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August 30, 2012

Ms. Alicia Rowe
South Carolina Department of Health and Environmental Control
Water Quality Certification and Wetlands Section
2600 Bull Street
Columbia, South Carolina 29201

Subject: William States Lee III Nuclear Station
Public Notice No.: 2009-122-SIR
Request for Additional Information

Dear Ms. Rowe:

With reference to your May 24, 2012 letter, attached are Duke Energy's responses to many of your requests for information regarding Duke Energy's Section 401 Water Quality Certification. Additional information responsive to remaining requests will be forthcoming with a transmittal to your office planned in September.

Please contact me at 704 382-4669 if you have questions or need additional information.

Sincerely,

Robert Wylie

Robert Wylie
Environmental Project Manager

Enclosure:

Response to SCDHEC 401 Request for Additional Information

Duke Energy Response to SCDHEC
401 Request for Additional Information
August 30, 2012

SCDHEC 401 Request for Information (Letter to Robert Wylie from Alicia Rowe) Letter Dated: May 24, 2012

1. **SCDHEC Comment:**

   Provide an outline of the proposed Drought Contingency Plan.

   Duke Energy Response:

   To minimize withdrawal of water from the Broad River during low-flow periods, a drought contingency pond (Pond C) will be built to complement existing drought contingency Pond B.

   During normal flow periods on the Broad River (>538 cfs), Duke Energy will withdraw all of its Lee Nuclear Station operational water requirements from the Ninety-Nine Islands Reservoir through the primary section of the river intake into the existing on site Pond A. The primary section of the river intake will have a design intake flow of 98 cfs. Pond A will provide water for plant processes and cooling tower makeup. Based on the historical Broad River flow conditions, Duke Energy anticipates this will be the water withdrawal scheme employed greater than 95 percent of the time.

   As the Broad River flow drops below 538 cfs and begins to approach 483 cfs, Duke Energy will proportionally withdraw its consumptive water requirements (≤63 cfs) from Ninety-Nine Islands Reservoir and drought contingency Ponds B and/or C. Pond B will be drawn down first. If Pond B drawdown reaches 30 feet, drawdown from Pond B will cease and water will be withdrawn from Pond C to a nominal drawdown ≤30 feet.

   When Broad River flow is at or below 483 cfs, only non-consumptive cooling water (approximately 23 cfs) will be withdrawn from the Ninety-Nine Islands Reservoir. That water (approximately 23 cfs) will be returned to the reservoir immediately after use in order to maintain adequate flows in the Broad River. The remaining water needed to operate Lee Nuclear Station (≤63 cfs) will be drawn from drought contingency Ponds B and/or C. Pond B will be drawn down first. If Pond B drawdown reaches 30 feet, drawdown from Pond B will cease and water will be withdrawn from Pond C to a nominal drawdown ≤30 feet. Based on modeling using worst case droughts over the 85-year period of record of Broad River flows, Duke Energy does not anticipate that any additional drawdown from Ponds B and C will be required. However, should worse than historical drought conditions persist, any additional drawdown or other water management protocols will be performed pursuant to a drought contingency plan to be developed in accordance with the South Carolina Surface Water Withdrawal Permitting, Use, and

Reporting Act and associated regulations after consultation with appropriate regulatory agencies.

During the period of July through February, and only when the Broad River flows are above 483 cfs, Ponds B and/or C will be refilled, as needed, by withdrawing water from the Ninety-Nine Islands Reservoir through the drought contingency section of the river intake. During this period, the water necessary to operate the Lee Nuclear Station will also be withdrawn from the Ninety-Nine Islands Reservoir via the primary section of the river intake.

The drought contingency section of the river intake will have a maximum design intake flow of 206 cfs. However, the actual refill rate will be determined using a flow-sensitive approach to ensure Broad River flows do not fall below 483 cfs due to refill of the drought contingency ponds. Further, regardless of river flows, refilling of Ponds B and C will not occur from March through June, to minimize the potential for entrainment.

2. **DHEC Comment:**

Information regarding minimum flows to London Creek from "Drought Contingency Pond C" (Pond C) during and after construction of the proposed project.

Duke Energy Response:

Based on historical flow data collected at London Creek (see Attachment 1), Duke Energy proposes the following minimum seasonal flow releases from Pond C to London Creek downstream of Pond C dam:

January through April - 1.50 cfs

May, June and December - 1.00 cfs

July through November - 0.75 cfs

SC Department of Natural Resources (Letter to Dr. Richard Darden and Alicia Rowe from Bob Perry) Letter Dated: March 6, 2012

3. **SCDNR Comment:**

The Applicant proposes a 300-ft buffer around Make-Up Pond C, 50 ft of which is proposed to be cleared, grubbed, grassed, and maintained to prevent debris from washing into the reservoir. DNR concurs with the proposed 300-ft buffer but does not support maintaining a grassed 50-ft shoreline buffer. If a natural shoreline buffer

is maintained, Pond C would naturalize and support a greater variety of aquatic life and wildlife.

Riparian zones perform numerous ecological functions, including providing food, cover, and nesting sites for a variety of wildlife species as well as detritus and woody debris which are an important source of energy and cover for aquatic life. Canopy cover helps to maintain water quality by reducing surface water temperatures and evaporative losses. Riparian zones function as biofilters and remove nutrients and other pollutants from stormwater runoff before it enters rivers, lakes, and streams. Maintenance of the 50-ft buffer likely will contribute to lowered water quality. DNR recommends the Applicant explore alternatives for preventing debris from entering intake structures in order to protect water quality, maximize wildlife habitat and reduce evaporative losses.

Duke Energy Response:

Upon further evaluation, Duke Energy now proposes to allow a natural shoreline buffer and install a log boom in order to protect blockage of the Pond C spillway.

