

ATTACHMENTS

Attachment A

*Biological Assessment for Endangered, Threatened, and Noteworthy Species, Wetlands,
and Significant Natural Areas
in Association With Catawba Nuclear Station and Related Power Transmission Lines,*

L.L. Gaddy. March 2001

BIOLOGICAL ASSESSMENT FOR
ENDANGERED, THREATENED, AND NOTEWORTHY SPECIES,
WETLANDS, AND SIGNIFICANT NATURAL AREAS
IN ASSOCIATION WITH THE
CATAWBA NUCLEAR STATION
AND RELATED POWER TRANSMISSION LINES

prepared for

Duke Power Company

Charlotte, North Carolina

by

L. L. Gaddy, Ph. D.

terra incognita

2333 Terrace Way

Columbia, South Carolina 29205

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Project Description

The action proposed by Duke Energy Corporation is the continued operation of the Catawba Nuclear Station in York County, South Carolina under a renewed license of the Nuclear Regulatory Commission. In addition, 42.4 miles (68.3 km) of transmission lines associated with the Catawba Nuclear Station in the original environmental impact analysis (U. S. Nuclear Regulatory Commission, 1973) will continue to be operated and maintained. No new construction will be carried out as part of this action.

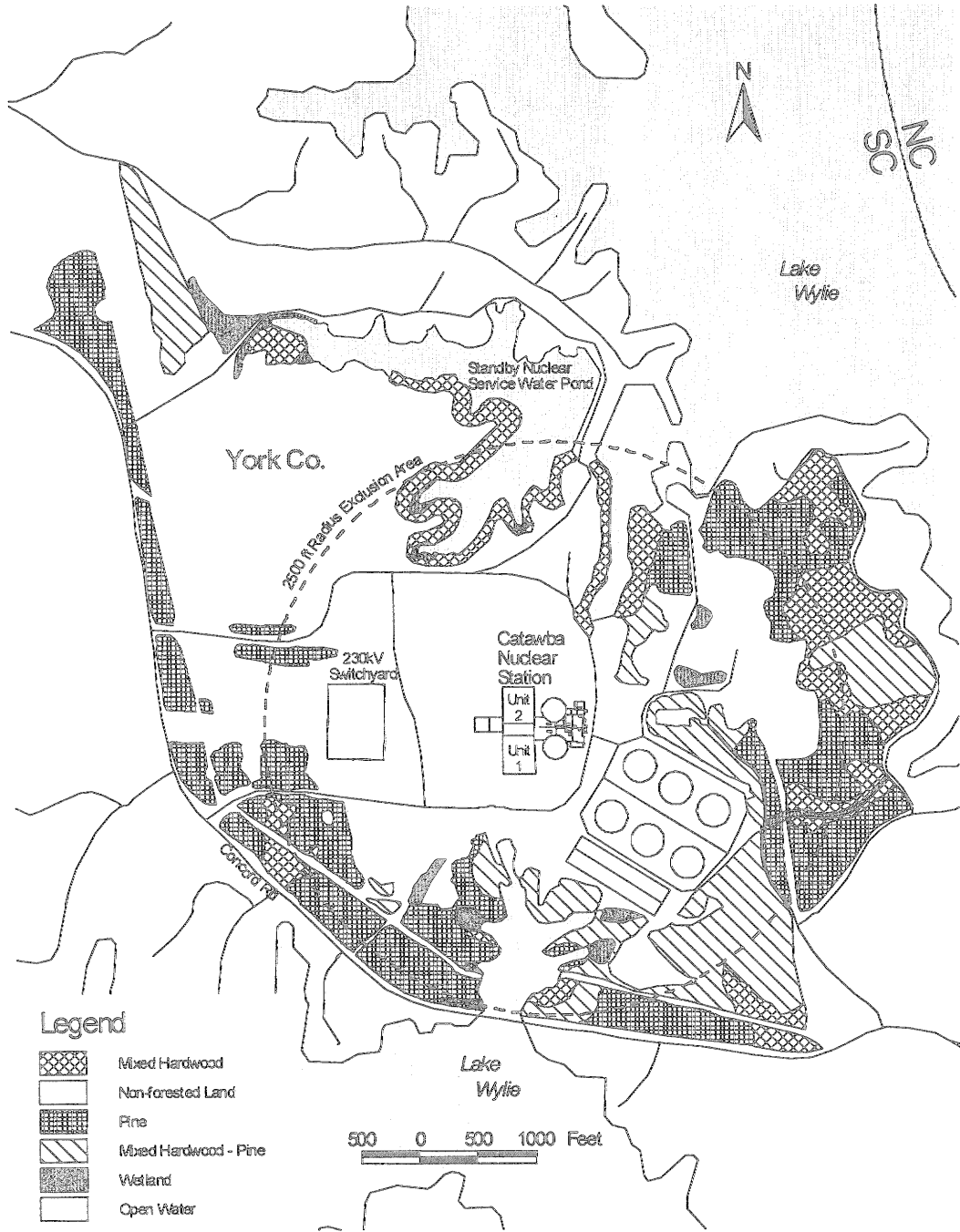
Project Area

Catawba Nuclear Station is located approximately nine miles (14.4 km) north northwest of Rock Hill, South Carolina. The station is on the western shore of Lake Wylie, just over one mile west of the North Carolina-South Carolina state line. The Catawba site is found in the Piedmont physiographic province of South Carolina. The study area harbors typical Piedmont plant communities such as pine, pine-mixed hardwoods, mixed hardwoods, and bottomland mixed hardwoods. The soils of at the Catawba site and those in related power transmission line rights-of-way are relatively diverse. In eastern York County, there are belts of the poorly-drained, basic to circumneutral Iredell soils; in central York County, typical Piedmont sandy and clay loams such as Cecil and Lloyd are prevalent; and in western York County and eastern Cherokee County, the sandy, rocky soils of the Kings Mountain belt prevail.

The Exclusion Area, delineated on Figure 1, is the study area for the Catawba relicensing project. It is a circle with a 2500-foot (757.6 m) radius from a center point located between the two reactor buildings and encompasses 450.5 acres (182.4 ha). The relicensing project area also includes approximately 42.4 miles (68.3 km) of transmission rights-of-way radiating northward, southward, and westward from Catawba Nuclear Station (Figure 2).

Table 1 presents a comparison of the plant community coverage of the Exclusion Area in 1974 (from Duke Power Company, 1975) and in 2000 (from Figure 1). Sixty-nine percent of the Exclusion Area is now nonforested land, while only five percent of the site was nonforested before construction began. The total pine acreage of the study area has dropped from 69% to 25%, the pine-mixed hardwood area from 16% to 9% of the Exclusion Area, and the mixed hardwood acreage from 22% to 2%. Currently, approximately 36% of the Exclusion Area is forested.

