CHRISTOPHER M. FALLON
Vice President
Nuclear Development

Duke Energy
EC09D/ 526 South Church Street
Charlotte, NC 28201-1006

Mailing Address:
P.O. Box 1006 – EC09D
Charlotte, NC 28201-1006

704-382-9248
704-519-6173 (cell)
Christopher.Fallon@duke-energy.com

March 13, 2013

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

10 CFR 52.80

Subject: Duke Energy Carolinas, LLC
William States Lee III Nuclear Station – Docket Nos. 52-018 and 52-019
AP1000 Combined License Application for the
William States Lee III Nuclear Station Units 1 and 2
Supplemental Information Regarding Environmental Review
Ltr# WLG2013.03-01

Reference: Letter from Christopher M. Fallon (Duke Energy) to NRC Document Control Desk, Supplemental Information Related to Design Changes to the Lee Units 1 and 2 Physical Locations, Ltr# WLG2012.12-02, dated December 20, 2012 (ML12361A057)

This letter provides supplemental environmental information for purpose of the NRC review. The design of site specific structures, systems and components and construction planning for the William States Lee III Nuclear Station (WLS) has continued to progress since the submission of the Environmental Report and subsequent responses to associated requests for additional information (RAIs) from the Nuclear Regulatory Commission (NRC). In 2012, Duke Energy informed the Nuclear Regulatory Commission (NRC) that both units at the proposed William States Lee III Nuclear Station (Lee) were shifting position to manage construction risk. Supplemental information is being provided as part of the environmental review with regards to plant relocation, site specific grading changes and other related items.

Enclosure 1 of this letter describes the plant relocation, an obstruction ("10L") assessment for the Permanent Meteorological Tower, and dose/dispersion model results associated with the plant relocation. Enclosure 2 discusses Duke Energy's plans for performing the site-specific seismic hazard calculation for Lee Nuclear Station. Updates to the list of environmental-related authorizations, permits, and certifications are provided in Enclosure 3. Evaluation of environmental impacts resulting from land disturbances is provided in Enclosure 4. Air dose/dispersion model input/output files and GIS shapefiles are provided in Enclosures 5 and 6, respectively.

The supplemental information contained in the attached native files in Enclosures 5 and 6 is provided to support the NRC's environmental review of Lee Nuclear Station, but do not comply with the requirements for electronic submission. The NRC staff requested these files be submitted in their native formats for utilization during review of this submittal.

D093
NRO

If you have any questions or need additional information, please contact Robert Kitchen, Nuclear Development Licensing Director, at (704) 382-4046.

Sincerely,

Christopher M. Fallon

Christopher M. Fallon
Vice President
Nuclear Development

Enclosures:

1. Lee Nuclear Station Units 1 and 2 Relocation Description
2. Severe Accidents Initiated by Seismic Events
3. Authorizations, Permits, and Certifications
4. Environmental Impacts Resulting from Land Disturbances
5. Dose/Air Dispersion Model Input/Output Files (CD)
6. Facility and Land Cover Disturbance Shapefiles and Figures 1 through 4 (CD)

xc (w/out enclosures):

Frederick Brown, Deputy Regional Administrator, Region II

xc (w/ enclosures):

Brian Hughes, Senior Project Manager, DNRL
Patricia Vokoun, Project Manager, DSER
Terry Miley, PNNL

AFFIDAVIT OF CHRISTOPHER M. FALLON

Christopher M. Fallon, being duly sworn, states that he is Vice President, Nuclear Development, Duke Energy Carolinas, LLC, that he is authorized on the part of said Company to sign and file with the U. S. Nuclear Regulatory Commission this combined license application for the William States Lee III Nuclear Station, and that all the matter and facts set forth herein are true and correct to the best of his knowledge.

Christopher M. Fallon

Christopher M. Fallon, Vice President
Nuclear Development

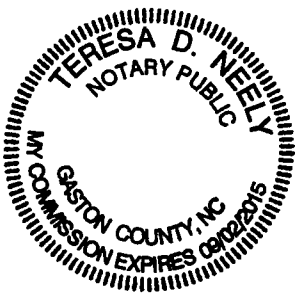
Subscribed and sworn to me on March 13, 2013

Teresa D. Neely

Notary Public

My commission expires: 9/2/2015

SEAL



Lee Nuclear Station Units 1 and 2

Relocation Description

Lee Nuclear Station Units 1 and 2

Relocation Description

Relocation Description

Duke Energy is relocating Lee Nuclear Station Units 1 and 2. Lee Unit 1 is relocated 50 feet east and 66 feet south, and Lee Unit 2 is relocated 66 feet south. The units are relocated to manage future construction risks and improve the overall construction schedule. In addition, the relocated Unit 1 better utilizes the existing concrete overlain on continuous rock in the Unit 1 nuclear island footprint and optimizes site earthwork by moving the nuclear island outside of the Unit 1 northwest depression. Unit 2 is being relocated south to maintain the original orientation between the two units. The new site centerpoint Universal Transverse Mercator grid coordinates (NAD83) in meters (m) for the center line between Units 1 and 2 are 453,331 m east and 3,877,239 m north.

A thorough discussion of the plant relocation was provided in Reference 1. This submittal included updates on the following:

a. Site Coordinates
b. Exclusion Area Boundary
c. Site Grading
d. Site Layout
e. Surface Water Flooding Elevations
f. Goundwater Movement/Elevation
g. Dispersion/Dose Assessment
h. Preliminary Assessment of Geotechnical Information

The following provides additional information on the environmental impact of plant relocation:

Offsite Traffic

The relocation of Lee Nuclear Station Units 1 and 2 will not result in a change to offsite traffic volumes or patterns. Excess spoil material will be transported and relocated using onsite roads within the property boundaries. The offsite traffic is also being minimized by the installation of a new railroad turnaround north of Make-Up Pond B for additional railcar storage as discussed in Enclosure 4.

Permanent Meteorological Tower

The location of Permanent Meteorological (MET) Tower will not change as a result of the plant relocation. The Permanent MET Tower is located northwest of the power block. Figure 1 presents a revised to scale drawing of the Lee Nuclear site layout with the locations of permanent structures and significant topographical features identified, with respect to the Permanent MET Tower (Attachment 1). Figure 1 also provides the distance and orientation of site structures and features relative to the Permanent MET Tower.

As indicated on Figure 1, the closest spoil area is located 1,270 ft. from Permanent MET Tower with a top elevation of approximately 660 ft. With a MET Tower grade elevation of 595.5 ft., the "10L" requirement for this spoils pile is satisfied at a distance of 645 ft.

Attachment 1 also contains Table 1, which provides a revised summary of the distances, directions and elevations for the features and revised plant structure locations. The tree line and surrounding vegetation near the Permanent MET Tower are periodically maintained to ensure the "10L" criteria for open exposure in Regulatory Guide 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants, Rev. 1" is met.

Dose/Dispersion Model Results

1. Short-term Atmospheric Dispersion (PAVAN Code)

The PAVAN code (NUREG/CR-2858), which implements Regulatory Guide 1.145, was used to determine the atmospheric dispersion for accident conditions. In accordance with NUREG-1555, the results presented in Table 1.1 below are based on nominal meteorological conditions (50 percentile values) for the Exclusion Area Boundary (EAB) and Low Population Zone (LPZ). The short-term atmospheric dispersion factors reflect: (1) DCD changes in release locations which resulted in an increase in the release boundary from 550 to 575 ft., (2) DCD changes in building heights, (3) two years of meteorological data (MET Tower 2), (4) calculation of individual X/Q values for each unit (with an individual unit release boundary of 448 ft), and (5) plant relocation:

Table 1.1 Short-Term 50% Probability Atmospheric Dispersion Factors For Lee Nuclear Station Site DBA Calculations

Time Period	Boundary	χ/Q (sec/m^3) Updated (50% Probability)
0-2 hours	EAB	8.30×10^{-5}
0-8 hours	LPZ	8.80×10^{-6}
8-24 hours	LPZ	7.51×10^{-6}
1-4 days	LPZ	5.33×10^{-6}
4-30 days	LPZ	3.25×10^{-6}

The impact of the revised short-term atmospheric dispersion values on the Environmental Report is determined by recalculating the design basis accident doses. The Design Basis Accident Doses using the revised atmospheric dispersion factors are given below:

Table 1.2 Summary of Design Basis Accident Doses

DCD/SRP Section	DCD Accident Description	Dose (rem TEDE)		
		EAB	LPZ	Limit[1]
15.1.5	Steam System Piping Failure			
	Pre-Existing Iodine Spike	8.3E-02	1.6E-02	25
	Accident-Initiated Iodine Spike	9.1E-02	4.6E-02	2.5
15.2.8	Feedwater System Pipe Break	Bounded by steam system piping failures		
15.3.3	Reactor Coolant Pump Shaft Seizure	-	-	-
	No Feedwater	6.6E-02	6.8E-03	2.5
	Feedwater Available	5.0E-02	1.4E-02	2.5
15.3.4	Reactor Coolant Pump Shaft Break	Bounded by Shaft Seizure		
15.4.8	Spectrum of Rod Cluster Control Assembly Ejection Accidents	3.0E-01	1.0E-01	6.25
15.6.2	Failure of Small Lines Carrying Primary Coolant Outside Containment	1.7E-01	1.8E-02	2.5
15.6.3	Steam Generator Tube Rupture	-	-	-
	Pre-Existing Iodine Spike	1.8E-01	2.2E-02	25
	Accident-Initiated Iodine Spike	9.1E-02	1.5E-02	2.5
15.6.5	Loss-of-Coolant Accident Resulting from a Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary	4.0E+00	9.4E-01	25
15.7.4	Fuel Handling Accident	4.3E-01	4.6E-02	6.25

[1]The 10 CFR 50.34 limits are the safety analysis criteria because no environmental report criteria exist for DBA consequences.

2. Long-term Atmospheric Dispersion (XOQDOQ Code)

The XOQDOQ code (NUREG/CR-2919) determines the annual atmospheric dispersion (X/Q) values for normal radionuclide releases. The atmospheric dispersion analysis has been evaluated and the results are shown in the Table 2.1. The revised atmospheric dispersion analysis includes the plant relocation, use of two years of meteorological data (MET Tower 2), calculation of

individual atmospheric dispersion factors for each unit, and updated land use survey data. Updates to the AP1000 DCD Rev. 19 and calculation of separate results for each unit are also incorporated.

