UNITED STATES OF AMERICA 153 FERC ¶ 62,134
FEDERAL ENERGY REGULATORY COMMISSION

Duke Energy Carolinas, LLC Project No. 2232-522

ORDER ISSUING NEW LICENSE

(Issued November 25, 2015)

INTRODUCTION

1. On August 29, 2006, Duke Energy Corporation filed an application pursuant to sections 4(e) and 15 of the Federal Power Act (FPA)[1] for a new license to continue operation and maintenance of its 843.102-MW megawatt (MW)[2] Catawba-Wateree Hydroelectric Project No. 2232 (Catawba-Wateree Project, or project). The application was supplemented on March 7, 2008. The project includes 11 developments and is located on the Catawba and Wateree Rivers in Burke, McDowell, Caldwell, Catawba, Alexander, Iredell, Mecklenburg, Lincoln, and Gaston Counties, North Carolina, and York, Lancaster, Chester, Fairfield, and Kershaw Counties in South Carolina. The project does not occupy federal land.

2. On August 25, 2006, Duke Energy Corporation filed an application with the Commission to transfer the license for the Catawba-Wateree Project from Duke Energy Corporation to Duke Power Company LLC. On October 25, 2006, Duke Power Company LLC notified the Commission that it had changed its name to Duke Energy Carolinas, LLC (Duke Energy), effective October 1, 2006. On March 23, 2007, the Commission approved the transfer of license from Duke Energy Corporation to Duke Energy.[3]

3. As discussed below, this order issues a new license for the Catawba-Wateree Project authorizing a total installed capacity of 819.102 MW.

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[1] 16 U.S.C. §§ 797(e) and 808 (2012).

[2] As discussed herein, 24 MW out of a total of 843.102 MW of currently installed capacity is inoperable and will not be rehabilitated.

[3] *Duke Energy Corporation*, 118 FERC ¶ 62,223 (2007).

BACKGROUND

4. The Commission issued the original license for the Catawba-Wateree Project on September 17, 1958,[4] and the license expired on August 31, 2008.[5] Since then, the project has operated under annual licenses pending the disposition of the new license application.

5. On August 29, 2006, Duke Energy filed a Comprehensive Relicensing Agreement (Agreement).[6] The Agreement was signed by 70 entities, including Duke Energy, Duke Power Company LLC, the North Carolina Department of Environment and Natural Resources (North Carolina DENR), the North Carolina Wildlife Resources Commission (North Carolina WRC), the South Carolina Department of Natural Resources (South Carolina DNR), the South Carolina Department of Parks, Recreation, and Tourism (South Carolina DPRT), the South Carolina Department of Archives and History (South Carolina DAH), the Catawba Indian Nation, the Catawba Indian Nation Tribal Historic Preservation Office, 29 local and county governments, 26 conservation and other non-governmental organizations, and six individuals.[7] Duke Energy adopted the terms of the Agreement as its relicensing proposal. The Agreement purports to resolve all the signatories' outstanding issues associated with the project's relicensing, with the exception of fish passage. The Commission issued public notice of the Agreement on September 13, 2006, with a comment deadline of November 12, 2006. Comments were filed by North Carolina WRC, South Carolina DPRT, the National Marine Fisheries Service (NMFS), South Carolina DNR, the U.S. Department of the Interior (Interior), North Carolina DENR, 15 county and local governments, six conservation and other non-

[4] The Wateree and Catawba Rivers are navigable waters of the United States, at least as far upstream as the Catawba Development (known presently as the Wylie Development). *See* 20 F.P.C. 360 (1958). Because the project is located, in part, on navigable waters of the United States, section 23(b)(1) of the FPA, 16 U.S.C. § 817(1) (2012) requires the project to be licensed.

[5] 20 F.P.C. 360 (1958).

[6] On December 29, 2006, Duke Energy filed a revised Agreement. The revised Agreement is substantially the same as the August 29, 2006 Agreement. The revised Agreement: (1) removes from the list of Parties those entities and individuals that elected not be become Parties; (2) removes actions that were contingent upon an entity becoming a Party where such entity elected not to become a Party; (3) reflects actions that had already occurred (*e.g.*, filing of the license application); and (4) corrects typographical and grammatical errors.

[7] *See* Agreement at 1 and SIG (Signature of Parties) at 1-20.

governmental organizations, and three individuals.[8] In addition, 155 individuals commented on flooding risks along Lake Wateree related to changes proposed in the Agreement.

6. On November 9, 2006, the Commission issued a public notice that was published in the *Federal Register* accepting the application for filing and setting January 8, 2007, as the deadline for filing motions to intervene and protests.[9] South Carolina DNR, Interior, North Carolina WRC, North Carolina DENR, South Carolina DPRT, and NMFS filed notices of intervention.[10] The Catawba-Wateree Relicensing Coalition (Relicensing Coalition); American Whitewater Association (American Whitewater); American Rivers and the South Carolina Coastal Conservation League (Conservation Groups); the Lake Wateree Association; the Wateree Homeowners Association; the Foothills Conservancy of North Carolina; Lancaster County Water & Sewer District and Union County, North Carolina, collectively; the town of Cornelius, North Carolina; the Catawba Riverkeeper Foundation, Inc. (Catawba Riverkeeper); the city of Charlotte, North Carolina; Catawba County, North Carolina; Bowater, Inc., and the State of South Carolina filed motions to intervene.[11] The North Carolina Electric Membership Corporation filed a late motion to intervene.[12]

7. On April 7, 2008, the Commission issued a public notice that was published in the *Federal Register* indicating the application was ready for environmental analysis and soliciting comments, recommendations, terms and conditions, and prescriptions.[13] The notice set June 6, 2008, as the deadline for filing comments, recommendations, terms and

[8] *See* EIS at 10-11.

[9] 71 *Fed. Reg.* 66774-776 (November 16, 2006).

[10] Under Rule 214(a) of the Commission's Rules of Practice and Procedure, South Carolina DNR, Interior, North Carolina WRC, North Carolina DENR, South Carolina DPRT, and NMFS became parties to the proceeding upon the timely filing of their notices of intervention. *See* 18 C.F.R. § 385.214(a) (2015).

[11] Timely, unopposed motions to intervene are granted by operation of Rule 214(c) of the Commission's Rules of Practice and Procedure. *See* 18 C.F.R. § 385.214(c) (2015). Duke Energy responded to the notices of intervention and motions to intervene on January 24, 2007, but did not oppose any of the motions.

[12] The North Carolina Electric Membership Corporation withdrew its motion to intervene on June 3, 2008.

[13] 73 *Fed. Reg.* 20276-20278 (April 15, 2008).

conditions, and prescriptions. Interior, the U.S. Fish and Wildlife Service (FWS), NMFS, North Carolina DENR, North Carolina WRC, South Carolina DNR, Catawba Riverkeeper, the Conservation Groups, the Relicensing Coalition, the town of Cornelius, North Carolina, the Community of Lake James, Shirley M. Greene, and Jean E. McKinley (through U.S. Senator Elizabeth Dole and U.S. Representative Patrick McHenry) filed comments and recommendations. Duke Energy filed reply comments on July 21, 2008.

8. A draft Environmental Impact Statement (EIS), prepared by Commission staff and issued on March 6, 2009, analyzes the effects of the proposed project and alternatives to it. Comments on the draft EIS were filed by Interior; FWS; NMFS; the U.S. Environmental Protection Agency (EPA); North Carolina DENR; North Carolina WRC; South Carolina DNR; South Carolina Depart of Health & Environmental Control (South Carolina DHEC); South Carolina DPRT; South Carolina DAH; the Catawba Indian Nation; the State of South Carolina Office of Regulatory Staff; the State of South Carolina Office of Attorney General; the Conservation Groups; Catawba Riverkeeper; the Relicensing Coalition; American Whitewater; the North Carolina Wildlife Federation; Duke Energy; eight non-governmental organizations; six local governments; and 12 individuals. Duke Energy filed reply comments on May 13, 2009 and June 8, 2009. The City of Charlotte, North Carolina and Duke Energy filed reply comments to the State of South Carolina Office of Attorney General's comments on June 3, 2009 and June 8, 2009, respectively.

9. Commission staff prepared a final EIS, which was issued on July 23, 2009.[14] The Lake James Environmental Association filed comments on the final EIS on August 28, 2009; EPA filed comments on August 31, 2009; the Community of Lake James filed comments on September 1, 2009; and Duke Energy filed comments on October 2, 2009.

10. The interventions, comments, and recommendations have been fully considered in determining whether, and under what conditions, to issue this license.

PROJECT DESCRIPTION

A. Project Area

11. The Catawba-Wateree Project lies on the east side of the Blue Ridge Mountains in North and South Carolina.[15] The project is located on an approximately 300-mile-long

[14] Unless otherwise specified, references in this order to the EIS are to the final EIS.

[15] *See* EIS at 59.

stretch of the Catawba River, which is a major tributary of the Wateree River. The Catawba River drains a portion of the eastern slopes of the Blue Ridge Mountains in western North Carolina and some of the Piedmont area of North Carolina and South Carolina, including most of the urban area of Charlotte, North Carolina.[16] The Catawba River merges with several creeks south of Great Falls, South Carolina, including the Big Wateree Creek, to form the Wateree River,[17] which drains the sandhills[18] and upper Coastal Plain of South Carolina. The watershed upstream from Wateree Dam is about 4,750 square miles in size. Below the Wateree Development, the Wateree River flows for 77 miles to its confluence with the Congaree River to form the Santee River, which flows into Lake Marion,[19] then continues southeast to the Atlantic Ocean.

12. The eleven project developments include, from upstream to downstream (*see* figure 1): (1) Bridgewater at river mile (RM) 279.6;[20] (2) Rhodhiss at RM 248.0; (3) Oxford at RM 230.0; (4) Lookout Shoals at RM 220.3; (5) Cowans Ford at RM 186.9; (6) Mountain Island at RM 171.5; (7) Wylie at RM 143.5; (8) Fishing Creek at RM 104.8; (9) Great Falls and Dearborn at RM 101.5; (10) Rocky Creek and Cedar Creek at RM 99.3; and (11) Wateree at RM 76.85. The flow of the Catawba River is highly regulated, and flow at each project development is influenced by the flow at the upstream development.[21]

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[16] *See* EIS at 66.

[17] The Catawba River joins Big Wateree Creek at the upper end of Lake Wateree to form the Wateree River. *See* EIS at 59.

[18] The Sandhills is a physiographic region in the interior of North and South Carolina. It is a strip of ancient beach dunes, which generally divides the Piedmont from the Coastal Plain. *See* https://www.google.com/search?q=sand+hills+in+south+carolina&sourceid=ie7&rls=com.microsoft:en-US:IE-Address&ie=&oe=&gws_rd=ssl.

[19] Lake Marion is part of the South Carolina Public Service Authority's Santee-Cooper Hydroelectric Project No. 199.

[20] The Bridgewater Development includes Catawba Dam on the Catawba River, Paddy Creek Dam and Spillway on Paddy Creek, and Linville Dam on the Linville River. River mile is measured from the confluence of the Wateree and Congaree Rivers.

[21] *See* EIS at 66.

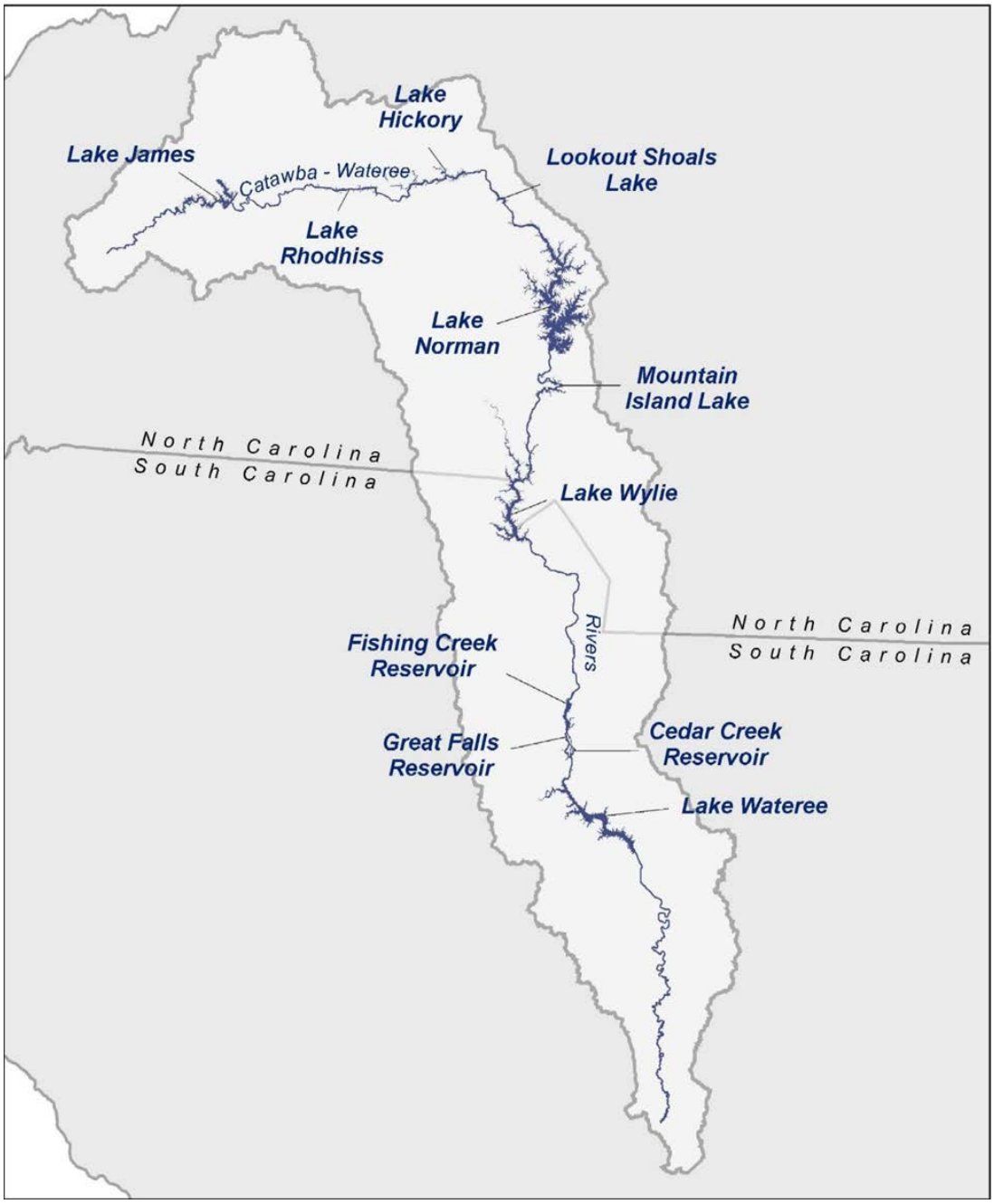

Figure 1. Map of the Catawba-Wateree Project.

B. Project Facilities

13. Each of the project developments includes a dam(s), powerhouse(s), impoundment(s), and project recreation sites. The detailed project description contained in Ordering Paragraph (B)(2) is summarized below.

1. Bridgewater Development[22]

14. The Bridgewater Development includes a reservoir (Lake James), three dams (Catawba, Paddy Creek, and Linville) that form Lake James, two spillways (on the Catawba River and Linville-Paddy Creek), an intake structure, and a powerhouse located at the toe of Linville Dam. There are two bypassed reaches associated with the Bridgewater Development; the 5.6-mile-long Catawba River bypassed reach and the 0.64-mile-long Paddy Creek bypassed reach.

15. Lake James consists of two impoundments connected by a canal. One impoundment is on the main stem of the Catawba River and the other is on both Paddy Creek and the Linville River. Lake James is 6,754 acres at a full pond elevation 1,200 feet,[23] and has 57,349 acre-feet of usable storage between the maximum (1,200 feet) and minimum (1,190 feet) reservoir elevations.

16. Catawba Dam is a 120-foot-high, 3,155-foot-long, concrete gravity dam and has a crest elevation at 1,224 feet. The dam includes 3 sluice gates, a continuous minimum flow discharge system,[24] and an uncontrolled concrete gravity ogee spillway about 305

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[22] On June 13, 2008, the Commission authorized construction of a new powerhouse about 200 feet downstream of the original powerhouse at the Bridgewater Development. Relocation of the powerhouse was necessary to improve the stability of Linville Dam, which required modifications to the dam's downstream berm. The Commission issued an Order Amending License on July 6, 2011, revising Exhibit M "General Description of Mechanical, Electrical, and Transmission Equipment" to reflect the new powerhouse. *See* 136 FERC ¶ 62,013. The Order amended the license to reflect a new powerhouse with three turbines having an installed capacity of 27.867 MW, which increased the project's total authorized installed capacity from 724.74 to 732.607 MW. The new powerhouse was placed in service on November 14, 2011. Duke Energy filed approved as-built Exhibit L and K drawings of the Bridgewater Development on October 26, 2012. On June 24, 2013, the Commission authorized the modification of Linville Dam to improve its stability, which was near completion as of October 2015.

[23] Unless otherwise specified, all elevations referred to in this order are referenced relative to mean sea level (msl).

[24] *See* the June 4, 2009 authorization to construct a minimum flow discharge system. The discharge system is designed to release a continuous minimum flow from Catawba Dam, consistent with the Agreement. The flow ranges from 25 to 75 cubic feet per second (cfs), depending on the time of year, and also includes a deep water intake capable of providing 5 cfs of cold water for a potential new trout hatchery downstream of the dam.

feet wide. Paddy Creek Dam is a 165-foot-high, 1,610-foot-long earthen dam with no control gates, and has a crest elevation of 1,224 feet. Linville Dam is a 160-foot-high, 1,325-foot-long earthen dam, and has a crest elevation at 1,224 feet. There is an uncontrolled spillway (Linville-Paddy Creek spillway) located midway between the Linville and Paddy Creek Dams. The Linville-Paddy Creek spillway is a 430-foot-wide overflow weir without crest control, and has a paved channel extending about 464 feet downstream from the spillway. The intake tower that supplies water to the powerhouse is located in Lake James immediately upstream of Linville Dam, and is connected to the dam by a catwalk. The intake tower includes three bays with trashracks, three vertical lift gates, and three 14-inch diameter bypass gate valves. The intake connects to a 900-foot-long conduit which passes through Linville Dam to the powerhouse, which is located at the downstream toe of Linville Dam.

17. The Catawba River bypassed reach starts at Catawba Dam and runs about 5.65 miles to the confluence with the Linville River. The Paddy Creek bypassed reach starts at Paddy Creek Dam and runs about 0.64 mile to the confluence with the Catawba River bypassed reach. There are no required flows for the bypassed channels.

18. The powerhouse at Linville Dam is integral with the toe of the dam and includes a reinforced concrete structure housing two vertical shaft Francis turbines, and one smaller horizontal Francis turbine.[25] The total installed capacity for the three generating units is 27.867 MW,[26] with a peak efficiency flow of 2,645 cubic feet per second (cfs) and a maximum hydraulic capacity of 3,260 cfs. The generating units release water into a 155-foot-long channel which leads to the Linville River and meets the Catawba River about 4,500 feet downstream. Power generated at the powerhouse is converted to 100 kV by three step-up transformers located adjacent to the powerhouse, which convert generator voltages to 100kV for the distribution system.

19. Duke Energy owns five existing project recreation sites at the Bridgewater Development, which are managed cooperatively with North Carolina WRC and North Carolina DENR. These sites provide amenities for boating, fishing, camping, swimming, and picnicking. The North Carolina WRC also manages Duke Energy's canoe portage around Linville Dam.

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[25] The orientation of the turbine (*i.e.*, vertical or horizontal) is relative to the unit's shaft, unless otherwise indicated.

[26] The generating units are sized and configured so that they can run individually, or in combinations to support the requirements for continuous minimum and recreation flows in the Bridgewater tailrace, as defined in the Agreement. In addition, the units are capable of providing flow aeration to enhance dissolved oxygen (DO) levels in the tailrace.

2. Rhodhiss Development

20. The Rhodhiss Development includes a reservoir, dam, powerhouse, and transmission line. The reservoir (Lake Rhodhiss) is 2,724 acres at normal maximum elevation 994.1 feet, and has a full pond elevation of 995.1 feet. Lake Rhodhiss has 7,097 acre-feet of usable storage between the normal maximum (994.1 feet) and normal minimum (990.1 feet) reservoir elevations.

21. Rhodhiss Dam is 72 feet high by 1,517 feet long, and consists of, from left to right: (1) a left non-overflow section; (2) a concrete powerhouse intake section with three intakes protected by trashracks; (3) an 800-foot-long ungated ogee spillway section with a crest elevation of 995.1 feet; (4) a right concrete non-overflow section; and (5) an earthen embankment non-overflow section extending to the right bank.

22. The concrete intake and powerhouse are integral with the dam. The powerhouse contains three vertical Francis turbine-generator units with a total installed capacity of 32.225 MW.[27] The power generated at the powerhouse is conveyed to three step-up transformers, located in a switchyard immediately adjacent to the powerhouse, which convert the power to 44 kV. The 44-kV power is further transmitted to the Rhodhiss Tie Substation, located about 0.17 miles away, where it connects to the grid.

23. Duke Energy owns five existing project recreation sites at the Rhodhiss Development, which are managed cooperatively with North Carolina WRC and the Town of Sawmills, North Carolina. These sites provide amenities for boating and fishing. Duke Energy also operates and maintains a canoe portage around Rhodhiss Dam.

3. Oxford Development

24. The Oxford Development includes a reservoir, dam, and powerhouse. The reservoir (Lake Hickory) is 4,072 acres at a normal maximum elevation 934 feet, and has a full pond elevation of 935.0 feet. Lake Hickory has 9,834 acre-feet of usable storage between the normal maximum (934.0 feet) and normal minimum (931.5 feet) reservoir elevations.

[27] *See* 142 FERC ¶ 62,173. On February 28, 2013, the Commission issued an Order Amending License, which increased the project's authorized installed capacity from 732.607 to 739.182 MW. The authorized installed capacity for the Rhodhiss Development increased from 25.5 to 32.225 MW, while the authorized installed capacity for the Oxford Development decreased from 36.0 to 35.85 MW.

25. Oxford Dam is 142 feet high by 1,394 feet long, and consists of, from left to right: (1) an emergency spillway section; (2) a left non-overflow wall section; (3) a gated spillway section with 10 vertical lift gates; (4) a concrete powerhouse intake section with two intakes protected by trashracks; (5) a right concrete non-overflow section; and (6) a sheet pile wall non-overflow section extending to the right bank.

26. The concrete intake and powerhouse are integral with the dam. The powerhouse contains two vertical Francis turbine-generator units with a total installed capacity of 35.85 MW.[28] The power generated at the powerhouse is converted to 100 kV by two step-up transformers and conveyed 40 feet to a switchyard located adjacent to the powerhouse, where it connects to the grid.

27. Duke Energy owns five developed project recreation sites and one undeveloped project recreation site at the Oxford Development. Duke Energy operates and maintains recreation amenities at the Oxford Access Area, while the other facilities are managed cooperatively with North Carolina WRC and Alexander County, North Carolina. These sites provide amenities for boating, fishing, and picnicking. Duke Energy also operates and maintains a canoe portage around Oxford Dam.

4. Lookout Shoals Development

28. The Lookout Shoals Development includes a reservoir, dam, powerhouse, and transmission line. The reservoir (Lookout Shoals Lake) is 1,155 acres at a normal maximum elevation 837.1 feet, and has a full pond elevation of 838.1 feet. Lookout Shoals Lake has 2,138 acre-feet of usable storage between the normal maximum (837.1 feet) and normal minimum (834.6 feet) reservoir elevations.

29. Lookout Shoals Dam is 88 feet high by 2,731 feet long, and consists of, from left to right: (1) a left concrete non-overflow section; (2) a concrete powerhouse intake section with four intakes protected by trashracks; (3) a 933-foot-long, ungated ogee spillway section with a crest elevation of 838.1 feet; (4) a right concrete non-overflow section; and (5) an earthen embankment extending to the right bank.

30. The concrete intake and powerhouse are integral with the dam. The powerhouse contains three large vertical Francis turbine-generator units, and two small vertical Francis turbine-generator units, with a total installed capacity of 25.715 MW. The power generated at the powerhouse is converted to 100 kV by two step-up transformers and conveyed to a switchyard located adjacent to the powerhouse. The 100-kV power is further transmitted to the Lookout Tie substation about 0.2 miles away, where it connects with the grid.

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[28] *Id.*

31. Duke Energy owns two project recreation sites at the Lookout Shoals Development, which are cooperatively managed with the North Carolina WRC. These sites provide amenities for boating.

5. Cowans Ford Development

32. The Cowans Ford Development includes a reservoir, dam, saddle dike, powerhouse, and transmission line. The reservoir (Lake Norman) is 32,339 acres at normal maximum and full pond elevation 760.0 feet. Lake Norman has 298,142 acre-feet of usable storage between the normal maximum (760.0 feet) and normal minimum (750.0 feet) reservoir elevations.

33. Cowans Ford Dam is 130 feet high by 8,738 feet long, and consists of, from left to right: (1) a left earthen embankment; (2) a left concrete non-overflow section; (3) a gated concrete spillway section with 11 Tainter gates; (4) a concrete powerhouse intake section with four intakes protected by trashracks; (5) a right concrete non-overflow section; and (6) an earthen embankment extending to the right river bank. An earthen saddle dike, known as Hicks Crossroads Dike, is located approximately 3 miles east of the main dam.

34. The concrete intake and powerhouse are integral with the dam. The powerhouse contains four adjustable-blade Kaplan propellers with a total installed capacity of 332.5 MW. The power generated at the powerhouse is converted to 230 kV by two step-up transformers located in a switchyard on top of the powerhouse. The 230-kV power is further transmitted through two lines to the McGuire Switching Station, about 1.67 miles away, where it connects to the grid.

35. Duke Energy owns ten developed and three undeveloped project recreation sites at the Cowans Ford Development. Duke Energy operates and maintains recreation amenities at Stumpy Creek Access Area and McGuire Fishing Area, while the other facilities are managed cooperatively with North Carolina WRC, Lincoln County, North Carolina, and Mecklenburg County, North Carolina. These sites provide amenities for boating, fishing, picnicking, hiking, and swimming.

6. Mountain Island Development

36. The Mountain Island Development includes a reservoir, dam, and powerhouse. The reservoir (Mountain Island Lake) is 10,146 acres at normal maximum elevation 647.0 feet, has a full pond elevation of 647.5 feet. Mountain Island Lake has 10,146 acre-feet of usable storage between the normal maximum (647.0 feet) and normal minimum (643.5 feet) reservoir elevations.

37. Mountain Island Dam is 140 feet high by 1,375 feet long, and consists of, from left to right: (1) an ungated, 997-foot-long ogee spillway with a crest elevation at 647.5 feet; (2) a left concrete non-overflow section; (3) a concrete powerhouse intake section with

four intakes protected by trashracks; (4) a right non-overflow section; and (5) an earthen embankment extending to the right river bank. There is a 0.7-mile-long bypassed reach that extends from the Mountain Island Dam spillway downstream, along the east side of the river, before rejoining the flow from the Mountain Island Powerhouse. There are currently no required flows for the bypassed channel.

38. The concrete intake and powerhouse are integral with the dam. The powerhouse contains four identical vertical Francis turbine-generator units with a total installed capacity of 55.05 MW. The power generated at the powerhouse is converted to 44 kV by two step-up transformers and conveyed to a switchyard located adjacent to the powerhouse, where it connects to the grid.

39. Duke Energy owns two project recreation sites at the Mountain Island Development, which are cooperatively managed with North Carolina WRC. These sites provide amenities for boating and bank fishing.

7. Wylie Development

40. The Wylie Development includes a reservoir, dam, and powerhouse. The reservoir (Lake Wylie) is 12,177 acres at normal maximum elevation 568.4 feet, and has a full pond elevation of 569.4 feet. Lake Wylie has 40,145 acre-feet of usable storage between the normal maximum (568.4 feet) and normal minimum (564.4 feet) reservoir elevations.

41. Wylie Dam is 119 feet high by 3,165 feet long, and consists of, from left to right: (1) a left concrete non-overflow section; (2) a concrete powerhouse intake section with four intakes protected by trashracks; (3) a gated spillway section with five vertical lift gates and a crest elevation of 539.4 feet; (4) an ungated ogee spillway section with a crest elevation of 569.4 feet; (5) a gated spillway section with six vertical lift gates and a crest elevation of 539.4 feet; (6) a concrete non-overflow section; and (7) an earth embankment extending to the right river bank.

42. The concrete intake and powerhouse are integral with the dam. The powerhouse contains four identical vertical Francis turbine-generator units with a total installed capacity of 69 MW. The power generated at the powerhouse is converted to 44 kV by four step-up transformers and conveyed to a switchyard located adjacent the powerhouse, where it connects to the grid.

43. Duke Energy owns ten project recreation sites at the Wylie Development. Duke Energy operates and maintains four of those recreation sites, while the others are cooperatively managed with North Carolina WRC; the City of Mount Holly, North Carolina; Mecklenburg County, North Carolina; and York County, North Carolina. These sites provide amenities for boating, fishing, picnicking, hiking, camping, and swimming.

8. Fishing Creek Development

44. The Fishing Creek Development includes a reservoir, dam, and powerhouse. The reservoir (Fishing Creek Reservoir) is 3,431 acres at normal maximum elevation 416.2 feet, and has a full pond elevation of 417.2 feet. Fishing Creek Reservoir has 11,159 acre-feet of usable storage between the normal maximum (416.2 feet) and normal minimum (412.2 feet) reservoir elevations.

45. Fishing Creek Dam is 97feet high by 1,770 feet long, and consists of, from left to right: (1) a left ungated spillway section with a crest elevation of 417.2 feet; (2) a gated ogee spillway section with 22 vertical lift gates; (3) a concrete powerhouse intake section with five intakes protected by trashracks; and (4) a right concrete non-overflow section.

46. The concrete intake and powerhouse are integral with the dam. The powerhouse contains five vertical Francis turbine-generator units, with a total installed capacity of 48.12 MW. The power generated at the powerhouse is converted to 100 kV by two step-up transformers and conveyed to a switchyard adjacent to the powerhouse, where it connects with the grid.

47. Duke Energy owns and operates two project recreation sites at the Fishing Creek Development. These sites provide amenities for boating and bank fishing.

9. Great Falls-Dearborn Development

48. The Great Falls/Dearborn Development includes a diversion dam (Great Falls Diversion Dam), reservoir (Great Falls), Great Falls Long Bypassed Reach, Great Falls Short Bypass Spillway, Great Falls Short Bypassed Reach, Great Falls Dam and Powerhouse, Dearborn Dam and Powerhouse, and transmission lines. Two large islands, Mountain Island and Big Island, are located in the section of the Catawba River impounded by the project dams.

49. Great Falls Diversion Dam consists of a 1,558-foot-long uncontrolled spillway, with a crest elevation of 355.8 feet, which diverts flows from the Catawba River into the west river channel. The diversion dam creates the 2.25-mile-long Great Falls Long Bypassed Reach. The Canal Headworks is located in the west river channel, approximately 1.8 miles downstream from the diversion dam. The headworks include: (1) a 270-foot-long intake section protected by trashracks, which passes flows into a canal; (2) a main spillway which creates the 0.75-mile-long Great Falls Short Bypassed Reach; and (3) a canal spillway with 4-foot-high flashboards which overflow at crest elevation 355.8 feet. The canal feeds water to the development's two powerhouses, Great Falls and Dearborn, located about 1.4 miles downstream of the Canal Headworks.

50. The Great Falls reservoir has a surface area of 353 acres at normal maximum elevation 355.3 feet, and has a full pool elevation at 355.8 feet. The reservoir has 1,966

acre-feet of usable storage between the normal maximum (355.3 feet) and normal minimum (349.6 feet) reservoir elevations.

51. Great Falls-Dearborn Dam is about 103 feet high and 835 feet long. It consists of, from left to right, the left Dearborn non-overflow section, the concrete Dearborn intake section with three intakes protected by trashracks and head gates, the right Dearborn non-overflow section, and a concrete non-overflow section leading to the right river bank. The concrete Great Falls intake section, with nine intakes protected by trashracks, is located in the center of the right non-overflow section.

52. The Great Falls Powerhouse contains eight horizontal-shaft Francis turbine-generator units, and an exciter unit, with a total installed capacity of 24.0 MW.[29] The power generated at the Great Falls Powerhouse is converted to 44 kV by four step-up transformers located within the powerhouse. The 44-kV power is conveyed through two lines to the Great Falls Switching Station, which is located about 0.2 miles downstream.

53. The Dearborn Powerhouse contains three vertical Francis turbine-generator units with a total installed capacity of 42.0 MW. The power generated at the Dearborn Powerhouse is converted to 100 kV by 3 step-up transformers and one 44-kV step-up transformer located within the powerhouse. There is a 0.13-mile-long 100-kV transmission line and a 0.08-mile-long 44-kV transmission line that conveys the power to the Great Falls Switching Station, where the two lines connect to the grid.

54. Duke Energy provides no project recreation facilities at the Great Falls-Dearborn Development.

10. Rocky Creek-Cedar Creek Development

55. The Rocky Creek-Cedar Creek Development includes a reservoir (Cedar Creek Reservoir), dam (Great Falls-Dearborn Dam), a gated spillway, a non-gated overflow spillway, Cedar Creek Powerhouse, a forebay canal leading to the Rocky Creek Powerhouse, Rocky Creek Powerhouse, and transmission lines. Cedar Creek Reservoir has a surface area of 748 acres at normal maximum elevation 283.9 feet, and has a full pool elevation at 284.4 feet. The reservoir has 2,190 acre-feet of usable storage between the normal maximum (283.9) and normal minimum (280.9) reservoir elevations.

56. Cedar Creek Dam is about 69 feet high and 1,219 feet long, and consists of, from left to right: (1) the left Cedar Creek non-overflow section; (2) the concrete Cedar Creek intake section with three intakes protected by trashracks and head gates; (3) the Cedar

[29] Four units in the Great Falls Powerhouse are currently in disrepair, and Duke Energy has no plans to repair them. *See* Duke Energy's May 17, 2010 filing.

Creek gated spillway section; (4) the Cedar Creek uncontrolled spillway section with a crest elevation of 284.4 feet; (5) the Rocky Creek non-overflow canal section; and (6) the Rocky Creek intake section with nine intakes protected by trashracks. The Rocky Creek intake section ties into the right river bank. The Rocky Creek non-overflow canal section and right river bank create a forebay canal leading to the Rocky Creek Powerhouse intake.

57. The Rocky Creek Powerhouse contains eight horizontal Francis turbine-generator units, and an exciter unit, with a total installed capacity of 25.8 MW.[30] The power generated at Rocky Creek is converted to 44 kV by four step-up transformers at a switchyard located in a building that sits over the tailrace, where it connects to the grid.

58. The Cedar Creek Powerhouse contains three vertical Francis turbine-generator units with a total installed capacity of 42.975 MW. Two turbines are equipped with aeration equipment. The power generated at Cedar Creek is converted to 100 kV by three step-up transformers and conveyed to a switching station located adjacent the powerhouse. The 100-kV power is then passed through two lines to the Great Falls Switching Station, which is located about 2.0 miles away, where it connects to the grid.

59. Duke Energy owns and operates two project recreation sites at the Rocky Creek-Cedar Creek Development. Each site provides a boat ramp and parking.

11. Wateree Development

60. The Wateree Development includes a reservoir, dam, and powerhouse. The reservoir (Lake Wateree) is 13,025 acres at normal maximum elevation 224.5 feet, and has a full pond elevation of 225.5 feet. Lake Wateree has 65,568 acre-feet of usable storage between the normal maximum (224.5 feet) and normal minimum (218.5 feet) reservoir elevations.

61. Wateree Dam is 76 feet high by 1,753 feet long, and consists of, from left to right: (1) a left, ungated ogee spillway section with a crest elevation of 225.5 feet; (2) a concrete powerhouse intake section with five intakes protected by trashracks; and (3) an earth/concrete embankment extending to the right river bank.

62. The concrete intake and powerhouse are integral with the dam. The powerhouse contains five large vertical Francis turbine-generator units, with a total installed capacity of 82 MW. The power generated at the powerhouse is converted to 100 kV by five step-

[30] All units are currently inoperable. Duke Energy has no plans to repair Units 1 through 4. Duke Energy has scheduled Units 5 through 8 for rehabilitation and plans to return them to service by December 2016. *See* Duke Energy's July 29, 2010 filing.

up transformers located within the powerhouse and conveyed to a switching station located immediately downstream the powerhouse, where it connects with the grid.

63. Duke Energy owns and operates eight project recreation sites at the Wateree Development. These sites provide amenities for boating and fishing.

C. Project Recreation Facilities

64. Under the current license, Duke Energy owns, operates, and maintains, or provides for the operation and maintenance of, facilities at 58 project recreation sites.[31] The recreation sites are spread out geographically across 10 out of 11 project developments (Great Falls-Dearborn Development has none). The recreation sites provide a variety of amenities, including boat ramps and courtesy docks, canoe portages, fishing piers, swim areas, picnic areas, camp grounds, walking/hiking trails, bank fishing access, and parking.

D. Project Boundary

65. The existing project boundary includes the area within the full pool elevation of the project reservoirs[32] and the lands immediately surrounding the dams and powerhouses. The project boundary also extends upland from the full pool elevation to encompass the 58 project recreation sites, which have a total area of about 1,992 acres.

E. Current Project Operation

66. Duke Energy currently operates the project's generating facilities to meet the peak and load-following energy demands of its transmission and distribution systems. As explained more fully below, Duke Energy currently operates the project developments in accordance with reservoir guide curves[33] and, at most of the developments, maintains

[31] *See* Duke Energy's June 12, 2015 filing responding to Commission staff's May 14, 2015 Additional Information Request.