Catawba Nuclear Station
 Site Land Cover
 Figure 1



Catawba Nuclear Station
Transmission Lines
Figure 2

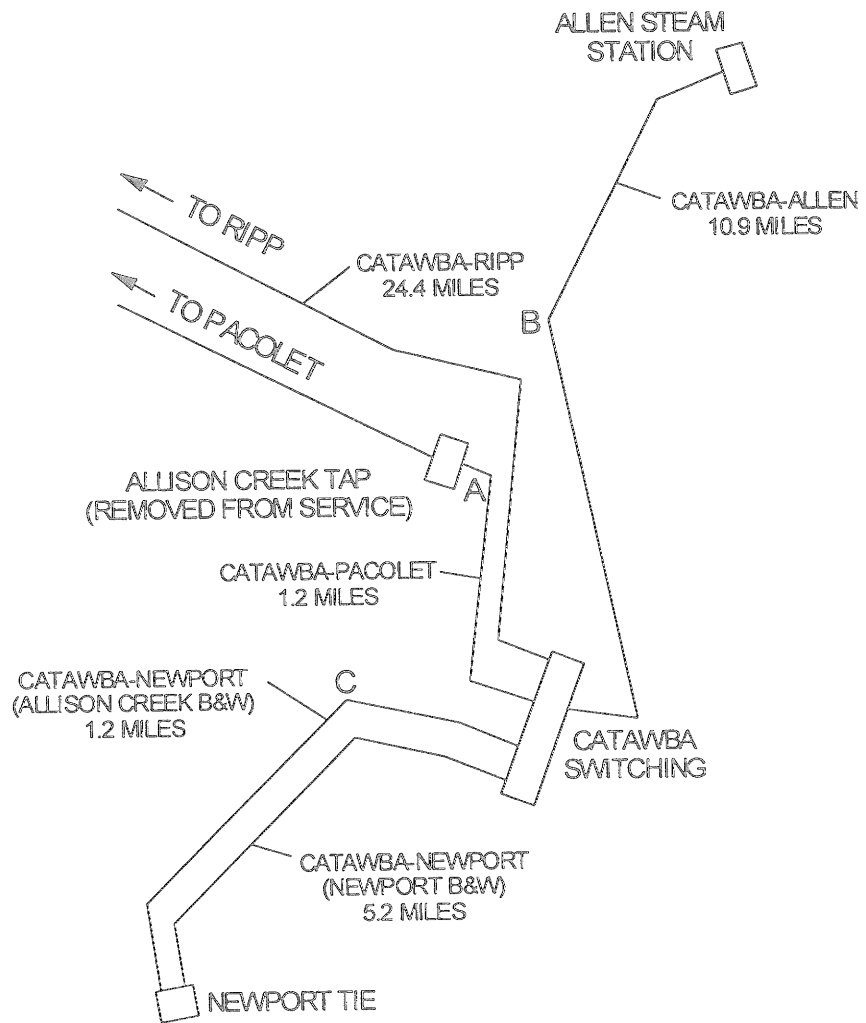


Table 1. Plant community percentage cover at the site of the
Catawba Nuclear Station: 1974 and 2000.¹

PLANT COMMUNITY/COVER TYPE	1974	2000
NON-FORESTED AREAS (Clearings, Parking Lots, Transmission Corridors, etc.)	4	67
PINE	60	23
PINE-MIXED HARDWOOD	15	8
MIXED HARDWOOD	21	1
WETLAND	0	<1

¹ Data used in this table was taken from ER Table 2.2.1-1 in the Catawba Nuclear Station Environmental Report, Volume 2 (Duke Power Company, 1975) and from Figure 1 herein.

Methodology

Fieldwork for this project began in June 2000 and continued into the autumn of 2000. All communities and cover types within the Exclusion Area were thoroughly inventoried, with the exception of the industrial areas in the immediate center of the site near the station. Black and white and natural color aerial photographs were used, supplemented by extensive fieldwork, to compile Figure 1—The 2000 vegetation map of the Catawba site.

Table 2, a list of all endangered, threatened, and noteworthy species, habitats, and special areas from York and Cherokee counties, South Carolina, was compiled prior to the initiation of the fieldwork. This list was consulted during the floristic and faunistic fieldwork, which lasted from late June through December. A checklist of the vascular plants of the Exclusion Area and the power transmission rights-of-way was compiled from field notes and serves as the Appendix for this report. Areas that appeared to be reasonable habitat for federally- and state-listed species were intensively inventoried in the summer and in early autumn.

The power transmission rights-of-way associated with the project were also inventoried in summer and early fall. Intensive surveys of the rights-of-way were conducted where reasonable habitat for listed species in Table 2 existed or where a known population of a listed species occurred within 0.5 mile (0.8 km) of the project's transmission lines.

Description of Plant Communities and Habitats Present within the Project Area

According to Figure 2.2.1-1 accompanying the original survey of the vegetation communities of the Catawba Site (Duke Power, 1975), six major plant community/cover types were present before construction began. They were: 1) clearings; 2) fields or pastures; 3) early successional shortleaf pine-Virginia pine; 4) loblolly pine; 5) mixed pine-hardwoods; and 6) hardwoods.

Figure 1 is a new plant community/cover type map of the Catawba Exclusion Area compiled from color and false color infrared aerial photography and from fieldwork conducted in the summer and fall of 2000. Six cover types, including five major plant community types, are included in Figure 1. The plant community types are: 1) non-forested land (includes "clearings" and "fields or pastures" from the 1974 map); 2) pine (includes "early successional shortleaf pine-Virginia pine" and "loblolly pine" from the 1974 map); 3) pine-mixed hardwood (equals "mixed pine-hardwood" on the 1974 map); 4) mixed hardwood ("hardwoods" on the 1974 map); and 5) wetland (not included in the 1974 map). The final cover type included in the 2000 map is open water, which was not considered a category on the 1974 map. Table 1 gives the changes in percentage cover of the plant community types from 1974 to 2000.

Table 2. Endangered, threatened, and noteworthy species and habitats known from York and Cherokee counties, South Carolina.

SCIENTIFIC NAME	COMMON NAME	GROUP	GLOBAL	STATE RANK	LEGAL STATUS
ACRIS CREPITANS CREPITANS	NORTHERN CRICKET FROG	AMPHIB	G5T5	S5	SC
AGALINIS AURICULATA	EARLEAF FOXGLOVE	PLANT	G3	S1	SC
AGRIMONIA PUBESCENS	SOFT GROOVEBUR	"	G5	S1	SC
ALLIUM CERNUUM (C)	NODDING ONION	"	G5	S?	SC
AMPHIANTHUS PUSILLUS	POOL SPRITE	"	G2	S1	FT/ST
ASTER GEORGIANUS (B)	GEORGIA ASTER	"	G2G3	S?	F/Candidate
ASTER LAEVIS	SMOOTH BLUE ASTER	"	G5	S?	SC
CAMASSIA SCILLOIDES	WILD HYACINTH	"	G4G5	S2	RC
CAREX SCABRATA (C)	ROUGH SEDGE	"	G5	S?	SC
CYPERUS GRANITOPHILUS	GRANITE-LOVING FLATSEDEGE	"	G3Q	S?	SC
DASISTOMA MACROPHYLLA	MULLEIN FOXGLOVE	"	G4	S?	SC
ELEOCHARIS PALUSTRIS	SPIKE-RUSH	"	G5	S?	SC
ELIMIA CATENARIA	GRAVEL ELIMIA	MOLLUSK	G?	S?	SC
ELYMUS RIPARIUS	WILD-RYE	PLANT	G5	S?	SC
ETHEOSTOMA COLLIS	CAROLINA DARTER	FISH	G3	S?	SC
EUPATORIUM SESSILIFOLIUM VAR VASEYI	THOROUGHWORT	PLANT	G5T?	S?	SC
HALIAEETUS LEUCOCEPHALUS	BALD EAGLE	BIRD	G4	S2	FT/SE
HELIANTHUS LAEVIGATUS (B)	SMOOTH SUNFLOWER	PLANT	G4	S?	SC
HELIANTHUS SCHWEINITZII	SCHWEINITZ'S SUNFLOWER	"	G2	S1	FE/SE
HEXASTYLIS NANIFLORA (C)	DWF-FLWERED HEARTLEAF	"	G2	S2	FT/ST
HYDRANGEA CINEREA (C)	ASHY HYDRANGEA	"	G4	S?	SC
HYMENOCALLIS CORONARIA	SHOALS SPIDER-LILY	"	G2Q	S2	NC
ISOETES PIEDMONTANA	PIEDMONT QUILLWORT	"	G3	S2	SC
JUNCUS GEORGIANUS	GEORGIA RUSH	"	G4	S?	SC
LILIUM CANADENSE	CANADA LILY	"	G5	S1?	SC
LIPOCARPHA MICRANTHA	DWARF BULRUSH	"	G4	S2	SC
MELANTHIUM VIRGINICUM	VIRGINIA BUNCHFLOWER	"	G5	S?	SC
MENISPERMUM CANADENSE (B)	CANADA MOONSEED	"	G5	S?	SC
MINUARTIA UNIFLORA	ONE-FLOWER STITCHWORT	"	G4	S?	SC
MONADNOCK (B)		HABITAT	G?	S?	SC
MYOTIS AUSTRORIPARIUS (C)	SOUTHEASTERN MYOTIS	MAMMAL	G3G4	S2S3	ST
NAJAS FLEXILIS	SLENDER NAIAD	PLANT	G5	S?	SC
OUTCROP		HABITAT	G?	S?	SC
PANAX QUINQUEFOLIUS	AMERICAN GINSENG	PLANT	G4	S2S3	RC
POA ALSODES	BLUE-GRASS	"	G4G5	S?	SC
QUERCUS BICOLOR	SWAMP WHITE OAK	"	G5	S1	SC
QUERCUS OGLETHORPENSIS	OGLETHORPE'S OAK	"	G3	S3	SC
RANA PALUSTRIS	PICKEREL FROG	AMPHIB	G5	S?	SC
RANUNCULUS FASCICULARIS	EARLY BUTTERCUP	PLANT	G5	S?	SC
RATIBIDA PINNATA	GRAY-HEAD PRAIRIE CONEFLOWER	"	G5	S?	SC
RUDBECKIA HELIOPSISIDIS	SUN-FACING CONEFLOWER	"	G2	S1	NC
SCUTELLARIA PARVULA	SMALL SKULLCAP	"	G4	S?	SC