Table 2.1 – Long-Term Atmospheric Dispersion Factors for Lee Nuclear Station Site

Receptor	Downwind Sector	Distance (mi)	No Decay Undepleted X/Q (s/m^3)	No Decay Depleted X/Q (s/m^3)	D/Q ($1/m^2$) [See Note below]
EAB	SE, Unit 2	0.81	$6.3x10^{-6}$	$5.6x10^{-6}$	$1.3x10^{-8}$
Residence	SE	0.99	$4.6x10^{-6}$	$4.0x10^{-6}$	$9.4x10^{-9}$
Meat Animal	SE	1.65	$2.2x10^{-6}$	$1.8x10^{-6}$	$3.9x10^{-9}$
Vegetable Garden	SSE	1.00	$2.4x10^{-6}$	$2.1x10^{-6}$	$4.3x10^{-9}$
Milk Cow/Goat	SE	1.65	$2.2x10^{-6}$	$1.8x10^{-6}$	$3.9x10^{-9}$

Note: D/Q values listed correspond to the sector and distances listed but are not necessarily the maximum D/Q values for all sectors.

The above changes to the long-term X/Q values result in proportional changes in the normal offsite doses to the individual and population. The significance of these changes is discussed in the GASPAR code discussion below.

3. Normal Offsite Doses from Gaseous Effluents (GASPAR Code)

The GASPAR code (NUREG/CR-4653) is used to determine the offsite dose consequences resulting from normal radionuclide effluent releases. This code used the revised atmospheric dispersion results given above to determine the normal effluent dose consequences to offsite individuals. Offsite dose consequences considered the following exposure pathways: plume immersion, direct shine from deposited radionuclides, ingestion of vegetables, and ingestion of milk and meat. The revised WLS analysis evaluated the milk (cow) and milk (goat) pathway locations separately and used the limiting pathway in maximum individual dose calculations in accordance with RG 1.109 guidance.

Results of revised analysis accounting for plant relocation, two-year meteorological data, and dose pathway land use survey changes are presented in the summary table below.

Table 3.1 Normal Effluent Doses

Pathway	Age Group	Total Body Dose (mrem/yr)	Max Organ (mrem/yr)	Skin Dose (mrem/yr)	Thyroid Dose (mrem/yr)
Plume	All	0.473	0.473	2.380	0.473
Ground	All	0.114	0.114		0.114
Inhalation	Adult	0.052	0.482		0.482
	Teen	0.052	0.602		0.602
	Child	0.046	0.703		0.703
	Infant	0.027	0.630		0.630
Vegetables	Adult	0.138	0.908		0.908
	Teen	0.207	1.230		1.230
	Child	0.459	2.420		2.420
Meat	Adult	0.040	0.173		0.066
	Teen	0.032	0.146		0.051
	Child	0.058	0.274		0.087
Cow Milk	Adult	0.054	0.813		0.813
	Teen	0.089	1.290		1.290
	Child	0.199	2.600		2.600
	Infant	0.399	6.230		6.230
Goat Milk	Adult	0.071	1.060		1.060
	Teen	0.109	1.690		1.690
	Child	0.220	3.370		3.370
	Infant	0.423	8.080		8.080
TOTAL	Adult	0.888			3.103
	Teen	0.987			4.160
	Child	1.370			7.167
	Infant	1.037			9.297

The maximum individual total body dose increased by approximately 5% but remained below 10 CFR 50 Appendix I dose design objectives. The largest increase (60 %) came from the ingestion of goat milk. However, these doses are still below dose objectives of Appendix I of 10 CFR Part 50. The total body plume pathway dose increased to 0.473 millirem (mrem), which is below the objective of 5 mrem. The maximum organ dose (infant thyroid) is 9.30 mrem, which is below the objective of 15 mrem. The maximum skin dose is 2.38 mrem, which is below the objective of 15 mrem.

GASPAR is also used to determine the annual individual and collective dose to construction workers during the construction of the second unit. The distance between Units 1 and 2 changed

by 50 ft. However, the distance to the nearest construction worker changed by 25 ft. The other significant change in the construction worker dose calculation was the use of two years of meteorological data. As a result of plant relocation and using two years of meteorological data, the annual individual dose to a Unit 2 construction worker increased from approximately 0.3 to 0.4 mrem. This value remains below the annual dose limit to an individual of the public found in 10 CFR 20.1301. The maximum estimated annual collective dose to construction workers, based on an estimated workforce of 2,100 workers, increased from 0.61 to 0.834 person-rem. Although the construction worker dose increased, the doses are well within NRC annual exposure limits which are designed to protect the public health.

4. Seasonal/Annual Cooling Tower Impacts (SACTI)

The relocation of the Lee Nuclear Station Units 1 and 2 results in no effect on the SACTI results as they are dependent on the cooling tower design parameters and dimensions only. The two-tower orientations for each unit relative to true north as well as the location of the cooling towers for each unit remain unchanged.

5. Severe Accident Analysis (MACCS2 Code)

The consequences of a severe accident at the Lee site were evaluated using the MACCS2 computer code (NUREG/CR-6613). The only distances used in the severe accident consequence analysis were radial distances from the site centerpoint. Distances from the site were used to develop a special grid out to 50 miles from the site. Distances used in the special grid were: 2 km (1.24 mi.), 4 km (2.5 mi.), 6 km (3.7 mi.), 8 km (5 mi.), 10 km (6.2 mi.), 16 km (10 mi.), 40 km (25 mi.), 60 km (37 mi.) and 80 km (50 mi.). For each grid element, the MACCS2 input data defined the population data, the fraction of land, the region index, the watershed index, and crop data, including the fraction of land devoted to various types of crops. The change in the site centerpoint is insignificant compared to the radial distances considered in the MACCS2 analysis (out to 50 miles). Therefore, no changes to the severe accident analyses are necessary due to relocation of the units.

6. Conclusions

The revised modeling results remain below regulatory limits. Therefore, the environmental impact associated with the relocation of units at the Lee Nuclear Station site is SMALL.

Reference:

1. Letter from Christopher M. Fallon (Duke Energy) to NRC Document Control Desk, Supplemental Information Related to Design Changes to the Lee Units 1 and 2 Physical Locations, Ltr# WLG2012.12-02, dated December 20, 2012 (ML12361A057)

Attachment:

Attachment 1

- Figure 1: Distances and Direction from the Permanent Meteorological Tower
- Table 1: Permanent Meteorological Tower Revised "10L" Assessment

Attachment 1

Figure 1: Distances and Direction from the Permanent Meteorological Tower (Revised)

Table 1: Permanent Meteorological Tower Revised "10L" Assessment

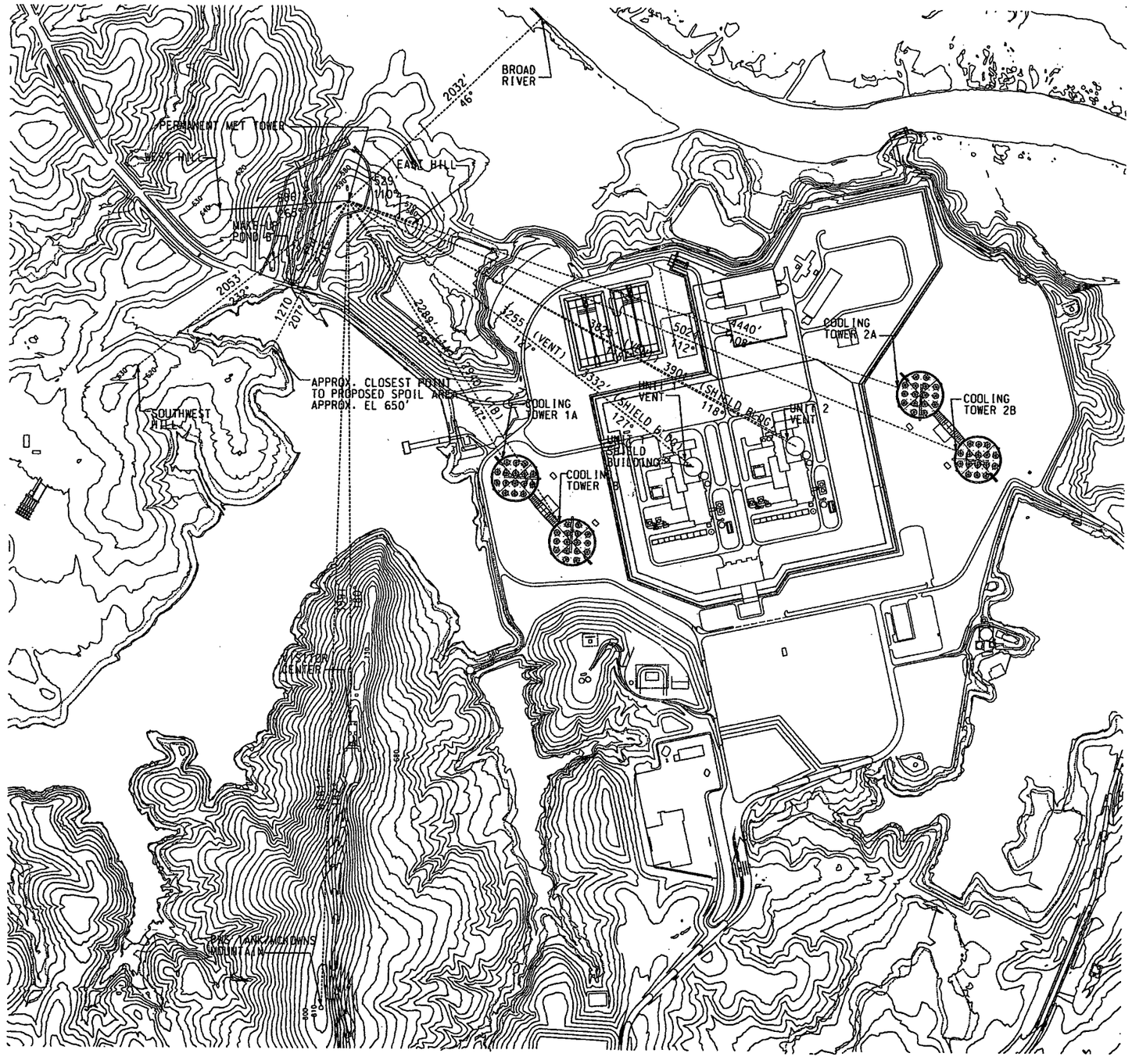


Figure 1: Distances and Direction from the Permanent Meteorological Tower

TRUE NORTH

NOTE:
THE CONTOUR INTERVALS SHOWN ON THIS SKETCH ARE 10 FEET.