[32] The full pool elevations are 1,200 ft. (Lake James), 995.1 ft. (Lake Rhodhiss), 935.0 ft. (Lake Hickory), 838.1 ft. (Lookout Shoals Lake), 760.0 ft. (Lake Norman), 647.5 ft. (Mountain Island Lake), 569.4 ft. (Lake Wylie), 417.2 ft. (Fishing Creek Reservoir), 355.8 ft. (Great Falls Reservoir), 353.3 ft. (Cedar Creek Reservoir), and 225.5 ft. (Lake Wateree).

[33] Although the Catawba-Wateree license issued September 17, 1958 does not specify elevation requirements for each of the project reservoirs, Duke Energy currently operates the project under the reservoir guide curves described, herein.

minimum flow releases[34] to protect aquatic resources downstream from the development(s).

67. In addition to the operational provisions described below, Duke Energy voluntarily operates Lake James (Bridgewater), Lake Norman (Cowans Ford), Lake Wylie (Wylie), and Lake Wateree (Wateree) as part of a Spring Lake Level Stabilization Program. Under this program, Duke Energy limits the fluctuation of these four project reservoirs during a 3-week spring fish-spawning period to support fish spawning.[35] The initiation of the program each spring begins at Lake Wateree and shifts upstream according to the following schedule: for Lake Wylie, the 3-week program begins 2 days after it starts on Lake Wateree; for Lake Norman, the program begins 8 days after it starts on Lake Wateree; and for Lake James, the program begins 14 days after starting on Lake Wateree.

1. Bridgewater Development

68. The target operating elevation for Lake James varies during the year from a low of 1,192.0 feet (normal minimum) on March 1 to a high of 1,198.0 feet (normal maximum) from June through September 1, plus or minus 2 feet. The full pond water surface elevation is 1,200.0 feet. The reservoir elevation is maintained through a combination of releases from the powerhouse, spillage over the uncontrolled spillway, or releases through the gated sections of Catawba Dam into the Catawba River.[36]

69. To maintain minimum flows, one or more generating units are run at efficiency load as necessary to meet the minimum average daily release requirement of 66 cfs. The development's continuous minimum flow of 25 cfs is met through wicket gate leakage at

[34] The minimum flow requirements for each development described under current operation are requirements of the Catawba-Wateree license issued September 17, 1958.

[35] The spring spawning period is initiated by a sequence of four consecutive noontime forebay temperature readings of at least 65 degrees Fahrenheit (°F), or observed blackbass spawning in Lake Wateree. Once initiated, the reservoir level is maintained for 3 weeks within a range of 1 foot below and 2 feet above the level that exists on the day of initiation.

[36] In addition to providing for Bridgewater Powerhouse's generating demands, Lake James' large storage capacity is used to augment the smaller storage capacities of the downstream Rhodhiss, Oxford, and Lookout Shoals Developments.

Linville Dam during times of non-generation.[37] There are currently no minimum flow requirements for the Catawba River and Paddy Creek bypassed reaches.

2. Rhodhiss Development

70. The target operating elevation for Lake Rhodhiss is 992.1 feet, plus or minus 2 feet. All flows are released through the generating units. The maximum full pond water surface elevation is 995.1 feet, after which water begins to spill over the ungated spillway.

71. Duke Energy operates one of the facility's generating units at efficiency load, at least once per day, to provide the development's minimum average daily flow requirement of 225 cfs. The development's continuous minimum flow requirement of 40 cfs is met through wicket gate leakage during times of non-generation.

3. Oxford Development

72. The target operating elevation for Lake Hickory is 932.0 feet, plus 2 feet or minus 0.5 foot, and the maximum full pond water surface elevation is 935.0 feet. Flows are released through the generating units or released through the spill gates. Flows are passed over the emergency spillway once elevation 935.0 feet is reached.

73. Duke Energy operates one of the facility's generating units at efficiency load at least once per day to provide the development's minimum average daily flow requirement of 261 cfs. The development's continuous minimum flow requirement of 40 cfs is met through wicket gate leakage during times of non-generation. The Oxford Development's generating units have black start capability,[38] which enables Duke Energy to bring the station back on line after a system outage, as well as to operate the development's floodgates even under emergency conditions.

4. Lookout Shoals Development

74. The target operating elevation for Lookout Shoals Reservoir is 836.1 feet, plus 1 foot or minus 1.5 feet. All flows are released through the generating units. Maximum

[37] Wicket gate(s) control the amount of water flowing from the penstock through the turbine. As is the case here and at Duke Energy's other Catawba-Wateree Developments, leakage through the wicket gate(s) stem from leaky seals resulting in an uncontrolled release.

[38] A black start is the process of restoring an electric power station or a part of an electric grid to operation without relying on the external transmission network.

full pool for Lookout Shoals Reservoir is 838.1 feet. Once elevation 838.1 feet is reached, excess flow is passed over the ungated ogee spillway.

75. Duke Energy operates one generating unit at efficiency load, as necessary, to provide the development's minimum average daily flow requirement of 278 cfs. The development's continuous minimum flow requirement of 60 cfs is provided by operating one of the smaller units at efficiency load 24 hours a day.

5. Cowans Ford Development

76. Duke Energy owns and operates two generating facilities on Lake Norman: the Marshall Steam Station, a coal-fired fired powerplant, and the McGuire Nuclear Station. McGuire Nuclear Station's cooling water intake and discharge are located in the left earthen embankment of Cowans Ford Dam. There is a second cooling water intake located in the east concrete bulkhead adjoining the spillway. To provide adequate cooling water, the reservoir level is not to be drawn down more than 15 feet below full pond, which is elevation 745.0 feet, without violating the Nuclear Regulatory Commission limits set specifically for the McGuire Nuclear Station. Thermal effects further limit the reservoir's lower level to 750.0 feet, 10 feet below full pool. In addition, there is an underwater weir in front of the Cowans Ford Powerhouse intake that has a crest elevation of 725.0 feet, which restricts reservoir drawdowns to that level.

77. Considering the above restrictions, the target operating elevation for Lake Norman varies during the year, from a low of 752.0 feet in March to a high of 758.0 feet from June through September 5. Maximum full pool for Lake Norman is 760.0 feet. The project is operated to maintain the lake level within about a 2-foot band around (above or below) the target operating elevation. Flows are released through the generating units. Once elevation 760.0 feet is reached, excess flow is passed through the gated spillway.

78. Duke Energy operates one generating unit at efficiency load, as necessary, to provide the development's minimum average daily release requirement of 311 cfs. The development's continuous minimum flow requirement of 80 cfs is provided through wicket gate leakage when the project is not generating.

79. The Cowans Ford Development is the largest of the Catawba-Wateree Project developments, and its reservoir, Lake Norman, has the greatest storage capacity of the Catawba-Wateree Project developments. In addition to maintaining the lake elevation and minimum flow limits described above, Duke Energy uses Lake Norman's large storage capacity to augment generation flows for the downstream Catawba-Wateree developments. As described below, Duke Energy releases flows from the Cowans Ford Development to minimize spillage at the downstream Mountain Island Development.

6. Mountain Island Development

80. On Mountain Island Reservoir Duke Energy owns and operates the coal-fired Riverbend Steam Station, which withdraws up to 622.1 million gallons per day from the reservoir. In addition, Duke Energy manages the Mountain Island Development to provide sufficient storage in the reservoir so that flow released from the upstream Cowans Ford Development does not result in spillage at Mountain Island Dam. To do so, Duke Energy often begins generation at Mountain Island in anticipation of the Cowans Ford releases, thus reducing the reservoir's water level.

81. Considering the above restrictions, the target operating elevation for the Mountain Island Reservoir is 644.5 feet, plus 2.5 feet or minus 1.0 foot. Flows are released through the generating units. Maximum full pool for Mountain Island Reservoir is 647.5 feet. Once this elevation is reached, flows are passed over the ungated ogee spillway.

82. Duke Energy operates one generating unit at efficiency load at least once per day to provide the development's minimum average daily release requirement of 314 cfs. The development's continuous minimum flow requirement of 80 cfs is provided through wicket gate leakage when not generating.

7. Wylie Development

83. Duke Energy owns and operates two generating facilities on Lake Wylie that withdraw water from the lake: the Catawba Nuclear Station and the coal-fired Allen Steam Station. Considering these needs, the target operating elevation for Lake Wylie is 566.4 feet, plus or minus 2 feet. Flows are released through: (1) the generating units; (2) one or more of the 11 vertical lift gates, which pass flows at elevation 539.4 feet and above; or (3) over the ungated spillway once the full pool elevation of 569.4 feet is reached.

84. Duke Energy also operates the Wylie Development to generate electricity on a daily basis to provide approximately 700 cfs for downstream industrial water users. This is done voluntarily. Duke Energy also operates one generating unit at efficiency load, as necessary, to provide the development's minimum average daily release requirement of 411 cfs. An instantaneous minimum flow is not currently required. Finally, Duke Energy uses the black start capability of the Wylie generating units to bring the station back online after a system outage, and to operate the development's flood gates under emergency conditions.

8. Fishing Creek Development

85. The target operating elevation for Fishing Creek Reservoir is 414.2 feet, plus or minus 2 feet. Flows up to the maximum pool of 417.2 feet are released through the generating units or the spillway gates. Above the maximum full pool of 417.2 feet,

excess flow passes over the uncontrolled spillway. Duke Energy operates one generating unit at efficiency load, at least once per day, to provide the development's minimum average daily release requirement of 440 cfs. An instantaneous minimum flow is not currently required.

86. Due to capacity differences between the Fishing Creek and Great Falls-Dearborn Developments, Duke Energy operates the Fishing Creek Development to minimize spill at the downstream Great Falls-Dearborn Development. This is accomplished by limiting generation at the Fishing Creek Development to 6 hours when generating with five units.[39] Finally, consistent with the generation limitations, Duke Energy uses flow from the Fishing Creek Development to refill the downstream Great Falls Reservoir and Cedar Creek Reservoir prior to generation occurring at the Great Falls, Dearborn, Rocky Creek, and Cedar Creek Developments. The Fishing Creek Development has black start generating units, which Duke Energy uses to bring the station back online after a system outage, and to operate the development's flood gates under emergency conditions.

9. Great Falls and Dearborn Development

87. The target operating elevation for Great Falls Reservoir is 353.3 feet, plus 2.0 feet or minus 3.5 feet. Maximum full pool for Great Falls Reservoir is 355.8 feet. The reservoir elevation is maintained through a combination of releases from the development's two powerhouses, and spillage over uncontrolled spillways into the two bypassed reaches once elevation 355.8 feet is reached.

88. Duke Energy operates one of the Dearborn generating units at efficiency load, at least once per day, to provide the development's minimum average daily release requirement of 444 cfs. An instantaneous minimum flow is not currently required. Since the three generating units at the Dearborn Powerhouse are more efficient than the eight units at the Great Falls Powerhouse, Duke Energy only uses the Great Falls units after the hydraulic capacity at Dearborn is exceeded.[40]

[39] To prevent spill at the downstream Great Falls-Dearborn Development, Duke Energy maintains the Fishing Creek tailrace elevation, through generation at Fishing Creek, so as to not exceed 355.8 feet, which is the top of Great Falls Diversion Dam and the Great Falls Headworks.

[40] As discussed in the Inoperable Units section of the order, four of eight turbine/generator units at the Great Falls Powerhouse are currently inoperable.

10. Rocky Creek and Cedar Creek Development

89. The target operating elevation for Cedar Creek Reservoir is 281.9 feet, plus 2.0 feet or minus 1 foot. Maximum full pool for Cedar Creek Reservoir is 284.8 feet. The reservoir elevation is maintained through a combination of releases from the development's two powerhouses, and/or spillage through the gated spillway or over the uncontrolled spillway into the Catawba River once elevation 284.8 feet is reached.

90. Duke Energy operates one of the Cedar Creek generating units at efficiency load, at least once per day, to provide the development's minimum average daily release requirement of 445 cfs. An instantaneous minimum flow is not currently required.[41]

11. Wateree Development

91. The target operating elevation for Lake Wateree varies during the year, from a low of 220.5 feet in December and January, to a high of 222.5 feet from March through November. Duke Energy maintains Lake Wateree at its target elevation, plus or minus 2 feet. Flows are released through the generating units. Maximum full pool for Lake Wateree is 225.5 feet. Once elevation 225.5 feet is reached, excess flow passes over the uncontrolled spillway.

92. Duke Energy provides the developments minimum average daily released requirement of 446 cfs through seepage from Wateree Dam and by operating one of the station's generating units at efficiency load, at least once per day. An instantaneous minimum flow is not currently required. From March 15 to May 31, Duke provides a continuous flow release to 200 cfs to support fish spawning in Lake Wateree as part of a voluntary spring Lake Level Stabilization Program.

F. Proposed Project Operation and Environmental Measures

93. Duke Energy proposes to operate and maintain the project in accordance with the Agreement. The provisions of the Agreement are summarized below.[42] The Agreement also includes measures that are not intended to be incorporated into the new license.[43]

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[41] As discussed in the Inoperable Units section of the order, all eight turbine/generator units at the Rocky Creek Powerhouse are currently inoperable.

[42] The summary provided herein, as well as the parentheticals, reference sections of the Agreement, including Appendix A of the Agreement (sections A-1.0 through A-11.0) which sets forth Duke Energy's proposed action.

[43] Sections 2.2 (reservoir levels); 3.2 and 3.3 (recreation flows); 4.2 and 4.4 to 4.9 *(continued ...)*

1. Reservoir Levels

94. To protect and enhance aquatic resources which may be affected by reservoir level fluctuations, Duke Energy proposes to operate each reservoir within a range between the normal minimum and normal maximum elevations at all times (*see* section 2.1.1 of the Agreement and the reservoir elevations article of section A-1.0 in Appendix E of this order),[44] except when operating under the proposed Low Inflow Protocol (LIP), Maintenance and Emergency Protocol (MEP), or the proposed Spring Reservoir Level Stabilization Program described below.

95. Duke Energy's proposal would generally change the target reservoir elevation for each development, compared to current operation, as follows:

> At the Bridgewater Development, the target reservoir elevation for Lake James would increase in 4 of 12 months (*e.g.*, the target elevation for Lake James would increase by 3 feet in March, from elevation 1,192.0 feet to elevation 1,195.0 feet.
>
> At the Rhodhiss Development, the target reservoir elevations for Lake Rhodhiss would not change from current operation.
>
> At the Oxford Development, the target reservoir elevation for Lake Hickory would decrease by 1 foot in January and February.
>
> At the Lookout Shoals Development, the target reservoir elevation for Lookout Shoals Lake would decrease by 1 foot January through December.

(habitat flows, which include the Wateree Spring Stable Flow Periods and Wateree Floodplain Inundation Protocols, as well as flow mitigation packages for North and South Carolina); 5.2 to 5.11 (water use); 6.2 to 6.6 (drought operations); 7.2 and 7.3 (maintenance and emergency operation); 8.2 to 8.16 (public information dissemination); 9.3 to 9.5 (cultural resources); 10.2 to 10.27 (recreation measures); 11.2 to 11.8 (species protection measures, which include plans for state-listed species); 12.2 to 12.7 (shoreline management); 13.2 to 13.10 (water quality); 14 (other resource enhancements, which include flood management at Wateree Dam); and 15.2 to 15.6 (gaging and monitoring) do not contain proposed articles and, thus, are not intended to be requirements of the license. *See* Agreement filed December 29, 2006 at 2-1 through 15-2.

[44] The target elevations are set forth in section A-1.0 (A) of the Agreement for Lake James, Lake Rhodhiss, Lake Hickory, Lookout Shoals Lake, Lake Norman, Mountain Island Lake, Lake Wylie, Fishing Creek Reservoir, Great Falls Reservoir, Cedar Creek Reservoir, and Lake Wateree.

At the Cowans Ford Development, the target reservoir elevation for Lake Norman would increase in 7 of 12 months (*e.g.*, the April target elevation would increase by 2.7 feet, from elevation 754.0 feet to elevation 756.7 feet.

At the Mountain Island Development, the target reservoir elevation for Mountain Island Lake would decrease by 1 foot January through December.

At the Wylie Development, the target reservoir elevations for Lake Wylie would not change from current operation.

At the Fishing Creek Development, the target reservoir elevation for Fishing Creek Reservoir would increase by 1 foot January through December.

At the Great Falls-Dearborn Development, the target reservoir elevations for Great Falls Reservoir would not change from current operation.

At the Rocky Creek-Cedar Creek Development, the target reservoir elevations for Cedar Creek Reservoir would not change from current operation.

At the Wateree Development, the target reservoir elevations for Lake Wateree would not change from current operation.

96. Duke Energy proposes to continue implementing a Spring Lake Level Stabilization Program that would limit the fluctuation of reservoir levels for a 3-week period to support fish spawning in the reservoirs at Lake James, Lake Norman, Lake Wylie, and Lake Wateree (*see* section 2.1.2 of the Agreement and the spring reservoir level stabilization program article of section A-1.0 in Appendix E of this order).[45] Duke Energy would maintain the reservoir level within a range of 1 foot below and 2 feet above the level at the time when the program is triggered, to enhance littoral fish spawning habitat.

97. The initiation of the Spring Lake Level Stabilization Program at each project reservoir participating in the program would be keyed to the start date on Lake Wateree. Duke Energy would suspend the Spring Reservoir Level Stabilization Program whenever it is operating in accordance with its proposed LIP or MEP, or during any time period in which maintaining the stabilized reservoir level on Lake Wateree would prevent or alter

[45] Duke Energy has been implementing the Spring Lake Level Stabilization Program voluntarily under the existing license. Duke Energy attempts to maintain water levels in Lake Wateree during the spring spawning period for bass within a range of 1 foot below to 2 feet above the level on the first day of the program. Duke Energy initiates the program on the fourth consecutive day of a noontime forebay temperature of at least 65°F and continues the program for 3 weeks.

flow releases from the Wateree Development that are needed to support downstream fish habitat.

2. Minimum Flows and Other Stream Protection Measures

a. Aquatic Habitat and Water Quality Flows

98. To protect and enhance aquatic habitat and water quality downstream from the project developments, Duke Energy proposes to implement a Flow and Water Quality Implementation Plan (*see* section 4.1.3 of the Agreement and flow and the water quality implementation plan of section A-2.0 in Appendix E) that provides for: (1) the replacement of a powerhouse or valve system at the Bridgewater Development; (2) construction of minimum flow valves at Catawba Dam[46] and Oxford Dam; (3) installation of a minimum flow unit at the Wylie Development; (4) installation of flow release structures at the Great Falls Headworks and Great Falls Diversion Dam; and (5) installation of a minimum flow unit at the Wateree Development. Following installation of the minimum flow structures, Duke Energy proposes to provide the minimum flows described in section 4.1.1 of the Agreement and the minimum flow article of section A-2.0 in Appendix E of this order.

99. Duke Energy's proposal would generally change the minimum flows for each development, compared to current operation, as follows:

> At the Bridgewater Development, the minimum average daily flow at Linville Dam would decrease from 66 to 0 cfs. The minimum continuous release would increase from 25 cfs to between 95 and 145 cfs, depending on the month. At Catawba Dam, the minimum continuous release would increase from 0 cfs to either 50 cfs or 75 cfs depending on the month.
>
> At the Rhodhiss Development, the minimum average daily flow would not change from current operation, and the continuous minimum flow (approximately 40 cfs) would continue to be maintained through leakage.
>
> At the Oxford Development, the minimum average daily flow would decrease from 261 to 0 cfs, and the continuous minimum flow would increase from 40 to 150 cfs.

[46] Duke Energy installed a continuous minimum flow valve at the Bridgewater Development's Catawba Dam in 2010. *See* Duke Energy's June 12, 2015 Filing at Appendix A at 13.

At the Lookout Shoals Development, the minimum average daily flow would decrease from 278 to 0 cfs, and the continuous minimum flow would increase from 60 to 80 cfs.

At the Cowans Ford Development, the minimum average daily flow would not change from current operation, and the continuous minimum flow (approximately 80 cfs) would continue to be maintained through leakage.

At the Mountain Island Development, the minimum average daily flow would not change from current operation, and the continuous minimum flow (approximately 80 cfs) would continue to be maintained through leakage.

At the Wylie Development, the minimum average daily flow would decrease from 411 to 0 cfs, and the continuous minimum flow would increase from 0 to 1,100 cfs.

At the Fishing Creek Development, the minimum average daily flow would not change from current operation, and the continuous minimum flow would continue to be maintained through leakage.

At the Great Falls-Dearborn Development, the minimum average daily flow would not change from current operation. The continuous minimum flow from Great Falls Diversion Dam into the Great Falls Long Bypass would increase from 0 cfs to either 450 cfs or 850 cfs depending on the month. The continuous minimum flow from the Great Falls Headworks into the Great Falls Short Bypass would increase from 0 to 100 cfs.

At the Rocky Creek-Cedar Creek Development, the minimum average daily flow would not change from current operation, and the continuous minimum flow would continue to be maintained through leakage.

At the Wateree Development, the minimum average daily flow would decrease from 446 to 0 cfs, and the continuous minimum flow would increase from 0 cfs to between 930 and 2,700 cfs depending on the month.

100. To support downstream water withdrawal requirements for public water supply and industrial processes, Duke Energy proposes to provide flows at the Bridgewater, Wylie, and Wateree Developments as described in section 5.1.1 of the Agreement and the flows supporting public water supply and industrial processes article of section A-2.0 in Appendix E of this order. Duke Energy would provide the agreed upon flows, except for temporarily variances when Duke Energy is operating in accordance with the proposed MEP or Stage 4 of the LIP. Duke Energy, however, may not meet the 16-hour, 1,000-cfs flow requirement at RM 120 (location of the Bowater Pulp and Paper Mill) when operating in Stages 1 through 4 of the proposed LIP.

101. To provide additional protection and enhancement of aquatic habitat downstream of the Wylie Development whenever adequate inflow to the project is available, Duke Energy proposes to implement the Wylie High Inflow Protocol (*see* section 4.1.2 of the Agreement and the Wylie high inflow protocol article of section A-2.0 in Appendix E of this order). Duke Energy would suspend the Wylie High Inflow Protocol if operating under the LIP or the MEP.

102. To conserve the project's storage capacity, as well as protect water supplies and aquatic habitat and organisms in the Catawba-Wateree River Basin during extended low inflow or drought conditions, Duke Energy proposes to implement the LIP (*see* section 6.1.1 of the Agreement and the low inflow protocol for the Catawba-Wateree Project article of section A-3.0 in Appendix E of this order).[47] The goal of the LIP would be to preserve storage and delay the point at which the project's usable water storage inventory is fully depleted.[48]

b. Recreation Flows

103. Duke Energy proposes to provide recreational flow releases to support paddling, wade fishing (or angling while walking through shallow water), boat fishing, and other activities, subject to temporary modification in accordance with Duke Energy's proposed LIP or MEP *(see* section 3.1.1 of the Agreement and the recreational flows article of section A-2.0 in Appendix E of this order). Depending on development and season, the recreation flows would vary from a low of 900 cfs to a high of 6,000 cfs. Duke Energy would provide these scheduled flows in the Bridgewater, Oxford, Wylie, and Wateree regulated river reaches, in addition to scheduled flow releases for canoeing and whitewater boating in the Great Falls bypassed reaches. In addition to these recreational flows, Duke Energy would provide up to 10 additional hours of recreational flow releases per calendar year, in increments of no less than 1 hour each at the five developments.

[47] The LIP sets forth a formal set of procedures for operating the project in drought conditions that are based on weather and watershed inflow triggers which would advance through four stages of conservation and management as the duration and severity of drought conditions increase. The LIP establishes the Catawba-Wateree Drought Management Advisory Group (Advisory Group). The Advisory Group and the activities of the group are elements of the LIP that would not be enforceable by the Commission because the Commission cannot enforce the provisions of a settlement against parties it does not regulate. *See, e.g., Avista Corporation,* 93 FERC ¶ 61,116 at 61,329 (2000).

[48] This reduction in generating capacity would be met by other sources on the power grid and by implementing or encouraging conservation measures during periods of peak load.

104. In March of each year, Duke Energy proposes to convene an Annual Recreational Flow Schedule Planning Meeting with North Carolina DENR, North Carolina WRC, South Carolina DNR, South Carolina DPRT, and other entities with recreational expertise to: (1) identify potential improvements to the recreational flow release schedule; (2) establish the schedule for the 10 hours of additional recreational flow releases; and (3) identify potential dates for replacement flows at the Bridgewater Development for the current calendar year (*see* section 3.1.1. of the Agreement and the recreational flows article of section A-2.0 in Appendix E of this order).

3. Flow and Reservoir Elevation Monitoring

105. To monitor target elevations and draw-down limitations at the project reservoirs, Duke Energy proposes to use existing lake level monitors installed at all of the developments. In addition, Duke Energy would use the six existing streamflow gaging stations that are operated by the USGS in the Catawba-Wateree Basin to document flow releases at each development. To facilitate the Commission's administration of the license, Duke Energy proposes to file with the Commission, following each full calendar year for the term of the license, a report documenting compliance with continuous minimum flows, minimum average daily flows, the normal minimum and normal maximum elevations for reservoir levels, the Spring Reservoir Level Stabilization Program, recreational flow releases, and the Wylie High Inflow Protocol (*see* sections 2.1.3 and 4.1.4 of the Agreement, and the flow and reservoir elevation monitoring article of section A-6.0 in Appendix E of this order).[49]

106. To monitor compliance with the minimum flow and recreational flow releases from the Bridgewater Development, Duke Energy proposes to fund the installation of a new USGS streamflow gaging station on the Linville River, between Linville Dam and the confluence of the Catawba River *(see* the USGS streamflow gages article of section A-6.0 in Appendix E of this order). To assure the continuing availability of the gages, Duke Energy would also fund the annual maintenance costs associated with the new gage and the six existing gages in the watershed for the term of the license.

4. Water Quality

107. Duke Energy proposes to modify the project developments to help meet state water quality standards (*see* sections 4.1.3 and 13.1.1 of the Agreement, and the flow and

[49] The report would include: (1) hourly flow records for the Bridgewater, Oxford, Lookout Shoals, Wylie, and Wateree Developments; (2) documentation of downstream flow releases for recreation and aquatic habitat; and (3) data, graphs, and summaries of hourly lake levels for each reservoir. The report would also identify instances of any noncompliance events and any proposed or implemented corrective actions.

water quality implementation plan article of section A-2.0 in Appendix E of this order). Duke Energy would file with the Commission a Flow and Water Quality Implementation Plan for completing the modifications at the project necessary to satisfy the water quality certificate requirements. Duke Energy would include in the plan: (1) descriptions of the equipment installed at each development;[50] (2) any proposed modifications to project structures to meet the states' water quality certification (certification) requirements; and (3) implementation schedules.

108. To monitor compliance with water quality requirements, Duke Energy proposes to develop, in consultation with North Carolina DWQ and South Carolina DHEC, a water quality monitoring plan, and file the plan with the Commission (*see* section 13.1.2 of the Agreement and the water quality monitoring plan article of section A-5.0 in Appendix E of this order). In the plan, Duke Energy would identify the compliance monitoring devices and locations used to accurately monitor and record flows, including the dissolved oxygen (DO) and water temperature, released from each of the project's developments, and include an implementation schedule. Duke Energy would file, for the term of the license, annual reports verifying compliance with each state's certification for the previous calendar year.

5. Recreation Measures

Bridgewater Development

109. To enhance recreational opportunities at the Bridgewater Development, Duke Energy proposes to add restrooms, shade trees, trails, picnic facilities, primitive camping sites, canoe/kayak access sites, boat ramps, and other various improvements to the development's existing Black Bear, Linville, and Bridgewater Access Areas. To provide additional access to Lake James, Duke Energy proposes to construct a new 10-acre New Linville Access Area for launching trailered boats, and a new 1- to 3-acre Muddy Creek Access Area for canoe/kayak access. At Linville Dam, Duke Energy proposes to develop a 10-acre pocket park with parking facilities, picnic facilities, photographic overlooks, and a bank fishing trail. To enhance the Lake James State Park and Islands Management Zone along the shoreline adjoining the state park, Duke Energy would offer North Carolina DENR a nominal-cost lease for the term of the license (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

[50] Duke Energy installed minimum flow generating units, with aerating runners at the Bridgewater Development in 2012, and at the Rhodhiss and Oxford Developments in 2013. *See* Duke Energy's June 12, 2015 filing in Appendix A at 13-21.

Rhodhiss Development

110. To enhance recreational opportunities at the Rhodhiss Development, Duke Energy proposes to construct restrooms, parking, a boat ramp, and trails at the development's existing Conley Creek (Sawmill Veterans Park), Rhodhiss, and Castle Bridge Access Areas. Duke Energy proposes to evaluate the condition of the existing portage trail and signage at the Rhodhiss Dam Canoe Portage and provide any needed improvements. Duke Energy also proposes to acquire approximately 10 acres to construct a launching ramp for trailered boats on Lake Rhodhiss at the Corpening Road Bridge over the Johns River (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

Oxford Development

111. To enhance recreational opportunities at the Oxford Development, Duke Energy proposes to add restrooms, parking, swimming areas, trails, canoe/kayak access, a primitive campground, or other improvements at the development's existing Wittenburg Access Area, Dusty Ridge Access Area, Lovelady Access Area, Long Shoals Access Area, Oxford Access Area, and Oxford Dam Canoe Portage. Duke Energy proposes to construct a new fishing area at the tailrace of Oxford Dam. Duke Energy also proposes to acquire approximately 15 additional acres to include in the development's Wittenburg Access Area for restrooms, picnic facilities, and additional paved parking (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

Lookout Shoals Development

112. To enhance recreational opportunities at the Lookout Shoals Development, Duke Energy proposes to construct parking, restrooms, a primitive campground, and trailered boat access at a new 1- to 5-acre access area on Lookout Shoals Reservoir. Duke Energy also proposes to develop new facilities for public fishing and a portage trail at Lookout Shoals Dam. Duke Energy proposes to improve the existing Lookout Shoals Access Area by constructing restrooms (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

Cowans Ford Development

113. To enhance recreational opportunities at the Cowans Ford Development, Duke Energy proposes to develop picnic facilities, parking, trails, swimming areas, and add shade trees at the development's existing Beatty's Ford, Hagers Creek, Stumpy Creek, Little Creek, and Island Point Access Areas. Duke Energy proposes to develop a new portage trail and overlook at Cowans Ford Dam. Duke Energy also proposes to offer North Carolina DENR a nominal-cost lease for the term of the license for the development's Lake Norman State Park Management Zone along the shoreline adjoining

the state park, including one island (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

Mountain Island Development

114. To support non-motorized boating at the Mountain Island Development, Duke Energy proposes to construct two new recreation sites with parking and boat launch facilities for canoe and kayak access to Mountain Island Lake. Duke Energy also proposes to construct a new portage trail at Mountain Island Dam. Duke Energy would improve the existing Riverbend Access Area with restrooms, a swimming area, and fishing facilities (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

Wylie Development

115. To enhance recreational opportunities at the Wylie Development, Duke Energy proposes to add parking, trails, picnic facilities, restrooms, a fishing pier, or other improvements at the development's existing South Point, Buster Boyd, Allison Creek, and Fort Mill Access Areas. Duke Energy proposes to develop canoe/kayak access to Lake Wylie at the new Dutchmans Creek Access Area. Duke Energy also proposes to offer a lease for the 37-acre Saddler Island to the U.S. National Whitewater Center for individual and group environmental education and outdoor recreation programming, and a lease for the Landsford Canal State Park Management Zone to South Carolina DPRT for management of project shoreline adjoining Landsford Canal State Park (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

Fishing Creek Development

116. To enhance recreational opportunities at the Fishing Creek Development, Duke Energy proposes to permanently close the existing Cane Creek Access Area and construct boat ramps, parking, and fishing facilities at a new 18-acre Springs Park Access Area. Duke Energy would also develop a tailrace fishing area and make improvements, including a fishing pier, picnic facilities, and swimming area at the existing Fishing Creek Access Area (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

Great Falls-Dearborn Development

117. To enhance opportunities for whitewater boating at the Great Falls-Dearborn Development, Duke Energy proposes to construct a new 1- to 5-acre access area with a canoe/kayak launch in the vicinity of the intersection of Highway 200, Highway 21, and Fishing Creek, and a new canoe/kayak launch on Great Falls Reservoir downstream from the Great Falls headworks. Duke Energy proposes to construct three new portages to

provide boater access to the Great Falls Long Bypassed Reach, Great Falls Short Bypassed Reach, and the Cedar Creek Reservoir. Duke Energy also proposes to evaluate safety concerns associated with boating near the development's Great Falls Diversion Dam, Great Falls Headworks, and Great Falls-Dearborn Dam, and to determine the need for installing upstream boating safety devices. Duke Energy would report its conclusions to the Commission and submit a revised public safety plan if boating safety devices are determined necessary. Duke Energy would complete the evaluation and install any necessary boating safety devices prior to constructing any public boat launching areas and before releasing recreational flows (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

Rocky Creek-Cedar Creek Development

118. To enhance recreational opportunities at the Rocky Creek-Cedar Creek Development, Duke Energy proposes to develop canoe/kayak access with ten gravel parking spaces at the development's new 1- to 5-acre Mud Cat Inn Access Area. Duke Energy also proposes to offer, at nominal cost, a lease of the islands associated with the Great Falls-Dearborn and Rocky Creek-Cedar Creek Development to South Carolina DPRT to establish and maintain a new state park centered on the development's Dearborn Armory site (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

Wateree Development

119. To enhance recreational opportunities at the Wateree Development, Duke Energy proposes to provide a fishing pier, picnic facilities, parking, restrooms, a courtesy dock, or other improvements at the development's existing Wateree Creek, Colonels Creek, Taylors Creek, and Lugoff Access Areas. Duke Energy proposes to acquire about 100 acres to provide a swimming area, paved parking, restrooms, trails, bank and pier fishing, picnic facilities, and trailered boat access at the development's new Molly Creek Park. Duke Energy also proposes to offer South Carolina DENR a nominal-cost lease for the term of the license for the development's Lake Wateree State Park Management Zone along the shoreline adjoining the state (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement).

Recreation Management

120. Duke Energy proposes to file with the Commission a Recreation Management Plan (RMP), including an implementation schedule, for making the proposed recreation improvements noted above at each of the project's developments (*see* section 10.1.1 of the Agreement and the proposed recreation management plan article in section A-9.0 of the Agreement). Duke Energy would include in the RMP: (1) maps that clearly identify all existing and proposed recreation sites and public access areas in relation to the project boundary; (2) maps that clearly identify where the project boundary is to be modified to

accommodate the proposed recreation measures; (3) descriptions of how new facilities would be constructed, and how new and existing facilities would be operated and maintained; (4) procedures for temporary closures of recreation sites for maintenance, emergencies, or management needs; (5) facility construction schedules grouped in 5-year increments; and (6) a description of the proposed recreational signage program for the recreational sites.

121. To facilitate management of recreation and public access at the project over the term of a new license, Duke Energy proposes to conduct a review of the project's recreation needs (*e.g.*, a recreation use and needs assessment), and identify any additional public recreation facility needs at the project, 20 years following license issuance and every 10 years thereafter. Duke Energy would complete the review in consultation with North Carolina WRC, South Carolina DPRT, South Carolina DNR, local governments, and other interested entities. Based on the consultation, Duke Energy would file with the Commission a supplement to its RMP that details additional activities or facilities to be developed (*see* section 10.1.2 of the Agreement and the proposed recreation planning article in section A-9.0 of the Agreement).

6. Other Settlement Measures

122. To facilitate its management of project operation, Duke Energy proposes to implement a MEP if it becomes necessary to temporarily suspend or modify some operational requirements of the license, in the event of emergency or other abnormal situations, and during equipment failure and maintenance activities (*see* section 7.1.1 of the Agreement and the maintenance and emergency protocol for the Catawba-Wateree Project article in section A-4.0 of Appendix E of this order).

123. To facilitate public use of the project's resources, Duke Energy proposes to enhance public information systems and provide public information related to river flow, 2-day and 3-day flow release forecasts, and reservoir levels in a manner that ensures the most up-to-date information possible through an internet, website, and telephone communications (*see* section 8.1.1 of the Agreement and the proposed public information article in section A-8.0 of the Agreement).

124. To protect cultural resources at the Catawba-Wateree Project, Duke Energy proposes to implement a Historic Properties Management Plan (HPMP) (*see* section 9.1.1 of the Agreement and the proposed historic properties article in section A-11.0 of the Agreement).

125. To protect and enhance rare and federally listed threatened and endangered (RTE) species at the project, Duke Energy proposes to implement species protection plans for the Schweinitz's sunflower, dwarf-flowered heartleaf, bald eagle, wood stork, American

alligator,[51] and shortnose sturgeon. (*see* section 11.1.1 of the Agreement and the proposed federal threatened and endangered species protection plans article in section A-7.0 of the Agreement). The species protection plans include: (1) specific methods for (a) monitoring each species, and (b) determining the effectiveness of management and conservation measures proposed for each species; and (2) annual communication and consultation with the appropriate state and federal agencies. Duke Energy also proposes to annually update the list of threatened and endangered species, after consultation with FWS, North Carolina DENR, North Carolina WRC, and South Carolina DNR.

126. To protect near-shore aquatic and riparian habitat, as well as scenic quality at the project, Duke Energy proposes to modify shoreline management classifications, lake use restrictions, and Shoreline Management Guidelines to implement a new Shoreline Management Plan (SMP) (*see* section 12.1.1 of the Agreement and the proposed shoreline management plan article of section A-10.0 in the Agreement). Duke Energy also proposes to: (1) review and update the SMP 10 years following license issuance and every 10 years thereafter for the term of the license, in consultation with a workgroup consisting of North Carolina DENR, North Carolina WRC, South Carolina DPRT, South Carolina DNR, FWS, local governments, and other interested entities; and (2) update and file revised shoreline classification maps with the revised SMP (*see* section 12.1.2 of the Agreement and the proposed shoreline management plan review and update procedures article of section A-10.0 in the Agreement).

