



UNITED STATES DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
 Southeast Regional Office
 263 13th Avenue South
 St. Petersburg, Florida 33701-5505
<http://sero.nmfs.noaa.gov>

APR 12 2018

F/SER31: SF

Briana A. Grange, Aquatic Biologist
 Division of License Renewal
 Office of Nuclear Reactor Regulation
 U.S. Nuclear Regulatory Commission
 Washington, DC 20555-0001

Dear Ms. Grange:

This letter responds to the U.S. Nuclear Regulatory Commission (NRC) request for consultation with us, the National Marine Fisheries Service (NMFS), pursuant to Section 7 of the Endangered Species Act (ESA) for the following action.

Applicant	SER Number	Project Type
NRC	SER-2017-18839	Westinghouse Columbia Fuel Fabrication Facility (CFFF) License Renewal

Consultation History

We received your letter requesting consultation on August 16, 2017. We requested additional information on September 22, 2017, October 12, 2017, December 12, 2017, February 13, and March 2, 2018. We received a final response on March 5, 2018, and initiated consultation that day.

Project Location

Address	Latitude/Longitude (North American Datum 1983)	Water body
5801 Bluff Road, Columbia, Richland County, South Carolina	33.88111°N, 80.92333°W ¹	Congaree River

¹ NMFS converted coordinates provided by NRC as 33°52'52"N and 80°55'24"W to North American Datum 1983 with "Coordinate Conversion and Transformation Tool (NCAT)" available at <https://beta.ngs.noaa.gov/NCAT/>.



