CHAPTER 2
ENVIRONMENTAL DESCRIPTION

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ACRONYMS AND ABBREVIATIONS

μg/L	micrograms per liter
μm	micrometer
μmho/cm	micromhos per centimeter
μS/cm	microSiemens per centimeter
°C	degrees Celsius
°F	degrees Fahrenheit
7Q10	7-day, 10-year low flow
AADT	average annual daily traffic
ac.	acre
ac-ft	acre-foot
ADD	average day demand
AEC	U.S. Atomic Energy Commission
AP1000	Westinghouse Electric Company, LLC's AP-1000 Reactor
ASOS	Automated Surface Observing System
bgs	below ground surface
BMP	best management practice
BTOC	below top of casing
$CaCO_3$	calcium carbonate
CEMA	Chatham County Emergency Agency
CCSS	Chatham County School System
cm	centimeter
cm/sec	centimeter per second
cm^2/sec	square centimeter per second

ACRONYMS AND ABBREVIATIONS (CONTINUED)

CO	carbon monoxide
COL	Combined License
COLA	Combined License Application
CP&L	Carolina Power & Light Company
CWA	Clean Water Act
DCD	Westinghouse Electric Company, LLC, AP1000 Design Control Document
delta-T	delta temperature
EAB	exclusion area boundary
EIS	Environmental Impact Statement
EM	Emergency Management
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EPT	ephemeroptera, plecoptera, and trichoptera
EPZ	emergency planning zone
ER	Environmental Report
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FSAR	Final Safety Analysis Report
ft.	foot
ft.^{2}	square foot
ft/day	feet per day

ACRONYMS AND ABBREVIATIONS (CONTINUED)

ft^2/day	square feet per day
ft^3/day	cubic feet per day
GIS	Geographic Information System
gpd	gallon per day
gpm	gallon per minute
gpm/ft	gallon per minute per foot
G.S.	General Statute
ha	hectare
HAR	proposed Shearon Harris Nuclear Power Plant Units 2 and 3
HAR 2	proposed Shearon Harris Nuclear Power Plant Unit 2
HAR 3	proposed Shearon Harris Nuclear Power Plant Unit 3
HCEM	Harnett County Emergency Management
HCSS	Harnett County School System
HEEC	Harris Energy & Environmental Center
HLA	Harding Lawson Associates Group, Inc.
HNP	existing Shearon Harris Nuclear Power Plant Unit 1
in.	inch
IVM	Integrated Vegetation Management
kg	kilogram
kg/m^2	kilograms per square meter
km	kilometer
km/h	kilometers per hour
km^2	square kilometer

ACRONYMS AND ABBREVIATIONS (CONTINUED)

l/min	liters per minute
lb.	pound
LCD	Local Climatological Data
lpd	liters per day
LPZ	low population zone
LWSP	Local Water Supply Plan
m	meter
m^2	square meter
ft^3/s	cubic foot per second
m^3/s	cubic meter per second
MACTEC	MACTEC Engineering and Consulting, Inc
MAX	maximum
MCFRBA	Middle Cape Fear River Basin Association
MDD	maximum day demand
mg/L	milligram per liter
mgd	million gallons per day
mi.	mile
$mi.^2$	square mile
MIN	minimum
mL	milliliter
mld	million liters per day
mm	millimeter
MOU	Memorandum of Understanding

ACRONYMS AND ABBREVIATIONS (CONTINUED)

mph	miles per hour
msl	mean sea level
MWe	megawatt electrical
NAAQS	National Ambient Air Quality Standards
NCBI	North Carolina Biotic Index
NCCGIA	North Carolina Center for Geographic Information and Analysis
NCDA&CS	North Carolina Department of Agriculture & Consumer Services
NCDC	National Climatic Data Center
NCDCR	North Carolina Department of Cultural Resources
NCDENR	North Carolina Department of Environment and Natural Resources
NCDOC	North Carolina Department of Commerce
NCDPI	North Carolina Department of Public Instruction
NCDOT	North Carolina Department of Transportation
NCDWQ	North Carolina Division of Water Quality
NCDWR	North Carolina Division of Water Resources
NCIBI	North Carolina Index of Biotic Integrity
NCNHP	North Carolina Natural Heritage Program
NCWRC	North Carolina Wildlife Resources Commission
NH_3-N	ammonia nitrogen
NHPA	National Historic Preservation Act
NHVRy	New Hope Valley Railway
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration

ACRONYMS AND ABBREVIATIONS (CONTINUED)

NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity unit
NWI	National Wetlands Inventory
NWS	National Weather Service
NWTF	National Wild Turkey Federation
OEM	Office of Emergency Management
PA	Programmatic Agreement
PEC	Progress Energy Carolinas, Inc.
PMF	probable maximum flood
PMWP	probable maximum winter precipitation
PSD	Prevention of Significant Deterioration
psf	pound per square foot
psi	pound per square inch
RDU	Raleigh-Durham International Airport
RFI	Request for Information
ROW	right-of-way
RTP	Research Triangle Park
SCO	State Climate Office
SDC	State Data Center
SHPO	State Historic Preservation Office
SMRP	Satellite and Mesometeorology Research Project

ACRONYMS AND ABBREVIATIONS (CONTINUED)

SU	standard unit
SWAP	Source Water Assessment Program
TMDL	total maximum daily load
TRI	Toxics Release Inventory
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
WCPSS	Wake County Public School System
Westinghouse	Westinghouse Electric Company, LLC
WRF	water reclamation facility
WTP	water treatment plant
WWTP	wastewater treatment plant

2.0 ENVIRONMENTAL DESCRIPTION

This chapter of the ER describes the existing environmental conditions at the proposed Shearon Harris Nuclear Power Plant Units 2 and 3 (HAR) site, the site vicinity, and the region. The HAR will be co-located with the existing Shearon Harris Nuclear Power Plant Unit 1 (HNP). The environmental descriptions provide sufficient detail to identify those environmental resources that have the potential to be affected by the construction, operation, or decommissioning of the new units.

This chapter is divided into eight sections:

- Section 2.1 — Station Location
- Section 2.2 — Land
- Section 2.3 — Water
- Section 2.4 — Ecological Description
- Section 2.5 — Socioeconomics
- Section 2.6 — Geology
- Section 2.7 — Meteorology and Air Quality
- Section 2.8 — Related Federal Project Activities

For the purposes of this discussion and consistent with the information presented in Chapters 4, 5, and 6, the following terms are used:

- **Plant Site**. The plant site is the area within the fence line (Figure 2.0-1). This area includes the footprint of the HAR, including the reactor buildings and generating facilities.
- **HAR Site.** The HAR site is an irregularly shaped area comprised of the following site components: the plant site (area within the fence line), Harris Reservoir, Harris Reservoir perimeter, the dam at Harris Reservoir, the pipeline corridor, and the intake structure and pumphouse (Figure 2.0-2). The HAR site is located within Wake and Chatham counties.
- **Exclusion Zone.** The area within the exclusion area boundary (EAB). The exclusion zone is represented by two overlapping areas centered on the reactor buildings of each unit. The areas are defined by a circular distance of 1600 meters (m) (5249 feet [ft.]) in the southerly sectors (east-southeast through west-southwest) and 1245 m (4085 ft.) in the east, west, and northerly sectors (west through east). The overall shape

of the HAR EAB is defined by the outermost boundary of each unit's area (Figure 2.0-3).

- **Pipeline Corridor**. The pipeline corridor includes the Harris Lake makeup water system pipeline and corridor connecting the Harris Reservoir and the Cape Fear River. The pipeline components will transport makeup water from the Cape Fear River to the Harris Reservoir (Figure 2.0-4).

- **Intake Structure and Pumphouse.** The Harris Lake makeup water system intake structure and pumphouse will be constructed on the Cape Fear River (Figure 2.0-5).

- **Harris Lake**. Harris Lake includes both the Harris Reservoir and the Auxiliary Reservoir.

- **Harris Reservoir.** The Harris Reservoir is also known as the Main Reservoir. It does not include the affiliated Auxiliary Reservoir.

- **Harris Reservoir Perimeter.** The Harris Reservoir perimeter describes the area impacted by the 6-meter (m) (20-foot [ft.]) change in the reservoir's water level.

- **Transmission Corridors and Off-Site Areas.** Transmission corridors and off-site areas describe areas outside of the site boundary that may fall within the footprint of new or existing transmission line corridors.

- **Vicinity.** The vicinity is a band or belt 9.7 kilometers (km) (6 miles [mi.]) wide surrounding the HAR site (Figure 2.0-6). The vicinity includes a much larger tract of land than the HAR site. The vicinity is located within four counties: Wake, Chatham, Harnett, and Lee.

- **Region.** The region applies to the area within an 80-km (50-mi.) radius from the center point of the HAR power block footprint, excluding the site and vicinity (Figure 2.0-7). The following counties are located entirely within the region: Chatham, Durham, Harnett, Lee, Orange, and Wake. The following counties are located partially within the region: Alamance, Caswell, Cumberland, Franklin, Granville, Guilford, Hoke, Johnston, Montgomery, Moore, Nash, Person, Randolph, Richmond, Robeson, Sampson, Scotland, Vance, Wayne, and Wilson. The region includes the economic centers of Raleigh, Durham, Fayetteville, Cary, and Chapel Hill.

2.1 STATION LOCATION

The HAR will be co-located with the existing Shearon Harris Nuclear Power Plant Unit 1 (HNP). The HAR will be built approximately north and west of the existing plant, on a peninsula that extends into Harris Reservoir from the northwest (Figure 1.1-1). The Tom Jack Branch of the Harris Reservoir lies to the west; the Thomas Branch of the Harris Reservoir lies to the east.

The HAR site is located in the extreme southwestern corner of Wake County, North Carolina, with portions located in southeastern Chatham County. The City of Raleigh, North Carolina, is approximately 34.9 km (21.7 mi.) northeast of the plant, and the City of Sanford, North Carolina, is approximately 26.5 km (16.5 mi.) southwest of the plant. The Cape Fear River flows in a northwest-to-southeast direction approximately 11.3 km (7 mi.) south of the plant. The HAR site is shown on the New Hill U.S. Geological Survey (USGS) quadrangle map 7½-minute series (Reference 2.1-001). Figure 2.1-1 shows the geographic location of the HAR site in relation to these towns and counties.

Table 2.1-1 shows the coordinates of the HAR. The distance between the centerpoint of the reactor buildings for proposed Shearon Harris Nuclear Power Plant Unit 2 (HAR 2) and proposed Shearon Harris Nuclear Power Plant Unit 3 (HAR 3) is 289.5 meters (m) (950 feet [ft.]).

The HAR reactor buildings and generating facilities will lie within the exclusion area boundaries for HNP Unit 1, access to which is controlled. The exclusion areas for HARs 2 and 3 are defined by a circular distance of 1600 m (5249 ft.) in the southerly sectors (east-southeast through west-southwest) and 1245 m (4085 ft.) in the east, west, and northerly sectors (west through east). The overall shape of the HAR EAB is defined by the outermost boundary of each unit's area. (Figure 2.1-2).

There are no mineral resources associated with the proposed HAR facilities that are leased and available for use by parties other than PEC. There are no minerals being utilized on property owned by PEC for HNP or land intended for HAR. More information on mineral resources is provided in Section 4.1.1.2.6.

2.1.1 REFERENCES

2.1-001 GeoCommunity, "New Hill USGS quadrangle map 7½-minute series," Website, www.geocomm.com, accessed August 18, 2006.

Table 2.1-1
Universal Transverse Mercator (UTM) Coordinates of Proposed Reactors

Reactor Unit	Latitude	Longitude	State Plane Northing	State Plane Easting	UTM Zone 17N Northing	UTM Zone 17N Easting
2	35 38 15.39	-78 57 29.84	686990.26	2012392.80	3945674.61	684865.21
3	35 38 23.90	-78 57 34.71	687851.26	2011991.31	3945934.53	684737.50

2.2 LAND

This section describes the land use in the area that surrounds the proposed Shearon Harris Nuclear Power Plant Units 2 and 3 (HAR) site. The section is divided into three subsections:

- Subsection 2.2.1 — HAR Site and Vicinity
- Subsection 2.2.2 — Transmission Corridors and Appurtenant Areas
- Subsection 2.2.3 — Region

2.2.1 HAR SITE AND VICINITY

Figure 2.1-1 and Figure 2.1-2 show the location of the HAR site and exclusion area, respectively. The HAR site is an irregularly shaped area comprised of the following site components: the plant site (area within the fence line), Harris Reservoir, Harris Reservoir perimeter, the dam at Harris Reservoir, the pipeline corridor, and the intake structure and pumphouse. The HAR site is located within Wake and Chatham counties. The U.S. Geological Survey (USGS) (1998) land use classification for the HAR site is primarily water body, southern yellow pine, high intensity developed, managed herbaceous cover, and bottomland forest/hardwood swamp (Figure 2.2-1). The tabulation of areas within the site by each land use category is presented in Table 2.2-1.

The vicinity is a band or belt 9.7-kilometer (km) (6-mile [mi.]) wide surrounding the HAR site. The vicinity includes a much larger tract of land than the HAR site. The vicinity is located within four counties: Wake, Chatham, Harnett, and Lee. Figure 2.2-2 shows the land use for the vicinity. The primary USGS (1998) land use classifications for the vicinity are southern yellow pine, mixed hardwoods/conifers, bottomland forest/hardwood swamps, and water bodies. The tabulation of areas within the vicinity by each land use category is presented in Table 2.2-1.

The counties located within the site and vicinity have land use plans. These counties–Wake, Chatham, Lee, and Harnett–are discussed below.

- **Wake County**. According to the "Wake County Land Use Plan," the land within the vicinity is classified as "non-urban area" (Reference 2.2-001). The "Southwest Wake Area Land Use Plan: Land Use Classification Map" shows the westernmost portion of Wake County as primarily residential with some office/research park and industrial uses along U.S. Highway 1 (Reference 2.2-002). Other large land areas include the Shearon Harris Game Lands, which are classified as forestry/light industry.

- **Chatham County**. The area south and west of the HAR site is located in Chatham County. The Chatham County zoning categories for this area include heavy industrial use and office and institutional use along U.S.

Highway 1 and Old U.S. Highway 1. Old U.S. Highway 1 is surrounded by low-density residential/agricultural use. The area south of the proposed intake and pumphouse site is primarily rural and undeveloped. (Reference 2.2-003) The 64.5-km (40-mi.) shoreline of Harris Reservoir is mostly wooded and the 183.9-square-kilometer (km^2) (71-square-mile [$mi.^2$]) drainage area is mostly rolling hills with land used primarily for forestry and agriculture. The conversion of areas from forestry or agricultural purposes to residential uses continues in many areas of the drainage (Reference 2.2-001).

- **Lee County**. The area immediately south of the intake structure and pumphouse on the Cape Fear River is located in Lee County. The southern edge of the Buckhorn Dam abuts rural forested areas in the county. Sanford, which is located in central Lee County, is the largest population area. The northern portion of the county is largely rural and undeveloped, with residential and industrial uses planned for the U.S. Highway 1 corridor that bisects the county. Land use plans for the area note the need to promote development along highway corridors, but otherwise to maintain the area's open, rural character. As shown on the Sanford and Lee County 2020 Land Use Map, the banks of the Cape Fear River in Lee County are designated for conservation. (References 2.2-004 and 2.2-005)

- **Harnett County**. Harnett County abuts the area immediately east and south of Lee County and the Buckhorn Dam along the Cape Fear River. Northern Harnett County, which also abuts Wake and Chatham counties, experiences growth in that area because of the rapid population changes in Wake County. Harnett County's land use plan was updated in 1999. One study has been developed to address growth from Wake County, and Harnett County asserts that its land use plan will be revised. (References 2.2-006 and 2.2-007) The Harnett County land use map shows conservation areas along the Cape Fear River in Harnett County (Reference 2.2-008).

Some clearing and other development will be required for the construction and operation of the HAR, as discussed in Chapters 4 and 5. Currently, there are limited industrial, commercial, or institutional structures on the HAR site other than the existing Shearon Harris Nuclear Power Plant Unit 1 (HNP) facility. Additional structures include the Auxiliary and Main Dams, and support structures such as firing ranges and storage buildings.

Carolina Power & Light (CP&L) constructed a dam in 1980 on Buckhorn Creek about 4 km (2.5 mi.) north of its confluence with the Cape Fear River to create the 1659-hectare (ha) (4100-acre [ac.]) Harris Reservoir for cooling tower makeup. The dam is located in the southeastern reaches of Chatham County. Filling of the reservoir began in the fall of 1980 and was completed in early 1983. The HNP power block area (reactor building, generating facilities, and switchyard) is located on the northwest shore of the reservoir, about 7 km (4.5 mi.) north of the Main Dam.

