private treatment plants. The Forsyth County government desires to construct state-of-the-art treatment and distribution systems for the beneficial reuse of wastewater. These objectives and the FCWSD's projected wastewater needs are further described in the planning documents referenced in Section 1.3.1. The County currently operates the Fowler WRF membrane bioreactor (MBR) plant in the Big Creek drainage sub-basin which is permitted to treat to urban reuse standards as established by the GA EPD.

An 11-mile reuse force main (FM) extends through the southern part of the county, beginning at the Fowler WRF and terminating at the Threatt LAS. The buried drip system at the Threatt LAS is permitted to apply 1.25 mgd to open pasture, where hay is cultivated. Plans are underway to provide reuse water to major outdoor water users, offsetting potable water use and reducing additional withdrawal needs. Figure 1-3 provides a general location map for the proposed Shakerag WRF, the LAS, and discharge diffuser. Detailed design drawings of the project components are also provided in Attachment 3 of Appendix A, the Wetlands SOF.

The ROW permit would support Forsyth County's effort to expand its beneficial reuse system through construction of a new advanced treatment WRF (Shakerag WRF), that would produce a high-quality effluent using MBR technology, and the discharge of up to 6.0 mgd to the Chattahoochee River. This treatment technology meets the intent of Georgia's Antidegradation Rule (391-3-6-03(2)) by protecting existing instream water uses and water quality via the "highest statutory and regulatory requirements for all new and existing point sources" Based on the Wasteload Allocation (WLA) and NPDES permit issued by GA EPD in December of 2007 and August of 2010 respectively, the final, combined Fowler and Shakerag WRF discharge limits are anticipated to closely reflect Table 1-1.



However, while section B.4, Effluent Limitations and Monitoring Requirements, of the NPDES permit and the WLA notes pH limits of not less than 6 or greater than 9 standard units, FCWSD is planning on a final permit range of 6 to 8.5. This reflects the pH standard for waterways such as the Chattahoochee River that are designated for Drinking Water, Recreation and as a Secondary Trout Stream. Additionally, as discussed in Section 2.6, this segment of the Chattahoochee River was added to the 303(d) list in 2008 for pH and, while a Total Maximum Daily Load (TMDL) has not yet been developed, current pH TMDLs for other stream segments in North Georgia are requiring an upper limit of 8.5 of local point sources in spite of not definitely linking them as a source of the violations.

TABLE 1-1
Shakerag WRF WLA and NPDES Permit Limits (including flows from Fowler WRF)
Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Parameter	GA0038954	
	Monthly Average (mg/L) <i>unless otherwise specified</i>	Weekly Average
Combined Flow (mgd)	6.0	7.5
5-Day Carbonaceous Biochemical Oxygen Demand (CBOD5)	2.9	4.35
Total Suspended Solids (TSS)	10	15
Fecal Coliform Bacteria (col./100 mL) ^a	200	400
Ammonia as N	0.5	0.75
Total Phosphorus (TP) as P	0.3	0.45
Ortho-Phosphorus as P	Report	
Organic Nitrogen	Report	
pH, standard units	6.0 – 8.5	
Temperature	Report ^b	
Chronic Wet Effluent Toxicity (WET)	Report NOEC	

Source: GA EPD Permitting, Compliance and Enforcement Program, December 2007 and August 2010.

The minimum Dissolved Oxygen (DO) shall be 6.0 milligrams per liter (mg/l) or higher.

^a Geometric mean.

^b Per GA EPD Revisions to section B.1 and Part I.C.8 of the Final Permit, August 18, 2010. "The treated wastewater discharge shall not increase the temperature of the Chattahoochee River between the upstream and downstream monitoring locations."

When operational, the Shakerag WRF would initially receive flows that are treated by Fulton County and subsequently would allow the decommissioning of two small LASs (1 public and 1 private), thereby reducing the County's consumptive water use. The design flows for this project are based on the combined wastewater flows from the service areas in the Chattahoochee and Etowah River basins to address the need to return the water withdrawn from the Chattahoochee River basin and thus minimize inter-basin transfer (IBT) of surface water.

In 1999, GA EPD began developing strategies to improve water quality in the Chattahoochee River. Until those strategies were implemented, no additional discharges could occur, even those that could have a net positive effect on water quality. Recently, GA EPD completed an evaluation of wasteload capacity for the Chattahoochee River and determined that additional discharges of reclaimed water can be permitted. A WLA was requested by FCWSD and approved by GA EPD in June 2004 for a maximum 6-mgd discharge (GA EPD #23-123, Appendix B).

Forsyth County is committed to meeting its growing wastewater treatment needs by having a beneficial reuse system that either offsets potable demands or withdrawals from the waters of the state. Under the Forsyth County master plan, the reuse FM between the Fowler WRF and the Threatt LAS would remain in service (Jordan, Jones & Golding, Inc. [JJ&G], 2004). Reuse water is currently being provided to one golf course, two County parks, a large mixed use development, and five public school campuses. FCWSD plans to expand the reuse system as additional reuse supply becomes available. The County's reuse program includes conservation to reduce consumptive use and maximize the water available for downstream needs.

The planned Chattahoochee River discharge provides an option that increases the capacity and operational flexibility in the Forsyth County beneficial reuse system. However, beneficial reuse of reclaimed water in irrigation has seasonal limitations, with reduced demand and uptake capacities in cold or wet weather. The State has recognized that the return of high-quality reclaimed water to waterways is preferable to non-beneficial disposal alternatives, which do not reduce consumptive use. In addition, there is recognition at the regulatory level that return of reclaimed water to the watershed is a form of beneficial reuse. In line with these goals, the Metropolitan North Georgia Water Planning District (MNGWPD) *Long-Term Wastewater Management Plan* (JJ&G, 2003) recommends that Forsyth County return up to 6.0 mgd to the Chattahoochee River by 2010. To meet this goal, Forsyth County has applied for and obtained a year-round WLA from GA EPD for the river discharge (Appendix B). When the Shakerag WRF is operational and permitted to discharge to the Chattahoochee River, the County would ultimately discontinue the routine use of the Threatt LAS.

1.3.1 Previous Planning

The need for the Proposed Action is further described by Forsyth County's Sewer System Master Plan, which includes the transfer of wastewater services from private systems and onsite systems to county-owned treatment works, with a goal of having 85 percent of the county served by the sewer system (JJ&G, 2004). Additional treatment capacity such as that of the proposed Shakerag WRF would be required to accomplish these objectives. This increase in capacity is consistent with the MNGWPD *Long-term Wastewater Management Plan*

(JJ&G, 2003). The transfer of wastewater to a new MBR facility would provide the latest treatment technologies and produce high-quality reuse water.

The GA EPD, through the wastewater permitting process, requires a series of planning, environmental, engineering, and economic evaluations. These include:

- **Wasteload Allocation Request:** Forsyth County submitted a request for a WLA to GA EPD to discharge reclaimed water to the Chattahoochee River near McGinnis Ferry Road. The GA EPD evaluated the request based on the existing water quality model for the Chattahoochee and responded with the recommended effluent discharge limits required to meet the water quality standards in this reach of the river.
- **Anti-degradation Report:** The GA EPD requires an anti-degradation analysis as part of the wastewater NPDES permitting process. This analysis is designed to protect water quality, minimize point source discharges, and promote “no discharge” alternatives. The evaluation must demonstrate that the costs for the proposed discharge would not pose an undue socioeconomic burden on utility customers or that the “no discharge” alternative is not feasible. Based on this analysis, the “no discharge” alternative was significantly more expensive than the discharge alternative and the proposed effluent quality would meet water quality standards in the river. The anti-degradation report (CH2M HILL, 2002) was submitted for public review and approved by GA EPD.
- **Environmental Information Document (EID):** The GA EPD requires local governments requesting NPDES permits that require facility improvements or new construction to prepare an EID to evaluate the potential environmental consequences of the proposed construction and operation of the facilities. This evaluation was completed in parallel with the preparation of the design development report (DDR), discussed below. The document was submitted for public review and a public meeting was held to present the EID and the DDR. GA EPD approved the document after taking into account the public comments regarding the project.
- **Design Development Report (DDR):** The DDR provides a summary of the proposed project design and outlines the facilities required to meet the GA EPD required effluent limits. This document, along with the EID, was reviewed and approved by GA EPD as part of the NPDES permitting process.
- **NPDES Permit Application:** The last step in the NPDES permitting process is the submittal of the actual permit application. GA EPD typically holds a final public meeting on the permit application prior to approval of the final NPDES permit.

These additional planning and permitting studies provided much of the basis for the development of this EA.

1.3.2 Scoping

In accordance with the NPS guidelines for implementing the NEPA, external (that is, public and agency) scoping was undertaken to review the Proposed Action. As part of the external scoping process, NPS and FCWSD coordinated with the Georgia Department of Natural Resources Wildlife Resources Division (DNR WRD) Buford Trout Hatchery staff and U.S. Army Corps of Engineers (USACE) to discuss potential impacts of the Proposed Action.

As part of the EID, a public meeting was held on Thursday, November 17, 2005 from 7 PM to 9 PM in the Commissioners Chambers at the Forsyth County Administration Building, 110 East Main Street, Suite 150, Cumming, Georgia 30040. A public notice (attached, with affidavits, in Appendix D) was posted in the newspaper of record (Forsyth County News) every Wednesday for a period of 4 weeks. Four people attended the public meeting and no comments were received at the meeting or by telephone, mail, or email within the 30-day comment period. A sign-in sheet from the meeting, the public comment form, and a list of frequently asked questions are included in an appendix to the EID.

As part of the NEPA process, this EA was made available to the public and resource agencies for a minimum of 30 days to solicit additional questions and comments. Questions and comments received regarding this project were considered in the NEPA process. Comments received during the public review period are included in Appendix D.

1.4 Issues

In addition to the scoping materials described in Section 1.3.2, FCWSD received information from NPS staff and other agencies to aid in the identification of the issues that are discussed in this EA. The following impact topics were derived from these issues and were evaluated as part of this EA.

1.5 Impact Topics and Consequences

Based on the issues identified to date, specific impact topics were developed to focus the EA and to allow comparison of the environmental consequences of each alternative. These impact topics were identified based on the sources discussed in Sections 1.3 and 1.4, as well as federal laws, regulations, and Executive Orders; 2006 NPS *Management Policies* (2006); and NPS staff knowledge of limited or easily affected resources.

Consequences are determined by comparing future conditions under each alternative with the existing baseline conditions. The analysis includes consideration of the intensity and duration of the alternatives. The following definitions will be used in describing the consequences to the impact topics.

Intensity of impact from the Proposed Action to each impact topic was determined and is defined as follows:

- *No Effect* – There will be no impacts that will affect the resource or discipline.
- *Negligible* – Impact to the resource or discipline is barely perceptible and not measurable and confined to a small area.
- *Minor* – Impact to the resource or discipline is perceptible and measurable and is localized.
- *Moderate* – Impact is clearly detectable and could have appreciable effect on the resource or discipline.
- *Major* – Impact would have a substantial, highly noticeable influence on the resource or discipline on a regional scale.

Duration of the impacts in this analysis is defined as follows:

- *Short-term* - When impacts occur only during construction or last less than one year.
- *Long-term* - Impacts that last longer than one year.

A brief rationale for the selection of each impact topic and impact consequence is given below, as well as the rationale for dismissing other topics from further consideration. Appendix I describes the specific impact thresholds associated with each resource area to provide context for the quantification of potential environmental effects in Section 4.0.

Cultural Resources

The National Historic Preservation Act of 1966, NEPA, the 1916 NPS Organic Act, the Archaeological Resources Protection Act, and NPS *Management Policies* (2006) require federal agencies to consider the effects of their proposed actions on cultural resources. Protection and preservation of cultural resources at the CRNRA are of critical importance.

Natural Resources (Aquatic and Terrestrial)

NEPA calls for an examination of impacts on the components of affected ecosystems. NPS *Management Policies* (2006) requires the protection of natural abundance and diversity of all the CRNRA's naturally occurring communities. Impacts to resources such as terrestrial vegetation (including the introduction of non-native species during construction), terrestrial wildlife, and aquatic resources are included in this impact topic. Since natural resources within the CRNRA could incur short-term, minor impacts during construction, the environmental effects are evaluated.

Special Status Species

Section 7 of the Endangered Species Act of 1973 (ESA) directs all federal agencies to help ensure conservation of rare, threatened, and endangered species. Federal agencies are required to consult with the U.S. Fish and Wildlife Service (USFWS) and state agencies to ensure that any action authorized, funded, or carried out by the agency would not jeopardize the continued existence of any listed species or critical habitat. NPS policy also requires examination of the impacts on state-listed threatened, endangered, rare, declining, or sensitive species.

Endangered species are those at risk of extinction in all or a significant portion of their range. Threatened species are those that could be listed as endangered in the near future. Sensitive species are those federally listed as candidate, proposed endangered and proposed threatened species. Candidate species are those for which USFWS has sufficient information on biological vulnerability and threats to support proposals to list them as endangered or threatened, but issuance of proposed rules for these species is precluded by higher priority listing actions. Proposed endangered and threatened species are those proposed for listing as endangered and threatened, respectively, and for which formal ruling is in progress. At present, none of those species receive legal protection under the ESA.

Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds" (2001), recognizes the ecological and economic importance of migratory birds. It requires federal agencies to evaluate the effects of their actions and plans on migratory birds (with an

emphasis on species of concern) in NEPA documents. Species of concern are (1) those identified in the report *Migratory Nongame Birds of Management Concern in the United States* (USFWS, 1995), (2) priority species identified by established plans such as those prepared by Partners in Flight, and (3) species listed in 50 CFR 17.11, *Endangered and Threatened Wildlife*.

Wetlands and Floodplains

Executive Order 11990, "Protection of Wetlands" (1977), requires an examination of impacts to wetlands, while Executive Order 11988, "Floodplain Management" (1977), requires federal agencies to avoid, to the extent possible, adverse impacts associated with the occupancy and modification of floodplains and to avoid development in floodplains whenever there is a practical alternative. Because wetlands and floodplains could incur short-term, minor impacts during construction, the environmental effects are evaluated and an SOF was prepared (Appendix A). It outlines the steps taken to first avoid wetlands and then minimize unavoidable impacts per DO #77-1. Since the adverse impact on wetlands (direct plus indirect impacts) from the entire project totals less than 0.1 acres and isolated within a single, highly localized area, Forsyth County is requesting that wetland compensation requirements be waived. Additionally, FCWSD is coordinating with the USACE on the development of a Section 10/ Individual Permit for the Proposed Action.