4. **SCDNR Comment:**

The Applicant indicates that security fencing will be installed around the perimeter of the pond, and DNR understands that there are no plans for any type of public access to Drought Contingency Pond C. DNR appreciates the sensitive nature of operation and protection of a nuclear generation station. However, London Creek constitutes WOUS and any impacts to it for purposes of a reservoir the size of the one being proposed should include an examination of compatible public use opportunities. These compatible public use opportunities might include boating and fishing opportunities and other compatible appreciative uses along the northern boundary. DNR recommends continued discussion with the Applicant regarding the potential, compatible public use opportunities on a portion of proposed Make-Up Pond C

Duke Energy Response:

Duke Energy plans to continue discussion with the SCDNR regarding the potential, compatible public use opportunities on a portion of the proposed drought contingency Pond C.

5. **SCDNR Comment:**

Grassland birds are among the most steeply declining of all bird populations in North America due to loss and degradation of grassland and shrub-scrub habitats. Transmission corridors can provide significant habitat for grassland birds, as well as

raptors and small mammals, functioning as linear grassland/shrublands through forest-dominated landscapes. Excellent wildlife habitat, as well as safe and efficient power delivery, can be provided by managing these areas as a combination of native grasses, forbs, and small shrubs through direct seeding or natural regeneration. Any direct seeding of corridors should utilize only native plant materials. Sod-forming grasses like Bermuda grass and fescue, and aggressive non-native forbs provide poor wildlife habitat along the right-of-way and can potentially escape to adjacent woodlands or fields resulting in additional habitat degradation. DNR recommends that, where possible, lands within transmission line corridors be managed for the benefit of wildlife.

Duke Energy Response:

Duke Energy will work with the SCDNR to manage the corridors where possible so that habitat will be present for grassland birds and other wildlife.

Duke Energy will construct and maintain the transmission lines in accordance with the Duke Energy Carolinas *Best Management Practices for Stormwater Management and Erosion Control, Policy and Procedures Manual* (Revised 1999) and maintenance procedures described in the *Duke Energy Carolinas Transmission Vegetation Management Program.* Permanent and temporary seeding mixes prescribed in these plans have the primary purpose of providing quick stabilization of the site to prevent erosion and sedimentation into the waterways.

Duke Energy manages the vegetation on its rights-of-way through an Integrated Vegetation Management Program. The program encompasses environmental stewardship and utilizes various right-of-way management tools, including mowing; hand-cutting; removal of dead, diseased, dying or decaying trees; pruning; and the use of environmentally safe herbicides. Herbicide use prevents vegetation from posing a threat to the transmission lines and equipment while promoting power system compatible ecosystems within the right-of-way corridor.

6. SCDNR Comment:

DNR has concluded that Applicant has conducted a thorough and exhaustive review of the need for obtaining additional water supply for safe operation of the proposed facility during periods of extreme drought. A number of the alternatives that have been put forward for additional water supply represent engineering solutions exceeding the capability for DNR analysis. DNR is satisfied the Applicant has identified the least damaging alternative to natural resources for provision of additional water supply based on comparison of alternative supplemental water supply options.

Duke Energy Response:

Duke Energy appreciates the comment and will continue to partner with SCDNR as the project progresses.

7. **SCDNR Comment:**

The provision of a seasonally-adjusted minimum flow is SCDNR policy and is embraced by the South Carolina Water Withdrawal, Permitting, Use, and Reporting Act (SC Code 33 Ann. 49-4). DNR recommends the Section 404 permit/Section 401 water quality certification be conditioned to include a seasonal minimum flow release from Drought Contingency Pond C Dam that is protective of downstream aquatic resources. The minimum flow should commence with the filling of the pond to avoid and minimize adverse impacts to fish and the macrobenthic community downstream of the dam to the confluence of London Creek with the Broad River.

Duke Energy Response:

Based on historical flow data collected at London Creek (see Attachment 1), Duke Energy proposes the following minimum seasonal flow releases from Pond C to London Creek downstream of Pond C dam:

January through April - 1.50 cfs

May, June and December - 1.00 cfs

July through November - 0.75 cfs

8. **SCDNR Comment:**

DNR staff met with Applicant in August 2010 regarding DNR's concern about view-shed impacts from the transmission lines to the Scenic Broad River. During the meeting, the Applicant provided the DNR with a presentation depicting the transmission lines as seen from the Broad River. Based on the depictions, DNR understands that the transmission lines will be minimally visible to the recreating public during winter, leaf-off conditions. Furthermore, DNR understands that impacts can be further reduced through the employment of shorter towers along the Scenic Broad River corridor. DNR requested and was assured of continued consultation during the design phase of the transmission lines; however, as of this date, DNR has not received any such consultation. DNR urges the Licensee to avoid and minimize to the greatest practicable extent through the careful design and

placement of transmission lines (e.g., shorter towers and the use of wider buffer in those sections of the corridor along the Scenic Broad River).

Duke Energy Response:

During the transmission line siting study for the Lee Nuclear 230 kV and 525 kV Fold-in Lines, Duke Energy conducted an extensive analysis to determine the probable visibility of the various alternate routes from the scenic designated segment of the Broad River. The analysis considered all alternate routes that would possibly be visible from the Scenic Broad River Corridor. The methodology included computer modeling to predict areas along the river that would likely have some degree of view of the future lines. Additionally, potential views from the river were carefully analyzed in the field by inspection from the river during a canoe excursion from the Ninety-Nine Islands Dam to the Highway 211 bridge.

Following the selection of the routes for the 230 kV and 525 kV Fold-in Lines, Duke conducted additional analyses in 2008 that focused on the selected routes and their potential visibility from the scenic designated segment of the Broad River. These analyses were conducted prior to the completion of preliminary line engineering and assumed structure heights that exceed the actual heights of the preliminarily engineered structures. These analyses, which included extensive computer modeling and photographic simulation preparation, revealed that a very minimal number of structures would potentially be visible from the scenic designated segment of the Broad River during winter, leaf-off conditions. It was concluded that, under these initial analyses, any visible portions of the structures during leaf-off conditions would likely be unrecognized by casual viewers.

Due to the reduction in structure height of the preliminarily engineered structures compared to the structure heights used in the initial visual analyses of the 230 kV and 525 kV Fold-in Lines, Duke is confident that the information presented to SCDNR staff during the August 2010 meeting represents a worst case scenario regarding potential views of the 230 kV and 525 kV Fold-in Lines that will not likely occur due to reductions in structure heights that were evaluated during preliminary line engineering. For that reason, Duke believes no further consultation with the SCDNR has been warranted since the August 2010 meeting. Discussions with SCDNR will occur upon the completion of final engineering of the Lee Nuclear Station 230 kV and 525 kV Lines.