SCUTELLARIA SERRATA*	SERRATE-LEAVED SKULLCAP	"		S1	?
SILPHIUM TEREBINTHINACEUM	PRAIRIE ROSINWEED	"	G4G5	S1	SC
SOLIDAGO PTARMICOIDES	PRAIRIE GOLDENROD	"	G5	S?	SC
SOLIDAGO RIGIDA	PRAIRIE GOLDENROD	"	G5	S1	SC
THERMOPSIS MOLLIS	SOFT-HAIRED THERMOPSIS	"	G4?	S?	SC
TIARELLA CORDIFOLIA VAR CORDIFOLIA	HEART-LEAVED FOAM FLOWER	"	G5T5	S?	SC
TORREYOCHLOA PALLIDA	PALE MANNA GRASS	"	G5?	S?	SC
VERBENA SIMPLEX	NARROW-LEAVED VERVAIN	"	G5	S?	SC
VERONICASTRUM VIRGINICUM	CULVER'S-ROOT	"	G5	S?	SC
XEROPHYLLUM ASPHODELOIDES (C)	TURKEY-BEARD	"	G4	S1	SC

Species in bold are federally-listed or candidates for listing. Underlined species are found within 0.5 mile of the site or one of the associated rights-of-way.

Rank: G=global; S=state. 1=0-5 populations or critically imperiled; 2=6-20 populations or imperiled; 3=21-100 populations or rare or uncommon; 4=greater than 100 populations known or apparently secure; 5=secure globally, though may be locally rare.

Status: F=federal; S=state. E=endangered; T=threatened; NC=national concern; RC=regional concern; SC=state concern.

*First published record from South Carolina; currently this species is not listed in South Carolina, but is listed on the North Carolina "watch" list in Amoroso (1999).

Data in Table 2 taken from South Carolina Department of Natural Resources web site; last updated June, 2000.

(B)-FOUND IN BOTH COUNTIES; (C)-FOUND ONLY IN CHEROKEE COUNTY; ALL OTHER SPECIES ONLY FOUND IN YORK COUNTY.

The five cover types mapped on Figure 1 are discussed below:

1. **Non-forested Land.** This cover type includes industrial areas, parking lots, lawns, and ornamental planting areas (e.g., trees in parking lot medians). Native species are generally absent from these areas. Some weedy disturbed areas have a flora similar to that of transmission line rights-of-way (see Transmission Rights-of-Way Related to the Catawba Relicensing Project below). Many parking lot banks and roadbanks are planted with sericea lespedeza (*Lespedeza cuneata*).
2. **Pine.** Most of the pine communities of the Catawba Site Exclusion Area are young, planted loblolly pine (*Pinus taeda*) communities. These communities range between 20 and 50 years old and are scattered throughout the project area (Figure 1). Virginia pine (*Pinus virginiana*) and, rarely, shortleaf pine (*Pinus echinata*) are widely scattered in the pine communities. The understory and herbaceous layer of this type has very few species.
3. **Pine-Mixed Hardwood.** The pine-mixed hardwood stands at Catawba are the product of natural succession from pine woods to hardwoods. This type is highly variable and includes xeric (dry) and mesic (moist) stands. Most of the pine-mixed hardwood stands, however, are dry-site communities found on upper slopes or ridges. In these stands, xeric species such shortleaf pine, Virginia pine, white oak (*Quercus alba*), southern red oak (*Quercus falcata*), post oak (*Quercus stellata*), black oak (*Quercus velutina*), mockernut hickory (*Carya tomentosa*) dominate the canopy. In areas with more moisture such as bluffs and ravines, this type is often found mixed with the mixed hardwood type, especially where clearing has taken place in the past. Here, tulip poplar (*Liriodendron tulipifera*), red oak (*Quercus rubra*), white ash (*Fraxinus americana*), are mixed in the canopy with scattered shortleaf pines. The understory species in the pine-mixed hardwood type are sourwood (*Oxydendrum arboreum*), sparkleberry (*Vaccinium arboreum*), chalk maple (*Acer leucoderme*) (see Natural Areas below), and dogwood (*Cornus florida*). The herbaceous layer in this plant community is often open with scattered spotted wintergreen (*Chimaphila maculata*), woodland oat grass (*Stipa avenacea*), and other dry-site herbs and graminoids.

4. **Mixed Hardwood.** The mixed hardwood type is found in coves, ravines, on bluffs, and on moist slopes. Here, pines are generally absent or rare in the canopy and deciduous tree species are the dominant species. In mesic coves and ravines, white oak, red oak, white ash (*Fraxinus americana*), tulip poplar, (*Liquidambar styraciflua*), American beech (*Fagus grandifolia*), and pignut hickory (*Carya glabra*) are the most commonly-seen species. On the other hand, on drier slopes and xeric ridgetops, post oak, black oak, southern red oak, and scattered shortleaf pine prevail in the canopy. Dogwood (*Cornus florida*), redbud (*Cercis canadensis*), sourwood, beech, red maple (*Acer rubrum*), eastern red cedar (in dry communities), and elms (*Ulmus rubra* and *Ulmus alata*) are found in the understory of the mixed hardwood type. Bloodroot (*Sanguinaria canadensis*), Virginia snakeroot (*Aristolochia serpentaria*), sedges (*Carex* spp.), and common heartleaf (*Hexastylis arifolia*) were among the most common species of the herbaceous layer of this cover type.
5. **Wetland.** The “wetland” cover type is a catch-all type that includes numerous small wetland plant communities scattered around the Catawba Site. Among the wetland areas mapped on Figure 1 are small bottomlands, beaver ponds, disturbed seepages, creekbanks, lake margins, and artificial impoundments. Black willow (*Salix nigra*), tag alder (*Alnus serrulata*), river birch (*Betula nigra*), buttonbush (*Cephalanthus occidentalis*), sycamore (*Platanus occidentalis*), and sweet gum (*Liquidambar styraciflua*) are the woody dominants in these wetland types. In disturbed, open areas such as beaver ponds and disturbed seepages and creekbanks, black willow and tag alder dominate. Along lake margins, buttonbush, black willow, swamp tupelo (*Nyssa biflora*) (rarely), and nonwoody species such as seedboxes (*Ludwigia* spp.), cutgrasses (*Leersia* spp.), and sedges (*Carex* spp.) are abundant. Cattail (*Typha latifolia*) and woolgrass bulrush (*Scirpus cyperinus*) are present in openings in one impoundment with black willow and other wetland species. Two wet ravine bottoms in the southern portion of the project area along Lake Wylie harbor stands of bottomland hardwood species such as sweet gum, river birch, black willow, green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), sycamore, and cottonwood (*Populus deltoides*). The understories here are dominated by false nettle (*Boehmeria cylindrica*), flat-seeded cutgrass (*Leersia lenticularis*), and Virginia dayflower (*Commelina virginica*).