Geology and Soils

Geology and soils in the CRNRA are expected to incur short-term impacts during construction of components of the Proposed Action. The ARC Chattahoochee Corridor Plan developed to administer the MRPA, sets forth specific standards in three categories (Vulnerability, Buffer Zone, Floodplains), all of which must be met for a certificate to be granted indicating consistency with the plan. These standards address land disturbance, impervious surfaces, and activities within 150 feet of the river or within the river's 100-year and 500-year floodplains. Since all land-disturbing activity in the corridor must be reviewed, approved, and certified for consistency with the Chattahoochee Corridor Plan standards, an application for a certificate under the provisions of the MRPA was filed by FCWSD with the Georgia Mountain RDC and the certificate has been received. The *Manual for Erosion and Sediment Control in Georgia* requires that appropriate best management practices (BMPs) be implemented during construction to minimize potential impacts (Georgia Soil and Water Conservation Commission, 2002). Since soils would be disturbed during construction of the diffuser, the environmental effects are evaluated.

Water Quality and Flow

NPS (2006) requires protection of water quality consistent with the Clean Water Act (CWA). Construction activities and surface water discharges require coordination with state and federal agencies for applicable permits, including a WLA and wastewater Discharge Permit under the NPDES program and USACE Section 404 individual permit.

The Proposed Action would occur within a 12-mile segment of the Chattahoochee River, from Dicks Creek to Johns Creek, that is listed in Georgia's 2010 Integrated 305(b)/303(d) Report (also referred to as Water Quality in Georgia 2008-2009) as not supporting its designated uses of recreation and drinking water due to pH from urban runoff and nonpoint sources. (GA EPD, 2010) However, the Draft 2010 Report noted a change in the priority year from 2012 to 2017 because the trend in the pH data is improving with no pH

violations since 2006; GA EPD anticipates that pH will be able to be removed in 2012. DNR WRD staff requested that temperature be an impact topic due to the diffuser's proposed location just over 6 river miles downstream of the Buford Trout Hatchery. This segment of the river, including the CRNRA and the hatchery, is illustrated in Figure 1-2. Because the proposed construction has the potential to affect water quality through erosion, stormwater runoff, and construction of the diffuser as well as during operation, the environmental effects are evaluated.

Noise

Construction activities would produce noise that could affect sensitive resources in the vicinity of the CRNRA. Therefore, the environmental effects are evaluated.

Visitor Use and Experience and Public Safety

The Proposed Action is anticipated to affect visitors to the CRNRA in the short term during construction, potentially affecting viewsheds and posing potential hazards to recreational users of the Chattahoochee River. Effects during operations are expected to be minor, although NPS has indicated that environmental effects must be evaluated to ensure no unacceptable impacts. Unacceptable impacts are defined by the NPS to be impacts that, individually or cumulatively, would

- *“be inconsistent with a park's purposes or values, or*
- *impede the attainment of a park's desired conditions for natural and cultural resources as identified through the park's planning process, or*
- *create an unsafe or unhealthy environment for visitors or employees, or*
- *diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or*
- *unreasonably interfere with*
 - *park programs or activities, or*
 - *an appropriate use, or*
 - *the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park, or*
 - *NPS concessioner or contractor operations or services.” (NPS, 2006)*

The MRPA also includes language that allows the NPS to protect park aesthetics and viewsheds in the vicinity of the CRNRA by requiring certification of any land-disturbing activity to ensure compliance with the Chattahoochee Corridor Plan. When enforced, these provisions help protect the viewshed along the river corridor. Additionally, the 2008 NPS General Management Plan notes that the NPS objective is to allow views of the CRNRA and Chattahoochee River corridor from the outside but to ensure that high-rises and nearby developments are not obvious from inside the CRNRA (NPS, 2008).

Cumulative Impacts

As required in the CEQ's regulation, 40 CFR Part 1508.25(c) implementing NEPA, all past, present, and reasonably foreseeable future actions must be considered in the environmental documentation (CEQ, 1997). Cumulative impacts are those incremental impacts on the

environment that result from the Proposed Action when added to other, past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such actions (40 CFR 1508.7). Cumulative impacts may occur shortly after project construction, or may occur over many years.

Recently completed, planned, and potential future projects in the vicinity of the Proposed Action are considered in the cumulative impact analysis provided in Section 4.9. The vicinity of the Proposed Action is defined as the Chattahoochee River from Buford Dam to Peachtree Creek, the extent of the CRNRA. These projects include water or wastewater facilities recently constructed or planned in the vicinity of the diffuser as well as any potential substantial changes in the operation of Buford Dam.

1.5.1 Impact Topics Dismissed from Further Analysis

The following topics were considered but dismissed from further analysis, following an initial screening with the NPS of the potential for impacts to the CRNRA due to the riverine nature of the Proposed Action. For example, prime farmlands do exist within the southernmost parcel of the Settles Bridge unit in Gwinnett County; however, these lands have not been identified as unique and are not considered an issue (NPS, 2008).

- Prime and Unique Farmland
- Transportation
- CRNRA Operations
- Air Quality

2.0 Affected Environment

This section describes the existing environmental and cultural resource conditions potentially impacted by the construction and operation of a discharge diffuser in the Chattahoochee River between river miles 340 and 341 within the boundaries or viewshed of the CRNRA. It provides the baseline information, based on current conditions, from which environmental and cultural resource changes to the NPS property or viewshed likely to result from implementation of the Proposed Action were identified and evaluated. The potential environmental and cultural resource impacts of implementing the various project alternatives are described in Section 4.

In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989 et seq., this description of the affected environment focuses on the resources and conditions potentially subject to impacts: cultural resources, natural resources (terrestrial vegetation, terrestrial wildlife, and aquatic resources), special status species, wetlands and floodplains, geology and soils, water quality and flow, noise, and visitor use. The Supplemental Draft General Management Plan/Environmental Impact Statement (NPS, 2008) evaluates alternatives for the future management of the CRNRA. The following sections summarize the affected environment as described in the General Management Plan while providing a more specific discussion of features, if present, that could be affected by the Proposed Action.

2.1 Cultural Resources

The CRNRA shows evidence of occupation for at least 10,000 years. The earliest known occupation of the CRNRA dates to the Early Archaic Period, between 8000 and 6000 BC. As demonstrated by numerous archeological sites within the CRNRA, the chronology of the region shows steady cultural and scientific advancement in Native American populations until the arrival of the first Europeans.

Archeological sites have turned up numerous artifact scatters within the CRNRA and include ceramic scatters, lithic scatters, historic artifact scatters, and scatters encountered in association with rock shelters, open habitations, and villages.

Early European farmers brought with them agricultural tools and a variety of crops and domesticated animals that eventually expanded the agricultural abilities of both European and Native American populations. Family farming, along with maintaining livestock, became the primary activity along the river corridor through the Civil War, reaching its peak between 1910 and 1920.

Intensive farming and deforestation of the Chattahoochee's headwaters gradually reduced soil fertility in the region. By the 20th century, other power sources, such as steam generated and electrical, were becoming more common and the Chattahoochee River became less important for industrial manufacturing and more important for uses such as drinking water supply and hydroelectric power generation. Known historic sites within the CRNRA boundaries include structural components of Civil War sites, old bridges, mills, and structural foundations, as well as cemeteries (NPS, 2008).

A Phase I cultural resource survey of the entire property was conducted in 1995 by TRC Garrow & Associates. In this survey, no sites or isolated finds were identified in the northern third of parcel, the location of the project components (Appendix H). The survey determined that negligible adverse impacts to archaeological, historical, or cultural resources are expected from the construction or operation of the proposed Shakerag WRF and Chattahoochee diffuser (Appendices H and I).

2.2 Natural Resources

2.2.1 Terrestrial Vegetation

The CRNRA lies within the Piedmont Physiographic zone, a transitional area between the Blue Ridge and the Coastal Plains, giving it some of the most diverse vegetation in the region. Flora studies conducted within the CRNRA indicates at least 982 plant species are present, including algae, bryophytes (mosses), ferns, gymnosperms (pines and cedars), monocots (sedges, rushes, grasses, orchids, etc.), and dicots (willows, maples, oaks, hollies, and asters (NPS,2008).

The landscape in the CRNRA is a mixture of fields, natural stands of second growth trees, some near-original stands of forest, and planted trees. Today, the forest can be described as a modified second growth deciduous hardwood and hardwood-pine mixtures. Residential development and other sources have brought several invasive species, including English Ivy (*Hedera helix*), privet (*Ligustrum spp*), kudzu (*Pueraria*), Japanese honeysuckle (*Lonicera japonica*), princess tree (*Paulownia tomentosa*), mimosa (*Albizia julibrissin*), and periwinkle (*vinca spp*). Additionally, the Chestnut blight disease and pine beetle parasite are inflicting dramatic negative impacts on native tree populations (NPS, 2008).

The site of the proposed Chattahoochee Diffuser is adjacent to the Threat LAS property which contains mostly open fields and some mature mesic hardwood and pine forests. Figure 2-1 illustrates the upland area that will be crossed with the proposed pipeline and documents that the existing vegetation is dominated by grasses. The riparian upland adjacent to the river and stream bank is also illustrated in Figure 2-1. Vegetation in the riparian area is dominated by a shrub layer of river cane and privet with a limited canopy of ironwood, red maple, and small oaks. Within the streambank area the vegetation is limited to a sparse cover of privet and scattered grasses. These photos also help to document that no impacts to wetlands outside of the Chattahoochee River would result from construction and operation of the proposed Shakerag WRF and Chattahoochee River diffuser. A 2,500 square foot area within the 50 foot riparian buffer of the River would be impacted during construction of the proposed ROW.

FIGURE 2-1

View of Area of Proposed Action

Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment



View Looking East Towards Chattahoochee River



View Looking North (with Chattahoochee River Corridor on right)

FIGURE 2-1
View of Area of Proposed Action
Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment



View Looking North along the Western Bank of the Chattahoochee River



View Looking South along the Western Bank of the Chattahoochee River

2.2.2 Terrestrial Wildlife

The CRNRA provides habitat for a variety of wildlife, including birds, mammals, reptiles, and amphibians. Up to 189 bird species, including songbirds, birds of prey, waterfowl, neotropical migrants and shorebirds use the wetlands and upland habitats in the CRNRA. Ducks and sandpipers are known to use the Chattahoochee River during their seasonal migrations; a variety of birds of prey including: hawks, kites, eagles and falcons utilize the CRNRA as important nesting and feeding habitat; and occasionally, areas in the CRNRA are frequented by sandhill cranes (*Grus canadensis*), and the federally threatened bald eagle (*Haliaeetus leucocephalus*). Sightings of the federally endangered whooping crane (*Grus americana*) are also reported but not within the immediate CRNRA vicinity (NPS, 2008).

Common mammals in the CRNRA include deer, raccoons, opossums, bats, squirrels, eastern cottontail rabbits, short-tailed shrew, pine vole, deer mouse, and chipmunk. The presence of coyotes has also been reported in the CRNRA. A total of 23 amphibian species and 40 reptile species are documented in the CRNRA including snakes, lizards, turtles, frogs, and salamanders (NPS, 2008).

2.2.3 Aquatic Resources

Fish

Historically a naturally warm-water stream, the Chattahoochee River became an artificially created cold-water stream with the completion of Buford Dam and Lake Lanier in 1958. Hypolimnetic (bottom) releases from Lake Lanier provide cold-water conditions suitable for introduced trout in a 48-mile section of river, which the DNR has designated as a secondary trout stream. Secondary trout streams are those with no evidence of natural reproduction but which are capable of supporting trout throughout the year. GAEPD (2009) Rules and Regulations for Water Quality Control (Chapter 391-3-6) establish water quality criteria for secondary trout streams, including that: there shall be no elevation exceeding 2°F of natural stream temperatures; and a daily average of 6.0 milligrams per liter (mg/L) and no less than 5.0 mg/L dissolved oxygen concentration shall be maintained at all times.

The DNR WRD first began stocking trout in 1960 from its Buford Trout Hatchery, which is located 2 miles downstream of Buford Dam and 6 miles upstream of the Chattahoochee diffuser project area (Figure 1-2). Formerly a warm water Piedmont stream, the Chattahoochee River now supports one of the southern-most tailwater trout fisheries (Nestler et al., 1986). The DNR WRD has been stocking non-native rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*) in the river between Buford Dam (river mile 348.3) and Peachtree Creek (river mile 300.5). Stocking of brook trout (*Salvelinus fontinalis*) was discontinued in the 1990s due to poor survival and angler return.

The DNR WRD manages the trout fishery in the CRNRA in two distinct segments: a 36-mile upstream reach between Buford Dam and Morgan Falls dam (Bull Sluice Lake); and a 12-mile downstream reach below Morgan Falls dam. The proposed discharge point is located in the upstream reach at approximately river mile 340.5.

The upstream reach between Buford Dam and Georgia Highway 9 (Roswell Road), referred to as the Buford Dam tailwater, is currently managed as a “put-and-take” rainbow trout fishery and as a “wild” brown trout fishery. DNR WRD stocks the reach annually from late

February through fall with about 160,000 catchable-size (9 inches or larger) rainbow trout. Because brown trout have been found to successfully reproduce in the upstream reach, DNR WRD stopped stocking them in 2005 for a period of 3 to 5 years to assess the viability of maintaining a wild brown trout population (GA DNR, 2008). The waters of the Buford Dam tailwater are colder, have fewer natural shoals, and have more widely fluctuating river stages due to operations at Buford Dam than the downstream reach (Nestler et al., 1986).

The downstream reach between Morgan Falls dam and Peachtree Creek, referred to as the Morgan Falls tailwater, is managed as a put-and-take trout fishery with seasonal catch-and-release restrictions. About 50,000 catchable-size rainbow trout and brown trout, some as large as 18 inches, are stocked annually as part of a "Delayed Harvest" program offering catch-and-release fishing from November 1 through May 14. Anglers can keep trout caught from May 15 through October 31. The Morgan Falls tailwater fluctuates less than the upstream Buford Dam tailwater as a result of flow reregulation by Morgan Falls dam, tributary inflow, and an increase in channel width (Nestler et al., 1986). Water temperatures increase in the downstream direction toward more ambient warm-water conditions, influenced by inflow from naturally warmwater tributaries and in part by stormwater runoff from the metropolitan Atlanta area (Georgia Power, 2007).

A list of fish species known and historically known to occur within the CRNRA were compiled in 2007 (Georgia Power, 2007). In all, at least 55 species of fish in 16 families were found along the 48-mile reach between Buford Dam (river mile 348) and Peachtree Creek (river mile 300) and within the Willeo Creek (river mile 316) and Big Creek (river mile 317) tributaries. Most of the species are native warm-water fishes. Fishery surveys have documented 38 fish species in the mainstem river between Buford Dam and Morgan Falls dam and 42 species in the river between Morgan Falls dam and Peachtree Creek. The cold releases from Buford Dam depress many warm-water species populations in the mainstem river (Hess, 1980; Biagi and Brown, 1997). Rare species of fish with potential to occur in the project vicinity are evaluated in Section 2.3.

The principal sport fishes in the Buford Dam tailwater in the vicinity of the proposed diffuser are rainbow trout and brown trout. Other sport fishes presently known to occur in this upstream reach include largemouth bass (*Micropterus salmoides*), spotted bass (*Micropterus punctulatus*), shoal bass (*Micropterus cataractae*), bluegill (*Lepomis macrochirus*), redbreast sunfish (*Lepomis auritus*), black crappie (*Pomoxis nigromaculatus*), channel catfish (*Ictalurus punctatus*), chain pickerel (*Esox niger*), and yellow perch (*Perca flavescens*).