Approximately 405 ha (1000 ac.) of vegetation were cleared during development and construction of the HNP site. Most borrow areas and laydown yards were planted (or re-planted) in pines in 1981 and 1982. Approximately 162 ha (400 ac.) of the HNP site were cleared and graded and are now occupied by existing generating facilities, parking lots, warehouses, equipment storage, and laydown areas. The Wake County Fire/Rescue Training Facility, Cary Police Department Firing Range, and Progress Energy Firing Range occupy approximately 8 ha (20 ac.) just east of the developed part of the HNP site, across Thomas Creek. Most of the remaining area is forested, some of which is managed for timber production. Areas along the shore of the Harris Lake and buffer zones (i.e., wetlands) are generally left in a natural state.

Located within the HAR site and vicinity are soil types identified as prime and unique farmlands. However, there are no active farmlands within the site, though there are farmlands within the vicinity. ER Section 2.5 discusses agricultural details.

Recreational areas within the HAR site and vicinity include Harris Lake County Park (3 km [2 mi,] SE), two public boat launch facilities on Harris Lake, the Shearon Harris Game Lands, Jordan Lake State Recreation Area (8 to 19 km [5 to 12 mi.] NW), and the Cape Fear River. Recreational activities revolve around the lakes and rivers and include boating, fishing, hunting, hiking, and bicycling.

Population is sparse in the vicinity, and the closest towns are more than 13 km (8 mi.) from the HAR site.

Industrial activity in the vicinity is not intensive. Sawmills, brick manufacturers, and quarries are the predominant industries within a 10-km (6-mi.) radius of the HAR site. Details about economics and demography in the vicinity are described in Section 2.5 of this ER.

Generally, transportation in the area is limited to state and county roads. The only exception is U.S. Highway 1, which passes north of the HAR site. The CSX Corporation Railroad passes north of the plant, and the Southern Railroad crosses south of the Main Dam. Railway access to the plant is provided by a PEC rail spur that connects to the CSX Corporation Railroad.

The Dixie Pipeline Company owns an 8-in. liquefied petroleum gas pipeline, which is located 2.5 km (8214 ft or 1.6 mi.) from the project site. This pipeline runs in a northwest-southeast direction north of the site. (Reference 2.2-009) Additionally, an abandoned pipeline intersects the vicinity.

2.2.2 TRANSMISSION CORRIDORS AND APPURTENANT AREAS

While the HAR will increase the electrical output of the site, this section only describes existing transmission corridors. The transmission system and any proposed changes to it, including proposed transmission lines associated with the HAR and HNP are more fully described in Section 3.7.

The HNP Final Safety Analysis Report (FSAR) identifies seven 230-kilovolt (kV) transmission lines connecting HNP to the electric system. An eighth line is planned for 2011.These lines are summarized in the following paragraphs; the system itself is described in more detail in ER Section 3.7. The lines generally have 30-meter (m) (100-foot [ft]) corridors, with some exceptions in places.

- Siler City – This line terminates at Siler City, 30.2 mi. from HNP, but formerly extended to Asheboro, approximately 55 mi. from the plant. The new Siler City substation was completed in 2006.

- Cape Fear North – This is the original Cape Fear line considered in the operations FES. It connects HNP with the Cape Fear Steam Plant 7.4 mi. southwest of HNP (Figure 3.7-1).

- Cape Fear South – This newer line was not considered in the FES for operation of HNP. It connects the plant with the Cape Fear Steam Plant following a more southerly 6.5-mi. route than the north line (Figure 3.7-1).

- Apex-U.S. Highway 1 – This line terminates approximately 5.0 mi. northeast of HNP, but formerly extended another 7 mi. to the Cary Regency Park substation. In the Operating License Engineering Report, this line was referred to as the “Method Line.”

- Erwin – This line was called the “Harris-Fuquay-Erwin North line” in the FES for operation. It is 29.8 mi. long. The Harris-Lillington-Erwin South line described in the Operating License Engineering Report was never constructed.

- Fort Bragg – Woodruff Street – This line terminates at the Woodruff Street substation on the Fort Bragg post, approximately 35.5 mi. from HNP. It formerly extended another 21 mi. to Fayetteville, North Carolina.

- Wake – This 230-kV line was built, in part, along the same corridor that was created for the originally planned 500-kV line to Wake County identified in the revised operating permit FES. This line is approximately 37.8 mi. long.

- Planned RTP – This line will terminate at a RTP Substation. A portion of the existing transmission system between Apex and Green Level will be upgraded from 115 kV to 230 kV. Right of way acquired initially for the 115-kV line will accommodate the 230-kV line.

The corridors for the Erwin, Fort Bragg and Wake lines will be expanded a maximum of 100 feet to accommodate new lines to support HAR 3. The land use in the area affected by the proposed expansion is provided in Figure 2.2-3. More detail is provided in Sections 3.7 and 4.1.

CP&L designed and constructed all HNP transmission lines in accordance with industry guidance that was current when the lines were built. Ongoing surveillance and maintenance of HNP-related transmission facilities ensure continued conformance to design standards.

2.2.3 REGION

The HAR site and vicinity are centered in a rural, minimally populated area. However, it is part of a region that has been experiencing rapid growth for more than 10 years. The region comprises an 80-km (50-mi.) radius that includes Durham, Guilford, Alamance, Orange, Wake, and Lee counties. Several interstate highways intersect the region, and the economic centers of Raleigh, Durham, and Chapel Hill are also within the region’s boundaries.The region also includes the most concentrated population areas of the State. Figure 2.2-3 presents the land use for the region. The primary USGS (1998) land use classifications for the region are deciduous forest, evergreen forest, mixed forest, and row crops. The tabulation of areas within the region by each land use category is presented in Table 2.2-2.

The region is most closely associated with the Research Triangle Park, a research and business area in Wake and Durham counties located between Duke University in Durham, North Carolina State University in Raleigh, and the University of North Carolina in Chapel Hill. The county has experienced rapid, growth in recent years. Projections for 2007 suggest Wake County's population will near 800,000. Wake County is expected to pass 1,000,000 residents in 2016, and by 2030 Wake County is expected to have nearly doubled its current population, reaching 1,384,019 (Reference 2.2-010). The City of Fayetteville, North Carolina, lies approximately 72 km (45 mi.) south of the HAR site.

Durham, Wake, Guilford, Alamance, and Orange counties contain the most concentrated industrial areas within the region. There is some light industry at the 2266-ha (5600-ac.) Research Triangle Park, which is located approximately 32 km (20 mi.) north-northeast of the HAR site.

The Raleigh-Durham International Airport is located in the northerly part of the region, in Wake County. The Fort Bragg military reserve and Pope Air Base are located on its southern boundary, in Cumberland, Hoke, and Harnett counties. These installations are described more fully in Chapter 2 of the HAR FSAR.

No federal or state land use plans have been developed for the region. The Triangle J Regional Council of Governments Planning Department also has not developed a regional land use plan. Regional transportation plans have been developed for Raleigh and Durham (Reference 2.2-011). The primary transportation project in the region is the proposed Western Wake Parkway. Section 2.5 further discusses the regional transportation system. Land use plans have been developed at the county level, and specific information on development patterns in the region are described below for Wake, Chatham, Lee, and Harnett counties, which are adjacent to the HAR site.

Wake County Land Use Plan*:* The Wake County Land Use Plan and land use map were completed in 1999 and were most recently updated in July 2007. The county is considering a land use study for the area surrounding the HAR. Large scale residential development is not recommended within 20 mi. of the HAR. However, one possible scenario for development is to expand industrial land uses in the area. (Reference 2.2-012)

Chatham County Land Use Plan*:* The Chatham County Land Use Plan was completed in 1999 and does not include a land use map. The county has no new major development planned within a 20-mi. radius of HAR, however, on the periphery of that 20-mi. radius (north of 64), there are some large multi-use subdivisions planned. The Town of Pittsboro had several approved major multi-use developments in the works. (Reference 2.2-013)

Lee County Land Use Plan*:* The 2020 Sanford-Lee County Land Use Plan and land use map are dated 1998 to 1999. Several large developments are planned primarily along the northern edge of the county. Plans are underway to extend public sewer lines at the edge of the county where U.S. Highway 1 crosses into Lee County. A phased 15-year, 2800-multi-unit residential development is planned on 1100 ac. where Highway 15/501 crosses into Chatham County (Cullen Road, also known as Deep River Area). Approximately 40 to 50 ac. of this development will be set aside for commercial use. Expansion of the Lee County Industrial Park is anticipated because land is still available and is being heavily marketed. (Reference 2.2-014)

Harnett County Land Use Plan*:* The Harnett Land Use Plan and land use map were completed in 1999. The county does not anticipate a trend toward increased growth in the northern section of Harnett County, near the HAR. This area is already developed and no new subdivisions or industrial parks are planned. A new sewer line is planned west of the 401 corridor toward the Harris area (in the vicinity of the lake area); however, minimal of growth is projected. (Reference 2.2-015)

Figure 2.2-4 presents the public trust lands within the region. Located within the region are 86 public trust lands that total 1488 ha (3676 ac.), none of which are affected by the HAR site. The following organizations manage the public trust lands: Association for the Preservation of the Eno, Conservation Trust for North Carolina, Deep River Park Association, Eno River Association, North Carolina Coastal Land Trust, Piedmont Land Conservancy, Sandhills Area Land Trust, and Triangle Land Conservancy.

No new industrial development is anticipated within the immediate vicinity of the HAR site. Contacts have been made with the Chatham, Harnett, and Wake County industrial development authorities, and there are no plans for any significant future industrial development within an 8-km (5-mi.) radius of the HAR site.

2.2.4 REFERENCES

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2.2-003 Chatham County Planning Department, “Chatham County Zoning Atlas, Cape Fear Township,” May 24, 2006.

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2.2-006 Harnett County, “Long Range Planning,” Website, www.harnett.org/planning/long-range-planning.asp, accessed April 2, 2007.

2.2-007 Harnett County, “Neill’s Creek Area,” Website, www.harnett.org/planning/neills-creek-area.asp, accessed April 2, 2007.

2.2-008 Harnett County GIS, “Harnett County Landuse Map,” April 7, 2006, Website, mapgallery.harnett.org/pdf/landuse1.pdf, accessed April 2, 2007.

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2.2-011 Triangle J Regional Council of Governments, Planning Department, Personal Communication with Paul Black, Cynthia Williams, CH2M HILL, October 19, 2007.

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2.2-013 Chatham County Planning Department, Personal Communication with Jason Sullivan, Cynthia Williams, CH2M HILL, October 19, 2007.

2.2-014 Lee County Community Development Department, Personal Communication with Marshall Downey, Cynthia Williams, CH2M HILL, October 16, 2007.

2.2-015 Harnett County Planning Department, Personal Communication with Jay Sikes, Cynthia Williams, CH2M HILL, October 17, 2007.

2.2-016 U.S. Environmental Protection Agency, “Metadata,” Website, www.epa.gov/waterscience/basins/metadata/giras.htm, accessed June 27, 2007.

Table 2.2-1
USGS Land Use Categories for the HAR Site and Vicinity

	Site			Vicinity		
USGS Land Use	**Area (acres)**	**Area (m^2)**	**Percent of Site**	**Area (acres)**	**Area (m^2)**	**Percent of Vicinity**
Bottomland Hardwood/ Hardwood Swamps	870	3,520,765	10%	25,123	101,669,983	17%
Cultivated	0	0	0%	13,474	54,526,534	9%
Deciduous Shrubland	22	89,840	0%	1,802	7,292,840	1%
Evergreen Shrubland	118	477,934	1%	10,163	41,129,821	7%
High Intensity Developed	214	865,218	3%	1,369	5,538,690	1%
Low Intensity Developed	18	70,820	0%	1,440	5,829,092	1%
Managed Herbaceous Cover	198	801,278	2%	8,010	32,414,915	5%
Mixed Hardwoods/ Conifers	489	1,979,317	6%	24,506	99,171,859	16%
Mixed Shrubland	5	20,113	0%	385	1,556,826	0%
Mixed Upland Hardwoods	147	593,674	2%	6,900	27,924,523	5%
Oak/Gum/Cypress	15	61,715	0%	16	66,611	0%
Southern Yellow Pine	2,404	9,728,643	29%	50,037	202,492,029	34%
Unconsolidated Sediment	2	9,753	0%	151	610,792	0%
Unmanaged Herbaceous Upland	22	90,973	0%	120	486,554	0%
Water Bodies	3,827	15,487,320	46%	5,772	23,359,710	4%
Total	8,351	33,795,298	100%	149,269	604,070,616	100%

Notes:

Totals subject to rounding.

Source: Reference 2.2-016

Table 2.2-2
USGS Land Use Categories for the HAR Region

USGS Land Use	Region		
	Area (acres)	Area (m^2)	Percent of Region
Bare Rock/Sand/Clay	10,620	42,980,066	0%
Commercial/Industrial/Transportation	65,049	263,246,646	1%
Deciduous Forest	151,0216	6,111,653,705	30%
Emergent Herbaceous Wetlands	10,269	41,558,467	0%
Evergreen Forest	998,989	4,042,781,575	20%
High Intensity Developed	43,460	175,877,177	1%
Low Intensity Developed	160,509	649,563,111	3%
Mixed Forest	576,052	2,331,212,217	11%
Pasture/Hay	431,335	1,745,559,727	9%
Quarries/Strip Mines/Gravel Pits	7,966	32,239,400	0%
Transitional	51,939	210,192,361	1%
Row Crops	789,605	3,195,432,453	16%
Urban/Recreational Grasses	17,723	71,723,344	0%
Woody Wetlands	300,176	1,214,776,549	6%
Water Bodies	71,584	289,692,257	1%
Total	5,045,498	20,418,489,065	100%

Notes:

Totals subject to rounding.

Source: Reference 2.2-016

2.3 WATER

This section includes the site-specific and regional descriptions of the hydrology, existing water use, and water quality conditions that could affect, or be affected by, the construction or operation of the proposed Shearon Harris Nuclear Power Plant Unit 2 (HAR 2) and Unit 3 (HAR 3). This description of the site-specific and regional surface and groundwater information will be used to establish the baseline hydrologic conditions to assess potential construction or operational effects and the adequacy of the related monitoring programs. The potential construction and operational impacts to water resources are discussed in Chapters 4 and 5 of the ER, respectively, and monitoring programs are presented in Chapter 6.

The proposed HAR site is located in southwest Wake County and southeast Chatham County, North Carolina. Progress Energy Carolinas, Inc. (PEC), owns the site. Major cities near the site include Cary, Raleigh, and Sanford, North Carolina. The closest major city is Cary, which is located 21 kilometers (km) (13 miles [mi.]) northeast of the site. Raleigh is located 34.9 km (21.7 mi.) northeast of the HAR site, and Sanford is located 26.5 km (16.5 mi.) southwest of the HAR site. One 900 megawatt electrical (MWe) Westinghouse Electric Company, LLC (Westinghouse) pressurized water reactor is currently in operation. This reactor is referred to as the HNP. PEC has selected Westinghouse’s AP1000 Reactor (AP1000) as the certified plant design for the proposed Shearon Harris Nuclear Power Plant Units 2 and 3 (HAR).

Currently, the HNP obtains its water supply from the Main Reservoir (also known as Harris Reservoir). The Main Reservoir was originally designed to provide cooling water and remove the design heat load from the Cooling Tower blowdown water for four reactor units. During construction activities for the units, a decision was made to reduce the number of units to one; therefore, only the HNP was completed. The Main Reservoir was completed before the decision and therefore, the current reservoir was designed for multiple units; however, the reservoir level was only raised to the level to support the one unit and the makeup water system from the river was never built. PEC intends to use the Main Reservoir for the HAR and HNP.

Harris Lake consists of two reservoirs: the Main Reservoir (also known as Harris Reservoir) and the Auxiliary Reservoir (Figure 2.3-1). PEC constructed the Harris Reservoir in 1980 by building an earthen dam across Buckhorn Creek about 365.8 meters (m) (1200 feet [ft.]) downstream of the confluence of White Oak and Buckhorn Creeks. PEC constructed the Auxiliary Reservoir in 1980 by installing an earthen dam across Tom Jack Creek. The Auxiliary Reservoir is an emergency water source for the HNP but the Auxiliary Reservoir will not be an emergency water source for the HAR.

The HAR site is located immediately north of the HNP between the Thomas Creek and Tom Jack Creek branches of Harris Lake about 7.2 km (4.5 mi.) north of the Main Dam and about 11.3 km (7 mi.) north of the Cape Fear River. The nominal grade elevation for the HNP facility and the HAR site is 79.2 m (260 ft.) National Geodetic Vertical Datum of 1929 (NGVD29) (Reference 2.3-001). The proposed nominal plant grade elevation for the HAR site is 79.6 m (261 ft.) NGVD29. The actual plant grade will be lower and will vary to accommodate site grading, drainage, and local site flooding requirements. The nominal plant grade floor elevation for the HAR site is 79.6 m (261 ft.) NGVD29.

The current normal pool water elevation for Harris Reservoir and the Auxiliary Reservoir is 67.1 m (220 ft.) and 76.8 m (252 ft.) NGVD29, respectively (Reference 2.3-001). The proposed normal pool water elevation for Harris Reservoir is 73.1 m (240 ft.) NGVD29; no reservoir level changes are proposed for the Auxiliary Reservoir.