Federally-Listed Species Known From York and Cherokee Counties

Table 2 includes both federally- and state-listed endangered, threatened, and otherwise noteworthy species (species that are not listed by federal or state officials that the author or Duke Energy has deemed noteworthy for a specific reason) known from York County, South Carolina. Species listed by the U. S. Fish and Wildlife Service (federally-listed species) and those waiting to be listed (candidate species) are given in bold type. Three federally-listed species and one federal candidate species are known to occur or have occurred in York County. They are: pool sprite (*Amphianthus pusillus*) (Threatened), bald eagle (*Haliaeetus leucocephalus*) (Threatened), Schweinitz' sunflower (*Helianthus schweinitzii*) (Endangered), Georgia aster (*Aster georgianus*) (Candidate). The possible presence of these species at the Catawba site and its related power transmission rights-of-way is discussed below:

Pool Sprite; Snorkelwort. Pool sprite is found in shallow vernal pools on granite flatrocks. It is not known near the Catawba Site, but it has been reported from a rock outcrop near one of the transmission lines in the project area. A five-mile (8 km) section of the transmission line near this population was checked closely for granitic flatrocks that may harbor this federally-listed threatened species. Although several small outcrops and some boulder fields were found, no habitat for this species occurred.

Bald Eagle. Although habitat for the threatened bald eagle exists around Lake Wylie, no nesting sites are currently known within the Catawba site or along the related power transmission lines. An abandoned nest, not known to have been active in over a decade, is found one mile (1.6 km) southeast of the Exclusion Area.

Schweinitz' sunflower. Schweinitz' sunflower, listed as endangered by the U. S. Fish and Wildlife Service, is found in glade-like woods or in nonforested areas over magnesium- and calcium-rich soils such as the Iredell type. No Iredell soils are found at the Catawba site itself within the Exclusion Area; however, there are several populations of the sunflower 3.0 miles (4.8 km) south of the Catawba site. An inventory of transmission lines near known populations of the plant revealed that no Schweinitz' sunflowers were growing within the transmission line rights-of-way.

Georgia Aster. Georgia aster is a "candidate" species for listing by the U. S. Fish and Wildlife Service. This status means that the U. S. Fish and Wildlife Service has already determined that it should be listed and the species is awaiting listing. It is known from the Piedmont of South Carolina on Iredell and other basic and circumneutral soils in openings and in disturbed areas. In York County, however, it occurs in the western portion of the county on more acidic soils associated with the Kings Mountain geological belt. Although several populations of the aster are found north of the Allison Creek Tap to Ripp Switching transmission in Cherokee County, no plants of this species were found along the actual rights-of-way or within the Catawba Exclusion Area.

Dwarf-flowered Heartleaf. The western portion of the Allison Creek Tap to Ripp Switching transmission right-of-way passes through the northeastern corner of Cherokee County, South Carolina. Dwarf-flowered heartleaf, federally-listed as threatened (Table 2), is known from Cherokee County. Most populations of the rare heartleaf, however, are found in central and western Cherokee County. The plant has not been reported from the Kings Mountain geological belt in northeastern Cherokee County. In the spring of 1999, I examined several populations of heartleaves in the Kings Mountain belt of North and South Carolina—all populations turned out to be the Piedmont heartleaf (*Hexastylis minor*). Several populations of what I assumed to be Piedmont heartleaf are found in ravines and on bluffs of the Allison Creek Tap to Ripp Switching transmission right-of-way south of Ripp Switching Station. Spring inventories of these sites will be conducted for positive determination of species. None of these populations, however, actually occur within the right-of-way of the transmission line.

State-Listed Species Known from York and Cherokee Counties

Table 2 presents South Carolina state-listed species that are known to occur or have occurred in York and Cherokee counties. Of the 40 state-listed species known from York County, 36 are vascular plants, two are amphibians, one is a mollusk, and one is a fish. Additionally, South Carolina Department of Natural Resources lists two habitat types—monadnock and [rock] outcrop—as noteworthy types in York County. Species underlined in Table 2 are found within 0.5 mile (0.8 km) of the Catawba site Exclusion Area or one of its related transmission lines.

No state-listed species were found in the Exclusion Area or within the rights-of-way of any transmission lines related to the Catawba relicensing project. One plant new to South Carolina—showy skullcap (*Scutellaria serrata*)—was growing on a rich bluff just south of one of the transmission rights-of-way. This record will be brought to the attention of the South Carolina Department of Natural Resources and will be included in Duke Power's vegetation management database.

Wetlands of the Project Area

The wetlands of the project area are discussed in detail in the section Plant Communities and Habitats Present within the Project Area above. Figure 1 illustrates eleven wetlands within the Catawba site Exclusion Area and three wetlands just outside of the Exclusion Area. Duke Power (1999) also contains information and maps on the wetlands of the Catawba site.

As discussed earlier, the wetlands of the project area are small bottomlands, beaver ponds, disturbed seepages, creek banks, and artificial impoundments. Most of the wetlands, with the exception of the bottomlands and creek banks, are in an early successional stage. Only 7.1 percent of the Exclusion Area is wetland. About 75-90 percent of these wetlands would probably be considered jurisdictional in the sense of the U. S. Army Corps of Engineers (1987). Site environmental work policies filed by Duke Power prohibit construction work in wetlands.

Significant Natural Areas

Several mature mixed hardwood ravines were found on the shores of Lake Wylie in the southern portion of the Catawba Site Exclusion Area (Figure 1). Here, good stands of chalk maple are found in the understory of middle-aged mixed hardwood stands. The most significant natural community within the project area, however, is a northwest-facing dry bluff adjacent to Catawba Park, a boat-landing/recreation area in the northern portion of the Exclusion Area.

Here, scattered mature southern red oak, white oak, black oak [trees to 28 inches (71 cm) in diameter at breast height], slippery elm (*Ulmus rubra*), and mockernut hickory dominate the bluff with widely scattered shortleaf pine. Sourwood, eastern red cedar, dogwood, and excellent open stands of mature chalk maple are found in the understory. The herbaceous layer is also relatively open with spotted wintergreen, round-leaved beggar-ticks (*Desmodium rotundifolium*), and common heartleaf (*Hexastylis arifolia*) were common. This community resembles the Oak-Chalk Maple glade type that is known from mafic and calcareous sites in the Piedmont of the Carolinas. In most known dry, open, glade-like chalk maple communities, however, the canopy dominant is usually chestnut oak (*Quercus prinus*); here, the dominant tree is black oak (*Quercus velutina*). This site therefore harbors what may be a rare and little-known Piedmont community type in South Carolina.

Transmission Rights-of-Way Related to the Catawba Relicensing Project

Transmission rights-of-way related to the relicensing of the Catawba Nuclear Station include approximately 42.4 miles (68.3 km) of right-of-way. These rights-of-way are listed in Table 3. Duke Energy has a well-established set of management practices for transmission line right-of-way maintenance (Duke, 1996). These best management practices include: erosion and sediment control, soil stabilization, stream and wetland protection, and protection of sensitive areas and sensitive species. Vegetation control of the transmission lines of the project has historically involved mowing and/or treatment with herbicides.

Table 3. Power Transmission Lines in Miles (Kilometers) Related to the Relicensing Permit
for the Catawba Nuclear Station, York County, South Carolina.

	Catawba-Allen	Catawba-Ripp	Catawba-Pacolet	Catawba-Newport (Allison Creek B&W)	Catawba-Newport (Newport B&W)	Totals
Total R/W Length mi(km)	10.9(17.5)	24.4(39.3)	1.2(1.9)	0.7(1.1)	5.2(8.4)	42.4(68.3)
Comments	9.6(15.5) rebuilt; 1.3(2.1) new	24.4(39.3) all new	Extended line 1.2(1.9) from former Allison Creek tie; no work performed on remainder of line	0.7(1.1) new line; 4.5(7.2) removed from service	5.2(8.4) all new	

The vegetation in the transmission rights-of-way associated with the project was predominantly herbaceous and graminaceous and varied considerably with moisture regime and slope position. Although tag alder and black willow often sprouted along seepages wetlands and on the back waters of beaver ponds, most of the vegetation of the rights-of-way consists of old-field and disturbed area nonforested species such as grasses of the genera *Andropogon* (bluestems), *Aristida* (wire-grasses) and herbs of the composite family such as *Helianthus* (sunflowers), *Solidago* (goldenrods), and *Aster* (asters). The vascular plant species list in the Appendix includes all vascular plant species encountered along the transmission line rights-of-way.