The Chattahoochee River is characterized by three major habitat types based on channel morphology and substrate composition: shoals, runs, and pools (Nestler et al., 1986). Using these classifications, the proposed discharge segment at river mile 340.5 is best characterized as run habitat. Stream width is about 170 feet; depth averages approximately 4.25 feet; gradient is moderate; bottom substrates consist mainly of shifting sand and protruding bedrock; and current velocities average approximately 1.1 feet per second (fps). Depths may fluctuate up to several feet on a daily basis due to peaking power releases from Buford Dam. Stream banks are relatively steep and composed primarily of sand and silt. Riparian vegetation is well developed along both margins of the stream. Bank erosion has resulted in many leaning or overhanging trees, and occasional fallen timber provides instream cover along the shorelines.

Trout typically inhabit clear, cold streams containing silt-free riffle-run areas for invertebrate food production and spawning, pool habitats for feeding and resting, and abundant instream cover (Raleigh, 1982; Raleigh, et al., 1984; Raleigh et al., 1986). Based on an instream flow study conducted by Nestler et al. (1986), habitat area in the Chattahoochee River for adult rainbow trout and adult brown trout generally peaks at river flows of about 1,500 cfs and declines to its minimum at 12,000 cfs. Habitat area for brown trout juveniles peaks at or near 500 cfs and declines to a minimum at 12,000 cfs.

A major factor limiting the downstream distribution of trout in the Chattahoochee River is water temperature. Trout require water temperatures below about 25 degrees Celsius (°C) for survival and typically prefer temperatures below 20°C for feeding, growth, and reproduction. Table 2-1 summarizes temperature preference data for adults of the two trout species presently occurring in the Chattahoochee River. Spawning, egg, fry, and juvenile life stage temperature preference data also are provided for brown trout, which successfully reproduces in the upstream reach of the CRNRA. The preferred temperature ranges, upper avoidance temperatures, and upper lethal limits are based on literature accounts of field and laboratory studies conducted for a variety of purposes (see sources listed in Table 2-1). The maximum weekly mean temperatures of adults were derived by Eaton et al. (1995) using the "Fish and Temperature Database Matching System (FTDMS)." The FTDMS value is based on extensive field data collected to correlate fish occurrences with long-term temperature monitoring data. The value reported is the 95th percentile of weekly mean temperatures and represents a conservative estimate of the upper thermal tolerance limit of the species.

TABLE 2-1

Temperature Preference Data for Trout Species Occurring in the Chattahoochee River^a
Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Species	Temperature (°C)			
	Preferred Range	Upper Avoidance	Upper Lethal Limit	FTDMS Maximum Weekly Mean ^b
Rainbow trout	12-19 (adults)	19-22	25-25.6	24.0
Brown trout	12-19 (adults) 7-19 (juveniles) 7-15 (fry) 2-13 (egg hatching) 7-9 (spawning)	20	25.6-27.2	24.1

^aData reported are principally for adults.

^bFTDMS - Fish and Temperature Data Base Matching System (Eaton et al., 1995).

Sources: Hokanson et al., 1977; Coutant, 1977; Raleigh et al., 1984; Raleigh et al., 1986; Armour, 1994; Eaton et al., 1995; Biagi and Brown, 1997.

A study by the GA DNR (Biagi and Brown, 1997) focused on the upper temperature tolerance of juvenile and adult brown and rainbow trout. The authors noted that stormwater runoff has become a significant source of increased summer maximum water temperatures and recommended that GA EPD implement more protective measures to address temperature increases below Buford and Morgan Falls Dams. GA DNR and GA EPD currently are studying and considering site-specific temperature criteria more protective of trout in the Chattahoochee River.

Freshwater Mussels

In 2003 a freshwater mussel survey was conducted for the NPS (O'Brien and Brim Box, 2003). Eighteen sites were searched for the presence of mussels, including the Chattahoochee River 1,000 meters downstream of McGinnis Ferry Road and approximately 0.75 mile downstream of the diffuser project area, Island Ford (20 miles downstream of the diffuser project area), the Morgan Falls impoundment at Gold Branch (27 miles downstream of the diffuser project area), and four sites on the Chattahoochee River downstream of the Morgan Falls (Johnson Ferry, Cochran Shoals, Powers Island, and Paces Mill). No live native mussel species were found.

The invasive Asian clam (*Corbicula fulminea*) was documented in the mainstem of the river at Island Ford, Big Creek (a major tributary), and four mainstem sites downstream of Morgan Falls Dam (O'Brien and Brim Box, 2003). Based on the survey findings, O'Brien and Brim Box (2003) concluded that the native freshwater mussel fauna appears to be extirpated from the upper Chattahoochee River, including the proposed project area. The absence of native mussel fauna has likely resulted from a combination of habitat alterations over the past 160 years, including impoundments, water quality changes, peaking discharges, habitat alteration, and sedimentation from nonpoint sources (O'Brien and Brim Box, 2003; Brim Box and Williams, 2000).

2.3 Special Status Species

The CRNRA is a biologically significant resource that harbors a range of protected and rare plants and animals referred to here as Special Status Species. The NPS is required under the ESA to ensure that federally listed species and their habitats are protected on lands within the agency's jurisdiction. In addition, CRNRA policy and management actions include maintaining state and heritage program listed species as part of the CRNRA's natural heritage. As summarized in Appendix F, the Georgia Department of Natural Resources (GA DNR), Natural Heritage Program and the NPS identified federally and state protected species and other species of concern potentially occurring within the CRNRA or within 3 miles of the CRNRA based on historic and present records of occurrence. No Special Status Species are known to occur at the proposed diffuser site.

No federally listed aquatic species presently are known to occur within the project vicinity. The federally endangered shinyrayed pocketbook, a freshwater mussel species, historically occurred in the project vicinity but apparently has been extirpated from the mainstem Chattahoochee River. Special status fish species potentially occurring in the CRNRA include the state rare bluestripe shiner and highscale shiner (Appendix F). Shoal bass, tracked as a special concern species in Georgia, may occur in the project vicinity but is mainly limited in the Chattahoochee River to warmer waters downstream of Morgan Falls dam and in larger warm-water tributaries such as Big Creek. Other protected or watch list species historically reported to potentially occur in the vicinity of the CRNRA include: the peregrine falcon, greater sandhill crane, jack-in-the-pulpit, Boott's sedge, dark green sedge, pink ladyslipper, yellow ladyslipper, Shuttleworth's ginger, goldenseal, Canada lily, bunchflower, loose watermilfoil, Stone Mountain mint, Biltmore's carrion-flower, goldenrod, and mountain camellia (NPS, 2008). Many or most of these species could occur

in the CRNRA, although detailed, site-specific surveys would be required to confirm their existence.

2.4 Wetlands and Floodplains

2.4.1 Wetlands

Approximately 152 acres of wetlands delineated by the National Wetlands Inventory (NWI) are found throughout the CRNRA. Major wetland types found in the CRNRA include: palustrine forested (21.5 acres), palustrine scrub/shrub (10.3 acres), palustrine unconsolidated bottom or shore (7.8 acres), palustrine emergent (6.2), lacustrine (33.4 acres), and riverine (72.7 acres) wetlands (NPS, 2008).

The largest percentages of the CRNRA's wetlands are classified as riverine wetlands, 48 percent (72.2 acres), which includes all wetlands and deepwater habitats contained in natural or artificial channels periodically or continuously containing flowing water or which form a connecting link between two bodies of standing water. The entire 48-mile reach of the Chattahoochee River within the CRNRA is classified as a riverine wetland. Riverine wetlands provide valuable aquatic habitats for the fish and invertebrates described in the EA and are a source of primary production (aquatic vascular plants). Riverine wetland functions and values include:

- Biotic functions – aquatic habitat for fish and invertebrates and primary production of aquatic vascular plants,
- Hydrologic functions - flood attenuation and stream flow maintenance,
- Cultural values from recreational users, and
- Economic value from fisheries management and tourism along the CRNRA.

Lacustrine wetlands make up approximately 22 percent (33.4 acres) of the wetlands within the CRNRA. Lacustrine wetlands are defined as wetlands and deepwater habitats with all of the following characteristics: (1) situated in a topographic depression or a dammed river channel; (2) lacking trees, shrubs, persistent emergents, emergent mosses, or lichens with greater than 30 percent aerial coverage, and (3) total area exceeds 20 acres. Examples within the CRNRA include the fringes of the small pond in the Sope Creek area and the large beaver pond at the southern end of Cochran Shoals.

Palustrine forested wetlands make up approximately 14 percent (21.5 acres) of the total acreage of wetlands in the CRNRA. Mature hardwood trees that inhabit the floodplains of the Chattahoochee River, tributary streams, and associated sloughs dominate these wetlands. These areas experience variable degrees of flooding, but are flooded frequently enough to qualify as wetlands. The remaining wetland types, palustrine scrub/shrub, palustrine unconsolidated bottom or shore, and palustrine emergent are relatively small and geographically separated from one another. They are commonly associated with beaver ponds or the boundaries of lesser streams and ponds (NPS, 2008).

Site analysis of the project area determined that no wetlands occur along the proposed ROW to the Chattahoochee River; see Appendix A for the Wetlands SOF. The diffuser would be

situated within the Chattahoochee River itself, which is classified as riverine wetland. Minor temporary adverse impacts to riverine wetlands are anticipated during construction of the diffuser; however, impacts during construction would be minimized by working within a temporary coffer dam and utilizing appropriate BMPs.

2.4.2 Floodplains

A Flood Insurance Rate Map (FIRM), produced by FEMA, indicates that areas of the CRNRA are located within Zone X and Floodway Areas in Zone AE, see Attachment 2 of Appendix A (SOF). Zone X is defined by FEMA as an area where the flood hazard is yet to be determined outside the 0.2 percent annual chance floodplain or "500-year event." Floodway Areas in Zone AE are defined by FEMA as the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1 percent annual chance flood or "100-year event," can be carried without substantial increases in flood height.

At the proposed site, the 100-year floodplain begins at an elevation of 911.0 feet above mean sea level (msl) at McGinnis Ferry Road and rises to 912.0 feet msl approximately 4,000 feet upriver and continues at 912.0 feet msl beyond the project area. No changes to the existing floodplain boundary would occur as a result of the Proposed Action.

2.5 Geology and Soils

The CRNRA is located within the Piedmont Physiographic Province, along the Brevard Fault and within the Gainesville Ridges District. The ridge formations and Brevard Fault zone resulted from forces associated with continental drift millions of years ago. Those forces produced the unique Palisades Cliffs at the southern end of the CRNRA, which were the original basis for designating the CRNRA as a National Recreation Area. Most of the rocks are hard igneous and metamorphic rocks derived from the recrystallization of ancient (300 to 600 million years old) sediments that were once deeply buried and subjected to high temperatures and pressures.

Soils in the vicinity of the CRNRA are dominated by ultisols, characterized by deeply weathered sandy or loamy surface horizons and loamy or clayey subsurface horizons (Soil Conservation Service (SCS), 1982; Couch et al., 1996). Piedmont ultisols are acidic, low in nitrogen and phosphorus, and generally lack the original topsoil due to massive soil movement from historical agricultural practices (Wharton, 1978). The predominant soil types at the Shakerag project site are various fine sandy loams (SCS 2008).

2.6 Water Quality and Flow

2.6.1 Water Quality

Section 305(b) of the Clean Water Act (CWA) requires States to assess and describe the quality of its waters every two years in a report called the 305(b) report. Section 303(d) of the Clean Water Act requires States to submit a list of all of the waters that are not meeting their designated uses and that need to have a TMDL(s) written for them. The 303(d) list is also to be submitted every two years. GA EPD (2009) classifies the designated uses of the four

segments of the Chattahoochee River within the CRNRA to be drinking water supply and recreation, see Table 2-2.

The draft Georgia 2010 305(b)/303(d) list of waters (GA EPD, 2010) identifies a 12-mile segment of the Chattahoochee River between Dicks Creek and Johns Creek (the reach within the proposed project is located) as not supporting its designated uses (Category 5) because of violations of pH criteria attributed to nonpoint/unknown sources and urban runoff/effects (Table 2-2). However, based on an improving trend in the pH data since 2006, GA EPD anticipates that pH will be able to be removed in 2012. The Buford Dam-to-Dicks Creek segment upstream of the Proposed Action (ending approximately 1 mile upstream) and the Johns Creek-to-Morgan Falls Dam segment downstream of the Proposed Action (beginning about 11 miles downstream) are currently supporting their designated uses.

TABLE 2-2

Assessment of Waters of the Chattahoochee River within the CRNRA, Draft Georgia 2010 305(b)/303(d) List
Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Stream Segment	Water Use Classification	Criterion Violated ^b	Evaluated Causes ^c	Stream Miles	Category ^d
Buford Dam to Dicks Creek	Recreation / Drinking Water	N/A		8	1
<i>Dicks Creek to Johns Creek^a</i>	<i>Recreation / Drinking Water</i>	<i>pH</i>	<i>NP, UR</i>	12	5
Johns Creek to Morgan Falls Dam	Recreation / Drinking Water	N/A		17	1
Morgan Falls Dam to Peachtree Creek	Recreation / Drinking Water	FC, FCG (PCBs)	UR	12	4a

Source: GA EPD (2010).

^a The project area is located within this reach

^b N/A = Not Applicable since segment is supporting its designated uses, FC = Fecal coliform bacteria, pH = percent Hydrogen, FCG = Fish Consumption Guidance, PCBs = Polychlorinated Biphenyls

^c NP = nonpoint sources/unknown sources, UR = Urban Runoff/Urban Effects

^d Category 1 - Data indicate that waters are supporting their designated use(s).

Category 4a - Data indicate that at least one designated use is not being supported, but TMDL(s) have been completed for the parameter(s) that are causing a water not to meet its use(s).

Category 5 - Data indicate that at least one designated use is not being supported and TMDL(s) need to be completed for one or more pollutants. Waters in Category 5 make up the 303(d) list.

However, two of the four segments (Table 2-2) of the Chattahoochee River in the CRNRA do not meet their designated uses. As noted earlier in Section 1, GA EPD anticipates that the listing for the 12 miles of the Chattahoochee River from Dicks Creek to Johns Creek, the location of the Proposed Action, will be changed to supporting in 2012 because the trend in the pH data is improving with no pH violations since 2006 (GA EPD, 2010). The other segment of the Chattahoochee River not supporting its designated use is from Morgan Falls Dam south to Peachtree Creek, over 27 miles downstream of the Proposed Action, due to fecal coliform (FC) from urban runoff and fish consumption guidance (FCG) due to legacy PCB issues. TMDLs were completed for FC in 2003 and FCG (PCBs) in 2003. Other water

quality issues noted during scoping include dissolved oxygen (DO), nutrients, and temperature changes from point and nonpoint source pollutants. Sedimentation and erosion during construction also have the potential to impact water quality.