HNP collects cooling tower makeup water at the Cooling Tower Makeup Water Intake Structure located on the Thomas Creek branch of Harris Reservoir east of the HNP site (Figure 2.3-2). The blowdown water is discharged into Harris Reservoir through a 122-centimeter- (cm) (48-inch [in.])-diameter, 6096-m (20,000-ft.)-long pipeline at a location about 1484.4 m (4870 ft.) north of the Main Dam. Under conditions of Main Dam failure, the HNP would use the independent Auxiliary Reservoir for emergency core cooling purposes. Emergency service water would be supplied through the emergency service intake screening structure and the emergency service water intake structure in the Auxiliary Reservoir to the cooling tower and discharged back into the Auxiliary Reservoir through the emergency service water discharge structure. A separating dike located across the east arm of the Auxiliary Reservoir creates a flow boundary between the emergency service water intake and discharge structures to extend the emergency service water residence time within the Auxiliary Reservoir. The decks of the emergency service water and Cooling Tower makeup water intake structure, the emergency service intake screening structure, and the emergency service water discharge structure for the HNP are all at an elevation of 79.9 m (262 ft.) NGVD29 (Reference 2.3-001).

HAR 2 and HAR 3 will collect cooling tower makeup water at the proposed HAR raw water pumphouse structure located on the Thomas Creek branch of the Harris Reservoir east of the HAR site and approximately 975.4 m (3200 ft.) north of the HNP Cooling Tower Makeup Water Intake Channel (Figure 2.3-3). After usage, the cooling tower blowdown water will be discharged into Harris Reservoir through a new pipe installed parallel to the current discharge pipe for the HNP. Under conditions of Harris Reservoir failure, HAR 2 and HAR 3 will use a passive core cooling system to provide emergency core cooling without the use of active equipment such as pumps and AC power sources. Use of the Auxiliary Reservoir will not be required to provide emergency cooling water for HAR 2 and HAR 3. The proposed elevation of the HAR Raw Water Pumphouse structure deck is 79.9 m (262 ft.) NGVD29.

Makeup water will be obtained from the Cape Fear River to maintain the proposed operating water level of the Main Reservoir at 73.2 m (240 ft.) NGVD29. The Harris Lake makeup water system has been designed to maintain the required reservoir level. This system includes the Intake Channel in the Cape Fear River, the Harris Lake makeup water system pumphouse on the Cape Fear River, the Harris Lake makeup water system pipeline from the Cape Fear River to the Harris Reservoir, and the Harris Lake makeup water system discharge structure on the Harris Reservoir (Figure 2.3-3). The maximum flow capacity from the Harris Lake makeup water system pumphouse to the Main Reservoir is 60,000 gallons per minute (gpm) or 3.79 cubic meters per second (m^3/s) (133.68 cubic feet per second [cfs]).

Water from the Cape Fear River, in addition to the Main Reservoir drainage area, will be required to fill and maintain the required pool level for normal operations. The rate at which water is withdrawn from the Cape Fear River for maintenance of water quality will be based on a set of operational rules designed to meet target flows, such as a minimum discharge of 0.57 m^3/s (20 cfs) from the Main Reservoir to Buckhorn Creek. A higher withdrawal rate will be used during high river flow periods to fill the lake and manage water quality. During periods of drought, the Main Reservoir will provide some or all of the required cooling water supply. To achieve a minimum discharge of 0.57 m^3/s (20 cfs) from the Main Reservoir to Buckhorn Creek during periods when water does not flow over the Main Dam spillway, water can be released from the Main Reservoir through three Howell-Bunger valves located in the central pier and side abutments of the spillway. For more information on the Howell-Bunger valves, see Section 2.4.8 of the HNP FSAR (Reference 2.3-001).

2.3.1 HYDROLOGY

This subsection describes surface water and groundwater aquifer resources that are present in the vicinity of the HAR site that could affect HAR and HNP water supply and effluent disposal or could be affected by construction or operation of the HAR. The regional and site-specific data on the physical and hydrological characteristics of surface water and groundwater have been summarized to provide a basis for evaluation of impacts on water bodies and aquifers in the area.

The data and information on the hydrologic system are organized into the following subsections:

- Subsection 2.3.1.1 — Freshwater Streams
- Subsection 2.3.1.2 — Lakes and Impoundments
- Subsection 2.3.1.3 — Groundwater

2.3.1.1 Freshwater Streams

The general hydrologic network and its relation to the HAR site are presented on Figure 2.3-1 and discussed in the following subsections.

2.3.1.1.1 Buckhorn Creek

Buckhorn Creek has its headwaters in the vicinity of Holly Springs and Apex, North Carolina, and flows southwest to its confluence with the Cape Fear River. The confluence is located about 22.0 km (13.7 mi.) northwest of the Town of Lillington, North Carolina. Harris Reservoir was formed by constructing a dam on Buckhorn Creek, approximately 4.8 km (3 mi.) upstream of its confluence with the Cape Fear River. Flow in Buckhorn Creek downstream of Harris Reservoir is presently controlled by the operation of Harris Reservoir. Water is discharged to the creek when enough water is present in Harris Reservoir to spill over the spillway. There is no minimum flow requirement from Harris Reservoir into the Buckhorn Creek. During low flow, the majority of flow in Buckhorn Creek downstream of Harris Reservoir is from Beaver Creek, a tributary to Buckhorn Creek just downstream of the Main Dam.

As shown on Figure 2.3-4, Buckhorn Creek has five tributaries above the Main Dam: Tom Jack Creek, Thomas Creek, Little White Oak Creek, White Oak Creek, and Cary Creek. These five creeks, together with the remainder of Buckhorn Creek's basin, drain a watershed area of approximately 205.9 square kilometers (km^2) (79.5 square miles [$mi.^2$]). The entire drainage basin lies near the eastern edge of the Piedmont Plateau, with elevations between 45.7 and 137.2 m (150 and 450 ft.) mean sea level (msl).

A U.S. Geological Survey (USGS) gauging station (USGS 02102192 Buckhorn Creek near Corinth, North Carolina [NC]) is located on Buckhorn Creek about 0.9 km (0.56 mi.) below the Main Dam Spillway. Periods of record for data collected include June 9, 1972, through the present day (for stream stage and flow measurements) and December 15, 1972, through September 1, 1978 (for suspended sediment concentrations). The drainage area at the station is 197.6 km^2 (76.3 $mi.^2$) (Reference 2.3-002).

Table 2.3-1 presents the mean monthly discharge (June 1972 through September 2004) for the Buckhorn Creek basin at the Buckhorn Creek gauging station (Reference 2.3-003). The average monthly discharge of Buckhorn Creek for this 33-year period is 1.69 m^3/s (59.8 cfs). March has the highest average monthly discharge of 4 m^3/s (143 cfs) and October has the lowest average monthly discharge of 0.5 m^3/s (18.7 cfs). The average of the monthly minimums is 0.03 m^3/s (1.1 cfs) and the average of the monthly maximums is 7.7 m^3/s (271.2 cfs). A maximum average daily streamflow of 88.6 m^3/s (3130 cfs) was recorded on February 2, 1973 (Table 2.3-2).

Currently, no reservoirs, dams, or creek control structures are located upstream or downstream of the Harris Lake that can affect the availability of the water supply to the reservoir system and the HAR site structures. Furthermore, Buckhorn Creek (downstream of the Main Dam) is not a likely candidate for changes that would result in additional water demand because the flow is often low for long periods of time and a small drainage basin area is associated with this stream segment.

There is no historical evidence of channel diversion above the Main Dam within Buckhorn Creek, Tom Jack Creek, Thomas Creek, Little White Oak Creek, White Oak Creek, or Cary Creek. Examination of USGS 1:24,000-scale topographic maps associated with the Buckhorn Creek drainage basin did not reveal evidence of natural channel diversions (e.g., oxbow lakes or broad, well developed floodplains). Creeks and streams within the watershed generally occur in well-defined valleys and, therefore, limit the possibility of water diversion into adjacent drainage basins. Topographic characteristics and geological features of the drainage basin indicate there is no possibility for the occurrence of a landslide blocking or limiting streamflow into Harris Lake. Because ice effects are expected to be limited to minor freezing, they are not expected to create flow diversion during winter months.

2.3.1.1.1.1 Floods

The review of yearly peak streamflow measurements (based on average daily streamflow measurements) recorded at the Buckhorn Creek gauging station (USGS 02102192) from 1972 to 2005 (33 years) indicates the Auxiliary Reservoir and Harris Reservoir are significantly attenuating flood flows in Buckhorn Creek (Table 2.3-2 and Figure 2.3-5). Prior to completion of the Auxiliary Dam and the Main Dam structures in late 1980, the average yearly peak streamflow was 49.6 m^3/s (1754 cfs) with a maximum average daily discharge of 88.6 m^3/s (3130 cfs) occurring on February 2, 1973. Following the completion of Harris Lake, the average yearly peak streamflow has been 16 m^3/s (565 cfs) with no recorded discharge rates exceeding 55 m^3/s (1940 cfs) (September 6, 1996) (Reference 2.3-002).

Figure 2.3-6 shows the flood frequency analysis curves created using the Log Pearson Type III Distribution statistical technique for the Buckhorn Creek gauging station. Table 2.3-3 shows calculated recurrence intervals of 2.33, 10, 25, 50, and 100 years, and associated streamflows for Buckhorn Creek. The maximum recorded average daily discharge of 88.6 m^3/s (3130 cfs) at the Buckhorn Creek gauging station has a calculated recurrence interval of about 40.5 years. Table 2.3-4 presents the mean monthly gauge heights measured at the Buckhorn Creek gauging station (USGS 02102192).

2.3.1.1.2 Cape Fear River

The Cape Fear River basin is the largest river basin located entirely in North Carolina. The basin has an oblong shape with a maximum width of about 96.5 km (60 mi.), maximum length of about 321.9 km (200 mi.), and about 9734.9 km (6049 mi.) of streams and rivers (Reference 2.3-003). The basin has a total area of 223,673 km^2 (9140 $mi.^2$) of which approximately 8099 km^2 (3127 $mi.^2$) are located above the confluence of the Deep and Haw Rivers (Reference 2.3-004). The Cape Fear River is formed by the confluence of the Deep and Haw Rivers. The Cape Fear River flows southeast for about 318.7 km (198 mi.) and empties into the Atlantic Ocean at Cape Fear, North Carolina, located 45.1 km (28 mi.) below Wilmington, North Carolina. Figure 2.3-7 shows the location of the Cape Fear River basin and its relation to the Cape Fear River.

The lower Cape Fear River is an estuary with the tidal reach extending to Lock and Dam 1, about 62.8 km (39 mi.) above Wilmington, North Carolina. The river is navigable to Fayetteville, North Carolina:

- A channel width of generally 121.9 m (400 ft.) and a depth ranging from 9.1 to 10.7 m (30 to 35 ft.) occurs from the Atlantic Ocean to Wilmington, North Carolina.
- A 61.0-m (200-ft.) width and 7.6-m (25-ft.) depth occurs from Wilmington to Navassa, North Carolina.
- A depth of 2.4 m (8 ft.) with varying widths occurs for the remaining distance to Fayetteville, North Carolina.
- The average width of the floodplain is about 3.5 km (2.2 mi.) (Reference 2.3-001).

Flows in the Cape Fear River are partially regulated by releases from the dam at Jordan Lake and managed by meeting target flows at Lillington as defined by the 1992 Water Control Manual for B. Everett Jordan Lake (Reference 2.3-005). An evaluation of the overall impact of additional withdrawals will need to be performed prior to submitting the permit application. Appropriate analytical methods to evaluate impacts on Cape Fear River flow are discussed in ER Subsection 5.2.3.

Table 2.3-5 presents the locations of flow monitoring stations in the Cape Fear River basin and the maximum flows at each station. Bank-full flood discharge for the Cape Fear River is an estimated 849.5 m^3/s (30,000 cfs) at Lillington, North Carolina and 858 m^3/s (30,300 cfs) at Fayetteville, North Carolina; distances downstream from the confluence of the Buckhorn Creek and Cape Fear River are approximately 22.0 km and 80.8 km (13.7 mi. and 50.2 mi.), respectively (Table 2.3-5). Figure 2.3-8 shows USGS monitoring stations located on the Haw, Deep, and Cape Fear rivers.

Table 2.3-6 presents the mean monthly discharge (January 1924 through September 2004) for the Cape Fear River USGS gauging station 02102500 at Lillington, North Carolina. The average monthly discharge for the Cape Fear River at Lillington is 95.9 m^3/s (3387 cfs). March has the highest average monthly discharge of 182.4 m^3/s (6441 cfs) and August has the lowest average monthly discharge of 55.8 m^3/s (1970 cfs). A maximum average daily streamflow of 3964.4 m^3/s (140,000 cfs) was recorded on September 19, 1945 (Table 2.3-6). (Reference 2.3-006) The drainage area at the Lillington USGS station is 8972 km^2 (3464 $mi.^2$). The proposed withdrawal from the Cape Fear River of 2.36 cm/sec (93.76 cfs), for operation and water quality control, is approximately

3.6 percent (2.36 cm/sec / 65 cm/sec = 3.6 percent) of the average daily flow reported at the USGS gauge at Lillington (USGS02102500). (Reference 2.3-007)

The 7-day, 10-year low flow (7Q10) is a commonly used measurement of low-flow conditions and is frequently the basis for determining point source discharge limits. The 7Q10 for the Cape Fear River at the USGS station near Lillington, North Carolina, from 1982-2005 was determined to be 11.72 cm/sec (414 cfs) using USGS flow data and the U.S. Environmental Protection Agency's (USEPA's) DFLOW3 program. The 7Q10 at the confluence of Buckhorn Creek and the Cape Fear River was calculated as 10.82 cm/sec (382 cfs) (Reference 2.3-008).

State water use guidance values are based on withdrawals of 20 percent or more of the 7Q10. For the Cape Fear River at Buckhorn Creek, this would equate to 2.16 cm/sec (76.4 cfs) (0.2 multiplied by 10.82 cm/sec equals 2.16 cm/sec [0.2 multiplied by 382 cfs equals 76.4 cfs]). Therefore, these values will be useful for examining relative impacts of water withdrawals in this ER. (Reference 2.3-008)

2.3.1.1.2.1 Cape Fear River Basin - Dams, Reservoirs, and Locks

There are a number of regulating structures and reservoirs on the Cape Fear River. Figure 2.3-9 shows the locations of these structures and reservoirs. Lock and Dam 1, Lock and Dam 2, and the William O. Huske Dam, which are all operated by the U.S. Army Corps of Engineers (USACE), are located at river miles 67, 99, and 123, respectively. Buckhorn Dam, which is located at river mile 192, has a spillway crest elevation of 48.21 m (158.18 ft.) msl.

Lockville Hydro Dam (owned by Lockville Hydropower) is situated on the lower reach of the Deep River. In addition, on August 7, 2001, the Piedmont Triad Regional Water Authority began construction of the Randleman Dam, which is located on the upper reach of the Deep River (Reference 2.3-009). Upon completion, Randleman Lake will be located in Randolph and Guilford counties, North Carolina, and have a surface area of 12.2 km^2 (4.7 $mi.^2$). Water from the dam will be used as a local water supply for the Piedmont Triad region (Reference 2.3-010).

The B. Everett Jordan Lake and associated dam are located on the lower reach of the Haw River about 4.2 river miles above the confluence of the Haw and Deep Rivers, and about 18.2 km (11.3 river miles) upstream of the confluence of the Buckhorn Creek and Cape Fear River. The lake has a normal pool elevation of 65.8 m (216 ft.) msl, a surface area of about 56.4 km^2 (21.8 $mi.^2$ or 1.3 percent of the drainage area), and a storage capacity of 2.7 x 10^8 cubic meters (m^3) (215,130 acre-feet [ac-ft]) at normal pool elevation (Reference 2.3-004). The drainage area for the B. Everett Jordan Lake at the dam site is 4377 km^2 (1690 $mi.^2$).

The B. Everett Jordan Dam is constructed of earth and rockfill (zoned) with an uncontrolled spillway and a multilevel intake structure. The dam has a length of 405.4 m (1330 ft.), a top-of-dam elevation of 81.2 m (266.5 ft.) msl, and a maximum height of 34.4 m (113 ft.) (Reference 2.3-004). The spillway has a crest net length of 243.8 m (800 ft.), a top-of-spillway elevation of 73.2 m (240 ft.) msl, and a capacity of 7334.1 m^3/s (259,000 cfs) at an elevation of 79.7 m (261.5 ft.) msl. To support aquatic life and other downstream uses, the flow in the Cape Fear River is controlled by releases from B. Everett Jordan Dam. USACE operates B. Everett Jordan Dam to meet a target flow at Lillington of 17 +/- 1.4 m^3/s (600 +/- 50 cfs) during low-flow periods.

Additionally, there are four water withdrawals between Jordan Lake and Lock and Dam 1 (Figure 2.3-10), that rely on the Cape Fear River for drinking water supply. Any significant changes in the flow volume of the Cape Fear River during low-flow conditions might affect drinking water withdrawal capacity. There are no other industrial, municipal, commercial, mining, or agricultural users of the Cape Fear water between Buckhorn Dam and Lock and Dam 1 (Reference 2.3-011).