AREA SURROUNDING CFFF

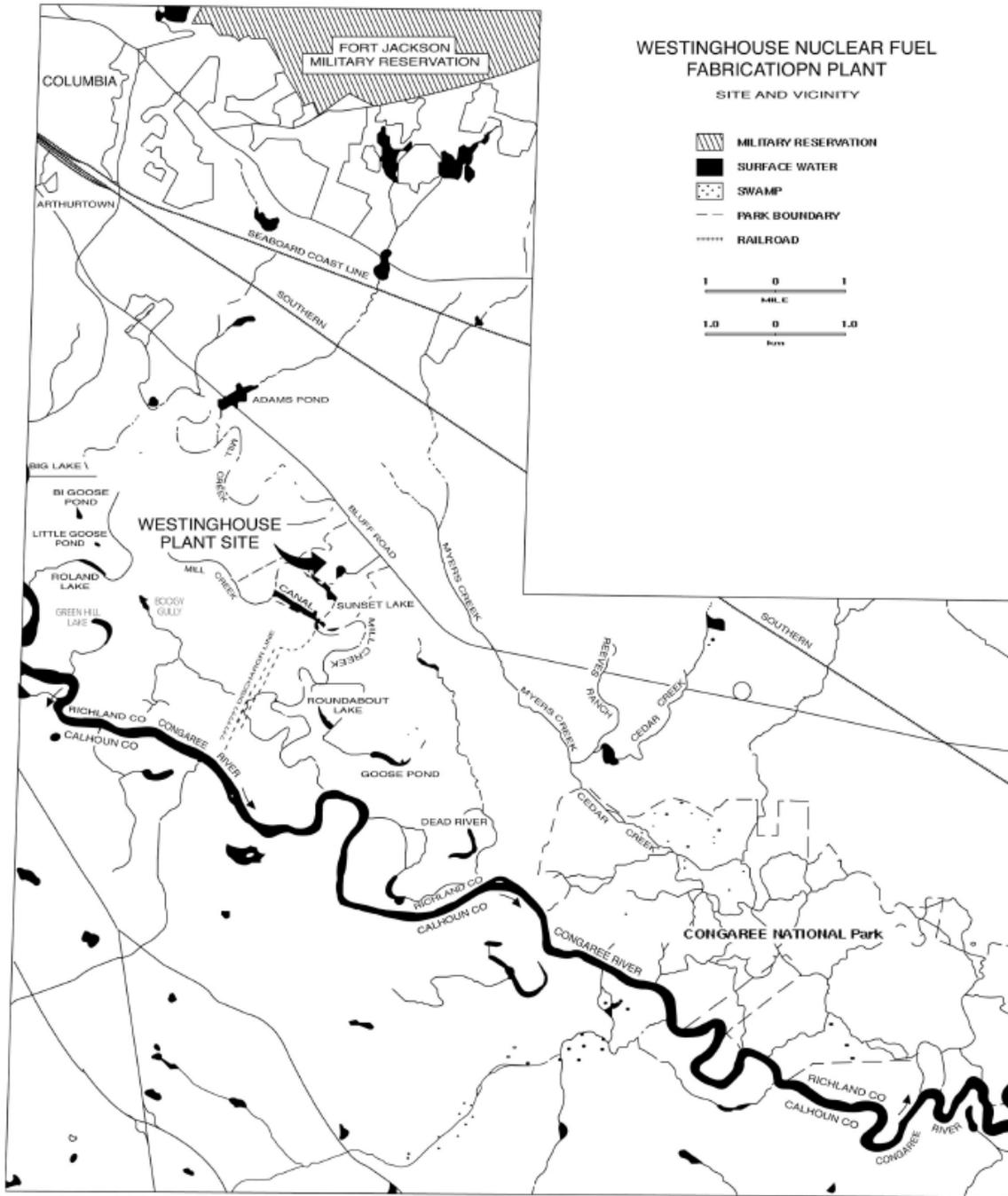


Figure 1. Geographical Location of CFFF (Modified From NRC, 1995)

Figure 1. Image from “Final Environmental Assessment for the Renewal of U.S. Nuclear Regulatory Commission License No. SNM-1107 for Westinghouse Columbia Fuel Fabrication Facility.” NRC (2007). Image is page 3.