Fecal coliform sources include nonpoint runoff, sewer line overflows, spills of raw sewage from sewer line breaks, and sewer line and septic system leaks. An extensive network of sewage lines surrounds the CRNRA, some of which are located inside the CRNRA. Domestic animals (cows, horses, dogs) and wildlife (duck, geese) also cause direct bacterial contamination of the river and tributaries. Failure to meet the fecal coliform standard is the most commonly listed cause of non-support of designated uses in the CRNRA and the Atlanta region. Historically high levels of bacteria in the Chattahoochee River initiated the creation of a partnership monitoring program in 2000 between State and Federal agencies and non-governmental organizations called BacteriALERT. The goal of the program is the collect real time total coliform and *E. coli* bacteria counts by using instantly available turbidity measurements to predict total bacteria counts. Results are posted on a publicly-accessible web site within 24 hours of data collection.

The segment of the Chattahoochee River near the proposed diffuser location currently meets fecal coliform standards and is not included on the list of impaired waters for fecal coliform bacteria. The design discharge limits for the Chattahoochee diffuser would result in the discharge meeting the urban reuse criterion of 23 colonies/100 ml or less of fecal coliform bacteria.

DO has been a concern due to the previous levels of organic loadings from both point and nonpoint sources in the river and the loss of oxygen-carrying capacity as a result of the heat load associated with discharges to the river from the Georgia Power electric generating facilities (McDonough and Atkinson). The GA EPD has been working with regional utilities for several years to evaluate the assimilative capacity of the Chattahoochee River and has developed a water quality model to evaluate discharge limits for oxygen-demanding constituents (CBOD, NH₃, and organic nitrogen) see Appendix G. The model indicates that future discharges meeting these standards as well as removal of the heat load from the Georgia Power electric generating plants by 2008 would not adversely impact DO levels in the Chattahoochee River (Appendix G). The proposed Shakerag WRF is designed to meet these limits.

Total Phosphorus (TP) levels are a concern due to the potential for eutrophication in downstream reservoirs, particularly West Point Lake. As determined by GAEPD, the annual loadings of TP from the Chattahoochee River have been limited to 1,400,000 pounds. Predictive models for both point and nonpoint source TP loading to the Chattahoochee River demonstrated that the GAEPD limit can be met if point source effluent concentrations are kept to 0.3 mg/L (JJ&G, 2003 and Appendix G). The Shakerag WRF is designed to meet this criterion in and of itself however the inclusion of a phosphorus polishing facility as a component of the design will provide a second layer of redundancy.

Temperature conditions in the mainstem Chattahoochee River were historically warm. However, after construction of Buford Dam in 1958 the release of cold water through the dam from Lake Lanier's hypolimnion now provides a thermal regime in the river suitable for introduced trout. The upper Chattahoochee River below Buford Dam, including the area of the Proposed Action, is classified as a secondary trout stream. As such, no elevations

in temperature exceeding 2°F above natural stream temperatures are allowed (GA DNR, 2009). Based on the temperature evaluation and modeling performed, and presented as a Technical Memorandum (TM) in Appendix E, it was determined that the temperature change within all diffuser port plumes would result in water temperature increases of less than 2°F and only within close proximity (first 10 feet) to the ports. As a result, the existing temperature standards for secondary trout streams would be met by the Proposed Action, which assumes up to a 6-mgd discharge during operation of the diffuser.

2.6.2 Flow

The surface water hydrology of the Chattahoochee River within the CRNRA area is shaped both by the geological setting in the Piedmont Physiographic region as well as hydrologic flow regulation by Buford Dam and its reservoir, which has altered the Chattahoochee River both physically and chemically. The portion of the Chattahoochee River watershed encompassed by the CRNRA, extending from river mile 348.3 at Buford Dam to river mile 300.5 at Peachtree Creek, drains 416 square miles below Buford Dam. Flow of the river is now mainly controlled by water releases from Buford Dam. The construction of Morgan Falls Dam and Hydroelectric Plant, located at river mile 312.6, created Bull Sluice Lake, the only lake located within the CRNRA boundary.

Water release through Buford Dam and Morgan Falls Dam (downstream of the diffuser site) must meet the minimum flow target set by GA DNR regulations. These minimum flows are used by the GAEPD as the basis for determining wastewater discharge limits for meeting water quality standards in the river. Recently under the new drought contingency and water management plan, minimum instantaneous flows at Peachtree Creek must be no less than 750 cfs during the summer months (May-October) and 650 cfs during the winter months (November-April). These targets are the basis for regulatory decisions including determination of TMDLs and NPDES discharge permit limits under the CWA and Georgia Water Quality Control Act for meeting water quality standards in the Chattahoochee River. Appendix E provides a TM evaluating the final diffuser design based on these reduced stream flow conditions at the area of the Proposed Action. Additionally, the side plan view provided in the Design Drawings as Attachment 3 of Appendix A illustrates river depth under low flow conditions, 650 cfs, and how the diffuser ports would relate to the river bottom. The river bottom was characterized by a bathymetric survey conducted in March 2007 which is provided as Attachment 4 of Appendix A. Based on this information, the river depth under low flow conditions would be approximately 5.4 ft (Appendix E).

The CRNRA is located within the 16-county MNGWPD, which was established by the Georgia legislature in 2001 to address the need for comprehensive water resources management in the metropolitan area. The Districts goals are aimed at protecting water quality and public water supplies in and downstream of the Metropolitan Atlanta region, protecting recreational values of the waters in and downstream of the region, and minimizing potential adverse impacts of development on waters in and downstream of the region.

Due to limited regional groundwater resources, MNGWPD relies on surface water for 99 percent of its water usage (AECOM 2008b). The Chattahoochee basin accounts for approximately 73 percent of the permitted available water supply in the Metro Water District. Based on 2006 population estimates, approximately 214-mgd (permitted monthly

average) are withdrawn from Lake Lanier for municipal use. Within the CRNRA boundary, a total of approximately 497-mgd (permitted monthly average) are withdrawn from the Chattahoochee River by four municipalities (Cobb County-Marietta Water Authority, DeKalb County Water System, City of Atlanta, and Atlanta-Fulton County Water Resources Commission). The projected baseline water demand for Lake Lanier and the Chattahoochee River for the year 2035 are 303-mgd (permitted monthly average) and 523-mgd (permitted monthly average), respectively (AECOM, 2008b). Approximately 71 mgd of treated water is returned to the river within the CRNRA boundary, between Buford Dam and Morgan Falls Dam, by eight wastewater treatment plants within three counties (JJ&G, 2003).

The proposed diffuser site is located between Buford Dam and Norcross U.S. Geological Survey (USGS) stations. At its full permitted discharge volume, the proposed discharge would represent an increase of 0.35 to 0.60 percent to the average annual flow, 0.10 percent to the maximum flow, and 2.4 percent of the minimum flow. While a 2.4 percent increase in low flow periods would be a minor benefit to water quantity, there could be additional benefits to aquatic organisms from the slight increase in minimum flows (CH2M HILL, 2006).

2.7 Noise

One of the primary recreational values expressed by visitors is the desire to achieve a sense of solitude within natural areas of the CRNRA. This requires a low-noise environment and an absence of unwanted sound (NPS, 2008). Current visitors seeking a recreational experience in the CRNRA are exposed to a variety of noise generators, primarily vehicular traffic on bridges, along roads, and in parking lots adjacent to CRNRA property. The closest CRNRA units to the project area are Settles Bridge across the Chattahoochee River in Gwinnett County and McGinnis Ferry to the south in Fulton County. Hikers, boaters, float-tubers, and fisherman are the primary visitors to this segment of CRNRA based on the recreation amenities offered at these units.

Depending on their proximity to the noise sources in this area, visitors may hear noise from vehicles on McGinnis Ferry Road or from adjacent residential areas. The densely forested areas in many parts of the CRNRA, however, serve to dampen vehicular noise, providing a sense of solitude largely absent of road noise. Areas such as the Palisades, for example, are especially effective at dampening noise, even though they are located close to major arterials such as I-75 and I-285.

The U.S. Environmental Protection Agency (EPA) developed an index as a standard descriptor for noise impacts from a variety of sources. Where typical Day-Night Average Noise Level (LDN) values exceed 65 dB_a, residential development is not recommended. Noise levels in typical urban residential areas range from 58 dB_a to 72 dB_a, from 50 dB_a to 60 dB_a in typical suburban areas, and are around 40 dB_a in a typical quiet office or rural home (USEPA, 1974).

2.8 Visitor Use

2.8.1 Visitor Use

The CRNRA annually hosts approximately 2.7 million visitors to the 10,000-acre, 16-unit park for passive and active recreation experiences. The southern end of the CRNRA, including the City of Atlanta and parts of Fulton County, is the most densely developed area, and the most heavily used by visitors. The northern portion of the CRNRA still contains some open fields and forests, and Forsyth County has large pockets of rural land uses and horse farms. However, development is increasing as urbanization sprawls northward (NPS, 2008).

Visitors frequent the CRNRA for passive recreational purposes to enjoy the natural beauty of the river and adjacent forested lands. Visitors can experience the changing seasonal colors of the forests, wildlife, and rushing waters in solitude or in the company of others. Some areas of the CRNRA offer more active opportunities for recreation, such as fishing, hiking, horse-back riding, biking, and boating. Most visitors are residents of the Atlanta metropolitan area. However, people from all over the country who visit the Atlanta area also visit the CRNRA. Visitors come from a wide variety of economic backgrounds representing many groups from the adjacent neighborhoods and society at large.

Table 2-3 summarizes the principal recreation amenities provided by the NPS or the USACE to visitors along the CRNRA near the area of the Proposed Action. Settles Bridge is the unit closest to the Proposed Action, located directly across the Chattahoochee River in Gwinnett County. It provides a step-down canoe/kayak/raft only launch approximately 3 miles upstream of the proposed diffuser. The closest formal boat launches are at Bowmans Island, located approximately 8 miles upstream of the Proposed Action, and Abbots Bridge, located 5 ½ miles downstream. A commercial outfitter in Sugar Hill offers canoe and kayak trips from Buford Dam all the way to Abbots Bridge, but their float-tube trips extend from the dam only to Settles Bridge. As a result, the number of float-tubers expected in the project area would be small, primarily fishermen in float-tubes.

TABLE 2-3

Recreation Facilities

Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

CRNRA Unit	Boating	Power Boat Launch	Fishing	Hiking	Parking	Comment
Bowmans Island	X	X	X	X	X	Operated by USACE, includes equestrian facilities. Large shoals for fly fishing.
Orrs Ferry	X		X			Large shoals for fly fishing.
Settles Bridge	X		X	X	X	Unit with lands closest to area of Proposed Action, across River in Gwinnett County.
McGinnis Ferry	X			X		Limited shoal area upstream of Road, limited (unimproved)

TABLE 2-3

Recreation Facilities

Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

CRNRA Unit	Boating	Power Boat Launch	Fishing	Hiking	Parking	Comment
						access to River.
Suwanee Creek	X		X	X		
Abbotts Bridge	X	X	X	X	X	Includes Picnic area.

Source: NPS, 2008.

Table 2-3 illustrates that recreational fishing and boating are the primary visitor uses of the CRNRA near the area of the Proposed Action. This includes visitors wishing to fly fish who CRNRA and put in near the remains of the actual Settles Bridge to float downstream to the unimproved take-out at the McGinnis Ferry Road bridge (AFFC, 2009).

1.1.1 Public Health and Safety

NPS is responsible for maintaining safe conditions for the health and protection of CRNRA visitors and its employees. This includes providing safe facilities, utilities, and grounds within the CRNRA, as well as conducting NPS program and project operations. The NPS continuously monitors total coliform and *E.coli* levels in the Chattahoochee River through the BacteriALERT program. As part of this program the NPS has established a low health-risk level from *E.coli* exposure to be less than 177 colonies/100mL and a high-health risk level to be above 235 colonies/100mL.

3.0 Alternatives

This section provides a description of the alternatives that were considered in detail in the EID for the Proposed Action (CH2M HILL, 2006).

3.1 No-Action Alternative (Alternative A)

The no-action alternative assumes no discharge into the Chattahoochee River. Forsyth County would not expand its treatment capacity and any future growth would rely on additional onsite systems for wastewater disposal. Given that withdrawal from the Chattahoochee River basin would continue to increase as the Forsyth County customer base expands, the No-Action Alternative would contribute to depletion of the region's water supply and would exacerbate IBTs. Additionally, the County would incur additional costs for monitoring and enforcing maintenance of onsite systems, which would increase due to the lack of wastewater capacity and are considered to be a consumptive water use.

3.2 Land Application System (Alternative B)

In Alternative B, which was examined in the Anti-Degradation Review as the No Discharge Alternative, treated effluent would be applied to land for infiltration. Pump stations and FMs would be required to deliver the water to the potential LASs. Feasibility studies on land application for Forsyth County have indicated that typical application rates would necessitate large land areas and associated high land costs. In addition, there would be reductions in system capacity during cold months, further increasing the land requirements. In Forsyth County, there are limited tracts of land of suitable size for a LAS. More than 2,500 acres would be needed for a LAS to accommodate 6.0 mgd of reclaimed water, with a conservative application rate of 1.25 inches per week. No single tract of land in Forsyth County is large enough to accommodate a LAS of this size. Southern Forsyth County, within a 10-mile radius of the proposed Shakerag WRF, does not have any large (500+ acres) tracts of land available. Suitable tracts are located in northern Forsyth County, but this would require extensive and costly infrastructure to serve the Shakerag WRF, and to provide safe storage for periods when conditions are unsuitable for land application. Additionally, use of a LAS would result in increased IBT of water from the Chattahoochee to the Etowah River basin. For these reasons, LAS is not a practicable alternative for Forsyth County for disposal of 6.0 mgd of reclaimed water.

3.3 Blended Reuse (Alternative C)

Under Alternative C, reclaimed water would be piped to a reuse reservoir and blended with raw water from a filter plant. Water in the reservoir would be filtered and treated for use. This alternative was not considered practicable because of the high costs of constructing additional infrastructure (reservoir, pipelines, pump stations, etc.), the environmental impacts associated with constructing a reservoir, the general lack of public acceptance of

blended reuse, and the lack of an existing regulatory framework for potable blended reuse in Georgia.

3.4 Direct Reuse (Alternative D)

In Alternative D, future reclaimed water would undergo additional treatment to achieve potable water quality. The reclaimed water would be transferred to the drinking water filter plant, mixed with treated raw water, and additionally treated for use. The high costs of implementation, the lack of an existing regulatory framework, and the low public acceptability of this alternative do not make it practicable at this time.

3.5 Surface Water Discharge to Big Creek (Alternative E)

Under Alternative E, reclaimed water would be discharged directly to Big Creek. As Big Creek is in the Chattahoochee River basin, this alternative would not contribute to IBT. However, discharge to Big Creek is not practicable because the WLA for Big Creek has been completely allotted and there is no more assimilative capacity remaining. Water quality deterioration would result if the 6.0 mgd were discharged to Big Creek and, therefore, this alternative would not be permitted.