9. SCDNR Comment:

DNR notes that only the discharge proposed for normal operations, 18 cfs, was considered in model scenarios. The maximum discharge of 64 cfs was not modeled. During an interagency meeting with the Applicant on February 17, 2012, DNR was assured that maximum blowdown would occur only during periods of high flows. DNR requests additional information on the duration of such events and the magnitude of the thermal plume produced during anticipated maximum blowdown conditions. DNR urges due diligence by the South Carolina Department of Health and Environmental Control to ensure that the NPDES permit for the Lee Nuclear Station will be conditioned to require appropriate biological and chemical monitoring, to include fish community

Duke Energy Response:

The maximum blowdown (62.4 cfs) condition occurs when the cooling towers are operated at two cycles of concentration (COC) due to elevated Total Suspended Solids (TSS) levels in the river water. Based on the correlation of TSS and river flow data, it is estimated that the river flow has to be greater than 17,000 cfs to require a two COC cooling tower operation. At 17,000 cfs the maximum blowdown is less than 0.4 percent of the river flow. With such a great difference between river flow and the maximum blowdown flow, the influence of maximum blowdown on the river is negligible. During maximum blowdown, temperature increase, if any, will typically be less than 0.1 degrees F at the edge of the permitted mixing zone.

US Department of the Interior: Fish and Wildlife (Letter to Dr. Richard Darden from Jay Herrington) Letter Dated: March 6, 2012

10. USFWS Comment:

Power generation by the William State Lee facility represents potential impacts to the Broad River. These potential impacts were not described in this public notice. However, the USFWS believes that impacts to the river should be an integral consideration as the proposed construction activities will lead into operation of the facility. Therefore, comments were included on potential impacts to the Broad River system.

Duke Energy Response:

All cooling water intake structures and wastewater discharges from Lee Nuclear Station to the Broad River will be regulated by the NPDES permit. The NPDES permit is issued by SCDHEC and is drafted to ensure all pertinent regulations are

implemented in order to protect the receiving water body. Lee Nuclear Station is installing cooling towers, which significantly reduces water withdrawal needs and thermal loading to the Broad River. Based on the projected operation of the cooling towers, the installation of a diffuser, the historical river flow, and the characteristics of the wastewater, the discharge from Lee Nuclear will not adversely impact the aquatic ecology in the Broad River.

11. USFWS Comment:

The USFWS believes that due to the significance, coverage, and magnitude of the impacts, the Applicant should be required to compensate in an equally significant manner. The USFWS recommends that the Applicant prepare a compensation package that will suitably mitigate for impacts that will occur at the landscape level. As stated in the public notice, the Applicant's compensation package is a conceptual plan. Considering the complex nature of this project, the USFWS understands the difficulties in identifying suitable areas to affect appropriate mitigation. Therefore, USFWS believes it would be appropriate to review the proposed mitigation locations during a multi-agency site visit prior to finalizing the proposed impact mitigation.

Duke Energy Response:

Similar to the development of a mitigation bank, the development of Duke Energy's permittee-responsible mitigation plan included involvement from state and federal resource and permitting agencies. Multiple meetings were held to solicit input on the mitigation plan from USACE, Nuclear Regulatory Commission (NRC), USEPA, USFWS, NMFS, SCDNR, and SCDHEC, and to also address resource and permitting agency issues and concerns and to ensure 2008 Mitigation Rule compliance. This Agency input was instrumental in the development of the proposed mitigation plan. An interagency meeting was held at USACE in Charleston, SC on February 17, 2012 and a two-day field trip to the proposed mitigation sites in the Sumter National Forest and Turkey Creek was held on April 24 -25, 2012. USFWS staff participated in both the interagency meeting and the field trip.

12. USFWS Comment:

The USFWS is concerned with the effects of the proposed cooling tower blowdown discharge on the aquatic system of the Ninety-Nine Islands Reservoir and the Broad River downstream of the dam. The blowdown discharge would contain biocides, chemical additives, radioactive waste, and thermal effluent. The chronic and cumulative effect of chemicals and radioactive waste would adversely affect fish and invertebrate spawning and recruitment in the vicinity of the discharge within the reservoir, and downstream of the dam, particularly during periods of low flow.

Duke Energy Response:

All cooling water intake structures and wastewater discharges from Lee Nuclear Station to the Broad River will be regulated by the NPDES permit. The NPDES permit is issued by SCDHEC and is drafted to ensure all pertinent regulations are implemented in order to protect the receiving water body. Lee Nuclear Station is installing cooling towers, which significantly reduces water withdrawal needs and thermal loading to the Broad River. Based on the projected operation of the cooling towers, the installation of a diffuser, the historical river flow, and the characteristics of the wastewater, the discharge from Lee Nuclear will not adversely impact the aquatic ecology in the Broad River. In addition, the discharge of treated wastewater from Lee Nuclear Station to the Broad River will be governed by 10 CFR Parts 20 and 50.

13. USFWS Comment:

Thermal effluent from reactor operations would affect fish and invertebrate spawning, and biological systems through stress and/or direct mortality. It would especially affect non-motile or slow moving invertebrates such as freshwater mussels and other aquatic invertebrates. In addition, the USFWS is concerned that the levels of copper and zinc proposed on the effluent will exceed DHEC criterion maximum concentration for these metals, which may violate SC Water Quality Classifications and Standards that establish maximum concentrations for freshwater.

Duke Energy Response:

All cooling water intake structures and wastewater discharges from Lee Nuclear Station to the Broad River will be regulated by the NPDES permit. The NPDES permit is issued by SCDHEC and is drafted to ensure all pertinent regulations are implemented in order to protect the receiving water body. Lee Nuclear Station is installing cooling towers, which significantly reduces water withdrawal needs and thermal loading to the Broad River. Based on the projected operation of the cooling towers, the installation of a diffuser, the historical river flow, and the characteristics of the wastewater, the discharge from Lee Nuclear will not adversely impact the aquatic ecology in the Broad River.