2.3.1.1.2.2 Floods

Yearly peak streamflow measurements (based on average daily streamflow measurements) recorded for the Cape Fear River at the Lillington gauging station (USGS 02102500) from 1924 to 2005 (82 years) were also reviewed (Table 2.3-7 and Figure 2.3-11). The average yearly peak streamflow based on available data was 1021.1 m^3/s (36,059 cfs), with a maximum average daily discharge of 3964.4 m^3/s (140,000 cfs) occurring on September 19, 1945. Since 1945, the average yearly peak streamflow has been 924.2 m^3/s (32,637 cfs), with a maximum average daily discharge of 2024.7 m^3/s (71,500 cfs) occurring on March 5, 1952 (Reference 2.3-006). Table 2.3-8 presents the mean monthly gauge heights measured at the Cape Fear River, Lillington gauging station.

Figure 2.3-12 shows the flood frequency analysis curves created using the Log Pearson Type III Distribution statistical technique for the Cape Fear River at the Lillington gauging station. Table 2.3-3 shows calculated recurrence intervals of 2.33, 10, 25, 50, and 100 years, and associated streamflows for the Cape Fear River at the Lillington gauging station. The maximum recorded average daily discharge of 3964.4 m^3/s (140,000 cfs) has a calculated recurrence interval of about 678.5 years. The highest maximum average daily discharge after 1945 was 2024.7 m^3/s (71,500 cfs), which has a calculated recurrence interval of about 21.5 years. The unusually high yearly peak streamflow measurements (greater than 1982.2 m^3/s [70,000 cfs]) of the Cape Fear River at the Lillington gauging station occurred prior to 1952. These elevated measurements are likely attributed to land usage and to fewer locks and dams built on the Cape Fear River to attenuate flood events.

2.3.1.1.2.3 Bathymetry

Through GIS-based bathymetric survey techniques, the depth contour profiles of the Cape Fear River were developed. The elevations of the bottom of Cape Fear River were measured from the proposed Harris Lake makeup water system pumphouse to approximately 3.2 km (2.0 mi.) upstream. Figure 2.3-13 graphically presents the elevation of the river bottom. Near the Harris Lake makeup water system pumphouse, the elevation of the river bottom ranged from 48.8 m (160 ft.) NGVD29 at the shoreline to approximately 46.3 m (152 ft.) NGVD29.

2.3.1.1.3 Cape Fear River Basin—Tributaries

The Cape Fear River has two major tributaries above the Buckhorn Dam (which is located immediately upstream of the confluence of Buckhorn Creek and Cape Fear River): the Haw and Deep Rivers, both of which originate in Forsyth County, North Carolina. The Deep River has a total length of 186.7 km (116 mi.) and a drainage area of 3732 km^2 (1441 $mi.^2$) (Reference 2.3-004). The Haw River is about 144.8 km (90 mi.) in length and drains about 4416 km^2 (1705 $mi.^2$). Both rivers originate at elevations of about 304.8 m (1000 ft.) msl and have numerous falls and rapids, with the Haw River having the steepest gradient. The water surface elevation of the junction of the two rivers is about 48.2 m (158 ft.) NGVD29 (Reference 2.3-001).

Other major tributaries downstream of the withdrawal point include the Black River and Northeast Cape Fear River. The Black River, which has a drainage area of 4048 km^2 (1563 $mi.^2$), joins the Cape Fear River at river mile 44. The Northeast Cape Fear River drains a basin of 4501 km^2 (1738 $mi.^2$) and enters the Cape Fear River at Wilmington, North Carolina (Reference 2.3-001).

There are numerous minor tributaries including Upper Little River, Little River, Rockfish Creek, and Buckhorn Creek.

2.3.1.2 Lakes and Impoundments

As stated in Section 2.3, the principal source of water for the HAR and the HNP is the Harris Reservoir, which is part of Harris Lake (Figure 2.3-1). The Harris Reservoir, situated on Buckhorn Creek, is impounded by an earthen dam located just below the confluence of White Oak Creek and Buckhorn Creek. The Auxiliary Reservoir, located on Tom Jack Creek, is formed by an earthen dam situated to the west of the plant site. There are two reservoir branches adjacent to the HAR site: Tom Jack Creek to the west and Thomas Creek to the east. Drainage area for Harris Lake at the Main Dam site is 182.1 km^2 (70.3 $mi.^2$) (Reference 2.3-011).

2.3.1.2.1 Harris Reservoir

Currently, Harris Reservoir has the following characteristics (Reference 2.3-012):

- A maximum depth of about 18 m (59 ft.).
- A mean depth of 5.3 m (17.4 ft.).
- A normal pool elevation of 67.1 m (220 ft.) NGVD29.
- A storage capacity of 9.0 x 10^7 m^3 (73,000 ac-ft) at the normal pool elevation.
- A surface area of about 14.6 km^2 (5.6 $mi.^2$ or 7.8 percent of the drainage area).
- A residence time of 28 months.

From 2001 through 2006, the mean pool elevation of the Main Reservoir was 219.79 ft. NGVD29 (Table 2.3-9). The maximum and minimum elevation of the Main Reservoir during that period was 223.80 and 212.69 ft. NGVD29, respectively. With the addition of the HAR, the normal pool elevation of the Main Reservoir will be raised to 73.2 m (240 ft.) NGVD29. The storage capacity and surface area will increase to 2.2 x 10^8 m^3 (177,563 ac-ft) and 29.1 km^2 (11.2 $mi.^2$ or approximately 16 percent of the drainage area), respectively. Figure 2.3-14 shows area and capacity curves for the Main Reservoir.

2.3.1.2.1.1 Dam and Appurtenances

The Main Dam structure has a length of 472.4 m (1550 ft.) with a 2:1 (horizontal to vertical) slope on both the upstream and downstream faces. The top of the dam is at an elevation of 79.2 m (260 ft.) NGVD29 (about 12.2 m [40 ft.] above the current normal pool elevation and 6.1 m [20 ft.] above the proposed normal pool elevation), with a width of 7.6 m (25 ft.). The maximum height of the dam is 32.9 m (108 ft.) above the top of bedrock. Riprap is provided on the upstream slope of the dam for protection against wind-wave erosion. The downstream slope has a 1.2-m (4-ft.) thick layer of oversized rock for erosion protection. (Reference 2.3-001 and Reference 2.3-013)

The Main Dam currently includes a concrete spillway with an ogee-shaped crest on the west abutment of the dam to pass floods as the only flow component. The spillway is uncontrolled and has a crest net length of 15.2 m (50 ft.) with a pier at mid-length. The crest of the current spillway is at an elevation of 67.1 m (220 ft.) NGVD29. The proposed spillway design for the Main Dam includes raising the existing uncontrolled, ogee-shaped crest to 73.1 m (240 ft.) NGVD29 in one span and installing a Tainter gate in the second span, with a spillway crest at 67.1 m (220 ft.) NGVD29.

The uncontrolled spillway at the Main Dam is designed to release flood waters so that the water level within the Harris Reservoir does not exceed the design basis of the dam. To achieve a minimum discharge from the Harris Reservoir to Buckhorn Creek during periods when water does not flow over the Main Dam spillway, water can be released from the Harris Reservoir through three Howell-Bunger valves located in the central pier and side abutments of the spillway at different elevations.

The 61-cm (24-in.) Howell-Bunger valve located in the central pier has a centerline elevation of 63 m (206.7 ft.) NGVD29 and an intake elevation of 59.4 (195 ft.) NGVD29. The 91-cm (36-inch) Howell-Bunger valves located in the east and west abutments of the Main Dam spillway have centerlines at an elevation of 64.9 m (213 ft.) NGVD29. The intake for the west abutment valve is at elevation 64.9 m (213 ft.) NGVD29, whereas the intake for the east abutment valve is at elevation 54.9 m (180.0 ft.) NGVD29.

2.3.1.2.1.2 Bathymetry

Through GIS-based bathymetric survey techniques the depth contour profiles of three identified areas in Harris Reservoir were developed. Depths to the bottom of Harris Lake were measured near the proposed Harris Lake makeup water system discharge structure, the proposed HAR blowdown pipeline liquid release point, and the proposed HAR raw water pumphouse (Figure 2.3-15). The elevation of the lake bottom near the proposed Harris Lake makeup water system discharge structure ranged from 67 m (220 ft.) NGVD29 at the shoreline to a maximum of approximately 62 m (204 ft.) NGVD29 and the elevation of the lake bottom at the proposed HAR blowdown pipeline liquid release point is approximately 51 m (167 ft.) NGVD29 as shown on Figure 2.3-16. The elevation of the Harris Lake bottom near the proposed HAR Raw Water pumphouse ranged from 67 m (220 ft.) NGVD29 at the shoreline to a maximum of approximately 64 m (210 ft.) NGVD29 as shown on Figure 2.3-17.

2.3.1.2.1.3 Sedimentation

By assuming 100 percent sediment trap efficiency for Harris Reservoir, the total volume of sediment deposited from Buckhorn Creek is estimated to be about 460 ac-ft, accumulated over 40 years of plant life. In addition, makeup water from the Cape Fear River will add an estimated 100 ac-ft of sediment to the Harris Reservoir. Based on these assumptions, sediment accumulation of 560 ac-ft (7.43×10^6 m^3) represents about 0.3 percent of Harris Reservoir capacity and an additional sediment depth of approximately 0.88 in (2.41 cm) (7.43×10^6 m^3/30.8 km^2 = 2.41 cm) at the proposed operating level of 73.2 m (240 ft.) NGVD29. Any noticeable effect of sediment on the shorelines and bottom will be localized. (Reference 2.3-014)

Tables 2.3-32 and 2.3-45 show that total suspended solids in the Cape Fear River are higher than those currently found in Harris Reservoir. However, the maximum proposed daily inflow is less than 1.0 percent of the Harris Reservoir volume under current conditions and less than 0.5 percent of the proposed volume. In addition, a significant portion of the suspended solids will settle out relatively quickly. Therefore, settling in the Harris Reservoir is expected to effectively reduce most introduced sediments, even under maximum pumping. Additional information on sedimentation and erosion due to construction activities can be found in Section 4.2, Water-Related Impacts.

Erosion of the plant site is minimized by planting vegetation, paving, and control of storm runoff by catch basins and storm drains (Reference 2.3-015).

2.3.1.2.1.4 Currents

Factors that may be involved in producing nontidal currents in Harris Reservoir are (1) wind speed, direction, and fetch, (2) flow-through of runoff from tributaries, and (3) rotation of the earth. Due to the size of and dendritic pattern of Harris Reservoir channels, the currents created by stream flow-through are generally negligible, except during very high floods. The modification of current patterns caused by the rotation of the Earth is insignificant in a reservoir of this small size. Harris Reservoir currents are thus primarily induced by wind stress. Meteorological observations indicate a predominantly bimodal tendency toward the northeast and southwest in the diurnal distribution of wind directions. Consequently, the current patterns resulting from winds in these two general directions should be more common than from the others (Reference 2.3-014). The cooling tower blowdown at the point of discharge within Harris Reservoir may create localized current effects at the liquid release point of the HNP blowdown pipeline.

The proposed maximum daily inflow of water into the Harris Reservoir from the Cape Fear River is only about 0.5 percent of the proposed volume of Harris Reservoir. Therefore, only localized currents are expected at the discharge point near the proposed HAR Reservoir Makeup Water Discharge structure.

2.3.1.2.1.5 Floods

The flooding effects of a probable maximum flood (PMF) on Harris Lake and a local probable maximum precipitation on the plant site are the design bases for flood protection. Detailed information pertaining to maximum flood events are presented in the Shearon Harris Nuclear Power Plant Units 2 and 3 COLA, Part 2, FSAR.

2.3.1.2.1.6 Droughts

To demonstrate that HNP, HAR 2, and HAR 3 can continue to operate during low flow conditions, two evaluations were performed. The first hypothetical situation evaluates the ability of the three units to operate under low flow conditions. The second hypothetical situation evaluates how long the three plants could operate without withdrawing water from the Cape Fear River.

2.3.1.2.1.6.1 Hypothetical Operation of HNP and HAR under Low Flow Conditions

This hypothetical evaluation determines if a normal pool elevation of 73.2 m (240 ft.) NGVD29 within the Main Reservoir could sustain the HNP and HAR during severe drought conditions. For the evaluation, historical inflows, meteorological data, and projected consumptive use were used to compute the water balance and the Main Reservoir water level on a monthly basis for a period from October 1939 to September 2004. Inputs into Harris Lake included inflow from the Buckhorn Creek drainage basin above the Main Dam, precipitation onto the Main Reservoir and the Auxiliary Reservoir, and inflow from the Harris Lake makeup water system to the Main Reservoir. Multiple makeup water flow rates from the Cape Fear River were considered in the evaluation to determine a reasonable makeup flow. Outputs consisted of spillage above a proposed normal pool elevation of 73.2 m (240 ft.) NGVD29, consumptive use from plant operation (forced evaporation), makeup water pumping to the Auxiliary Reservoir from the Main Reservoir, seepage, and natural evaporation.

Two outage periods of 15 days each were considered in the evaluation. The first outage period included the HNP and one proposed AP1000 unit; the second period was staggered by 6 months for the second proposed AP1000 unit. These outages were repeated once every 18 months. During these periods, the plant’s consumptive use was considered zero for the respective units in outage.

Water balance computations for a proposed Main Reservoir normal pool elevation of 73.2 m (240 ft.) NGVD29 were completed to determine the minimum makeup water flow from the Cape Fear River required for a three-unit operation so that the minimum water level would be equal to 67.1 m (220 ft.) NGVD29. This effort required trial and error computations using different assumed makeup water flows, with a resulting determination that a makeup water flow rate of 1.1 m^3/s (40.3 cfs) supports the minimum lake water level criteria.

Results from the evaluation include the following:

- Four severe drought periods occurred during the period of analysis from October 1939 to September 2004 as observed by changes in reservoir water levels: 1940 to 1943, 1950 to 1957, 1966 to 1972, and 1985 to 1997. The worst drought period occurred between 1985 and 1997.

- For this computation only, the net total consumptive water use for the HNP is 0.8 m^3/s (27.2 cfs) as specified in Subsection 2.4.11.6 of the HNP FSAR and assumed to be 1.9 m^3/s (66.8 cfs) for the HAR. Therefore, the total assumed consumptive use for the HNP and the HAR is 2.7 m^3/s (94 cfs).

- Streamflow in the Cape Fear River near the confluence of Buckhorn Creek is regulated upstream by the B. Everett Jordan Dam. A review of streamflow data from the Cape Fear River indicates regulated releases have been occurring since 1982. Therefore, it was determined that the 7Q10 in the river near the confluence of the Buckhorn Creek for the period after 1982 would be relevant for use in this analysis. The 7Q10 for the period 1982 to 2004 near the confluence of the Buckhorn Creek and Cape Fear River was estimated as 10.8 m^3/s (382 cfs). The minimum available makeup water flow from the Cape Fear River during low-flow periods is assumed to be 20 percent of the 7Q10 or about 2.2 m^3/s (76.4 cfs).

- Assuming plant outages, a proposed normal pool elevation within the Main Reservoir of 73.2 m (240 ft.) NGVD29, and a continuous Cape Fear makeup water flow rate of 1.1 m^3/s (40.3 cfs), the minimum Main Reservoir water elevation during the period of October 1939 to September 2004 was 67.1 m (220 ft.) NGVD29 with the HNP and two proposed AP1000 units operating. Using these parameters, the computed average monthly downstream releases from the Main Dam would be 0.3 m^3/s (10.3 cfs) for the period from 1939 to 2004.

Based on this evaluation, a proposed normal pool elevation of 73.2 m (240 ft.) NGVD29 within the Main Reservoir and a continuous makeup water flow rate from the Cape Fear River of 1.1 m^3/s (40.3 cfs) would be acceptable for the operation of HNP, HAR 2, and HAR 3 during historical low water periods.

2.3.1.2.1.6.2 Hypothetical Operation of HNP, HAR 2, and HAR 3 without Makeup Water from the Cape Fear River

This hypothetical evaluation was performed to estimate the length of time the storage volume of the Main Reservoir could sustain the HNP and the HAR during drought conditions without makeup water flow from the Cape Fear River. The assumed water level elevation of the Main Reservoir was 73.2 m (240 ft.) NGVD29 at the start of the period in which no water is being withdrawn from the river.

The following assumptions were made in the computation:

- No net makeup flow from the Cape Fear River will be available for the entire period.
- No water will be released from the Main Reservoir other than that required to meet minimum flow requirements (no net consumption from the Cape Fear River).
- For the operation of HNP and the HAR, the lowest permissible water level in the Main Reservoir is 67.1 m (220 ft.) NGVD29.
- Outage periods are not considered.
- Main Reservoir area at elevation 67.1 m (220 ft.) NGVD29 = 3561.44 ac.