Intensive surveys were done on the western portion of the Allison Creek Tap to Ripp Switching right-of-way for Georgia aster, which has been reported from near the right-of-way, and for dwarf-flowered heartleaf, which is known from Cherokee County. The central portion of the transmission line was checked for granite flatrocks along a two-mile (3.2 km) section near where populations of one-flowered stichwort (*Minuartia uniflora*) and pool sprite (*Amphianthus pusillus*), two listed plant species (Table 2), are known to exist. Several populations of Schweinitz' sunflower have been reported from near the Catawba Switching to Newport Tie right-of-way along SC Highway 274. Here, an intensive inventory for Schweinitz' sunflower was conducted along the right-of-way in early autumn, but no plants of the rare sunflower could be found.

In summary, no federally-listed or state-listed plants or animals or good habitat for such species were found within the rights-of-way of transmission lines related to the relicensing of the Catawba Nuclear Station.

SUMMARY AND CONCLUSIONS

The Catawba Nuclear Station relicensing project area consists of a 450.5-acre (182.4 ha) Exclusion Area [a circle with a 2500-foot (757.6 m) radius centered at the reactors] and approximately 42.4 miles (68.3 km) of related power transmission line right-of-way. The findings of an inventory for endangered species, wetlands, and natural areas carried out in the summer and fall of 2000 are summarized below:

1. Five major plant community/habitat types were found within the Exclusion Area. Most of the Exclusion Area is non-forested, open land and open water; currently, approximately 36% of the Exclusion Area is forested.
2. Eleven small wetlands totaling approximately 34 acres (ca. 14 ha) occur within the Exclusion Area. Several significant natural areas, including mixed hardwood ravines and one small mature stand of a dry slope oak-chalk maple forest, were found during the course of the biological inventory of the Exclusion Area.
3. Intensive surveys of the Exclusion Area and related power transmission line rights-of-way revealed that no state- or federally-listed species or critical habitat for such species occur within the Exclusion Area or within the related rights-of-way.

Literature Cited

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Appendix

VASCULAR PLANTS OF THE CATAWBA NUCLEAR STATION AND
ASSOCIATED TRANSMISSION LINE RIGHTS-OF-WAY

COMMUNITIES

P-Pine

PMH—Pine-Mixed Hardwoods

MH—Mixed Hardwoods

WET—Wetlands

ROW/CL—Power Line Rights-of-Way/Cleared Areas

*Introduced species

Acer leucoderme (chalk maple) MH

Acer negundo (box elder) WMH

Acer rubrum (red maple) MH, WET, PMH

**Albizzia julibrisin* (mimosa) ROW

Allium bivalve (false garlic) ROW

Alnus serrulata (tag alder) WET

Amelanchier arborea (sarvisberry) MH

Amorpha fruticosa (lead bush) MH

**Analeima keisak* (Asiatic dayflower) WET

Andropogon virginicus (broomsedge) ROW

Antennaria plantaginifolia (pussy-toes) MH

Apios americanus (ground nut) WET

Aristolochia serpentaria (Virginia snakeroot) MH

Aster solidagineus (flat-topped aster) ROW

Baccharis halimifolia (salt bush) WET

Bidens bipinnatifida (Spanish needles) WET

Bignonia capreolata (cross vine) MH, WET

Boehmeria cylindrica (false nettle) WET

Botrychium virginianum (rattlesnake fern) MH

Campsis radicans (trumpet creeper) ROW, WET

Carex crinita (fringed sedge) MA

Carex flaccosperma (thin-fruited sedge) WET

Carex frankii (Frank's sedge) WET

Carex lurida (shallow sedge) WET

Carex nigromarginata (black-edged sedge) PMH, MH

Carex striatula (striatulate sedge) MH

Carpinus caroliniana (ironwood) WET, MH

Carya glabra (pignut hickory) MH

Carya tomentosa (mockernut hickory) PMH, MH

Celtis occidentalis (sugarberry) MH

Cephalanthus occidentalis (buttonbush) WET

Cercis canadensis (redbud) MH

Chimaphila maculata (pipsissewa) PMH, MH
Clitoria mariana (butterfly-pea) ROW, PMH
Commelina virginiana (Virginia dayflower) WET
Cornus florida (dogwood) MH
Crataegus sp. (hawthorn) ROW
Cynoglossum virginianum (Virginia hound's tongue) MH
Cyperus sp. 1 (flat-sedge) ROW
Cyperus sp. 2 (flat-sedge) WET
Danthonia sp. (oat grass) ROW
Daucus carota (Queen Anne's lace) ROW
Desmodium nudiflorum (beggar-ticks) MH
Desmodium rotundifolium (round-leaved beggar-ticks) MH
Desmodium virginianum (Virginia beggar-ticks) PMH, MH, ROW
Dioscorea villosa (wild yam) MH
Diospyros virginiana (persimmon) MH
Duchesnea indica (Indian strawberry) ROW
*Eleagnus umbellata (silverberry) MH, PMH
Eleocharis baldwinii (Baldwin's spikerush) WET
Elephantopus sp. (elephant's foot) ROW
Elymus sp. (wild rye grass) ROW, WET
Eragrostis sp. (love grass) ROW
Erechtites hieracifolia (fireweed) ROW
Erianthus sp. (plume grass) ROW
Erigeron pulchellus (daisy fleabane) MH
Erigeron sp. (fleabane) ROW
Eryngium prostratum (creeping eryngium) WET
Euonymus americanus (American euonymus, hearts-a-bursting) MH, PMH
Eupatorium album (white thoroughwort) PMH, MH
Eupatorium capillifolium (dog fennel) ROW/CL
Eupatorium sp. (thoroughwort) ROW
Euphorbia corollata (spurge) MH
Fagus grandifolia (American beech) MHP
*Festuca sp. (fescue) ROW
Fraxinus americana (white ash) MH
Fraxinus pennsylvanica (green ash) WET
Galium circaezans (bedstraw) MH
Gelsemium sempervirens (yellow jessamine) ROW
Gnaphalium sp. (rabbit tobacco) ROW
Helenium sp. (sneezeweed) ROW
Helianthus atrorubens (red-stemmed sunflower) ROW
Helianthus sp. (sunflower) ROW
Heliathus microcephalus (small-headed sunflower) PMH
Hepatica americana (American liverleaf) MH
Heterotheca subaxillaris (camphorweed) ROW
Hexastylis arifolia (common heartleaf) MH
Houstonia purpurea (broad-leaved bluet) MH