WEC SAFETY CLASSIFICATION: N/A

Duke Energy.

DUKE ENERGY CAROLINAS, LLC
WILLIAM STATES LEE III
NUCLEAR STATION

DESIGNED BY: [illegible] 2-20-13
CHECKED BY: [illegible] 2-21-13
APPROVED BY: [illegible] 2/21/13

Shaw Stone & Webster, Inc.

SCALE: N.T.S.
DATE: 2/21/13

FIGURE NO. 124029-00000-C-SK-004-1-A | REV NO. A

THIS DRAWING CREATED ELECTRONICALLY

Table 1: Permanent Meteorological Tower Revised "10L" Assessment

Object	Degrees (CW) from True North (ft)	Ground Elevation (ft)	Height Above Ground (ft)	Elevation at Top of Object	Relative Height (ft) above MET Tower Grade Level (L) [a]	10L (ft)	Distance from MET Tower (ft)	Is Distance > 10 L?
Instrument Building	174	596.3	10	606.3	10.8	108	109	Yes
East Hill [b]	110	590.0	10	600.0	4.5	45	529	Yes
West Hill [b]	265	640.0	10	650.0	54.5	545	986	Yes
Southwest Hill [b]	232	630.0	10	640.0	44.5	445	2053	Yes
North Tree Line[c]	341	530.0	100	630.0	34.5	345	408	Yes
West Tree Line [c]	284	605.0	100	705.0	109.5	1095	1171	Yes
East Tree Line [c]	92	556.0	100	656.0	60.5	605	614	Yes
Nearest Spoil Area [b]	207	650	10	660.0	64.5	645	1270	Yes
PWS Tank McKowns Mtn	182	814.5	32	846.5	251.0	2510	6161	Yes
Visitor Center McKowns Mtn [d]	180	750.0	35	785.0	189.5	1895	3991	Yes
Cooling Tower 1A	149	588.0	85	673.0	77.5	775	2289	Yes
Cooling Tower 1B	147	588.0	85	673.0	77.5	775	2940	Yes
Cooling Tower 2A	108	588.0	85	673.0	77.5	775	4440	Yes
Cooling Tower 2B	112	588.0	85	673.0	77.5	775	5024	Yes
Unit 1 Shield Building	127	592.0	230.4	822.4	226.9	2269	3332	Yes
Unit 2 Shield Building	118	592.0	230.4	822.4	226.9	2269	3901	Yes
Unit 1 Vent	127	592.0	183.7	775.7	180.2	1802	3255	Yes
Unit 2 Vent	118	592.0	183.7	775.7	180.2	1802	3825	Yes
Make-Up Pond B[e]	213	570.0	0.0	570.0	N/A	N/A	794	N/A
Broad River [e]	46	511.1	0.0	511.1	N/A	N/A	2032	N/A

(a) Permanent MET Tower grade level is 595.5 ft

(b) Assumes vegetation is no higher than 10 ft

(c) Assumes Mature Tree Height of 100 ft

(d) Estimated Height assumes two stories - not designed at this time.

(e) Bodies of water are below grade level (Elev 595.5') of Permanent MET Tower

Severe Accidents Initiated by Seismic Events

NRC reviewers have inquired about Duke Energy's consideration of severe accidents initiated by seismic events. Duke Energy is currently developing its response to the NRC staff's seismic hazard FSAR Request for Additional Information (RAI) (Reference 1). In this FSAR RAI, Duke Energy was requested to evaluate the potential impacts of the newly released CEUS-SSC model, as documented in NUREG-2115, on the Lee Nuclear Station site-specific seismic hazard calculation. This model considers the latest seismic source information for the Central and Eastern United States. In responding to this FSAR RAI, Duke Energy will demonstrate that the AP1000 seismic capacity is greater than the site-specific seismic demands calculated using the NUREG-2115 methodology. The NRC staff will review Duke Energy's evaluations and confirm the stated conclusions. Reference 2 describes Duke Energy's plans for performing these evaluations, and Reference 3 updates the anticipated schedule for completion.

References:

1. Letter from Brian Hughes (NRC) to Christopher Fallon (Duke Energy), Request for Additional Information Letter No. 105 Concerning Implementation of Fukushima Near-Term Task Force Recommendations for the William States Lee Ill Units 1 and 2 Combined License Application, dated April 25, 2012 (ML12116A336)
2. Letter from Christopher Fallon (Duke Energy) to NRC Document Control Desk, Partial Response to Request for Additional Information (RAI No. 6419), Ltr# WLG2012.05-04, dated May 24, 2012 (ML12151A110)
3. Letter from Christopher Fallon (Duke Energy) to NRC Document Control Desk, Updated Schedule for Future Submittals Related to the William States Lee III Station Combined Operating License Application, Ltr# WLG2012.10-01, dated October 17, 2012 (ML12293A238)

Authorizations, Permits, and Certifications

Authorizations, Permits, and Certifications

The following table contains a list of the environmental-related authorizations, permits, and certifications potentially required by Federal, State, regional, local, and affected Native American Tribal agencies related to the combined construction permit and operating licenses (COLs) for the proposed William States Lee III Nuclear Station (Lee Nuclear Station) Units 1 and 2.

Federal, State, and Local Authorizations Required for a Combined License

Agency	Authority	Requirement	Activity Covered	Status
Radioactive Materials				
NRC	10 *Code of Federal Regulations* Part 30 (10 CFR 30)	Byproduct license	Approval to receive, possess, and use byproduct material.	To be issued as part of COLs.
NRC	10 CFR Part 40	Source materials license	Approval to receive, possess, and use source material.	To be issued as part of COLs.
NRC	10 CFR 52, Subpart Part C	Combined licenses	Construction and operation of two new nuclear units.	Application submitted in December 2007.
NRC	10 CFR Part 70	Special nuclear materials license	Approval to receive, possess, and use special nuclear material.	To be issued as part of COLs.
NRC	10 CFR Part 61	Licensing requirements for land disposal of radioactive wastes	Procedures, criteria, and terms and conditions for the licensing of land disposal facilities intended to contain byproduct, source, and special nuclear materials.	If required.
NRC	10 CFR Part 71	Packaging and transportation of radioactive material	The regulations in this part provide requirements, procedures, and standards for packaging, preparation for shipment, and transportation of licensed material.	If required.
NRC	10 CFR Part 72	Licensing requirements for the independent storage of spent nuclear fuel and high-level radioactive waste	The issuance of licenses to receive, transfer, and possess power reactor spent fuel and other associated radioactive materials in an independent spent fuel storage installation and the terms under which the Commission will issue such a license.	If required.
South Carolina Department of Health and Environmental Control (SCDHEC)	SC R. 61-63	South Carolina radioactive material license	Bringing any radioactive source on the Lee Nuclear Station site.	This license will be received by the contractors owning the radioactive material.

Federal, State, and Local Authorizations Required for a Combined License (continued)

Agency	Authority	Requirement	Activity Covered	Status
Air				
SCDHEC	SC R. 61-62	Construction permit (emissions)	Duke-operated permanent air-emitting sources.	Preparation of application not initiated.
SCDHEC	SC R. 61-62	Title V air operating permit or conditional major source permit	Air emissions operating permit for all operating sources post-construction. Facility-wide emissions will be evaluated for applicability of Title V permit (100 T or greater of any one criteria pollutant) or a conditional major permit. A regulatory analysis with appropriate calculations will be performed to determine whether New Source Review/Prevention of Significant Deterioration is applicable.	Preparation of application not initiated.
SCDHEC	SC R. 61-62	Title V Construction Air Permit (third-party construction sources)	Third-party contracted stationary fuel-driven engine, concrete batch plant, fuel storage tanks, etc.	Preparation of application not initiated.
Cherokee County	Fire Marshall	Approval	Open burning for vegetation/right-of-way clearing.	Permit has been received.
Groundwater				
SCDHEC	SC R. 61-71	Well permits	Installation and abandonment of wells.	Permits have been received.
Historic Properties				
South Carolina State Historic Preservation Officer (SHPO) at South Carolina Department of Archives and History Federally recognized American Indian tribes	36 CFR 800	Consultation	Identification and evaluation of historic properties.	Surveys of the Lee Nuclear Station site, the railroad-spur corridor, transmission-line corridors, and Make-Up Pond C have been completed in coordination with the South Carolina SHPO and no adverse effects to historic properties have been identified. Memorandum of Agreement (including a cultural resources management plan) has been signed by Duke, USACE, SHPO, and the Catawba Indian Nation.
Surface Water				
U.S. Army Corps of Engineers (USACE)	33 CFR 322, 323, 328, and 330	Section 404 dredge and fill permit	Construction of cooling water intake structures, dredging in pond/river, and construction in "Waters of the US". Construction of Make-Up Pond C and transmission lines.	Application submitted in November 2011.
Federal Energy Regulatory Commission (FERC)	18 CFR 4	FERC Order for Non-Project Use of Project Lands and Water	Construction of intake and discharge structures in, and water withdrawal and discharge from, Ninety-Nine Islands Reservoir.	Preparation of application not initiated.
SCDHEC	SC Code, Title 49, Chapter 4, Section 49-4-40	Water withdrawal registration	Water withdrawal from Ninety-Nine Islands Reservoir (Broad River).	Preparation of application not initiated.