3.6 Surface Water Discharge to Etowah River (Alternative F)

In Alternative F, reclaimed water would be discharged to surface waters in the Etowah River basin. This alternative is not practicable because it would increase the amount of IBT and would require more costly infrastructure to transfer reclaimed water from the Shakerag WRF to the Etowah River basin for discharge.

3.7 Surface Water Discharge to Chattahoochee River (Alternative G)

Under Alternative G, the Proposed Action, 6.0 mgd of high-quality reclaimed water would be discharged to surface water in the Chattahoochee River basin. The planned Chattahoochee River discharge provides an option that increases the capacity and operational flexibility in the Forsyth County beneficial reuse system. The State has recognized that the return of high-quality reclaimed water to waterways is preferable to non-beneficial disposal alternatives, which do not reduce consumptive use. This alternative is also preferable because it would reduce the amount of IBT and augment stream flows for downstream users.

The discharge would result in minor elevations in water temperature in the immediate vicinity of the diffuser. However, the minor impacts associated with water temperature would be localized (within 10 feet of the diffuser) and of short duration. Modeling for the diffuser design indicates that all temperature standards would be met in the Chattahoochee River. In addition, Forsyth County is required by the NPDES permit to ensure no temperature increase in the river. Water resource impacts would be minor, because of the high quality of the effluent, and would be limited to minor increases in temperature (less

than 2°F) near the diffuser. Wastewater impacts would also be minor because of the high quality of the reclaimed water and would not pose a threat to aquatic life or human health. Similarly, only minor impacts to aquatic life/trout streams would occur as a result of the discharge and would be limited to slight increases in water temperature in the immediate vicinity of the diffuser.

3.8 Best Management Practices of the Proposed Action

Some or all of the BMPs discussed below would be implemented as part of the proposed action to lessen the potential adverse effects of the Proposed Action.

The Proposed Action is anticipated to adversely impact approximately 1000 sf (0.023 acres) during construction and to result in 800 sf / 0.018 acres of permanent adverse impacts to riverine wetlands during operation. After the diffuser is secured to the bedrock, the excavated sediment would be used to return the disturbed area to the pre-construction river bottom elevation resulting in a negligible loss of wetlands and their functions.

Wetlands within the construction area, the Chattahoochee River, would be isolated by silt fencing to prevent ingress of sediment. Fuel for construction vehicles would not be stored onsite. All work associated with the pumping facilities and pipeline would be performed in accordance with Forsyth County plans for stormwater management and environmental controls, which would incorporate these and additional site-specific BMPs consistent with the *Manual for Erosion and Sediment Control in Georgia* (Georgia Soil and Water Conservation Commission, 2000), the *Field Manual for Erosion and Sediment Control in Georgia* (Georgia Soil and Water Conservation Commission, 2002), and the January 1, 2009, updates to the *Manual for Erosion and Sediment Control in Georgia* (Georgia Soil and Water Conservation Commission, 2009).

Construction of the reclaimed water pipeline and diffuser at the project location would not substantially alter the existing grades or drainage patterns of the site; views of existing riparian conditions are provided in Figure 2-1. Existing vegetation would be removed only as required during initial site preparation operations. Areas would be graded to match pre-construction conditions, where feasible. Final site restoration would include seeding all disturbed areas where maintained grass was present prior to construction activities or surfaced with crushed aggregate. Only native plant seed mixtures approved by CRNRA staff would be used. Any areas that were natural prior to construction activities would be rehabilitated using appropriate native plant materials approved by NPS. All disturbed areas would be stabilized as soon as practical to further limit erosion.

All construction entrances would be provided with stabilized stone traps to limit tracking of sediment offsite. Sediment traps (silt fencing) would be established around the perimeter of construction areas for sedimentation and erosion control. Forsyth County would have an inspector who is certified through the State of Georgia Erosion and Sediment Control Education and Training Certification Program overseeing the installation of silt fencing. The silt fencing would be maintained by Forsyth County through the duration of construction activities and removed from the site at the end of construction activities.

During in-river construction (aquatic land) activity using a temporary cofferdam, turbidity curtains would be used to encircle the intake and discharge structures during placement into the river bed and connection to intake and discharge piping.

3.9 Alternatives Considered but Dismissed

Several additional alternatives were initially considered, but ultimately dismissed from further analysis because of their lack of technical feasibility, potential for severe environmental impacts to the CRNRA, and/or conflicts with the CRNRA's statement of purpose and significance and other CRNRA policies.

As discussed in Section 1.3.1, FCWSD initially identified six potential alternatives to the direct discharge to the Chattahoochee River. Alternatives B to F were eliminated because they were not cost-effective or have high potential for impacts to one or more of the following impact topics: archaeological resources, natural resources, sensitive habitats, rare species, and visitor use. The remaining two alternatives, Alternative A, No Action, and Alternative G, the Proposed Action, are presented in this EA.

3.10 Environmentally Preferred Alternative

According to CEQ guidelines, the Environmentally Preferred Alternative is the alternative that would promote the national environmental policy as expressed in Section 101 of NEPA, which considers the following:

1. *Fulfilling the responsibilities of each generation as trustee of the environment for succeeding generations*
2. *Assuring for all generations safe, healthful, productive, and aesthetically and culturally pleasing surroundings*
3. *Attaining the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences*
4. *Preserving important historic, cultural, and natural aspects of our national heritage and maintaining, wherever possible, an environment that supports diversity and variety of individual choice*
5. *Achieving a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities*
6. *Enhancing the quality of renewable resources and approaching the maximum attainable recycling of depletable resources (NEPA Section 101).*

The direct discharge to the Chattahoochee River (Alternative G) has been selected as the Environmentally Preferred Alternative, because it addresses many of these policy considerations. Although the discharge would have minor adverse impacts to water and aquatic resources due to slight increases in temperature within the immediate vicinity of the diffuser, overall Alternative G meets Forsyth County's wastewater needs while achieving a balance between population and resource use. By focusing on beneficial reuse of reclaimed water, FCWSD has selected the alternative that causes the least damage to the biological and

physical environment and that best protects, preserves, and enhances historic, cultural, and natural resources over the long term by minimizing IBTs and reducing consumptive uses by providing an alternative to septic tanks.

3.11 Alternatives Comparison Table

Table 3-1 presents a summary of each alternative's ability to meet the purpose and need of the Proposed Action.

TABLE 3-1

Description of Alternatives Considered

Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Alternative	Description
A – No Action	The No-Action Alternative would not meet the project needs, because it would not allow for FCWSD capacity expansion and beneficial reuse of reclaimed water.
B - Land Application System	Alternative B would not meet the project needs because there is not enough suitable property for creation or expansion of an LAS with adequate capacity to accommodate the discharge from the Shakerag WRF.
C - Blended Reuse	Alternative C would not meet the project needs, because it is not economically feasible and would have high environmental impacts.
D - Direct Reuse	Alternative D would not meet the project needs because of the high cost of implementation and the lack of a regulatory framework.
E - Surface Water Discharge to Big Creek	Alternative E would not meet the project needs, because the WLA for Big Creek has already been completely allotted and any new discharge would further deteriorate water quality and would not be permitted.
F – Surface Water Discharge to Etowah River Basin	Alternative F would not meet the project needs, because it would increase Inter-Basin Transfer (IBT) and would require costly infrastructure that is not economically feasible.
G (Proposed Action) – Surface Water Discharge to the Chattahoochee River ^a	Alternative G would meet the project needs, because it would increase FCWSD capacity and make a beneficial reuse of reclaimed water while reducing IBT.

^a Proposed Action and Environmentally Preferred Alternative

3.12 Summary of Environmental Effects

Table 3-2 presents a concise summary of potential effects by impact topic; additional information about the potential environmental effects of the Proposed Action is presented in Section 4.

TABLE 3-2
Summary of Environmental Effects
Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Impact Topics	No-Action Alternative	Surface Water Discharge to Chattahoochee River (Proposed Action)
Cultural, Historic, and Archaeological Resources		
Cultural, Historical and Archaeological Resources	NE	NE
Natural Resources		
Vegetation	NE	Short-term MAI, Long-term NAI
Wildlife	NE	NAI
Aquatic resources	NE	MAI
-Trout	NE	MAI
Special status species	NE	NAI
Wetlands and floodplains	NE	Short-term MAI, Long-term NAI
Geology and soils	NE	Short-term MAI, Long-term NAI
Water quality and flow		
Flow	NAI	NBI
pH (not supporting designated use)	NE	MAI
Fecal Coliform	NE	MAI
Dissolved Oxygen	NE	NAI
Nutrients	NE	MAI
Temperature	NE	MAI
Noise		
Recreation Area users	NE	Short-term MDA, Long-term NAI
Residents	NE	Short-term MDA, Long-term NAI
Visitor and Community Values		
Fly-Fishers	NE	Short-term MDA, Long-term MAI
Cumulative Impacts		

TABLE 3-2
 Summary of Environmental Effects
Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Impact Topics	No-Action Alternative	Surface Water Discharge to Chattahoochee River (Proposed Action)
Water Quality	NE	NAI
Visitor and Community Values	NE	NAI

NE – No Effect, NAI – Negligible Adverse Impact, NBI – Negligible Beneficial Impact, MAI – Minor Adverse Impact, MDA - Moderate Adverse Impact, MJI – Major Adverse Impact,

4.0 Environmental Effects

This section presents a review of the potential environmental effects of the No-Action Alternative (Alternative A) and the Proposed Action for a ROW permit to construct and operate a discharge diffuser in the Chattahoochee River (Alternative G). Certain impact topics have no potential to be affected by the proposed Shakerag WRF and Chattahoochee River diffuser. These topics are excluded from further discussion and are listed in Section 1.5.1.

In 1916, Congress passed the Organic Act, which created the NPS to “preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations.” Thus, any management actions in the CRNRA must recognize that preserving the natural and cultural resources and values of the CRNRA is paramount, and that any visitor activities associated with “enjoyment, education, and inspiration” can occur only to the extent that they do not impair the natural and cultural resources and values for future generations.

4.1 Cultural Resources

4.1.1 No-Action Alternative (Alternative A)

The No-Action Alternative would not be expected to result in any adverse effects to cultural resources or any impairment to the CRNRA, see Appendix I, Table I-1. Under this alternative, there would be no change from existing conditions and, therefore, no effect on cultural resources would occur.

4.1.2 Surface Discharge to the Chattahoochee River (Alternative G)

A cultural resource survey, including a combined pedestrian and survey and subsurface testing program, was conducted for the entire project tract in 1995 by TRC Garrow & Associates (TRC, 1996). Provided as Appendix H, the survey notes that much of the proposed project area has been recently impacted by agriculture, animal husbandry, and sand processing activities. It identified seven archaeological sites and two isolated finds within the Threatt LAS property boundaries east of Kemp Road; however, these sites are all located south of the proposed Chattahoochee River diffuser project area. Therefore, no adverse effects to archaeological resources would be expected from the construction or operation of the proposed facility. The literature search also did not identify any historically significant individuals or events associated with the project site. Based on the impact thresholds discussed in Appendix I, this alternative would be expected to result in negligible adverse impacts, if any, to cultural resources.

4.2 Natural Resources

Evaluation of impacts to natural resources is based on (1) the importance (legal, commercial, recreational, ecological, or scientific) of the resource, (2) the rarity of a species or habitat regionally, (3) the sensitivity of the resource to proposed activities, and (4) the duration and magnitude of ecological ramifications. Impacts to biological resources are considered to be greater if priority species or habitats are adversely affected over relatively large areas and/or disturbances cause reductions in population size or distribution of a priority species.

4.2.1 No-Action Alternative (Alternative A)

No effect on terrestrial vegetation would be expected from implementation of Alternative A because under this alternative, there would be no construction or clearing activities. In addition, no impact to terrestrial wildlife or aquatic resources would be expected from implementation of Alternative A because there would be no construction or clearing activities.

4.2.2 Surface Discharge to the Chattahoochee River (Alternative G)

Terrestrial Wildlife and Vegetation Resources

A Stream Buffer variance application was submitted by FCWSD to GA EPD in December of 2008 and revised in April of 2009 requesting a variance under GA Regulation 391-3-7-.05(2)(a) which addresses the construction or repair of structures which, by their nature, must be located within the buffer and which specifically addresses “waste water discharges”. The temporary disturbed (linear) width from the top-of-bank to the edge of the 50-foot buffer is anticipated to 50 feet, or 2,500 sf. The total buffer disturbance area of 17,000 square feet includes the area within the 50-foot buffer from top of bank (roughly 50 feet by 50 feet), and also the area within the river bed (roughly 100 feet by 145 feet). Best management practices to mitigate these temporary impacts are described in section 3.8 while the Variance Application includes an Overall Sediment and Erosion Control Plan that calls for both temporary and permanent vegetation to be installed.

Much of the remaining property around the proposed ROW is already managed as open fields and little or no additional clearing would occur. Forested areas along the river that would be cleared include pine forest, submesic hardwood forest, and mesic hardwood forest; see Figure 2-1 for a view of existing riparian conditions. All forested land is regrowth forest and current habitat conditions range from relatively undisturbed since the time of last clearing to highly disturbed since the time of last clearing. The amount of clearing required for the ROW is within the clearing limits for the Chattahoochee River corridor and would result in short term, minor adverse impacts to terrestrial vegetation as defined in Table I-2 of Appendix I. Because the area of vegetation disturbance would be limited and wildlife can easily move into adjacent areas, negligible adverse impacts to terrestrial wildlife are anticipated as a result of the construction and operation of the diffuser.

Aquatic Resources

The following sections describe the aquatic habitat in the Chattahoochee River near the diffuser, principally with respect to trout, and the potential effects of the predicted temperature change on the trout species known to inhabit this section of the river.

Habitat and Resource Description

This section describes the potential impacts identified by the Technical Memorandums provided in Appendix E evaluating the Outfall Diffuser Design (Appendix E-1) and modeling instream temperature conditions (Appendix E-2). Reclaimed water from the Shakerag and Fowler WRFs would be discharged through a single bottom diffuser into the Chattahoochee River approximately at river mile 340.5. McGinnis Ferry Road is located about 0.5 river mile downstream. The Chattahoochee diffuser would occupy the final 77.5 feet of a 100-foot, 36-inch-diameter HDPE pipe embedded into the bed and bank of the Chattahoochee River. The diffuser would include 10 ports (6-inch diameter and about 6 to 8 inches above the bottom) spaced over the last 77.5 feet, each located at a spacing of 7.5 feet center to center.

As discussed in Section 2.6.1, GAEPD (2009) Rules and Regulations for Water Quality Control (Chapter 391-3-6) establish that in streams designated as secondary trout waters there shall be no elevation exceeding 2°F of natural stream temperatures. The results of temperature discharge modeling for rates of 6-mgd, 9.6-mgd, and 14.4-mgd are presented in Appendix E-1 and summarized in Table 4-1 below. Results are presented in Degrees Celsius (°C) where 1.1°C is approximately equal to 2°F. In Table 4-1, data are shown for both summer and winter conditions. The 90th percentile plume temperatures for both summer and winter conditions were determined during modeling to be approximately the maximum temperature of the discharge plume immediately at the discharge port. The summer and winter (seasonal) “natural” stream temperature¹ was derived from the 90th percentile of long-term ambient temperature record from the Chattahoochee River. The maximum allowable temperature elevation of 1.1 °C was then added to these seasonal natural stream temperature estimates to derive the summer and winter (seasonal) critical condition temperatures. The critical condition temperatures were used as the basis for evaluating the discharge modeling results.