Hypericum punctatum (spotted St. Johns-wort) ROW
Hypericum hypericoides (St. Johns-wort) MHP, P, ROW
Ilex opaca (American holly) MH, PMH
Juncus canadensis (Canada needlerush) WET
Juncus coriaceous (tough needlerush) WET
Juncus effusus (common needlerush) WET, ROW
Juncus sp. (needlerush) ROW
Juniperus virginiana (eastern red cedar) PMH, MH, ROW
Leersia lenticularis (flat-seeded cutgrass) WET
**Lespedeza cuneata* (sericea) ROW
Liatris squarrosa (spreading blazing star) ROW
**Ligustrum sinensis* (Chinese privet) ROW, WET
Liquidambar styraciflua (sweet gum) P, MH, PMH, WET
Liriodendron tulipifera (tulip poplar) MH, PMH, WET
**Lonicera japonica* (Japanese honeysuckle) PMH, P, MH, ROW
Lotus sp. (trefoil) ROW
Ludwigia alternifolia (alternate-leaved seedbox) ROW
Ludwigia glandulosa (glandular seedbox) WET
**Ludwigia uruguayensis* (Uruguayan seedbox) WET
Lycopodium flabelliforme (ground cedar) P
**Melia azedarach* (Chinaberry) ROW/CL
**Melilotus albus* (tall white clover) ROW/CL
**Microstegium vimineum* (Nepalese browntop) ROW
Morus rubra (red mulberry) MH
Nyssa biflora (swamp tupelo) WET
Nyssa sylvatica (black gum) MH
Obolaria virginica (pennywort) MH
Oenothera sp. (evening primrose) ROW/CL
Oxydendrum arboreum (sourwood) MH
Panicum boscii (Bosc's panic grass) MH
Panicum dichotomum (fall panicum) MHP
Parthenocissus quinquefolia (Virginia creeper) PMH
Phytolacca americana (pokeweed) ROW
Pinus echinata (shortleaf pine) PMH
Pinus virginiana (Virginia pine) P
Plantago lanceolata (lance-leaved plantain) ROW
Platanus occidentalis (sycamore) WET
Polystichum acrostichoides (Christmas fern) MHP
Prenanthes trifoliata (trifoliolate rattlesnake root) PMH, MH
Prenanthes sp. (gall-of-the-earth) P, PMH
**Prunella vulgaris* (self-heal) ROW
Prunus serotina (black cherry) ROW, P, PMH, MH
**Pueraria lobata* (kudzu) ROW/CL
Quercus alba (white oak) MH
Quercus falcata (southern red oak) PMH, MH
Quercus marilandica (blackjack oak) PMH

Quercus nigra (water oak) PMH
Quercus phellos (willow oak) WET, MH
Quercus rubra (red oak) MH
Quercus stellata (post oak) MH, PMH
Quercus velutina (black oak) MH
Rhus copallina (winged sumac) ROW
Rhus glabra (smooth sumac) ROW
Rhus radicans (poison ivy) ROW, P, MH, PMH
Robinia pseudoacacia (black locust) ROW, PMH
Rubus sp. (blackberry) ROW
Ruellia carolinensis (Carolina wild petunia) MH
Salix nigra (black willow) WET, ROW
Sambucus canadensis (elderberry) WET
Sanicula sp. (snakeroot) MH
Scleraria microphylla (sensitive brier) ROW
Scleria triglomerata (nutrush) P, PMH, MH
Scutellaria integrifolia (skullcap) MH
Scutellaria serrata (serrate-leaved skullcap) ROW, MH
Senecio anonymus (Small's ragwort) ROW
Silene virginica (fire pink) ROW
Silphium angustifolium (narrow-leaved rosinweed) ROW
Smilacina racemosa (false Solomon's seal) MH
Smilax bona-nox (cat-brier) ROW
Smilax rotundifolia (round-leaved greenbrier) P, PMH
Smilax sp. (greenbrier) PMH
Solidago altissima (tall goldenrod) ROW
Solidago odora (licorice goldenrod) ROW, PMH, MH
Solidago sp. (goldenrod) ROW
Spiranthes grayi (Gray's ladies-tresses) MH
Stellaria media (chickweed) MH
Tiarella cordifolia (foamflower) MH
Tipularia discolor (crane-fly orchid) MH
Tragia urens (tragia) PMH
Ulmus alata (winged elm) MH, PMH
Ulmus americana (American elm) WET, MH
Ulmus rubra (slippery elm, red elm) MH
Uvularia perfoliata (perfoliate bellwort) MH
Vaccinium arboreum (sparkleberry) P, MHP, MH
Vaccinium stamineum (squawberry) P, PMH, MH
Vernonia sp. (ironweed) WET
Viburnum prunifolium (black haw) P, PMH, MH
*Vinca minor (lesser periwinkle) PMH
Viola sp. (violet) MH
Vitis aestivalis (summer grape) MH
Vitis rotundifolia (muscadine) PMH, WET, MH

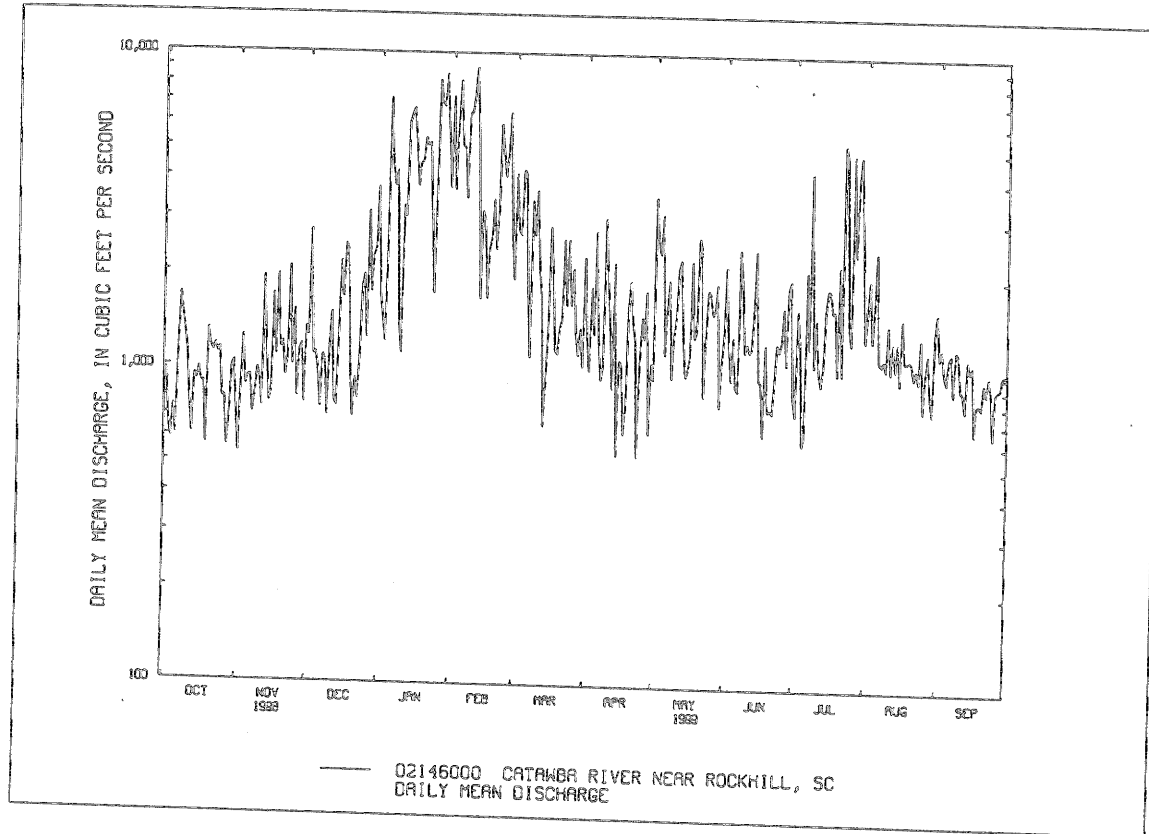
Attachment B

USGS Water Resources Data
(as applicable)
South Carolina Water Year 1999

SANTEE RIVER BASIN

SUMMARY STATISTICS	02146000 CATAWBA RIVER NEAR ROCK HILL, SC--Continued		FOR 1998 CALENDAR YEAR		FOR 1999 WATER YEAR		WATER YEARS 1896 - 1999	
ANNUAL TOTAL	1563510		702030					
ANNUAL MEAN	4284		1923					
HIGHEST ANNUAL MEAN						4390		1901
LOWEST ANNUAL MEAN						9635		1999
HIGHEST DAILY MEAN						1923		
LOWEST DAILY MEAN	15400	Apr 22	9000	Feb 11	127000			May 23 1901
ANNUAL SEVEN-DAY MINIMUM	534	Nov 1	534	Nov 1	227			Apr 26 1986
INSTANTANEOUS PEAK FLOW	760	Oct 26	760	Oct 26	541			Oct 19 1954
INSTANTANEOUS PEAK STAGE			13500	Feb 11	* 151000			May 23 1901
ANNUAL RUNOFF (CFSM)	1.40		7.51	Feb 11	* 24.15			May 23 1901
ANNUAL RUNOFF (INCHES)	19.07		.63		1.44			
10 PERCENT EXCEEDS	10300		8.56		19.56			
50 PERCENT EXCEEDS	2690		4230		8650			
90 PERCENT EXCEEDS	803		1270		3590			
			778		919			

* Site and datum then in use.