Federal, State, and Local Authorizations Required for a Combined License (continued)

Agency	Authority	Requirement	Activity Covered	Status
SCDHEC	SC R. 61-9	National Pollutant Discharge Elimination System (NPDES) permit	Discharge of wastewater to surface waters (contractor concrete batch plant, cooling water blowdown, and process waste discharge).	Application submitted in August 2011. SCDHEC public notice of a draft NPDES permit anticipated in March 2013.
SCDHEC	SC R. 61-9 SC R. 72-300	NPDES storm water construction permit	Stormwater to surface water discharges associated with land disturbance and industrial activity. Requires notice of intent, grading permit, erosion control plan prior to excavation, and Stormwater Pollution Prevention Plan.	Permits received for site activities completed prior to 2013. All activities are now stable and permits have been terminated. Permit applications for future phases will be submitted prior to excavation activities as required by SCDHEC.
SCDHEC	SC R. 61-67	NPDES permit to construct	Construction of a wastewater treatment plant.	Preparation of application not initiated.
SCDHEC	Clean Water Act, Section 401, SC R. 61-101	Water quality certification	Federally permitted activities that may result in discharges to State waters. Certification states applicable effluent limits and water quality standards will not be violated.	Application submitted November, 2011.
SCDHEC	SC R. 61-58	Permit	Construction and operation of a public water distribution system.	Preparation of application not initiated.
SCDHEC	SC R. 72-1 to 72-9	Dam repair permit	Required before making repairs to an existing dam.	Permit has been approved.
SCDHEC	SC R. 72-1 to 72.9	Dam Construction Permit	Required in order to construct dam for Make-Up Pond C.	Preparation of application not initiated.
Threatened And Endangered Species				
U.S. Fish and Wildlife Service	Endangered Species Act/Migratory Bird Treaty Act (50 CFR 13, 17, 222,226, 227, 402, 424, 450-453)	Consultation	Consultation concerning potential impacts to federal threatened and endangered species and migratory birds.	Consultation process for the Lee Nuclear Station site, railroad-spur corridor, transmission-line corridors, and Make-Up Pond C will continue.
South Carolina Department of Natural Resources	Nongame and Endangered Species Conservation Act (SC Code, Title 50, Chapter 15, Section 50). Applies only to wildlife.	Consultation	Consultation concerning potential impacts to State threatened and endangered wildlife species.	Consultation process for the Lee Nuclear Station site, railroad-spur corridor, transmission-line corridors, and Make-Up Pond C will continue.
South Carolina Department of Natural Resources	South Carolina has no law or regulation for protection of State-ranked plant species	Consultation	Consultation concerning potential impacts to state-ranked plant species.	Consultation process will continue.

Federal, State, and Local Authorizations Required for a Combined License (continued)

Agency	Authority	Requirement	Activity Covered	Status
Transportation				
Federal Aviation Administration	Federal Aviation Act, 14 CFR 77	§ 77.15 Permit	Permit for structures over 200 ft. in height (construction cranes, reactor buildings).	Preparation of application not initiated.
South Carolina Department of Transportation	SC Code Annotated § 57-5-1080	Highway encroachment permit	Building an alternate construction entrance to the Lee Nuclear Station site. Relocation of Hwy 329 for Make-Up Pond C.	Pre-application discussions held with SCDOT on Hwy 329 relocation. Preparation of application not initiated.
Waste Management				
SCDHEC	SC R. 61-79 and 61-104	Resource Conservation and Recovery Act (RCRA) ID number	90-day accumulation of hazardous waste.	RCRA generator ID number has been received.
Miscellaneous	-			
South Carolina Public Service Commission	SC Code Annotated § 58-33-110	Certificate of Environmental Compatibility and Public Convenience and Necessity	Construction and operation of a generating station of more than 75 megawatts.	Preparation of application not initiated.
South Carolina Public Service Commission	SC Code Annotated § 58-33-110	Certificate of Environmental Compatibility and Public Convenience and Necessity	Construction and operation of any transmission line with a designed voltage of 125 kV or more.	Preparation of application not initiated.
South Carolina Fire Marshall Office	Chapter 71, 1976 Code Section 23-36-80, as amended	Blasting permit	Magazine storage and use of high explosives on the Lee Nuclear Station site and Make-Up Pond C.	Preparation of application not initiated.
SCDHEC	SC R. 61-107.11, Part III	Temporary construction and demolition debris permit	Storing of engineered fill. Part III permit-by-rule through notification of SCDHEC.	Permit received as a result of notification to SCDHEC.
Cherokee County	Building Safety	Building permit	Construction of offices and warehouses only. Buildings subject to inspection.	Preparation of application not initiated.

Environmental Impacts Resulting from Land Disturbances

Environmental Impacts Resulting from Land Disturbances

Introduction

The design of site specific structures, systems and components (SSCs) and construction planning for the William States Lee III Nuclear Station (WLS) has continued to progress since the submission of the Environmental Report and responses to associated requests for additional information (RAIs) from the Nuclear Regulatory Commission (NRC). Late in 2012, Duke Energy determined that several million cubic yards of excess spoil material would be generated from site earthwork/excavation activities (CB&I 2013). Onsite storage of the excess spoil material was determined to be the best disposal alternative to avoid offsite traffic impacts. Duke Energy evaluated the Lee Nuclear Site for additional spoil areas making sure that impacts to jurisdictional wetlands and streams were avoided. In addition to the land disturbance from additional spoil areas, the following recent design changes and construction planning updates also result in additional land disturbances: addition of a railroad turnaround north of Make-Up Pond B, site grading changes, expanding laydown areas to support construction, and minor design changes to the Make-Up Pond C dam and spillway (CB&I 2013).

Duke Energy evaluated the effects of the updated design of site specific SSCs and construction planning for the Lee Nuclear Station Units 1 and 2 on environmental resources (Atkins 2013). Specifically, Duke Energy evaluated the potential impacts from land disturbance activities on terrestrial ecology and cultural resources, socioeconomics, water quality and aquatic resources.

LEE NUCLEAR SITE

Updates to the design and construction planning for Lee Nuclear Station include: the relocation of Units 1 and 2, additional spoil areas, railroad turnaround and associated construction laydown area, refined grading plans and expanded laydown areas to support construction. Land disturbances described below reflect the total expected impacts and more accurately compares these impacts to the earlier impacts resulting from construction of Cherokee Nuclear Station in the 1970s and early 1980s.

Terrestrial Ecology

The delineation of existing ecological cover types was updated from the original coverage presented in the Environmental Report (Rev 1) provided by Duke Energy to the NRC (Duke 2009). Ecological cover types were updated and include *Waters of the US*, based on results of the approved jurisdictional determination (JD) (USACE 2013). Figure 1 depicts the revised ecological cover types. Table 1 provides the updated totals for each land cover category.

Aerial photographs from 1977 and 1983 were georeferenced using Geographical Information Systems (GIS) software and used to delineate and approximate the limits of vegetation clearing outside the existing limits of open water as depicted in the JD.

U.S. Department of Agriculture National Aerial Imagery Program (NAIP) photographs taken in 2011 for Cherokee County were used to validate that no major land cover disturbance has occurred since the original mapping and changes to the land cover classes (i.e. removing the stream buffer category) were only undertaken to maintain consistency with the approved JD. Results from review of the 2011 aerial photographs indicate habitat conditions and associated resources have not substantially changed since the 2009 surveys. This determination is consistent with NRC Draft Regulatory Guide DG-4016 (NRC 2011a), as related to terrestrial surveys.

ArcGIS shapefiles depicting the current design (Figure 2) were overlain on the revised cover types to determine acreage impacts for each habitat. Figure 3 depicts impacts to ecological cover types on the Lee Nuclear Site (some ecological cover types depicted on Figure 1 and located beneath impact areas may not be visible on Figure 3). Table 2 provides updated ecological cover type impacts associated with construction at the Lee Nuclear Site. The acreage of forest clearing required for the spoil piles, construction laydown areas, railroad turnaround, and grading areas on the Lee Nuclear Site represent an increase from the acreage presented in the Environmental Report. Much of the habitat proposed for impact at the Lee Nuclear Site has been previously disturbed or affected by Cherokee Nuclear Station development and is low quality. All land clearing will be conducted according to federal and state regulations, permit requirements, Duke Energy's existing good construction practices, and established best management practices (BMPs) (e.g., erosion and sediment control) (Duke 1999). Following construction, temporary work spaces (such as laydown areas or temporary parking lots) would be seeded with herbaceous plants and/or grass, and in some cases planted with native shrubs and trees (Duke Energy 2009).

As shown in Table 2, the majority of the additional land use impacts occur within the open/field meadow and upland scrub habitats. The design criteria prioritized the use of these areas considering they were previously disturbed during the Cherokee construction. Table 3 compares impacts occurring on areas previously disturbed during Cherokee construction with impacts to areas not part of Cherokee construction. Although the areas of impact are larger than previously reported, use of previously disturbed areas containing habitats of low ecological value and less impact to habitats of greater value will not result in a change to the previous impact category level of SMALL on a site and vicinity scale. Because these habitats are regionally common, the loss of the additional vegetation will not be noticeable nor destabilize the resource. Therefore, effects on terrestrial vegetation are still considered SMALL on a site and vicinity scale.

The increased land clearing of forested cover types may result in an increased impact to wildlife and wildlife habitat. The effects to wildlife due to forest clearing and other construction activities are discussed in subsection 4.3.1.1.3 of the Environmental Report and include temporary, short-term, and long-term (or permanent) durations (Duke Energy 2009). A temporary effect occurs during construction when wildlife is displaced from areas adjacent to construction zones or when species shift their established movement patterns. Short-term effects may last from the time of construction to several years post-construction, and include loss of grass and shrub habitats and disruption of burrowing species in areas where construction-related surface soil disturbance occurs. Long-term (permanent) effects can include the loss of forests, snags used by cavity-nesting species, and vegetative cover used during critical periods (e.g., during nesting or birthing periods) (Duke Energy 2009). Since the overall quality of habitat proposed for impact on the Lee Nuclear Site is generally low and adequate habitat occurs in the vicinity, the impact to wildlife on the Lee Nuclear Site is still expected to be small at the site and vicinity level for all durations of impact.