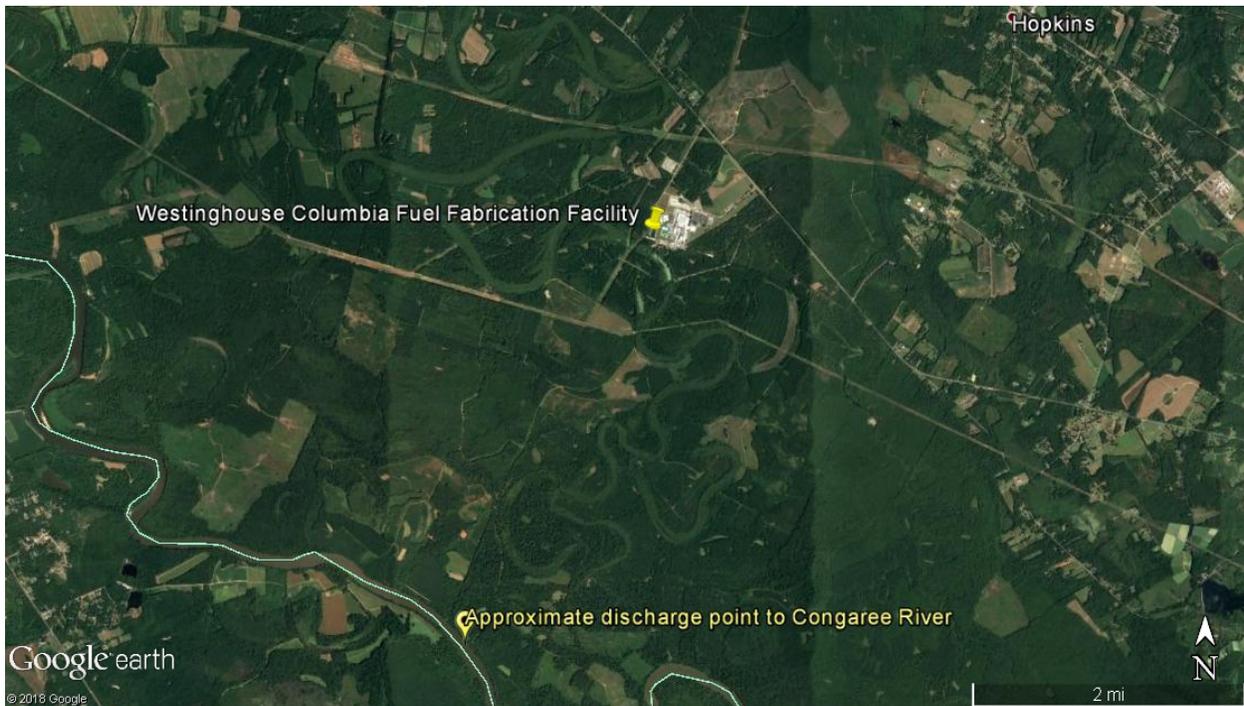


Figure 2. Image of the project action area (i.e., the approximate discharge point to Congaree River) (© 2018 Google)

Existing Site Conditions

The project consultant completed an environmental assessment (“report”) in December 2014. The CFFF is a nuclear fuel fabrication facility that has been operating since 1969. It is located on a 469-hectare (1,158-acre) site about 13 kilometers (8 miles [mi]) southeast of the city of Columbia and about 4 mi northeast of the Congaree River.

Liquid wastes are generated from process liquid waste streams and sanitary uses. Westinghouse Electric Company, LLC (WEC) treats both process and sanitary liquid waste streams onsite prior to discharge into the Congaree River. Liquid effluent is monitored and treated to remove uranium, ammonia, and fluorides through filtration, flocculation, lime addition, distillation, and precipitation in a series of holding lagoons at the facility.

According to information provided by the NRC, after traveling through and processing in the holding lagoons for a week or more, liquid effluent (process and sanitary) is routed offsite to the Congaree River through a 15-centimeter (cm) (6-inch [in]) pipeline, which meets with and submerges below the river’s surface at a point about 3.5 mi south of the main plant facility. Effluent enters the river roughly at ambient temperature from a 2-meter (m)-long diffuser near the river bottom that is perpendicular to river flow and about 6 m (20 ft) from the shore. The diffuser has three 2-in ports to release the effluent. All discharged effluent must meet the requirements and limitations of National Pollutant Discharge Elimination System (NPDES) permit number SC0001848 issued by the South Carolina Department of Health and Environmental Control (SCDHEC).

River depth in the discharge vicinity is about 9 ft, and river width is about 420 ft. Benthos consists of sand and mud typical of Piedmont streams.

According to the project consultant's environmental report, the effluent's annual average ammonia-Nitrogen (total as N) ("ammonia") and fluoride concentrations are 20.1 milligrams (mg) per liter (L) and 8 mg/L, respectively. Fiscal year (FY) 2016 and 2017 discharge monitoring report (DMR) data for ammonia and fluoride within United States Environmental Protection Agency's (USEPA's) Enforcement and Compliance History Online (ECHO) database appeared to fall below these annual averages (about 12 mg/L and 4 mg/L, respectively).² Scientific studies of ammonia in shortnose sturgeon fingerlings³ and fluorides in Siberian sturgeon⁴ point to lethal levels of ammonia in fingerlings starting around 150 mg/L, and fluoride levels of 10 mg/L significantly inhibiting growth of Siberian sturgeon, when exposure was for 90 days or more.

According to the NRC, 2011-2015 annual Congaree River fish tissue and sediment sampling conducted by WEC as part of its current NRC license yielded no uranium in fish tissue samples.⁵ Total uranium activity in sediment was less than 2 picocuries (pCi) per gram (g).⁶ Data collected in the Congaree River from June 2011 through December 2015 indicate gross alpha concentrations were less than 10 pCi/L, which is below the USEPA's drinking water maximum contaminant level for gross alpha of 15 pCi/L.⁷

The NPDES permit prevents the applicant from discharging effluent with dissolved oxygen (DO) content of less than 1.0 mg/L. According to information provided by the NRC, the minimum of 1 mg/L for DO was based on modeling done by the State of South Carolina to ensure the in-stream DO at critical stream flow would not fall below the state's DO standards for freshwater. FY 2016 and 2017 DMR data for DO within USEPA's ECHO database show DO levels ranging from 6.5 mg/L and 10.4 mg/L.⁸ These levels are protective of shortnose sturgeon survival and growth for all life stages.⁹

² USEPA. "ECHO: ICIS-NPDES Permit Limit and Discharge Monitoring Reports (DMRs) Data Sets," <https://echo.epa.gov/tools/data-downloads/icis-npdes-dmr-and-limit-data-set>, accessed November 8, 2017.