TRANSMISSION LINES

127. Duke Energy states that there are no primary transmission lines at any of the project's 11 developments,[52] arguing that all of the power lines at the project are part of the regional distribution system.

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[51] The species protection plans for wood stork and American alligator include a provision that Duke Energy implement the Wateree Floodplain Inundation Protocol (section 4.9 of the Agreement). Under this protocol, and following periods of high natural inflow that occur between February 1 and May 31 creating spill at Wateree Dam, Duke Energy would operate the Wateree Hydro Station to gradually reduce floodplain inundation in the Wateree Regulated River Reach to approximate natural inflow conditions until Lake Wateree returns to within 1 foot above or below the normal target elevation. However, Duke Energy does not propose to include the protocol as a license requirement at this time. Rather, 10 years after the Flow and Water Quality Implementation Plan modifications are completed at the Wateree Development, Duke Energy would consult with FWS, NMFS, and South Carolina DNR on a license amendment for the Wateree Floodplain Inundation Protocol.

[52] *See* Duke Energy's June 12, 2015 response to the Commission's additional *(continued ...)*

128. As part of a June 12, 2015 filing in response to a Commission staff request for information, Duke Energy submitted one-line diagrams for each of the project's developments that show the interconnections of lines from each of the powerhouses, and identifies a grid interface point, or the point at which the lines leading from the powerhouse connect with the regional distribution system. Staff reviewed these one-line diagrams and, applying the Commission's test for a primary line,[53] concludes that 10 lines at six project powerhouses qualify as primary lines.

129. The description of the lines is as follows:

> The Rhodhiss Development includes a lead line from the Rhodhiss Powerhouse to a switching station adjoining the powerhouse. Power is transferred from the switching station to the Rhodhiss Tie Substation located 0.17 miles away. This 0.17-mile-long section is a primary line.
>
> The Lookout Shoals Development includes a lead line from the Lookout Shoals Powerhouse to the switching station adjoining the powerhouse. Power is transferred from the switching station to the Lookout Tie Substation located 0.20 miles away. This 0.20-mile-long section is a primary line.
>
> The Cowans Ford Development includes a switching station on top of the Cowans Ford Powerhouse. Two lines transmit power from the switching station to the McGuire Switching Station located 1.67 miles away. These two 1.67-mile-long sections are primary lines.
>
> The Great Falls-Dearborn Development includes a switching Station at the Great Falls Powerhouse. Two lines transfer power from this switching station to the Great Falls Switching Station located 0.20 miles away. These two 0.20-mile-long sections are primary lines. In addition, there is a switching station at the Dearborn Powerhouse. There is a 0.13-mile-long 100-kV transmission line and a 0.08-mile-long 44-kV transmission line that convey power from this switching station to the Great Falls Switching Station. The 0.13-mile-long section and the 0.08-mile-long section are primary lines.
>
> The Rocky Creek-Cedar Creek Development includes a switching station adjoining the Cedar Creek Powerhouse. Two lines transmit power from this

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information request issued May 14, 2015.

[53] The criterion applied by the Commission is that the line is used solely to transmit power from the licensed project to a load center, and that without the line there would be no way to transmit all the project power to market.

switching station to the Great Falls Switching Station located 2.0 miles away. These two 2.0-mile-long sections are primary lines.

130. The project's Exhibit A and Exhibit G included in the license application must be revised to include these lines as project facilities. Articles 202 and 204 require these revisions.

INOPERABLE TURBINES

131. In a June 12, 2015 filing, Duke Energy explains that Great Falls units 3, 4, 7, and 8 and Rocky Creek units 1, 2, 3, and 4 are no longer necessary and will likely be retired after a new license is issued. These eight turbine/generator units account for 24 MW of the project's current authorized capacity. The units have been inoperable since before 2010, and there is no evidence in the record to support continued authorization of the units' generating capacity. Therefore, the authorized installed capacity for the Catawba-Wateree Project, as licensed herein, does not include the 24-MW combined capacity of these eight units. Article 208 requires Duke Energy to file a plan and schedule for decommissioning the eight units within 1 year of license issuance.

132. In a May 17, 2010 filing, Duke Energy provided a schedule for rehabilitating four inoperable turbine/generator units (units 5, 6, 7, and 8) at the Rocky Creek Powerhouse. In a June 12, 2015 filing, Duke Energy states that the feasibility of using these units depends on the flows required by the new project license, and requests two years to evaluate the units' viability. Given the size and complexity of this project, additional time to study these units seems reasonable. However, one year should provide adequate time for this evaluation. Article 209 requires Duke Energy to file a plan and schedule within 1 year of license issuance to either restore the four units to service or decommission them. Should Duke Energy's study conclude that all four turbine/generator units be decommissioned, the Rocky Creek Powerhouse would contain no operable turbine/generator units, and may no longer be needed. Therefore, Article 209 also requires Duke Energy to file a decommissioning plan for the Rocky Creek Powerhouse in the event all units are decommissioned.

AUTHORIZED INSTALLED CAPACITY

133. The original license issued for the Catawba-Wateree Project authorized an installed capacity of 951,000 horsepower, or about 713.250 MW. Since Duke Energy filed its license application in 2006, the Commission has approved several capacity amendments for the project. The current authorized capacity, based on a capacity amendment approved on February 28, 2013,[54] is 739.82 MW.

[54] *See* 142 FERC ¶ 62,173.

134. Commission staff have reviewed the authorized capacity at each of the project's 13 powerhouses using the criteria that the authorized capacity for each turbine/generator unit is determined by the lesser of the turbine or generator ratings. Based on this review, staff concluded that the authorized capacity for the 13 powerhouses is 843.102 MW.[55] As discussed above, this license does not include 24.0 MW of capacity from eight turbine/generator units which are inoperable and will not be repaired. Therefore, this license authorizes a total installed capacity of 819.102 MW for the Catawba-Wateree Project.[56]

SUMMARY OF LICENSE REQUIREMENTS

135. Except as indicated below, this license requires most of Duke Energy's proposed environmental measures, and includes modifications to some of the proposed measures to afford additional protection to resources affected by the project and to facilitate the Commission's administration of the license.

136. To protect shortnose sturgeon and Atlantic sturgeon, as well as their habitat, the license requires the terms and conditions included in NMFS'S Biological Opinion (BO), as outlined in Appendix D. The license also requires a species protection plan that details how the terms and conditions of the BO will be implemented.

137. To protect certain state listed RTE species, this license requires Duke Energy to implement species protection plans for flat bullhead, snail bullhead, robust redhorse, seven freshwater mussels,[57] rocky shoals spider lily, Rafinesque's big-eared bat, and great blue heron (*i.e.*, rookeries).

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[55] *See* Commission Staff Additional Information Request issued May 14, 2015. In a response filed June 12, 2015, Duke Energy concurred with staff's determination that the total authorized capacity for the Catawba-Wateree Project is 843,102 kW.

[56] The capacity of each powerhouse is: (a) Bridgewater Powerhouse – 27.867 MW; (b) Rhodhiss Powerhouse – 32.225 MW; (c) Oxford Powerhouse – 35.850 MW; (d) Lookout Shoals Powerhouse – 25.715 MW; (e) Cowan's Ford Powerhouse – 332.5 MW; (f) Mountain Island Powerhouse – 55.05 MW; (g) Wylie Powerhouse – 69.0 MW; (h) Fishing Creek Powerhouse – 48.12 MW; (i) Great Falls Powerhouse – 12.0 MW; (j) Dearborn Powerhouse – 42.0 MW; (k) Rocky Creek Powerhouse – 13.8 MW; (l) Cedar Creek Powerhouse – 42.975 MW; and (m) Wateree Powerhouse – 82.0 MW.

[57] The seven mussels are the creeper, eastern floater, paper pondshell, eastern creekshell, notched rainbow, brook floater, and rayed pink mucket.

138. To increase public awareness and prevent the introduction and/or spread of aquatic invasive species at the project reservoirs, the license requires Duke Energy to expand its existing "Stop the Aquatic Hitchhikers" educational campaign by installing "Stop the Aquatic Hitchhikers!" signage at all project access areas and boat ramps.

139. To enhance public use of the Catawba and Wateree Rivers, the license requires Duke Energy to post reservoir level information and flow release schedules on the company's website, and provide this information to the public through a link on the website and via a toll-free telephone line.

140. To enhance recreational opportunities at the project, the license requires Duke Energy to develop and implement a RMP to guide the construction of the proposed recreation facility enhancements, as well as operation and maintenance responsibilities for all project recreation facilities over the term of a new license.

141. To ensure that adequate public safety measures are in place before constructing any recreation amenities to support recreational boating at Great Falls Reservoir and commencing recreation flows at the Great Falls-Dearborn Development, the license requires Duke Energy to evaluate boating safety concerns and determine the need for installing boating safety devices, such as warning sirens, boat barriers, buoys, or signage, and file a revised Public Safety Plan, as necessary.

142. To protect scenic, recreational, and environmental resources at the project, the license requires Duke Energy to modify its proposed SMP to clarify its provisions for reviewing and revising the SMP without prior Commission approval, as well as to address changes made to the Shoreline Classification Maps and Shoreline Management Guidelines since the filing of the license application. To provide a mechanism for tracking shoreline resources and uses and facilitate future reviews, the license also requires Duke Energy to file Geographic Information System (GIS) data for the project area and shoreline management classifications.

143. The license does not require Duke Energy to create or lease management zones adjoining Lake James State Park, Lake Norman State Park, Landsford Canal State Park, and Lake Wateree State Park, and does not require Duke Energy to lease Saddler Island to the U.S. National Whitewater Center for environmental education and outdoor recreation because doing so would require a contract between two parties that the Commission has no authority to regulate.

WATER QUALITY CERTIFICATION

144. Under section 401(a)(1) of the Clean Water Act (CWA),[58] the Commission may not issue a license authorizing the construction or operation of a hydroelectric project unless the state water quality certifying agency has either issued water quality certification for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed 1 year. Section 401(d) of the CWA provides that the certification shall become a condition of any federal license that authorizes construction or operation of the project.[59]

A. North Carolina

145. On June 5, 2008, Duke Energy filed an application with the North Carolina Division of Water Quality (North Carolina DWQ) for certification pursuant to the CWA for the Catawba-Wateree Project, which North Carolina DWQ received the same day. On November 14, 2008, North Carolina DWQ issued its certification for the Catawba-Wateree Project that includes conditions which are set forth in Appendix A of this order and incorporated into the license by Ordering Paragraph D.

146. The North Carolina certification includes nine conditions to protect water quality and ensure the project complies with state water quality standards, four of which are general or administrative and are not discussed further.[60] The remaining five conditions require Duke Energy to: (1) identify and report consumptive water uses at the project to North Carolina DWQ and the North Carolina Division of Water Resources; (2) implement the Agreement's measures specified in section 4.5; (3) implement Duke Energy's proposed the Quality Assurance Procedures Plan, dated October 20, 2008 (Revision #0);[61] (4) implement the Agreement's (a) reservoir levels (section 2.0), (b) instream flow measures, except those for recreation (section 4.0), (c) flow mitigation

[58] 33 U.S.C. § 1341(a)(1) (2012).

[59] 33 U.S.C. § 1341(d) (2012).

[60] The general terms and conditions stipulate that: (1) no contaminants resulting from construction activities are permitted to enter wetlands, waters, or riparian areas beyond the footprint of the impact depicted in the certification; (2) no sediment and erosion control measures be placed in wetlands or water to the maximum extent practicable; (3) the certification does not grant or affirm any property right, license, or privilege in any waters or any right of use in any waters; and (4) the licensee conduct its activities in a manner consistent with state water quality standards, and applicable law.

[61] *See* Duke Energy's April 22, 2015 filing.

measures (section 4.5), (d) low inflow protocol provisions (section 6.0), (e) maintenance and emergency protocol provisions (section 7.0), (f) water quality measures (section 13.0),[62] (g) streamflow gauging and monitoring measures (section 15.0), and (h) the proposed license articles in Appendix A of the Agreement, including A-1.0, A-2.0 (except recreation flows), A-3.0, A-4.0, A-5.0, and A-6.0; and (5) notify North Carolina DWQ within 5 working days of discovering any flow and lake level deviations.

B. South Carolina

147. On June 5, 2008, Duke Energy filed an application with South Carolina DHEC for certification pursuant to the CWA for the Catawba-Wateree Project, which South Carolina DHEC received the same day. On May 15, 2009, South Carolina DHEC issued a Notice of Department Decision regarding measures it proposed to include in the project's certification. On May 29, 2009, the Conservation Groups requested final review of South Carolina DHEC's decision by the South Carolina Board of Health and Environmental Control (South Carolina BHEC).[63] South Carolina BHEC reversed South Carolina DHEC's decision and, on August 6, 2009, denied Duke Energy's application for water quality certification. On August 11, 2009, Duke Energy filed a petition asking the Commission to declare that the State of South Carolina had waived its right to issue a certification for the project,[64] on the grounds that neither South Carolina BHEC nor South Carolina DHEC took final action to grant or deny certification before expiration of

[62] Duke Energy requests the license clarify that the DO enhancement technologies installed will be implemented in accordance with the Water Quality Management Plan approved by the Commission. *See* Duke Energy's October 2, 2009 filing at 2-3. North Carolina's certification does not require a Water Quality Management Plan, but rather requires a Flow and Water Quality Implementation Plan. Therefore, Ordering Paragraph D of this license requires the latter plan. The plan is to be developed in consultation with state and federal agencies and include an implementation schedule. The plan must be approved by the Commission before it can be carried out.

[63] *See* Duke Energy's July 12, 2009 filing at 2. Duke Energy styled its filing as a motion to lodge additional information into the Commission's record. The Conservation Groups filed a response on July 27, 2009, which Duke Energy responded to on August 5, 2009. All of these filings are treated as comments.

[64] The Conservation Groups and the State of South Carolina, through the South Carolina Attorney General's Office, filed responses to Duke Energy's petition on August 17 and September 10, 2009. Duke Energy filed a response to these filings on September 25, 2009.

the 1-year waiver period. The Commission denied Duke Energy's petition on April 17, 2014.[65]

148. Duke Energy pursued its judicial remedies at the state level to obtain relief from South Carolina BHEC's denial of its water quality certification. Duke Energy filed an appeal of South Carolina BHEC's decision with the South Carolina Administrative Law Court,[66] and its appeal was granted. The Conservation Groups appealed the decision of the Administrative Law Court to the South Carolina Court of Appeals, which reversed the Administrative Law Court's decision, and Duke Energy sought rehearing. The status of South Carolina's certification remained pending at the state court level until Duke Energy, the Conservation Groups, and South Carolina DHEC reached resolution regarding South Carolina DHEC's certification for relicensing the Catawba-Wateree Project.[67]

149. On July 18, 2014, Duke Energy again applied to South Carolina DHEC for certification pursuant to the CWA.[68] On February 12, 2015, South Carolina DHEC issued its certification for the Catawba-Wateree Project that includes conditions, which are set forth in Appendix B of this order, and incorporated into the license by Ordering Paragraph E.

150. The South Carolina certification includes six conditions to protect water quality and ensure the project complies with state water quality standards, one of which is general or administrative and is not discussed further.[69] The remaining five conditions require Duke Energy to: (1) implement the Agreement's (a) reservoir levels (section 2.0, excluding subsection 2.2), (b) recreation flows (section 3.0, excluding subsection 3.3), (c) instream flow measures (subsection 4.1), (d) low inflow protocol provisions (section 6.0, excluding subsection 6.6), (e) maintenance and emergency protocol provisions

[65] *Duke Energy Carolinas, LLC*, 147 FERC ¶ 61,037. Duke Energy filed for rehearing of the Commission's order on May 16, 2014, which it later withdrew on February 18, 2015. The Commission terminated the proceeding on March 6, 2015.

[66] *See* Duke Energy's September 17, 2009 filing.

[67] *See* Duke Energy's August 5, 2014 filing.

[68] *Id*. at 2.

[69] The general condition stipulates that Duke Energy take all measures necessary to prevent contaminants resulting from project operation and maintenance activities to enter adjacent waters or wetlands.

(section 7.0), (f) protection measures for federally listed species (subsection 11.1),[70] (g) water quality measures (section 13.0), (h) streamflow gauging and monitoring measures (subsections 15.1 to 15.5), (i) proposed license articles in Appendix A of the Agreement, including A-1.0, A-2.0, A-3.0, A-4.0, A-5.0, and A-6.0, and (j) plans in Appendices C, D, F, and L of the Agreement; (2) implement Duke Energy's proposed Quality Assurance Procedures Plan, dated January 6, 2009 (Revision #0);[71] (3) provide fish passage facilities at Wateree Dam consistent with FWS's fishway prescription; (4) provide an annual report of the Wateree Dam's flow releases occurring from February 15 and May 15 to South Carolina DHEC, American Rivers, and the Coastal Conservation League; and (5) consult with FWS, NMFS, and South Carolina DNR on changes to the Agreement's provisions for Wateree Spring Stable Flow Periods and Wateree Floodplain Inundation 10 years after the Flow and Water Quality Implementation Plan modifications are completed at the Wateree development, and file such changes with the Commission.

C. Discussion of Measures

1. Target Lake Levels

151. In the Agreement, Duke Energy and other signatories specify the normal minimum, target, and maximum reservoir elevations that would be met on the first day of each month at each development. The normal minimum and maximum elevations would be strictly maintained. However, Duke Energy would "…endeavor in good faith to achieve…" normal target elevations at each development. The certifications for both North Carolina and South Carolina require the reservoir elevations in the Agreement, including the normal target elevations. In the EIS,[72] Commission staff did not recommend Duke Energy's proposal to "…endeavor in good faith to achieve…" normal target elevations at each development, because "good faith" cannot be objectively defined and, therefore, the measure is unenforceable. However, because this measure with the subjective language is a condition of the certifications, it is included in this license (*see* Appendix E, A-1.0 (Reservoir Elevations)). Hourly monitoring of reservoir levels,

[70] The bald eagle protection plan provides, and the certification requires, that the effective date for implementing specific measures in the plan be tied to when the license order is final and non-appealable as it relates to species protection. However, because of the uncertainty of such a date, the deadline for implementing the measures included in the plan is tied to the license issuance date. *See Virginia Electric Power Company*, 106 FERC ¶ 62,245 at P 46 (2004); and *Pacificorp*, 105 FERC ¶ 62,207 at PP 25-29 (2003).

[71] *See* Duke Energy's April 22, 2015 filing.

[72] *See* EIS at 467.

reporting of deviations between the normal minimum and maximum elevations, and annual reporting will ensure that the required reservoir elevations are met.

2. Land Use Measures

152. North Carolina's certification requires Duke Energy to implement the provisions of section 4.5 of the Agreement. These provisions include: (1) establishing conservation easements in the riparian corridor along about 22 bank miles of the Johns, Catawba, and Linville Rivers and about 6.6 bank miles of 1st and 2nd order tributaries to the Catawba River;[73] (2) developing a plan to provide public access, open space, and trails; and (3) contingency planning should item 2 not occur.

153. In the EIS,[74] Commission staff did not recommend the measures included in section 4.5 of the Agreement because the land parcels and other measures are not necessary for project purposes or to ameliorate a project effect.[75] Although these are conditions of the certification, they are beyond the scope of the license and not related to the project. While these measures are included in the Agreement, and it is expected that the licensee will implement them as it has agreed to do, they are beyond the Commission's jurisdiction and are not included as conditions of this license.

3. Wateree Floodplain Inundation

154. The North Carolina certification requires Duke Energy to implement the habitat flow provisions (section 4) of the Agreement, including measures to inundate the Wateree River floodplain downstream from Wateree Dam and potentially file a license amendment application to formalize floodplain inundation procedures.[76] The South

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[73] The conservation easements are 100-foot wide perpetual easements that affect about 343 acres of Duke Energy-owned, non-project lands. Duke Energy would transfer the easements to the State of North Carolina, or a state-chosen land trust, within 18 months of the license becoming final and non-appealable.

[74] *See* EIS at 479-80.

[75] The parties to the Agreement did not intend for these land conveyance measures to be included in any new license issued for the project. *See* Joint Explanatory Statement filed December 29, 2006 at 6 and 18-19, and the Agreement at 4-1 and 4-2.

[76] Section 4.9 of the Agreement, *Wateree floodplain Inundation*, requires Duke Energy to operate the Wateree Development to gradually reduce floodplain inundation in the Wateree Regulated River Reach to approximate natural inflow conditions, until the elevation of Lake Wateree returns to its target elevation, plus or minus 1 foot. Unless operating under the LIP or MEP, Duke Energy would operate the Wateree Development *(continued ...)*

Carolina certification does not explicitly require these measures, but does require Duke Energy to consult with FWS, NMFS, and South Carolina DNR on a proposed license article for the inundation of the Wateree River floodplain.

155. In the EIS,[77] Commission staff did not recommend the floodplain inundation procedures included in section 4.9 of the Agreement because: (1) the ability to meet the goals of floodplain inundation in any given year is more a function weather conditions, natural inflows, regulated flows coming into the Wateree Development, and floodplain geomorphology than project operation; and (2) the measures included in the Agreement that affect inflow and discharge of water at Lake Wateree[78] create operational complexities that are not easily managed. Nonetheless, since the floodplain inundation procedures are required by the certifications, which are attached as Appendices A and B, they are included in this license. In addition, Article 401(d) requires that any proposed changes in the Wateree floodplain inundation procedures be filed with the Commission for approval.

4. EPA Consultation

156. The North Carolina and South Carolina certifications require Duke Energy to develop and implement a Flow and Water Quality Implementation Plan and a Water Quality Monitoring Plan in consultation with FWS, NMFS, North Carolina DENR, North Carolina WRC, South Carolina DNR, and South Carolina DHEC. EPA requests to be added to the list of agencies Duke Energy is required to consult with in developing and implementing the two plans.[79] Appendix E of this license includes the Agreement's proposed articles, which are conditions of the certifications, that require Duke Energy to develop and implement a Flow and Water Quality Implementation Plan (A-2.0 Flow

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in this manner following natural high flow conditions that occur between February 1 and May 31, and that result in spill flow conditions at Wateree Dam. Ten years after the Flow and Water Quality Implementation Plan modifications required by section 4.1.3 of the Agreement are completed at the Wateree Development, Duke Energy would consult with FWS, NMFS, and South Carolina DNR on a proposed license amendment to institute a floodplain inundation protocol.

[77] *See* EIS at 497-98.

[78] The Agreement's measures that affect flow management at Lake Wateree include minimum flow releases, lake level stabilization, floodplain inundation, and flood management.

[79] *See* EPA's August 31, 2009 filing at 2.

Articles) and a Water Quality Monitoring Plan (A-5.0 Water Quality Article) in consultation with EPA, as well as the agencies listed above.

COASTAL ZONE MANAGEMENT

157. Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA),[80] the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's coastal zone management program, or the agency's concurrence is conclusively presumed by its failure to act within 6 months of its receipt of the applicant's certification.

158. The State of North Carolina's coastal zone is defined as any counties that, in whole or in part, are adjacent to, adjoining, intersected by, or bounded by the Atlantic Ocean or any coastal sound.[81] The State of South Carolina's coastal zone includes the counties of Beaufort, Berkeley, Charleston, Colleton, Dorchester, Horry, Jasper, and Georgetown.[82] The Catawba-Wateree Project is not located within the North Carolina or South Carolina coastal zones, nor does it affect resources within the designated coastal zone boundaries.[83] Therefore, no consistency certification is required.

SECTION 18 FISHWAY PRESCRIPTION

159. Section 18 of the FPA[84] provides that the Commission shall require the construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate.

160. On June 25, 2008, FWS, on behalf of the Secretary of the Interior, filed a fishway prescription for the Catawba-Wateree Project. The prescription generally requires: (1) an upstream Trap-Sort-Transport fish passage facility for American shad and blueback herring at Wateree Dam; (2) 3-years of American eel passage siting studies downstream from each project dam, in an upstream sequence beginning at Wateree Dam; (3) constructing upstream American eel passage facilities within 2 years of completing the siting study at each project dam; (4) annual reports on American eel populations,

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[80] 16 U.S.C. § 1456(c)(3)(A) (2012).

[81] N.C. Gen. Stat. § 113A-103(2) (2012).

[82] S.C. Code Regs. 48-39-10 (2008).

[83] *See* EIS at 7.

[84] 16 U.S.C. § 811 (2012).

movement, and passage in the Catawba-Wateree river system; (5) a plan to study the downstream passage of American eels in the system, with studies commencing in 2024; (6) an operation and maintenance plan, as well as a plan to study the effectiveness of the Trap-Sort-Transport facility and eel passage facilities; and (7) a handling protocol for sturgeon that may enter the Trap-Sort-Transport facility. FWS's fishway prescription is attached to this order as Appendix C, and made a requirement of the license by Ordering Paragraph F.

161. FWS, in its letter filed June 25, 2008, and NMFS, on behalf of the Secretary of Commerce, in a letter filed June 6, 2008, requested that the Commission reserve authority to prescribe fishways. Consistent with Commission policy, Article 402 reserves the Commission's authority to require fishways that may be prescribed by Secretaries of Interior or Commerce for the Catawba-Wateree Project.

THREATENED AND ENDANGERED SPECIES

162. Section 7(a)(2) of the ESA of 1973[85] requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of their designated critical habitat.

163. Eight federally listed species are known to occur, or potentially occur, in the project area and downstream in the Wateree River. These species include: (1) the threatened dwarf-flowered heartleaf, wood stork,[86] American alligator,[87] and bog turtle;[88]

[85] 16 U.S.C. § 1536(a) (2012).

[86] On June 30, 2014, FWS down-graded the status of wood stork from endangered to threatened. *See* 79 Fed. Reg. 37078-37103.

[87] The American alligator is currently classified as threatened due to similarity of appearance to American crocodiles and other endangered crocodilians in foreign countries. FWS regulates the harvest of alligators and legal trade in the animals, their skins, and products made from them, as part of efforts to prevent the illegal take and trafficking of related reptiles that are threatened or endangered.

[88] The bog turtle is listed as threatened in the United States, except in Georgia, North Carolina, South Carolina, and Virginia. This southern population of the bog turtle is listed as threatened due to similarity of appearance to bog turtles found in northern states (*i.e.*, Connecticut, Delaware, Maryland, Massachusetts, New Jersey, New York, and Pennsylvania). This designation bans the collection and interstate and international commercial trade of the bog turtle from the southern population, but has no effect on land management activities by private landowners within the southern population range. FWS *(continued ...)*

and (2) the endangered Schweinitz's sunflower, Carolina heelsplitter (a freshwater mussel), and shortnose and Atlantic sturgeon. No critical habitat has been designated for federally listed species within the Catawba-Wateree Project area.[89]

164. As discussed in the EIS,[90] the dwarf-flowered heartleaf, Carolina heelsplitter, wood stork, American alligator, and bog turtle occur in the Catawba-Wateree Project area, including tributaries to the project impoundments and downstream in regulated portions of the Wateree River. Commission staff concluded that continued operation of the Catawba-Wateree Project, as proposed by Duke Energy and with staff's recommended measures, would not affect the bog turtle since this species and its preferred habitat are not known to occur within the project boundary or within the project's zone of operational influence.[91] Staff also concluded that continued operation of the project, as proposed by Duke Energy and with staff's recommended measures, is not likely to adversely affect the dwarf-flowered heartleaf, wood stork, American alligator, and Carolina heelsplitter,[92] because the proposed minimum flows, species protection plans, DO enhancement measures, and protective buffers/conservation easements would improve the species' habitat.[93] FWS concurred with staff's findings by letter filed May 27, 2009. Condition 1 of the South Carolina certification included in Appendix B of this order requires Duke Energy to implement its proposed species protection plans for these five species.

165. The Schweinitz's sunflower, shortnose sturgeon, and Atlantic sturgeon, which required formal consultation, are discussed below.

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also considers the southern population of the bog turtle as a federal species of concern due to habitat loss.

[89] *See* EIS at 6.

[90] *See* EIS at 212-14 and 216-17.

[91] *See* EIS at 224-25.

[92] During its 2004 relicensing surveys, Duke Energy found two Carolina heelsplitter mussels near the Wylie Development in Waxhaw Creek, a tributary of the Catawba River, but 1.5 miles upstream of the project's zone of influence and well outside of the project boundary. While there is no species protection plan specifically for the Carolina heelsplitter, this species will benefit from the minimum flows and water quality enhancements required by this license, as well as Duke Energy's implementation of the freshwater mussel protection plan discussed later in this order.

[93] *See* EIS at 219-20 and 223-24.

A. Schweinitz's Sunflower

166. One of the largest known populations of the Schweinitz's sunflower occurs in the spillway channel of the Mountain Island bypassed reach within the project boundary. In the draft EIS,[94] Commission staff determined that continued project operation would likely adversely affect the Schweinitz's sunflower due to scouring and inundation of the existing population downstream from the dam. Staff requested initiation of formal consultation with FWS on March 23, 2009. Staff also reiterated is findings in the final EIS.[95]

167. On August 12, 2009, FWS filed its BO for the Schweinitz's sunflower at the Catawba-Wateree Project. FWS concluded that the proposed action is not likely to jeopardize the continued existence of the species.[96] The BO includes an incidental take statement, but no Reasonable and Prudent Measures (RPM) or associated terms and conditions. The BO does, however, include three recommended conservation measures to protect and promote the recovery of the species.[97] The measures would require Duke Energy to develop, in consultation with FWS: (1) a detailed map and description of the Schweinitz's sunflower populations within the project boundary and its right-of-ways[98] prior to conducting any ground-disturbing activities; (2) a comprehensive management plan for the species on project land and within its right-of-ways that includes monitoring, as well as management and protection measures to address any project effects; and (3) a species propagation plan.[99]

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[94] *See* draft EIS at 208.

[95] *See* EIS at 218-19.

[96] *See* BO at 14.

[97] Conservation measures are discretionary recommendations. The regulations implementing the ESA define conservation recommendations as "suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information." *See* 50 C.F.R. § 402.02 (2014).

[98] Commission staff assumes that FWS's reference to right-of-ways refers to Duke Energy-owned, non-project land.

[99] The plan would include provisions to evaluate methods of enhancing existing populations and potentially restoring a priority prairie site through seed collection and propagation, translocation, or a combination of the two.

168. Duke Energy's proposed Schweinitz's sunflower protection plan is consistent with FWS's conservation recommendations with regard to mapping, describing, and monitoring the existing population of the species and implementing protection measures for populations within the project boundary. However, Duke Energy's proposed species protection plan does not include FWS's conservation recommendation to map and protect all known Schweinitz's sunflower populations on Duke Energy-owned, non-project land. Managing populations of the Schweinitz's sunflower on lands that are not influenced by the project or otherwise not needed for project purposes is beyond the scope of this license. Therefore, this license does not require FWS's conservation recommendation for Duke Energy to manage and protect populations of the Schweinitz's sunflower on Duke Energy-owned, non-project lands.

169. The license also does not require Duke Energy to implement FWS's conservation recommendation to implement a propagation plan for the Schweinitz's sunflower. As noted by Duke Energy, the North Carolina Botanical Garden (Botanical Garden) is researching and collecting seeds from all the Schweinitz's sunflower populations in North Carolina.[100] Such efforts may aid in the recovery of the Schweinitz's sunflower in the Catawba River Basin. However, the Botanical Garden is best equipped to conserve the genetic material of rare plants, as well as implement a propagation and restoration program for the species in the basin and elsewhere in North and South Carolina. Because this effort is a state-wide research initiative that does not necessarily address a project-specific effect, there is no demonstrated need for a license condition requiring Duke Energy to implement a Schweinitz's sunflower propagation program at the project. Nonetheless, Duke Energy is free to support this effort off license.

170. Condition 1 of the South Carolina certification included in Appendix B of this order requires Duke Energy to implement its species protection plan for Schweinitz's sunflower.

B. Shortnose and Atlantic Sturgeon

171. Shortnose sturgeon use portions of the Santee-Cooper River system,[101] though no established population exists in the Wateree River downstream from the project.[102] The

[100] *See* Schweinitz's Sunflower Protection Plan, Book 3, Appendix B of the License Application.

[101] The Wateree River joins the Congaree River to form the Santee River, which travels southeast a short distance before flowing into Lake Marion, which is part of the Santee-Cooper Hydroelectric Project No. 199 complex, and ultimately to the Atlantic Ocean.

[102] *See* EIS at 221.

draft EIS[103] found that, with Commission staff's recommended measures, relicensing the Catawba-Wateree Project would not be likely to adversely affect the shortnose sturgeon. Staff requested NMFS'S concurrence with this finding on March 23, 2009. Staff reiterated this finding in the final EIS.[104]

172. On September 8, 2009, NMFS advised Commission staff that it did not concur with staff's finding in the EIS. NMFS indicated that the record was incomplete and requested additional information, which staff provided on October 2, 2009. Staff subsequently met with NMFS, Duke Energy, and others[105] on May 24, 2011, to discuss the status of, and what was needed to complete, consultation for shortnose sturgeon. Based on the discussions and information presented at the meeting, NMFS indicated that, with Duke Energy filing a species protection plan, NMFS would have the information it needed to issue a BO for the Catawba-Wateree Project.[106] Duke Energy filed a species protection plan for shortnose and Atlantic sturgeon (Sturgeon Protection Plan) on August 24, 2011.

173. On February 6, 2012, NMFS listed the Atlantic sturgeon as endangered under the ESA,[107] including the Carolina Distinct Population Segment (DPS) that inhabits the Santee-Cooper River system, including the Wateree River. This listing became effective April 6, 2012. Because the Catawba-Wateree Project would potentially affect Atlantic sturgeon in a similar way as the shortnose sturgeon, Commission staff determined that relicensing the project would be likely to adversely affect the Atlantic sturgeon and its habitat. Staff requested formal consultation with NMFS on March 5, 2012.

174. On July 8, 2013, NMFS filed its BO for the Catawba-Wateree Project, which concluded that the proposed action is not likely to jeopardize the continued existence of shortnose sturgeon or the Carolina DPS of Atlantic sturgeon. The BO includes an incidental take statement with four RPMs to minimize take of shortnose and Atlantic sturgeon, along with 12 terms and conditions to implement the measures. The RPMs are

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[103] The draft EIS served as Commission staff's Biological Assessment. *See* draft EIS at 6 and 210-12.

[104] *See* EIS at 223.

[105] The others included personnel from FWS, South Carolina DNR, the South Carolina Public Service Authority, South Carolina Electric & Gas, the Southern Environmental Law Center, and American Rivers.

[106] *See* ESA Meeting Summary filed by Commission staff on June 28, 2001.

[107] 77 Fed. Reg. 5880 and 5914.

to minimize the incidental take of shortnose and Atlantic sturgeon from: (1) constructing fish passage for anadromous fish at Wateree Dam or other in-water work in the Action Area;[108] (2) handling of sturgeon during daily fish passage operation and sturgeon monitoring efforts for the term of license; and (3) poor water quality.

175. The terms and conditions require Duke Energy to: (1) limit in-water construction work associated with fish passage construction or maintenance activities within 500 yards of Wateree Dam to May 1 through January 31, except for dam safety and other emergency work; (2) design upstream fish passage facilities to exclude sturgeon; (3) allow NMFS access to fish passage records and facilities; (4) prepare and submit to NMFS an annual operation and inspection report on the upstream fish passage facilities; (5) handle sturgeon in accordance with NMFS'S handling protocol;[109] (6) collect tissue samples from captured and released sturgeon; (7) scan captured sturgeon for a PIT tag;[110] (8) notify NMFS of any sturgeon take; (9) should lethal take occur, freeze the carcass and contact NMFS for shipping instructions; (10) monitor flows in the Action Area; (11) quantify and map available spawning habitat under the new flow regime in the Action Area; and (12) monitor water quality in the Action Area and identify monitoring locations in consultation with South Carolina DHEC and USGS. The terms and conditions of the BO are attached as Appendix D and made requirements of the license by Ordering Paragraph G.

176. As noted above, Duke Energy filed a species protection plan for sturgeon in the Wateree River, which Condition 1 of South Carolina's certification requires Duke Energy to implement. This proposed plan is discussed below.

1. Duke Energy's Proposed Sturgeon Protection Plan

177. Duke Energy's Sturgeon Protection Plan describes: (1) the status of the species and critical habitat within the Action Area; (2) the proposed action;[111] (3) potential

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[108] The Action Area in the BO is defined as the 77 miles of the Wateree River from Wateree Dam downstream to the river's confluence with the Congaree River. *See* NMFS'S BO at 9.

[109] *See* BO, Attachment A. Kahn, J. and M. Mohead. 2010. A protocol for use of shortnose, Atlantic, Gulf, and green sturgeons. *In* NOAA technical memorandum NMFS-OPR-45. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Silver Spring, Maryland. 62 p.

[110] PIT tags are Passive Integrated Transponder tags that are used to track the movements of individual organisms of a species.

[111] The proposed action, as described in the Sturgeon Protection Plan, includes *(continued ...)*

effects of the proposed action on the species/habitat; and (4) additional measures that include (a) partially funding the Santee River Accord's sturgeon monitoring program, (b) providing the sturgeon monitoring data to NMFS, (c) consulting with NMFS on the design of the fish passage facilities at Wateree Dam, and (d) implementing a sturgeon handling protocol. In its present form, however, the plan does not address most aspects of the BO's terms and conditions. Nor does the plan provide for filing reports of the species and habitat monitoring with the Commission. Therefore, Article 403 requires Duke Energy to revise the Sturgeon Protection Plan to describe, in detail, how it will implement the terms and conditions of the BO, as well as include a provision to file monitoring reports with the Commission.