A population of southern adder's tongue fern (*Ophioglossum vulgatum*) was observed during a field survey of the Lee Nuclear Station site in 2006. The population consisted of 25 individuals and was located in a ravine above an old, man-made stock pond in a cut-over beech/mixed-hardwood forest in the southwestern portion of the site (Duke Energy 2009). The new land clearing limits indicate the population found during the 2006 survey may exist within the footprint of a spoil area. Duke Energy has contacted the botanist responsible for the original survey to re-survey the area during the flowering period to determine whether the plant currently exists. In the event southern adder's tongue fern is found in this area, Duke Energy will notify South Carolina Department of Natural Resources (SCDNR) regarding potential mitigative measures. The southern adder's tongue fern is generally rare in South Carolina (i.e., state ranked: S2-Imperiled [SCDNR 2012], but is not imperiled or vulnerable range wide (at the present time, no plans or commitments have been developed to relocate this population). Considering the species occurs on the Lee Nuclear Station site and in 13 other counties in South Carolina and is widely distributed elsewhere in eastern North America, where it is considered to be secure throughout its range (NatureServe Explorer 2010), the loss of this population would have a negligible impact overall on the species. If this population of southern adder's tongue fern is required by regulatory agencies to be relocated, formal discussions will be initiated with the SCDNR. Since this particular plant species is not particularly rare in the region, impacts to the southern adder's tongue fern are not expected to be noticeable nor destabilize the population. No other federally or state listed species or special interest species would be impacted by updates to the Lee Nuclear Site design and construction planning. Impacts to special interest species due to development of the Lee Nuclear Site are expected to be SMALL.

Since the development of the Lee Nuclear Site is expected to result in SMALL impacts to terrestrial vegetation, wildlife, and species of special interest, the overall impact to terrestrial ecology from development of the Lee Nuclear Site will remain SMALL. In the Environmental Report, the evaluation indicated that the development of Make-Up Pond C would result in MODERATE impacts to terrestrial ecology and the overall impact from Lee Nuclear Station development to terrestrial ecology as MODERATE. The impacts associated with the increase in disturbed area at the Lee Nuclear Site taken cumulatively with the impacts from Make-Up Pond C will continue to have MODERATE impacts to terrestrial ecology for Lee Nuclear Station.

Cultural Resources

The spoil piles, construction laydown areas, railroad turnaround, and grading areas on the Lee Nuclear Site were designed to avoid known cultural resources. Considering cultural resource surveys had not been conducted in some areas, an additional survey was conducted in February 2013 (Brockington 2013).

The study included areas not previously impacted by the former Cherokee project and not previously surveyed during earlier studies. The investigation also included the locations of a revised road alignment and water line to McKown Mountain, a revised alignment for the proposed wastewater discharge pipeline at Ninety-Nine Islands Dam, and a small expansion to the Area of Potential Effect (APE) at the proposed location for the Make-Up Pond C dam. The survey investigated approximately 450 acres (Brockington 2013).

The cultural resource survey was conducted in accordance with Section 106 of the National Historic Preservation Act to ensure that activities permitted by the Nuclear Regulatory Commission (NRC) or the U.S. Army Corps of Engineers (USACE) will not affect Historic Properties (e.g., cultural resources that are eligible for, or that are listed on the National Register of Historic Places). The survey was completed following the Standards and Guidelines for archaeological survey established by the Council of South Carolina Professional Archaeologists (COSCAPA) and adopted by the State Historic Preservation Office in 2005.

Four archaeological sites were identified during the recent field investigation, including two prehistoric lithic scatters, the ruins of one nineteenth century house site, and one small scatter of nineteenth century ceramic artifacts. Brockington concluded that the sites identified during the survey were not eligible for the National Register of Historic Places (NRHP). The addition of the proposed grading and subsequent spoil areas to the overall WLS APE will not impact historic properties (Brockington 2013). The proposed project is in the vicinity of two previously identified cemeteries, the McKown Family Cemetery and the Stroup Cemetery. These cemeteries will be preserved and a 50 foot buffer has been established around each, as stipulated in the Cultural Resources Management Plan for the WLS.

Permanent state archaeological site forms will be completed for each site and submitted to the South Carolina Institute of Archaeology and Anthropology (SCIAA). A detailed technical report including the permanent site numbers for each identified site will be submitted to the SHPO, NRC, USACE, and the Catawba Indian Nation in March 2013.

Other Environmental Impacts

Potential effects to terrestrial and cultural resources resulting from site grading changes, onsite storage of the excess spoil material, addition of a railroad turnaround, expanding laydown areas and minor design changes to the Make-Up Pond C dam and spillway have been thoroughly evaluated and the results presented in this enclosure. Other potential environmental impacts were considered minor and are discussed below.

Socioeconomics

Noise impacts to off-site receptors would occur during construction activities. Those impacts have been evaluated in the Environmental Report. The increases in on-site activities are not expected to result in a significant change to those conditions evaluated in the Environmental Report. The need to transport spoil material off-site was avoided, thereby, minimizing impacts to local residents.

Construction related activities will result in land clearing, changes in site topography, and other visual effects. These changes would be most noticeable from individuals using the Broad River, Ninety-Nine Islands Reservoir, or traveling along McKown Mountain Road. Considering spoil piles and other temporarily disturbed areas will be revegetated, and/or in some locations allowed to develop into mature forests, the aesthetic impacts would be noticeable, but not destabilizing. No changes to findings contained in the Environmental Report, as related to socioeconomics are required.

Water Quality/Aquatic Resources

Potential spoil, laydown, and other land disturbance areas have been located in upland areas, beyond the limits of wetlands, streams, or other *Waters of the U.S.* Additionally, 50-foot buffers have been included to further protect adjacent waterbodies from indirect impacts. Appropriate BMPs will be followed during construction, as well as conditions contained within sediment and erosion control permits. Areas temporarily disturbed during construction will be revegetated and allowed to develop into a mature forest community (except in areas as required to comply with 10L criteria for the mentioned tower). No changes to findings contained in the Environmental Report, as related to water quality or aquatic resources are required.

MAKE-UP POND C

Updated design for the Make-Up Pond C infrastructure includes additional clearing limits for the main dam and spillway, detailed grading for the raw water system line and underground cable to the intake/ refill structure, incorporation of the laydown yard associated with the raw water system line located on the Lee Nuclear Site into a larger laydown area in the same location for the railroad spur, and expanded vegetation clearing limits along the railroad spur in the Make-Up Pond C study area. Updates to the main dam, spillway, and raw water system line represent minor changes from the impacts assessed in the supplement to the Environmental Report. The laydown area is accounted for in the disturbance area for the Lee Nuclear Site. The Make-Up Pond C intake/refill structure will be powered with underground cables from the station that will be routed below ground and within the area of disturbance for the raw water system pipeline.

Changes in impacts to the environment due to the updated design of Make-Up Pond C infrastructure are minor. Figure 4 provides updated ecological cover type impacts associated with the development of Make-Up Pond C. Tables 4a, 4b, and 4c provide updated ecological cover type impacts associated with the development of Make-Up Pond C, including impacts occurring on the Lee Nuclear Site that result from facilities supporting Make-Up Pond C. Make-Up Pond C construction will result in a permanent impact to 1,091.92 acres, an increase of 33.09 acres. The greatest increase results from vegetation clearing (30.02 acres) associated with the main dam and saddle dikes. Temporary impacts to existing cover types will result in a decrease of 6.51 acres, resulting from the incorporation of the 6.51-acre laydown area for the raw water service line with the laydown area associated with the railroad turnaround on the Lee Nuclear Site. Since these updates represent a minor change from the Environmental Report, the construction impact category levels for environmental resources would remain the same and were not reevaluated.

References:

1. Atkins. 2013. Environmental Impact for Land Cover Changes – William States Lee III Nuclear Station. Rev. 1. February 2013.
2. Brockington. 2013. Archaeological Survey of Proposed Grading and Spoil Areas, W.S. Lee Nuclear Station (WLS) Draft Report. February 2013.
3. Duke Energy. 1999. Best Management Practices for Stormwater Management and Erosion Control – Policy and Procedures Manual. February 1999.

4. Duke Energy. 2009. William States Lee III Nuclear Station COL Application, Part 3, Applicant's Environmental Report, Revision 1, March 2009.
5. NatureServe Explorer. 2010. An Online Encyclopedia of Life. Version 7.1, last updated August 2010. Accessed various dates 2010 at http://www.natureserve.org/explorer
6. CB&I (CBI). 2013. Land Disturbance Study. Lee Nuclear Station Units 1 and 2, Rev. E. February 19, 2013.
7. South Carolina Department of Natural Resources (SCDNR). 2012. Rare, Threatened, and Endangered Species and Communities Known to Occur in South Carolina. February 23, 2012. http://www.dnr.sc.gov/species/pdf/SC_state_wide.pdf accessed on February 8, 2013.
8. U.S. Army Corps of Engineers (USACE). 2013. Jurisdictional Determination for the Lee Nuclear Station. SAC 2009-122-SJR. Charleston District of the U.S. Army Corps of Engineers.
9. U.S. Department of Agriculture National Aerial Imagery Program (NAIP). 2011. USDA FSA APFO Digital Ortho Mosaic, Blacksburg SE. April 30, 2011. http://www.fsa.usda.gov/FSA/apfoapp?area=home&subject=prog&topic=nai accessed on May 21, 2012.
10. U.S. Nuclear Regulatory Commission (NRC). 2011a. Draft Regulatory Guide DG-4016 – Terrestrial Environmental Studies for Nuclear Power Stations *(Proposed Revision 2 of Regulatory Guide 4.11, dated August 1977).*
11. U.S. Nuclear Regulatory Commission (NRC). 2011b. Draft Environmental Impact Statement for Combined License (COLs) for William States Lee III Nuclear Station Units 1 and 2. December 2011.

