ADAPTIVE MANAGEMENT PLAN

STEVENS CREEK WATER QUALITY

STEVENS CREEK HYDROELECTRIC PROJECT
FERC NO. 2535

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ADAPTIVE MANAGEMENT PLAN
FOR
WATER QUALITY AT THE STEVENS CREEK PROJECT

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

A	
AMP	Adaptive Management Plan
B	
BOD	biochemical oxygen demand
C	
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
Conductivity	a measure of the ability of water to pass an electrical current; impacted by the presence of inorganic dissolved solids as well as temperature
D	
DESC	Dominion Energy South Carolina Inc.; Licensee for the Stevens Creek Project
DO	dissolved oxygen
F	
FERC	Federal Energy Regulatory Commission
G	
GADNR	Georgia Department of Natural Resources
GAEPD	Georgia Environmental Protection Division
L	
Licensee	Dominion Energy South Carolina, Inc.
M	
mg/L	milligram per liter; used as a unit of measurement for DO and, in this case, ammonia, nitrate-nitrite, orthophosphate, phosphorus, and TKN
MW	megawatt
N	
NGO	Non-Governmental Organization
NMFS	National Marine Fisheries Service, housed within the U.S. Department of Commerce's National Oceanic and Atmospheric Administration
P	
pH	a term used to indicate the alkalinity or acidity of a substance as ranked on a scale from 1.0 to 14.0

Project	Stevens Creek Hydroelectric Project, FERC No. 2535

R

RCG	Resource Conservation Group

S

SCDHEC	South Carolina Department of Health and Environmental Control
SCDNR	South Carolina Department of Natural Resources
Study Plan	Stevens Creek Water Quality Study Plan

T

Thurmond	J. Strom Thurmond Dam; also known as Clarks Hill Dam; built and managed by USACE
TKN	Total Kjeldahl Nitrogen; the total concentration of organic nitrogen and ammonia

U

USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

ADAPTIVE MANAGEMENT PLAN
FOR
WATER QUALITY AT THE STEVENS CREEK PROJECT

1.0 INTRODUCTION

Dominion Energy South Carolina, Inc. (DESC; Licensee) is the Licensee of the Stevens Creek Hydroelectric Project (Federal Energy Regulatory Commission [FERC] No. 2535; Project). The Project has an installed capacity of 17.28 megawatts (MW). It is located in Edgefield and McCormick counties, South Carolina, and Columbia County, Georgia, at the confluence of Stevens Creek and the Savannah River. The Project's dam (Stevens Creek Dam) is located approximately 1 mile upstream of the Augusta Diversion Dam and approximately 13 miles downstream of the United States Army Corps of Engineers (USACE) J. Storm Thurmond Dam (Thurmond Dam).

DESC is currently administrating a multi-year relicensing process for the Project, which is anticipated to culminate with the issuance of a new Project license by FERC on or before October 31, 2025. The relicensing has involved a cooperative effort between DESC and stakeholders, including state and federal resource agencies, non-governmental organizations, (NGOs) and concerned citizens, to address the operational, recreational, and ecological resources associated with the Project. During the relicensing process, the issue of water quality in the Stevens Creek arm of the Project impoundment was identified by the Water Quality Resource Conservation Group (RCG) as an issue to further investigate. Members of the RCG include representatives from DESC, South Carolina Department of Natural Resources (SCDNR), Georgia Department of Natural Resources (GADNR), South Carolina Department of Health and Environmental Control (SCDHEC), Georgia Environmental Protection Division (GAEPD), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), U.S. Forest Service (USFS) and the Savannah Riverkeeper.

Water quality studies have been ongoing prior to and throughout the relicensing process. Similarly, continued consultation with the RCG is necessary subsequent to filing the Final License Application for the Project to review the results of targeted water quality surveys. As such, DESC has prepared this Adaptive Management Plan (AMP) framework to outline a process for evaluating the results of water quality studies and making decisions based on the best available information. DESC will continue to work with the RCG members to build the objectives and processes incorporated into this AMP for the new license term.