2. Biological Opinion Conservation Recommendations

178. In addition to the incidental take conditions, NMFS recommends five conservation measures to help protect, and promote the recovery of, shortnose and Atlantic sturgeon.[112] These measures would require Duke Energy to: (1) construct upstream and downstream fish passage facilities for all anadromous species at the 11 dams that comprise the Catawba-Wateree Project; (2) support future monitoring to identify migration patterns of shortnose and Atlantic sturgeon within the Santee-Cooper system, including evaluating the relationship between stream flow and sturgeon movement; (3) support future monitoring to facilitate population estimates for shortnose and Atlantic sturgeon in waters downstream from Wateree Dam; and (4) quantify the amount of sturgeon spawning habitat and rearing habitat that exists between Wateree Dam and Lake Wylie.

179. The license does not require fish passage for all anadromous species at all project dams. The anadromous species of concern at the project include American shad, blueback herring, as well as shortnose and Atlantic sturgeon.[113] FWS's section 18 fishway prescription and this license require passage for shad and herring at Wateree Dam. As to sturgeon, no Atlantic sturgeon have been observed in the Wateree River in recent history, and, thus, we have no basis to require passage for this species at this time.

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anticipated minimum flows downstream from Wateree Dam and drought management measures, DO enhancements at Wateree Dam and monitoring in the Wateree River, the protection measures outlined in section 11.2.6 of the Agreement (*see* Agreement at 11-3), sturgeon monitoring as outlined in the Santee River Accord, and future flow management and fish passage opportunities at the project, as necessary.

[112] *See* n. 97, *supra*.

[113] *See* Santee River Accord at 6.

While shortnose sturgeon are known to ascend and use habitat in the Wateree River,[114] requiring passage for this species at this time would conflict with the terms and conditions of NMFS'S BO, which stipulates that fish passage structures at Wateree Dam are to be designed to exclude sturgeon.[115] Moreover, requiring passage of shortnose sturgeon would conflict with FWS's mandatory section 18 fishway prescription, which prohibits upstream passage of shortnose sturgeon at Wateree Dam. Article 402 will allow the Commission to reopen the license to include fish passage facilities that FWS or NMFS later prescribe for sturgeon.

180. The license also does not require Duke Energy to (a) support monitoring of sturgeon movement in the Santee-Cooper system, or (b) support monitoring designed to establish population estimates for sturgeon in the Santee-Cooper River system. While such efforts may lead to information that would support general sturgeon recovery efforts in the Santee-Cooper system, these measures would not address a project. Nonetheless, Duke Energy is free to continue to work with NMFS, FWS, and South Carolina DNR to implement the conservation recommendations off license through its participation in the Santee River Accord.[116]

181. Finally, the license does not require Duke Energy to quantify sturgeon spawning and rearing habitat from Wateree Dam to Lake Wylie. NMFS states in the BO that sturgeon have a tendency to migrate as far upstream as possible to spawn.[117] However, NMFS provides no historical accounts or other direct observations to support the notion that sturgeon would have used habitat on the Wateree River as far upstream as Wylie Dam. Regardless, sturgeon will not be passed at Wateree Dam for the foreseeable future, so it is premature to require Duke Energy to assess the quality and quantity of sturgeon spawning and rearing habitat between Wateree Dam and Wylie Dam.

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[114] *See* BO at 32 and 56-9.

[115] The BO does not require passage at Wateree Dam because: (1) the limited number of individuals using the Wateree River; (2) the expected improvement in habitat conditions downstream from Wateree Dam; and (3) the lack of proven technologies to pass sturgeon on the East Coast. See BO at 66-68.

[116] On July 28, 2011, the Santee River Accord members, including Duke Energy, approved South Carolina DNR's proposed Sturgeon Monitoring Program – Work Plan for 2011-2016 (*see* Appendix B of Duke Energy's August 24, 2011 Sturgeon Protection Plan). South Carolina DNR's program addresses NMFS'S conservation measures for sturgeon monitoring. As outlined in section 5 of the sturgeon protection plan, Duke Energy is partially funding the monitoring program.

[117] *See* BO at 60.

NATIONAL HISTORIC PRESERVATION ACT

182. Under section 106 of the National Historic Preservation Act (NHPA)[118] and its implementing regulations,[119] federal agencies must take into account the effect of any proposed undertaking on properties listed or eligible for listing in the National Register of Historic Places (defined as historic properties) and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking. This process generally requires the Commission to consult with the State Historic Preservation Officer (SHPO) to determine whether and how a proposed action may affect historic properties, and to seek ways to avoid or minimize any adverse effects.

183. To satisfy these responsibilities, the Commission executed a Programmatic Agreement (PA) with the North Carolina SHPO and the South Carolina SHPO, and invited Duke Energy, the Catawba Indian Nation, and the Eastern Band of Cherokee Indians to concur with the stipulations of the PA. Duke Energy and the Catawba Indian Nation concurred. The PA requires the licensee to implement the HPMP filed on August 29, 2006, for the term of any new license issued for the project. Execution of the PA demonstrates the Commission's compliance with section 106 of the NHPA. Article 410 requires Duke Energy to implement the PA and HPMP.

RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES PURSUANT TO SECTION 10(J) OF THE FPA

184. Section 10(j)(1) of the FPA[120] requires the Commission, when issuing a license, to include conditions based on recommendations submitted by federal and state fish and wildlife agencies pursuant to the Fish and Wildlife Coordination Act,[121] to "adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)" affected by the project.

185. In response to the April 7, 2008, public notice that the project was ready for environmental analysis, Interior (on behalf of FWS), NMFS, North Carolina WRC, and South Carolina DNR filed a total of 24 recommendations under section 10(j).[122] Fifteen

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[118] 54 U.S.C. § 306108. Pub. L. 113-287, 128 Stat. 3188 (2014). (The National Historic Preservation Act was recodified in Title 54 in December 2014).

[119] 36 C.F.R. Part 800 (2014).

[120] 16 U.S.C. § 803(j)(1) (2012).

[121] 16 U.S.C. §§ 661 *et seq*. (2012).

[122] Interior filed 17 recommendations on June 4, 2008, amended on July 17, 2008; *(continued ...)*

recommendations were determined to be outside the scope of section 10(j) and are discussed in the next section. The license includes conditions consistent with the remaining nine recommendations that are within the scope of section 10(j), including: (1) Interior's and NMFS'Ss recommendations for a Low Inflow Protocol (Condition 8 of Appendix A and Condition 1 of Appendix B); (2) NMFS'S recommendation for a Flow and Water Quality Implementation Plan (Condition 8 of Appendix A and Condition 1 of Appendix B); (3) Interior's and NMFS'S recommendations for minimum instream flows (Condition 8 of Appendix A and Condition 1 of Appendix B);[123] (4) Interior's and NMFS'Ss recommendations to implement the Lake Wateree Spring Stable Flow Program (Condition 8 of Appendix A and Condition 1 of Appendix B); (5) FWS's recommendation to implement the Wylie High Inflow Protocol (Condition 8 of Appendix A and Condition 1 of Appendix B); and (6) protection measures consistent with FWS's recommendation that Duke Energy develop bald eagle management guidelines for inclusion in a bald eagle protection plan (Article 404).

SECTION 10(a)(1) OF THE FPA

186. Section 10(a)(1) of the FPA[124] requires that any project for which the Commission issues a license be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce; for the improvement and utilization of waterpower development; for the adequate protection, mitigation, and enhancement of fish and wildlife; and for other beneficial public uses, including irrigation, flood control, water supply, recreation, and other purposes.

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and NMFS filed seven recommendations on June 6, 2008. North Carolina WRC and South Carolina DNR filed comment letters on June 5 and June 18, 2008, respectively, supporting the measures included in the Agreement as protective of their fish and wildlife interests, but did not provide recommendations pursuant to section 10(j) of the FPA.

[123] As part of the flow recommendations, the agencies recommend the new license include a provision to reevaluate and implement modified minimum flows downstream from the Wylie, Great Falls-Dearborn, and Wateree Developments once fish passage is established at Wateree Dam. This measure is not within the scope of section 10(j), as it is a recommendation for a future, conditional measure. Therefore, it is discussed under section 10(a) of the FPA.

[124] 16 U.S.C. § 803(a)(1) (2012).

A. FWS's and NMFS's Recommendations

1. Drought Management Advisory Group

187. The Agreement includes a provision for Duke Energy to establish a Drought Management Advisory Group (Advisory Group) to periodically evaluate and revise the LIP. FWS and NMFS recommend that formation of the Advisory Group be included as a condition of the license, and NMFS requests that it be included as a member of the group. In the EIS,[125] Commission staff concluded that the formation of the group would be beneficial and inclusion of FWS and NMFS on the Advisory Group would ensure that federal interests are represented in drought planning and response activities, and in revising the LIP. Both the North Carolina and South Carolina certifications included in Appendices A and B of this order, respectively, require the Low Inflow Protocol Article (A-3.0) included in Appendix E of this license, which requires Duke Energy to invite FWS and NMFS to be members of the Advisory Group.

2. Maintenance and Emergency Protocol Consultation

188. FWS and NMFS recommend that the MEP be included as a license requirement. NMFS requests that it be added to the list of agencies consulted during the process of modifying the MEP. In the EIS,[126] Commission staff determined that the MEP would be beneficial because it would establish an approach for handling maintenance and emergency situations and communicating appropriate information to all potentially affected stakeholders. In addition, staff recommended that NMFS be consulted in modifying the MEP to ensure adequate federal representation in protecting aquatic resources.[127] Both the North Carolina and South Carolina certifications included in Appendices A and B of this order, respectively, require the Maintenance and Emergency Protocol Article (A-4.0) included in Appendix E of this license, which requires that Duke Energy consult with NMFS in reviewing and modifying the MEP

3. Future Minimum Flows

189. Interior and NMFS recommend that the license include a provision that Duke Energy re-evaluate and implement revised instream flows in the Wylie Regulated River Reach, the Great Falls Long Bypassed Reach, and the Wateree Regulated River Reach if

[125] *See* EIS at 465 and 467.

[126] *See* EIS at 121-22.

[127] *See* EIS at 467.

future prescriptions for fish passage are issued. In the EIS,[128] Commission staff did not recommend this provision, concluding that the license's standard reopener provision would be a sufficient means for adjusting project flows in the future if needed. Neither agency objected to this approach. Because future fish passage flow needs cannot be predicted at this time, this license does not include fish passage flow requirements.

4. Catawba-Wateree Project Fisheries Technical Committee

190. NMFS recommends that Duke Energy establish a Fisheries Technical Committee comprised of representatives of NMFS, FWS, North Carolina DENR, North Carolina WRC, South Carolina DNR, South Carolina DHEC, Duke Energy, and non-governmental conservation organizations. The committee would review: (1) plans for resource monitoring and evaluation studies; (2) project operation plans; and (3) maintenance issues with the Catawba-Wateree Project. Because Duke Energy will be required to consult with the individual agencies that will be part of the committee in implementing many of its proposed environmental measures, there is no need to form the committee. For this reason, the license does not require establishment of the committee. Duke Energy, however, is free to pursue establishment of the Fisheries Technical Committee off license.

5. Wateree Floodplain Inundation

191. The FWS recommends that the Wateree Floodplain Inundation provisions described in section 4.9 of the Agreement be made a requirement of the license. Under these provisions, Duke Energy would develop a plan, in consultation with FWS and NPS, that describes: (1) when to initiate the Agreement's Wateree River floodplain inundation provisions; (2) how the project would be operated to provide prolonged periods of floodplain inundation; and (3) how compliance with the plan will be documented.

192. As explained in the water quality certification section of this order, Appendix A of the license requires Duke Energy to implement the Wateree Floodplain Inundation provisions described in section 4.9 of the Agreement.

193. On a related matter, as part of implementing the Wateree Floodplain Inundation provisions, Duke Energy must consult with FWS, NMFS, and South Carolina DNR 10 years after the Flow and Water Quality Implementation Plan modifications for the Wateree Development are completed to develop a formal Wateree Floodplain Inundation Plan that would be filed with the Commission and implemented for the remainder of the license term. In the EIS,[129] staff concluded that the 10-year assessment period would be a

[128] *See* EIS at 494.

[129] *See* EIS at 498.

reasonable approach to evaluating on-going floodplain studies and monitoring, as well as refining the protocols included in the Agreement. Article 401(d) of this license requires that any proposed changes in the Wateree floodplain Inundation procedures included in section 4.9 of the Agreement be filed with the Commission for approval.

6. Lake Wateree Flood Control Measures

194. To mitigate the project's effect on flooding on Lake Wateree, the Agreement includes a provision for Duke Energy to install a 10,000-cfs bladder dam, measuring 4 feet deep by 300- to 400-feet wide, on the Wateree Spillway. Under the Agreement, this measure would be contingent upon Duke Energy receiving a 50-year license for the project.[130]

195. FWS and some of the property owners around Lake Wateree recommend the bladder dam to mitigate the project's effect on flooding at Lake Wateree, which include: (1) flooding of roads, which restricts emergency access to certain areas; (2) damage to structures, land, and septic systems; (3) damage to docks and the interruption of recreational opportunities; and (4) shoreline erosion. Alternatively, some land owners around Lake Wateree recommend lowering the entire Wateree Dam to alleviate flooding issues on the margins of Lake Wateree rather than installing the 10,000-cfs bladder dam, while others recommend increasing the size of the bladder dam to 40,000 cfs.

196. Duke Energy's modeling over a 50-year period shows that flooding from major storm events in the watershed occurs about 5 days per year above the Lake Wateree full pond elevation of 225.5 feet, and less than 1 day every 5 years at an elevation of 228.5 feet. Under Duke Energy's proposal to replace an existing large turbine at the Wateree Development with a smaller turbine having a lower hydraulic capacity, flooding above the Lake Wateree full pond elevation of 225.5 feet would increase from 5 days to 13 days per year. The average occurrence of floods reaching an elevation above 228.5 feet would be less than 1 day per year.

197. In the EIS,[131] staff determined that adding a 10,000-cfs bladder dam would reduce flooding around Lake Wateree to up to 3 days per year above 225.5 feet. The height and duration of major flooding events would be reduced and some minor flooding events would be eliminated. Flooding above elevation 228.5 feet would remain at 1 day every 5

[130] *See* Agreement at 14-5 (Section 14.6.3.1, *Flood Management at Lake Wateree*). Duke Energy would notch a portion of the Wateree Spillway and replace it with an inflatable rubber dam that could be deflated to increase the hydraulic capacity of Wateree Dam by up to 10,000 cfs.

[131] *See* EIS at 113-114.

years. The annual cost of providing this measure would be about $2,048,728. Staff concluded that adding a 40,000-cfs bladder dam would limit flooding to those areas above 228.5 feet, which would come at an annual cost of $3,277,965. Finally, staff concluded that lowering the dam's spillway would eliminate flooding, but would adversely affect the storage inventory in Lake Wateree, aquatic habitat and recreation use of the Wateree Regulated River Reach, and recreational access to Lake Wateree. In addition, lowering the dam's spillway would reduce the development's generating capacity, as well as require upgrades to maintain access to Lake Wateree from public and private docks, piers, and boat launches.

198. A 10,000-cfs bladder dam would reduce the height and duration of major flood events around Lake Wateree and reduce some minor flood events. As Commission staff determined in the EIS, installing the 10,000-cfs bladder dam provides a reasonable level of protection from flooding at a reasonable cost, regardless of license term.[132] Therefore, this license authorizes Duke Energy to install a 10,000-cfs bladder dam at Wateree Dam and Article 301 requires Duke Energy to file the plans and specifications for installation of the bladder.

7. Invasive Species Management and Education

199. In its comments on the final EIS,[133] Duke Energy explains that the EIS discusses several approaches for managing invasive aquatic and terrestrial species at the Catawba-Wateree Project, but is not clear as to the measures Commission staff recommended for inclusion in any new license issued for the project. While Duke Energy is correct in this regard, the EIS also includes Commission staff's recommendations concerning invasive species management.[134] Those recommendations and Duke Energy's obligations under the new license, with regard to invasive species management, are described below.

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[132] The Commission does not extend a license term beyond that dictated by the extent of the new activities required simply because the parties have agreed to such a term. *See Portland General Electric Company*, 134 FERC ¶ 61,206 at P 3 (2011); and *Public Utility District No. 2 of Chelan County, Washington*, 127 FERC ¶ 61,152 at P.17 (2009).

[133] *See* Duke Energy's October 2, 2009 filing at 1-2.

[134] *See* EIS at 468-69.

Aquatic Species

200. Five aquatic invasive plant species occur at the project: hydrilla; parrot feather; Brazilian elodea; marsh dewflower; and alligator weed.[135] To control and manage these species at the project, Duke Energy voluntarily: (1) consults with North Carolina WRC, South Carolina DNR, and North Carolina State University to address important invasive species issues; (2) coordinates with Hickory and Longview, North Carolina, North Carolina DENR, and North Carolina WRC to manage parrot feather; (3) stocks sterile grass carp in Lake James, Lake Norman, Lake Hickory, and Mountain Island Lake; and (4) distributes educational literature with lake use permits and at information kiosks at project access areas.[136] Under the Agreement, but off license, Duke Energy would continue to implement these measures. Interior recommends that Duke Energy includes the materials and signs associated with the "Stop Aquatic Hitchhikers" program in its efforts to control these species.

201. In the EIS,[137] Commission staff recommended that Duke Energy continue to implement its existing aquatic invasive species management measures at the project. In addition, staff supported Interior's recommendation to expand the educational program to include "Stop Aquatic Hitchhikers!" signage at project boat ramps to provide residents and visitors specific: (1) procedures for cleaning boats and other aquatic recreational vehicles; and (2) guidelines to prevent the spread of aquatic invasive species from one water body to another. Therefore, Article 405 requires Duke Energy to install "Stop Aquatic Hitchhikers!" signage at the project boat ramps.

Terrestrial Species

202. Six terrestrial invasive plant species occur at the project, including: autumn olive; Chinese privet; Chinese wisteria; Japanese honeysuckle; Vietnamese grass; and kudzu.[138] Duke Energy has no specific management policy or plan to control these species at the project, but does include vegetation management requirements in its Shoreline Management Guidelines.[139] Duke Energy also controls vegetation as part of routine

[135] *See* EIS at 187-88.

[136] *See* EIS at 205-07.

[137] *See* EIS at 468.

[138] *See* EIS at 187.

[139] Under the Shoreline Management Guidelines, adjacent property owners are allowed to selectively manage invasive terrestrial plants or poisonous plants with written concurrence from Duke Energy.

maintenance at each project development.[140] Interior recommends that Duke Energy implement invasive terrestrial and riparian vegetation management measures as part of the species protection plans for special status species.

203. In the EIS,[141] Commission staff recommended that the species protection plans for the Schweinitz's sunflower, dwarf-flowered heartleaf, and rocky shoals spider lily be implemented pursuant to the Agreement, and include provisions for managing invasive plant species that threaten the populations of the special status species. The species protection plans required by the South Carolina certification for federally listed species (*see* Threatened and Endangered Species Protection Plans article in Appendix E of this order), and Article 405, for state listed and other rare species, include such provisions. Therefore, no further measures to control the spread of terrestrial invasive plant species at the project are needed at this time. All of the species protection plans include consultation and reporting requirements that will allow Duke Energy and the resource agencies to address invasive species issues.

8. Bald Eagle Monitoring

204. Bald eagles nest in the project area and use the project tailrace areas and open water of the reservoirs for foraging.[142] Given that there are persistent reports of bald eagles throughout the project area and the population is increasing, Interior recommends that Duke Energy provide an annual bald eagle monitoring report to the Commission, FWS, North Carolina WRC, and South Carolina DNR. The report would include the methodology for monitoring bald eagles and nest trees, transient bald eagle occurrences, and the location of resident or nesting bald eagles within the project boundary. Duke Energy's bald eagle protection plan provides for collection of data on the species status, new nest sites, and recruitment estimates in the project area every 3 years, beginning 5 years after license issuance. Information from these surveys would be shared with FWS, North Carolina WRC, and South Carolina DNR.

205. In the EIS,[143] Commission staff found that implementing Duke Energy's plan would result in continued protection and potential enhancement of the bald eagle

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[140] Routine vegetation maintenance activities at each development (*i.e.*, access areas, dams, powerhouses, and transmission right-of-ways) include mowing and spraying of herbicides.

[141] *See* EIS at 469.

[142] *See* EIS at 201.

[143] *See* EIS at 203.

population, but that annual bald eagle surveys conducted during the winter would provide the most current data on bald eagle nesting, fledging success, and transient use of the project area. Therefore, staff recommended adopting Duke Energy's proposed species protection plan for the bald eagle,[144] with Interior's recommended interval for monitoring and reporting.[145] Article 404 of this license requires Duke Energy to implement its species protection plan for the bald eagle, including annually consulting with FWS, North Carolina WRC, and South Carolina DNR to review the species' status at the project.

9. Land Conservation

206. Interior recommends three land conservation measures at the project, which would require Duke Energy to: (1) develop a comprehensive plan to conserve and protect project land, including fish and wildlife habitat, in the project area, as well as lands and waters within the Congaree National Park, in concert with federal and state resource agencies, the Catawba Indian Nation, local communities, and non-profit organizations; (2) reacquire and restore contiguous shoreline segments for those reservoirs where shoreline development has exceeded 50 percent, and for areas where this is not possible, protect key tracts along project-regulated river reaches; and (3) expand the project boundary to include a 50-foot-wide vegetated buffer to protect riparian resources. In the EIS,[146] Commission staff did not recommend these measures because there is no evidence in the record that additional measures, beyond the land conservation provisions of the Agreement,[147] are needed to protect resources affected by the Catawba-Wateree Project. In addition, staff found the measures to be cost-prohibitive and impractical. Therefore, this license does not include the measures.

207. Interior also recommends that the project's SMP be revised to require Duke Energy or its lessees to: (1) plant native vegetation and install fish-friendly pier features under docks; and (2) minimize or avoid any effects to shoreline vegetation or near-shore habitats. In the EIS,[148] Commission staff did not recommend these measures because the SMP, already encourages landowners to plant native vegetation and install fish-friendly pier features under docks. In addition, the SMP includes provisions that minimize or

[144] *See* EIS at 463.

[145] *See* EIS at 496.

[146] *See* EIS at 370 and 481-82.

[147] *See* Agreement at 4-1 through 4-3 (sections 4.5, 4.6, and 4.7) and 14-2 through 14-5 (sections 14.5 and 14.6).

[148] *See* EIS at 479.

avoid effects to shoreline vegetation or near-shore habitats. For example, under the SMP, shorelines with significant wetland areas are protected from development. Given that Interior's recommendations are essentially accommodated by Duke Energy's shoreline management policies, this license does not require changes to the SMP for such purposes.

B. Water Quality Standards for Trout Waters

208. EPA states that its main concern related to relicensing the Catawba-Wateree Project is the water quality of releases from project dams, particularly those of the Bridgewater Development (*i.e.*, below Linville Dam).[149] EPA clarifies that the trout standard for DO applies at a distance of less than 1 mile downstream from the Bridgewater Powerhouse.[150] In addition, EPA notes that North Carolina's new trout standards were not evaluated by North Carolina DWQ in its review of Duke Energy's certification application. EPA asserts that these new standards need to be considered now. Finally, EPA argues that the license application, Agreement, and North Carolina DWQ's certification do not include guidelines for implementing required DO enhancement measures to meet North Carolina's DO standard. Therefore, EPA recommends that Duke Energy: (1) meet applicable water quality standards, including protecting designated trout uses 0.6 mile upstream of Muddy Creek's confluence with the Catawba River; and (2) maintain DO levels of not less than 6.0 mg/L at all times in the designated trout waters.

209. Condition 5 of North Carolina DWQ's certification, which is included as Appendix A and made a part of the license by Ordering Paragraph (D), requires Duke Energy to operate the Catawba-Wateree Project in a manner consistent with state water quality standards, which include designated uses for trout downstream from the Bridgewater Powerhouse. Should such standards not be met (including failure to sustain a designated use), Condition 5 provides that North Carolina DWQ may reevaluate and modify the certification to include conditions necessary to assure compliance with water quality standards. Moreover, Conditions 8.f and 8.h (A-5.0 – Water Quality Article) require Duke Energy to develop and implement a water quality monitoring plan, which is to include the locations of devices installed to monitoring water quality. This plan will be developed in consultation with state and federal resources agencies, including EPA. Therefore, no additional measures are needed at this time.

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[149] *See* EPA's August 31, 2009 letter at 2-3.

[150] The EIS states that the trout standard for DO (*i.e.*, 6.0 mg/L) does not apply until approximately 1 mile downstream from the Bridgewater Powerhouse. However, EPA states that the trout standard for DO applies at a point 0.6 mile upstream of the confluence of Muddy Creek and the Catawba River, which EPA says is about 1 mile downstream from the Bridgewater Powerhouse.

C. Species Protection Plans

210. A number of state-protected species, including American eel, flat bullhead, snail bullhead, robust redhorse, freshwater mussels,[151] rocky shoals spider lily, bald eagle, little blue heron (rookeries), and Rafinesque's big-eared bat occur in the Catawba-Wateree Project area, including tributaries to the project reservoirs and in regulated portions of the Wateree River.[152] Under section 11.3 of the Agreement, Duke Energy will file its proposed protection plans for state RTE species with North Carolina WRC and South Carolina DNR, as appropriate, and implement management activities and other protection measures for each species.[153]

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[151] There are seven species of freshwater mussel listed as species of concern by North Carolina and South Carolina, including the creeper, eastern floater, paper pondshell, eastern creekshell, notched rainbow, brook floater, and rayed pink-mucket.

[152] *See* EIS at 152-54, 188, and 192-93.

[153] Under the Agreement, Duke Energy will: (1) monitor efforts to list the American eel and cooperate with FWS and NMFS on eel conservation initiatives; (2) continue to partner with the Robust Redhorse Conservation Committee regarding the management and protection of the species in the project area; (3) monitor freshwater mussels at selected locations influenced by hydro operations at 3-year intervals for the duration of the license, beginning within 5 years of license issuance; (4) enhance habitat suitability for the rocky shoals spider lily in the Great Falls Long Bypassed Reach and the Wylie Regulated River Reach near Landsford Canal State Park with proposed flow releases, monitor the spider lily population at Landsford Canal State Park, and partner with FWS to restore and monitor spider lily in the Great Falls Long Bypassed Reach; (5) collect and share (with FWS and the state resource agencies) information regarding bald eagle nest sites within and adjoining the project boundary, develop the species protection plan in accordance with FWS's Bald Eagle Habitat Management Guidelines, and place a conservation easement on a 25-acre tract of licensee-owned land on the east side of the Wateree tailrace; (6) collect and share (with FWS and the state resource agencies) information regarding heron rookeries within and adjoining the project boundary from Lake James downstream to the confluence of the Wateree River with the Congaree River and continue to manage and protect colonial wading bird rookeries and nesting areas within the project boundary; and (7) install artificial roost structures for the Rafinesque's big-eared bat and other bat species at appropriate locations within 2 years of license issuance, discourage removal of large hollow trees from within the project boundary and adjacent licensee-owned land, and conduct a 2-year bat survey within 5 years of license issuance, with an annual survey at 3-year intervals thereafter for the duration of the license at the Bridgewater and Wateree Developments.

211. In the EIS,[154] Commission staff found that continued project operation, as proposed by Duke Energy with staff's recommended measures, including implementing Duke Energy's proposed protection plans for state RTE species, DO enhancement measures, and protective buffers/conservation easements would improve the species and their habitat. Staff recommended that the species protection plans, as proposed by Duke Energy, be implemented. Therefore, Article 404 requires Duke Energy to implement its proposed protection plans for the state RTE species listed above, with the additional requirement that they file documentation of the annual reviews specified by the plans.

D. Public Information on Flow and Reservoir Levels

212. Duke Energy proposes to post reservoir levels and flow release schedules for each project reservoir, and provide that information to the public through a link on the company's website and toll-free telephone number. In the EIS,[155] Commission staff concluded that this measure would ensure that adjacent landowners and recreation users have readily accessible information about project operation, which would enhance recreation opportunities. Article 406 requires Duke Energy to provide this information.

E. Recreation Facilities

1. Recreation Management Plan

a. Facility Enhancement Measures

213. To enhance 58 existing and 23 new project recreation sites, Duke Energy proposes to develop and implement an RMP that includes: (1) a description of proposed recreation enhancement measures for both existing and new project recreation sites; (2) maps showing all existing and new project recreation sites, and any required modifications to the project boundary to enclose the project recreation amenities; (3) facility construction schedules and descriptions of how the facilities would be constructed, operated, and maintained; (4) a discussion of procedures for temporary closure of recreation sites; (5) a discussion of how the needs of the disabled were considered in the planning and design of recreation facilities; (6) a discussion of how low impact development strategies were considered in the planning and design of the recreation facilities; (7) a description of Duke Energy's recreation signage program; and (8) biennial reporting, for 20 years

[154] *See* EIS at 469.

[155] *See* EIS at 477-78.

following Commission approval of the RMP, of the progress in implementing the measures included in the plan.[156]

214. As discussed in the EIS,[157] the proposed enhancement measures for the existing and new project recreation sites would alleviate overcrowding at existing recreation sites, help address future recreation needs, and provide additional recreation amenities for different user types, including whitewater boaters. The most significant measures at the recreation sites include provisions for: (1) installing fishing piers at 13 sites; (2) constructing canoe/kayak launches at 16 sites; (3) installing or improving picnic facilities at 21 sites; (4) constructing or improving portage trails at eight sites; (5) installing restrooms at 28 sites; (6) developing swimming areas at 10 sites; and (7) constructing, expanding, or improving parking at 33 sites.[158]

215. These measures will enhance recreational opportunities at the project. However, some of Duke Energy's proposed measures lack specificity. In particular, the Agreement does not contain provisions for the continued operation and maintenance of Duke Energy's existing project recreation sites particularly where no improvements are proposed. Therefore, Article 407 requires Duke Energy to continue operating and maintaining its existing project recreation sites as part of the RMP.

216. The Agreement includes a provision for Duke Energy to relocate the existing Cane Creek Access Area to the new 18-acre Springs Park Access Area at the Fishing Creek Development. Duke Energy, however, has implemented this measure, as well as provided new recreation amenities at the site.[159] Therefore, Article 407 does not require the construction of the Springs Park Access Area or closure of Cane Creek Access Area, as proposed under the Agreement. Rather, Article 407 includes the Springs Park Access Area as an existing project recreation site.

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[156] *See* Agreement at Appendix A, A-9.0.

[157] *See* EIS at 311-16; 470-73.

[158] *See* Agreement at Section 10.7.3.

[159] 125 FERC ¶ 62,237 (2008). On October 1, 2010, the Commission approved Duke Energy's as-built drawings for the measures required by the Commission's December 9, 2008 order. The as-built drawings show the site improvements for the Springs Park Access Area, which include parking, two boat ramps, and an information kiosk, as well as the closure of the Cane Creek Access Area.

b. Leases of Project Lands for Recreation

217. The Agreement provides that, as part of the RMP, Duke Energy will: (1) create and lease management zones[160] within the project boundary along the shorelines adjacent to four non-project state parks managed by North Carolina DENR and South Carolina DPRT;[161] and (2) lease the 37-acre Saddler Island, which is located on the Wylie Development, to the U.S. National Whitewater Center for environmental education and outdoor recreation. In the EIS,[162] Commission staff found that the lands underlying the management zones were necessary for project purposes because they lie within the normal full pool elevation of the project reservoirs and are subject to changes in water level due to project operation. Staff also found that all of the Duke Energy-owned islands within the project reservoirs and regulated river reaches are necessary for providing public recreation access and should remain available for recreation (unless otherwise designated as off-limits to protect cultural resources, species of special concern, or public safety) as required by the SMP and section 10.9 of the Agreement.[163] Therefore, the lands associated with the management zones and Saddler Island will remain within the project boundary.

218. As discussed in the EIS,[164] staff did not recommend requiring Duke Energy to lease the management zones or Saddler Island because doing so would require a contract between the licensee and a third party that the Commission would have no jurisdiction to enforce. Therefore, the license does not require Duke Energy to create or lease the Lake James State Park Management Zone, the Lake Norman State Park Management Zone, the Landsford Canal State Park Management Zone, or the Lake Wateree State Park Management Zone to North Carolina DENR and South Carolina DPRT. The license also does not require Duke Energy to lease Saddler Island to the U.S. National Whitewater Center. Rather, Duke Energy may negotiate leases of project lands to these entities

[160] In this instance, a management zone is defined as 300 horizontal feet lakeward from full pool elevation of the reservoir. *See* EIS at 480-81.

[161] The four sites are Lake James State Park (Bridgewater Development), Lake Norman State Park (Cowans Ford Development), Landsford Canal State Park (Wylie Development), and Lake Wateree State Park (Wateree Development).

[162] *See* EIS at 368.

[163] *See* EIS 491.

[164] *See* EIS at 474.

pursuant to the Commission's standard land use article, to the extent that mutually agreeable terms can be reached (Article 411).[165]

219. The Agreement also includes a provision within the RMP for Duke Energy to offer a lease of the islands associated with the Great Falls-Dearborn and Rocky Creek-Cedar Creek Development, which total over 900 acres, to South Carolina DPRT for the creation of a new state park. The new park would be centered on the National Register-eligible Dearborn Armory Site (Site 38CS307).[166] As noted above, all of the Duke Energy-owned islands within the project reservoirs and regulated river reaches are necessary for providing recreation, unless otherwise designated as off limits to protect resources or safety, consistent with the SMP and section 10.9 of the Agreement.

220. In the EIS, staff concluded that Duke Energy could lease lands associated with the Great Falls/Cedar Creek Island complex for a new state park under the standard land use article (*see* Article 411 of this license), but that the license could not require the lease because doing so would require a contract between the licensee and a third party that the Commission would have no jurisdiction to enforce.[167]

221. In addition, these lands must also be developed consistent with the RMP's definition of public day-use[168] because the state park would encompass the entirety of the islands within the Cedar Creek Reservoir, which have been designated by Duke Energy for day-use recreation. Designating this new park as a project recreation site would ensure it is maintained over the term of the license. Therefore, Article 407 requires Duke Energy to include within its RMP the plans that are developed for the new project recreation site centered on the Dearborn Armory Site. Any additional facilities provided at the site must be consistent with a Commission-approved RMP for the project.

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[165] Duke Energy comments that the Agreement only contemplates conveying a lease for that portion of the Landsford Canal State Park Management Zone that lies within the proposed project boundary, and not expanding the project boundary. *See* Duke Energy's October 2, 2009 filing at 2. This license does not require Duke Energy to lease the management zones or expand the project boundary to do so.

[166] The Dearborn Armory Site is located at the Great Falls-Dearborn Development, as described in Appendix C of the HPMP, filed with Duke Energy's final license application.

[167] *See* EIS at 481.

[168] *See* section 10.9 of the Agreement at 10-2, which defines day-use access as public recreation activities such as fishing, wading, picnicking, hiking, and hunting.

c. Wildlife Viewing Facilities

222. FWS recommends that fish and wildlife-based recreation, especially bird watching, be considered in the development of the RMP. In the EIS,[169] Commission staff recommended that Duke Energy assess the need for, and feasibility of, constructing wildlife viewing facilities within the project boundary. Article 407 requires Duke Energy to include in its RMP a provision for providing wildlife viewing facilities at select project recreation sites, if determined feasible.

d. Lake Cornelius Recreation Access

223. Lake Cornelius is a part of the Cowans Ford Development, located within the project boundary. Lake Cornelius is hydraulically linked to Lake Norman through a culvert that passes under Interstate 77. The Town of Cornelius, North Carolina recommends that Duke Energy provide public recreation opportunities, including a swimming area, fishing pier, and boat access at Lake Norman, especially public access to the shoreline of Lake Cornelius, where no public access exists.

224. Information provided by Duke Energy in its license application, and analyzed by Commission staff in the EIS,[170] indicates that there are numerous existing opportunities for developed recreation including swimming, fishing, and boating on Lake Norman. Duke Energy also proposes to develop two new swimming areas, five fishing piers, and one new boating access facility on Lake Norman over the term of a new license to address the demand for recreation facilities identified by the Town of Cornelius in its comments.

225. Duke Energy does not propose to develop recreation facilities or improve public access to Lake Cornelius. In the EIS,[171] staff concluded that project operation affects Lake Cornelius. Because no public access to Lake Cornelius exists, Duke Energy has a responsibility to ensure public access to its waters. In comments on the license application, the Town of Cornelius specifically cited the need for non-motorized (paddle sport) access on Lake Cornelius. Article 407 requires Duke Energy to include in its RMP a provision for providing informal access (without developed recreation facilities) to the Lake Cornelius portion of the Cowans Ford Development that would allow residents to access the water for paddle sports. The location of this informal access site would be developed in consultation with the Town of Cornelius.

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[169] *See* EIS at 473.

[170] *See* EIS at 246-48.

[171] *See* EIS at 314.

2. Recreation Management Plan Review and Update Procedures

226. Duke Energy proposes to review the project's recreational use and needs 20 years following Commission approval of the RMP and every 10 years, thereafter, for the term of the new license. Duke Energy proposes to conduct the review after consultation with North Carolina DENR, North Carolina WRC, South Carolina DPRT, South Carolina DNR, local governments, and interested entities. The review would include a recreation use and needs assessment, and would identify any recreation facility needs at the project recreation sites.