SANTEE RIVER BASIN

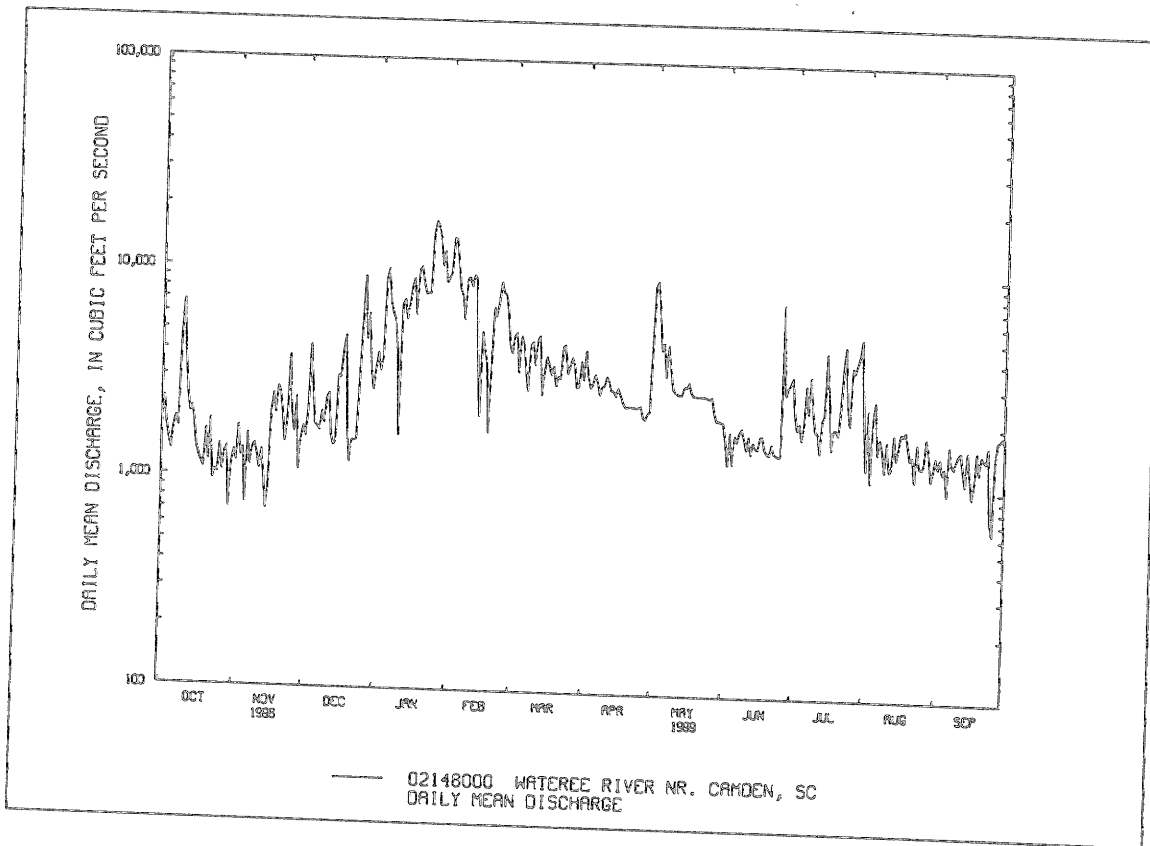
SUMMARY STATISTICS

02148000 WATEREE RIVER NEAR CAMDEN, SC--Continued
FOR 1998 CALENDAR YEAR FOR 1999 WATER YEAR

WATER YEARS 1930 - 1999

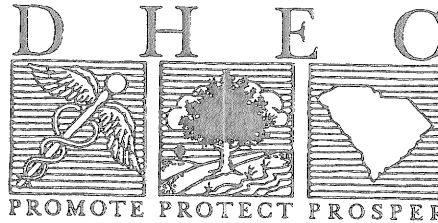
	2714630	1188654				
ANNUAL TOTAL						
ANNUAL MEAN	7437	3257				
HIGHEST ANNUAL MEAN					6219	
LOWEST ANNUAL MEAN					9964	1960
HIGHEST DAILY MEAN					3241	1988
LOWEST DAILY MEAN	35300	Feb 5	16900	Jan 25	149000	Oct 3 1929
ANNUAL SEVEN-DAY MINIMUM	698	Nov 14	640	Sep 25	143	Sep 28 1980
INSTANTANEOUS PEAK FLOW	1100	Nov 9	1100	Nov 9	279	Jul 1 1959
INSTANTANEOUS PEAK STAGE			17000	** Jan 25	* 366000	Aug 26 1908
ANNUAL RUNOFF (CFSM)			16.51	** Jan 25	* 39.70	Aug 26 1908
ANNUAL RUNOFF (INCHES)	1.47		.64		1.23	
10 PERCENT EXCEEDS	19.92		8.72		16.67	
50 PERCENT EXCEEDS	17200		7250		13000	
90 PERCENT EXCEEDS	4470		2330		4960	
	1380		1260		1100	

* Site and datum then in use, from records of National Weather Service, from rating curve extended above 122,000 ft³/s, on basis of computations, by Duke Energy Corporation, of peak flow of 362,000 ft³/s over dam at Rocky Creek Reservoir.
** Also occurred Jan. 26.



Attachment C

NPDES Permit (Applicable Pages)
Catawba Nuclear Station
Issued April 30, 2001



South Carolina Department of Health
and Environmental Control

*National Pollutant Discharge
Elimination System Permit*
for Discharge to Surface Waters

This Permit Certifies That

*Duke Energy Corporation
Catawba Nuclear Plant*

has been granted permission to discharge from a facility located at

*Newport, South Carolina
York County*

to receiving waters named

Lake Wylie

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof. This permit is issued in accordance with the provisions of the Pollution Control Act of South Carolina (S.C. Code Sections 48-1-10 *et seq.*, 1976), Regulation 61-9 and with the provisions of the Federal Clean Water Act (PL 92-500), as amended, 33 U.S.C. 1251 *et seq.*, the "Act."

A handwritten signature in cursive script, reading 'Marion F. Sadler, Jr.', is written over a horizontal line.

Marion F. Sadler, Jr., Director
Industrial, Agricultural, and Storm Water Permitting Division
Bureau of Water

Issued: *April 30, 2001*

Expires: *June 30, 2005*

Effective: *June 1, 2001*

Permit No.: *SC0004278*

- = 29.5 C (85.1°F) long term average value (Summer) 184 samples
- = 35.1 C (95.18°F) maximum 30 day value (Summer)
- = 35.1 C (95.18°F) maximum daily value (Summer)
- 2. Previous Permit: 5.6°C(10.0°F) (Apr-Sep) temperature rise above ambient;
7.8°C(14.0°F) (Oct-Mar) temperature rise above ambient
- 3. Water Classifications and Standards (Reg. 61-69): The receiving water temperature may not be increased by more than 5°F(2.8°C) above natural conditions or exceed a maximum of 90°F(32.2°C) unless a mixing zone has been established or a Section 316(a) determination under the Federal Clean Water Act has been completed.
- 4. Conclusion: On September 15, 1988, a Section 316(a) report was submitted in support of a 316(a) thermal variance request. Subsequently, correspondence dated July 1, 1992, from the permittee to SCDHEC proposed a delta T of 10°F from April through August, and a delta T of 14°F from September through March. After a review of this request, our Office agreed with the following limits:

	<u>Monthly Average</u>
Temperature Rise above ambient (April - September)	5.6°C(10.0°F)
Temperature Rise above ambient (October - March)	7.8°C(14.0°F)

Required monitoring shall be continuous by recorder, as in the previous permit.