- Main Reservoir area at elevation 73.2 m (240 ft.) NGVD29 = 7179.33 ac.
- Average area for elevation range between 67.1 m (220 ft.) NGVD29 and 73.2 m (240 ft.) NGVD29 is (3561.44 ac. + 7179.33 ac.) / 2 = 5370.39 ac.
- Storage volume between elevations 67.1 m (220 ft.) NGVD29 and 73.2 m (240 ft.) NGVD29 is 177,563 ac-ft - 73,000 ac-ft = 104,563 ac-ft.
- Average monthly inflow volume into the Main Reservoir during a drought period is 1309 ac-ft/month.
- Average monthly volume of net evaporation is 979.4 ac-ft/month.
- Average monthly seepage volume is 446.25 ac-ft/month.
- Makeup pumping from the Main Reservoir to the Auxiliary Reservoir is 265.15 ac-ft/month.
- Average monthly volume of consumptive use from the Main Reservoir is 5596 ac-ft/month.
- Total monthly use volume from Main Reservoir is 979.4 ac-ft/month + 446.25 ac-ft/month + 265.15 ac-ft/month + 5596 ac-ft/month = 7287 ac-ft/month.
- Net monthly water use from the reservoir is 7287 ac-ft/month -1309 ac-ft/month = 5978 ac-ft/month.

Using these assumptions, the estimated length of time that the storage volume of the Main Reservoir between elevations 73.2 m (240 ft.) NGVD29 and 67.1 m (220 ft.) NGVD29 could sustain the HNP and HAR without makeup water flow from the Cape Fear River is 17.5 months (104,563 ac-ft divided by 5978 ac-ft/month equals 17.5 months).

2.3.1.2.2 Auxiliary Reservoir

The Auxiliary Reservoir has a current normal pool elevation of 76.8 m (252 ft.) NGVD29 and a surface area of about 360 ac. (0.6 mi.^{2}, 0.7 percent of the drainage area); no changes to the current water level will occur in the Auxiliary Reservoir. HAR 2 and HAR 3 do not discharge into the Auxiliary Reservoir. The average elevation of water in the Auxiliary Reservoir during the period of 2001 through 2006 was 76.8 m (251.80 ft.) NGVD29, and the maximum and minimum elevations were 252.78 ft. NGVD29 and 249.10 ft. NGVD29 (Table 2.3-9). Figure 2.3-18 shows the area and capacity curves for the Auxiliary Reservoir. Additional information on sedimentation and erosion due to construction activities can be found in Section 4.2, Water-Related Impacts.

2.3.1.2.2.1 Dam and Appurtenances

The Auxiliary Dam structure has a length of 1189.6 m (3903 ft.), with a 2.5:1 (horizontal to vertical) slope on both the upstream and downstream faces (Reference 2.3-001). The top of the dam is at an elevation of 79.2 m (260 ft.) NGVD29 (about 2.4 m [8 ft.] above the normal pool elevation), with a width of 6.1 m (20 ft.) (Reference 2.3-013). The maximum height of the dam is 21.9 m (72 ft.) above the top of bedrock. Riprap is provided on the upstream and downstream slope of the dam for protection against wind-wave erosion.

The Auxiliary Dam includes a concrete service spillway with an ogee-shaped crest on the west abutment of the dam to pass floods as the only flow component. The crest of the spillway is at an elevation of 76.8 m (252 ft.) NGVD29 and has a crest length of 51.8 m (170 ft.).

The Auxiliary Reservoir Separating Dike is located about 518.1 m (1700 ft.) north of the Auxiliary Dam across the eastern arm of the Auxiliary Reservoir separating the Emergency Service Water Intake Channel from the Emergency Service Water Discharge Channel used by the HNP. The structure has a length of 365.8 m (1200 ft.), with a 2.5:1 (horizontal to vertical) slope on both the upstream and downstream faces (Reference 2.3-001). The top of the dike is at an elevation of 77.7 m (255 ft.) NGVD29 (about 0.9 m [3 ft.] above the normal pool elevation), with a width of 6.1 m (20 ft.) (Reference 2.3-013). The maximum height of the dike is 16.7 m (55 ft.) above the top of bedrock. Riprap is provided on the upstream and downstream slope of the dike for protection against wind-wave erosion.

2.3.1.2.2.2 Sedimentation

By assuming that the quantity of sediment load is proportional to drainage area, the total volume of sediment deposited in the Auxiliary Reservoir for the HNP plant life is estimated to be 20 ac-ft, which is equivalent to 0.4 percent of the Auxiliary Reservoir capacity at a normal operating level of 76.8 m (252 ft.) NGVD29. The overall effect on the bottom and shoreline configuration is negligible. Sediment that is pumped into the Auxiliary Reservoir from Harris Reservoir is insignificant because Harris Reservoir serves as a sedimentation basin (Reference 2.3-014).

2.3.1.2.2.3 Currents

Due to its small size, wind-induced currents in the Auxiliary Reservoir will be insignificant (Reference 2.3-014).

2.3.1.2.3 Other Area Bodies of Water

Two ponds are located within the boundary of the HAR site. Originally, both ponds were drainage valleys or depressions that directed overland flow to Tom Jack Creek and Thomas Creek prior to construction of the HNP. The drainage areas filled with water after Harris Reservoir and the Auxiliary Reservoir were filled to capacity. PEC proposes to fill the pond located directly north of the HAR site with soil during construction activities for HAR 2 and HAR 3. The other pond is located west of the HNP reactor and has a width of about 16.7 m (55 ft.) and a length of about 45.7 m (150 ft.).

2.3.1.2.4 Wetlands

Wetlands within the project area are listed and described in Subsection 2.4.2, Aquatic Ecology.

2.3.1.3 Groundwater

Regional groundwater is associated with non-productive aquifers (producing little water) in the early Mesozoic, Sanford Basin of the Newark Supergroup (upper Triassic Series) (Reference 2.3-015). Figure 2.3-19 presents the geologic map of North Carolina. Geologic units of the Sanford Basin consist of claystone, shale, siltstone, sandstone, conglomerate, and fanglomerate. These units have low effective porosity and poorly interconnected pores (Reference 2.3-001). Porosity is typically less than 1 percent (Reference 2.3-016). Groundwater flows primarily along joints, fractures, and bedding planes that create anisotropic conditions where most water movement is parallel to the strike of the beds. Exceptions to the Sanford Basin lithology are thin, vertically oriented, diabase dikes. These dikes are characterized by very low primary porosity and generally yield little water. However, in some locations, the strata adjacent to the dikes have been fractured by the intrusion and water wells in these areas produce higher yields. (Reference 2.3-015)

The regolith associated with the Sanford Basin consists of a thin layer of dense, clayey soil grading downward into highly to moderately weathered bedrock with increased depth. The thickness and texture of the regolith is largely dependent on the composition of the parent rock. Because the bedrock provides very low storage volumes, most groundwater (by volume) is stored in the unconsolidated materials overlying the bedrock.

To determine the minimum infiltration rate, the average soil type covering each subbasin was determined (Figure 2.3-20). Table 2.3-10 briefly summarizes the soil types in the Buckhorn Creek watershed. The study basin contains primarily three soil types: Creedmoor, Mayodan, and White Store. The U.S. Department of Agricultural (USDA) soil texture can be described approximately as sandy clay loam that falls into hydraulic soil group “C.” Characteristics of the White Store – Creedmoor–Mayodan soil types indicate a high percentage of fine soil textures with relatively high porosity but low saturated hydraulic conductivity. These soil characteristics are indicative of relatively impervious surfaces with limited infiltration and percolation.

The primary permeability of the Triassic age, sedimentary bedrock aquifer is very low. However, a secondary permeability occurs within the aquifer based on interconnected fractures. These fractures are common to depths of 30.5 m (100 ft.) below ground surface (bgs), but become less prevalent with increased depth. At depths greater than 121.9 m (400 ft.), the fractures are closed and sealed to water flow (Reference 2.3-001). Some interbedded lenses of relatively higher permeability exist. However, these units are not extensive and are commonly bound both above and below by materials with relatively lower permeability.

Results from a pilot study, conducted within Triassic age sedimentary bedrock approximately 4.5 km (2.8 mi.) to the southwest of the HAR site, indicated fractures above 61.0 m (200 ft.) bgs are mostly parallel to the bedding plane and most fractures are steeply dipping (Reference 2.3-017). Results also indicated that hydraulically significant fractures along bedding planes generally occur along contacts where large contrasts in physical properties exist (e.g., a contact between coarse-grained to conglomeratic sandstones and underlying siltstones or claystones).

Recharge in the region occurs by percolation of precipitation through the overburden. However, most of the precipitation either is returned to the atmosphere through evapotranspiration or becomes surface runoff. The predominance of surface and near-surface deposits with extremely low permeability results in rapid runoff of precipitation. An average of 15 percent of precipitation within Wake County, North Carolina recharges the groundwater aquifer; within the Triassic Basin (includes Sanford Basin), recharge values are 6 percent or lower (Reference 2.3-018). Therefore, natural recharge to the aquifer occurs at a very low rate. The low percentage of precipitation that percolates downward is confined laterally by the diabase dikes and vertically by the absence of open fractures or joints at depth.

Maximum well yields in the Triassic age sedimentary rocks are typically less than 94.6 liters per minute (l/min) (25 gpm), with average yields less than 37.9 l/min (10 gpm) (Reference 2.3-018). The use of groundwater in the region is limited because of the low well yields. A few communities in the area use the water within Triassic rocks as a water source; however, total groundwater usage is low.

2.3.1.3.1 Site Hydrogeologic Conditions

In the vicinity of the HAR site, a thin regolith overlying Triassic age, sedimentary rock consists of clayey soils and highly weathered bedrock that have low groundwater yields. The Triassic rocks, which are thick and widespread in extent, constitute the principal aquifer in the area. However, because of compaction and cementation of individual rock layers, the bedrock aquifer produces little water, and is a minor groundwater source. Boring and well locations are provided in Figures 2.3-21, 2.3-22, 2.3-23, 2.3-24, 2.3-25, 2.3-26, 2.3-27, and 2.3-28.

While constructing the HNP, the existing regolith was removed and stockpiled during site grading activities and used as fill for areas below the HNP nominal plant grade elevation of 79.2 m (260 ft.) NGVD29. No fill soil was required from outside locations that might have consisted of different soil types. During construction of the HAR, the same procedures are assumed for site preparation. Therefore, the existing and future regolith for HNP and HAR sites will consist of a mixture of native soil types.

Numerous borings were advanced during initial field investigations conducted for the HNP to gather geologic information in the plant site and the Auxiliary and Harris Reservoir areas. The bedrock below the regolith and highly weathered bedrock zones appears to have two distinct components of permeability. The primary permeability of the bedrock matrix is very low. However, a secondary permeability occurs within the aquifer based on interconnected fractures. This principal component is measured as permeability during hydrogeologic tests at the HAR site. On-site borings confirm fractures within the Triassic rocks are filled with water below the water table. These fractures are common to depths of 30.5 m (100 ft.), but become less prevalent with increased depth. At a depth greater than 121.9 m (400 ft.), the fractures are closed and sealed to water flow (Reference 2.3-001).

Down-hole pressure tests within the Triassic rocks were conducted during past site investigations in borings located in the vicinity of the HNP. Three borings were tested in 3.0-m (10-ft.) intervals under pressures up to 110 pounds per square inch (psi) at depth intervals ranging from 3.0 to 44.2 m (10 to 145 ft.) bgs (Reference 2.3-001). As reported in HNP FSAR, down-hole pressure test results ranged from 4.7 x 10^{-7} to 2.37 x 10^{-4} centimeters per second (cm/sec) (0.47 to 2.54 feet per year [ft/year]) in fine sandstone, 6.7 x 10^{-6} to 4.2 x 10^{-4} cm/sec (6.71 to 12.93 ft/year) in shaley siltstone, and 1.31 x 10^{-6} to 2.91 x 10^{-6} cm/sec (1.31 to 2.91 ft/year) in siltstone. Test results indicated zones with small water losses under high pressure were vertically positioned between dense, impervious rock layers. These impermeable intervals showed no water losses during pressure testing and ranged in thickness from 3.0 to 44.2 m (10 to 50 ft.).

Yields from known wells in the area generally range up to 76 l/min (20 gpm), but average only about 19 l/min (5 gpm) or about 0.03 gallons per minute per foot (gpm/ft) of well. Of 57 wells with an average depth of 48.2 m (158 ft.) that were constructed in the Triassic formation in western Wake County, 16 percent yield less than 3.8 l/min (1 gpm) (Reference 2.3-019). Such relatively low permeability also explains why the Triassic formation is the lowest producing groundwater source in the region.

Generally, the principal areas of groundwater storage in the Triassic Basin are found near diabase dikes that have intruded the Triassic sediments. During the construction of the HNP, 20 water wells were installed near the diabase dikes to provide water for use during construction activities; these water wells were abandoned or removed from service during HNP operational status. Based on a total capacity of 757 l/min (200 gpm) for seven wells completed in 1973 and a total capacity of 946 l/min (250 gpm) for eight wells completed over the 1977-1979 period, the average discharge rate for the 15 wells was approximately 14 l/min (30 gpm). Additional information from six site wells located in the proximity of dikes yielded specific capacity values from 24-hour driller's tests that ranged from 0.6 to 2.23 l/min (0.16 to 0.59 gpm/ft). The specific capacity values correspond to transmissivity values of about 3.7 to 12 square meters per day (m^2/day) (40 to 130 square feet per day [ft^2/day]) (Reference 2.3-001). According to observed behavior of water in a diabase dike fracture system during pumping tests at existing wells W-13 and W-15 (locations of monitoring wells are shown on Figure 2.3-28), it is possible that measurable changes in the water level may occur a few hundred feet from the reservoir in such fracture systems.

Hydrophysical logging methods were used to locate conducting features and estimate flow capacities within Triassic age, sedimentary bedrock. Logging was performed at a pilot study site located approximately 4.5 km (2.8 mi.) to the southwest of the HAR site. Flow-rate values measured at the site ranged from 0.0038 to 4.01 l/min (0.001 to 1.06 gpm) (Reference 2.3-017). The distribution of conductive zones was concentrated within the weathered zone, along strata-concordant fractures, and within an enhanced fracture zone at a fault. Most of the conductive zones were located within the weathered zone. In addition to hydrophysical logging, packer tests were performed at targeted conductive intervals. Results from packer tests indicated transmissivity values within the weathered zone ranged from 1×10^{-4} to 1×10^{-2} square centimeters per second (cm^2/sec) (0.009 to 0.9 ft^2/day) and within the unweathered zone from 1×10^{-5} to 1×10^{-1} cm^2/sec (0.0009 to 9 ft^2/day). Strata-concordant or fault fractures within the unweathered zone were typically more transmissive with values of 1×10^{-2} to 1×10^{-1} cm^2/sec (0.9 to 9 ft^2/day) (Reference 2.3-017).

To confirm the permeability results of the site investigation for the HNP, the slug test method was used within 18 monitoring wells at the HAR site to determine in-situ permeability or hydraulic conductivity values for the surficial and bedrock aquifers. Table 2.3-11 summarizes the test results. Average horizontal permeability values range from 5.1×10^{-5} cm/sec (0.1 ft/day) to 1.9×10^{-3} cm/sec (5.4 ft/day) in the surficial aquifer and 8.6×10^{-7} cm/sec (0.002 ft/day) to 3.0×10^{-4} cm/sec (0.8 ft/day) in the bedrock aquifer. These values are indicative of low permeability conditions and reflect the results from site investigations for the HNP.

Linear groundwater velocity and Darcy flux estimates for the surficial and bedrock aquifers were calculated using site parameters for HAR 2 and HAR 3. Table 2.3-12 shows the results for the seepage velocity and Darcy flux. Locations of monitoring wells tested are shown on Figures 2.3-27 and 2.3-28. Nested monitoring wells were selected both upgradient and downgradient, where possible, for each proposed unit to more accurately compare the surficial and bedrock aquifers. For HAR 2, the seepage velocity and Darcy flux for the surficial aquifer between monitoring wells MWA-3S and MWA-5S are about 0.5 ft/day and 0.052 cubic feet per day (ft^3/day), respectively; for the bedrock aquifer, the seepage velocity and Darcy flux between monitoring wells MWA-3D and MWA-5D are about 0.09 ft/day and 0.0046 ft^3/day, respectively.

Similar estimates were calculated for HAR 3. The seepage velocity and Darcy flux for the surficial aquifer between monitoring wells MWA-7S and MWA-9S are about 1.2 ft/day and 0.1 ft^3/day, respectively; for the bedrock aquifer, the seepage velocity and Darcy flux between monitoring wells MWA-7D and MWA-9D are about 0.3 ft/day and 0.013 ft^3/day, respectively. Monitoring wells MWA-7D and MWA-9D are upgradient and downgradient of HAR 3. When comparing nested monitoring wells MWA-8 and MWA-9, the bedrock values dramatically change. The seepage velocity and Darcy flux for the surficial aquifer between monitoring wells MWA-8S and MWA-9S are about 1.5 ft/day and 0.15 ft^3/day, respectively; for the bedrock aquifer, the seepage velocity and Darcy flux between monitoring wells MWA-8D and MWA-9D are about 0.002 ft/day and 0.000087 ft^3/day, respectively. A small gradient between the bedrock monitoring wells creates a numerical change in magnitude for the bedrock aquifer downgradient of HAR 3. MWA-9D had a measured depth-to-water above the ground surface that created artesian conditions. These conditions are assumed to be associated with localized diabase dikes.