227. In the EIS,[172] staff recommended the plan include a review and update provision. However, 20 years post-plan approval is not an adequate timeframe for the initial review. First, Duke Energy has already implemented recreation enhancement measures that were proposed in the Agreement as new license requirements.[173] Second, Duke Energy conducted a recreation use and needs assessment for the project in 2004 as part of the relicensing process; the data is now 11 years old. This license does not modify the 20-year timeframe for completing all the recreation enhancement measures proposed in the Agreement and required by Article 407. However, for the reasons described above, and given the predicted future recreation growth of 57 percent (from 2004 to 2050)[174] as well as the potential changes in recreation use at the project that may result from the new recreation flows required by the license, the first review of the RMP must be conducted earlier. Article 407 requires Duke Energy to conduct its first review of the approved RMP 10 years following license issuance and every 10 years, thereafter, during the term of the license.

3. Great Falls-Dearborn Development Public Boating Safety

228. Duke Energy proposes to evaluate boating safety at the Great Falls-Dearborn Development, as well as determine the need for constructing boating safety devices upstream of the Great Falls Diversion Dam, Great Falls Headworks, and Great Falls-Dearborn Dam. In the EIS,[175] Commission staff recommended these measures, because review of boating safety would provide a mechanism for Duke Energy to update a Commission-approved Public Safety Plan for the Great Falls-Dearborn Development prior to the commencement of recreation flow releases or construction of recreation

[172] *See* EIS at 476.

[173] 125 FERC ¶ 62,237 (2008).

[174] *See* EIS at 268.

[175] *See* EIS at 315-16.

amenities to support recreational boating at the development. Article 408 requires Duke Energy to evaluate public boating safety at the Great Falls-Dearborn Development, and assess the need to update its Public Safety Plan, accordingly.

4. Project Boundary Modifications

229. Duke Energy proposes to modify the project boundary to enclose all lands necessary for the proposed recreation enhancement measures at existing and proposed new project recreation sites. In the EIS,[176] staff recommended that Duke Energy include all Duke Energy-owned project recreation sites within the project boundary, including any portions of existing project recreation sites that may currently lie partially outside of the project boundary. In this regard, Duke Energy clarified that since the Agreement was signed, it has acquired parcels of land for project recreation facilities.[177] As discussed below, Article 203 requires Duke Energy to file revised Exhibit G drawings enclosing, within the project boundary, all lands associated with the existing and new project recreation sites required by Article 407.

F. Shoreline Management

1. Shoreline Management Plan

230. To protect scenic, recreational, and environmental resources at the project, Duke Energy proposes to modify the project's 2003 Commission-approved SMP[178] with revised Shoreline Classification Maps (filed as Volume 5, Book 5 of the license application) and Shoreline Management Guidelines (filed as Appendix J of the Agreement). Duke Energy proposes to review and update the SMP every 10 years following license issuance.

231. In the EIS,[179] staff recommended Duke Energy's approach as a reasonable means for updating the SMP. However, at this time, the Shoreline Classification Maps and Shoreline Management Guidelines require updating. The Commission has approved a number of amendments to the SMP[180] and reclassifications of the project shorelines.[181]

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[176] *See* EIS at 482-491.

[177] *See* Duke Energy's filing of June 12, 2015.

[178] 105 FERC ¶ 62,027 (2003).

[179] *See* EIS at 478-79.

[180] *See* 126 FERC ¶ 62,121 (2009); 123 FERC ¶ 62,040 (2008); and 118 FERC ¶ 62,072 (2007).

In addition, under the 2003 SMP, Duke Energy may make minor revisions to the Shoreline Management Guidelines without Commission approval. The Commission reserved the right to review such changes and has, at times, reviewed and concurred with specific revisions to the Shoreline Management Guidelines[182] since the proposed SMP was filed. These actions indicate that the Shoreline Classification Maps and Shoreline Management Guidelines filed with the license application and Agreement no longer reflect current conditions. Therefore, Article 409 requires Duke Energy to file updates to the Shoreline Classification Maps and Shoreline Management Guidelines that reflect both Duke Energy's proposal in the license application, as well as any Commission-approved or required modifications.

232. Recent compliance actions taken by the Commission for the Catawba-Wateree Project also document a need for Duke Energy to provide greater detail for two provisions in the 2003 Commission-approved SMP into the proposed SMP. These provisions have allowed Duke Energy to make minor modifications to the SMP, Shoreline Classification Maps, and Shoreline Management Guidelines, as necessary, without prior Commission approval. However, the Commission has found discrepancies in how changes to the SMP are applied and when the Commission is notified of such changes.[183] To correct the discrepancies, Article 409 requires Duke Energy to modify the SMP to provide: (1) additional detail on its on-going practice to make modifications to the SMP, Shoreline Classification Maps, and Shoreline Management Guidelines without Commission approval; and (2) an explanation of its process for filing shoreline reclassification requests with the Commission. Article 409 also requires Duke Energy to incorporate the SMP's review and update provisions into the SMP itself, rather than as a separate license requirement.

233. Finally, the license requires Duke Energy to file GIS data regarding the project area and shoreline management classifications to provide a mechanism for tracking shoreline resources and uses, as well as facilitate future reviews. Article 409 includes the details and filing specifications for the GIS data required by the Commission.

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[181] *See* 150 FERC ¶ 62,179 (2015); 150 FERC ¶ 62,046 (2015); and 136 FERC ¶ 62,069 (2011).

[182] *See* letter from R. Fletcher, Chief, Land Resources Branch, Division of Hydropower Administration and Compliance, FERC, Washington, D.C., to E.M. Oakley, Duke Energy Carolinas, LLC, Charlotte, North Carolina, December 15, 2014.

[183] *See* letter from R. Fletcher, Chief, Land Resources Branch, Division of Hydropower Administration and Compliance, FERC, Washington, D.C., to E.M. Oakley, Duke Energy Carolinas, LLC, Charlotte, North Carolina, July 29, 2014; and 150 FERC ¶ 62,046 (2015).

2. Shoreline Classifications

234. Ms. Ellen Huffman, an adjacent landowner on Mountain Island Lake, in comments on Duke Energy's proposed Shoreline Classification Maps and associated lake use restrictions,[184] notes that she purchased waterfront property at the end of Allison Ferry Road in 2005, but that Duke Energy did not inform her that the portion of shoreline adjacent to her property would be reclassified as "Project Operations," thereby restricting private access to project waters.[185] However, in a separate filing, Ms. Huffman indicated that Duke Energy informed her of the shoreline classification in 2006. At that time, Duke Energy informed Ms. Huffman that her shoreline was classified as "Project Operations" because it fell within the downstream clear zone[186] for Cowans Ford Dam.

235. Commission staff review of the Shoreline Classification Maps filed with the 2003 plan and the license application indicate that Ms. Huffman's shoreline was classified as "Project Operations" on both maps. Duke Energy has filed with the Commission no revisions to the Shoreline Classification Maps showing modifications to the shoreline classifications for the properties located at the end of Allison Ferry Road. Classifying shorelines within the downstream clear zone for Cowans Ford Dam as "Project Operations" is appropriate to provide for public safety because operation of the Cowans Ford Development affects flow rates and water levels. Therefore, this license requires no changes to the maps or classification of this shoreline area.

236. Ms. Huffman also raises concerns about inconsistencies between her property's allowable uses and those of neighboring properties, as well as the notification procedures for adjacent landowners about SMP revisions. The Shoreline Classification Maps indicate that near Ms. Huffman's property, some shoreline parcels have classifications (Existing Residential) allowing residential access to project waters. This classification likely indicates uses that predate Duke Energy's SMP or classification of properties within the downstream clear zone as project operation. The Commission supports a

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[184] *See* July 8, July 21, and August 30, 2011 filings.

[185] This designation prohibits new or expanded residential marina, commercial marina, or residential facilities within the project boundary.

[186] Downstream clear zones include project lands and waters immediately downstream of all operating hydro stations that are potentially subject to rapid and significant variations in flow rates based on plant operations. At a minimum, downstream clear zones extend 1,000 feet downstream from the dam to the downstream edge of the hydro plant property or to a bridge crossing within 2,500 feet of the dam, whichever provides for greater distance. Downstream clear zones do not extend to areas outside of the project boundary.

licensee's ability to be restrictive in its permitting procedures for providing private access to project waters, especially in instances where private access may affect project operations or public use and safety. In this situation, we find that Duke Energy was implementing its permitting process consistent with the provisions of the Commission-approved SMP. Finally, the evidence in the relicensing record indicates that Duke Energy has met the requirements for public notification and there has been fair opportunity for public comment on the SMP.

G. Adequacy of the EIS

237. The reservoirs in the Catawba-Wateree Project are generally operated as an integrated system. This integrated system balances power, industrial, agricultural, and public water system demands, while supporting stream flows for recreation and aquatic resources over the duration of the license. To evaluate the effects of potential changes in project operation on the available water supply in the river basin, Duke Energy designed a simulation model (Computer Hydro Electric Operations and Planning Software, or CHEOPS) to assess the project's capacity to support regional water supply during extended drought periods over the next 50 years.[187]

238. The State of South Carolina, in its May 8, 2009 comments on the draft EIS and September 10, 2009 comments on the final EIS,[188] asserts that the EIS is inadequate and staff's analysis should be revised, because it relies on modeling that both ignores the significant drought period of 2007-2008 and substantially underestimates future low-flow periods. South Carolina contends that, by predicting that a serious low-flow condition (where public water supplies can become fully depleted) could occur in 4 months over the next 51 years, when it was actually experienced for 15 months (from October 2007 through January 2009), the CHEOPS model provides an overly optimistic and unrealistic forecast of the reasonably foreseeable water flows in the Catawba River Basin.[189]

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[187] Duke Energy proposed a LIP and an MEP to address periods of drought or emergency maintenance activities when the system's capacity to provide flow stability and natural hydrograph conditions may be compromised. Unlike the existing license, the proposed LIP allows Duke Energy to adjust the minimum reservoir elevations for more effective management of water storage inventory throughout the project, as low inflow or drought conditions continue to worsen.

[188] *See* State of South Carolina's Opposition to Duke Energy's Petition for Declaratory Order (referred to as "Opposition to Petition"), at 27-41, filed September 10, 2009.

[189] *See* Opposition to Petition at 27.

239. The EIS noted that although the historic flow record used for calibration and validation of the model did not include data for the 2007-2008 drought, this omission did not impair the usefulness of the model for comparative analysis of project operations because, regardless of the accuracy of the flow prediction, the relative relationship among competing uses of the water would be consistent.[190] South Carolina disagrees and insists that the Commission require Duke Energy to revise its modeling to incorporate the 2007-2008 drought of record, and correct any erroneous assumptions used in the model, including overestimating the available water supply, and revise the EIS, as appropriate, based on Duke Energy's modeling revisions.

240. The data used in developing the CHEOPS model was filed as part of Duke Energy's license application in 2006, and, therefore, predated the 2007-2008 drought. However, Duke Energy subsequently adjusted the model to more closely represent the operating parameters of drought year 2007, and filed the results of the additional modeling on July 16, 2008, and June 8, 2009, in response to staff requests for additional information. The results show that the model accurately analyzed the extreme drought event (including the most critical low-storage period in December 2007), and that no additional validation modelling is needed.[191]

241. South Carolina has not responded to Duke Energy's additional modeling and has not provided any new data or evidence to substantiate its claim that the modeling data is flawed or overestimates available water supplies. Duke Energy's revised modeling data is now part of the record, and there is no need to revise the EIS to incorporate Duke Energy's revised modeling.[192]

242. The Lake James Environmental Association and the Community of Lake James assert that the proposed LIP is inadequate for drought management in the Catawba-Wateree Basin.[193] They argue that contrary to Commission staff's response to their

[190] *See* EIS at 87.

[191] *See* Duke Energy's Comments on the EIS, filed October 2, 2009.

[192] According to the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act, a supplement to an EIS is only necessary if there have been substantial changes made to the proposed action, or if significant new information about the project becomes available. *See* 40 C.F.R. Part 1502.9(c)(1) (2014). Neither situation is applicable to the Catawba-Wateree Project. The proposed action has not changed in concept from the original proposal, and there is no significant new information about the project.

[193] *See* Lake James Environmental Association's August 28, 2009 filing and Community of Lake James' September 1, 2009 filing.

comments on the draft EIS,[194] actions downstream in the basin (*e.g.*, flow releases) affect upstream storage, in this case for Lake James, the upper most reservoir of the Catawba-Wateree Project. The Lake James Environmental Association and the Community of Lake James recommend that the useable storage in Lake Norman be expanded beyond the existing 10-foot limitation.[195]

243. As staff explained in the EIS, the critical intake constraint elevation for Lake Norman is 10 feet below the full pool elevation of 745.0 feet and the critical boat access constraint elevation for the lake is 9 feet below elevation 745.0 feet.[196] Because Duke Energy operates the Cowans Ford Development to maintain lake levels within 2 feet of the target elevation, which would be elevation 752.0 feet in March, expanding useable storage in Lake Norman does not appear to be a feasible option. Doing so would impair operations at Duke Energy's McGuire Nuclear Station. Also, using more storage in Lake Norman would unreasonably restrict boat access to the lake in times of drought. Therefore, the license does not require changes to Lake Norman's useable storage. If future implementation of the LIP indicates that increasing useable storage in the lake would improve drought management, Duke Energy may request the LIP be changed accordingly.

ADMINISTRATIVE PROVISIONS

A. Annual Charges

244. The Commission collects annual charges from licensees for administration of the FPA. Article 201 provides for the collection of such funds.

B. Exhibit A Project Description

245. Exhibit A filed with the license application does not include the project's transmission lines. Therefore, Exhibit A is not approved. Article 202 requires Duke Energy to file a revised Exhibit A that includes a description of the 10 line segments identified by Commission staff as primary transmission lines.

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[194] *See* EIS at Appendix D-13.

[195] As described earlier in this order (*see* operations discussion for the Cowans Ford Development), Lake Norman cannot be drawn down more than 15 feet below the full pool elevation of 745 ft. without impairing operations at the McGuire Nuclear Station. Thermal effects further limit the lake level to 750 ft., 10 feet below full pool.

[196] *See* Table 15 of the EIS at 91.

C. Exhibit F and G Drawings

246. The Commission requires licensees to file sets of approved project drawings in electronic file format. The Commission previously approved project drawings for the Bridgewater Development in an order approving revised Exhibit K drawings issued on September 12, 2012.[197] These Exhibit L drawings must be updated to rename the drawings using the current "Exhibit F" naming convention. Article 203 requires the filing of Exhibit F drawings for all 11 Catawba-Wateree Project developments.

247. The Exhibit G drawings filed with the license application, as well as the revised Exhibit K-1A for the Bridgewater Development approved by the Commission on September 12, 2012,[198] do not enclose and show the project's primary transmission lines and all of the licensed project recreation facilities. Therefore, the Exhibit G drawings are not approved. Article 204 requires Duke Energy to file revised Exhibit G drawings to show the primary transmission lines and all of the licensed recreation facilities enclosed within the project boundary.

D. Amortization Reserve

248. The Commission requires that for new major licenses, non-municipal licensees must set up and maintain an amortization reserve account upon license issuance. Article 205 requires the establishment of the account.

E. Headwater Benefits

249. Some projects directly benefit from headwater improvements that were constructed by other licensees, the United States, or permittees. Article 206 requires the licensee to reimburse such entities for these benefits if they were not previously assessed and reimbursed.

F. As-Built Exhibits

250. Where new construction or modifications to the project are involved, the Commission requires the licensee to file revised drawings of project features as built. Article 207 provides for the filing of these drawings.

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[197] 140 FERC ¶ 62,190.

[198] *Id.*

G. Use and Occupancy of Project Lands and Waters

251. Requiring a licensee to obtain prior Commission approval for every use of occupancy of project land would be unduly burdensome. Therefore, Article 411 allows the licensee to grant permission, without prior Commission approval, for the use and occupancy of project lands for such minor activities as landscape planting. Such uses must be consistent with the purposes of protecting and enhancing the scenic, recreational, and environmental values of the project.

H. Review of Final Plans and Specifications

252. Article 301 requires the licensee to provide the Commission's Division of Dam Safety and Inspections (D2SI) Atlanta Regional Office with final contract drawings and specifications, together with a supporting design report, consistent with the Commission's engineering guidelines. The submittal must include a temporary construction emergency action plan, a quality control and inspection program, and a soil erosion and sediment control plan.

253. Article 302 requires the licensee to provide the Commission's D2SI-Atlanta Regional Office with cofferdam and deep excavation construction drawings.

254. Article 303 requires the licensee to coordinate any modifications that would affect project works or operation resulting from environmental requirements, with the Commission's D2SI – Atlanta Regional Office.

I. Resource Plan Requirements, Notification, and Filing of Amendments

255. In Appendices A, B, and C, there are certain certification conditions and fishway prescriptions that require FWS approval with not set date for Commission approval; do not require the licensee to file a report with the Commission; require agency, but not Commission notification of emergencies and other activities; or require license amendments. Therefore, Article 401 requires the licensee to: (1) file the plans with the Commission for approval; (2) file the report with the Commission; (3) notify the Commission of emergencies and other activities; and (4) file amendment applications, as appropriate.

STATE AND FEDERAL COMPREHENSIVE PLANS

256. Section 10(a)(2) of the FPA[199] requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving,

[199] 16 U.S.C. § 803(a)(2)(A) (2012).

developing, or conserving a waterway or waterways affected by the project.[200] Under section 10(a)(2)(A) of the FPA, federal and state agencies filed 72 comprehensive plans that address various resources in North Carolina and South Carolina. Of these, the Commission staff identified and reviewed 24 comprehensive plans that are relevant to this project.[201] No conflicts were found.

APPLICANT'S PLANS AND CAPABILITIES

257. In accordance with sections 10(a)(2)(C) and 15(a) of the FPA,[202] Commission staff evaluated Duke Energy's record as a licensee for these areas: (A) conservation efforts; (B) compliance history and ability to comply with the new license; (C) safe management, operation, and maintenance of the project; (D) ability to provide efficient and reliable electric service; (E) need for power; (F) transmission services; (G) cost effectiveness of plans; and (H) actions affecting the public. This order adopts staff's analyses and conclusions.

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[200] Comprehensive plans for this purpose are defined at 18 C.F.R. § 2.19 (2015).

[201] The list of applicable plans can be found in section 5.3 of the EIS for the project. In addition to the comprehensive plans reviewed in the EIS, staff reviewed 13 additional plans, including: (1) Amendment 1 to the Interstate Fishery Management Plan for Atlantic sturgeon (*Acipenser oxyrhynchus oxyrhynchus*) (Report No. 31), dated July 1998; (2) Amendment 1 to the Interstate Fishery Management Plan for shad and river herring (Report No. 35), dated April 1999; (3) Technical Addendum 1 to Amendment 1 of the Interstate Fishery Management Plan for shad and river herring, dated February 2000; (4) Amendment 2 to the Interstate Fishery Management Plan for shad and river herring, dated May 2009; (5) Amendment 3 to the Interstate Fishery Management Plan for shad and river herring, dated February 2010; (6) Interstate Fishery Management Plan for American eel (*Anguilla rostrata*) (Report No. 36), dated April 2000; (7) Final Recovery Plan for the shortnose sturgeon (*Acipenser brevirostrum*), dated December 1998; (8) Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service, undated; (9) North Carolina State Outdoor Recreation Plan (SCORP): 2009-2013, dated December 2008; (10) South Carolina Water classifications and standards, and classified waters, dated June 1985; (11) South Carolina instream flow studies: a status report, dated June 1989; (12) Instream flow study – Phase I: identification and priority listing of streams in South Carolina for which minimum flow levels need to be established (Report No. 149), dated June 1985; and (13) Vision Quest 2010: Catawba County's Comprehensive Plan, dated October 1996.

[202] 16 U.S.C. §§ 803(a)(2)(C) and 808(a) (2012).

A. Conservation Efforts

258. Section 10(a)(2)(C) of the FPA requires the Commission to consider the extent of electricity consumption efficiency improvement programs in the case of license applicants primarily engaged in the generation or sale of electric power, like Duke Energy. Duke Energy has provided conservation services for its electricity customers since 1971. Duke Energy has several programs to promote conservation and energy efficiency for residential, commercial, industrial, and agricultural customers, including: (1) making available special electric rates to customers who modify or build their homes to meet insulation and other energy conservation requirements and to large industrial customers that shift usage from peak times; (2) providing the public with energy saving tips through local advertisements; (3) making available an online energy audit suitable for individual residences or small business; and (4) providing on-site energy needs assessments along with recommendations on how to solve energy-related problems for larger businesses. These programs show that Duke Energy is making an effort to conserve electricity and has made a satisfactory good faith effort to comply with section 10(a)(2)(C) of the FPA.

B. Compliance History and Ability to Comply with the New License

259. Based on a review of Duke Energy's compliance with the terms and conditions of the existing license, Commission staff finds that Duke Energy's overall record of making timely filings and compliance with its license is satisfactory. Therefore, staff believes Duke Energy can satisfy the conditions of a new license.

C. Safe Management, Operation, and Maintenance of the Project

260. Commission staff has reviewed Duke Energy's management, operation, and maintenance of the Catawba-Wateree Project pursuant to the requirements of 18 C.F.R. Part 12 and the Commission's Engineering Guidelines. Staff concludes that the dams and other project works are safe, and that there is no reason to believe that Duke Energy cannot continue to safely manage, operate, and maintain these facilities under a new license.

D. Ability to Provide Efficient and Reliable Electric Service

261. Commission staff has reviewed Duke Energy's plans and its ability to operate and maintain the project in a manner most likely to provide efficient and reliable electric service. Staff's review indicates that Duke Energy has devices that monitor structural movement or stress, seepage, uplift, and equipment failure at the project. Duke Energy regularly inspects the project turbine generator units to ensure they continue to perform in an optimal manner, schedules maintenance to minimize effects on energy production, and, since the project has been in operation, has undertaken several initiatives to ensure the project is able to operate reliably into the future. Staff concludes that Duke Energy is

capable of operating the project to provide efficient and reliable electric service in the future.

E. Need for Power

262. The Catawba-Wateree Project provides hydroelectric generation to meet part of North Carolina's and South Carolina's power requirements, resource diversity, and capacity needs. The project as licensed will have an installed capacity of 819.102 MW, and generate approximately 1,483,304 MWh of electricity annually.

263. The North American Electric Reliability Corporation (NERC) annually forecasts electrical supply and demand nationally and regionally for a 10-year period. The project is located in the SERC Reliability Corporation region of NERC (SERC). According to NERC's 2014 forecast, the planning reserve margins in this region for summer are expected to range from 23.3 to 34.2 percent between 2015 and 2024, compared to the planning goal of 15 percent. Peak season demand is expected to increase from 47,116 MW in 2015 to 53,844 MW in 2024.[203] SERC anticipates that additional capacity will be needed to maintain reliability. Staff concluded that power from the Catawba-Wateree Project will help meet a need for power in the SERC region.

F. Transmission Services

264. The project's transmission facilities include the generator leads, station transformers, buses, and switch yards located near some of the project's developments, and in some cases transmission lines connecting the project to the point of interconnection with the grid. Neither Duke Energy proposes, nor does this license require, any changes that would affect its own, or other transmission services in the region.

G. Cost Effectiveness of Plans

265. Duke Energy proposes to: (1) increase minimum flows and/or provide recreation flow releases downstream from the Bridgewater, Oxford, Lookout Shoals, Wylie, Great Falls-Dearborn, and Wateree Developments; (2) install measures to improve water quality in the tailwaters of the Bridgewater, Rhodhiss, Oxford, Cowans Ford, Wylie, and Wateree Developments; (3) install and maintain new DO monitors at each of the project's developments; and (4) install flood control measures at the Wateree Development. Duke Energy also proposes several measures and plans to enhance fish and wildlife, terrestrial, recreation, and cultural resources at the project. Based on Duke Energy's record as an

[203] North American Electric Reliability Corporation. 2014 Long Term Reliability Assessment. November 2014.

existing licensee, Commission staff concludes that these proposals are likely to be carried out in a cost-effective manner.

H. Actions Affecting the Public

266. Duke Energy provided extensive opportunity for public involvement in the development of its application for a new license for the Catawba-Wateree Project. In addition to using the project to help meet local power needs, during the previous license period Duke Energy provided facilities to enhance the public use of project lands and facilities, and operated the project with consideration for the protection of downstream uses of the Catawba and Wateree Rivers.

PROJECT ECONOMICS

267. In determining whether to issue a new license for an existing hydroelectric project, the Commission considers a number of public interest factors, including the economic benefits of project power. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,[204] the Commission uses current costs to compare the costs of the project and likely alternative power with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. The basic purpose of the Commission's economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and of reasonable alternatives to project power. The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

268. In applying this analysis to the Catawba-Wateree Project, Commission staff considered three options: no action, Duke Energy's proposal, and the project as licensed herein.[205] Under the no action alternative, the project would continue to operate as it does now. The project generates an average of 1,483,304 MWh of electricity annually. Multiplying staff's estimate of average generation by the alternative power cost of $60.26/MWh[206] yields a total value of the project's power of $89,383,899 in 2015

[204] 72 FERC ¶ 61,027 (1995).

[205] Details of staff's economic analysis for the project as licensed herein and for various alternatives are included in the EIS issued on July 23, 2009, at section 4.0, *Developmental Analysis*. All costs identified in the EIS were adjusted to 2015 dollars, based on the CPI-U index for years 2008-2015 (*see* Duke Energy's June 12 and 19, 2015 filings).

[206] The alternative power cost was estimated for 2015, and includes the value of energy generated plus a value for dependable capacity. The value of energy is a composite of on-peak and off-peak rates.

dollars. The average annual project cost is about $70,204,778, or $47.33/MWh. To determine whether the proposed project is currently economically beneficial, staff subtracts the project's cost from the value of the project's power. Therefore, the project costs $19,179,121, or $12.93/MWh, less to produce power than the likely alternative cost of power.

269. As proposed by Duke Energy, the levelized annual cost of operating the project is $89,558,099, or $61.67/MWh. The project would have an authorized installed capacity of 843.102 MW and generate an estimated average of 1,452,215 MWh of energy annually. When the estimate of average generation is multiplied by the alternative power cost of $61.20/MWh, the result is a total value of the project's power of $88,875,558 in 2015 dollars. Therefore, in the first year of operation, the project would cost $682,541, or $0.47/MWh, more than the likely alternative cost of power.

270. As licensed herein, with the mandatory conditions and staff measures, the levelized annual cost of operating the project would be about $88,425,371, or $60.89/MWh.[207] The project would have an authorized installed capacity of 819.102 MW, the same amount of estimated average generation, and the same alternative power cost as Duke Energy's proposal. The project would produce power valued at $88,875,558 in 2015 dollars. Therefore, subtracting the project's cost from the value of power, in the first year of operation, the project would produce power at a cost of $450,187, or $0.31/MWh, less than the likely alternative cost of power.

271. In considering public interest factors, the Commission takes into account that hydroelectric projects offer unique operational benefits to the electric utility system (ancillary service benefits). These benefits include the ability to help maintain the stability of a power system, such as by quickly adjusting power output to respond to rapid changes in system load, and to respond rapidly to a major utility system or regional blackout by providing a source of power to help restart fossil-fuel based generating stations and put them back on line.

COMPREHENSIVE DEVELOPMENT

272. Sections 4(e) and 10(a)(1) of the FPA[208] require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and

[207] Duke Energy's proposal and the as licensed alternative include Duke Energy's estimated cost of $330,263 per year for implementing the conditions of the final BO issued by the NMFS on July 8, 2013.

[208] 16 U.S.C. §§ 797(e) and 803(a)(1) (2012).

wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued must be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

273. The EIS for the project contains background information, analysis of effects, and support for related license articles. The project will be safe if operated and maintained in accordance with the requirements of the license.

274. Based on Commission staff's independent review and evaluation of the Catawba-Wateree Project, recommendations from the resource agencies and other stakeholders, and the no-action alternative, as documented in the EIS, the proposed Catawba-Wateree Project, as licensed herein, is best adapted to a comprehensive plan for improving or developing the Catawba-Wateree River system.

275. This alternative was selected because: (1) issuance of a new license will serve to maintain a beneficial, dependable, and inexpensive source of electric energy; (2) the required environmental measures will protect and enhance fish and wildlife resources, water quality, recreational resources, and historic properties; and (3) the 819.102 MW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution.

LICENSE TERM

276. Section 15(e) of the FPA[209] provides that any new license issued shall be for a term that the Commission determines to be in the public interest, but not less than 30 years or more than 50 years. The Commission's general policy is to establish 30-year terms for projects with little or no redevelopment, new construction, new capacity, or environmental mitigation and enhancement measures; 40-year terms for projects with a moderate amount of such activities; and 50-year terms for projects with extensive measures.[210]

277. The license authorizes a moderate amount of new construction (*e.g.*, fish passage facilities and bladder dam on the Wateree spillway) and new environmental mitigation and enhancement measures (*e.g.*, higher minimum flow releases from the Bridgewater, Oxford, Lookout Shoals, Wylie, Great Falls-Dearborn, and Wateree Developments; recreation flow releases from the Bridgewater, Oxford, Wylie, Great Falls-Dearborn, and

[209] 16 U.S.C. § 808(e) (2012).

[210] *See Consumers Power Co.*, 68 FERC ¶ 61,077, at 61,383-84 (1994).

Wateree Developments; diadromous fish monitoring associated with fish passage program, sturgeon monitoring, and recreation development). Because the license requires a moderate amount of measures, a 40-year license term for the Catawba-Wateree Project is appropriate.

The Director orders:

(A) This license is issued to Duke Energy Carolinas LLC (licensee), for a period of 40 years, effective the first day of the month in which this order is issued, to operate and maintain the Catawba-Wateree Hydroelectric Project. This license is subject to the terms and conditions of the Federal Power Act (FPA), which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The Project consists of:

(1) All lands, to the extent of the licensee's interests in these lands, described in the project description and the project boundary discussion of this order.

(2) Projects works which include:

Bridgewater Development consisting of: (a) a 6,754-acre reservoir (Lake James) at full pond elevation 1,200 feet msl; (b) the 120-foot-high, 3,155-foot-long Catawba Dam which includes three sluice gates and a continuous minimum flow discharge system; (c) the 165-foot-high by 1,610-foot-long Paddy Creek Dam; (d) the 160-foot-high by 1,625-foot-long Linville Dam; (e) an intake with three bays, three vertical lift gates, and three 14-inch-diameter bypass gate valves; (f) an approximately 900-foot-long penstock, connecting the intake to a powerhouse; (g) a concrete powerhouse containing two vertical-Francis turbine/generator units, and one horizontal-shaft Francis turbine/generator unit with a total installed capacity of 27.867 MW; and (h) appurtenant facilities.

Rhodhiss Development consisting of: (a) a 2,724-acre reservoir (Lake Rhodhiss) at normal maximum elevation 994.1 feet msl and a full pond elevation 995.1 feet msl; (b) a 72-foot-high, 1,517-foot-long dam consisting of (i) a 119.6-foot-long left concrete gravity non-overflow section, (ii) a 194-foot-long concrete powerhouse intake section consisting of three intakes protected by trashracks and headgates, (iii) an 800-foot-long, 70-foot-high ungated ogee spillway with a crest elevation of 995.1 feet msl, (iv) a 55-foot-high 119.6-foot-long right concrete non-overflow section, and (v) a 35-foot-high 283.8-foot-long earthen embankment non-overflow section extending to the right bank; (c) a 194-foot-wide by 60-foot-deep concrete powerhouse integral with the dam containing three vertical-Francis turbine/generator units, with a maximum hydraulic

capacity of 8,325 cfs and total installed capacity of 32.225 MW; (d) a 0.17-mile-long, 44-kV transmission line to the Rhodhiss Tie sub-station; and (e) appurtenant facilities.

Oxford Development consisting of: (a) a 4,072-acre reservoir (Lake Hickory) at normal maximum elevation 934 feet msl and full pond elevation 935 feet msl; (b) a 142-foot-high, approximately 1,394-foot-long dam consisting of (i) a 193-foot-long emergency overflow spillway section with a crest elevation of 936 feet msl, (ii) a 7.5-foot-long left non-overflow wall, (iii) a 540-foot-long gated spillway section with ten 25-foot-high by 45-foot-wide vertical lift gates, (iv) a 124-foot-long by 65-foot-wide concrete powerhouse intake section consisting of two intakes protected by trashracks and headgates, (v) a 429-foot-long right concrete non-overflow section; and (vi) a 55-foot-long sheet pile wall non-overflow section extending to the right bank; (c) a 124-foot-wide by 65-foot-deep concrete powerhouse integral with the dam containing two vertical-Francis turbine/generator units, with a maximum hydraulic capacity of 3,450 cfs and total installed capacity of 35.85 MW; and (d) appurtenant facilities.

Lookout Shoals Development consisting of: (a) a 1,155-acre reservoir (Lookout Shoals Reservoir) at normal maximum elevation 837.1 feet msl and full pond elevation 838.1 feet msl; (b) an 88-foot-high, approximately 2,731-foot-long dam consisting of (i) a left 282.1-foot-long concrete non-overflow section, (ii) a 176.1-foot-long concrete powerhouse intake section with four intakes protected by trashracks, (iii) a 933-foot-long ungated ogee spillway section with a crest elevation of 838.1 feet msl, (iv) a 65-foot-long right concrete non-overflow section, and (v) an approximately 1,250-foot-long earthen embankment section leading to the right bank; (c) a 176-foot-wide by 56-foot-deep concrete powerhouse integral with the dam containing three vertical-Francis turbine/generator units each rated at 6.24 MW and two vertical Francis turbine-generator units each rated at 0.266 MW, with a total installed capacity of 25.715 MW; (d) a 0.2-mile-long, 100-kV transmission line leading to the Lookout Tie Sub-station; and (e) appurtenant facilities.

Cowans Ford Development consisting of: (a) a 32,339-acre reservoir (Lake Norman) at normal maximum and full pond elevation 760 feet msl; (b) a 130-foot-high, approximately 8,738-foot-long dam consisting of (i) a left concrete non-overflow section, (ii) 465-foot-long gated concrete spillway section with 11 Tainter gates, each 28 feet high by 35 feet wide, (iii) a 328-foot-long concrete powerhouse intake section with four intakes protected by trashracks, (iv) a 276-foot-long right concrete non-overflow section, and (v) an earthen embankment extending to the right river bank; (c) a 3,139-foot-long earthen saddle dike (Hicks Crossroads Dike) located east of the main dam; (d) a 328-foot-wide by 127-foot-deep concrete powerhouse integral with the dam containing four Kaplan turbine/generator units, with a total installed capacity of 332.5 MW; (e) a 1.67-mile-long, 230-kV transmission line leading to the McGuire Switching Station; and (f) appurtenant facilities.

Mountain Island Development consisting of: (a) a 3,117-acre reservoir (Mountain Island Lake) at normal maximum elevation 647 feet msl and full pond elevation 647.5 feet msl; (b) a 140-foot-high, approximately 2,372-foot-long dam consisting of, from left to right, (i) a 997-foot-long, ungated, ogee spillway with a crest elevation at 647.5 feet msl, (ii) a left 259-foot-long concrete non-overflow section, (iii) a 246-foot-long concrete powerhouse intake section with four intakes protected by trashracks and headgates, (iv) a right 200-foot-long non-overflow section, and (v) an approximately 670-foot-long earthen embankment extending to the right river bank; (c) a 0.7-mile-long bypassed reach located downstream of the spillway; (d) a 246-foot-wide by 65-foot-deep concrete powerhouse containing four vertical-Francis turbine/generator units, with a total installed capacity of 55.05 MW; and (e) appurtenant facilities.

Wylie Development consisting of: (a) a 12,177-acre reservoir (Lake Wylie) at normal maximum elevation 568.4 feet msl and full pond elevation 569.4 feet msl; (b) a 119-foot-high, approximately 3,165-foot-long dam consisting of, from left to right, (i) a 234-foot-long left concrete non-overflow section, (ii) a 272-foot-long concrete powerhouse intake section with four intakes protected by trashracks, (iii) a 265-foot-long gated spillway section with five vertical lift gates with a crest elevation of 539.4 feet msl, (iv) a 206-foot-long ungated ogee spillway section with a crest elevation of 569.4 feet msl, (v) a 320-foot-long gated spillway section with six vertical lift gates with a crest elevation of 539.4 feet msl, (vi) a 401-foot-long concrete non-overflow section, and (vii) an earth embankment extending to the right river bank; (c) a 271-foot-wide by 72-foot-deep concrete powerhouse containing four vertical-Francis turbine/generator units, with a total installed capacity of 69 MW; and (d) appurtenant facilities.

Fishing Creek Development consisting of: (a) a 3,431-acre reservoir (Fishing Creek) at normal maximum elevation 416.2 feet msl and full pond elevation 417.2 feet msl; (b) a 97-foot-high, approximately 1,770-foot-long dam consisting of (i) a 114-foot-long ungated spillway section with a crest elevation of 417.2 feet msl, (ii) a 1,210-foot-long gated ogee spillway section with twenty-two 25-foot-high by 45-foot-wide vertical lift gates, (iii) a 205-foot-long concrete powerhouse intake section with five intakes protected by trashracks, and (iv) a 214-foot-long concrete non-overflow section extending to the right river bank; (c) a 259-foot-wide by 50-foot-deep concrete powerhouse containing five vertical-Francis turbine/generator units, with a total installed capacity of 48.12 MW; and (d) appurtenant facilities.