¹ Within this reach of the Chattahoochee River, “natural” stream temperature reflects the man-made creation of an artificially cold temperature regime as a result of releases from Buford Dam.

TABLE 4-1

Results of Temperature Modeling for Diffuser Port for 6-mgd
Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Summer Critical Conditions				
Discharge (mgd)	90 th Percentile Plume Temperature zero feet from port (°C)	Summer Critical Temperature* (°C)	Distance from Diffuser Port where Plume Temperature is less than Summer Critical Temperature (feet)	Projected Plume Temperature (°C)
6.0	26.6	14.83	9.34	14.72
Winter Critical Conditions				
Discharge (mgd)	90 th Percentile Plume Temperature zero feet from port (°C)	Winter Critical Temperature* (°C)	Distance from Diffuser Port where Plume Temperature is less than Winter Critical Temperature (feet)	Projected Plume Temperature (°C)
6.0	23	13.39	6.75	13.35

*Seasonal critical condition temperatures are determined from the 90th percentile of long-term temperature record from the Chattahoochee, plus 1.1°C.

90th percentile temperature of Chattahoochee River. Winter: 12.29°C Summer: 13.73°C

Temperature change (ΔT) must be less than 1.1 °C within 10 feet of port.

Data from CH2M HILL 2005, 2009, Appendix E

Temperature modeling determined the approximate distance from the diffuser ports where the effluent plume temperature from the diffuser dropped below the seasonal critical temperature, indicating the distance beyond which the temperature elevation above natural stream temperature was less than 1.1°C. A range of discharge volumes (6-mgd, 9.6-mgd, and 14.4-mgd) was modeled during both winter and summer seasons to characterize sensitivity to temperature, see Appendix E. The results of the modeling indicate that the Proposed Action would not cause a maximum temperature change of 1.1°C beyond 9.34 feet from the diffuser, see Table 4-1. During summer critical conditions, at a discharge rate of 6.0-mgd, where the summer critical temperature is 14.83°C, the effluent plume would drop below the summer critical temperature at a distance of 9.34 ft from the ports and have a temperature of 14.72°C; yielding a temperature change of 0.11°C from the summer critical temperature and an elevation of 0.99 °C from natural stream temperature. During winter critical conditions, the plume temperature would not exceed 1.1°C above natural stream temperature beyond 6.75 feet from the diffuser, corresponding at that point with an elevation of 1.06 °C from natural stream temperature. Thus, the temperature-change criterion for a secondary trout stream would not be exceeded in the case of a 6-mgd discharge volume since there would be less than a 1.1°C change in temperature from the natural stream temperature at distances of 7 to 10 feet beyond the diffuser ports.

Studies on juvenile trout (Biagi and Brown, 1997) indicate that rainbow trout and brown trout have critical thermal maximum (CTM) temperatures of 28.2°C and 28.7°C, respectively. Maximum temperatures at the diffuser would occur during the summer and may

occasionally exceed 28°C (100th percentile plume temperature). However, due to effluent mixing, these elevated temperatures would occur only very near the diffuser. Based on the diffuser modeling, trout could experience temperatures above these levels only during limited periods in the summer and only within a few feet of the diffuser.

The following factors indicate that acute temperature effects to trout would be minor and that the diffuser would not pose a barrier to the upstream or downstream movement of trout in this segment of the river:

- Trout closely approaching the diffuser in the upstream direction would be capable of avoiding the steep temperature gradient at the diffuser ports by selecting passage routes between the 7.5-foot gaps between diffuser ports or to the outside of the entire diffuser itself, where temperatures would be at or near the ambient upstream river temperature.
- Trout passing with strong river currents downstream over the diffuser would be exposed to an abrupt temperature rise, followed by a fluctuating but rapid decrease in temperature to a mixed temperature slightly above ambient at a distance of approximately 10 feet downstream of the diffuser (Appendix E). The maximum ΔT experienced by these fish would be substantially lower than that predicted for the diffuser ports, because the fish would not intersect the rising, horizontally directed plume until some distance downstream of the diffuser. This distance would depend on the vertical position of the fish in the water column and other factors affecting the shape of the plume.
- Laboratory studies conducted by Coutant (1973) investigating the effects of thermal shock on juvenile salmonids found that exposure of young rainbow trout to shock temperatures of 26 to 30°C increased vulnerability of fish to predation. However, increased vulnerability was not observed until uninterrupted exposure times exceeded 30 minutes. Exposure times experienced by trout at the diffuser would be very brief (on the order of seconds) at temperatures likely to be several degrees lower than 26°C. Therefore, trout moving past the diffuser would not be expected to exhibit behaviors associated with thermal shock.
- The width of the river at this location is 173 feet. The maximum width of the thermal plume near the diffuser would be approximately 90 feet in the middle of the river, 77.5 feet along the length of the diffuser plus 6 feet on either side of the diffuser (see Appendix E). This would leave about 42 feet of space on either side of the plume to the adjacent banks (a total of 48 percent of the river cross section) where elevated ΔT s associated with the direct thermal plume would not occur. The diffuser would clearly not present a barrier to the upstream and downstream passage of trout and other fish and aquatic organisms inhabiting this segment of the Chattahoochee River.
- Modeling of the temperature effects of the combined effluents indicates that even under the lowest discharge volume conditions, 6.0 mgd, less than 10 feet downstream of the diffuser the ΔT would be lower than the maximum allowed under Georgia state water quality standards for secondary trout streams (2°F). The ΔT would drop to <1.0°C during low flows in all seasonal temperature conditions within 10 feet of the diffuser.

Based on analysis of the acute temperature effects associated with the highest ΔT s predicted for the diffuser ports and at the downstream point where the thermal plume reaches the surface, the proposed action would result in minor adverse impacts to the existing trout fishery in this segment of the Chattahoochee River as defined in Table I-2 of Appendix I. The diffuser was specifically designed to minimize the ΔT and the downstream length of the discharge temperature plume by promoting rapid mixing, thereby mitigating any adverse effects to the trout fishery.

Additional analysis of the potential cumulative effects of the proposed discharge on temperatures in the Chattahoochee River was also completed (Appendix E-2). The analysis was completed using the RIV1 hydrodynamic model developed by GA EPD for the 115 miles of the river below Buford Dam. This model has been used by GA EPD to define discharge limits for new facilities and to evaluate potential water quality impacts from various activities in this reach of the river. Model inputs included Buford Dam flows and temperatures; tributary and wastewater flows and temperatures; withdrawal flow rates; and metrological data. Results of the modeling (Appendix E-2) indicate that the maximum difference in temperature would occur directly downstream of the diffuser (0.234 degrees C occurred during one day during the simulation period) and would average only 0.097 degrees C (over the entire May - October model simulation period). Modeling of the potential cumulative temperature effects associated with the proposed discharge indicates that the temperature elevation would not exceed the state temperature standards for secondary trout streams and would not reach temperatures detrimental to stocked trout, wild brown trout, or warm water fish species that are native to the river.

4.3 Special Status Species

Evaluation of impacts to special status species is based on (1) the importance (legal, commercial, recreational, ecological, or scientific) of the resource, (2) the rarity of a species or habitat regionally, (3) the sensitivity of the resource to proposed activities, and (4) the duration and magnitude of ecological ramifications. Impacts to special status species are considered to be greater if priority species or habitats are adversely affected over relatively large areas and/or disturbances cause reductions in population size or distribution of a priority species.

4.3.1 No-Action Alternative (Alternative A)

No effect on threatened or endangered species or habitat would be expected from the implementation of Alternative A because under this alternative, there would be no construction or clearing activities.

4.3.2 Surface Discharge to the Chattahoochee River (Alternative G)

During an investigation of the proposed ROW project site and its vicinity, no state or federally protected species or potentially suitable habitat for protected species was observed (CH2M HILL, 2000). Upland of the area of the Proposed Action on the site of the Threat LAS are hayfields and adjacent re-growth woodlands. Previous investigations determined that potential habitat for two state-listed plant species occurred in the woodland, but that

neither occurred on the site (CH2M HILL, 2000). These species are goldenseal (*Hydrastis canadensis*) and Ozark bunchflower (*Melanthium woodii*).

Within the Chattahoochee River corridor, no special status aquatic species or their potentially suitable habitats were identified or are presently known to occur within the reach downstream of the proposed diffuser location. Therefore, the proposed construction of the ROW and subsequent discharge of up to 6 mgd of reclaimed water to the Chattahoochee River would not be expected to result in any adverse impacts to protected species or their habitats (i.e., negligible adverse impacts based on the thresholds defined in Appendix I, Table I-3).

4.4 Wetlands and Floodplains

Evaluation of wetland impacts is based on (1) the importance (legal, commercial, recreational, ecological, or scientific) of the resource, (2) the rarity of a species or habitat regionally, (3) the sensitivity of the resource to proposed activities, and (4) the duration and magnitude of ecological ramifications.

Impacts of flood hazards on proposed actions can be significant if such actions are proposed in areas with high probabilities of flooding; however, these impacts can be mitigated through the use of specific design features to minimize the effects of flooding. Impact thresholds for wetlands and floodplains are further defined in Table I-4 of Appendix I.

4.4.1 No-Action Alternative (Alternative A)

No effect on wetlands or floodplains would be expected from the implementation of Alternative A because under this alternative, there would be no construction or clearing activities.

4.4.2 Surface Discharge to the Chattahoochee River (Alternative G)

Wetlands

CH2M HILL conducted wetland delineations at the site of the proposed ROW and its surrounding areas in 1999 and 2007, following USACE methods (USACE, 1987). Onsite wetlands were identified and were limited to bed and bank palustrine forested systems associated with two streams and three ponds on the property.

Review of natural resource databases, aerial photography, National Wetlands Inventory (NWI) maps, USGS 7.5-minute quadrangle maps, and Natural Resources Conservation Service (NRCS) soil maps identified the Chattahoochee River as a riverine wetland at the location of the proposed diffuser. Field inspection confirmed that the Chattahoochee River conforms to the definition of a riverine wetland under the USFWS classification system (Cowardin et al., 1979) due to its substrate type at the proposed project location. However, field inspection also determined that the river is more similar to a free flowing river system than to a riverine wetland at this location.

No wetlands occur along the proposed pipeline route from the Shakerag WRF site to the Chattahoochee River. The only wetland that would be impacted by the project is the river itself. As noted in Table 4-2, the Proposed Action is anticipated to impact approximately

1000 sf (0.023 acres) during construction and to result in 800 sf / 0.018 acres of permanent adverse impacts to Riverine wetlands during operation. This total impact is less than 0.03 percent of the existing riverine wetlands within the CRNRA.

TABLE 4-2
CRNRA NWI wetlands as compared to Proposed Action
Shakerag WRF ROW and Discharge Environmental Assessment

National Wetland Inventory Type	Acres of Each NWI Type in CRNRA	Proposed Action - Construction	Proposed Action - Operation
Palustrine Forested	21.5		
Palustrine Scrub/Shrub	10.3		
Palustrine Unconsolidated Bottom or Shore	7.8		
Palustrine Emergent	6.2		
Lacustrine	33.4		
Riverine	72.7	1000 sf / 0.023 acres	800 sf / 0.018 acres
Total:	151.9		

Source: USFWS, 2001 and NPS, 2008.

During the design stage, the location of the proposed Shakerag WRF and the proposed route for the discharge line were selected to avoid wetlands at the site. However, further avoidance of impacts is not practicable because modeling to support the design indicates that the diffuser must be 100 feet out in the river channel to allow appropriate mixing of the discharge. From a biotic standpoint, the river substrate functions as habitat for invertebrates and invertebrates would be expected to recolonize the area once construction was complete. This section of the river does not contain appreciable growth of aquatic macrophytes, but these also would recolonize the area after construction is complete. The water column provides habitat for fish and there would be no change in fish species assemblages expected as a result of the Proposed Action. Although the Proposed Action is anticipated to temporarily adversely impact approximately 1000 sf of riverine wetlands during construction and 800 sf of permanent adverse impacts during operation, Table 4-2 illustrates that this is a fraction of a percent of the total existing riverine wetlands within the CRNRA. Therefore, there would be short term minor adverse impacts to wetlands and wetland functions during construction however negligible long term adverse impacts are expected as a result of the Proposed Action.

Impacts to wetlands from the diffuser and pipeline construction would be minimized by working within a coffer dam and utilizing all appropriate BMPs. Impacts would be short term and minor during construction; there would be a minor amount, 800 sf, of wetlands impacted as a result of operation of the proposed diffuser within the ROW. Further avoidance of impacts is not practicable because the design requires the diffuser to be 100 feet out in the channel.

Floodplains

The Proposed Action at the project location would be within the 100-year floodplain of the Chattahoochee River. A "100-year floodplain" or "100-year flood" describes an area or event subject to a 1 percent probability of a certain size flood occurring in any given year. The 100-year floodplain for the Chattahoochee River at this location begins at an elevation of 911.0 feet above mean sea level (msl) at McGinnis Ferry Road and rises to 912.0 feet msl approximately 4,000 feet upriver and continues at 912.0 feet msl beyond the project area. All above-ground construction for the WRF would occur at or above elevation 960 feet msl, which is well outside the 100-year and 500-year floodplains for the Chattahoochee River at this site. Therefore, no impacts to floodplains would occur from above-ground features.

Construction of the reclaimed water pipeline and diffuser would require temporary disturbance within the floodplain. However, the pipeline would be buried and the ground surface returned to the original contours. Therefore, short-term, minor impacts to floodplains would result from construction of the pipeline. Once installed, there would be no change in flood elevations, flood conveyance, or flood storage as a result of the project resulting in negligible long term adverse impacts.

4.5 Geology and Soils

Protection of unique geologic features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards and soil limitations are considered when evaluating impacts to geology and soil resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering designs are incorporated into project development.

Analysis of potential impacts to geologic resources typically includes identification and description of resources that could be affected, examination of the potential effects that an action may have on the resource, assessment of the significance of potential impacts, and provision of mitigation measures in the event that potentially significant impacts are identified. Analysis of impacts to soil resources resulting from proposed activities includes an examination of the suitability of locations for proposed operations and activities. Impacts to soil resources can result from construction that would expose soil to wind or water erosion. Impact thresholds for geology and soils are further defined in Table I-5 of Appendix I.

4.5.1 No-Action Alternative (Alternative A)

No effect on geology and soils would be expected from the implementation of Alternative A, because under this alternative, there would be no construction or clearing activities. No impairment of geology and soils within the CRNRA would occur under this alternative.