South Carolina Wildlife Federation (Letter to Dr. Richard Darden from Ben Gregg) Letter Dated: March 6, 2012

14. SCWF Comment:

During major flood events in London Creek and Lake Cherokee, the peak flow will be significantly faster and higher in magnitude because of the lake water body in

London Creek. The flood impact on Broad River may not be very significant because the size difference of the drainage area between London Creek and Broad River. However, the flood impact of London Creek will be very significant on property and personnel in the drainage area between Broad River and the proposed dam on London Creek. Flood zone volume should be considered in the design of London Creek dam to catch and store the flood volume and release it downstream in non-flood magnitudes. Releases from the Ninety-Nine Islands Hydroelectric Project should be synchronized with the flood from London Creek to minimize its impact on the Broad River.

Duke Energy Response:

Hydrologic/hydraulic modeling of London Creek with the proposed Pond C demonstrates that peak flow will not be faster or higher in magnitude during major flood events. Rather, modeling results show that Pond C would serve as a detention structure that has the ability to store and discharge peak flood waters at significantly lower peak flows than if the reservoir was not constructed. The combination of storage and discharge over the spillway structure would tend to reduce the magnitude of peak flows in London Creek below Pond C and discharging in the Broad River. Proposed operating conditions at Pond C are expected to decrease the peak Pond C basin discharge during the inflow design flood (IDF) (the probable maximum precipitation for the 3.88 sq mi basin) from approximately 31,184 cfs (without Pond C) to 11,360 cfs (peak discharge during the IDF from the proposed spillway).

A comparison of the London Creek basin discharges for the existing and proposed Pond C conditions is provided below in Table 1 and Figure 1. This table provides an assessment of Pond C basin discharge in terms of an equivalent return period on the Broad River below the Ninety-Nine Islands Reservoir. Return period information was calculated based on the synthesized hydrologic data developed during the LNS permitting and design process. The hydrologic data is based on the USGS 02153500 stream gauge located on the Broad River near Gaffney, SC along with two USGS stream gauges, USGS 02153200 Broad River near Blacksburg, SC and USGS 02151500 Broad River near Boiling Springs, NC, used to supplement missing data. The synthesized hydrology set was then prorated to the drainage area of the Ninety-Nine Islands Reservoir.

Table 1: Pond C Basin Discharge Comparison for Various Storm Events under Existing and Proposed with Pond C Conditions.

Frequency Storm	Pond C Basin Discharge, cfs		Equivalent Return Period (Years) on Broad River near the Ninety-Nine Islands Reservoir	
	Existing Conditions	Proposed with Pond C Conditions	Existing Conditions	Proposed with Pond C Conditions
10-year	1,960	353	0.90	0.83
25-year	2,648	458	0.94	0.83
50-year	3,146	559	0.96	0.84
100-year	3,752	670	0.99	0.84
500-year	5,299	1,053	1.06	0.86
PMF	31,184	11,360	3.26	1.35

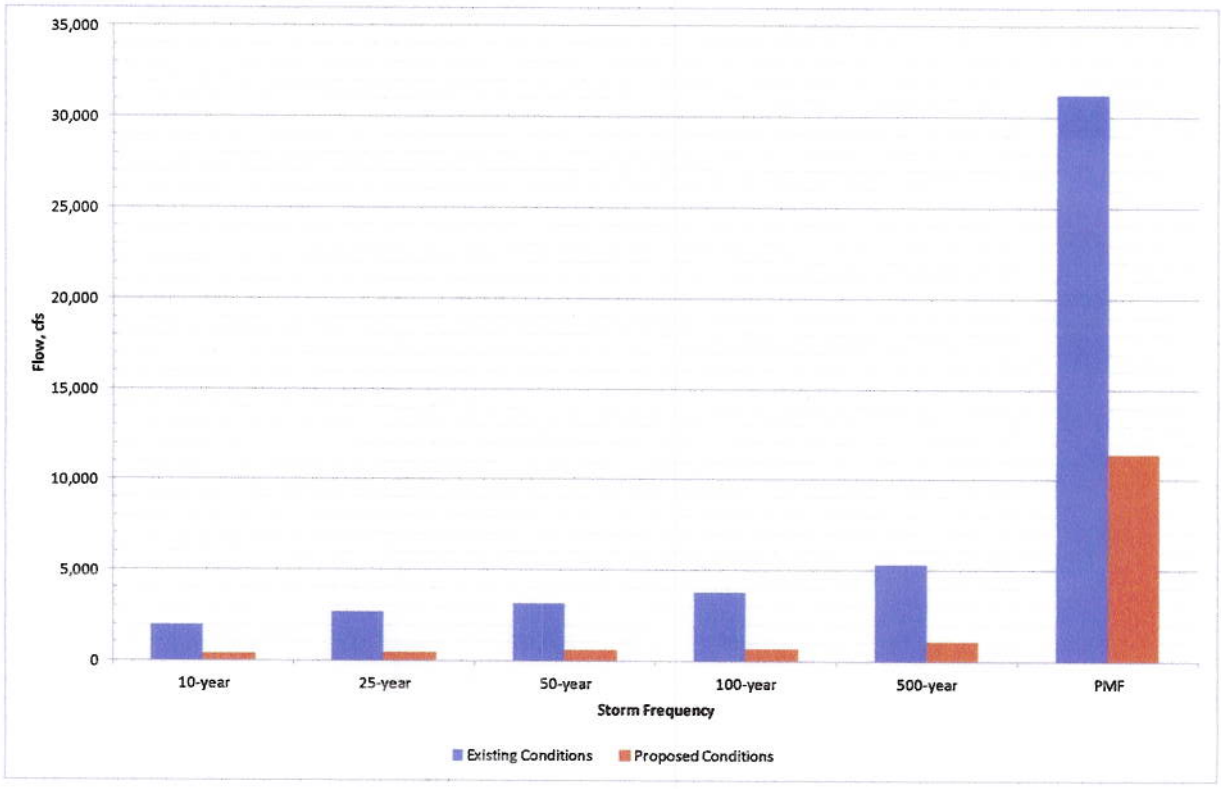

Figure 1: Pond C Frequency Storm Discharge Comparison under Existing and Proposed (with Pond C) Conditions.