³ Isely, J.J., and J. R. Tomasso. 1998. Acute toxicity of ammonia and nitrite to shortnose sturgeon fingerlings. *The Progressive Fish-Culturist* 60(4): 315-318.

⁴ Shi, X., and co-authors. 2009. The bioaccumulation of fluoride ion (F) in Siberian sturgeon (*Acipenser baerii*) under laboratory conditions. *Chemosphere* 75(3): 376-380.

⁵ J. Quintero, NRC, pers. comm. to S. Furtak, NMFS Protected Resources Division (PRD), January 24, 2018.

⁶ According to the Agency for Toxic Substances and Disease Registry (ATSDR), the average concentration of uranium in United States (U.S.) soils is 2 pCi/g (ATSDR. February 2013. Toxicological Profile for Uranium. <https://www.atsdr.cdc.gov/toxprofiles/tp150.pdf>, accessed February 28, 2018.).

⁷ As required by its current NRC license, WEC annually samples three locations within the Congaree River for radioactivity (i.e., gross alpha) 500 ft upstream of the CFFF discharge, 500 ft downstream of the CFFF discharge, and upstream of CFFF at Blossom Bridge in Columbia, South Carolina.

⁸ USEPA. "ECHO: ICIS-NPDES Permit Limit and Discharge Monitoring Reports (DMRs) Data Sets," <https://echo.epa.gov/tools/data-downloads/icis-npdes-dmr-and-limit-data-set>, accessed November 8, 2017.

⁹ USEPA. October 2004. "Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll *a* for the Chesapeake Bay and Its Tidal Tributaries," <https://nepis.epa.gov/Exe/ZyPDF.cgi/P1001WB8.PDF?Dockkey=P1001WB8.PDF>, accessed March 1, 2018.

Shortnose sturgeon spawning has been documented in the Santee-Cooper River System. More specifically, a spawning area was found about 60 kilometers north of Lake Marion – near Columbia, South Carolina, in the vicinity of CFFF.¹⁰ NMFS believes that Atlantic sturgeon presence in the action area, even if rare or nil at this time, may increase if dams are removed or fish passage(s) installed in the river system during the long duration of this project (see below).

Project Description

The applicant proposes to continue to operate CFFF for an additional 40 years from the date the renewed license (to receive, acquire, possess, and transfer byproduct, source, and special nuclear material) is granted by NRC.

Based on our analysis of the project effects below, the action area is the area of the mixing zone as calculated by SCDHEC with CORMIX hydrodynamic modeling software.¹¹ According to SCDHEC water quality standards, for surface waters, a mixing zone is an area where a discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient waterbody. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented (except as defined within a zone of initial dilution) and public health and welfare are not endangered.¹² According to SCDHEC's analysis,¹³ the mixing zone measures about 0.08 m (0.26 ft) long by 0.55 m (1.8 ft) high by 2 m (6.56 ft) wide. Based on NMFS's analysis, the volume of the mixing zone is about 0.088 cubic m (3.07 cubic ft [ft³]).

SCDHEC calculated un-ionized ammonia concentrations within the action area to be less than 0.0234 mg/L for both the monthly average (chronic toxic effect) permit limit and daily maximum (acute toxic effect) permit limit. According to a University of Florida study, un-ionized ammonia levels of 0.05 mg/L have been shown to be damaging to fish, and at 2.0 mg/L, the fish will die.¹⁴ SCDHEC used a conservative approach in calculating un-ionized ammonia levels as actual discharge data shows total ammonia concentrations less than the monthly average and daily maximum permit limits.¹⁵

Construction Conditions

All discharged effluent must meet the requirements and limitations of NPDES permit number SC0001848 issued by the SCDHEC.

WEC maintains an Industrial Stormwater General NPDES permit number SCR000000, which is separate from WEC's NPDES permit discussed above. As required by this stormwater permit, WEC has developed and implemented an approved Stormwater Pollution Prevention Plan.