2.3.1.3.2 Potentiometric Levels, Flow, and Interactions

Configuration of the potentiometric surface in the immediate vicinity of the HAR site was determined by measuring water levels in piezometers and monitoring wells installed after completing the HNP, and during the HAR site investigation conducted from June through August of 2006. On June 6 and 7, 2006, a well survey and gauging event was conducted at the HNP to determine the status of post-construction HNP monitoring wells and piezometers. An additional 21 monitoring wells were installed during the HAR site investigation to more accurately characterize the potentiometric surface, gradient, and flow pathways within the vicinity of HAR 2 and HAR 3. Nine nested well pairs (18 out of 21 wells) were installed during the investigation to determine the connectivity between the surficial and bedrock aquifers. Shallow monitoring wells were screened within the regolith directly above the residual soil/bedrock interface; deep monitoring wells were screened completely within the Newark Supergroup (upper Triassic Series) bedrock. Groundwater gauging events were conducted quarterly (August 2006, November 2006, February 2007, and May 2007) to account for seasonal and long-term variations. A summary of well construction details is presented in Table 2.3-13; potentiometric contour maps for each of the quarterly events are shown on Figures 2.3-21, 2.3-22, 2.3-23, 2.3-24, 2.3-25, 2.3-26, 2.3-27, and 2.3-28.

Recent groundwater elevations for the period of August 2006 through May 2007 are provided in Table 2.3-14. Historically, water level measurements in the bedrock aquifer collected before the construction of the HNP indicated the groundwater flow direction beneath the site was southeast toward White Oak Creek (pre-reservoir conditions) (Reference 2.3-001). Harris Reservoir, which began filling in December 1980, reached its current normal operating level of 67.1 m (220 ft.) NGVD29 in January 1983. The Auxiliary Reservoir filled to its operating level of 76.2 m (250 ft.) NGVD29 in March 1983. The operating level has since been changed to 76.8 m (252 ft.) NGVD29, which is the crest elevation of the Auxiliary Spillway (Reference 2.3-001). Current groundwater conditions are heavily influenced by surface water pressure from Harris Reservoir and the Auxiliary Reservoir. The HAR site and the HNP are bounded by the Auxiliary Reservoir to the northwest, west, southwest, and south (Emergency Service Water Intake Channel) and Harris Reservoir to the northeast, east, southeast, and south (Cooling Tower Makeup Water Intake Channel). The Emergency Service Water Discharge Channel separates the HAR site from the HNP on the western half of plant site (area where both the HAR and the HNP are located). The only area not bound by a surface water body is north of the HAR site, which is characterized as a topographic high (maximum ground surface elevation of approximately 91.4 m [300 ft.] NGVD29). The water table in the vicinity of the HAR site is influenced by the topographic high and occurs as a ridge-like mound west of HAR 3. The position of the groundwater ridge marks a recharge area from which groundwater flows west toward the Auxiliary Reservoir, south toward the Emergency Service Water Discharge Channel, and east toward the Thomas Creek Branch of Harris Reservoir. Groundwater south of the Emergency Service Water Discharge Channel is influenced by the Auxiliary Reservoir and generally flows to the southeast and east toward the Thomas Creek Branch of Harris Reservoir. The current direction of groundwater flow beneath the site in the surficial/overburden and bedrock aquifers is east in the proposed locations of HAR 2 and HAR 3, and east and southeast at the HNP.

A hydrologic alteration will result from construction activities, including the permanent change in groundwater levels within the HAR site from site grading and a series of stormwater drainage ditches. After site grading, a series of stormwater drainage ditches will be constructed around and within the site to direct stormwater and intercepted groundwater away from HAR facilities. Stormwater drainage ditches installed approximately 182.9 m (600 ft.) and farther north of HAR 3 will have bottom elevations ranging from approximately 80.5 m (264 ft.) NGVD29 or lower, while drainage ditches as close as approximately 61.0 m (200 ft.) north of HAR 3 will have bottom elevations ranging from approximately 78.0 m (256 ft.) NGVD29 or lower (Figure 2.3-29). This network of stormwater drainage ditches will intersect the water table based on known groundwater elevations and effectively lower the existing water table within the vicinity of the HAR facilities.

The series of drainage ditches surrounding the plant construction areas and the HAR facilities will form a collective barrier for the flow of groundwater into and out of the HAR facility. Groundwater will migrate to the lower open elevations in the ditch bottoms, resulting in a final groundwater regime at or slightly higher than the ditch bottom elevations. The ditches encompass the plant facilities where the final grade elevations outside of the facility limits are higher than the final plant grade of 79.6 m (261 ft.) NGVD29. They will also intercept any groundwater flow toward the HAR. These ditches will act as a natural barrier to the groundwater flow, preventing it from passing into the plant area and raising the groundwater level above the ditch bottom elevations. The groundwater levels may rise during periods of intense precipitation, but these elevated levels will be temporary.

Groundwater flow within the surficial material will be redirected toward these ditches and will ultimately discharge into the Main Reservoir.

Nine nested well pairs were installed during the 2006 HAR site investigation to determine the vertical gradient between the surficial and bedrock aquifers. Shallow monitoring wells were screened within the regolith directly above the residual soil/bedrock interface; deep monitoring wells were screened completely within the bedrock. Six of the nine nested well pairs had a greater hydraulic head within the surficial aquifer than the bedrock aquifer; this condition creates a downward vertical gradient (Table 2.3-15). Nested well pairs MWA-3S/D and MWA-8S/D located within the footprint of the safety-related structures for HAR 2 and HAR 3 had downward vertical gradients with elevation head differences as measured in the field on August 28, 2006 of 1.0 and 2.7 m (3.3 and 9.0 ft.), respectively (Table 2.3-15). Only three nested well pairs MWA-4S/D, MWA-9S/D, and MWA-10S/D installed immediately upgradient of suspected localized diabase dikes had an upward vertical gradient; elevation head differences as measured in the field on August 28, 2006 were 0.6 m, 2.0 m, and 0.3 m (1.9 ft., 6.4 ft., and 0.9 ft.), respectively. In monitoring well MWA-9D, the groundwater elevation within the bedrock aquifer was above the ground surface elevation creating artesian conditions. Vertical gradients between the surficial and bedrock aquifers remained consistent for all nested well pairs during each quarterly gauging event.

"Typical" seasonal variations (higher groundwater levels in the spring, lower groundwater levels in the fall and summer) are not consistent within the shallow or deep monitoring wells.

2.3.2 WATER USE

2.3.2.1 Surface Water Use for HAR 2 and HAR 3

The HAR site will use surface water from Harris Lake for domestic, process, and cooling tower makeup water. The normal water withdrawal from Harris Reservoir for the HAR is 42,074 gpm or 2.65 m^3/s (93.74 cfs). The normal consumptive water use from Harris Reservoir for the HAR will be 28,122 gpm or 1.77 m^3/s (62.66 cfs). The normal water returned to Harris Reservoir after usage by HAR 2 and HAR 3 is 13,952 gpm or 0.88 m^3/s (31.09 cfs). Table 2.3-16 summarizes the water withdrawal and water return flows for the HAR. Figure 2.3-30 presents a water use diagram for the HAR. The HAR water systems are described in detail in Subsection 3.3.2, Water Consumption.

Makeup water will be obtained from the Cape Fear River to maintain the proposed operating water level of the Main Reservoir at 73.2 m (240 ft.) NGVD29. The Harris Lake makeup water system has been designed to maintain the required reservoir level. This system includes the Intake Channel in the Cape Fear River, the Harris Lake makeup water system pumphouse on the Cape Fear River, the Harris Lake makeup water system pipeline from the Cape Fear River to the Main Reservoir, and the Harris Lake makeup water system discharge structure on the Main Reservoir (Figure 2.3-3). The maximum flow capacity from the Harris Lake makeup water system pumphouse to the Main Reservoir is 60,000 gpm or 3.79 m^3/s (133.68 cfs).

Water from the Cape Fear River, in addition to the Main Reservoir drainage area, will be required to fill and maintain the required pool level for normal operations. The rate at which water is withdrawn from the Cape Fear River for maintenance of water quality will be based on a set of operational rules designed to meet target flows, such as a minimum discharge of 0.57 m^3/s (20 cfs) from the Main Reservoir to Buckhorn Creek. A higher withdrawal rate will be used during high river flow periods to fill the lake and manage water quality. During periods of drought, the Main Reservoir will provide some or all of the required cooling water supply.

The requirements of the HAR and the potential impact on the water rights of other water users in the basin must be balanced. Numerous municipalities and industries rely on the Cape Fear River to provide water supply. National Pollutant Discharge Elimination System (NPDES) discharge permits for point sources in the basin are specified based on their impacts to water quality under drought conditions, usually the 7Q10 rate. Appropriate models will be used during the permitting process to affirm to the North Carolina Division of Water Resources (NCDWR) and the North Carolina Division of Water Quality (NCDWQ) that impacts to water quality will be minimal and that sufficient water supply remains for other users (Section 5.2.3).

Chatham County, where the water withdrawal is proposed to occur, does not require any locally specific permits in regards to water withdrawals. North Carolina water law is based on the “riparian rights” concept, rather than appropriated water rights. According to “riparian rights,” an owner is entitled to the natural flow of a stream running through or along his land in its channel, undiminished in quantity and unimpaired in quality. Some types of water resource projects are subject to State or federal regulations that establish parameters and procedures to determine what are reasonable uses. If a water resource development is not subject to any of these regulations, then a water use dispute could be handled as a civil law matter between riparian owners. North Carolina General Statute 143-215.22H requires a non-agricultural water user who withdraws 378,548 liters (100,000 gallons) or more in any one day of surface water to register their water withdrawals and surface water transfers and to update those registrations at least every 5 years. The federal government requires that applications for an intake construction permit (i.e., 404 Permit) and a Water Quality Certification permit (i.e., 401 Permit) be filed with the USACE and NCDWQ, respectively.

2.3.2.2 Surface Water Use

There are no known communities either upstream or downstream of Harris Reservoir that draw water from Buckhorn Creek for public water supply. The closest public surface water user downstream of the HAR site is in Lillington, North Carolina, on the Cape Fear River, about 22.0 km (13.7 mi.) downstream from the confluence of the Cape Fear River and Buckhorn Creek.

About 8851 meters (5.5 miles) upstream of the proposed HAR Reservoir Makeup Water Pumphouse structure is the Progress Energy Cape Fear Steam Electric Plant. The plant is a coal-fired steam cycle electric generating plant with two units. The plant withdraws about 20.23 m^3/s (714.51 cfs) of water from the Cape Fear River and discharges about 19.85 m^3/s (701.05 cfs) of water back into the Cape Fear River.

Public water supply locations for surface water and groundwater systems within 10 km (6 mi.) of the HAR site are shown on Figure 2.3-31 and presented in Table 2.3-17 (Reference 2.3-011 and Reference 2.3-020).

Public water supply locations for surface water and groundwater systems within 16.1 km and 40.2 km (10 mi. and 25 mi.) of the HAR site are presented in Tables 2.3-18, 2.3-19, 2.3-20, and 2.3-21 (Reference 2.3-011 and Reference 2.3-020).

Cities within 16.1 km (10 mi.) of the HAR site are Apex, Cary, Holly Springs, and Fuquay-Varina. The public water source for the cities of Apex (estimated 2004 population: 27,509) and Cary (2000 population: 94,536) is the B. Everett Jordan Lake (Reference 2.3-021, Reference 2.3-022, Reference 2.3-023, and Reference 2.3-024). Drinking water for Holly Springs, North Carolina (estimated 2004 population: 13,740) is supplied by Harnett County (Cape Fear River; intake is upstream of the Buckhorn Creek Dam) and the City of Raleigh (Falls Lake) (Reference 2.3-025 and Reference 2.3-026). The Town of Fuquay-Varina (estimated 2004 population: 11,110) purchases water from the City of Raleigh, Harnett County, and Johnston County; water sources are not specified (Reference 2.3-027 and Reference 2.3-028).

Chatham, Harnett, Lee, and Wake counties are within 16.1 km (10 mi.) of the HAR site and have a combined population of 676,770 that use groundwater and surface water from a public water supply source (Table 2.3-22). Public water supplies draw about 89 million gallons of water per day from surface waters. There are no known private surface water withdrawals for domestic water supply. Additional surface water withdrawals include: 1 million gallons per day (gpd) for livestock purposes, 17 million gpd for irrigation purposes, 2 million gpd for industrial purposes, and 387 million gpd for thermoelectric power using once-through technology (Reference 2.3-029).

Counties within a 80-km (50-mi.) radius of the HAR site have a combined population of 2,148,750 that use groundwater and surface water from a public water supply source. Public water supplies draw about 319 million gpd from surface waters. There are no known private surface water withdrawals for domestic water supply. Approximately 12 million gpd of surface water are withdrawn for livestock purposes, 94 million gpd of surface water are withdrawn for irrigation purposes, and 7 million gpd are withdrawn for industrial purposes (Reference 2.3-029).

Local governments that supply water have estimated future water use in the Cape Fear River basin for 2010. Table 2.3-23 presents the water use estimates by county. The NCDWR requires that local water systems maintain adequate water supplies and manage water demands to ensure that average daily use does not exceed 80 percent of their available supply. All six water systems in Chatham County estimate that, in 2010, water demand as a percentage of water supply will be less than 80 percent. The Cape Fear River Basin Water Supply Plan evaluates the long-term water needs of water supply systems through 2050. Table 2.3-24 presents the estimated water use by county for 2030 and 2050.

The Cape Fear River Basin Hydrologic Model was developed by Hydrologics Inc., for the NCDWR to evaluate water supply allocations (Reference 2.3-030) in the Cape Fear River basin. The model includes all significant withdrawals and discharges from the headwaters of the Cape Fear River to Lock and Dam 1. The Cape Fear River Basin Hydrologic Model will be used during the permitting process to affirm to NCDWR that no detrimental effects will occur as a result of the proposed makeup water withdrawals and that sufficient water supply remains for other uses.

Public recreation uses of Harris Lake are addressed in ER Subsection 2.5.2.6. A discussion of consultations with government agencies is contained in Section 1.2.

2.3.2.3 Groundwater Use

It is not likely that groundwater will be used at the HAR site during construction activities. No groundwater will be used for facility operation.

Maximum well yields in the Triassic age sedimentary rocks are typically less than 94.6 l/min (25 gpm), with average yields less than 37.9 l/min (10 gpm) (Reference 2.3-018). Use of groundwater in the region is limited because of low well yields and therefore, few communities in the area use the Triassic age sedimentary rocks as a source of water. In addition, most of the land within a 3.2-km (2-mi.) radius, and some beyond this distance, has been acquired by PEC. The future population in the HAR vicinity should not greatly increase and groundwater usage will remain essentially the same.

In September 2006, PEC performed a water use survey as part of the annual Land Use Census Survey for the HNP. The closest residents to the HAR site were surveyed concerning drinking water sources (groundwater, surface water, or public water supply) and well details, if known (Figure 2.3-32). Table 2.3-25 lists results from the survey. The closest resident is about 1.9 km (1.2 mi.) from the HAR site in the north-northwest direction. Visual observations confirmed all surveyed residents had water wells located on their property. Private water wells ranged in depth from 22.9 to 109.7 m (75 to 360 ft.) bgs and were completed within bedrock aquifer systems. No other water well details or usage rates were available from private residents.

Only two communities (one in New Hill, North Carolina, and one in Fuquay-Varina, North Carolina) use groundwater as a public water supply source within 8 km (5 mi.) of the HAR site. Both communities are located in Wake County. Water wells associated with these cities are located within the Carolina Slate Belt and not the Triassic basin. In the plant area, the same crystalline rocks are buried a few thousand feet beneath the Triassic sediments. Four transient, non-communities using five water wells are located in New Hill, North Carolina, and Raleigh, North Carolina, about 0.97 to 5.97 km (0.6 to 3.71 mi.) from the HAR site (Reference 2.3-020). No well details or usage rates were available for the public water supply users.

Table 2.3-23 lists the past and projected future Cape Fear River drainage basin water use for the years of 1997 and 2010.

2.3.3 WATER QUALITY

This subsection describes the water quality conditions in the surface water and groundwater that may potentially affect, or be affected by the construction or operation of the HNP facility. The potential construction effects on water quality are discussed in Chapter 4 of this ER. Operational effects on water quality and radionuclide data are discussed in Chapter 5.