Attachments:

1. Table 1 – Acreage Occupied by Various Ecological Cover Types at the Lee Nuclear Site
2. Table 2 – Ecological Cover Types to be Cleared During Construction at the Lee Nuclear Site
3. Table 3 – Impact Areas Disturbed by Cherokee Nuclear Construction
4. Table 4a – Ecological Cover Types Permanently Impacted During Make-Up Pond C Construction
5. Table 4b – Ecological Cover Types Temporarily Impacted During Make-Up Pond C Construction
6. Table 4c – Total Impacts to Ecological Cover Types Resulting from Make-Up Pond C Construction
7. Figure 1 – Ecological Cover Types
8. Figure 2 – Lee Nuclear Station Units 1 & 2 Site Plan

9. Figure 3 – Ecological Cover Types Disturbed at the Lee Nuclear Site
10. Figure 4 – Make-Up Pond C Ecological Cover Types and Vegetation Disturbed

Attachments

TABLE 1
ACREAGE OCCUPIED BY VARIOUS ECOLOGICAL COVER TYPES AT THE NUCLEAR SITE*

Map Symbol	Ecological Type	Acres	Percent of Total
OFM	Open/Field/Meadow	440.77	22.9
MH	Mixed Hardwood	418.49	21.7
MHP	Mixed Hardwood-Pine	311.84	16.2
OW	Open Water	260.23**	13.5
PMH	Pine-Mixed Hardwood	228.31	11.9
USC	Upland Scrub	154.07	8.0
OPMH	Open Pine-Mixed Hardwood	70.18	3.6
NJF	Nonjurisdictional Feature	9.25	0.5
P	Pine	17.40	0.9
NAW	Nonalluvial Wetland	12.60**	0.7
AW	Alluvial Wetland	3.33**	0.2
	Total	**1,926.47**	**100**

* Table format corresponds to Table 2.4-1 in the Environmental Report.

** Acreage of open water and wetlands in this table is larger than what is provided in the Jurisdictional Determination due to the smaller size of the project area submitted for the Jurisdictional Determination.

TABLE 2
ECOLOGICAL COVER TYPES TO BE CLEARED DURING CONSTRUCTION AT THE LEE NUCLEAR SITE*

	Estimated Total Acreage	Cover Types								
		MH	MHP	PMH	OPMH	P	NJF	OFM	USC	NAW
Construction Period										
Laydown	72.45	8.88	9.35	6.73	8.11	-	-	27.34	12.04	-
Spoils Area	254.31	63.50	41.36	51.47	39.75	7.34	-	12.48	38.41	-
Subtotal	326.76	72.38	50.71	58.20	47.86	7.34	0	39.82	50.45	0
Permanent Facilities										
Power Block	65.55	-	-	-	-	-	8.56	56.99	-	-
Cooling Towers	10.59	-	-	-	-	-	-	10.59	-	-
Switchyard	19.80	-	-	-	-	-	-	19.80	-	-
Meteorological Tower	7.25	-	4.36	1.87	-	-	-	-	1.02	-
Transmission	63.50	3.55	19.88	13.91	-	-	-	14.76	11.19	0.21**
Wastewater Treatment	10.13	-	0.13	4.42	-	-	0.42	3.76	1.40	-
Pipelines	23.47	3.23	3.67	1.82	-	0.12	-	10.83	3.80	-
General Grading and Transportation	376.58	38.02	25.67	16.40	12.68	2.42	0.27	245.97	35.15	-
Subtotal	576.87	44.80	53.71	38.42	12.68	2.54	9.25	362.70	52.56	0.21
Total	**903.63**	**117.18**	**104.42**	**96.62**	**60.54**	**9.88**	**9.25**	**402.52**	**103.01**	**0.21**
Percent of Total	**100**	**12.97**	**11.56**	**10.69**	**6.70**	**1.09**	**1.02**	**44.54**	**11.40**	**0.02**

Cover Type Key: 1) Open Areas, Fields and Meadows (OFM), 2) Pine (P), 3) Pine-Mixed Hardwood (PMH), 4) Upland Scrub (USC), 5) Mixed Hardwood (MH), 6) Mixed Hardwood-Pine (MHP), 7) Open Pine-Mixed Hardwood (OPMH), 8) Non-Jurisdictional Feature (NJF), 9) Non-Alluvial Wetland (NAW).

* Table format corresponds to Table 4.3-1 in the Environmental Report and Table 4-1 in the DEIS.

** The transmission lines cross a total of 1.24 acres of wetlands; however, only 0.21 acre is forested. Therefore, under the Duke Energy Best Management Practices for Stormwater Management and Erosion Control – Policy and Procedures Manual (Duke 1999), only the 0.21 acre will have vegetation altered, while herbaceous wetlands will not be disturbed.

TABLE 3
IMPACT AREAS DISTURBED BY
CHEROKEE NUCLEAR STATION

	Total*	MH	MHP	PMH	OPMH	P	NJF	OFM	USC	NAW
Lee Nuclear Site Impacts Previously Disturbed by Cherokee Development	584.07	31.34	33.63	40.42	11.68	6.42	9.22	388.46	62.69	0.21
Lee Nuclear Site Impacts Not Disturbed by Cherokee Development	361.30	89.06	89.61	61.49	55.47	3.46	0.03	21.86	40.32	0
Total Lee Nuclear Site Impacts	**945.37**	**120.40**	**123.24**	**101.91**	**67.15**	**9.88**	**9.25**	**410.32**	**103.01**	**0.21**
Percent of Impacted Habitat Previously Disturbed	**62%**	**26%**	**27%**	**40%**	**17%**	**65%**	**100%**	**95%**	**61%**	**100%**

* Includes 41.74 acres of impact from pipelines listed in Table 4a.

TABLE 4a
ECOLOGICAL COVER TYPES PERMANENTLY IMPACTED DURING MAKE-UP POND C CONSTRUCTION*

	Estimated Disturbed Acreage	OFM	P	PMH	USC	MH	MHP	OPMH	OW
Reservoir Features									
Impoundment	618.84	88.13	104.45	9.91	1.06	308.77	101.11	-	5.41
Dam Footprint	14.52	0.62	6.63	-	-	4.43	2.84	-	-
Saddle Dikes	6.96	0.95	5.27	-	-	0.74	-	-	-
Make-Up Pond C Spillway	2.38	-	0.01	-	-	1.74	0.63	-	-
Impacts Outside Inundation Area and within Make-Up Pond C Study Area									
Buck Mill Road	4.89	0.82	3.96	-	-	0.07	0.04	-	-
Grace Road	2.07	1.69	0.13	-	-	0.14	0.11	-	-
Heavy Haul Roads and Haul Paths	0.94	-	-	-	-	-	-	-	0.94
Lake Cherokee Spillway	0.43	0.43	-	-	-	-	-	-	-
Newly Built Road	3.40	-	0.16	-	2.14	-	1.10	-	-
Old Barn Road	8.03	8.03	-	-	-	-	-	-	-
Peeler Ridge Road	1.48	0.03	1.45	-	-	-	-	-	-
Pipeline	8.39	0.78	5.44	-	1.72	0.09	0.36	-	-
Pipeline Break Tank	0.16	-	-	-	0.16	-	-	-	-
Pond C Pumphouse	-	-	-	-	-	-	-	-	-
Rip Rap	0.29	0.23	-	-	-	0.06	-	-	-
Road to Pond C	6.49	0.61	1.60	-	-	1.37	2.91	-	-
Rolling Mill Road	15.10	7.15	5.54	-	-	1.22	0.93	0.26	-
SC 329 – New Alignment	31.11	15.96	2.43	4.36	-	7.45	0.91	-	-
Transmission Line – Re-route	18.45	7.17	1.66	2.36	-	5.19	0.23	-	1.84
Rail Line Crossings	8.19	-	3.55	0.02	-	2.58	2.04	-	-
Spoils Area	186.21	73.61	67.99	-	8.76	26.76	1.29	-	7.80
Vegetation Clearing	102.47	10.77	31.05	4.71	-	34.39	21.55	-	-
White Road	6.33	5.64	0.64	-	-	0.05	-	-	-
Impacts within Lee Site									
Pipeline	41.74	7.80	-	5.29	-	3.22	18.82	6.61	-
Impacts Outside Make-Up Pond C Study Area									
Transmission Line – Re-route	3.05	-	-	-	-	-	3.05	-	-
Total	**1,091.92**	**230.42**	**241.96**	**26.65**	**13.84**	**398.27**	**157.92**	**6.87**	**15.99**

Cover Type Key: 1) Open Areas, Fields and Meadows (OFM), 2) Pine (P), 3) Pine-Mixed Hardwood (PMH), 4) Upland Scrub (USC), 5) Mixed Hardwood (MH), 6) Mixed Hardwood-Pine (MHP), 7) Open Pine-Mixed Hardwood (OPMH), 8) Open Water (OW).

* Table format corresponds to Table 4.3-2a in the response to RAI 157 (ML101950207).

TABLE 4b
ECOLOGICAL COVER TYPES TEMPORARILY IMPACTED DURING MAKE-UP POND C CONSTRUCTION*

	Estimated Disturbed Acreage	OFM	P	PMH	USC	MH	MHP	OPMH	OW
Impacts Outside Inundation Area and within Make-Up Pond C Study Area									
Borrow Area	7.67	4.15	0.65	-	-	1.70	1.17	-	-
Dewatering Pipe	0.03	-	-	-	-	0.03	-	-	-
Diversion Pipe	0.36	-	-	-	-	0.34	0.02	-	-
Field Office	0.11	0.11	-	-	-	-	-	-	-
Heavy Haul Roads and Haul Paths	10.68	6.92	0.01	-	-	3.75	-	-	-
Laydown	4.78	3.21	-	-	1.04	-	0.53	-	-
Logging Roads	12.80	0.25	3.36	6.98	1.19	1.02	-	-	-
Mechanics Shop	0.17	0.17	-	-	-	-	-	-	-
Parking	13.03	9.37	1.95	-	-	0.61	1.10	-	-
Upstream Cofferdam	0.18	-	-	-	-	0.12	0.06	-	-
Total	**49.81**	**24.18**	**5.97**	**6.98**	**2.23**	**7.57**	**2.88**	**-**	**-**

Cover Type Key: 1) Open Areas, Fields and Meadows (OFM), 2) Pine (P), 3) Pine-Mixed Hardwood (PMH), 4) Upland Scrub (USC), 5) Mixed Hardwood (MH), 6) Mixed Hardwood-Pine (MHP), 7) Open Pine-Mixed Hardwood (OPMH), 8) Open Water (OW).