¹⁰ Collins, M.R., and co-authors. 2003. Shortnose sturgeon in the Santee-Cooper reservoir system, South Carolina. *Transactions of the American Fisheries Society* 132: 1244-1250.

¹¹ SCDHEC Water Facilities Permitting Division, "NPDES Application Supplement Mixing Zone Request Form," memo, May 21, 2009, available at <http://www.scdhec.gov/Environment/docs/f-mixzone.pdf>.

¹² SCDHEC. June 27, 2014. R.61-68, Water Classifications & Standards. Bureau of Water, Columbia, South Carolina. <http://www.scdhec.gov/Agency/docs/water-regs/R.61-68.pdf>, accessed February 27, 2018.

¹³ B. Amick, SCDHEC, pers. comm. to S. Furtak, NMFS PRD, February 13, 2018.

¹⁴ Francis-Floyd, R., and co-authors. 2015. Ammonia in aquatic systems. Fisheries and Aquatic Sciences Department, University of Florida/Institute of Food and Agricultural Sciences Extension.

¹⁵ B. Amick, SCDHEC, pers. comm. to S. Furtak, NMFS PRD, February 14, 2018.

WEC is also required to monitor and report to NRC on release of radiological effluents in accordance with 10 Code of Federal Regulations (CFR) 40.65 and 10 CFR 70.59.

Effects Determinations for Species the Action Agency or NMFS Believes May Be Affected by the Proposed Actions

Species	ESA Listing Status	Action Agency Effect Determination	NMFS Effect Determination
Fish			
Shortnose sturgeon	E	NLAA	NLAA
Atlantic sturgeon (Carolina distinct population segment [DPS])	E	NE	NLAA
E = endangered; T = threatened; NLAA = may affect, not likely to adversely affect; NE = no effect			

Critical Habitat

The project is not located in designated critical habitat, and there are no potential routes of effect to any designated critical habitat.

Analysis of Potential Routes of Effects to Species

Shortnose sturgeon and Atlantic sturgeon may be impacted by being exposed to effluent containing high levels of ammonia/un-ionized ammonia, fluorides, uranium, and inadequate DO. Impacts could include mortality, growth and development impairment, and fitness (i.e., the ability to survive and reproduce) reduction. However, we believe these effects are discountable because discharged effluent must meet the requirements and limitations of the NPDES permit number SC0001848 issued by SCDHEC. Ammonia, fluorides, and DO are covered in the NPDES permit, and occur at levels that are not likely to adversely affect shortnose sturgeon and Atlantic sturgeon. Uranium occurs at levels that are not likely to adversely affect shortnose sturgeon and Atlantic sturgeon. Also, WEC is required to monitor and report to NRC on release of radiological effluents in accordance with 10 CFR 40.65 and 10 CFR 70.59. Further, it is expected that fish and other organisms would not likely encounter the effluent in the mixing zone as the mixing zone is a very small fraction of the Congaree River. The mixing zone is about 3 ft³ in the Congaree River that is 420 ft wide, 9 ft deep, and tens of miles long.

Shortnose sturgeon and Atlantic sturgeon may be harmed by ingesting prey that contains high levels of uranium. However, we believe this effect is insignificant because uranium in sediment samples occurs at levels below average U.S. soil levels, and fish tissue samples yielded no uranium.

Conclusion

Because all potential project effects to listed species were found to be discountable, insignificant, or beneficial, we conclude that the proposed action is not likely to adversely affect listed species under NMFS’s purview. This concludes your consultation responsibilities under the ESA for species under NMFS’s purview. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in

a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. NMFS's findings on the project's potential effects are based on the project description in this response. Any changes to the proposed action may negate the findings of this consultation and may require reinitiation of consultation with NMFS.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions on this consultation, please contact Sarah Furtak, Consultation Biologist, at (954) 734-4713, or by email at sarah.furtak@noaa.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Roy E. Crabtree". The signature is fluid and cursive, with a long horizontal stroke at the end.

FW Roy E. Crabtree, Ph.D.
Regional Administrator

File: 1514-22.M