Additional analysis has been performed to estimate the impacts of discharges from Pond C at Ninety-Nine Islands Reservoir due to the transposition of contributing Pond C discharges under existing and proposed conditions (Table 2). This analysis conservatively assumes that the large flood events would occur over the Pond C basin while the mean annual flow of 2,580 cfs is being experienced on the Broad River and the Ninety-Nine Islands Reservoir. Reservoir elevations were estimated based on the Ninety-Nine Islands project spillway capacity derived from FERC license documents. This analysis indicates that reservoir levels would be lower under the proposed conditions.

Table 2: Estimated Ninety-Nine Islands Reservoir Elevation for Various Storm Events Under Existing and Proposed Conditions.

Flow Condition	Estimated Ninety-Nine Island Reservoir Elevation, ft	
	Existing Conditions	Proposed with Pond C Conditions
Mean Annual Flow	511.5	
Mean Annual Flow + 10-year Flows	512.0	511.6
Mean Annual Flow + 25-year Flows	512.1	511.6
Mean Annual Flow + 50-year Flows	512.2	511.7
Mean Annual Flow + 100-year Flows	512.4	511.7
Mean Annual Flow + 500-year Flows	512.7	511.8
Mean Annual Flow + PMF	516.1	513.7

These results are expected, as the Pond C basin only contributes approximately 3.9 sq mi of the 1,550 sq mi that make up the drainage area on the Broad River above the Ninety-Nine Islands Reservoir. This accounts for roughly 0.25% of the total inflow to the Ninety-Nine Islands drainage area.

15. SCWF Comment:

Although SCWF applauds the proposed 300 feet buffer zone, SCWF recommends that the Applicant work closely with SCDNR to enhance the 300 feet buffer and its functionality to provide excellent food, cover, and nesting sites for the local wildlife species.

Duke Energy Response:

Duke Energy plans to keep the entire 300 ft buffer surrounding Pond C in its natural state and protect the spillway from blockage by debris with the installation of a log boom.

16. SCWF Comment:

Lake Cherokee is public property owned by the State of South Carolina, and DNR maintains the use of that lake to provide recreational fishing opportunities to the public. SCWF recommends that the public recreational opportunities in and around

the lake not be adversely affected, especially during major flood events. The Applicant should work closely with SCDNR to ensure there will be no adverse effect on the public use of the Lake Cherokee resource.

Duke Energy Response:

Duke Energy will continue to work closely with SCDNR to ensure there will be no adverse effect on the public use of the Lake Cherokee resource. Construction of the proposed Pond C reservoir will not impact public access to Lake Cherokee or adversely affect public recreational opportunities in and around the lake, including during major flood events. Current plans for Lake Cherokee include improved public access by providing handicap-accessible paved and gravel parking areas to the east of the auxiliary spillway along with a pedestrian bridge to maintain access to the top of the dam for bank fishing. With respect to major flood events, the project also includes significant improvements to the auxiliary spillway to offset any loss in principal spillway capacity. The modified spillway has a calculated discharge of approximately 3,040 cfs, representing a 20 cfs increase in the Lake Cherokee auxiliary discharge capacity and a net "zero" impact to the total combined project discharge capacity.

17. SCWF Comment:

The plume, mixing zone, boundaries and magnitude were established by Duke's consultant based upon 18 cfs discharge. The plume, boundaries, and magnitude should be established during the maximum discharges of 64 cfs to minimize the adversely impact on the fish communities. The frequency of such high discharge should be calculated as well. SCWF also recommends more biological and chemical monitoring both before start-up and after commencement of operations so appropriate changes can be instituted.

Duke Energy Response:

All cooling water intake structures and wastewater discharges from Lee Nuclear Station to the Broad River will be regulated by the NPDES permit. The NPDES permit is issued by SCDHEC and is drafted to ensure all pertinent regulations are implemented in order to protect the receiving water body. Lee Nuclear Station is installing cooling towers, which significantly reduces water withdrawal needs and thermal loading to the Broad River. Based on the projected operation of the cooling towers, the installation of a diffuser, the historical river flow, and the characteristics of the wastewater, the discharge from Lee Nuclear will not adversely impact the aquatic ecology in the Broad River.

The maximum blowdown (62.4 cfs) condition occurs when the cooling towers are operated at two cycles of concentration (COC) due to elevated Total Suspended Solids (TSS) levels in the river water. Based on the correlation of TSS and river

flow data, it is estimated that the river flow has to be greater than 17,000 cfs to require a two COC cooling tower operation. At 17,000 cfs the maximum blowdown is less than 0.4 percent of the river flow. With such a great difference between river flow and the maximum blowdown flow, the influence of maximum blowdown on the river is negligible.

National Marine Fisheries Service (Letter to Lt. Colonel Edward Chamberlayne from Virginia Fay Letter Dated: March 6, 2012

18. NMFS Comment:

The Broad River and its tributaries provide important riverine spawning and maturation habitats for public-trust aquatic fisheries and resources. The Broad River flows through the Piedmont region, meeting the Saluda River near Columbia, SC, to form the Congaree River. Diadromous fishes of particular interest to NMFS within the Broad River include American shad, blueback herring, striped bass, American eel, Atlantic sturgeon, and shortnose sturgeon; the latter two species are listed as endangered under the Endangered Species Act.

NMFS identifies the Broad River as a high priority for habitat restoration and recovery of diadromous fishes. While dams along the Congaree River and Broad River currently block diadromous fishes from habitat at and near the site of the proposed nuclear station, the potential for removal of these impediments to passage is high.

Duke Energy Response:

In 2008, Duke Energy signed the Santee River Basin Accord (SRBA) in support of the Santee-Cooper Diadromous Fish Passage Restoration Plan. No Atlantic sturgeon or shortnose sturgeon have been found in the vicinity of the Proposed Lee Nuclear site, Pond C or Ninety-Nine Islands Hydroelectric Project.