2.3.3.1 Freshwater Streams

The streams and rivers in the vicinity of the HAR include Class B, Class C, Class WS-IV, and Class WS-V waters as defined by the North Carolina “Schedule of Classifications and Water Quality Standards” (Reference 2.3-031). Class B applies to waters used for primary recreation. Class C waters are defined as those supporting aquatic life propagation and maintenance of biological integrity, wildlife, secondary recreation, and agriculture. Class WS-IV waters are those defined as a source for drinking, culinary, or food-processing purposes where a more protective classification is not feasible. Class WS-V waters are protected as water supplies that are generally upstream and draining to Class WS-IV waters or waters previously used for drinking water supply purposes or waters used by industry to supply their employees, but not municipalities or counties, with a raw drinking water supply source.

The HNP uses water from Harris Reservoir that is fed by Buckhorn Creek (Class B, Class C depending on location) and its tributaries: White Oak Creek, Little White Oak Creek, Tom Jack Creek, Thomas Creek, and Cary Creek (all are Class C designation). Water quality monitoring of these streams has been very limited. However, Harris Lake, as well as downstream tributaries and Cape Fear River which are in the vicinity of the HAR are monitored frequently.

Four entities have historically collected water quality data in the project vicinity: the USGS, the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Water Quality (DWQ), the Middle Cape Fear River Basin Association (MCFRBA) and Progress Energy. Figure 2.3-33 presents the location of the water quality sampling stations in the vicinity of the HAR.

2.3.3.1.1 Cape Fear River

Data from the USGS Station 02102500 on the Cape Fear River at Lillington, North Carolina were collected from 1957 to 1983 and are summarized in Tables 2.3-26, 2.3-27, and 2.3-28 (Reference 2.3-032). Temperature measurements ranged from 0.6 to 29.2 degrees Celsius (°C) (33.1 to 84.6 degrees Fahrenheit [°F]) varying seasonally. Dissolved oxygen concentrations ranged from 6.1 to 14.5 milligrams per liter (mg/L) and varied seasonally higher in the winter months and lower in the summer months. The pH values of Cape Fear River ranged typically from 6 to 8 standard units (SU) with no significant temporal trends.

The most recent monitoring event (September 9, 2004) by the USGS showed that the concentrations of cadmium, chromium, copper, arsenic, mercury, nickel, zinc, ammonia, phosphorus, chloride, and sulfate meet North Carolina Water Quality Standards, where applicable, with no significant temporal trends.

The NCDWQ monitored the Cape Fear River at two stations on the Cape Fear River in the vicinity of the HAR—Station B6160000 (Cape Fear River at Highway NC-42 near Corinth) and Station B6370000 (Cape Fear River at Lillington) from 1968 to the present. Tables 2.3-29, 2.3-30, 2.3-31, 2.3-32, 2.3-33, and 2.3-34 summarize data from these stations. With the exception of an occasional outlier (often metals sampling from the early monitoring period), water quality has generally been good at both stations. Temperature measurements varied seasonally and ranged from 3.0 to 34.0°C (37.4 to 93.2°F) at Station B6160000 and from 2.0 to 32.0°C (35.6 to 89.6°F) at Station B6370000. The pH values ranged from 5.4 to 9.8 SU at Station B6160000 and 2.3 to 9.3 SU at Station B6370000. Dissolved oxygen concentrations ranged from 1.0 to 15.7 mg/L at Station B6160000 and from 4.1 to 13.1 mg/L at Station B6370000. Dissolved oxygen concentrations varied seasonally—higher in the winter months and lower in the summer months.

Metals concentrations at B6160000 were below applicable aquatic life and drinking water standards with the exception of mercury, which exceeded the State Water Quality Standard on two occasions in the early 1970s. Mercury concentrations exceeded the State Water Quality Standard numerous times at Station B6370000. However, at that station, the State's threshold for determining impairment was exceeded not more than 10 percent of the time. Fecal coliform concentrations were above 400 colonies per 100 milliliters (mL) at both stations, which indicates the potential for some level of impairment typical of stormwater runoff from urban and agricultural areas.

CP&L also collected data monthly from 1978 to 1983 at Station D2 on the Cape Fear River near the Buckhorn Dam, as shown on Figure 2.3-34 and summarized in Table 2.3-35. D2 was sampled most recently in January 2007. The results of this monitoring event showed that the concentrations of arsenic, nickel, ammonia, nitrate, nitrite, phosphate, orthophosphate, phosphorus, chloride, and sulfate are generally low and within the North Carolina Water Quality Standards, where applicable. Chromium, lead, and mercury observations were below the North Carolina Water Quality Standards. In at least one sample, zinc, manganese, and copper concentrations were above the State Water Quality Standard. It should be noted, however, that clean techniques for sampling metals were not used during the period of collection. In addition, the standards for zinc and copper are action level standards, which are generally not bioaccumulative and have variable toxicity to aquatic life because of chemical form, solubility, and stream characteristics. Historically, NCDWQ has not rated streams with high action level standards as impaired for those parameters unless accompanying biological data indicate impairment.

The MCFRBA summarized the current water quality findings for the Middle Cape Fear River Basin in their annual report of 2005 (Reference 2.3-033). Based on the results from samples collected from Station B6160000 (Cape Fear River above Buckhorn Dam) during 2005, the MCFRBA rated dissolved oxygen, turbidity and chlorophyll *a* within normal ranges for a Piedmont River. However, fecal coliform at Station B6160000 was measured above the acceptable water quality standard value. MCFRBA also collected samples at Station B6370000 (Cape Fear River at Highway NC-42 in Lillington). There were no exceedances of the water quality standards for lead, nickel, chromium, cadmium, copper, zinc, manganese, mercury, or arsenic. Dissolved oxygen, turbidity, and fecal coliform were rated as within the expected ranges at Station B6370000.

NPDES discharge permits for point sources are specified based on their impacts to water quality under low-flow conditions. Reductions in flow from makeup water withdrawals would also reduce the dilution potential of the river at these discharge points, potentially worsening water quality and requiring more stringent controls. The USEPA’s QUAL-2E model steady-state water quality model will be used during the permitting process to evaluate the potential impacts of the proposed withdrawals (Reference 2.3-034).

2.3.3.1.2 Haw River

Tables 2.3-36, 2.3-37, and 2.3-38 summarize data from the USGS Station 02098198 on the Haw River below B. Everett Jordan Dam in Moncure, North Carolina (Reference 2.3-035). The station was sampled during 1981 through 1985 and during 2004. Temperature measurements ranged from 4°C to 32°C varying seasonally. Dissolved oxygen concentrations ranged from 3.7 to 14.9 mg/L and varied seasonally, higher in the winter months and lower in the summer months. The pH of Haw River ranged from 5.4 to 8.5 SU with no significant temporal trends. The most recent monitoring event (September 9, 2004) showed that concentrations of chromium, copper, lead, mercury, arsenic, nickel, zinc, ammonia, phosphorus, chloride, and sulfate were below State Water Quality Standards, where applicable.

The NCDWQ monitored the Haw River at one station in the vicinity of the HAR, Station B4050000 (Haw River below B. Everett Jordan Dam), from 1971 to the present. Tables 2.3-39, 2.3-40, and 2.3-41 summarize data from this station.

Temperature measurements varied seasonally and ranged from 0.0° to 30.0°C (32° to 86°F). The pH values ranged from 2.7 to 9.0 SU. Dissolved oxygen concentrations ranged from 3.2 to 18.5 mg/L. Dissolved oxygen concentrations varied seasonally with higher concentrations in the winter months and lower concentrations in the summer months. Monitoring results for arsenic, lead, manganese, mercury, and zinc were typically below the detection limit but did exceed the State Water Quality Standards for a number of samples. Fecal coliform and turbidity measurements were also occasionally high.

2.3.3.1.3 Deep River

The USGS Station 02102000 on the Deep River at Moncure, North Carolina was sampled during 1955 and 1983 and during 2002 to 2004. Tables 2.3-42, 2.3-43, and 2.3-44 summarize data from USGS Station 02102000 (Reference 2.3-036). Temperature measurements from the station ranged from 2.4° to 30.8°C (36.3° to 87.4°F), varying seasonally. Dissolved oxygen concentrations ranged from 3.3 to 14.9 mg/L and varied seasonally higher in the winter months and lower in the summer months. The pH of Deep River typically ranged from 6 to 8 SU with no significant temporal trends. Recent monitoring showed that the concentrations of chromium, copper, lead, mercury, arsenic, nickel, zinc, manganese, ammonia, phosphorus, chloride, and sulfate are within water quality standards, where applicable.

The NCDWQ monitored the Deep River at one station in the vicinity of the HAR, Station B6050000 (Haw River below B. Everett Jordan Dam) from 1992 to 2002. Tables 2.3-45, 2.3-46, and 2.3-47 summarize data from this station.

Dissolved oxygen and pH values are all within NCDWQ water quality standards for Class C waters. Temperature measurements varied seasonally and ranged from 3.0° to 30.2°C (37.4° to 86.3°F). The pH values ranged from 5.6 to 8.2 SU. Dissolved oxygen concentrations ranged from 5.2 to 13.8 mg/L. Dissolved oxygen concentrations varied seasonally—higher in the winter months and lower in the summer months. Monitoring results for metals also demonstrated good water quality with the exception of two mercury exceedances and one observation of copper and zinc above their action level standards.

2.3.3.1.4 Buckhorn Creek

Flow in Buckhorn Creek downstream of Harris Reservoir is presently controlled by the Main Dam. Water is discharged to the creek when enough water is present in Harris Reservoir to spill over the Main Spillway. Monthly samples were collected for CP&L from Station BK2 on Buckhorn Creek near the convergence with Cape Fear River from 1978 to 1983, as shown on Figure 2.3-34 and summarized in Table 2.3-35. Temperature measurements ranged from 1.3 to 30°C (34.3 to 86°F), varying seasonally. Dissolved oxygen concentrations ranged from 4.3 to 13 mg/L and varied seasonally—higher in the winter months and lower in the summer months. The average pH of Buckhorn Creek was 7 SU, with no significant temporal trends.

Station BK2 was sampled for PEC most recently in January 2007. The results of this monitoring event showed that the concentrations of chromium, copper, manganese, mercury, zinc, arsenic, nickel, ammonia, nitrate, nitrite, phosphate, orthophosphate, phosphorus, chloride, sulfate, chemical oxygen demand, biochemical oxygen demand, and chlorophyll *a* are within acceptable levels.

2.3.3.2 Harris Lake

Harris Lake consists of Harris Reservoir and the Auxiliary Reservoir. The State of North Carolina classifies Harris Lake as Class WS-V (drinking water supply designation) (Reference 2.3-037). Water quality data have been gathered from Harris Reservoir since 1982.

Harris Reservoir may be affected by introduction of water from the Cape Fear River. The USACE's BATHTUB reservoir water quality model will be used during the permitting process to assess the potential affects of different inflow options (Reference 2.3-038).

As part of the nonradiological Environmental Monitoring Program, PEC collects water quality parameters and chemical data at four locations in Harris Reservoir. Harris Reservoir is currently monitored four times a year (January, May, July, and November) at four sample stations (E2, H2, P2, and S2), which are presented on Figure 2.3-34.

Water quality parameters of temperature, dissolved oxygen, specific conductivity, and pH were taken at the surface and at 1-m (3.3-ft.) intervals to the reservoir bottom. Secchi disk transparency measurements (a water clarity indicator) were taken at each location. Analytical samples were collected at the surface of sample stations E2, H2, P2, and S2, and at the bottom of Station E2. Table 2.3-48 summarizes the water chemistry data from 1990-2004. The 2004 Environmental Monitoring Report was the latest available at the time of this writing.

2.3.3.2.1 Temperature

Table 2.3-49 summarizes temperature data from 1990-2004. The waters at the stations in Harris Reservoir were generally stratified in May and July (warmer months) and were freely circulating in January and November. In the deepest station, E2, the mean temperature during May ranged from 13.0 to 22.3°C

(55.4 to 72.1°F). In November, the temperature in Station E2 ranged from 14.6 to 16.4°C (52.3 to 61.5°F).

Under State of North Carolina requirements, temperature of Harris Lake should not exceed 2.8°C (5 degrees Fahrenheit [°F]) above the natural water temperature and 32°C (89.6°F) for the lower piedmont waters.

2.3.3.2.2 Dissolved Oxygen

As the water temperature increases, a well-defined thermocline develops during the summer. Dissolved oxygen concentrations in the hypolimnion (bottom waters) typically decrease to anoxic conditions (less than 1 mg/L) due to lack of water circulation and bacterial respiration in the hypolimnion. A bottom water oxygen decline is typical in summer months in deeper parts of Harris Reservoir and also occurs in other productive southeastern water bodies (Reference 2.3-039). Table 2.3-50 summarizes dissolved oxygen data from 1990 to 2004.

2.3.3.2.3 Specific Conductance

Specific conductance is an estimation of the concentrations of the dissolved ions. Specific conductance was shown to increase with depth during the summer months as the water in Harris Reservoir became thermally stratified. When the water near the bottom became increasingly devoid of oxygen during stratification, conditions were favorable for chemical reduction and dissolution of ions to occur. Table 2.3-51 summarizes specific conductance data from 1990 to 2004.

2.3.3.2.4 pH and Total Alkalinity

Table 2.3-52 summarizes pH data from 1990-2004. There were no significant spatial trends for pH. During the summer months, pH tended to be slightly higher at the surface. Because chlorophyll *a* concentrations are higher during the summer months, higher pH values may be a result of photosynthesis by phytoplankton (Reference 2.3-040).

There were no significant spatial trends for alkalinity among the surface station samples, which ranged from 12.1 to 13.0 mg/L (as calcium carbonate [$CaCO_3$]). However, the alkalinity at the bottom of sample station E2 was on average approximately 70 percent higher in total alkalinity. Sharp increases at the bottom of sample station E2 during the July events attributed to the higher average.

2.3.3.2.5 Water Clarity

Table 2.3-53 summarizes Secchi disk transparency data from 1990 to 2004. The Secchi disk transparency depths from the four monitoring stations ranged from 0.3 to 4.5 m (0.98 to 14.8 ft.). There were no significant spatial trends for water clarity. The mean Secchi disk transparency depths at each station were not significantly different and ranged from 1.4 to 1.6 m (4.6 to 5.2 ft.).

Total dissolved solids were not significantly different, ranging from 10 to 140 mg/L and were below the State Water Quality Standard of 500 mg/L. Total suspended solids at the four surface stations ranged from 1 to 35 mg/L and were significantly higher at sample station S2. The mean total suspended solids measurement at sample station S2 was equal to the mean measurement at the lake bottom at sample station E2. The higher suspended solid measurements at sample station S2 may be because the S2 station has the shallowest depth and it is relatively close to the headwaters, which receives solids from tributary input.

Turbidity averages at each of the stations ranged for 3.1 to 9.4 nephelometric turbidity units (NTUs). The mean turbidity since 1990 at sample station S2 was significantly higher than the other stations during that period. However, the mean turbidity at sample station S2 for 2004 was less than those at the other three stations (3.2 NTU). However, all turbidity as well as solids data indicated that Harris Reservoir has relatively clear waters with low sediment loading from the surrounding watershed. All turbidity values were below the State Water Quality Standard of 50 NTU. Table 2.3-48 summarizes total solids, total dissolved solids, total suspended solids, and turbidity measurements.

2.3.3.2.6 Nitrogen

Nitrogen forms were analyzed in Harris Reservoir including total nitrogen, ammonia nitrogen (NH_3-N), and nitrate plus nitrite nitrogen. Table 2.3-48 summarizes nitrogen data from 1990-2004. Total nitrogen ranged from 0.05 to 7.3 mg/L. The mean of the samples collected at the surface were not significantly different. Harris Reservoir water is below the drinking water quality standard of 10.0 mg/L nitrate nitrogen; there is no surface water standard for nitrate.

2.3.3.2.7 Phosphorus

Table 2.3-48 summarizes total phosphorus concentrations in Harris Reservoir from 1990-2004, which ranged from 0.011 to 1.3 mg/L. There were no significant spatial differences among the mean surface waters of Harris Reservoir. However, the mean concentration of the samples collected at the bottom of sample station E2 was significantly higher than that of the samples collected at the surface This is a function of stratification of bottom waters and less biological uptake of nutrients in the hypolimnion by algae.

2.3.3.2.8 Ions and Hardness

Table 2.3-48 summarizes chloride, sulfate, calcium, and magnesium in Harris Reservoir from 1990-2004. There were no significant spatial differences in the mean chloride concentrations in Harris Reservoir. Chloride ranged from 3.1 to 14 mg/L and was below the water quality standard of 250 mg/L.

There were no significant spatial differences in the mean sulfate concentrations in Harris Reservoir. Sulfate, which ranged from 1 to 18 mg/L, was below the water quality standard of 250 mg/L.

There were no significant spatial differences in calcium or magnesium in the surface waters of Harris Reservoir. The mean hardness of the surface waters ranged from 15.8 to 18.4 mg/L as $CaCO_3$ and was below the water quality standard of 100 mg/L as $CaCO_3$.

2.3.3.2.9 Metals

Table 2.3-48 summarizes aluminum, arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc concentrations in Harris Reservoir. There were no spatial differences in the mean concentrations of arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc in Harris Reservoir; however, aluminum was significantly higher in mean concentration at sample station S2. With the exception of mercury, all metals were below State Water Quality standards, where applicable.