4.5.2 Surface Discharge to the Chattahoochee River (Alternative G)

Construction of the reclaimed water pipeline and diffuser at the project area location would have short-term, minor adverse impacts on the soils and geology of the site. The facility would be designed and constructed under general Permit Number GAR100002 for

infrastructure projects. An Erosion, Sedimentation, and Pollution Control Plan would be developed and implemented for construction. During construction, all work would comply with this plan. Appropriate BMPs, consistent with the *Manual for Erosion & Sediment Control in Georgia*, would be used to prevent erosion on the project site and would specifically address erosion control efforts associated with the temporary construction of the coffer dam and any associated stress it could place on the river bank. BMPs would be selected based on site-specific conditions and could include, but would not be limited to:

- Minimizing the amount of exposed soil
- Maintaining existing vegetative buffers around watercourses where possible
- Using sediment barriers (silt fences or straw bales)
- Installing temporary detention basins
- Implementing grade stabilization with seed and mulch
- Using geotextile slope stabilization

The diffuser would be installed in the Chattahoochee River bed. This work would result in short-term minor adverse impacts to the riverbed soils during construction. However, in addition to the BMPs described above, construction would be done within temporary coffer dams to provide a safe work area and to minimize impacts. With the exception of the diffuser ports, the river bed will be returned to preconstruction conditions upon completion of construction resulting in negligible long term adverse impacts to geology and soils.

4.6 Water Quality and Flow

Criteria for evaluating impacts related to water resources associated with a Proposed Action are water availability and use, water quality, and adherence to applicable regulations. Impacts are measured by the potential to reduce water availability to existing users, to endanger public health or safety by creating or worsening health hazards or safety conditions, to threaten or damage unique hydrologic characteristics in an area, or to violate laws or regulations adopted to protect or manage water resources. An impact to water resources would be significant if it would (1) reduce water availability to or interfere with the supply of existing users, (2) create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply sources, (3) adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions, (4) threaten or damage unique hydrologic characteristics, or (5) violate established laws or regulations that have been adopted to protect or manage water resources of an area. Impact thresholds for water quality and flow are further defined in Table I-6 of Appendix I.

4.6.1 No-Action Alternative (Alternative A)

No effect on water quality would be expected from the implementation of Alternative A because under this alternative, there would be no construction of the river discharge diffuser components. Negligible adverse impacts to flow within the CRNRA would occur under this alternative since the continued use of septic tanks and LAS would not result in return flows directly to the Chattahoochee River.

4.6.2 Surface Discharge to the Chattahoochee River (Alternative G)

The Proposed Action would have negligible effects on water quantity in the Chattahoochee River, as defined in Appendix I, and these effects would be beneficial in returning 6.0-mgd of high-quality water to the River while reducing consumptive uses (e.g., septic systems) and IBTs. The 6.0-mgd discharge volume of the facility would represent approximately 0.4 percent of the mean annual flow (MAF) of the river at the proposed diffuser location (MAF at Norcross Station is 2,289 cfs).

Water quality issues in the Chattahoochee River are focused on potential impacts resulting from fecal coliform bacteria, dissolved oxygen (DO), nutrients, and temperature changes due to the operation of the proposed WRF and diffuser; these topic areas are discussed below. Sedimentation and erosion during construction also has the potential to have minor impacts on water quality; however, a plan to control soil and sediment erosion during construction would be developed and implemented as discussed in Section 4.5.

The GA EPD issued the NPDES permit, Section 401 certification, and stream buffer variance in August 2010 (See Appendix B).

pH

As discussed in Section 2.6, the Dicks Creek to Johns Creek segment of the Chattahoochee River, the location of the Proposed Action, is currently not supporting its designated uses of fishing and recreation. However, GA EPD anticipates that this segment of the Chattahoochee River will be changed to supporting in 2012 because the trend in the pH data is improving with no pH violations since 2006 (GA EPD, 2010). The evaluated causes for this pH impairment are urban runoff and nonpoint sources. While a Total Maximum Daily Load (TMDL) and TMDL Implementation Plan have not yet been developed, current pH TMDLs for other stream segments in North Georgia are requiring an upper limit of 8.5 of local point sources in spite of not definitely linking them as a source of the violations. Section B.4, Effluent Limitations and Monitoring Requirements, of FCWD's NPDES permit and WLA notes pH limits of not less than 6 or greater than 9 standard units however FCWD is planning on a final permit range of 6 to 8.5. This reflects the pH standard noted in item 6.2 on page 4 of the NPDES permit application factsheet provided by GA EPD in December of 2007. This standard for waterways such as the Chattahoochee River that are designated for Drinking Water, Recreation and as a Secondary Trout Stream, ensures that the Proposed Action will meet the pH criterion at the point of discharge and therefore only have minor adverse impacts.

Fecal Coliform Bacteria

Fecal coliform bacteria is the most frequently listed parameter for water quality limited stream segments in metropolitan Atlanta and the Chattahoochee River, in particular, based on the 303(d) listed streams requiring development and implementation of TMDLs. The segment of the Chattahoochee River near the proposed diffuser is currently not included on the list of impaired waters for fecal coliform bacteria. The design discharge limits for the combined Forsyth discharge would result in a discharge meeting the urban reuse criterion as determined by GA EPD: 23 colonies/100 ml or less of fecal coliform bacteria. The discharge of reclaimed water would remain within the established permit limits due to (1) treatment technologies for disinfection and redundant facilities at the Shakerag WRF and

other treatment facilities contributing to the discharge and (2) intensive monitoring of the effluent. Minor impacts to water quality resulting from fecal coliform would be expected during construction or operation of facilities related to the Proposed Action.

Once the Shakerag WRF is operational, Forsyth County would be able to extend sewer service and begin eliminating onsite systems. Reduction in the number of septic systems would presumably reduce the number of septic systems that fail from improper loading or lack of maintenance. This would also indirectly reduce a potential source of fecal coliform bacteria within the county.

Dissolved Oxygen

DO was identified as a concern downstream of Peachtree Creek due to the previous levels of organic loadings from both point and nonpoint sources in the river and the loss of oxygen-carrying capacity as a result of the heat load associated with discharges to the river from two Georgia Power electric generating facilities (McDonough and Atkinson). GA EPD has been working with regional utilities for several years to evaluate the assimilative capacity of the Chattahoochee River and has developed a water quality model to evaluate discharge limits for oxygen-demanding constituents. This model (EPDRiv1) was used in a recent evaluation of the recommendations in the MNGWPD Long-term Wastewater Management Plan by Robert Olson with Natural Resource Engineering (NRE) (Appendix G).

Key assumptions in this evaluation included removal of the heat load from the Georgia Power electric generating plants no later than 2008, and implementation of the proposed MNGWPD limits for all discharges to the river:

- CBOD= 2.9 mg/L
- NH₃ = 0.5 mg/L
- Organic nitrogen =1.5 mg/L
- DO = 7.0 mg/L

The model indicates that discharges meeting these limits would not adversely impact DO levels in the Chattahoochee River. The proposed Shakerag WRF would be designed to meet these limits. In addition, Georgia Power has installed cooling towers at Plant McDonough and removed the discharge from Plant Atkinson, resulting in the removal of the associated heat load (GA EPD, 2010). Therefore, it is reasonable to assume that impacts to downstream DO concentrations resulting from the Proposed Action would be negligible.

Nutrients

Total Phosphorus (TP) levels have been a concern due to the potential for eutrophication in downstream reservoirs, particularly West Point Lake. TP standards for West Point Lake have been established by GA EPD to minimize the potential for eutrophication of this reservoir. The annual loadings of TP from the Chattahoochee River have been limited to 1,400,000 pounds. As part the MNGWPD long-term wastewater management planning process, NRE completed an evaluation of the existing and proposed TP loadings to the Chattahoochee River (Appendix G). For this analysis, the nonpoint source loadings used in the MNGWPD Watershed Management Plan (CH2M HILL 2003) and the point source loadings from the MNGWPD Long-term Wastewater Management Plan (JJ&G 2003) were used. Results for the 2004 scenario indicated that the annual TP loading to West Point Lake

could be met even without additional nonpoint source controls. This scenario assumed that the TP point sources would have effluent concentrations of 0.3 mg/L, the same as the Shakerag WRF is designed to meet. The model predicted a total TP loading (point and nonpoint sources) of 1,134,793 lb/yr compared to a TP loading limit for the Chattahoochee River of 1,400,000 lb/yr. Considering the proposed discharge would have a TP concentration limit of 0.3 mg/L, the additional 6 mgd (maximum) should have minor impacts on downstream eutrophication of West Point Lake. Additionally, the Shakerag WRF will provide redundancy via the inclusion of a phosphorus polishing facility as a component of the design.

Temperature

As described in Section 2.6, the Chattahoochee River below Buford Dam, including the location of the Proposed Action, is classified as a secondary trout stream. Trout are sensitive to elevated temperatures and changes in temperature associated with a point source discharge are not to exceed 2°F above natural stream temperatures. The potential effects on temperature for 6-mgd, 9.6-mgd, and 14.4-mgd discharges were evaluated using the Visual Plumes model (see Appendix E). This model directly simulates the widest variety of diffuser designs and is widely used for near-field modeling. The model is effective at evaluating single plumes from each diffuser port. Visual Plumes determines when individual plumes reach surface or bottom, and when individual plumes interact or merge with each other. These phenomena are the key issues when evaluating the potential impacts of reclaimed water on the temperature in the river.

Based on this modeling evaluation, it was determined that the temperature change within all diffuser port plumes for each rate of discharge would result in water temperature increases of less than 2°F within the first 10 feet. As a result, the existing temperature standards for secondary trout streams would be met with the proposed 6-mgd discharge (Table 4-2). In addition, the model results demonstrate that the temperature mixing zone could not influence the entire width of the river and would therefore not pose a barrier to trout movement up- and downstream of the diffuser (see Table 4-2 and Appendix E).

Additional modeling was completed to evaluate the far-field (beyond the immediate area of initial diffusion of the effluent) temperature effects and potential for cumulative changes in temperature conditions in the river between the proposed discharge and the Big Creek confluence (See Section 4.2.2, Surface Discharge to the Chattahoochee River, Aquatic Resources and Appendix E-2). Modeling was conducted using the GA EPD RIV1 that is used for water quality analysis and wastewater permitting evaluations in the Chattahoochee River. The net temperature changes associated with the discharge were modeled at several locations downstream of the diffuser (Table 4-3). Results indicate that the maximum net increase in temperature of 0.234 degrees C would occur just downstream of the diffuser and the average increase would be only 0.097 degrees C for the critical period May through October. Further downstream at the confluence with Big Creek the net temperature change would be a maximum of 0.072 degrees C and would average only 0.024 degrees C. This modeling indicates that the proposed 6 mgd discharge would have a minor adverse impact on the temperature conditions in the Chattahoochee River.

TABLE 4-3

Net Temperature Effect of the Shakerag Discharge May – December

Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Location	Temperature Difference (Degree C)		
	Maximum	Minimum	Average
Immediately Downstream of Forsyth County Discharge	0.234	0	0.097
Medlock Bridge Road	0.168	-0.001	0.062
Holcomb Bridge Road	0.13	-0.17	0.048
Ball Mill Creek	0.084	-0.34	0.029
Upstream of Big Creek Confluence	0.072	-0.052	0.024

Therefore, the Proposed Action would not cause exceedances of the water temperature criteria for a secondary trout stream and impacts would likely be minor. The diffuser was specifically designed to minimize the ΔT and the downstream length of the discharge temperature plume by promoting rapid mixing, thereby mitigating any adverse effects to water temperatures suitable for trout.

4.7 Noise

“Noise,” in the context of this analysis, refers to sounds generated by activities that could affect onsite workers, nearby residents, or wildlife. Noise levels typically are expressed in terms of decibels (dB), a measure of the sound pressure generated. The decibel scale is logarithmic rather than linear because humans perceive sound as the logarithm of the sound pressure rather than the actual sound pressure (EPA, 1974)

For determination of impacts to human receptors, noise measurements are weighted to increase the contribution of noises within the normal range of human hearing and decrease the contribution of noises outside the normal range of human hearing. For humans, this is an A-weighted scale (dB_a). When sound pressure doubles, the dB_a level increases by three. Psychologically, most humans perceive a doubling of sound as an increase of 10 dB_a (EPA, 1974). Sound pressure decreases with distance from the source. Typically, the amount of noise is halved as the distance from the source doubles (EPA, 1974).

Additionally, people tend to exhibit differing sensitivity to noises generated by time of day, with noise at night being more disturbing than daytime noise. Therefore, an LDN is used to determine whether noise would be perceived noise, in the context of this analysis, refers to sounds generated by activities that could affect onsite workers, nearby residents, or wildlife. Table I-7 of Appendix I further defines the impact thresholds associated with noise.

4.7.1 No-Action Alternative (Alternative A)

No effect on noise levels within the CRNRA would be expected from the implementation of Alternative A because under this alternative there would be no construction of new facilities.

4.7.2 Surface Discharge to the Chattahoochee River (Alternative G)

During construction, construction-related noise would be generated during normal working hours. No sensitive receptors are immediately adjacent to the proposed construction area, with the nearest residences approximately 1,000 feet to the west. Heavy equipment such as bulldozers, graders, backhoes, excavators, dump trucks, and cement trucks would generate noise that could affect onsite workers, nearby residents, and wildlife.

Construction equipment typically emits noise in the 86- to 94-dB range. However, at the nearest residence, approximately 1,000 feet from the site, this noise level would be reduced to below 60 dBA. This noise exposure, during the day and limited to the period of construction, would be short-term and minor to recreation users of the river and negligible to residents.

The Threatt LAS property, site of the proposed ROW, does not support abundant wildlife that would be receptors to construction noise. Wildlife may be temporarily displaced during construction, but could return to the area following construction, therefore there would be minor, short term adverse impacts to wildlife during construction. When operational, the diffuser within the area of the Proposed Action would produce minimal noise that would likely blend in with background noise levels. Thus, negligible adverse impacts from noise would result from operation of the diffuser.

4.8 Visitor Use and Public Safety

Criteria for evaluating impacts associated with the Proposed Action related to visitor use and public safety include potential impacts to CRNRA resources and values; section 1.5 lists the types of individual and cumulative impacts that the NPS deems unacceptable while Table I-8 of Appendix I further defines these impact thresholds.

4.8.1 No-Action Alternative (Alternative A)

No effect on visitor use or public safety within the CRNRA would be expected from the implementation of Alternative A because under this alternative there would be no construction or operation of new facilities.

4.8.2 Surface Discharge to the Chattahoochee River (Alternative G)

The proposed diffuser would be located adjacent to the southern-most unimproved lands of the Settles Bridge Unit in Gwinnett County. While located in a rapidly growing quadrant of the Atlanta region, the portion of the CRNRA that most closely brackets the area of the Proposed Action represents one of the least developed relative to the units located downstream of Abbotts Bridge and closer to the City of Atlanta. Visitor use of this segment of the CRNRA primarily consists of fishing (including fly fishing) float-tubing, canoeing,

and kayaking. The closest formal access point to the river is Settles Bridge located approximately 3 miles upstream of the Proposed Action site.