Great Falls and Dearborn Development consisting of: (a) a 1,558-foot-long diversion dam (Great Falls), with a 1,226-foot-long uncontrolled spillway with a crest elevation of 355.8 feet msl; (b) a 353-acre reservoir (Great Falls) at normal maximum elevation 355.3 feet msl and full pool elevation at 355.8 feet; (c) a 2.25-mile-long bypassed reach (Great Falls Long Bypassed Reach); (d) a 0.75-mile-long bypassed reach (Great Falls Short Bypassed Reach); (e) Canal Headworks which includes (i) a 270-foot-long intake section (Canal Intake) protected by trashracks, (ii) a 447-foot-long main

spillway with a gated trashway, and (iii) a 562-foot-long canal spillway with 4-foot-high flashboards which overflow at crest elevation 355.8 feet msl; (f) the 133-foot-high, 950-foot-long Great Falls-Dearborn Dam consisting of (i) a 160-foot-long non-overflow section (Dearborn), (ii) a concrete intake section (Dearborn) with three intakes protected by trashracks and head gates, (iii) a 65-foot-long non-overflow section (Dearborn), (iv) a 685-foot-long concrete non-overflow section (Great Falls) leading to the right river bank, and (v) a concrete intake section (Great Falls) with nine intakes protected by trashracks; (g) the 244-foot-wide by 49-foot-deep concrete Great Falls Powerhouse containing (i) four horizontal-shaft Francis turbine-generator units and an exciter unit, with a total installed capacity of 12.0 MW, (ii) two 0.20-mile-long, 44-kV transmission lines leading to the Great Falls Switching Station, and (iii) appurtenant facilities; (h) the 182-foot-wide by 50-foot-deep concrete Dearborn Powerhouse containing (i) three vertical-Francis turbine-generator units with a total installed capacity of 42 MW, (ii) a 0.13-mile-long, 100-kV transmission line and a 0.08-mile-long 44-kV transmission line leading to the Great Falls Switching Station, and (iii) appurtenant facilities.

Rocky Creek and Cedar Creek Development consisting of: (a) a 748-acre reservoir (Cedar Creek Reservoir) at normal maximum elevation 283.9 feet msl and full pond elevation 284.4 feet msl; (b) a 69-foot-high, approximately 1,219-foot-long dam consisting of (i) the left Cedar Creek non-overflow section, (ii) the concrete Cedar Creek intake section, with three intakes protected by trashracks and head gates, (iii) the Cedar Creek gated spillway section with two vertical lift gates, (iv) the Cedar Creek uncontrolled spillway section with a crest elevation of 284.4 feet msl, (v) the Rocky Creek canal non-overflow section, and (vi) the Rocky Creek intake section, with nine intakes protected by trashracks; (c) a 206-foot-wide by 66-foot-deep concrete powerhouse (Cedar Creek Powerhouse) containing three vertical-Francis turbine/generator units, with a total installed capacity of 42.975 MW; (d) a 242-foot-wide by 40-foot-deep concrete powerhouse (Rocky Creek Powerhouse) containing four vertical-Francis turbine/generator units, with a total installed capacity of 13.8 MW; (e) two 2.0-mile-long,100-kV transmission lines extending from the switching station at the Cedar Creek Powerhouse to the Great Falls switching station; and (f) appurtenant facilities.

Wateree Development consisting of: (a) a 13,025-acre reservoir (Lake Wateree) at normal maximum elevation 224.5 feet msl and full pond elevation 225.5 feet msl; (b) a 76-foot-high, approximately 1,753-foot-long dam consisting of (i) a 1,450-foot-long ungated ogee spillway section with a crest elevation of 225.5 feet msl, (ii) a new 10,000 cubic-feet-per-second inflatable bladder dam, (iii) a concrete powerhouse intake section with five intakes protected by trashracks, and (iv) a 1,370-foot-long earth/concrete embankment extending to the right river bank; (c) a 284-foot-wide by 52-foot-deep concrete powerhouse, integral with the dam, containing five vertical-Francis turbine/generator units, with a total installed capacity of 82 MW; and (d) appurtenant facilities.

The project works generally described above are more specifically shown and described by those approved portions of Exhibit F shown below:

BRIDGEWATER DEVELOPMENT[211]

Exhibit No.	Superseded FERC Drawing No.	Filed Date	FERC No.	Title
F-1A (L-1)	2232-182	10/26/12	1001	Bridgewater - Plans and Profiles
F-1B (L-1A)	2232-183	10/26/12	1002	Bridgewater – Catawba Dam Plan, Profile and Sections
F-1C (L-1B)	2232-184	10/26/12	1003	Bridgewater – Paddy Creek Dam Plans, Profiles and Sections
F-1D (L-1C)	2232-185	10/26/12	1004	Bridgewater – Linville Dam Plan, Profile and Section
F-2A (L-2)	2232-186	10/26/12	1005	Bridgewater – Linville Dam, Powerhouse and Diverting Canal – Sections and Details
F-2B (L-2A)	2232-187	10/26/12	1006	Bridgewater – Earthfill Embankment Powerhouse General Layout
F-2C (L-2B)	2232-188	10/26/12	1007	Bridgewater – Powerhouse Roof Deck Plan
F-2D (L-2C)	2232-189	10/26/12	1008	Bridgewater – Powerhouse Generator Floor Plan
F-2E (L-2D)	2232-190	10/26/12	1009	Bridgewater – Powerhouse Turbine Floor Plan
F-2F (L-2E)	2232-191	10/26/12	1010	Bridgewater – Powerhouse Basement Floor Plan
F-2G (L-2F)	2232-192	10/26/12	1012	Bridgewater – Powerhouse Traverse Section

[211] The approved Exhibit F drawings for the Bridgewater Development are the former Exhibit L drawings filed on April 13, 2012, and approved by the Commission in a September 12, 2012 Order, under the previous license. In the table, the former, superseded drawing number and new drawing number are shown for clarification. The filed date in the table is the date on which Duke Energy filed the approved drawings as directed by the September 12, 2012 Order.

Exhibit No.	Superseded FERC Drawing No.	Filed Date	FERC No.	Title
F-2H (L-2G)	2232-193	10/26/12	1013	Bridgewater – Powerhouse Longitudinal Section
F-2I (L-2H)	2232-194	10/26/12	1014	Bridgewater – Powerhouse Unit 3 and Ring Jet Valve Sections

RHODHISS DEVELOPMENT

Exhibit No.	Filed Date	FERC No.	Title
F-3	8/29/2006	1015	Catawba-Wateree Project, Rhodhiss Development Plan and Elevation
F-4	8/29/2006	1016	Catawba-Wateree Project, Rhodhiss Development Sections and Details

OXFORD DEVELOPMENT

Exhibit No.	Filed Date	FERC No.	Title
F-5	8/29/2006	1017	Catawba-Wateree Project, Oxford Development Plan and Elevation
F-5A	8/29/2006	1018	Catawba-Wateree Project, Oxford Development Sections

LOOKOUT SHOALS DEVELOPMENT

Exhibit No.	Filed Date	FERC No.	Title
F-6	8/29/2006	1019	Catawba-Wateree Project, Lookout Shoals Development Plan and Profile
F-7	8/29/2006	1020	Catawba-Wateree Project, Lookout Shoals Development Sections and Details

COWANS FORD DEVELOPMENT

Exhibit No.	Filed Date	FERC No.	Title
F-8	8/29/2006	1021	Catawba-Wateree Project, Cowans Ford Development Final Design Plan and Profile

Exhibit No.	Filed Date	FERC No.	Title
F-8A	8/29/2006	1022	Catawba-Wateree Project, Cowans Ford Development Hicks Crossroads Dike Plan and Sections
F-9	8/29/2006	1023	Catawba-Wateree Project, Cowens Ford Development Sections and Details
F-9A	8/29/2006	1024	Catawba-Wateree Project, Cowens Ford Development Typical Earthwork Sections

MOUNTAIN ISLAND DEVELOPMENT

Exhibit No.	Filed Date	FERC No.	Title
F-10	8/29/2006	1025	Catawba-Wateree Project, Mountain Island Development Plan and Elevation
F-11	8/29/2006	1026	Catawba-Wateree Project, Mountain Island Development Sections and Details

WYLIE DEVELOPMENT

Exhibit No.	Filed Date	FERC No.	Title
F-12	8/29/2006	1027	Catawba-Wateree Project, Wylie Development Plan and Elevations
F-13	8/29/2006	1028	Catawba-Wateree Project, Wylie Development Sections and Details

FISHING CREEK DEVELOPMENT

Exhibit No.	Filed Date	FERC No.	Title
F-14	8/29/2006	1029	Catawba-Wateree Project, Fishing Creek Development Plan and Profile
F-15	8/29/2006	1030	Catawba-Wateree Project, Fishing Creek Development Sections and Details

GREAT FALLS-DEARBORN DEVELOPMENT

Exhibit No.	Filed Date	FERC No.	Title
F-16	8/29/2006	1031	Catawba-Wateree Project, Great Falls-Dearborn Development Plans and Elevations
F-17	8/29/2006	1032	Catawba-Wateree Project, Great Falls-Dearborn Development Sections and Details

ROCKY CREEK-CEDAR CREEK DEVELOPMENT

Exhibit No.	Filed Date	FERC No.	Title
F-18	8/29/2006	1033	Catawba-Wateree Project, Rocky Creek-Cedar Creek Development Plans and Elevations
F-19	8/29/2006	1034	Catawba-Wateree Project, Rocky Creek-Cedar Creek Development Sections and Details

WATEREE DEVELOPMENT

Exhibit No.	Filed Date	FERC No.	Title
F-20	8/29/2006	1035	Catawba-Wateree Project, Wateree Development Plan and Profile
F-21	8/29/2006	1036	Catawba-Wateree Project, Wateree Development Sections and Details

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project, all portable property that may be employed in connection with the project, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) Exhibit F described above is approved and made part of this license. Exhibit A and the Exhibit G drawings filed as part of the application for license do not conform to the Commission's regulations and are not approved.

(D) This license is subject to the conditions submitted by the North Carolina Department of Environment and Natural Resources – Division of Water Quality under section 401(a)(1) of the Clean Water Act, 33 U.S.C. § 1341(a)(1)(2012), as those conditions are set forth in Appendix A to this order.

(E) This license is subject to the conditions submitted by the South Carolina Department of Health and Environmental Control under section 401(a)(1) of the Clean Water Act, 33 U.S.C. § 1341(a)(1)(2012), as those conditions are set forth in Appendix B to this order.

(F) This license is subject to the conditions submitted by the Secretary of the U.S. Department of the Interior under section 18 of the FPA, as those conditions are set forth in Appendix C to this order.

(G) This license is subject to the reasonable and prudent measures and their implementing incidental take terms and conditions of the biological opinion submitted by the National Marine Fisheries Service under section 7 of the Endangered Species Act, as those conditions are set forth in Appendix D to this order.

(H) This license is also subject to the articles set forth in Form L-3 (Oct. 1975), entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States," (*see* 54 F.P.C. 1792 et seq.), as reproduced at the end of this order, and the following additional articles:

Article 201. *Administrative Annual Charges*. The licensee must pay the United States annual charges, effective the first day of the month in which the license is issued, and as determined in accordance with the provisions of the Commission's regulations in effect from time to time, for the purposes of reimbursing the United States for the cost of administration of Part I of the Federal Power Act. The authorized installed capacity for that purpose is 819.102 megawatts.

Article 202. *Revised Exhibit A.* Within 90 days of the effective date of the license, the licensee must file, for Commission approval, a revised Exhibit A that includes a description of the following primary transmission lines:

1. Rhodhiss Development – The 0.17-mile-long segment of line leading from the Rhodhiss Powerhouse's switching station to the Rhodhiss Tie Substation.

2. Lookout Shoals Development – The 0.20-mile-long segment of line leading from the switching station adjoining the Lookout Shoals Powerhouse to the Lookout Tie Substation.

3. Cowans Ford Development – Two 1.67-mile-long segments of line leading from the Cowans Ford Powerhouse's switching station to the McGuire Switching Station.

4. Great Falls-Dearborn Development – Two 0.20-mile-long segments of line leading from the Great Falls Powerhouse to the Great Falls Switching Station;

and 0.08-mile-long and 0.13-mile-long segments of lines leading from the Dearborn Powerhouse to the Great Falls Switching Station.

5. Rocky Creek-Cedar Creek Development – Two 2.0-mile-long segments of line leading from the Cedar Creek Powerhouse's Switching Station to the Great Falls Switching Station.

Article 203. *Exhibit F Drawings*. Within 45 days of the date of issuance of this license, as directed below, the licensee must file the approved exhibit drawings in electronic file format on CD disks.

a) Digital images of the approved exhibit drawings must be prepared in electronic format. Prior to preparing each digital image, the FERC Project-Drawing Number (*i.e.*, P-2232-1001 through P-2232-1036) must be shown in the margin below the title block of the approved drawing. The licensee must file two separate sets of exhibit drawings in electronic format on CD disks with the Secretary of the Commission, ATTN: OEP/DHAC. Exhibit F drawings must be segregated from other project exhibits, and identified as **(CEII) material under 18 CFR §388.113(c)**. Each drawing must be a separate electronic file, and the file name must include: FERC Project-Drawing Number, FERC Exhibit, Drawing Title, date of this license, and file extension in the following format [P-2232-1001, F-1, Description, MM-DD-YYYY.TIF]. All digital images of the exhibit drawings must meet the following format specification:

IMAGERY - black & white raster file
FILE TYPE – Tagged Image File Format, (TIFF) CCITT Group 4
RESOLUTION – 300 dpi desired, (200 dpi min)
DRAWING SIZE FORMAT – 24" x 36" (min), 28" x 40" (max)
FILE SIZE – less than 1 MB desired

Article 204. *Revised Exhibit G Drawings*. Within 90 days of the effective date of the license, the licensee must file, for Commission approval, revised Exhibit G drawings enclosing within the project boundary all principal project works necessary for operation and maintenance of the project, including: (1) the project's primary transmission lines, as identified in Article 202; (2) all existing and new project recreation sites, as identified in Article 407; and (3) all licensee-owned islands in the project's reservoirs or on regulated river reaches. The Exhibit G drawings must comply with sections 4.39 and 4.41 of the Commission's regulations.

Article 205. *Amortization Reserve*. Pursuant to section 10(d) of the Federal Power Act, a specified reasonable rate of return upon the net investment in the project must be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The licensee must set aside in a project amortization reserve account at the end of each fiscal year one half of the project surplus

earnings, if any, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the licensee must deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The licensee must set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The licensee must maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves must be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly included in the licensee's long-term debt and proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rate for such ratios must be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity must be the interest rate on 10-year government bonds (reported as the Treasury Department's 10-year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 206. *Headwater Benefits*. If the licensee's project was directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the licensee must reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license. The benefits will be assessed in accordance with Part 11, Subpart B, of the Commission's regulations.

Article 207. *As-built Exhibits*. Within 90 days of completion of construction of the facilities authorized by this license, the licensee must file for Commission approval, revised exhibits A, F, and G, as applicable, to describe and show those project facilities as built.

Article 208. *Great Falls and Rocky Creek Inoperable Turbines*. Within one year of license issuance, the licensee must file, for Commission approval, a plan and schedule to decommission the inoperable turbine/generator units (units 3, 4, 7, and 8) at the Great Falls Powerhouse and the inoperable turbine/generator units (units 1, 2, 3, and 4) at the Rocky Creek Powerhouse.

Article 209. *Rocky Creek Inoperable Turbines*. Within one year of license issuance, the licensee must file, for Commission approval, a plan and schedule to either: (1) restore the Rocky Creek Powerhouse’s turbine/generator units 5, 6, 7, and 8 to commercial service; or (2) decommission units 5, 6, 7, and 8, as well as the Rocky Creek

Powerhouse. Should the licensee choose to rehabilitate the four units, and if the rehabilitation efforts result in an increase in capacity at any of the four units, the licensee must file an amendment, with the Commission, to change the authorized installed capacity of the units (*see* 18 C.F.R. § 4.201 for guidance).

Article 301. *Contract Plans and Specifications*. At least 60 days prior to the start of any construction (*e.g.*, 10,000 cubic-feet-per-second bladder dam and fish passage facilities), the licensee must submit one copy of its final contract plans and specifications and supporting design report to the Commission's Division of Dam Safety and Inspections (D2SI) – Atlanta Regional Engineer, and two copies to the Commission. The submittal must also include, as part of preconstruction requirements: a Quality Control and Inspection Program, a Temporary Construction Emergency Action Plan, and a Soil Erosion and Sediment Control Plan. The licensee must not begin construction until the D2SI – Atlanta Regional Engineer has reviewed and commented on the plans and specifications, determined that all preconstruction requirements have been satisfied, and authorized start of construction.

Article 302. *Cofferdam and Deep Excavation Construction Drawings*. Should construction require cofferdams or deep excavations, the licensee must: (1) have a Professional Engineer who is independent from the construction contractor, review the designs of any contractor-designed cofferdams and deep excavations and issue letters of approval regarding the designs prior to the start of construction; and (2) ensure that construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days before starting construction of any cofferdams or deep excavations, the licensee must submit one copy to the Commission's Division of Dam Safety and Inspections (D2SI) - Atlanta Regional Engineer and two copies to the Commission of the approved cofferdam and deep excavation construction drawings and specifications, and the letters of approval.

Article 303. *Project Modification Resulting From Environmental Requirements*. If environmental requirements under this license require modification that may affect the project works or operations, the licensee must consult with the Commission's Division of Dam Safety and Inspections – Atlanta Regional Engineer. Consultation must allow sufficient review time for the Commission to ensure that the proposed work does not adversely affect the project works, dam safety, or project operation.

Article 401. *Resource Plan Requirements, Notification, and Filing of Amendments*.

(a) Resource Plan Requirements

Conditions found in Appendix C of this license require the licensee to prepare fishway operation and maintenance plans (Condition 4), fishway designs (Condition 6),

and fishway and eelway effectiveness studies (Condition 7) in consultation with the U.S. Fish and Wildlife Service (FWS). The conditions either do not provide for Commission approval or do not specify when the plan(s) would be filed with the Commission for approval. Therefore, the due date for filing each plan with the Commission is as specified below:

FWS Fishway Prescription Condition No.	Plan Name	Due Date for Filing the Plan with the Commission
4	Fishway Operation and Maintenance Plan	October 1, 2017
6	Final design plans, construction schedules, and any hydraulic model or other studies for the Trap, Sort, & Transport Facility at Wateree Dam	December 31, 2015
6	American eel Siting Study Plans	Within 6 months of license issuance at Wateree Dam and every 6 months thereafter at each successive upstream dam
7	Trap, Sort, & Transport Facility Effectiveness Study	October 1, 2017
7	Upstream American Eel Passage Effectiveness Plan	October 1, 2017

The licensee must include with each plan filed with the Commission documentation that the licensee developed the plan in consultation with the National Marine Fisheries Service (NMFS), the North Carolina Wildlife Resources Commission (North Carolina WRC), and the South Carolina Department of Natural Resources (South Carolina DNR), and received approval from FWS. Each such plan also must include a provision to file resulting reports with the Commission, as well as the appropriate agency or agencies. The Commission reserves the right to make changes to any plan submitted. Upon Commission approval, the plan becomes a requirement of the license, and the licensee must implement the plan or changes in the project operation or facilities, including any changes required by the Commission.

(b) Requirement to File Reports

One South Carolina Department of Health and Environmental Control (South Carolina DHEC) certification condition in Appendix B requires the licensee to file a flow release report for the Wateree Development with other entities. Because this report

relates to compliance with a requirement of this license, and may have a bearing on future actions, it must also be filed with the Commission for information purposes. The report is listed in the following table:

South Carolina DHEC WQC Condition No.	Description	Due Date for Filing the Report with the Commission
4	Wateree Development Flow Release Report	By January 31 of each year for the prior calendar year, beginning year 2 after license issuance

The licensee must file with the Commission documentation of any consultation, and copies of any comments and recommendations made by any consulted entity in connection with the report. The Commission reserves the right to require changes to project operation or facilities based on the information contained in the report and any other available information.

(c) Requirement to Notify Commission of Planned and Unplanned Deviations from License Requirements, and Fulfilling License Requirements

One North Carolina Division of Water Quality (North Carolina DWQ) certification condition in Appendix A and one condition of FWS's fishway prescription in Appendix C would allow the licensee to temporarily modify the fish passage construction schedule or project operations under certain conditions. The Commission must be notified as soon as possible in writing, but no later than 10 days after each such modification. Temporary modifications must not exceed 30 days. Any modification exceeding 30 days requires prior Commission approval.

North Carolina DWQ WQC Condition No.	FWS Fishway Prescription Condition No.	License Requirement
9		Minimum flow rates and lake level fluctuations
	2	Extension of time developing fish passage facilities

(d) Requirement to File Amendment Applications

Certain conditions of the North Carolina DWQ's certification in Appendix A, the South Carolina DHEC's certification in Appendix B, and FWS's fishway prescription in Appendix C contemplate unspecified long-term changes to project operation or facilities

for the purposes of complying with state water quality standards or mitigating environmental impacts (*e.g.*, condition 8.b of North Carolina DWQ's and condition 5 of South Carolina DHEC's water quality certifications require the evaluation and potential license amendments pertaining to the Wateree Spring Stable Flow Period and Wateree Floodplain Inundation;[212] and condition 7 of FWS's fishway prescription requires the assessment of, and modification to, the trap/sort/transport facilities and activities, as well as the upstream American eel fish passage facilities). Such changes may not be implemented without prior Commission authorization granted after the filing of an application to amend the license.

Article 402. *Reservation of Authority to Prescribe Fishways*. Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or to provide for the construction, operation, and maintenance of such fishways as may be prescribed by the Secretary of the Interior and/or Secretary of Commerce pursuant to section 18 of the Federal Power Act.

Article 403. *Sturgeon Protection Plan*. Within four months of license issuance, the licensee must file, with the Commission for approval, a revised Sturgeon Protection Plan to minimize take of the federally listed shortnose sturgeon and Atlantic sturgeon. The plan must be based on, and include the provisions of, the Sturgeon Protection Plan filed on August 24, 2011, with, at a minimum, the following modifications:

(1) Detail the licensee's strategy for implementing the provisions outlined in the terms and conditions of the incidental take statement of the National Marine Fisheries Service's (NMFS) Biological Opinion, filed on July 8, 2013. The terms and conditions are included in Appendix D.

(2) Include a provision for filing any report required by the conditions of the incidental take statement with the Commission for review.

(3) Remove the *Financial Commitment to Complete the Accord [Santee River Basin Accord for the Protection, Restoration, and Enhancement of Diadromous Fish] Sturgeon Studies* provision of section 5 of the August 24, 2011 Sturgeon Protection Plan.

The revised Sturgeon Protection Plan must be developed after consultation with NMFS, the U.S. Fish and Wildlife Service, and the South Carolina Department of Natural Resources. The licensee must include with the plan an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it

[212] *See* sections 4.8 and 4.9 of the December 22, 2006 Revised Comprehensive Relicensing Agreement filed on December 29, 2006.

has been prepared and provided to the agencies above, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Implementation of the plan must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

Article 404. *Species Protection Plans*. The Species Protection Plans for: (1) the American eel, flat bullhead, snail bullhead, robust redhorse, and freshwater mussels filed August 29, 2006, as part of the License Application (*see* Book 2, Appendix A); and (2) the rocky shoals spider lily, bald eagle, great blue heron rookeries, and Rafinesque's big-eared bat filed as part of the License Application (see Book 3, Appendix B) are approved and must be implemented within 60 days of license issuance with the modifications outlined below.

(1) By no later than March 31 of each license year, the licensee must, in consultation with the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), North Carolina Wildlife Resources Commission (North Carolina WRC), North Carolina Department of Environment and Natural Resources (North Carolina DENR), and South Carolina Department of Natural Resources (South Carolina DNR), review state special status species lists applicable to the project area. This review must include any changes in species' status, as well as updated distribution and occurrence information.

(2) By no later than June 1 following the review required in item (1), the licensee must file documentation of the review. The review must include: (a) any updated species status, distribution, and occurrence information; (b) copies of the licensee's monitoring reports, if applicable, based on the requirements of the aforementioned plans; and (c) documentation of consultation with FWS and, as appropriate, NMFS, North Carolina WRC, North Carolina DENR, and South Carolina DNR, including copies of any comments and recommendations made by any consulted agency.

(3) The bald eagle protection plan is modified to include a requirement for annual bald eagle surveys conducted during the winter to collect data on bald eagle nesting, fledging success, and transient use of the project area. The licensee must document survey results in the annual bald eagle monitoring reports which include a description of: (a) the methods used to monitor for bald eagles and their nesting trees; (b) transient bald eagle occurrences within the project

boundary; and (c) the location of bald eagles residing or nesting within the project boundary. The annual reports must be provided to FWS.

The Commission reserves the right to require changes to the approved species protection plans. The approved species protection plans, as modified in this article, must not be amended without prior Commission approval. Upon Commission approval, the licensee must implement the plan revisions.

Article 405. *Invasive Aquatic Species Educational Signage*. Within one year of license issuance, the licensee must install "*Stop Aquatic Hitchhikers!*" signs to educate visitors at the Catawba-Wateree Project on preventing the transport of non-native invasive aquatic species at the licensed project boat ramps. To ensure use of the current signage design from the "*Stop Aquatic Hitchhikers!*" campaign or alternative signage developed by resource agencies, the signs must be installed after consultation with the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Department of Environment and Natural Resources, and the South Carolina Department of Natural Resources. The signs must: (1) measure at least 2 x 3 feet; (2) display the trademarked logo of the "*Stop Aquatic Hitchhikers!*" campaign; and (3) specify the procedures to be used in cleaning all recreational equipment before and after boat launching.

Within 60 days of completion of the installation of the signs, the licensee must file with the Commission photographs of the installed signs, as well as a table or map identifying the locations of all sites where the signs have been installed.

Article 406. *Public Information*. Within 60 days of license issuance, the licensee must provide the following information in the manner specified, to support the safe and effective public use of the project's resources:

(1) Normal minimum elevation, normal target elevation, and normal maximum elevation, actual reservoir level, 7-day reservoir level history, 13-month reservoir level history, near-term 3-day and 30-day reservoir level projections, points of contact for additional information, and special messages must be posted via the Internet.

(2) Special messages and actual levels for each project reservoir must be available via the licensee's toll-free telephone system.

(3) The annual scheduled flow release calendar must be posted on the licensee's website showing all scheduled flow releases from the Bridgewater, Oxford, Wylie, and Wateree Developments and into the Great Falls Long Bypassed Reach and Great Falls Short Bypassed Reach. The calendar must indicate the

dates, times of day, and expected minimum release rates of the scheduled releases.

(4) Two-day flow release forecasts must be posted on the licensee's website and via the licensee's toll-free telephone system for the Oxford, Wylie, and Wateree Developments and the Great Falls Long Bypassed Reach and Great Falls Short Bypassed Reach. The licensee must provide 3-day flow release forecasts on its website and via its toll-free telephone system for the Bridgewater Development.

Article 407. *Recreation Management Plan.* Within one year of license issuance, the licensee must file with the Commission for approval, a Recreation Management Plan (RMP) for the Catawba-Wateree Hydroelectric Project that includes the following:

(1) Provisions for the continued operation and maintenance of the existing project recreation sites described on pages E5-11 through E5-57 of the license application, and clarified in additional information filed on February 13, 2015 and June 12, 2015, as follows:

(a) At the Bridgewater Development: Black Bear Access Area, Hidden Cove Access Area, Canal Bridge Access Area, Linville Canoe/Kayak Access Area, Bridgewater Access Area, and Bridgewater Canoe Portage;

(b) At the Rhodhiss Development: Johns River Access Area, Huffman Bridge Access Area, Castle Bridge Access Area, Conley Creek Access Area (Sawmills Veterans Memorial Park), Rhodhiss Access Area, and Rhodhiss Canoe Portage;

(c) At the Oxford Development: Gunpowder Access Area, Lovelady Access Area, Wittenberg Access Area, Long Shoals Access Area, Dusty Ridge Access Area, Oxford Access Area, and Oxford Canoe Portage;

(d) At the Lookout Shoals Development: Lookout Shoals Access Area and Sharon Access Area;

(e) At the Cowans Ford Development: Buffalo Shoals Access Area, Long Island Access Area, Island Point Access Area, Stumpy Creek Access Area, Pinnacle Access Area, McCrary Creek Access Area, Marshall Fishing Area, Slanting Bridge Access Area, Hagers Creek Access Area, Little Creek Access Area, Beatty's Ford Access Area, Ramsey Creek Access Area, and McGuire Fishing Area;

(f) At the Mountain Island Development: Neck Road Access Area and Riverbend Access Area;

(g) At the Wylie Development: Mountain Island River Park, Mountain Island Tailrace Fishing Area, South Point Access Area, Allen Fishing Area, Copperhead Access Area, Buster Boyd Access Area, Allison Creek Access Area, Ebenezer Park Access Area, Nivens Creek Access Area, and Fort Mill Access Area;

(h) At the Fishing Creek Development: Springs Park Access Area and Fishing Creek Access Area;

(i) At the Rocky Creek and Cedar Creek Development: Stumpy Pond Access Area and Debutary Creek Access Area; and

(j) At the Wateree Development: Cedar Creek Access Area, Wateree Creek Access Area, Taylors Creek Access Area, June Creek Access Area, Colonel's Creek Access Area, White Oak Creek Access Area, Buck Hill Access Area, and Lugoff Access Area.

(2) Provisions for the construction, operation, and maintenance of the following new recreation sites or enhancements to existing recreation sites proposed in section 10.1.1 of the Comprehensive Relicensing Agreement filed December 29, 2006:

(a) At the Bridgewater Development: (1) restrooms, shade trees, shoreline buffer, trails, primitive camping sites, picnic facilities, and either a fishing pier or bank fishing trail, if suitable conditions for a fishing pier are not available, at the existing Black Bear Access Area; (2) two boat ramps for trailered motor boats, one courtesy dock, lighted and paved parking area, an access road, and a vault toilet at a new, approximately 10-acre New Linville Access Area; (3) picnic facilities, shade trees, restrooms, and conversion of the existing boat ramp to a canoe/kayak launch site at the existing Linville Access Area; (4) parking, picnic facilities, overlooks, and a bank fishing trail at a new, approximately 10-acre Pocket Park at Dam for Lake James Loop Trail; (5) restrooms, a boat ramp for trailered boats, additional parking, and picnic facilities at the existing Bridgewater Access Area; and (6) canoe/kayak access with approximately 10 gravel parking spaces at a new, 1 to 3-acre Muddy Creek Access Area;

(b) At the Rhodhiss Development: (1) a boat ramp for trailered boats and approximately 10 gravel parking spaces at the Johns River at a new, approximately 10-acre Corpening Bridge Access Area; (2) two additional miles of trail at the existing Conley Creek Access Area (Sawmills Veterans Park); (3) restrooms at the existing Rhodhiss Access Area; and (4) restrooms at the existing Castle Bridge Access Area;

(c) At the Oxford Development: (1) two new swimming areas, one each at Wittenburg Access Area and Oxford Access Area; (2) an approximately 15-acre expansion and addition of restrooms, picnic facilities, and paved parking at the existing Wittenburg Access Area; (3) an approximately 1-mile-long trail and restrooms at the existing Dusty Ridge Access Area; (4) a fishing pier at the existing Lovelady Access Area or another location on Lake Hickory in Caldwell County if a suitable location at Lovelady Access Area is not feasible; (5) canoe/kayak access with gravel parking at the existing Long Shoals Access Area; (6) a primitive campground, paved parking, picnic facilities, bank fishing, trails, and restrooms at the existing Oxford Access Area; (7) public fishing area facilities at a new Oxford Tailrace Fishing Area; and (8) improved gravel parking and an extended Oxford Dam Canoe Portage trail to Riverbend Park;

(d) At the Lookout Shoals Development: (1) a boat ramp for trailered boats, parking, restrooms, and primitive campground at a new, approximately 1 to 5-acre Upper Lookout Shoals Access Area; (2) restrooms at the existing Lookout Shoals Access Area; (3) public fishing area facilities at a new Lookout Shoals Tailrace Fishing Area; and (4) a new Lookout Shoals Dam Canoe Portage trail around Lookout Shoals Dam with canoe/kayak access and signage;

(e) At the Cowans Ford Development: (1) picnic facilities, a fishing pier, swimming area, restrooms, and shade trees at the existing Beatty's Ford Access Area; (2) additional paved parking, trails, bank fishing, picnic facilities, and if site conditions allow, a fishing pier, at the existing Hagers Creek Access Area; (3) a fishing pier, picnic facilities, a trail, restrooms, and additional paved parking at the existing Stumpy Creek Access Area; (4) restrooms, a fishing pier, paved parking, and a picnic shelter at the existing Little Creek Access Area; (5) trails, bank and/or pier fishing, picnic facilities, a swimming area, boat access facilities, and restrooms at the existing Island Point Access Area; and (6) a portage trail, a reservoir overlook with benches, and approximately 10 gravel parking spaces at the new Cowans Ford Dam Portage and Overlook;

(f) At the Mountain Island Development: (1) canoe/kayak access and approximately 10 gravel parking spaces at a new, approximately 2-acre Highway 73 Access Area; (2) canoe/kayak access and approximately 10 gravel parking spaces at a new Lucia Access Area; (3) restrooms, bank fishing, a swimming area, and fishing pier at the existing Riverbend Access Area; and (4) canoe/kayak access, a portage trail, and signage at the new Mountain Island Dam Canoe Portage;

(g) At the Wylie Development: (1) canoe/kayak access and approximately 10 gravel parking spaces at a new Dutchmans Creek Access Area; (2) trails, a fishing pier, bank fishing area, picnic facilities, a swimming area, restrooms, and additional paved parking at the existing South Point Access Area; (3) restrooms at the existing Buster Boyd Access Area; (4) a 48-acre expansion and the addition of restrooms, picnic facilities, paved parking, and approximately 1-mile-long trail at the existing Allison Creek Access Area; (5) a bank fishing trail with fishing stations, picnic facilities, swimming area, restrooms, and parking at a new, approximately 17-acre Rock Hill Park; and (6) restrooms and picnic facilities at the existing Fort Mill Access Area;

(h) At the Fishing Creek Development: (1) a fishing pier, additional paved parking, picnic facilities, restrooms, and a swimming area, if feasible, at the existing Fishing Creek Access Area; and (2) a platform, pier, or bank fishing trail and paved parking at a new Fishing Creek Tailrace Fishing Area;

(i) At the Great Falls-Dearborn Development: (1) a canoe/kayak launch, restrooms, and gravel parking area at a new, 1 to 5-acre Highway 200 Bridge Access Area; (2) a new Great Falls Diversion Dam Portage to provide boater access to the Great Falls Long Bypassed Reach; (3) a new Great Falls Headworks Portage to provide boater access to the Great Falls Short Bypassed Reach; (4) a new Great Falls Headworks-to-Cedar Creek Reservoir Portage along the Great Falls Short Bypassed Reach to Cedar Creek Reservoir; and (5) a canoe/kayak launch at the new, 1 to 7-acre Lower Great Falls Reservoir Canoe/Kayak Launch;

(j) At the Rocky Creek and Cedar Creek Development: (1) a canoe/kayak access with approximately 10 gravel parking spaces at a new, approximately 1 to 5-acre Mudcat Inn Access Area; and (2) a new state park on islands associated with the Dearborn-Great Falls and Rocky Creek-Cedar Creek Development, totaling approximately 900 acres, that is consistent with public day-use of the project lands; and

(k) At the Wateree Development: (1) a fishing pier, picnic facility, restrooms and approximately 10 gravel parking spaces at the existing Wateree Creek Access Area; (2) a swimming area, paved parking, restrooms, trails, bank and pier fishing, picnic facilities, and trailered boat access at the new, approximately 100-acre Molly Creek Access Area; (3) a courtesy dock, swimming area, restrooms, picnic shelter, and additional paved parking at the existing Colonels Creek Access Area; (4) an approximately 3-acre expansion (total of approximately 10 acres) and the addition of approximately 10 gravel parking spaces at the existing Taylors Creek

Access Area; and (5) restrooms and improve gravel parking at the existing Lugoff Access Area.

(3) For each measure identified in item 2, above, the plan must include conceptual drawings and specifications, and a schedule for implementing the measure, grouped in 5-year increments. All measures must be completed within 20 years following Commission approval of the RMP.

(4) Provisions to evaluate the need for and, if necessary, implement improvements to the portage trails and signage at the Bridgewater Access Area and Rhodhiss Dam Canoe Portage.

(5) Provisions for wildlife viewing facilities (*e.g.*, wildlife viewing platforms) at selected project recreation sites within the project boundary to be constructed within 20 years following Commission approval of the RMP, as discussed in section 10.5 of the Comprehensive Relicensing Agreement. At a minimum, the RMP must include: (1) the methods and criteria used to select the recreation sites to provide wildlife viewing facilities; (2) an accounting of the project recreation sites where wildlife viewing facilities will be provided, if any; and (3) conceptual drawings and specifications, cost estimates, and a schedule for implementing the measure(s).

(6) A provision to provide informal public access at the Lake Cornelius portion of Cowans Ford Development within 10 years of license issuance, developed after consultation with the Town of Cornelius, North Carolina.

(7) Maps clearly identifying all existing and proposed recreation sites in relation to the Catawba-Wateree Project boundary and indicating the project boundary modifications necessary to enclose all new and existing project recreation facilities in the project boundary.

(8) Procedures for temporary closure of project recreation sites; a discussion of how the needs of the disabled were considered in the planning and design of the recreation facilities and public access; a discussion of how low impact development practices were considered in the planning and design of the recreation facilities; a description of the signage program at the project recreation sites; and a provision for trash removal from the project recreation facilities.

(9) A provision to file, with the Commission, biennial reports documenting the progress made on completing the recreation enhancements under the Commission-approved RMP.