The NRC issued a letter to the NMFS on August 14, 2012 documenting its no effect determination, its findings relative to diadromous fishes, and NMFS's concurrence with same (Attachment 2). NRC further indicates in the letter that upon construction and operation of the Lee Nuclear Station, it will reinitiate consultation with the NMFS in the event of the successful implementation of the fish passage program as described in the SRBA, if there is potential for thermal, chemical, and physical impacts to Federally-protected species from the operations at the Lee Nuclear Station.

SC Department of Archives & History (Letter to Dr. Richard Darden from Rebekah Dobrasko) Letter Dated: January 20, 2012

19. State Historic Preservation Office (SHPO) Comment:

SC Department of Archives & History believes that proposed Lee Nuclear Station, Make-up Pond C, railroad spur, and transmission line corridors will cause no adverse effect on the identified historic properties provided the following conditions are met:

a. Public access to the cemeteries upon request is not limited
b. Fencing around cemeteries is maintained
c. Cemeteries are periodically monitored for vandalism or disturbance
d. Service Family Cemetery is relocated in consultation with the SC Department of Archives & History and interested parties
e. Any construction, ground disturbance, or future improvement along the railroad corridor within the boundaries of 38CK0068 (Ellen Furnace Works) are limited to the existing railroad right of way or are coordinated with SC Department of Archives & History

Duke Energy Response:

Duke Energy agrees with these conditions.

London Creek Minimum Flow Analysis

Background

The South Carolina Department of Natural Resources (SCDNR) and the South Carolina Department of Health and Environmental Control (SCDHEC) have requested that Duke Energy Carolinas, LLC (Duke Energy) evaluate flow conditions in London Creek and propose a minimum flow regime below the Drought Contingency Pond C (Pond C) Dam that would be protective of downstream aquatic resources. Excerpts from SCDNR and SCDHEC correspondence on Duke Energy's Section 404/401 permit application are provided below.

SCDNR Comment

The provision of a seasonally-adjusted minimum flow is SCDNR policy and is embraced by the South Carolina Water Withdrawal, Permitting, Use, and Reporting Act (SC Code 33 Ann. 49-4). DNR recommends the Section 404 permit/Section 401 water quality certification be conditioned to include a seasonal minimum flow release from Drought Contingency Pond C Dam that is protective of downstream aquatic resources. The minimum flow should commence with the filling of the pond to avoid and minimize adverse impacts to fish and the macrobenthic community downstream of the dam to the confluence of London Creek with the Broad River.

SCDHEC Comment

Information regarding minimum flows to London Creek from "Drought Contingency Pond C" (Pond C) during and after construction of the proposed project.

London Creek Flow Data

Duke Energy established two flow monitoring locations on London Creek in May 2009. The upper monitoring location is approximately 400 ft downstream from Hwy 329 (Victory Trail Road). The lower monitoring location is approximately 800 ft downstream from the proposed location of the Pond C spillway structure outlet and approximately 1,400 ft upstream from the Centerline Track rail spur crossing. Duke Energy currently plans to release any continuous minimum flow to London Creek via the Pond C spillway structure which is approximately 550 ft

downstream from the toe of the Pond C Dam. The stream distance between the upper and lower monitoring locations is approximately 15,630 ft (2.96 miles).

At each monitoring location, river stage is recorded and converted to a flow based on a discharge rating curve that was developed for each site. Calculated flows above the highest measured flow were eliminated from this analysis due to uncertainty with the discharge rating curve above the upper end of the measured flow regime. For the upper monitoring location, the highest measured flow was 41 cubic ft per second (cfs) (only 0.2 percent of the calculated flows were above this measured flow). For the lower monitoring location, the highest measured flow was 106 cfs (only 0.4 percent of the calculated flows were above this measured flow). The resulting monthly average flow data for the two monitoring locations is provided in Tables 1 and 2.

Table 1. London Creek Upper Monitoring Location – Monthly Average Flow Data

Year	Upper London Creek Monthly Average Flow (cfs)												Yearly Average Flow
	January	February	March	April	May	June	July	August	September	October	November	December	
2009	-	-	-	-	2.4	0.7	0.2	0.2	0.1	0.3	1.5	3.6	1.1
2010	3.3	3.4	3.0	1.8	1.6	1.8	1.0	0.8	0.7	0.9	1.7	1.2	1.8
2011	1.8	2.9	4.1	2.4	1.5	0.8	0.6	0.7	0.7	1.2	2.2	2.2	1.8
2012	2.7	2.3	4.1	3.1	4.6	2.4	-	-	-	-	-	-	3.21
Monthly Average Flow Total[1]	2.57	2.86	3.76	2.44	2.54	1.43	0.60	0.59	0.51	0.82	1.80	2.31	1.86
Adjusted Monthly Average Flow[2]	4.32	4.81	6.32	4.10	4.26	2.40	1.00	0.99	0.85	1.37	3.02	3.88	3.11
Proposed Minimum Flow[3]	1.50	1.50	1.50	1.50	1.00	1.00	0.75	0.75	0.75	0.75	0.75	1.00	1.06
Difference[4]	-2.82	-3.31	-4.82	-2.60	-3.26	-1.40	-0.25	-0.24	-0.10	-0.62	-2.27	-2.88	-2.05

[1]Mean annual flow based on individual monthly averages for the May 2009 – June 2012 period of record

[2]Monthly average flow at upper monitoring location adjusted to the Pond C spillway outlet location based on drainage area ratio method

[3]Seasonally adjusted, based on meeting a percentage of the MAF each month (40% January-April; 30% May-June and December; 20% July-November)