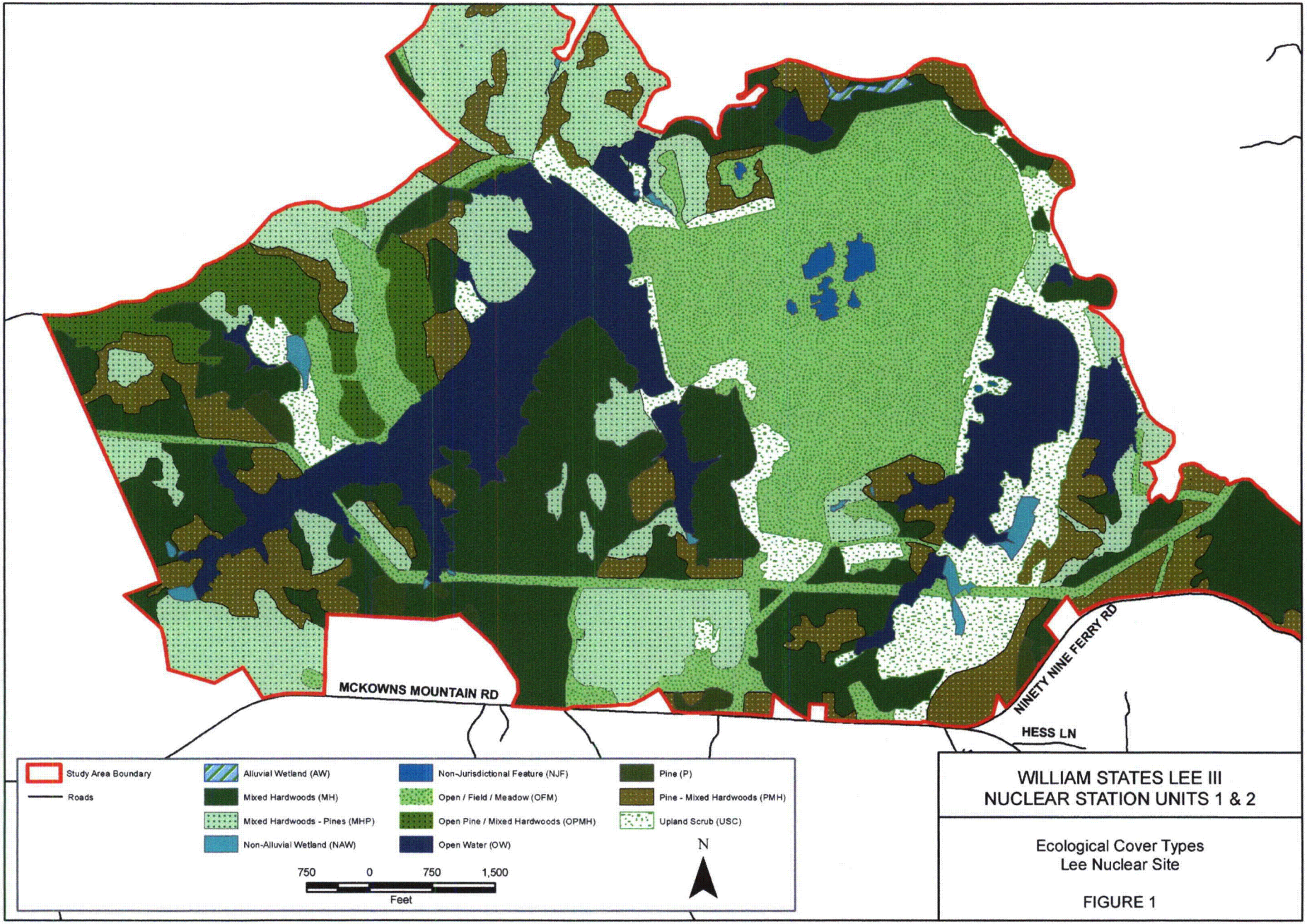
* Table format corresponds to Table 4.3-2b in the response to RAI 157 (ML101950207).

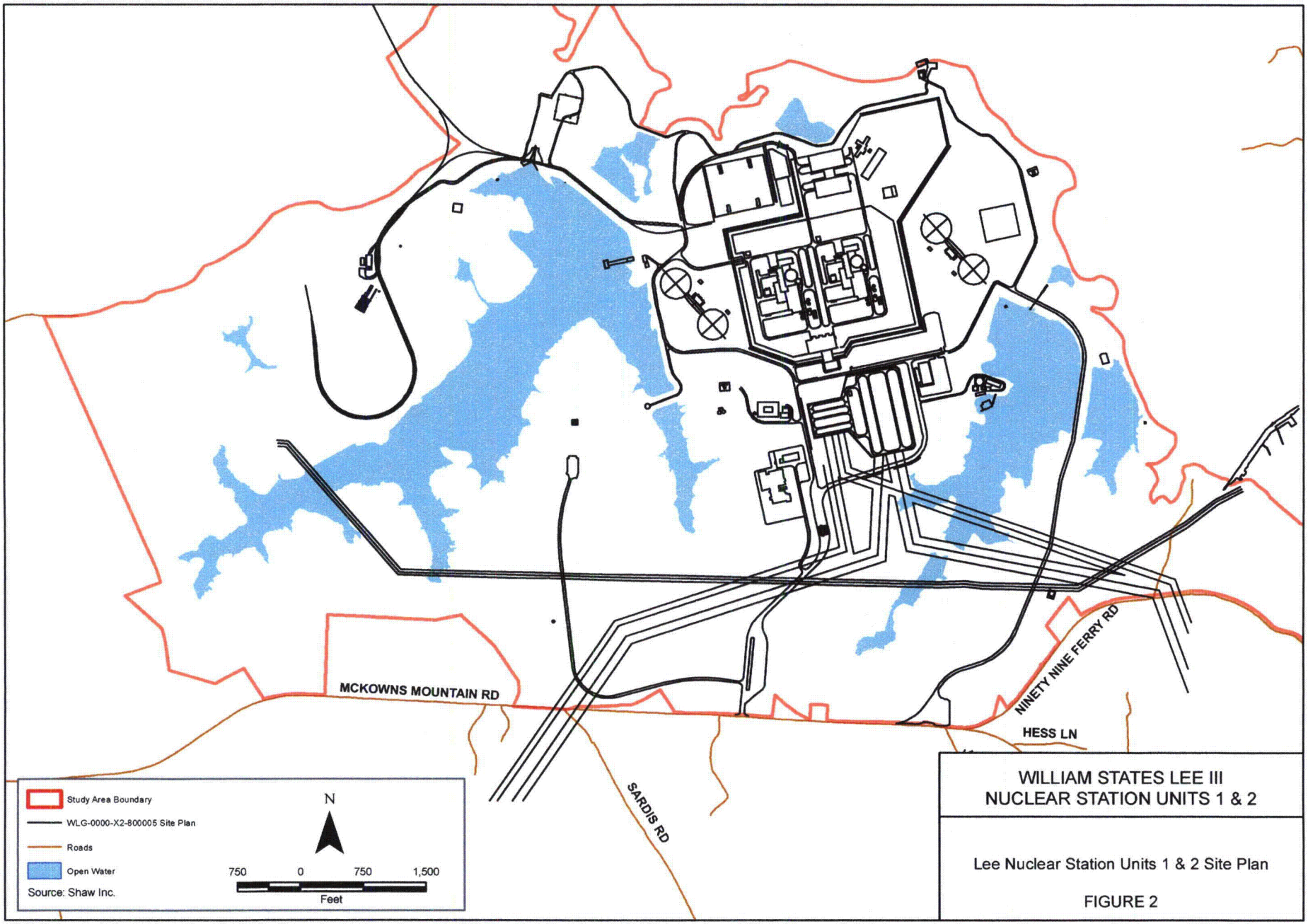
TABLE 4c
TOTAL IMPACTS TO ECOLOGICAL COVER TYPES RESULTING FROM MAKE-UP POND C CONSTRUCTION*

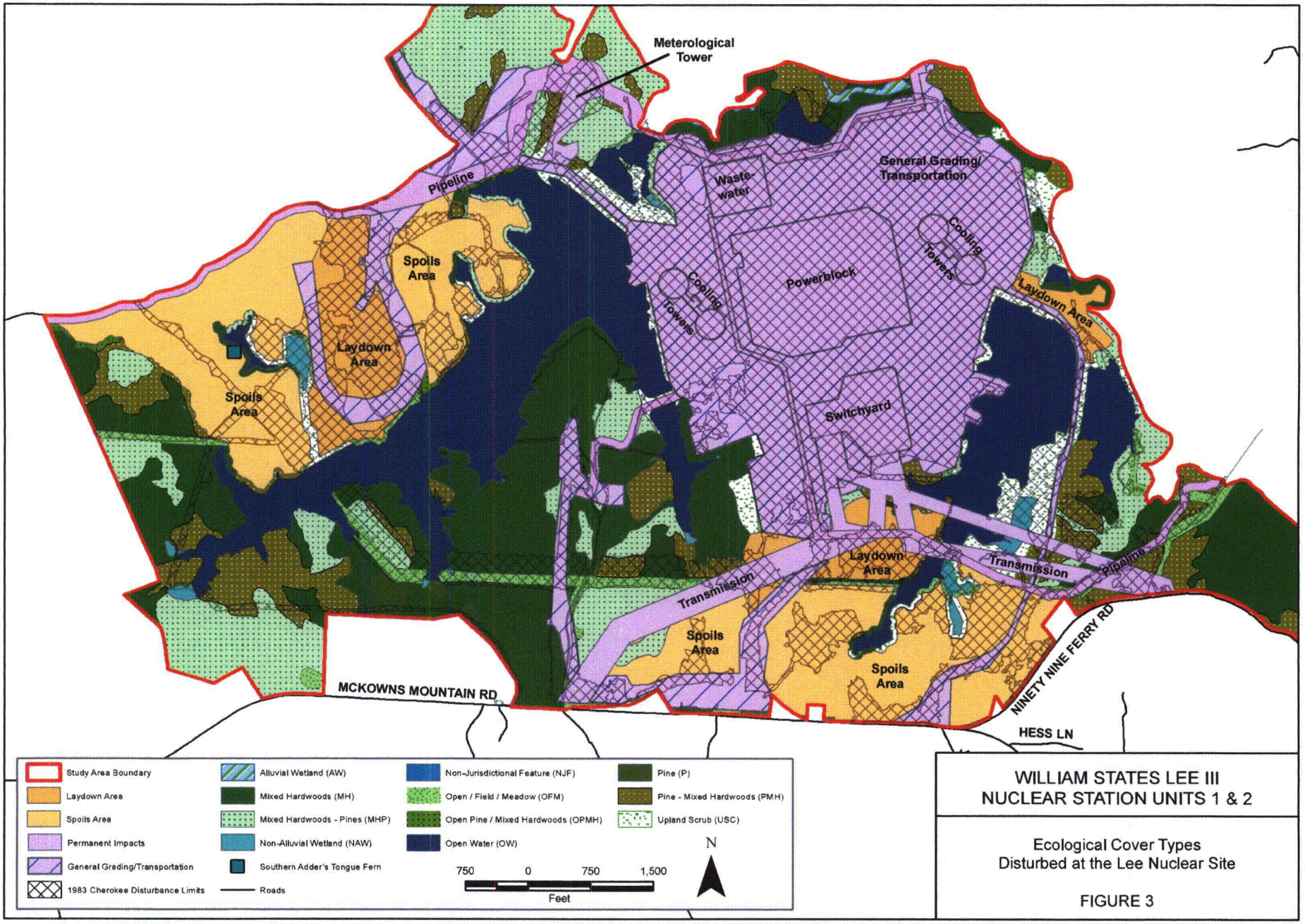
	Estimated Disturbed Acreage	OFM	P	PMH	USC	MH	MHP	OPMH	OW
Permanent Impacts	1,091.92	230.42	241.96	26.65	13.84	398.27	157.92	6.87	15.99
Temporary Impacts	49.81	24.18	5.97	6.98	2.23	7.57	2.88	-	-
Total	**1,141.73**	**254.60**	**247.93**	**33.63**	**16.07**	**405.84**	**160.80**	**6.87**	**15.99**