C. pH Limitations

- 1. Form 2C Value: (3-21-00) 52 samples
= 7.0 s.u. minimum, 8.3 s.u. maximum maximum daily value
- 2. Previous Permit: 6.0 s.u. minimum, 9.0 s.u. maximum
- 3. Water Classifications and Standards (Reg.61-68): The pH of the receiving waters shall be maintained between 6.0 standard units and 8.5 standard units.
- 4. Conclusion: Due to the Water Classifications and Standards (Reg.61-68), the permit shall monitor and report pH once per week by grab sample.

D. Total Residual Chlorine (TRC)

- 1. Form 2C Value: (3-21-00) 50 samples
= 0 mg/l long term average value
= 0 mg/l maximum 30 day value
= 0 mg/l maximum daily value
- 2. Previous Permit: Monthly Average 0.011 mg/l; Daily Maximum 0.019 mg/l
- 3. Effluent Guidelines: $(0.2 \text{ mg/l})(73.6 \text{ MGD})/(82.14 \text{ MGD}) = 0.18 \text{ mg/l}$
- 4. Wasteload Allocation: Monthly Average 0.011 mg/l; Daily Maximum 0.019 mg/l
- 5. Water Quality Criteria Allowable Effluent Concentration:
Aquatic Life Criteria from Reg.61-68 (50 FR 30784, July 29, 1985):
Monthly Average = $0.011 \text{ mg/l} \times DF_1 = 0.011 \text{ mg/l}$
Daily Maximum = $0.019 \text{ mg/l} \times DF_1 = 0.019 \text{ mg/l}$
- 6. Detection Limit: 0.05 mg/l
- 7. Conclusion: Since chlorine and sodium bromide are used in the cooling tower discharge, Total Residual Chlorine shall be limited to a monthly average of 0.011 mg/l and a daily maximum of 0.019 mg/l, which is based on the Water Classifications and Standards (Reg. 61-68) and effluent guidelines values for Total Residual Chlorine at a frequency of once per week.

VII. Previous Biological Studies

1. 316(a)

Studies of the thermal effects of the discharge were provided in support of the 316(a) variance request. Additionally, the Permittee has also conducted dye studies to determine the dispersion characteristics of Outfall 001 and its dilution with the receiving water.

2. 316(b)

In a March 17, 1987 letter, Duke Power Company provided information concerning the intake structures found in Lake Wylie and the Station's Standby Nuclear Service Water Pond. In a March 23, 1987 memorandum, it was determined that provided the screens are kept clean, the intake should not pose a significant threat to the biological integrity of Lake Wylie or the Standby Nuclear Service Water Pond because of low water velocities. As a result, a 316(b) study was not required to be performed.

VIII. Groundwater Monitoring

The Permittee shall monitor and report each of the four (4) groundwater monitoring wells semiannually for the following parameters:

Water Level, tenth/feet	Cadmium, total, mg/l
Total Dissolved Solids	Chromium, total, mg/l
Total Organic Carbon	Copper, total, mg/l
pH (field), standard units	Iron, total, mg/l
Specific Conductance (field), umhos/cm	Lead, total, mg/l
Ammonia, (NH ₃) mg/l	Manganese, total, mg/l
Nitrate, (NO ₃)	Mercury, total, mg/l
Sulfate, mg/l	Selenium, total, mg/l
Arsenic, total, mg/l	Silver, total, mg/l
Barium, total, mg/l	Zinc, total, mg/l

IX. Co-Treatment

Commingling and co-treatment of discharges were taken into account at Outfall 001 which combines cooling tower blowdown, once-through cooling water, liquid radiological wastes, and metal cleaning wastes. Commingling and co-treatment of discharges were taken into account at Outfall 002 which combines low volume wastewater, miscellaneous dilution water, and metal cleaning wastes. Where various wastes are combined for treatment and discharge, 40 CFR 423.15(n) requires that the quantity of each pollutant or pollutant property not exceed the specified limitation for that waste source. Applicable guideline concentrations were flow weighted in calculating final effluent concentrations.

X. Toxicity Testing

Since the chemical specific approach does not address all specific chemicals and their interactions with other components in the waste stream, a more comprehensive testing requirement is needed. To ensure that Water Quality Standards are not violated, whole effluent toxicity testing is being required at Outfalls 001 and 002. Testing will not be required for internal Outfalls or for the sanitary discharge Outfall 003.

Attachment D

Letter from Mary Santini, Duke Energy
to
Dr. John F. Brown, SC Dept. of Health and Environmental Control
requesting information on assessment of public health impacts
from thermophilic organisms from Catawba operation
dated June 7, 2000



Duke Power
Group Environment, Health & Safety
13339 Hagers Ferry Road (MG03A3)
Huntersville, NC 28078-7929

June 7, 2000

Dr. John F. Brown
State Toxicologist
Health Hazard Evaluation
SC Department of Health and Environmental Control
Box 101106
Columbia, SC 29211

Subject: Duke Power
Catawba Nuclear Station, Units 1 and 2
Environmental Report – Operating License Renewal
Thermophilic Organisms

Dear Dr. Brown:

Duke Power Company is preparing an application to the US Nuclear Regulatory Commission (USNRC) to renew the operating licenses for Catawba Nuclear Station (CNS). CNS is a two-unit, nuclear fission steam electric generation station, located on Lake Wylie in York County, approximately 8 miles west north west of Fort Mill, SC. Catawba is owned by Duke Power Company, North Carolina Electric Membership Corporation, North Carolina Municipal Power Agency Number 1, Piedmont Municipal Power Agency, and the Saluda River Electric Cooperative, Inc. but totally operated by Duke Power Company.

Catawba Unit 1 was issued a full power license on January 17, 1985, and Unit 2 was issued a full power license on May 15, 1985. The current NRC licenses expire on December 6, 2024 (Unit 1) and on February 24, 2026 (Unit 2). The extended licenses would be for a 20 year period (approximately) beyond the current license expiration dates, with the actual expiration date dependent on the date of issuance for the extended licenses.

The USNRC requires that an applicant assess certain site-specific environmental issues related to the continued operation of the plant during the term of the extended license. Among the issues to be evaluated is the impact of thermophilic organisms on public health. Specifically, 10 CFR 51.53(c)(3)(ii)(G) requires that:

If the applicant's plant uses a cooling pond, lake, or canal or discharges into a river having an annual average flow rate of less than 3.15×10^{12} ft³/year (9×10^{10} m³/year), an assessment of the impact of the proposed action on public health from thermophilic organisms in the affected water must be provided.

As part of this evaluation the NRC suggests that the applicant consult with the state agency responsible for environmental health as to whether there is a concern about the potential existence and concentration of *Naegleria fowleri* in the receiving waters for the plant cooling water discharge.

To facilitate your review of this issue, I have included copies of portions of NUREG-1437 Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS). The GEIS was prepared by the NRC to evaluate the impact of environmental issues related to license renewal of nuclear plants and to determine which environmental issues can be evaluated generically and which issues require plant specific evaluation. The Executive Summary and Chapter I provide a description of the evaluation process used in the GEIS. GEIS Section 4.3.6 contains an evaluation of the impact of microorganisms on human health. Appendix D to the GEIS provides background information used in the GEIS evaluation. Copies of these sections are included as Attachment 1.

Duke Power requests that you review the attached information and respond with your comments on any public health concerns you may have regarding the potential presence of *N. fowleri* and other thermophilic organisms in Catawba's thermal discharge plume.

Please feel free to contact me at 704-875-5346 or mmsantini@duke-energy.com if you have any questions regarding this matter.

Thank you for your timely assistance.

Sincerely,



Mary M. Santini
Microbiologist
Group Environment, Health & Safety

Attachments

cc :

Henry J. Porter	SCDHEC Division of Radioactive Waste Management
Cheryl Peed	Duke Power Catawba Nuclear Station
Tim Harris	Duke Power Catawba Nuclear Station
Greg Robison	Duke Power Nuclear Generation EC12R
Bob Gill	Duke Power Nuclear Generation EC12R
William M. Miller	Duke Power GEH&S EC12ZB
Gene E. Vaughan	Duke Power GEH&S MG03A3