(10) A provision to review, every 10 years following license issuance, the project's recreation needs. Following the review, the licensee must file with the Commission, for approval a report that includes: (1) a recreation use and needs assessment; (2) identification of any additional public recreation facility needs at the project; and (3) a discussion of the need for filing a revised RMP. Following Commission approval of the report, if required, the licensee must file with the Commission for approval, a revised RMP that describes in detail any changes to the existing RMP. If the revised RMP specifies additional recreational facilities to be developed, the licensee must provide conceptual drawings, construction schedules, cost estimates, and a provision to construct, operate, and maintain or provide for the construction, operation, and maintenance of, the additional recreation facilities for the term of the license. The recreation use and needs assessment and revision to the RMP must be developed after consultation with, at a minimum, the North Carolina Department of Environment and Natural Resources (North Carolina DENR), the North Carolina Wildlife Resources Commission (North Carolina WRC), the South Carolina Department of Parks, Recreation and Tourism (South Carolina DPRT), the South Carolina Department of Natural Resources (South Carolina DNR), and American Whitewater.

(11) A statement that discusses how the RMP was developed in coordination with the Sturgeon Protection Plan (Article 403), Species Protection Plans (Article 404), and the Historic Properties Management Plan (Article 410).

The RMP must be developed after consultation with North Carolina DENR, North Carolina WRC, South Carolina DPRT, South Carolina DNR, and American Whitewater. The licensee must include within the plan documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and make recommendations before filing the plan with the Commission. If a licensee does not adopt a recommendation, the filing must include the licensee's reason, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Land-disturbing or land-clearing activities must not begin until the licensee is notified by the Commission that the plan is approved. Upon Commission approval, the licensee must implement the plan, including any changes required by the Commission.

Article 408. *Evaluation of Great Falls Reservoir Boating Safety*.

Within one year of license issuance, the licensee must file with the Commission, for approval, a Boater Safety Plan that includes, at a minimum: (1) the results of a site-specific evaluation of safety concerns at Great Falls Diversion Dam, the Great Falls

Headworks, and Great Falls-Dearborn Dam; (2) the results of an evaluation of Great Falls Reservoir and bypassed reaches boating safety and associated recommendations; and (3) a discussion of any updates that are needed to the licensee's Commission-approved Public Safety Plan for the Great Falls-Dearborn Development if boating safety devices are determined necessary, including a schedule for implementing the boating safety devices.

The Boater Safety Plan must be developed after consultation with the South Carolina Department of Parks, Recreation and Tourism, the South Carolina Department of Natural Resources, and American Whitewater. The licensee must include within the plan documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and make recommendations before filing the plan with the Commission. If a licensee does not adopt a recommendation, the filing must include the licensee's reason, based on project-specific reasons.

The Commission reserves the right to require changes to the Boater Safety Plan. The prescribed recreation flows at the Great Falls-Dearborn Development, as required by Condition No. 1 of the South Carolina Department of Health and Environmental Control's water quality certification (in Appendix B), and construction of recreation amenities to support recreational boating at Great Falls Reservoir must not begin until the licensee is notified by the Commission that any needed updates to the licensee's Public Safety Plan are approved, and any necessary boating safety devices are installed at Great Falls Diversion Dam, the Great Falls Headworks, and Great Falls-Dearborn Dam. If flows are released at the Great Falls-Dearborn Development prior to the installation of any public safety measures, the licensee must notify the Commission as soon as possible, but no later than 10 days after each such release.

The Commission reserves the right to require changes to the Recreation Management Plan (RMP) required by Article 407 based on this evaluation. Upon Commission approval, the licensee must update the RMP required by Article 407, including any changes required by the Commission.

Article 409. *Shoreline Management Plan*. Upon license issuance, the licensee must implement the Catawba-Wateree Shoreline Management Plan (SMP) approved by the Commission on October 15, 2003 (105 FERC ¶ 62,027 (2003)), and amended under the prior license.[213] Within 6 months of license issuance, the licensee must file with the

[213] *See* 126 FERC ¶ 62,121 (2009); 123 FERC ¶ 62,040 (2008); 118 FERC ¶ 62,072 (2007); 116 FERC ¶ 62,008 (2006); and 111 FERC ¶ 62,252 (2005).

Commission for approval, an updated SMP incorporating the 2003 Commission-approved SMP, as amended, with the following modifications:

(1) A provision for addressing any licensee-requested authority to make changes to the SMP, Shoreline Classification Maps, or Shoreline Management Guidelines without prior Commission approval, along with an explanation of the type, nature, and scope of the licensee's authority to make such changes;

(2) A provision for addressing how and when shoreline reclassification requests, including identified mapping errors, will be filed with the Commission for approval; and

(3) A provision that every 10 years, the licensee must file a report describing whether or not revisions to the SMP, including the Shoreline Classification Maps and Shoreline Management Guidelines, are needed. The report must include an evaluation of the adequacy of the SMP and whether or not changes are warranted. If revisions are needed, the licensee may choose to either (a) provide a plan and schedule for filing the revision, or (b) file the revised SMP with the report (red-line documents are preferred so that plan modifications can be easily identified).

The licensee must file with the Commission for approval, the report and, if provided with the report, a revised SMP. The report/revised SMP must be developed after consultation with, at a minimum, the U.S. Fish and Wildlife Service, the North Carolina Department of Environment and Natural Resources, the North Carolina Wildlife Resources Commission, the South Carolina Department of Parks, Recreation, and Tourism, and the South Carolina Department of Natural Resources. The report/revised SMP must include documentation of consultation, copies of recommendations on the completed report/revised SMP after it has been prepared and provided to the agencies above, and specific descriptions of how the agencies' comments are accommodated by the report/revised SMP. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the report/revised SMP with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific reasons.

The updated SMP must include revised Shoreline Classification Maps that incorporate the proposed Shoreline Classification maps filed as part of Book 5, Volume 5 of the license application and their associated classifications and lake use restrictions proposed in Appendix J of the of the Comprehensive Relicensing Agreement filed on December 29, 2006. The revised maps must include and identify Commission-approved or required modifications[214] and any other changes made to protect newly discovered

[214] *See* 150 FERC ¶ 62,179 (2015); 150 FERC ¶ 62,046 (2015); 136 FERC ¶ *(continued ...)*

resources such as archeological or historic sites, threatened or endangered species, special concern species, or to correct any mapping errors since the SMP was approved in 2003. The filing must also include a detailed description of how the updated maps were developed and their accuracy level.

Within 90 days of license issuance, the licensee must file two separate sets of Geographic Information System (GIS) data in a georeferenced electronic file format (such as ArcView shape files, GeoMedia files, MapInfo files, or a similar GIS format) with the Secretary of the Commission, ATTN: OEP/DHAC. The data must include (a) polygon files of the project reservoir surface area including a separate polygon for the tailrace area, and (b) polyline file of the shoreline management classifications. The filing must be in CD or diskette format and must include polygon data that represents the surface area of each reservoir/tailrace, as shown on the project boundary exhibits, and polyline data that represents the linear extent of each shoreline classification segment as shown on maps in the SMP. A polygon GIS data file is required for the reservoir/ tailrace, with each reservoir separately identified. The attribute table for the reservoir/ tailrace must include at least the reservoir name, water elevation, and elevation reference datum. A polyline GIS data file is required for the shoreline classifications associated with each reservoir. The attribute table for each reservoir must include at least the reservoir name and management classification description for each polyline, consistent with the shoreline management plan.

All GIS data must be positionally accurate to ±40 feet in order to comply with National Map Accuracy Standards for maps at a 1:24,000 scale. The file name(s) must include: FERC Project Number, data description, date of this order, and file extension in the following format (P-2232, reservoir name polygon/or reservoir name shoreline polyline data, MM-DD-YYYY.SHP). The filing must be accompanied by a separate text file describing the spatial reference for the georeferenced data: map projection used (*i.e.*, UTM, State Plane, Decimal Degrees, etc.), the map datum (*i.e.*, North American 27, North American 83, etc.), and the units of measurement (*i.e.*, feet, meters, miles, etc.). The text file name must include: FERC Project Number, data description, date of this order, and file extension in the following format (P-2232, project reservoir/or shoreline classification metadata, MM-DD-YYYY.TXT).

The licensee must update the Shoreline Management Guidelines to incorporate the proposed guidelines in Appendix J of the Comprehensive Relicensing Agreement filed on December 29, 2006, as well as include and identify any additional Commission required modifications[215] since the SMP was approved in 2003.

62,069 (2011); 107 FERC ¶ 62,226 (2004); 107 FERC ¶ 62,172 (2004); and 107 FERC ¶ 62,127 (2004).

[215] *See* letter from R. Fletcher, Chief, Land Resources Branch, Division of *(continued ...)*

The Commission reserves the right to require changes to the SMP, including the Shoreline Classification Maps and Shoreline Management Guidelines. Upon Commission approval, the licensee must implement the updated plan, including any changes required by the Commission.

Article 410. *Programmatic Agreement and Historic Properties Management Plan*. The licensee must implement the "Programmatic Agreement Among the Federal Energy Regulatory Commission, the North Carolina State Historic Preservation Officer, and the South Carolina State Historic Preservation Officer for Managing Historic Properties that May be Affected by Issuing a New License to Duke Energy Carolinas, LLC for the Continued Operation of the Catawba-Wateree Hydroelectric Project in Burke, McDowell, Caldwell, Catawba, Alexander, Iredell, Mecklenburg, Lincoln, and Gaston Counties, North Carolina and in York, Lancaster, Chester, Fairfield, and Kershaw Counties, South Carolina," executed on September 26, 2012, by the North Carolina State Historic Preservation Officer (SHPO) and on September 17, 2012, by the South Carolina SHPO, and including but not limited to the Historic Properties Management Plan (HPMP) for the project. The Commission reserves the authority to require changes to the HPMP at any time during the term of the license. If the Programmatic Agreement is terminated, the licensee must continue to implement the provisions of its approved HPMP.

Article 411. *Use and Occupancy*. (a) In accordance with the provisions of this article, the licensee must have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee must also have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee must take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if

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Hydropower Administration and Compliance, FERC, Washington, D.C., to E.M. Oakley, Duke Energy Carolinas, LLC, Charlotte, North Carolina, December 15, 2014.

necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee must require multiple use and occupancy of facilities for access to project lands or waters. The licensee must also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee must: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee must file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is 5 acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must file a letter with the Commission, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Commission's authorized representative, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee must consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer;

(2) Before conveying the interest, the licensee must determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value;

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed must not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee must take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner

that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee must not unduly restrict public access to project waters;

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project must be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article must apply to any part of the public lands and reservations of the United States included within the project boundary.

(I) The licensee must serve copies of any Commission filing required by this order on any entity specified in the order to be consulted on matters related to that filing. Proof of service these entities must accompany the filing with the Commission.

(J) This order constitutes final agency action. Any party may file a request for rehearing of this order within 30 days from the date of its issuance, as provided in section 313(a) of the FPA, 16 U.S.C. § 825*l* (2012), and section 385.713 of the Commission's regulations, 18 C.F.R. § 385.713 (2015). The filing of a request for rehearing does not operate as a stay of the effective date of this license or of any other date specified in this order. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.

Ann F. Miles
Director
Office of Energy Projects

Form L-3
(October, 1975)

FEDERAL ENERGY REGULATORY COMMISSION
TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED MAJOR PROJECT AFFECTING NAVIGABLE WATERS OF THE UNITED STATES

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project area and project works shall be in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Article 4. The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and supervision of the Regional Engineer, Federal Energy Regulatory Commission, in the

region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him such information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and shall notify him of the date upon which work with respect to any alteration will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall submit to said representative a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of any such alterations to the project. Construction of said alterations or any feature thereof shall not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights or occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a nonpower licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall

make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

Article 7. The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 10. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the

interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 11. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

Article 12. The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail

to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 14. In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 17. The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable

modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 21. Material may be dredged or excavated from, or placed as fill in, project lands and/or waters only in the prosecution of work specifically authorized under the license; in the maintenance of the project; or after obtaining Commission approval, as appropriate. Any such material shall be removed and/or deposited in such manner as to reasonably preserve the environmental values of the project and so as not to interfere with traffic on land or water. Dredging and filling in a navigable water of the United States shall also be done to the satisfaction of the District Engineer, Department of the Army, in charge of the locality.

Article 22. Whenever the United States shall desire to construct, complete, or improve navigation facilities in connection with the project, the Licensee shall convey to the United States, free of cost, such of its lands and rights-of-way and such rights of

passage through its dams or other structures, and shall permit such control of its pools, as may be required to complete and maintain such navigation facilities.

Article 23. The operation of any navigation facilities which may be constructed as a part of, or in connection with, any dam or diversion structure constituting a part of the project works shall at all times be controlled by such reasonable rules and regulations in the interest of navigation, including control of the level of the pool caused by such dam or diversion structure, as may be made from time to time by the Secretary of the Army.

Article 24. The Licensee shall furnish power free of cost to the United States for the operation and maintenance of navigation facilities in the vicinity of the project at the voltage and frequency required by such facilities and at a point adjacent thereto, whether said facilities are constructed by the Licensee or by the United States.

Article 25. The Licensee shall construct, maintain, and operate at its own expense such lights and other signals for the protection of navigation as may be directed by the Secretary of the Department in which the Coast Guard is operating.

Article 26. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 27. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 28. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

APPENDIX A

Water Quality Certificate Conditions for the Catawba-Wateree Project Issued by the North Carolina Department of Environment and Natural Resources – Division of Water Quality on November 14, 2008

Conditions of Certification:

1. No waste, spoil, solids, or fill of any kind shall occur in wetlands, waters, or riparian areas beyond the footprint of the impacts depicted in the Certification. All construction activities, including the design, installation, operation, and maintenance of sediment and erosion control Best Management Practices, shall be performed so that no violations of state water quality standards, statutes, or rules occur.

2. Sediment and erosion control measures shall not be placed in wetlands or waters to the maximum extent practicable. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, they shall be removed and the natural grade restored within six months of the date that the Division of Land Resources has released the project.

3. The Applicant shall identify and report in writing existing and proposed consumptive uses to NCDWQ and the N.C. Division of Water Resources (NCDWR). The Applicant shall report the existing or projected (as appropriate) average consumptive withdrawal and maximum capacity for each withdrawal. The applicant shall report existing consumptive uses to NCDWQ and NCDWR within 60 days of the acceptance of the License and shall report proposed new or expanded consumptive uses to NCDWQ and NCDWR within 30 days of receiving a request for the proposed new or expanded withdrawal and before submitting any requests to FERC.

4. This Certification does not grant or affirm any property right license or privilege in any waters or any right of use in any waters. This Certification does not authorize any person to interfere with the riparian rights, littoral rights or water use rights of any other person, and this Certification does not create any prescriptive right or any right of priority regarding any usage of water. No person shall interpose this Certification as a defense in any action respecting the determination of riparian or littoral rights or other water use rights. No consumptive user is deemed by virtue of this Certification to possess any prescriptive or other right of priority with respect to any other consumptive user regardless of the quantity of the withdrawal or the date on which the withdrawal was initiated or expanded. This Certification issues on the express understanding of DENR that, pursuant to Federal Power Act section 27, 16 U.S.C. § 821, the License does not establish or determine a proprietary right to any use of

water. It establishes the nature of the use to which a proprietary right may be put under the Federal Power Act.

Continuing Compliance:

5. Duke Energy Carolinas, Inc.[216] shall conduct its activities in a manner consistent with State water quality standards and any other appropriate requirements of State law and federal law. If the Division determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions am necessary to assure compliance, the Division may reevaluate and modify this Certification to include conditions appropriate to assure compliance with such standards and requirements in accordance with 15A NCAC 2H.0507(d). Before modifying the Certification, the Division shall notify Duke Energy Carolinas, Inc. and the Federal Energy Regulatory Commission, provide public notice in accordance with 15A NCAC 2H.0503 and provide opportunity for public hearing in accordance with 15A NCAC 2H.0504. Any new or revised conditions shall be provided to Duke Energy Carolinas, Inc. in writing, shall be provided to the Federal Energy Regulatory Commission for reference in any Permit or License issued by that agency and shall also become conditions of the FERC License for the project.

Mitigation:

6. Compensatory mitigation shall be done as outlined in the Catawba-Wateree Comprehensive Relicensing Agreement, Signature Copy, Rev. l, dated December 22, 2006 and as outlined below. DWQ shall be copied on the property transfer, lease, and any related conservation easements for the property outlined in the Comprehensive Relicensing Agreement.

[216] On March 23, 2007, the Commission approved the transfer of the license for the Catawba-Wateree Project from Duke Energy Corporation to Duke Energy Carolinas LLC. *See Duke Energy Corporation*, 118 FERC ¶ 62,223 (2007).

Other Conditions:

7. The revised Quality Assurance Project Plan (QAPP),[217] dated October 20, 2008 (Revision #0), shall be followed while the FERC license is valid. If changes are proposed to the QAPP, they shall be submitted to DWQ for review and written approval before any changes are implemented.

8. The Catawba-Wateree Comprehensive Relicensing Agreement, Signature Copy, Rev. 1, dated December 22, 2006 (Comprehensive Relicensing Agreement or CRA) is hereby incorporated into this Certification by reference. If Duke Energy Carolinas believes that any items of that Agreement are not pertinent to water quality, then they shall so notify DWQ in writing for DWQ's written concurrence. In particular, the following sections of the Comprehensive Relicensing Agreement are hereby incorporated by reference into this Certification –

    a. 2.0 Reservoir Elevation Agreements
    b. 4.0 Habitat Flow Agreements
    c. *As per discussion in the order, this item dealing with Sections 4.5 and 4.6 of the CRA regarding compensatory mitigation has been omitted*
    d. 6.0 Low Inflow Protocol Agreement
    e. 7.0 Maintenance and Emergency Protocol Agreements
    f. 13.0 Water Quality Agreements
    g. 15.0 Gauging and Monitoring Agreements, Sections 15.1 through 15.5
    h. Appendix A: Proposed License Articles Sections A-1.0, A-3.0, A-4.0, A-5.0 and A-6.0[218]
    i. Appendix A: Proposed License Articles Section A-2.0 for Maximum Flows, Wylie High Inflow Protocol, Flows Supporting Public Water Supply and Industrial Processes, and Flow and Water Quality Implementation Plan.
    j. Appendix C: Low Inflow Protocol (LIP) for the Catawba-Wateree Project
    k. Appendix D: Maintenance and Emergency Protocol (MEP) for the Catawba-Wateree Project
    l. Appendix F: Water Quality Monitoring Plan

[217] North Carolina DWQ, in a letter dated January 14, 2009, concurred with, and made part of the record for the project, Duke Energy's clarification that that reference to the QAPP should be to the Quality Assurance Procedures Plan. *See* North Carolina DWQ's January 14, 2009 letter attached to Duke Energy's letter filed with the Commission on February 2, 2009.

[218] The proposed license articles, listed in items h and i of Condition 8 of the water quality certification, are included in Appendix E of this order, and have been modified, as necessary, to facilitate the Commission's administration of the license.

m. Appendix L: Flow and Water Quality Implementation Plan

As noted above, other sections of the CRA are also incorporated, unless Duke Energy Carolinas notifies DWQ that they are not pertinent and DWQ concurs in writing.[219]

9. The Division shall be notified in writing within five (5) days of any deviations to the Comprehensive Relicensing Agreement proposed flow rates and lake level fluctuations. Decreased flow shall be restored as soon as practical to the written satisfaction of DWQ.

[219] North Carolina DWQ, in a letter dated January 14, 2009, concurred with, and made part of the record for the project, Duke Energy's clarification that North Carolina DWQ's water quality certification should be based only on those provisions in items a. through m. pertinent to North Carolina. *See* North Carolina DWQ's letter attached to Duke Energy's letter filed with the Commission on February 2, 2009.

APPENDIX B

Water Quality Certificate Conditions for the Catawba-Wateree Project Issued by the South Carolina Department of Health and Environmental Control on February 12, 2015

Conditions of Certification:

1. The applicant, Duke Energy Carolinas, LLC shall operate the Catawba-Wateree Hydroelectric Project in accordance with the following parts of the Comprehensive Relicensing Agreement dated December 22, 2006 (CRA). The following portions, as applicable to South Carolina Developments, are hereby incorporated into this 401 Certification by reference:

   CRA – Resource Agreements:
   - 2.0 Reservoir Elevation Agreements (excluding subsection 2.2)
   - 3.0 Recreation Flow Agreements (excluding subsection 3.3)
   - 4.0 Habitat Flow Agreements (included are only the subsections listed here)*****
     - 4.1 Habitat Flow Amounts and Schedules
   - 6.0 Low Inflow Protocol (LIP) Agreements (excluding subsection 6.6)
   - 7.0 Maintenance and Emergency Protocol (MEP) Agreements
   - 11.0 Species Protection Agreements (included is subsection 11.1 only)
   - 13.0 Water Quality Agreements
   - 15.0 Gaging and Monitoring Agreements (15.1 – 15.5 only, 15.6 Groundwater Monitors is excluded)

   CRA – Appendices:
   - A: Proposed License Articles[220]
     - A-1.0 Reservoir Elevation Articles
       - Reservoir Elevations
       - Spring Reservoir Level Stabilization Program
     - A-2.0 Flow Articles
       - Recreation Flows
       - Minimum Flows
       - Wylie High Inflow Protocol (WHIP)
       - Flows Supporting Public Water Supply and Industrial Processes

[220] The proposed license articles listed in this section of the water quality certification are included in Appendix E of this order, and have been modified, as necessary, to facilitate the Commission's administration of the license.

Flow and Water Quality Implementation Plan (FWQIP)
A-3.0 LIP Article
LIP for the Catawba-Wateree Hydroelectric Project
A-4.0 MEP Article
MEP for the Catawba-Wateree Hydroelectric Project
A-5.0 Water Quality Article
Water Quality Monitoring Plan (WQMP)
A-6.0 Gaging and Monitoring Article
Flow and Reservoir Elevation Monitoring
Funding for USGS Streamflow Gages

C: LIP for the Catawba-Wateree Hydroelectric Project
D: MEP for the Catawba-Wateree Hydroelectric Project
F: WQMP
L: FWQIP

***** *Excluded are all subsections under "4.0 Habitat Flow Agreements" not listed above*

2. The applicant, Duke Energy Carolinas, LLC shall follow the Quality Assurance Procedures Plan; Revision #0; January 6, 2009 (QAPP) while conducting any and all water quality monitoring for the purpose of maintaining compliance with state water quality standards and meeting requirements of the FERC license. Any changes to the QAPP shall be submitted to the SCDHEC for review and written approval before being implemented.

3. The applicant, Duke Energy Carolina, LLC shall provide for upstream fish passage and downstream fish passage and protection at the Catawba-Wateree Hydroelectric Project in South Carolina, consistent with the United States Fish and Wildlife Service's (USFWS) June 22, 2009 fishway prescription.

4. Duke Energy will provide to the Department, American Rivers, and the South Carolina Coastal Conservation League a copy of the annual report documenting flow releases from the Wateree Development occurring between February 15 and May 15 during the preceding calendar year.

5. Ten years after the Flow and Water Quality Implementation Plan (as described in CRA Appendix A) modifications are completed at the Wateree Development, Duke energy shall consult with the USFWS, the National Marine Fisheries Service, and the South Carolina Department of Natural Resources on proposed license articles for Wateree Spring Stable Flow Periods and Wateree Floodplain Inundation. If Duke Energy and these agencies reach consensus on the wording of proposed license articles, Duke Energy shall: (i) provide notice to all CRA Parties advising them of the proposed license articles and Duke Energy's intent to file them with the FERC; and

(ii) file the proposed license articles with the FERC for approval as an amendment to the New License. Duke Energy will provide to the Department, American Rivers, and the South Carolina Coastal Conservation League notices of possible New License amendments that it is required to give all parties to the CRA by CRA Sections 4.8.6 and 4.9.2.

6. The applicant, Duke Energy Carolinas, LLC shall take all necessary measures during Catawba-Wateree Hydroelectric Project facility operation and maintenance to prevent fuel, oil, tar, trash, debris, and other pollutants from entering the adjacent waters or wetlands.

APPENDIX C

U.S. Department of the Interior, Fish and Wildlife Service Fishway Prescription for the Catawba-Wateree Hydroelectric Project (No. 2232), June 22, 2008

General Terms and Conditions for Fishways:

The term "Fishway" is used as defined by statute. Within this final prescription: "Trap, Sort, & Transport Facility" is used to identify the fishway prescribed for passage of adult anadromous American shad and adult anadromous blueback herring at the Wateree Development; "Eelway" is used to identify the fishways prescribed for the passage of American eel at the Project. Pursuant to §18 of the FPA [Federal Power Act], the following measures shall be incorporated into the Project license to mitigate for continuing Project operational effects to diadromous fisheries resources, and to ensure the effectiveness of the fishways pursuant to Section 1701(b) of the 1992 National Energy Policy Act (P.L. 102-0486, Title XVII, 106 Stat. 3008).

1. Fishways shall be constructed, operated, and maintained at the Licensee's expense to provide safe, timely, and effective passage for American shad, blueback herring, and American eel.

2. Fishways for anadromous Alosines at the Wateree Development shall commence operation no later than January 1, 2018. The Licensee shall notify, and obtain prior approval from the USFWS [U.S. Fish and Wildlife Service] for any extensions of time required to comply with the provisions set out in the Prescription for Fishways. A detailed schedule and timeline for work required shall be developed in coordination with the USFWS.

3. Fishways shall be constructed, maintained and operated, at the Licensee's expense to provide safe, timely and effective passage for American shad, blueback herring, and American eel. Fishways shall be operated and maintained throughout the upstream and downstream migration periods for the target species. Although subject to modification based on annual monitoring of fish runs, the initial migration periods for diadromous target species are as follows:

Target Species	Upstream Migration Season
American shad	March 1 – May 15
Blueback herring	March 1 – May 15
American eel	October 1 – June 30

4. The Licensee shall keep the Fishways in proper order and shall keep fishway areas clear of trash, logs, and material that would hinder safe or timely fish passage. Necessary maintenance shall be performed sufficiently in advance of a migratory period to assure that Fishways can be tested and inspected, and will operate effectively prior to and during the migratory periods. In consultation with the USFWS, the Licensee shall develop a Fishway operation and maintenance plan describing the anticipated operational protocols, maintenance, a maintenance schedule, and contingencies for the Trap, Sort & Transport Facility at the Wateree Development and for Eelways at the Catawba – Wateree Project. The plan shall be submitted to the USFWS no later than October 1, 2017 (90 days prior to commencement of operations on January 1, 2018), for final review and approval. Upon such approval, the plan containing the consultation comments of the USFWS shall be submitted to the Commission for approval.

5. The Licensee shall provide personnel of the Department, and other government resource agencies' designated representatives, access to the Project and to pertinent Project records for the purpose of inspecting the Fishways to determine compliance with the fishway prescriptions and for general evaluation and overview.

6. The Licensee shall develop, in consultation with the USFWS, all functional and final design plans, construction schedules, and any hydraulic model or other studies for the Trap, Sort & Transport Facility at the Wateree Development by December 31, 2015. The Licensee shall develop, in consultation with the USFWS, all Siting Study plans six months prior to installation for each successive American eel ramp/trap Eelways used for the Eelway Siting Studies beginning with the issuance of the license.

7. The Licensee shall develop plans for, and conduct effectiveness studies, in consultation with the USFWS on both, the upstream Trap, Sort & Transport Facility and the Eelways at the Catawba-Wateree Project. The plans for effectiveness studies shall be submitted to the USFWS for review and comment no later than October 1, 2017 (90 days prior to commencement of operations on January 1, 2018), and prior to being filed for approval by the Commission. Effectiveness studies (e.g., usefulness of attraction flows to increase capture of target fish and determination of target fish mortality associated with handling and transportation) shall be conducted by the Licensee during the first three years of operations (operation to commence by January 1, 2018), provided sufficient numbers of fish, as determined by USFWS are available to do so. Information from the effectiveness studies shall be used to improve effectiveness of the Trap, sort, & Transport Facility and Eelways. The results of effectiveness studies shall be submitted to the

USFWS for review and comment no later than 60 days prior to being filed for approval by the Commission. If the Licensee disagrees with any of the comments and recommendations from the USFWS, it shall provide an explanation in its filing with the Commission.

I. Final Prescription for Fishways for Anadromous Alosines

Upstream Passage: Trap, Sort, and Transport Facility at Wateree Dam

1) The Licensee at its own expense shall construct, operate, and implement a Fishway at the Wateree Development to annually capture American shad and blueback herring for relocation in upstream reaches. In the form of a Trap, Sort, & Transport Facility, this Fishway shall consist of a fish trap, a hopper, sorting and holding tanks, and appropriate transport trucks. The fish trap and a stainless steel or aluminimum hopper shall be installed on the downstream side of the Wateree Dam. The hopper shall discharge into a 5,000-gallon sorting tank that will gravity feed two additional 5,000-gallon tanks. Each holding tank shall be equipped with a water supply and aeration system. The holding tanks shall gravity feed into 1,000-gallon round tanks on trucks. The conceptual design of the Trap, Sort, & Transport Facility may be modified upon request by the Licensee. Modified designs are to be developed on consultation with the USFWS. Final designs shall be submitted to the USFWS for review and comment.

2) Beginning with the first year of operation of the Trap, Sort, & Transport Facility in 2018, anadromous American shad and blueback herring spawning adults captured in the fishway shall be relocated upstream of the dam in Lake Wateree. Relocation into Lake Wateree shall continue annually until the combined total of American shad and blueback herring spawning adults entering the Fishway equal or exceed 10,000 fish. In all subsequent years, adult spawning American shad and blueback herring shall be relocated to upstream reaches of the Catawba – Wateree River Basin within South Carolina.

3) A special handling protocol shall be developed by the Licensee in consultation with the National Marine Fisheries Service for any shortnose sturgeon that may enter the Trapping Facility. Shortnose sturgeon at this time shall not be passed upstream into Lake Wateree and shall be released downstream as specified by the National Marine Fisheries Service. The USFWS reserves its authority at this time to prescribe passage for the shortnose sturgeon.

Downstream Passage

1) The USFWS reserves its authority to prescribe downstream passage facilities for American shad and blueback herring species. Review of the existing turbines,

bypasses, spill gates, and spillways at the lower Catawba-Wateree developments indicate downstream passage will be possible for out-migrating juveniles without directed fishway facilities (Duke 2005). Downstream passage for adults is not warranted due to their semelparity. The Santee Accord [Santee River Basin Accord for Diadromous Fish Protection, Restoration, and Enhancement, filed on June 18, 2008] includes provisions to study downstream passage efficiency for out-migrating juveniles.

II. Final Prescription for Fishways for Catadromous American Eel

Upstream Passage

1) The Licensee shall conduct 3-year Eelway Siting Studies at each dam of the Project in an upstream sequence, beginning the Wateree Dam, to determine the best location for installation of semi-permanent or permanent upstream eelway passage facilities. These Siting Studies will allow for the most effective design and placement of permanent or semi-permanent passage devices for upstream passage of American eel juveniles at each dam.

   Study eelways shall consist of portable ramp/trap devices with adequate substrate and attraction flow. Siting Studies shall include weekly trap cheks during October through the middle of June, and biweekly in other seasons. The Licensee shall develop a study plan for each dam that shall be submitted to the USFWS for review and approval 6 months prior to study implementation. Each three year study shall collect information, including the size of elvers, timing of seasonal migrations, and locations of juvenile American eels in the tailrace areas below dams. American eels captured during each 3-year study shall be passed into the immediate upstream reservoir.

2) The Licensee shall design, construct, and operate, in consultation with the USFWS, at each development, permanent or semi-permanent upstream Eelways within 2 years of completion of the Eelway Siting Studies at each dam (Fig. 2).[221] Provided American eels are passed upstream at each development in a safe, timely, and effective manner, the Licensee may decide to continue operation of the ramp/trap eelways or construct new permanent eelway facilities at each of the Catawba-Wateree Project developments. Permanent eelways shall provide volitional passage of juvenile eels upstream of the dam.

[221] Figure 2 has been omitted here for brevity. This figure can be found in the section 18 Fishway Prescription filed by the U.S. Department of the Interior – U.S. Fish and Wildlife Service's (FWS) on June 22, 2008.

3) The Licensee shall compile and submit an annual report by October 1 of each year, to include a complete description of the length, condition, sex (if determinable), and capture/transport dates of all American eels. The annual report shall include a description of the location and configuration of each ramp/trap along with photographic records of the condition of each ramp/trap. Interim draft reports shall be submitted quarterly via electronic mail to the USFWS, to include provisional data on the date, number and sizes of eels captured at each development. The Licensee shall conduct an annual review (and site visit if requested) of the location of the devices during the fourth quarter of each year with the USFWS.

Downstream Passage

1) The Licensee shall commence studies in 2024 to address the safe, timely and effective downstream passage for American eels in the Catawba – Wateree system. By January 1 of the prior year, the Licensee shall submit a study plan to the USFWS for review and approval. The study plan shall incorporate an alternatives analysis of silver eel downstream passage methodologies. The alternatives analysis shall include provisions for downstream passage such as operational changes (e.g., seasonal nighttime shutdowns, or other changes); seasonal use of full depth screens and a bypass system; use of conventional weirs, fyke nets or other new methodologies to capture silver eels in reservoir tributaries, or along the shoreline, upstream of the dam(s). Trapping or other appropriate techniques may be used to intercept out-migrating adult silver eels in the Wateree Lake headwaters and truck them downstream of the dam.

2) The USFWS reserves its authority to prescribe downstream passage facilities for American eels.

Reservation of Authority

The Commission shall include the following conditions in any license it may issue for the Catawba – Wateree Hydroelectric Project:

> Pursuant to Section 18 of the Federal Power Act, as amended, the Secretary of the Department of the Interior, exercises its authority under Section 18 by reserving the authority to prescribe the construction, operation and maintenance of such fishways as deemed necessary including measures to evaluate the need for fishways, and to determine, ensure, or improve the effectiveness of such fishways. This reservation includes authority to prescribe fishways for existing riverine fish species, any fish species (including American shad, blueback herring, American eels, shortnose sturgeon and Atlantic sturgeon) to be managed, enhanced, protected, or restored in the basin during the term of the license.

Also, authority is reserved for the U.S. Fish and Wildlife Service to modify these Prescriptions for Fishways at any time before licenses are issued, as well as any time during the term of any license issued, after review of new information or for other pertinent reason.

APPENDIX D

Reasonable and Prudent Measures and Terms and Conditions included in the National Marine Fisheries Service's Biological Opinion for the Relicensing of the Catawba-Wateree Hydroelectric Project (No. 2232), July 8, 2013

REASONABLE AND PRUDENT MEASURES

1. All potential adverse impacts to sturgeon during the construction and operations of the fish passageways or during other construction activities or maintenance of the Wateree Dam are to be minimized to the greatest extent practicable.

2. Sturgeon captured or injured at the Wateree Dam in the TST [Trap-Sort-Transport] fish passage facility during the term of the license must be handled appropriately, as detailed by current NMFS protocol (Attachment A).[222]

3. Water quantity must meet or exceed levels detailed in Section 6.1, Table 6, to ensure appropriate and sufficient habitat is available to sturgeon in the Action Area over the full term of the new license.

4. Water quality in the Action Area must be monitored to meet water quality standards as outlined in Section 13 of the CRA [Comprehensive Relicensing Agreement] and over the full term of the new license.

TERMS AND CONDITIONS

1. To reduce adverse effects to sturgeon per RPM No. 1, FERC shall implement the following conditions for the protection of sturgeon:
    a. During construction of the fish passage facility or during any maintenance at the Wateree Dam or any other in-water work in the Action Area:
        i. No in-water work in the river from and within 500 yards of the Wateree Dam, may occur between February 1 and April 30 of any year. The inwater work prohibition applies to any in-water construction activity. This does not apply to emergency work (i.e., work that cannot wait until after the time restriction) or work related to dam safety.
        ii. If a sturgeon is seen within 100 yards of the active daily construction/maintenance operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection.

[222] *See* Attachment A to NMFS'S July 8, 2013 Biological Opinion.

These precautions shall include cessation of operation of any moving equipment closer than 50 feet to a sturgeon. Operation of any mechanical construction equipment shall cease immediately if a sturgeon is seen within a 50-ft radius of the equipment. Activities may not resume until the sturgeon has departed the Project area of its own volition.

iii. Appropriate erosion and turbidity controls shall be utilized during any in-water work carried out by Duke Energy in the Action Area to limit contaminant laden sediments from entering the water.

iv. No construction debris shall be allowed to enter the water.

v. Construction shall be conducted according to current best management practices (BMPs) for the State of South Carolina: *i.e.*, South Carolina's Complete Stormwater Management BMP Handbook: http://www.scdhec.gov/environment/water/swater/BMPhandbook.htm.

b. Fish passage structures at the Wateree Dam must be designed such that they exclude sturgeon (Atlantic and shortnose).

c. NMFS personnel (or its delegated representative) must be granted access to the fish passage records and facilities upon request.

d. An operations and inspections report of the fish passage facility and TST operation must be prepared and submitted to NMFS annually to the NOAA Southeast Regional Office, Assistant Regional Administrator, Protected Resources Division, National Marine Fisheries Service, 263 13th Avenue South, St. Petersburg, Florida 33701, phone (727) 824-5312. This opinion's issuance date, title, and identifier number (SER-2009-5473) shall be referenced in the correspondence. It must include at a minimum the:

i. quantity of the Atlantic or shortnose sturgeon captured or observed,

ii. hours of operation,

iii. volume of water utilized during operations,

iv. identity and quantity of sturgeon observed below the lift,

v. maintenance schedule,

vi. operational issues, if any, and

vii. proposed/recommended modification(s), if any.