[4]Proposed minimum flow minus the adjusted monthly average flow

Table 2. London Creek Lower Monitoring Location – Monthly Average Flow Data

Year	Lower London Creek Monthly Average Flow (cfs)												Yearly Average Flow
	January	February	March	April	May	June	July	August	September	October	November	December	
2009	-	-	-	-	7.7	2.8	1.1	1.0	0.9	1.4	4.1	8.7	3.4
2010	6.3	6.3	6.1	2.3	2.1	2.8	1.0	0.9	0.5	1.1	2.4	1.6	2.8
2011	1.9	4.1	7.0	3.2	1.6	0.7	0.1	0.9	0.4	0.8	4.4	8.2	2.8
2012	8.7	5.5	7.2	4.2	7.5	1.7	-	-	-	-	-	-	7.1
Monthly Average Flow Total[1]	5.62	5.29	6.75	3.21	4.71	2.01	0.73	0.90	0.60	1.10	3.62	6.17	3.39
Adjusted Monthly Average Flow[2]	5.59	5.26	6.72	3.19	4.69	2.00	0.73	0.90	0.60	1.10	3.60	6.14	3.38
Proposed Minimum Flow[3]	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Difference[4]	-4.09	-3.76	-5.22	-1.69	-3.19	-0.50	0.77	0.60	0.90	0.40	-2.10	-4.64	-1.88

[1]Mean annual flow based on individual monthly averages for the May 2009 – June 2012 period of record

[2]Monthly average flow at lower monitoring location adjusted to the Pond C spillway outlet location based on drainage area ratio method

[3]Seasonally adjusted, based on meeting a percentage of the MAF each month (40% January-April; 30% May-June and December; 20% July-November)

[4]Proposed minimum flow minus the adjusted monthly average flow

London Creek Minimum Flow Recommendation

Flows from the two monitoring locations were ratioed (based on drainage area) to the proposed location of the Pond C spillway outlet to determine background flows at this location. The drainage areas for the two monitoring locations and the outlet of the Pond C spillway structure are:

- Upper flow monitoring location: 938 acres
- Pond C spillway outlet: 2,513 acres
- Lower flow monitoring location: 2,526 acres

As a result, flows from the upper monitoring location were multiplied by a factor of 1.68 ((2,513 acres – 938 acres)/938 acres) and flows from the lower monitoring location were multiplied by a factor of 0.99 (2,513 acres / 2,526 acres). The mean annual flow (MAF) for the period of record (May 2009 through June 2012) for the upper and lower monitoring locations (pro-rated to the Pond C spillway outlet location) is:

- Upper flow monitoring location: 1.86 cfs x 1.68 multiplier = 3.12 cfs
- Lower flow monitoring location: 3.39 cfs x 0.99 multiplier = 3.37 cfs

The proposed seasonally-adjusted minimum continuous flow regime for London Creek below the Pond C spillway outlet is provided in Table 3. The same rationale that was used for setting the seasonally-adjusted minimum continuous flow regime below Duke Energy's Ninety Nine Islands Hydroelectric Station was used as the basis for the minimum continuous flow regime for London Creek downstream from Pond C at the spillway outlet. This methodology is based on releasing a percentage of the MAF based on season. Higher minimum flows (i.e., 40 percent of the MAF) are recommended for periods when higher flows would normally occur (i.e., January through April) and lower minimum flows (i.e., 20 percent of the MAF) are recommended for periods when lower flows would normally occur (i.e., July through November). During the "shoulder" months (i.e., May, June, and December), 30 percent of the MAF is proposed as the minimum continuous flow release.

Table 3. London Creek Proposed Minimum Continuous Flow Regime

London Creek Proposed Minimum Continuous Flow Regime					
Month	%MAF	Min Flow based on Upper Site (cfs)	Min Flow based on Lower Site (cfs)	Average Upper & Lower Flow (cfs)	Proposed Min Flow (cfs)
January	40	1.25	1.35	1.30	1.50
February	40	1.25	1.35	1.30	1.50
March	40	1.25	1.35	1.30	1.50
April	40	1.25	1.35	1.30	1.50
May	30	0.94	1.01	0.97	1.00
June	30	0.94	1.01	0.97	1.00
July	20	0.62	0.67	0.65	0.75
August	20	0.62	0.67	0.65	0.75
September	20	0.62	0.67	0.65	0.75
October	20	0.62	0.67	0.65	0.75
November	20	0.62	0.67	0.65	0.75
December	30	0.94	1.01	0.97	1.00

MAF (Mean Annual Flow) based on London Creek field data collected May 2009 – June 2012
Spillway Outlet MAF (based on upper site) = 3.12 cfs
Spillway Outlet MAF (based on lower site) = 3.37 cfs

August 14, 2012

Mr. David M. Bernhart
Assistant Regional Administrator
For Protected Resources
National Marine Fisheries Service
263 13th Avenue South
Saint Petersburg, FL 33701

SUBJECT: ENDANGERED SPECIES ACT, MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT, AND FISH AND WILDLIFE COORDINATION ACT CONSULTATION CLOSE OUT FOR THE WILLIAM STATES LEE III NUCLEAR STATION, UNITS 1 AND 2 COMBINED LICENSES APPLICATION ENVIRONMENTAL REVIEW

Dear Mr. Bernhart:

The U.S. Nuclear Regulatory Commission (NRC) staff is reviewing an application submitted by Duke Energy Carolinas, LLC (Duke) for a combined license (COL) application for construction and operation of two new nuclear reactors, William States Lee III Nuclear Station, Units 1 and 2 (Lee Nuclear Station), at the Lee Nuclear Station site in Gaffney, South Carolina. As part of its review of the proposed action, the NRC staff prepared a draft environmental impact statement (EIS) (NUREG-2111), which was published in December 2011. The draft EIS is available through the NRC's Agencywide Documents Access and Management System (ADAMS), which is accessible from the NRC's website at http://www.nrc.gov/reading-rm/adams.html at ADAMS Accession No. ML113430094. The draft EIS can also be found online at the NRC's Lee Nuclear Station specific webpage at http://www.nrc.gov/reactors/new-reactors/col/lee/documents/nrc-2011.html.

During the preparation of the draft EIS, the NRC staff issued a scoping letter to the National Marine Fisheries Service (NMFS) Southeast Regional Office dated April 9, 2008 (ADAMS Accession No. ML080850962), requesting information regarding Federally-protected species and critical habitat under NMFS' jurisdiction and, in support of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), any designated Essential Fish Habitat in the vicinity of the Lee Nuclear Station site. The NRC staff also requested any information considered appropriate under the provisions of the Fish and Wildlife Coordination Act (FWCA). By letter dated May 5, 2008 (ADAMS Accession No. ML081400585) NMFS provided a list of Federally-protected species for the state of South Carolina, which included the shortnose sturgeon (*Acipenser brevirostrum*). Subsequently, effective April 6, 2012, the NMFS listed the Carolina and South Atlantic distinct population segments of Atlantic sturgeon (*A. oxyrinchus oxyrinchus*) as endangered under the Endangered Species Act (ESA).