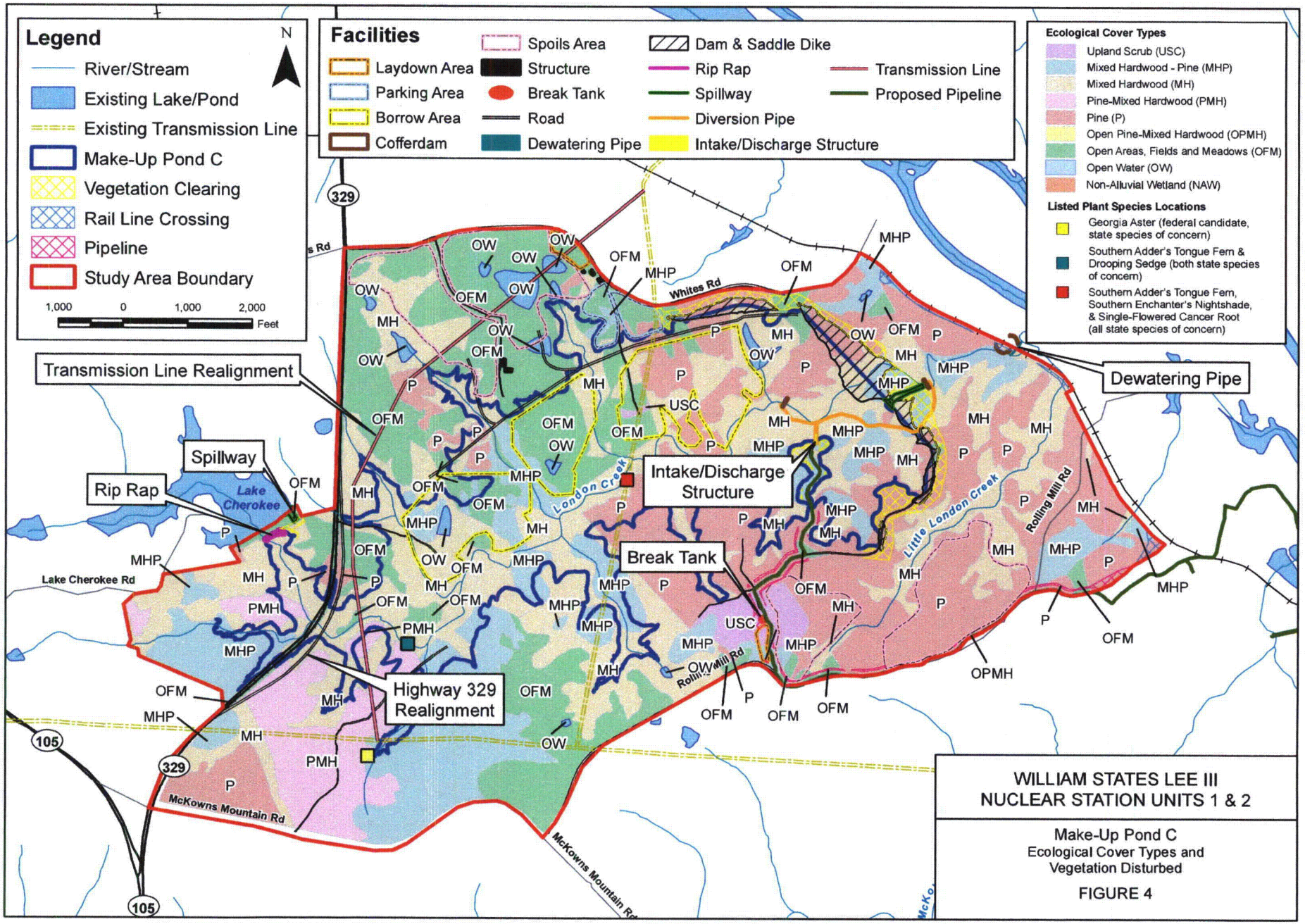
Cover Type Key: 1) Open Areas, Fields and Meadows (OFM), 2) Pine (P), 3) Pine-Mixed Hardwood (PMH), 4) Upland Scrub (USC), 5) Mixed Hardwood (MH), 6) Mixed Hardwood-Pine (MHP), 7) Open Pine-Mixed Hardwood (OPMH), 8) Open Water (OW).

* Table format corresponds to Table 4.3-2c in the response to RAI 157 (ML101950207).


MCKOWNS MOUNTAIN RD
NINETY NINE FERRY RD
HESS LN
Study Area Boundary
Roads
Alluvial Wetland (AW)
Mixed Hardwoods (MH)
Mixed Hardwoods - Pines (MHP)
Non-Alluvial Wetland (NAW)
Non-Jurisdictional Feature (NJF)
Open / Field / Meadow (OFM)
Open Pine / Mixed Hardwoods (OPMH)
Open Water (OW)
Pine (P)
Pine - Mixed Hardwoods (PMH)
Upland Scrub (USC)
N
750 0 750 1,500
Feet
WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2
Ecological Cover Types
Lee Nuclear Site
FIGURE 1


MCKOWNS MOUNTAIN RD
NINETY NINE FERRY RD
HESS LN
SARDIS RD
Study Area Boundary
WLG-0000-X2-800005 Site Plan
Roads
Open Water
Source: Shaw Inc.
N
750 0 750 1,500
Feet
WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2
Lee Nuclear Station Units 1 & 2 Site Plan
FIGURE 2


Meterological Tower
Pipeline
Waste-water
General Grading/ Transportation
Cooling Towers
Powerblock
Cooling Towers
Laydown Area
Spoils Area
Laydown Area
Spoils Area
Switchyard
Laydown Area
Transmission
Transmission
Pipeline
Spoils Area
Spoils Area
MCKOWNS MOUNTAIN RD
NINETY NINE FERRY RD
HESS LN
Study Area Boundary
Laydown Area
Spoils Area
Permanent Impacts
General Grading/Transportation
1983 Cherokee Disturbance Limits
Alluvial Wetland (AW)
Mixed Hardwoods (MH)
Mixed Hardwoods - Pines (MHP)
Non-Alluvial Wetland (NAW)
Southern Adder's Tongue Fern
Roads
Non-Jurisdictional Feature (NJF)
Open / Field / Meadow (OFM)
Open Pine / Mixed Hardwoods (OPMH)
Open Water (OW)
Pine (P)
Pine - Mixed Hardwoods (PMH)
Upland Scrub (USC)
N
750 0 750 1,500
Feet
WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2
Ecological Cover Types
Disturbed at the Lee Nuclear Site
FIGURE 3



WILLIAM STATES LEE III
NUCLEAR STATION UNITS 1 & 2

Make-Up Pond C
Ecological Cover Types and
Vegetation Disturbed

FIGURE 4

Dose/Air Dispersion Model Input/Output Files

Associated with Two Years of Meteorological Data
(12/01/2005 through 11/30/2007)
(Compact Disks Attached):

CD #1: XOQDOQ Files for WLS Long-Term Offsite Impacts from Routine Release
(WLS MET Inputs: 12/01/2005 - 11/30/2007)

CD #2: PAVAN Files for WLS Short-Term Offsite Impacts from Accident Release
(WLS MET Inputs: 12/01/2005 - 11/30/2007)

CD #3: ARCON96 Files for WLS Control Room Accident X/Qs
(WLS MET Inputs: 12/01/2005 - 11/30/2007)

CD #4: ARCON96 Files for WLS TSC Accident X/Qs
(WLS MET Inputs: 12/01/2005 - 11/30/2007)

CD #5: GASPAR Files for WLS Routine Release Off-Site Dose
(Two Years of MET Data)

CD #6: GASPAR and XOQDOQ Files for WLS Construction Worker Dose

Facility and Land Cover Disturbance Shapefiles
and
Figures 1 through 4
(Compact Disk Attached):

- **Facilities Shapefiles**
- **Landcover Shapefiles**
- **Figure 1 – Ecological Cover Types Lee Nuclear Station (.pdf)**
- **Figure 2 – Lee Nuclear Station Units 1 & 2 Site Plan (.pdf)**
- **Figure 3 – Ecological Cover Types Disturbed at the Lee Nuclear Site (.pdf)**
- **Figure 4 – Make-Up Pond C Ecological Cover Types and Vegetation Disturbed (.pdf)**