Construction associated with the Proposed Action would have short-term moderate impacts on visitors using the river for boating or fishing. Highly visibility warning signage will be posted upstream of the project site on the river bank and at common access points to ensure visitors are aware of the construction activities. These impacts would be mitigated by the opportunity for users to temporarily relocate their activities to nearby upstream CRNRA locations.

Impacts to visitors during operation of the facilities covered by the Proposed Action were assessed under low flow conditions (650 cfs) to fully bracket all potential scenarios. Appendix E describes the results of this analysis, which are illustrated by a side view of the diffuser location in Attachment 3 of Appendix A. The river depth would be approximately 5.4 ft at the diffuser location, providing a minimum of 4 ft of clearance for boaters. However, the potential would exist for the riverine pedestrian travel of those fly fishing to interact with the diffuser ports. These potential impacts to visitor use would be mitigated through the posting and maintenance of highly visible warning signage. As a result, there would be minor impacts on boaters and minor impacts on those fly fishing.

A Final Management Plan for the CRNRA was completed in 2009 which evaluated six alternatives for future management of the CRNRA. The purposes of this plan are to specify resource conditions and visitor experiences to be achieved in the area and to provide the foundation for decision-making and preparation of more specific resource plans regarding CRNRA management. One of the key management issues identified in the Plan is the parks sensitivity to the potential effects of encroachment and use due to the developing communities adjacent to the CRNRA. Additionally, water quality in streams within the park, including the Chattahoochee River, can be adversely impacted by nonpoint runoff from impervious surfaces from adjoining developed areas. Use of the Fowler / Threatt property as an LAS and WRF prevents further encroachment on the River from development from the west along this segment and the quality of the reclaimed water discharged as a result of the Proposed Action would not cause bacteria levels in the Chattahoochee River to increase. Therefore, only minor impacts to public safety and visitor use would result from contact recreation with the Chattahoochee River.

4.9 Cumulative Effects

Cumulative effects are defined as the impacts on the environment which result from the incremental impact of all actions (past, present, and future) regardless of what agency (Federal or non Federal) or person undertakes such other actions (CEQ 40 CFR § 1508.7). Furthermore, the analysis is designed to consider environmental impacts across both temporal (time) and geographical (spatial) boundaries relative to the project area. Without defining those temporal and geographical boundaries, there is potential to overextend analysis beyond the effects of the Proposed Action.

The geographic scope of cumulative impact analysis for the proposed ROW and diffuser defines the project's area of potential effect as the 48-mile Chattahoochee River corridor established by the MRPA (O.C.G.A. 12-5-440) and managed by CRNRA. This area includes

the two segments of trout stream managed by the DNR WRD (the Buford Dam tailwater and the Morgan Falls Dam tailwater), although much of the cumulative effects would likely dissipate far upstream of the Morgan Falls tailwater.

The temporal scope of the Chattahoochee River diffuser's cumulative effects considers past, present, and future actions and their effects on all impact topics. The temporal scope considered the potential for actions occurring up to 20 years into the future, concentrating on the effects on the resources from reasonably foreseeable future actions. The historical discussion of past actions and effects is based on the best available information for each topic. Both the No-Action Alternative (A) and the Proposed Action (G) were considered during the cumulative impacts analysis.

4.9.1 No-Action Alternative (Alternative A)

Under the No-Action Alternative (Alternative A), no effect to each of the identified impact topics would be expected when combined with all other actions in the vicinity of the CRNRA. Under Alternative A, there would be no construction, ground-disturbing, or riverine-disturbing activities and therefore no cumulative impacts to cultural resources, natural resources, special species, wetlands and floodplain, geology and soils, water quality and flow, noise, visitor use, or public safety.

4.9.2 Surface Discharge to the Chattahoochee River (Alternative G)

Cultural Resources

Negligible impact to cultural resources would be expected under Alternative G. No archeological or historically significant sites were identified in the immediate vicinity of the Proposed Action. Therefore, negligible adverse cumulative impacts on cultural resources are anticipated within the ROW or during operation of the diffuser.

Natural Resources

Under Alternative G, terrestrial resources would incur negligible impacts during construction of the proposed ROW. Trees associated with the narrow riparian buffer at the edge of the Chattahoochee River that also intersects the proposed 10-ft wide ROW would be selectively thinned during construction. Cumulatively, negligible impacts on forested land would occur since the amount of tree removal required for the ROW is within the clearing limits established by MRPA for the Chattahoochee River corridor.

Under Alternative G, negligible adverse cumulative impacts to aquatic resources would be expected from construction of the proposed diffuser, exclusive of temperature-sensitive trout species. Populations of these stocked trout would sustain minor adverse impacts from the proposed diffuser. Trout are sensitive to elevated temperatures and changes in temperature associated with a point source discharge are limited to 2°F. Locally, at the site of the proposed diffuser, temperature change within all diffuser port plumes would result in water temperature increases of less than 2°F and only within close proximity (10 feet) to the ports. As a result, trout would only incur short-term minor adverse impacts from discharge temperatures.

Cumulatively, the most significant contribution of heat to the artificially cold Chattahoochee River comes from its many naturally warm-water tributaries and the air-to-water interface,

which mixes with the river flow and contributes substantially to temperature rise. Additionally, stormwater runoff from increasingly developed upstream watersheds brings warm and turbid waters to the Chattahoochee River. Although trout may be impacted by a localized temperature gradient at the site of the proposed 6.0-mgd diffuser, cumulatively, temperatures along the 48-mile section of the Chattahoochee River are more significantly influenced by the river's naturally warm tributaries, which continue to carry more urban storm runoff.

Special Status Species

Negligible cumulative impacts to threatened or endangered species would be expected under the Proposed Action, Alternative G. Based on the results of field surveys and historical information, no special status species are known to occur in the project area. Additionally, within the Chattahoochee River corridor, no aquatic species or their potentially suitable habitats were identified within the reach downstream of the proposed diffuser. Therefore, negligible cumulative impacts on threatened or endangered species or their habitat would be anticipated from construction of the ROW and subsequent discharge of up to 6-mgd of reclaimed water to the Chattahoochee River.

Wetlands and Floodplains

Under Alternative G, negligible cumulative impacts to wetlands would be expected. The only wetland area to experience short-term minor adverse impacts by the proposed diffuser would be the Chattahoochee River itself, which is classified as a riverine wetland. Impacts to riverine wetlands from construction of the diffuser and ROW would be minimized by working within a coffer dam and utilizing appropriate BMPs. Impacts to riverine wetlands would be temporary and negligible long-term cumulative impacts would be anticipated.

Geology and Soils

Negligible cumulative impacts to geology and soils would be expected under the Proposed Action. Short-term minor adverse impacts to soils from excavation and grading during construction activities would be expected under Alternative G. Consequently, an Erosion, Sedimentation, and Pollution Control Plan would be developed and implemented for construction of the ROW and diffuser. During construction, all work would comply with this plan. Appropriate BMPs, consistent with the *Manual for Erosion & Sediment Control in Georgia*, would be used to prevent erosion on the project site.

Water Quality and Flow

Under Alternative G, the proposed Skakerag WRF diffuser would add an additional 6.0 mgd of reclaimed water to the Chattahoochee River. Currently, eight major municipal water users discharge treated wastewater to the Chattahoochee River basin between Buford Dam and Peachtree Creek (Table 5-1). The river is the region's primary receiving water for assimilating treated wastewater with a total available treatment capacity of 498 mgd (770 cfs), or 69 percent of existing capacity in the 16-county area (AECOM, 2008a). The eight facilities have a combined permitted capacity to discharge 71.25 mgd of treated wastewater to the Chattahoochee River basin between Buford Dam and Morgan Falls Dam (Table 5-1).

TABLE 5-1

Municipal Wastewater Facilities Discharging to the Chattahoochee River Basin Between Buford Dam and Peachtree Creek
Shakerag WRF Discharge Right-of-Way Request - Forsyth County, Georgia - Environmental Assessment

Receiving Stream	Facility Name	County	Permitted Capacity (mgd)
Buford Dam to Morgan Falls Dam:			
Richland Creek	Buford Westside Water Pollution Control Plant (WPCP)	Gwinnett	0.25
Suwanee Creek	Buford Southside WPCP	Gwinnett	2.00
Chattahoochee River	Johns Creek WRF	Fulton	7.00
Chattahoochee River	River Crooked Creek WRF	Gwinnett	16.00
Chattahoochee River	F. Wayne Hill Water Resources Center	Gwinnett	20.00
Big Creek	Cumming WPCP	Forsyth	2.00
Chattahoochee River	Big Creek WRF	Fulton	24.00
		Total	71.25
Morgan Falls Dam to Peachtree Creek			
Clear Creek (Peachtree Creek)	Atlanta Combined Sewer Overflow (CSO)	Fulton	NA
Tanyard Creek (Peachtree Creek)	Atlanta CSO	Fulton	NA

Notes:

*Several major facilities discharge to the Chattahoochee River downstream of Peachtree Creek, including: North Avenue CSO, Atlanta R. M. Clayton Water Reclamation Center (WRC) (122 mgd); Cobb R. L. Sutton WRF (60 mgd); South Cobb WRF (40 mgd); Atlanta South River WRC (54 mgd); Atlanta Utoy Creek WRC (44 mgd), and Fulton Camp Creek WRF (24 mgd).

The new Shakerag WRF at river mile 340 would be the only new large municipal wastewater facility that would discharge directly into the Chattahoochee, within the CRNRA, in the foreseeable future. Two existing major discharges, Buford Westside and Southside, occur upstream the proposed diffuser and do not directly discharge into the Chattahoochee River. The F. Wayne Hill Water Resources Center currently discharges 9 mgd downstream of the Shakerag site but that discharge is scheduled to be redirected to Lake Lanier. The remaining six dischargers, Johns Creek, Crooked Creek, Cumming, Big Creek, and both Atlanta CSOs discharge downstream of the proposed Shakerag discharge.

Negligible adverse cumulative impacts to water quality would be anticipated during operation of the Chattahoochee diffuser with the exception of temperature standards. Although the design discharge limits of the Shakerag WRF (Table 1-1) would be more stringent than the WLA discharge limits and the urban reuse standards (GA EPD, 2002), temperature standards for the Chattahoochee River would cumulatively receive minor adverse impact within the immediate vicinity of the diffuser. The Chattahoochee River is

classified as a secondary trout stream due to artificially cold water conditions from the hypolimnia (bottom) of Lake Lanier. While a localized minor temperature increase from the discharge effluent could occur near the proposed diffuser, cumulatively, the river's temperature standards in the CRNRA are more significantly influenced by several naturally warm-water tributaries carrying urban stormwater runoff and sediment. Modeling of the net temperature increase associated with the proposed 6 mgd discharge in the Chattahoochee River in the reach below the diffuser (See Section 4, Water Quality and Flow) indicates that water temperatures would rise a maximum of 0.234 degrees C directly below the diffuser during the critical period of May through October (Table 4-3). Net temperature influences of the discharge further downstream at the confluence with Big Creek would be a maximum of 0.072 degrees C. Results of this analysis indicate that the cumulative temperature effects of the proposed discharge would be negligible.

Historically, the only reach of the Chattahoochee River included on the GA EPD 305(b)/303(d) list for not supporting its designated use due to temperature was, in 2002, a 9.5-mile reach immediately downstream of the CRNRA from Peachtree Creek to Utoy Creek (GA EPD, 2003). Three wastewater plants (R.L. Sutton, R.M. Clayton, and South Cobb) and two power plants operated by Georgia Power (Atkinson and McDonough) were identified as the potential sources for the violation. GA EPD determined that the major cause of the violation was the two power plants and that a 100% reduction in their waste heat discharge would solve the problem and alleviate the standards violation. Although the three wastewater facilities also discharge heat to the listed segment, with the elimination of the heat load from the power plants, the combined heat from the three plants would not violate Georgia's temperature standard and no heat reductions from these plants were necessary. Since Georgia Power removed its waste heat discharges in 2008, the reach from Peachtree Creek to Utoy Creek no longer violates the temperature standards.

Negligible adverse cumulative impacts to river flows would be expected from operation of the proposed diffuser. Numerous water supply intakes are located along the CRNRA. Two major water supply intakes are operated above Morgan Falls Dam by the Atlanta/Fulton County Water Resources Commission and the DeKalb County Department of Public Works. The City of Roswell operates a small intake on Big Creek about 23 miles downstream of the proposed project site. Two major water supply intakes are operated by Cobb County-Marietta Water Authority (CCMWA) at Johnson Ferry Road (about 29 miles downstream of the proposed diffuser site) and the City of Atlanta just upstream of the river's confluence with Peachtree Creek. Approximately 416 mgd are withdrawn from the river by these facilities (AECOM, 2008b). The proposed Chattahoochee diffuser would return 6.0-mgd of high-quality reclaimed water to the river reducing IBT and increasing base flow even during drought conditions. The return of treated effluent to the river is consistent with Georgia State Plan and the MNGWPD and would result in a negligible beneficial impact to the flow in the Chattahoochee River.

Noise

Minor short-term impacts from noise during construction activities would be expected for the Proposed Action; however, because of the existing traffic and aircraft noise in the area, negligible contributions to a cumulative increase in noise would be expected from implementation of the Proposed Action.

Visitor Use and Public Safety

Implementation of the Proposed Action would not compromise water quality or human health due to the high-quality reclaimed water that would be returned to the river.

Additionally, recreational boaters would not be obstructed or discouraged by the diffuser's placement in the river because it would be designed to be sufficiently deep underwater and inside bedrock. The diffuser ports would protrude approximately 6 inches from the river bed. Even under low flow conditions (650 cfs) the river depth would be approximately 5.4 ft at the diffuser location, providing a minimum of 4 ft of clearance for boaters. However, there would be the potential for minor impacts to those users wading to fly fish. Negligible cumulative impacts to visitor use and public safety would be expected during construction and operation of the ROW and diffuser.

5.0 Consultation and Coordination

The following agencies were consulted during the preparation of this EA, previous planning efforts (see Section 1.3.1) or associated permitting documents:

- **Georgia Environmental Protection Division (GA EPD)** – Wasteload Allocation, Environmental Information Document, Anti-degradation Report, NPDES Permit, Stream Buffer Variance, and CWA Section 401 Certification.
- **United States Army Corps of Engineers (USACE)** – CWA Section 404 Individual Permit
- **United States Fish and Wildlife Service (USFWS)** – Consulted as part of Section 404 permit process, confirmed that it has no further comments under the Fish and Wildlife Coordination Act in August 2009.
- **Georgia Department of Natural Resources Wildlife Resources Division (GDNR WRD)** – Responded to comments from GDNR WRD staff on the NPDES permit application.

Since the Phase I Cultural Resource Survey performed by Garrow & Associates (Appendix H) in May of 1996 revealed no eligible cultural or archaeological resources on site, there was no further consultation with the Georgia Historic Preservation Division.

6.0 List of Preparers

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