2. To comply with RPM No. 2, FERC shall implement the following special conditions for the protection of sturgeon:

a. Any handling of sturgeon will comply with the NMFS's Protocol for Use of Shortnose, Atlantic, Gulf, and Green Sturgeons (Attachment A). http://www.nmfs.noaa.gov/pr/pdfs/species/kahn_mohead_2010.pdf.

b. A tissue sample shall be taken of any sturgeon handled, per Attachment A.

c. If any sturgeon are captured, injured, or killed during the term of the new license, notification of take shall be provided to NMFS at the following e-mail address within 24 hours: (takereport.nmfsser@noaa.gov); and this BO's issuance date, title, and identifier number (SER-2009-5473) shall be

referenced in the correspondence.

d. If a lethal take occurs, the carcass should be frozen and NMFS contacted immediately to provide instructions for shipping and preparation. NMFS requests all shortnose or Atlantic sturgeon interactions be reported to Kelly Shotts, (Kelly.Shotts@noaa.gov or (727) 551-5603).
e. All sturgeon handled in the TST fish passage facility shall be scanned for a PIT tag; codes shall be included in the take report submitted to NMFS. The PIT tag reader shall be able to read both 125 kHz and 134 kHz tags. Sturgeon without PIT tags will have one installed per guidance in Attachment A and included in the take report submitted to NMFS.

3. To comply with RPM No. 3 regarding habitat availability, FERC shall require Duke Energy to:
   a. Accurately monitor water quantity daily over the life of the license to determine the amount of habitat (WUAs) consistently available to sturgeon and to ensure flows meet levels specified in the CRA (also found in Section 6.1.1, Table 6 of this BO). An annual report detailing flows and the resulting WUAs must be prepared and submitted to NMFS annually to NOAA Southeast Regional Office, Assistant Regional Administrator, Protected Resources Division, National Marine Fisheries Service, 263 13th Avenue South, St. Petersburg, Florida 33701, phone (727) 824-5312. This opinion's issuance date, title, and identifier number (SER- 2009-5473) shall be referenced in the correspondence.
   b. Quantify and map available spawning habitat under the new flow regime in the Action Area (from the Wateree Dam to the confluence with the Congaree River), beginning one year after of the issuance of the new license to establish a reliable environmental baseline and confirm that the action is having the predicted effect of increasing spawning habitat within the Action Area that is available to shortnose and Atlantic sturgeon on a monthly basis. A report detailing the quantity and location of available spawning habitat under each flow level predicted in Table 6, Section 6.1.1, must be prepared and submitted to NMFS annually to NOAA Southeast Regional Office, Assistant Regional Administrator, Protected Resources Division, National Marine Fisheries Service, 263 13th Avenue South, St. Petersburg, Florida 33701, phone (727) 824-5312. This opinion's issuance date, title, and identifier number (SER-2009-5473) shall be referenced in the correspondence.

4. To comply with RPM No. 4, regarding water quality, FERC shall require Duke Energy to:
   a. Accurately monitor water quality (DO, and water temperatures, etc.) in the Action Area over the life of the license.

i. Monitoring stations shall be identified with the assistance of SCDHEC [South Carolina Department of Health and Environmenal Control] and USGS [U.S. Geological Survey] and approved by NMFS within one year of the issuance of the license. These stations should target locations where water temperatures are likely to be highest and DO concentrations lowest. An annual report detailing this information must be prepared and submitted to NMFS annually to NOAA Southeast Regional Office, Assistant Regional Administrator, Protected Resources Division, National Marine Fisheries Service, 263 13th Avenue South, St. Petersburg, Florida 33701, phone (727) 824-5312. This opinion's issuance date, title, and identifier number (SER-2009-5473) shall be referenced in the correspondence.

APPENDIX E

Proposed License Articles included in the Catawba-Wateree Project Comprehensive Relicensing Agreement, filed on August 29, 2006, as on December 29, 2006.

A-1.0 RESERVOIR ELEVATION ARTICLES

Article – Reservoir Elevations

(A) Reservoir Elevations – Within 60 days following the issuance of this license, to protect and enhance the Project's values that may be affected by reservoir level fluctuations, the Licensee must maintain the elevations of the Project reservoirs between the Normal Minimum and Normal Maximum Elevations indicated in the tables below and must endeavor in good faith to achieve the Normal Target Elevations in the tables. All elevations in the tables below are relative to the top of the dam (including floodgates and flashboards where applicable) with 100.0 ft. = Full Pond Elevation. The elevations included in the tables are for the first day of the given month; elevations for other days of the month are determined by linear interpolation.

Lake James (Full Pond is 1,200.0 ft. above mean Sea Level (MSL))			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January	93	96	100
February	92	94	100
March	92	95	100
April	92	96	100
May – October	95	98	100
November – December	93	96	100

Lake Rhodhiss (Full Pond is 995.1 ft. MSL)			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January – December	94	97	100

Lake Hickory (Full Pond is 935.0 ft. MSL)			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January – February	94	96	100
March – December	94	97	100

Lookout Shoals Lake (Full Pond is 838.1 ft. MSL)			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January – December	94	97	100

Lake Norman (Full Pond is 760.0 ft. MSL)			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January	93	96	100
February	91	94	100
March	92.26	95.26	100
April	93.65	96.65	100
May – October	95	98	100
November	93.98	97	100
December	93	96	100

Mountain Island Lake (Full Pond is 647.5 ft. MSL)			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January – December	94.3	96	100

Lake Wylie (Full Pond is 569.4 ft. MSL)			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January – December	94	97	100

Fishing Creek Reservoir (Full Pond is 417.2 ft. MSL)			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January – December	95	98	100

Great Falls Reservoir (Full Pond is 355.8 ft. MSL)			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January – December	95	97.5	100

Cedar Creek Reservoir (Full Pond is 284.4 ft. MSL)			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January – December	96	97.5	100

Lake Wateree (Full Pond is 225.5 ft. MSL)			
Month	**Normal Minimum (ft.)**	**Normal Target (ft.)**	**Normal Maximum (ft.)**
January	93	94.5	100
February	93	95	100
March – October	94	97	100
November	93	97	100
December	93	95	100

(B) Temporary Variances – The reservoir elevations outlined in Paragraph (A) above may be temporarily modified if the Licensee is operating in accordance with the Commission-approved Low Inflow Protocol, Maintenance and Emergency Protocol, or Spring Reservoir Level Stabilization Program. The Licensee must notify the Commission, the resource agencies and other interested parties of any such modifications affecting the Normal Maximum and Normal Minimum Elevations in accordance with the Low Inflow Protocol or the Maintenance and Emergency Protocol, or within 10 days of any unplanned event, whichever is earlier.

For unplanned events, the licensee must include, as part of its notification to the Commission, an incident report. The report must, to the extent possible, identify the cause, severity, and duration of the incident, and any observed or reported adverse environmental impacts resulting from the incident. The report also must include: (1) operational data before, during, and immediately after the incident; (2) a description of any corrective measures implemented at the time of the occurrence and the measures implemented or proposed to ensure that similar incidents do not recur; and (3) comments or correspondence, if any, received from interested parties regarding the incident. Based on the report and the Commission's evaluation of the incident, the Commission reserves the right to require modifications to the project facilities and operations to ensure future compliance.

(C) Level Monitoring Devices – The Licensee must maintain the existing reservoir level monitoring devices or suitable replacement devices at the dams at all Project developments for the term of this license.

Article – Spring Reservoir Level Stabilization Program

(A) Within 60 days following the issuance of this license, the Licensee must, in consultation with the North Carolina Wildlife Resources Commission and the South Carolina Department of Natural Resources, implement a Spring Reservoir Level Stabilization Program to promote fish spawning at Lake James, Lake Norman, Lake Wylie and Lake Wateree. This program must consist of the following elements:

1. Trigger Points – The stabilization period for each reservoir must begin when: (i) surface water temperatures within the subject reservoir reach 65°F or greater for four consecutive days; (ii) bass spawning is observed in the subject reservoir by a Licensee representative; or (iii) a Resource Agency representative notifies the Licensee that bass spawning has been observed in the subject reservoir, whichever occurs first.

2. Surface Water Temperature Monitoring Locations – Temperatures must be measured at least at one location on each reservoir that is subject to this stabilization program.

3. Reservoir Level Variability – The Licensee must endeavor in good faith to maintain the water level in the subject reservoir within a range between one foot below and two feet above the reservoir elevation at the time that the stabilization is triggered on that reservoir.

4. Stabilization Period – Once initiated by a trigger, the subject reservoir level must be stabilized for three weeks.

(B) The Licensee must implement the Spring Reservoir Level Stabilization Program unless it is operating in accordance with the Commission-approved Low Inflow Protocol or the Maintenance and Emergency Protocol. The Licensee must suspend the Spring Reservoir Level Stabilization Program on Lake Wateree during any time period in which maintaining the stabilized reservoir level on Lake Wateree would prevent or alter flow releases from the Wateree Development that are needed to support downstream fish habitat. The Licensee must notify the Commission within 10 days following suspending the Spring Reservoir Level Stabilization Program on Lake Wateree due to conflicts with downstream flow needs. The Licensee must also notify the Commission, the resource agencies and other interested parties of any suspensions of the Spring Reservoir Level Stabilization Program in accordance with the Low Inflow Protocol or the Maintenance and Emergency Protocol, or within 5 days of the suspension occuring.

(C) The Licensee may propose modifications to the Spring Reservoir Level Stabilization Program in consultation with the North Carolina Wildlife Resources Commission (North Carolina WRC) and the South Carolina Department of Natural Resources (South Carolina DNR). The Licensee must file such modifications with the Commission for approval prior to implementing any modifications. The License must include with its filing documentation of consultation with North Carolina WRC and South Carolina DNR, copies of the agencies' comments and recommendations on the proposed modifications, and specific descriptions of how the agencies' comments are addressed. The licensee must allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the proposed modifications to the program with the

Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific reasons.

The approved Spring Reservoir Level Stabilization Program must not be amended without prior Commission approval. The Commission reserves the right to require changes to the program.

A-2.0 FLOW ARTICLES

Article – Recreational Flows

(A) Bridgewater Development – Within 60 days following the issuance of this license, the Licensee must provide recreational flow releases at the Bridgewater Development to support float angling and paddling, in accordance with the schedule in the table below. Scheduled recreational flow release days must be divided approximately equally between flow releases to support float angling and flow releases to support paddling. The scheduling of the specific dates each year that are focused on float angling and the dates that are focused on paddling must be determined at the Annual Recreational Flow Schedule Planning meeting stipulated in Paragraph (H) below. The flows for float angling must be as close as feasible to 900 cfs, but must not exceed 1,200 cfs, and the flows for paddling must be at least 900 cfs. If the Licensee is not operating in accordance with the Maintenance and Emergency Protocol and needs to operate the Bridgewater Development to release more than 1,200 cfs for three or more hours during any of the scheduled flow release periods to support float angling, then the Licensee must endeavor in good faith to add equivalent hours of replacement recreational flow releases for float angling at the Bridgewater Development within the same calendar year. These equivalent hours may be added to the hours of flow releases on days already scheduled for recreational flow releases or the flow releases may be scheduled separately. Specific days and hours for potential replacement flow releases to support float angling will be determined at the Annual Recreational Flow Schedule Planning meeting stipulated in Paragraph (H) below.

Bridgewater Development Recreational Flow Schedule				
Dates (inclusive)	**Day / Description**	**Flow (at or above) (cfs)**	**Hour Start**	**Hour End**
Apr 1 – Apr 30	Last full weekend – Saturday and Sunday	900	10:00 am	3:00 pm
May 1 – Jul 15	Each Friday, Saturday and Sunday plus Memorial and Independence Day	900	10:00 am	3:00 pm

Jul 16 – Aug 31	Each Saturday and Sunday	900	10:00 am	3:00 pm
Jun 1 – Jul 31	Wednesdays and Thursdays	900	4:30 pm	6:30 pm
Sep 1 – Sep 30	Each Friday, Saturday, and Sunday plus Labor Day	900	10:00 am	3:00 pm
Oct 1 – Oct 31	Each Saturday and Sunday	900	10:00 am	3:00 pm

(B) Oxford Development – Within 60 days following issuance of this license, the Licensee must provide recreational flow releases at the Oxford Development of at least 2,600 cfs in accordance with the schedule in the table below.

Oxford Development Recreational Flow Schedule				
Dates (inclusive)	**Day / Description**	**Flow (at or above) (cfs)**	**Hour Start**	**Hour End**
May 1 – Sep 30	Each Saturday and Sunday plus Memorial, Independence, and Labor Day	2,600	10:00 am	3:00 pm
Oct 1 – Oct 31	First four Saturday	2,600	10:00 am	3:00 pm

(C) Wylie Development – Within 60 days following issuance of this license, the Licensee must provide recreational flow releases at the Wylie Development in accordance with the following schedule in the table below. In addition, the Licensee must, from May 1 to July 15 inclusive, release at least 1,300 cfs for six hours prior to the recreational flow release scheduled start times shown in the table below to ensure suitable water levels at Landsford Canal State Park.

Wylie Development Recreational Flow Schedule				
Dates (inclusive)	**Day / Description**	**Flow (at or above) (cfs)**	**Hour Start**	**Hour End**
Apr 1 – Apr 30	Last full weekend – Saturday and Sunday	3,000	10:00 am	4:00 pm
May 1 – Jun 15	Each Friday, Saturday, and Sunday plus Memorial Day	3,000	10:00 am	4:00 pm
Jun 16 – Jul 15	Each Friday, Saturday, and	6,000	10:00 am	4:00 pm

	Sunday plus Independence Day			
Jul 16 – Aug 31	Each Saturday and Sunday	6,000	10:00 am	4:00 pm
Sep 1 – Sep 30	Each Friday, Saturday, and Sunday plus Labor Day	6,000	10:00 am	4:00 pm
Oct 1 – Oct 31	Each Saturday and Sunday	3,000	10:00 am	4:00 pm

(D) Great Falls-Dearborn Development – Within 60 days following completion of the structural modifications in accordance with the Commission-approved Flow and Water Quality Implementation Plan at both the Great Falls Diversion Dam and the Great Falls Headworks that are necessary to deliver the recreation flow releases and the completion of the Highway 200 Bridge Access Area, the Great Falls Diversion Dam Portage, the Great Falls Headworks Portage, and the Great Falls Headworks-to-Cedar Creek Reservoir Portage in accordance with the Commission-approved Recreation Management Plan, the Licensee must provide recreational flow releases of at least 2,940 cfs into the Great Falls Long Bypassed Reach and at least 2,860 cfs into the Great Falls Short Bypassed Reach in accordance with the schedule in the table below.

Great Falls-Dearborn Development Recreational Flow Schedule					
Channel	**Dates (inclusive)**	**Day / Description**	**Flow (at or above) (cfs)**	**Start**	**End**
Long Bypassed Reach	Mar 1 – Oct 31	Two Saturdays per month	2,940	10:00 am	3:00 pm
		A total of four Sundays	2,940		

Great Falls-Dearborn Development Recreational Flow Schedule					
Channel	**Dates (inclusive)**	**Day / Description**	**Flow (at or above) (cfs)**	**Start**	**End**
Short Bypassed Reach	Mar 1 – Apr 30	One Saturday per month to correspond with Long Bypass releases	2,860	10:00 am	3:00 pm
	May 1 – Oct 31	Two weekends (Saturday and Sunday) per month	2,860		

(E) Wateree Development – Within 60 days following issuance of this license, the Licensee must provide the recreational flow releases at the Wateree Development of at least 2,760 cfs in accordance with the schedule in the table below.

Wateree Development Recreational Flow Schedule				
Dates (inclusive)	**Day / Description**	**Flow (at or above) (cfs)**	**Hour Start**	**Hour End**
Apr 1 – Apr 30	Last full weekend – Saturday and Sunday	2,760	10:00 am	3:00 pm
May 1 – Jul 31	Each Saturday and Sunday plus Memorial and Independence Days	2,760	10:00 am	3:00 pm
Sep 1 – Sep 30	Each Saturday and Sunday plus Labor Day	2,760	10:00 am	3:00 pm
Oct 1 – Oct 31	Each Saturday and Sunday	2,760	10:00 am	3:00 pm

(F) Additional Recreational Flow Releases – In addition to the recreational flow releases identified in Paragraphs (A) through (E) above, the Licensee must provide up to 10 additional hours of recreational flow releases per calendar year, in increments of no less than one hour each at each of the following locations: (i) Bridgewater; (ii) Oxford; (iii) Wylie; (iv) Great Falls-Dearborn Short Bypassed Reach; (v) Great Falls-Dearborn Long Bypassed Reach; and (vi) Wateree. These recreational flow releases shall be as follows: (i) Bridgewater – 900 to 1,200 cfs; (ii) Oxford – at least 2,600 cfs; (iii) Wylie – at least 3,000 cfs; (iv) Great Falls-Dearborn Short Bypassed Reach – at least 2,860 cfs; (v) Great Falls-Dearborn Long Bypassed Reach – at least 2,940 cfs; and (vi) Wateree – at least 2,760 cfs. The schedule for these additional recreational flow releases must be determined at the Annual Recreational Flow Schedule Planning meeting stipulated in Paragraph (H) below.

(G) Temporary Variances – The flows and schedules for the recreational flow releases outlined in Paragraphs (A) through (F) above may be temporarily modified if the Licensee is operating in accordance with the Commission-approved Low Inflow Protocol or the Maintenance and Emergency Protocol. The Licensee must notify the Commission, the resource agencies and other interested parties of any such modifications in accordance with the Low Inflow Protocol or the Maintenance and Emergency Protocol, or within 48 hours of the incident, whichever situation applies, and must provide the reason for the change in project operation.

(H) Annual Recreational Flow Schedule Planning – In March of each year of the license term, the Licensee must convene an Annual Recreational Flow Schedule Planning meeting with the North Carolina Department of Environment and Natural Resources, the North Carolina Wildlife Resources Commission, the South Carolina Department of Natural Resources, and the South Carolina Department of Parks, Recreation and Tourism, and other entities with recreational experience and/or expertise, as appropriate, to identify potential improvements to the recreational flow release schedule, to establish the schedule for the added recreational flow releases pursuant to Paragraph (F) above, and to identify potential dates for replacement flows at the Bridgewater Development for the current calendar year. Also, the Licensee, in consultation with the attendees of the Annual Recreational Flow Schedule Planning meeting, may (i) shift the hours of scheduled recreational flow releases to different times, (ii) reduce the total hours of recreational flow releases to conserve the water supply, or (iii) adjust the seasonal times for the recreational flow releases. However, the total volume of water used for these scheduled recreational flow releases over a calendar year from any individual development must not be increased even if the total volume from another development is decreased.

Article – Minimum Flows

(A) Minimum Continuous Flows – The Licensee must provide the following Minimum Continuous Flows at the Bridgewater, Oxford, Lookout Shoals, Wylie, Great Falls-Dearborn, Wateree Developments to protect and enhance aquatic habitat and water quality in the downstream riverine sections. The Minimum Continuous Flow may be provided by any combination of leakage, spillage, and generation from each development.

1. Bridgewater Development – Within 60 days following the completion of any construction in accordance with the Commission-Approved implementation plan of a replacement powerhouse or valve system necessary to provide the Minimum Continuous Flows specified in the table below for the Bridgewater Tailrace and within 60 days following completion of the construction in accordance with the Commission-approved Flow and Water Quality Implementation Plan of the minimum flow valve necessary to provide the Minimum Continuous Flows specified in table below for the Catawba River Bypassed Reach, the Licensee must provide Minimum Continuous Flows in accordance with the following table

Bridgewater Development		
Month	**Bridgewater Tailrace**	**Catawba River Bypassed Reach**
	Minimum Continuous Flows (cfs)	**Minimum Continuous Flows (cfs)**
Jan – Mar	145	75

Apr – Jun	95	75
Jul	95	50
Aug – Nov	75	50
Dec	145	75

2. Oxford Development – Within 60 days following the completion of the installation of a minimum flow valve at the Oxford Dam, in accordance with the Commission-approved Flow and Water Quality Implementation Plan, the Licensee must provide a year-round Minimum Continuous Flow of at least 150 cfs from the Oxford Development.

3. Lookout Shoals Development – Within 60 days following the issuance of this license, the Licensee must provide a year-round Minimum Continuous Flow of at least 80 cfs from the Lookout Shoals Development.

4. Wylie Development – Within 60 days following the completion of the installation of a minimum flow hydro unit, in accordance with the Commission-approved Flow and Water Quality Implementation Plan, the Licensee must provide a year-round Minimum Continuous Flow of at least 1,100 cfs from the Wylie Development.

5. Great Falls-Dearborn Development – Within 60 days following the completion of the installation of flow release structures, in accordance with the Commission-approved Flow and Water Quality Implementation Plan at the Great Falls Headworks and the Great Falls Diversion Dam, the Licensee must provide Minimum Continuous Flows in accordance with the following table.

Great Falls-Dearborn Development		
Month	**Long Bypassed Reach**	**Short Bypassed Reach**
	Minimum Continuous Flows (cfs)	**Minimum Continuous Flows (cfs)**
Jan – Feb 14	450	100
Feb 15 – May 15	850	100
May 16 – Dec	450	100

6. Wateree Development – Within 60 days following the completion of the installation of a minimum flow unit, in accordance with the Commission-approved Flow and Water Quality Implementation Plan, the Licensee must provide Minimum Continuous Flows in accordance with the following table.

Wateree Development	
Month	**Minimum Continuous Flows (cfs)**
Jan – Feb 14	930
Feb 15 – Feb 29	2,400
Mar – Apr	2,700
May 1 – May 15	2,400
May 16 – May 31	1,250
Jun – Dec	930

(B) Minimum Average Daily Flows – Within 60 days following issuance of this license, the Licensee must provide the following Minimum Average Daily Flows: 225 cfs from the Rhodhiss Development; 311 cfs from the Cowans Ford Development; 314 cfs from the Mountain Island Development; 440 cfs from the Fishing Creek Development; and 445 cfs from the Rocky Creek-Cedar Creek Development. The Minimum Average Daily Flow may be provided by any combination of leakage, spillage, and generation from each development.

(C) Temporary Variances – The flows outlined in Paragraphs (A) and (B) above may be temporarily modified if the Licensee is operating in accordance with the Commission-approved Low Inflow Protocol or the Maintenance and Emergency Protocol. The Licensee must notify the Commission, the resource agencies and other interested parties of such temporary modifications in accordance with the Low Inflow Protocol or the Maintenance and Emergency Protocol, or within 10 days of any unplanned event, whichever is earlier.

For unplanned events, the licensee must include, as part of its notification to the Commission, an incident report. The report must, to the extent possible, identify the cause, severity, and duration of the incident, and any observed or reported adverse environmental impacts resulting from the incident. The report also must include: (1) operational data before, during, and immediately after the incident; (2) a description of any corrective measures implemented at the time of the occurrence and the measures implemented or proposed to ensure that similar incidents do not recur; and (3) comments or correspondence, if any, received from interested parties regarding the incident. Based on the report and the Commission's evaluation of the incident, the Commission reserves the right to require modifications to the project facilities and operations to ensure future compliance.

Article – Wylie High Inflow Protocol

(A) Within 60 days following the completion of the installation of a minimum flow hydro unit, in accordance with the Commission-approved Flow and Water Quality

Implementation Plan, the Licensee must implement the Wylie High Inflow Protocol specified below to provide additional protection and enhancement of aquatic habitat downstream of the Wylie Development when adequate inflow to the Project is available.

(B) If the median flows for the three-month period from November 1 through January 31 for the USGS streamflow gages on the Catawba River near Pleasant Gardens, NC (USGS #02137727), the Johns River at Arney's Store, NC (USGS #02140991), and the South Fork Catawba River at Lowell, NC (USGS #02145000) are all at or above 105 percent of the three-month (Nov-Jan) median flows for the periods of record of those gages, then from February 15 through May 15, the Licensee must increase the Minimum Continuous Flow from the Wylie Development from 1,100 cfs to 1,300 cfs. If, when operating in the Wylie High Inflow Protocol, the February median flow for any one of these three streamflow gages is below the February median flow for the period of record of that gage, then the minimum flow requirement for the Wylie Development must be reduced on April 1 to 1,100 cfs. The Licensee may suspend the Wylie High Inflow Protocol if it is operating in accordance with the Commission-approved Low Inflow Protocol or Maintenance and Emergency Protocol. The Licensee must notify the Commission and the resource agencies of such suspension in accordance with the Low Inflow Protocol or the Maintenance and Emergency Protocol, or within 10 days of an event, whichever comes first, and must provide the reason for the change in project operation.

Article – Flows Supporting Public Water Supply and Industrial Processes

(A) Within 60 days following issuance of this license, the Licensee must provide flow releases with the conditions and rates indicated below from the Bridgewater, Wylie, and Wateree developments to support downstream water withdrawer requirements at the indicated River Miles - location of the most downstream point of the facility measured in miles along the centerline of the river with the River Miles starting at the confluence of the Wateree and Congaree Rivers (River Mile 00) and ascending upstream.

1. Bridgewater Development – At River Mile 264, at least 90 cfs continuous minimum flow for the City of Morganton's Catawba River Water Treatment Plant.

2. Wylie Development

   i. At River Mile 120, at least 600 cfs continuous minimum flow and approximately 1,000 cfs for a continuous 16-hour period each day for the Bowater Pulp and Paper Mill.

   ii. At River Mile 122, up to an additional 71 cfs above existing flows in the river (as measured at United States Geological Survey (USGS) Gage #02147000, Catawba River near Catawba, SC) during periods of low river flow, the day after the Licensee receives a request from the

Union/Lancaster Catawba River Water Treatment Plant, to allow this entity to operate within its permit (PERMIT NO. (P/N) 29 WS01 S02) issued by the South Carolina Department of Health and Environmental Control.

iii. At USGS Gage #02146000 (Catawba River near Rock Hill, SC) (River Mile 137.6), at least 619 cfs weekly average flow to avoid pumping restrictions at Charlotte-Mecklenburg Utilities' Mountain Island Development raw-water pumping facility imposed by Condition (B) of the Commission's Order Approving Non-Project Use of Lands, February 23, 2004 (106 FERC 62,151) until such time that the Commission removes those restrictions by a subsequent order.

iv. The above flow releases from the Wylie Development also meet the flow needs of the Rock Hill (SC) Municipal back-up water supply intake (River Mile 137), Celanese Acetate's intake (River Mile 136), and Nations Ford Chemical's intake (River Mile 135).

3 Wateree Development – At least 800 cfs continuous minimum flow at River Mile 12 for the South Carolina Electric & Gas Company's Wateree Steam Station and also for the International Paper facility at River Mile 17.

(B) Temporary Variances – The flows outlined in Paragraph (A) above may be temporarily modified if the Licensee is operating in accordance with the Commission-approved Maintenance and Emergency Protocol or Stage 4 of the Commission-approved Low Inflow Protocol or, for the 1,000-cfs flow in Paragraph (A).2i. when operating in Stages 1 through 4 of the Commission-approved Low Inflow Protocol. The Licensee must notify the Commission, the resource agencies, the affected water withdrawers and other interested parties of such temporary modifications in accordance with the Low Inflow Protocol or the Maintenance and Emergency Protocol, or within 48 hours of the event, whichever situation applies, and must provide the reason for the change in project operation.

Article – Flow and Water Quality Implementation Plan

(A) Within 180 days following the issuance of this license, the Licensee must file with the Commission, for approval, a Flow and Water Quality Implementation Plan (FWQIP) for completing the modifications necessary to satisfy the flow and water quality requirements at Project developments. The Plan shall include, at a minimum: (i) descriptions of any equipment, including flow release valves, minimum flow hydro units, or aerating hydro units to be installed; (ii) descriptions of any proposed modifications to any Project structures to provide prescribed flow releases or meet the requirements of the 401 Water Quality Certifications; and (iii) a schedule for the installations and

modifications to meet the prescribed flow releases or water quality requirements stipulated in this license.

(B) The Licensee must prepare the FWQIP in consultation with the US. Fish and Wildlife Service, the National Marine Fisheries Service, the U.S. Environmental Protection Agency, the North Carolina Department of Environment and Natural Resources, the North Carolina Wildlife Resources Commission, the South Carolina Department of Natural Resources, and the South Carolina Department of Health and Environmental Control. The Licensee shall include with the FWQIP documentation of consultation with the above agencies, copies of comments and recommendations on the FWQIP after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments and recommendations are accommodated in the FWQIP. The Licensee must allow a minimum of 30 days for the agencies to comment prior to filing the FWQIP with the Commission. If the Licensee does not adopt an agency's recommendation, the filing must include the Licensee's reasons.

(C) The Commission reserves the right to require changes to the FWQIP. Implementation of the FWQIP must not begin until the licensee is notified by the Commission that the FWQIP is approved. Upon Commission approval, the Licensee must implement the FWQIP, including any changes required by the Commission.

A-3.0 LOW INFLOW PROTOCOL ARTICLE

Article – Low Inflow Protocol for the Catawba-Wateree Project

(A) The Low Inflow Protocol for the Catawba-Wateree Project filed with the license application on August 29, 2006, is approved, and within 60 days following the issuance of this license, the Licensee must implement the Low Inflow Protocol, [*with the following Commission-required modification*]:

1. *In addition to entities listed in the Low Inflow Protocol (included as Appendix C to the Comprehensive Relicensing Agreement (page C-6)), the Catawba-Wateree Drought Management Advisory Group must include the U.S. Fish and Wildlife Service and the National Marine Fisheries Service*.]

The approved Low Inflow Protocol for the Catawba-Wateree Project must not be amended without prior Commission approval. The Commission reserves the right to make changes to the Low Inflow Protocol.

(B) The Licensee has reserved the right to make modifications to the Low Inflow Protocol in consultation with the Catawba-Wateree Drought Management Advisory Group. The Licensee also reserves the right to make temporary modifications to the Low Inflow Protocol to account for any changed physical conditions at any of the Project's

developments. The Licensee must notify the Commission of any such temporary modifications in accordance with the Low Inflow Protocol, or within 10 days of making a temporary change, whichever comes first, and must provide the reason for the change in project operation. Any such modifications may be subject to Commission approval.

A-4.0 MAINTENANCE AND EMERGENCY PROTOCOL ARTICLE

Article – Maintenance and Emergency Protocol for the Catawba-Wateree Project

(A) The Maintenance and Emergency Protocol for the Catawba-Wateree Project filed with the license application is approved and incorporated into this license. Within 60 days following the issuance of this license, the Licensee shall implement the Maintenance and Emergency Protocol, [*with the following modification:*

1. *In addition to the entities listed in the Maintenance and Emergency Protocol (included as Appendix D to the Comprehensive Relicensing Agreement (page D-5)), the Licensee must consult with the National Marine Fisheries Service in reviewing and revising the Maintenance and Emergency Protocol.*]

(B) The Licensee has reserved the right to make minor changes as necessary to the Maintenance and Emergency Protocol for the Catawba-Wateree Project. The Licensee also reserves the right to make temporary modifications to the Maintenance and Emergency Protocol to account for any changed physical conditions at any of the Project's developments. The Licensee must notify the Commission of any such temporary modifications in accordance with the Maintenance and Emergency Protocol, or within 10 days of making a temporary change, whichever comes first, and must provide the reason for the change in project operation. Any modifications may be subject to Commission approval.

A-5.0 WATER QUALITY ARTICLE

Article – Water Quality Monitoring Plan

(A) Within 180 days following the issuance of this license, the Licensee must file with the Commission, for approval, a Water Quality Monitoring Plan (WQMP) to monitor compliance with water quality requirements. The plan must include, at a minimum, identification of compliance monitoring locations and devices at applicable Project developments as needed to accurately monitor and record flows, dissolved oxygen, and water temperatures released from Project developments and an implementation schedule.

(B) The Licensee must prepare the WQMP in consultation with the U.S. Environmental Protection Agency, the North Carolina Division of Water Quality, and the South Carolina Department of Health and Environmental Control. The Licensee shall include with the

WQMP documentation of consultation with the above agencies, copies of comments and recommendations on the plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments and recommendations are accommodated in the WQMP. The Licensee must allow a minimum of 30 days for the agencies to comment prior to filing the Water Quality Monitoring Plan with the Commission. If the Licensee does not adopt a recommendation, the filing must include the Licensee's reasons.

(C) The Commission reserves the right to require changes to the WQMP. Implementation of the WQMP must not begin until the licensee is notified by the Commission that the WQMP is approved. Upon Commission approval, the Licensee must implement the WQMP, including any changes required by the Commission.

(D) By June 30 following each full calendar year for the term of this license, the Licensee must file with the Commission a report verifying compliance with any applicable 401 Water Quality Certification conditions, and must include in its filing the following information for the previous calendar year: (i) temperatures of water released from Project developments; (ii) dissolved oxygen concentrations in water released from Project developments; (iii) Minimum Continuous Flows released from the Bridgewater, Oxford, Lookout Shoals, Wylie, and Wateree developments; (iv) Minimum Continuous Flows released into the Great Falls Long and Short Bypassed Reaches; and (v) documentation of instances that the 401 Water Quality Certification requirements were not met, along with any proposed or implemented corrective actions. The Licensee must provide copies of the report to the NC Division of Water Resources, NC Division of Water Quality, NC Wildlife Resources Commission, SC Department of Natural Resources, SC Department of Health and Environmental Control, the U.S. Environmental Protection Agency, the US Fish and Wildlife Service, and the U.S. Environmental Protection Agency. The Commission reserves the right to require changes to Project operations or facilities based on the information in the report.

A-6.0 GAGING AND MONITORING ARTICLE

Article – Flow and Reservoir Elevation Monitoring

Licensee must file with the Commission a report verifying compliance with the Normal Minimum Elevation and Normal Maximum Elevation for Reservoir Levels, Spring Reservoir Level Stabilization Program, Recreational Flow Releases, Minimum Continuous Flows, Minimum Average Daily Flows, and the Wylie High Inflow Protocol, as set forth in this license. The Licensee must include, at least, the following information for the previous calendar year: (i) hourly flow records at Bridgewater, Oxford, Lookout Shoals, Wylie, and Wateree; (ii) documentation of flow releases in the Catawba River Bypassed Reach, as well as the Great Falls Long and Short Bypassed Reaches; (iii) documentation of Recreational Flow Releases; (iv) documentation of Minimum

Continuous Flows and Minimum Average Daily Flows; (v) hourly reservoir levels for each reservoir, along with yearly graphs showing the actual levels throughout the calendar year; and (vi) documentation of any instances that reservoir levels exceeded the Normal Operating Ranges, any instances where the Spring Reservoir Level Stabilization Program requirements or required flow releases were not met, along with any proposed or implemented corrective actions. The Licensee must provide copies of the report to the NC Division of Water Resources, NC Division of Water Quality, NC Wildlife Resources Commission, SC Department of Natural Resources, SC Department of Health and Environmental Control, and the U.S. Fish and Wildlife Service. The Commission reserves the right to require changes to Project operations or facilities based on the information in the report.

Article – Funding for USGS Streamflow Gages

(A) Within one year following implementation of the Minimum Continuous Flow from Linville Dam at the Bridgewater Development, the Licensee must fund the installation of one new United States Geological Survey (USGS) streamflow gage to monitor compliance with the minimum flow and recreational flow release requirements, and to provide a ready source of public information. The gage is to be located on the Linville River, between Linville Dam and the confluence of the Linville River and the Catawba River, just downstream of the Bridgewater Development.

(B) Within one year of license issuance and continuing through the term of this license, the Licensee must fund the annual maintenance cost for the new gage and the following existing USGS streamflow gages to (a) support implementation of the Commission-approved Low Inflow Protocol and Wylie High Inflow Protocol, (b) monitor compliance with the minimum flow and recreational flow release requirements, and/or (c) provide a ready source of public information as applicable: Gage No. 02137727 (Catawba River near Pleasant Gardens, NC); Gage No. 02140991 (Johns River at Arney's Store, NC); Gage No. 02145000 (South Fork Catawba River at Lowell, NC); Gage No. 02146000 (Catawba River near Rock Hill, SC); Gage No. 02147500 (Rocky Creek at Great Falls, SC), and Gage No. 02148000 (Wateree River near Camden, SC).

A-7.0 SPECIES PROTECTION ARTICLE

Article – Federal Threatened and Endangered Species Protection Plans

(A) The Federal Threatened and Endangered Species Protection Plans for the Schweinitz's sunflower (*Helianthus schweinitzii*), dwarf-flowered heartleaf (*Hexastylis naniflora*), bald eagle (*Haliaeetus leucocephalus*), wood stork (*Mycteria Americana*), American alligator (*Alligator mississippiensis*), and shortnose sturgeon (*Acipenser*

brevirostrum),[223] filed with the license application are approved and incorporated into this license. The Licensee shall implement these Federal Threatened and Endangered Species Protection Plans within 60 days following the issuance of this license.

(B) At least annually, the Licensee shall, after consulting with the U.S. Fish and Wildlife Service, the North Carolina Department of Environment and Natural Resources, the North Carolina Wildlife Resources Commission, and the South Carolina Department of Natural Resources, review and update the list of Threatened and Endangered Species based on a species status change and updated distribution and occurrence information. If the update has any species that is newly listed, delisted, or has a change of status, and that species is documented within the Project Boundaries or within the Catawba and Wateree Rivers and their associated floodplains and bottom lands from Lake James downstream to the confluence of the Wateree River with the Congaree River, the Licensee must: (i) consult with the U.S. Fish and Wildlife Service (USFWS) and, as appropriate, the National Marine Fisheries Service, the North Carolina Department of Environment and Natural Resources, the North Carolina Wildlife Resources Commission, and the South Carolina Department of Natural Resources; and (ii) after consulting with these agencies, file any required modified or additional Species Protection Plans with the Commission, for approval.

(C) The Commission reserves the right to require changes to any Species Protection Plan. The Licensee must implement any Species Protection Plans as approved by the Commission, including any changes required by the Commission.

[223] Duke Energy filed a revised species protection plan for shortnose and Atlantic sturgeon on August 24, 2011, after the filing of the license application. Article 403 of this license requires Duke Energy to file a revised sturgeon protection plan within 4 months of license issuance to include additional Commission-staff recommended measures.