1.1 PROJECT OPERATIONS

The Stevens Creek Reservoir is approximately 25 miles long, extending upstream to the Thurmond Dam and 12 miles up Stevens Creek. The reservoir's surface area at normal full pond level (elevation of 187.5 feet) is 2,400 acres. The Project drainage area is approximately 7,173 square miles. DESC operates the Project to generate clean, renewable energy and re-regulate highly variable river flows discharged by the USACE from the Thurmond Dam. The Stevens Creek Project is operated in accordance with an Operating Plan on file with FERC. The plan was developed in consultation with the USACE, USFWS, GADNR, SCDNR, and the City of Augusta. The normal operating target range for the Stevens Creek Project is to provide an hourly discharge of ±15 percent of the scheduled daily average discharge from the Thurmond Dam, if the actual discharge from the Thurmond Dam is within 500 cubic feet per second (cfs) of the scheduled discharge.

2.0 STEVENS CREEK AMP REVIEW COMMITTEE

2.1 COMMITTEE MEMBERS

A Review Committee will be formed within 120 days of license issuance to direct the implementation of the AMP. Members of the Review Committee will include state and federal resource agencies charged with managing aquatic resources within the Savannah River Basin, including: GADNR, GAEPD, NMFS, SCDHEC, SCDNR, USACE, USFS, and USFWS.

DESC will serve as chairperson of the Review Committee and be responsible for organizing meetings and distributing documents to committee members. Each entity will have the opportunity to select a representative to the Review Committee from within their organization.

The Review Committee will ultimately work to guide the discussions and decision-making processes (as appropriate) specified in the Water Quality AMP. The Review Committee will not make decisions that supersede state or federal law or USFWS Section 7 Authority. The Review Committee's responsibilities may include, but are not limited to:

- Evaluating baseline information and study reports;
- Providing overall guidance for the AMP process;
- Evaluating other study (i.e., existing) information or information that becomes available during the time period of evaluations and would be applicable to the AMP;
- Establishing and documenting the goals and objectives of each action undertaken as part of the AMP and advising when modification to metrics used for evaluation purposes are needed;
- Reviewing and considering Project economics during decision-making processes;
- Reviewing the Water Quality AMP Annual Report, which documents the prior year's AMP activities, which DESC will file with FERC, making it publicly available; and
- Advising on modifications to the AMP to be presented to FERC and advising if any amendment action is necessary during the license.

2.2 BUDGET/RESOURCES

The responsibility for implementation of this AMP will rest primarily with DESC as Licensee for the Stevens Creek Project. Annual budgets will be developed by DESC relative to the monitoring and study costs as well as administrative costs and expenses. DESC will also rely on other resources outside of its establishment, including but not limited to the following:

- Federal, state, and local grants
- Donated services (federal and state agency involvement)
- Equipment (purchases and loaners)
- Expertise (governmental, non-governmental, private)

2.3 COMMITTEE MEETINGS

The Review Committee is initially scheduled to consult twice per year via a meeting or conference call. The frequency of meetings may be adjusted based on need. The tentative schedule is provided in Section 6.0 of this plan. Minutes from each meeting, as well as any pertinent materials discussed in the meetings, will be filed with FERC as an appendix to the annual report of AMP activities, as described in Section 7.0.

3.0 AMP GOAL

The overall goal of this AMP is to evaluate water quality in the Stevens Creek Reservoir and provide guidance on potential measures for water quality improvement during the new license term. The members' desired outcomes of this AMP are to improve water quality year-round (specifically to meet state standards for dissolved oxygen and to improve dissolved oxygen levels in the Stevens Creek arm of the reservoir during summer/fall periods). The measures employed under this AMP to achieve the desired goal are described in Section 5.0, and the scope of this AMP is limited to the implementation of those measures. The members agree that if the desired improvements to water quality are not realized to the extent expected or desired despite implementing the methods described in Section 5.0, no further action on the part of DESC will be required under this AMP.

4.0 BASELINE DATA

Water quality has been extensively monitored during the term of the existing FERC license. As required by license articles 404 and 405, DESC has been responsible for collecting and synthesizing dissolved oxygen (DO), pH, conductivity, and water temperature data for the past 25 years at eight monitoring locations throughout the Stevens Creek Reservoir and in the tailwater. These articles were developed to specifically address water quality issues identified at the Stevens Creek Project prior to the USACE's implementation of oxygenation.