In the draft EIS, the NRC staff concluded that while not currently present in the vicinity of the Lee Nuclear Station site, two diadromous species (currently without Federal protection), the American eel (*Anguilla rostrata*) and American shad (*Alosa sapidissima*) had a historical presence at the site. Both shortnose and Atlantic sturgeon are not currently present nor were historically present in the vicinity of the site. The draft EIS cites the *Santee River Basin Accord for Diadromous Fish Protection, Restoration, and Enhancement of 2008*, and concludes that in

the future, should fish passage facilities be built in the Broad River, including at the Ninety-Nine Islands Dam, there is the possibility for diadromous fish to return to the vicinity of the Lee Nuclear Station.

As documented in an e-mail with Mr. Eric Hawk, ESA Section 7 Coordinator for NMFS, dated May 21, 2012 (ADAMS Accession No. ML12171A581), the NRC staff considers its consultation with NMFS under the ESA, MSFCMA, and FWCA for the Lee Nuclear Station COL application to be complete. However, upon construction and operation of the proposed Lee Nuclear Station and, in the event of the successful implementation of the fish passage program as described in the Santee River Basin Accord, the NRC staff will reinitiate consultation with NMFS, if there is potential for thermal, chemical, and physical impacts to Federally-protected species from operations at the Lee Nuclear Station.

If you have any questions regarding this matter, please contact the NRC environmental project manager, Ms. Sarah Lopas at 301-415-1147, or via e-mail to Sarah.Lopas@nrc.gov.

Sincerely,

/RA/

William F. Burton, Chief
Environmental Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket Nos.: 52-018 and 52-019

cc: See next page

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If you have any questions regarding this matter, please contact the NRC environmental project manager, Ms. Sarah Lopas at 301-415-1147, or via e-mail to Sarah.Lopas@nrc.gov.

Sincerely,
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Docket Nos.: 52-018 and 52-019
cc: See next page

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ADAMS Accession No: ML12173A383 **NRO-002**

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From:	Eric Hawk
To:	Lopas, Sarah
Cc:	Stephania Bolden; Cathy Tortorici
Subject:	Re: Lee Nuclear Station consultation requirements
Date:	Monday, May 21, 2012 2:17:27 PM

Hello Ms. Lopas,
Having read your letter, it appears to me that NRC has a proper basis for making a no-effect determination for sturgeon species, and thus meet their ESA Section 7 consultation responsibilities with NMFS. However, should the fish passage program be successfully implemented (as you mentioned, and is discussed in the Santee River Basin Accord for Diadromous Fish Protection, Restoration, and Enhancement of 2008), then the possibility of sturgeon presence at the Lee Nuclear Station site should be re-addressed. At that time I would recommend that you reinitiate consultation and seek our concurrence that thermal, chemical, and physical impacts from the plant on any life stages of sturgeon present would be minimal.
Thank you for your correspondence. If you wish to prepare a letter stating the above, we would be pleased to receive it.

Eric Hawk

On Mon, May 21, 2012 at 11:55 AM, Lopas, Sarah <Sarah.Lopas@nrc.gov> wrote:

> Hi Mr. Hawk,
>
> I thought it might be a good idea to send you letters related to the Lee Nuclear Station project - - so you have a little background, and then we can set up a time for a quick phone call.
>
> Back in April 2008 (see attached), we sent NMFS a scoping letter requesting:
>
> *To support the EIS preparation process and to ensure compliance with Section 7 of the*
>
> *Endangered Species Act, the NRC requests a list of endangered, threatened, candidate, and*
>
> *proposed species, and designated and proposed critical habitat that may be in the vicinity of the*
>
> *Lee site, which are under the jurisdiction of the National Marine Fisheries Service. In support of*
>
> *the Magnuson-Stevens Fishery Conservation and Management Act, the NRC also requests a*

list of federally managed species that have designated essential fish habitat in the vicinity of the

Lee site. Additionally, please provide any information you consider appropriate under the

provisions of the Fish and Wildlife Coordination Act.

In May, NMFS replied with a list of Federally protected species under the jurisdiction of NMFS for South Carolina (attached). The NRC aquatic biologists determined that there was no historical presence of Sturgeon at the Lee Nuclear Station site. Our EIS does speak to Diadromous Fish Species Potentially Available in the Future (see page 2-114 of Volume 1 of the EIS – located here: http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2111/). We also discuss this briefly in Chapter 5, where we discuss operational impacts of the plant - - page 5-37 of Volume 1. We conclude that American eel and American shad could eventually be found in waters near the proposed Lee Nuclear Station,

And finally, the U.S. Army Corps of Engineers, a cooperating agency on the Lee Nuclear Station environmental impact statement, received a comment from NMFS dated March 6, 2012, on their Joint Public Notice (which was issued in December 2011). In the letter (attached), it states:

Finally, in accordance with section 7 of the Endangered Species Act of 1973, as amended, it is the

responsibility of the lead federal agency to review and identify any proposed activity that may affect

endangered or threatened species and their habitat. Shortnose and Atlantic sturgeon may be present

within the action area during the life of the project. Determinations involving species under NMFS
jurisdiction should be reported to our Protected Resources Division at the letterhead address.

The NRC is the lead agency on the Lee Nuclear Station environmental review. Essentially, I am wondering what else, if anything, we need to do to complete our consultation? I took this project over about half-way through, and I'm guessing that after our aquatic ecologists determined there were no diadromous fish present in the vicinity of the Lee Nuclear Station, and furthermore, no historical presence, it was determined we did not have to pursue consultation. Perhaps we need to finalize our conclusions in a letter to you to formalize this?

Let me know a good time to discuss this. With the exception of being tied up in meetings for most of today, I am free for a call most anytime this week.

Thank you for your help!

-Sarah

Sarah L. Lopas
Environmental Project Manager

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