From January 2021 to February 2022, DESC monitored water quality according to a Study Plan developed in consultation with the RCG. DO levels measured in 2021 at DESC water quality study sites in the Savannah River portion of the Stevens Creek Reservoir (Deep Step, Above Powerhouse, and Above Spillway monitoring sites) were occasionally below the 5 mg/L average, but measurements below 4 mg/L were rare. DO levels in the Stevens Creek arm of the reservoir were the lowest among all sites. During the study, daily average DO was below 5 mg/L on 89 days, and 1,133 of 7,194 (15.7 percent) measurements were below 4 mg/L.

DO levels in the Savannah River immediately downstream of the Stevens Creek powerhouse and below the spillway near the South Carolina side were above the daily average and instantaneous minimum DO for the entire monitoring period. The monitoring data demonstrate that re-oxygenation occurs as water passes through the Stevens Creek Reservoir, powerhouse, and over the spillway. Additionally, values for temperature, pH, and specific conductivity were within the normal range through the main body of the reservoir and below the Stevens Creek Project.

Several factors may be responsible for the low DO levels observed in Stevens Creek proper. The magnitude of releases from Thurmond Dam and the presence of Stevens Creek Dam cause water levels in Stevens Creek to fluctuate. As water levels in Stevens Creek rise, shallow, off-channel areas that were dry become wetted. Dead and decaying materials in these previously dry areas likely exhibit some level of oxygen demand that manifests within the creek. A previous study found high levels of biochemical oxygen demand (BOD) within this vicinity of Stevens Creek (SNSA 2008). Additionally, a study by the United States Geological Survey (USGS) on the Roanoke River in Virginia found that DO sags were correlated with decreasing river flows and drainage of high-BOD waters from off-channel areas (Bales and Walters 2003).

DESC, in consultation with the RCG, is conducting a targeted water quality study in 2023 to better understand the potential mechanisms affecting DO in Stevens Creek within the Project boundary. The study will be conducted through October 31, 2023, and include continuous water quality monitoring at several sites in Stevens Creek in addition to longitudinal surveys and off-channel surveys within the creek. One of the main goals of the 2023 study is to determine the spatial extent of low DO conditions in Stevens Creek.

Section 5

5.0 IMPLEMENTATION

The RCG will work together to develop Section 5.0 of this AMP and to identify measures necessary to evaluate water quality during the new license term through this AMP.

6.0 SCHEDULE

The AMP schedule is described in the table below in relation to the issuance of the license by FERC. The dates below are targets and are subject to AMP member availability.

TABLE 6.1 AMP IMPLEMENTATION SCHEDULE

Period	Item
Within 90 days of license issuance	Submit Final Stevens Creek Water Quality AMP to FERC
120 days of license issuance	Form a Review Committee and review the Stevens Creek Water Quality AMP
Year 1 of new license	• Implementation of AMP • Review Committee annual meeting February of following year • File Annual Report with FERC – April 30th after Review Committee meeting
Year 2 of new license	• Implementation of AMP • Review Committee annual meeting February of following year • File Annual Report with FERC – April 30th after Review Committee meeting
Year 3 of new license	• Implementation of AMP • Review Committee annual meeting February of following year • File Annual Report with FERC – April 30th after Review Committee meeting
Year 4 of new license	• Implementation of AMP • Review Committee annual meeting February of following year • File Annual Report with FERC – April 30th after Review Committee meeting
Year 5 of new license	• Implementation of AMP • Review Committee annual meeting February of following year • Develop recommendations for completion or continuation of AMP • File Annual Report with FERC – April 30 of following year

7.0 COMPLIANCE

Compliance will be based on following the schedule in Section 6.0 and submission of an annual AMP report each year to FERC. The annual report will summarize all AMP activities during the previous year. The report will be made available to appropriate entities for review and comment at least 30 days prior to being submitted to FERC. All comments on the report, pertinent correspondence, and Review Committee meeting minutes will be appended to the annual report.

At the end of the 5-year AMP period, the Review Committee will provide recommendations to FERC on the extension or completion of the AMP.

8.0 REFERENCES

[Placeholder for final AMP development]

APPENDIX A

SUMMARY OF CONSULTATION

(TO BE FILED WITH THE FINAL AMP)