2.3.3.2.10 Chlorophyll *a*

Chlorophyll *a* concentrations are an indicator of algal biomass. Since 1994, chlorophyll *a* concentrations ranged from 1.2 to 86.8 micrograms per liter (µg/L). There were no significant spatial differences of mean chlorophyll *a* concentrations in the surface waters of Harris Reservoir. The North Carolina Water Quality Standard for chlorophyll *a* is 40 µg/L. Concentrations of chlorophyll *a* have not exceeded 40 µg/L since 1999.

2.3.3.3 Groundwater

The following description of the groundwater quality conditions is based on groundwater samples collected from wells located at the facility. Figure 2.3-35 presents the locations of monitoring wells. Groundwater samples were collected in three wells (Wells W-2, W-4, and W-7A) in March 1973 by the North Carolina Board of Health. Groundwater samples were also collected in September 2006 and January 2007 in wells MWA-4D, MWA-4S, MWA-7D, MWA-7S, MWA-9D, and MWA-9S for PEC. Table 2.3-54 presents the groundwater analytical data.

2.3.3.4 Impaired Waters and Pollutant Sources

Section 303(d) of the Clean Water Act (CWA) requires states to develop a list of waters that either do not meet water quality standards or have impaired uses. Listed waters must be prioritized, and a management strategy or total maximum daily load (TMDL) must subsequently be developed for all listed waters. Figure 2.3-36 presents a map of water bodies that are on the North Carolina impaired waters list within the vicinity of the HAR site. Table 2.3-55 presents the water bodies that are listed on the 2006 North Carolina 303(d) list for Chatham, Harnett, Lee, and Wake counties.

The Haw River just below the B. Everett Jordan Dam and upstream of the proposed intake on the Cape Fear River, which is classified as WS-IV, is listed as stressed for pH and chlorophyll *a* on the 2006 North Carolina 303(d) list.

Figure 2.3-37 presents the locations of wastewater treatment plants (WWTPs) within the vicinity of the HAR site. WWTPs can be a common source of water quality impairments due to elevated nutrients. Aside from the WWTPs at the HNP site, only one WWTP, located in Holly Springs, is within 10 km (6 mi.) of the HAR site. The town of Holly Springs is evaluating the relocation of its discharge to combine with discharge from future Western Wake Regional Wastewater Management Facilities and discharges may be into the Cape Fear River. This would eliminate some nutrients from Harris Reservoir. The HNP waste effluents are described in Section 3.6, Nonradioactive Waste Systems.

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Table 2.3-1 (Sheet 1 of 2)
Monthly Mean Streamflow Measurements for Buckhorn Creek, NC

Buckhorn Creek Monitoring Station
Chatham County (Near Corinth)
USGS Station Identification #: 02102192
Hydrologic Unit Code: 3030004
Latitude: 35˚33' 35" Longitude: -78˚58' 25"
Drainage Area: 76.3 mile²

	Monthly Mean Streamflow, in cfs											
Year	January	February	March	April	May	June	July	August	September	October	November	December
1972	ND	ND	ND	ND	ND	18.9	17.2	9.3	8.1	15.8	147.0	221.0
1973	135.0	344.0	158.0	178.0	35.1	153.0	32.5	15.4	4.8	2.8	4.9	25.9
1974	110.0	176.0	110.0	62.7	181.0	37.4	8.3	95.5	64.6	10.3	12.0	68.8
1975	299.0	188.0	209.0	52.1	24.4	12.7	291.0	8.5	34.4	24.7	48.5	95.3
1976	153.0	82.5	68.4	24.4	20.5	28.6	5.1	3.2	4.3	14.1	13.9	89.8
1977	150.0	40.2	279.0	66.1	8.5	4.9	1.7	3.5	12.4	22.8	46.7	57.5
1978	387.0	64.7	213.0	229.0	143.0	50.7	18.1	12.7	2.4	7.1	12.7	35.5
1979	178.0	270.0	105.0	137.0	165.0	44.1	38.7	10.8	160.0	28.7	224.0	41.1
1980	156.0	74.2	250.0	82.3	20.7	20.3	8.6	2.1	2.0	3.8	2.8	2.7
1981	2.5	8.9	2.7	1.8	2.0	0.7	0.3	1.1	0.9	0.7	1.9	3.0
1982	9.5	9.2	11.0	5.2	2.3	7.4	7.4	3.1	1.1	1.1	3.3	4.4
1983	9.8	215.0	249.0	240.0	73.7	35.0	9.6	1.3	1.4	3.4	7.2	143.0
1984	241.0	223.0	250.0	262.0	107.0	138.0	80.3	58.7	1.9	16.8	15.2	14.0
1985	46.7	187.0	46.3	12.1	4.5	1.9	11.0	24.9	3.9	1.3	37.3	38.5
1986	15.6	31.3	74.8	21.0	14.2	8.0	0.5	199.0	40.2	0.9	2.4	18.8
1987	219.0	159.0	248.0	149.0	44.6	3.2	1.7	1.1	1.8	0.9	2.0	3.8
1988	5.7	24.3	14.9	6.9	2.8	2.8	1.3	0.8	1.1	2.2	7.0	2.2
1989	2.6	46.5	335.0	168.0	184.0	48.3	102.0	28.0	10.6	60.5	48.7	121.0
1990	89.7	120.0	104.0	130.0	34.8	14.6	1.0	1.2	1.2	7.3	6.3	7.4

Table 2.3-1 (Sheet 2 of 2)
Monthly Mean Streamflow Measurements for Buckhorn Creek, NC

	Monthly Mean Streamflow, in cfs											
Year	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
1991	64.8	30.4	78.3	57.7	55.5	21.6	6.6	3.4	1.2	1.0	0.8	1.4
1992	2.5	1.4	1.7	1.1	1.6	42.9	56.3	1.7	1.8	2.1	100.0	105.0
1993	203.0	64.3	269.0	312.0	23.1	1.7	1.1	1.0	1.1	3.2	1.9	8.5
1994	6.3	28.8	150.0	57.8	15.1	1.6	4.6	1.3	1.2	9.7	18.8	20.8
1995	26.0	123.0	165.0	9.6	8.3	93.0	74.2	2.5	3.8	128.0	146.0	31.9
1996	83.0	156.0	101.0	57.0	51.7	18.3	8.9	4.3	335.0	66.5	49.7	85.6
1997	85.3	143.0	76.5	63.5	106.0	26.8	16.4	3.0	1.0	1.0	4.0	12.6
1998	153.0	348.0	421.0	138.0	104.0	12.0	1.2	0.7	1.5	2.6	3.0	2.4
1999	10.4	12.2	21.8	13.7	3.8	1.1	1.1	1.0	189.0	137.0	25.5	45.5
2000	125.0	215.0	55.7	31.3	10.4	8.7	2.9	8.4	6.6	2.8	1.9	2.3
2001	2.1	2.9	42.4	114.0	3.2	98.1	182.0	191.0	9.3	3.9	8.7	8.2
2002	83.3	63.6	7.9	44.4	1.5	0.9	0.6	0.3	0.7	5.4	58.3	154.0
2003	82.5	180.0	376.0	309.0	62.5	62.0	69.3	242.0	50.2	10.4	5.1	50.7
2004	21.3	94.3	73.4	18.7	65.0	26.1	15.7	72.4	98.6	14.7	9.4	8.0
2005	26.5	40.0	152.2	75.2	8.9	0.7	0.3	0.3	0.2	ND	ND	ND
Minimum	2.1	1.4	1.7	1.1	1.5	0.7	0.3	0.3	0.2	0.7	0.8	1.4
Maximum	387.0	348.0	421.0	312.0	184.0	153.0	291.0	242.0	335.0	137.0	224.0	221.0
Mean of Monthly Streamflow (cfs)	96	114	143	95	48	31	32	30	31	19	33	46

Notes:
cfs = cubic feet per second
ND = no data available for the given time period

Source: Reference 2.3-041

Table 2.3-2
Yearly Peak Streamflow Measurements for Buckhorn Creek, NC

Buckhorn Creek Monitoring Station
Chatham County (Near Corinth)
USGS Station Identification #: 02102192
Hydrologic Unit Code: 3030004
Latitude: 35˚ 33' 35"
Longitude: -78˚ 58' 25"
Drainage Area: 76.3 mile^2

Year	Date	Streamflow (cfs)
1972	December 16, 1972	1,530
1973	February 2, 1973	3,130
1974	August 7, 1974	890
1975	July 5, 1975	2,150
1976	January 28, 1976	891
1977	March 14, 1977	1,680
1978	April 26, 1978	2,820
1979	September 6, 1979	1,740
1980	March 21, 1980	951
1981	February 20, 1981	58
1982	July 29, 1982	129
1983	April 16, 1983	470
1984	March 29, 1984	781
1985	April 10, 1985	319
1986	August 20, 1986	766
1987	March 1, 1987	889
1988	March 28, 1988	114
1989	March 7, 1989	562
1990	April 1, 1990	328
1991	May 20, 1991	216
1992	November 26, 1992	390
1993	April 6, 1993	770
1994	March 3, 1994	453
1995	February 19, 1995	401
1996	September 6, 1996	1,940
1997	April 29, 1997	480
1998	March 19, 1998	1,190
1999	September 30, 1999	913
2000	February 1, 2000	314
2001	August 12, 2001	828
2002	January 25, 2002	347
2003	April 11, 2003	982
2004	May 3, 2004	200
2005	March 18, 2005	284

Notes:
cfs = cubic feet per second

Source: Reference 2.3-042

Table 2.3-3
Calculated Peak Flood Magnitudes and Frequencies at the Buckhorn Creek and Lillington Monitoring Stations

Monitoring Station	Recurrence Interval (year)	Streamflow (cfs)
Buckhorn Creek	2.33	764
	10	1,907
	25	2,695
	50	3,326
	100	3,985
Lillington	2.33	34,624
	10	57,900
	25	73,104
	50	85,389
	100	98,510

Table 2.3-4
Monthly Mean Measurements at the Buckhorn Creek Gauging Station (USGS 02102192)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.47	2.305	2.725
1997	2.716	3.177	2.609	2.283	2.806	1.927	1.664	1.421	1.382	1.68	ND	2.63
1998	3.637	4.86	4.9	3.155	ND	1.598	1.313	ND	1.401	1.454	1.582	1.446
1999	1.63	1.993	2.198	2.032	1.353	ND	1.263	1.222	3.329	3.868	2.027	2.21
2000	2.992	3.779	2.336	1.996	1.564	1.484	1.38	1.55	1.527	1.428	1.531	1.438
2001	1.421	1.449	1.98	2.792	1.4	2.721	3.205	3.209	1.647	1.509	1.64	ND
2002	2.282	2.494	1.697	2.206	1.389	1.265	1.406	1.214	1.237	ND	ND	ND
Mean of Monthly Gauge Height	2.45	2.96	2.62	2.41	1.7	1.8	1.71	1.72	1.75	2.07	1.82	2.09

Notes:
No incomplete data are used for statistical calculation. Measurements are in feet. Gauge datum 154.63 feet above sea level NGVD29.

ND = no data available for the given time period

Source: Reference 2.3-041

Table 2.3-5
Cape Fear River Basin Monitoring Station Summary

											Historical Water Records					
											High Water			Low Water		
USGS Monitoring Station	River or Creek Location	USGS Station Identification	Hydrologic Unit Code	Lat.	Long.	Drainage Area ($mile^2$)	Distance from Confluence of Buckhorn Creek and Cape Fear River (river feet/mile)	Flood Stage (feet)	Discharge at Flood Stage (cfs)	Monitoring Period	Date	Stage Height (feet)	Daily Mean Discharge (cfs)	Date	Stage Height (feet)	Daily Mean Discharge (cfs)
East Fork Deep River Near High Point, NC	Deep River	02099000	03030003	36° 02' 14"	79° 56' 44"	14.8	201,410 / 38.1(above)	ND	ND	October 1, 1928 – July 5, 2006	September 24, 1947	ND	1,670	August 8, 2002	2.15	0.61
Deep River at Ramseur, NC	Deep River	02100500	03030003	35° 43' 35"	79° 39' 20"	349	137,935 / 26.1 (above)	ND	ND	April 1, 1923 – July 5, 2006	September 18, 1945	ND	27,800	November 29, 1941	ND	0.7
Deep River at Moncure, NC	Deep River	02102000	03030003	35° 37' 37"	79° 06' 58"	1,434	19,587 / 3.7 (above)	20	ND	August 1, 1930 – July 4, 2006	September 18, 1945	ND	66,400	October 9, 1954	ND	6
Haw River at Haw River	Haw River	02096500	03030002	36° 05' 14"	79° 21' 58"	606	81,841 / 15.5 (above)	18	9,879	October 1, 1928 – July 4, 2006	September 7, 1996	26.61	42,000	September 6, 1930	ND	5
Haw River Near Bynum, NC	Haw River	02096960	03030002	35° 45' 55"	79° 08' 09"	1,275	33,011 / 6.25 (above)	11	13,790	September 26, 1973 – July 4, 2006	September 6, 1996	ND	58,000	September 10, 1983	ND	0.18
Buckhorn Creek NR Corinth, NC	Buckhorn Creek	02102192	03030004	35° 33' 35"	78° 58' 25"	76.3	On Buckhorn Creek	ND	ND	June 1, 1972 – July 5, 2006	February 2, 1973	ND	3,130	September 2, 1976	ND	0.04
Cape Fear River at Lillington, NC	Cape Fear River	02102500	03030004	35° 24' 22"	78° 48' 48"	3,464	72,575 / 13.7 (below)	14	30,000	January 1, 1924 – July 4, 2006	September 19, 1945	ND	140,000	October 14, 1954	ND	11
Cape Fear River at Fayetteville, NC	Cape Fear River	02104000	03030004	35° 03' 02"	78° 51' 30"	4,395	264,840 / 50.2(below)	35	30,300	January 1, 1889 – July 2, 2006	ND	ND	ND	ND	ND	ND
Cape Fear River R at Wilm O Huske Lock NR Tarheel, NC	Cape Fear River	02105500	03030005	35° 50' 45"	78° 49' 14"	4,852	369,865 / 70.1 (below)	42	17,000	October 1, 1937 – July 4, 2006	September 21, 1945	ND	112,000	August 13, 1999	0.36	154
Cape Fear R at Lock #1 NR Kelly, NC	Cape Fear River	02105769	03030005	34° 24' 16"	78° 17' 37"	5,255	666,983 / 126.3 (below)	24	45,830	July 1, 1969 – June 29, 2006	March 3, 1979	ND	57,100	August 10, 2002	14.00	179

Notes:
cfs = cubic feet per second
ND = no data recorded for parameter

Sources: Reference 2.3-043 and Reference 2.3-044

Table 2.3-6 (Sheet 1 of 3)
Monthly Mean Streamflow Measurements for the Cape Fear River at the Lillington Gauging Station (USGS 02102500)

Cape Fear River Monitoring Station
Harnett County
USGS Station Identification #: 02102500
Hydrologic Unit Code: 3030004
Latitude: 35° 24’ 22”
Longitude: -78° 48’ 48”
Drainage Area: 3,464.0 mile^2

Year	Monthly Mean Streamflow, in cfs											
	January	February	March	April	May	June	July	August	September	October	November	December
1924	4,222	5,896	4,322	4,765	3,565	1,785	4,825	2,574	4,525	4,510	1,409	2,450
1925	14,660	4,303	3,283	1,624	1,721	542	614	517	332	153	530	746
1926	2,833	8,058	4,961	4,185	550	730	1,705	912	287	89.8	300	2,200
1927	1,331	4,354	6,264	1,932	753	1,161	3,503	2,523	1,084	3,788	1,234	7,433
1928	1,342	3,816	2,743	8,142	4,420	2,842	1,947	5,770	22,970	2,410	958	928
1929	1,406	6,969	16,550	4,582	4,175	3,966	4,559	2,539	1,092	13,640	5,677	4,717
1930	4,591	5,380	2,416	2,097	1,054	1,648	1,064	405	166	101	396	2,007
1931	2,584	1,165	2,145	5,464	5,242	812	1,435	7,355	567	195	225	2,294
1932	7,201	4,100	6,761	2,451	1,463	3,081	441	553	360	3,183	3,891	9,350
1933	5,280	5,623	2,782	3,393	1,129	532	333	1,260	803	132	141	240
1934	458	1,280	4,410	6,137	1,811	5,201	2,594	1,637	5,154	1,061	2,032	5,639
1935	5,268	4,386	6,726	7,553	3,022	809	1,186	304	3,025	321	1,801	1,942
1936	14,940	11,650	9,427	13,730	877	3,138	2,150	2,685	782	3,750	1,065	6,382
1937	14,750	6,676	3,963	5,959	2,059	996	1,124	3,882	2,647	1,540	1,237	1,259
1938	3,451	1,603	2,617	3,171	1,342	3,104	7,063	1,386	778	347	1,753	3,136
1939	3,412	14,000	8,414	3,417	2,943	1,206	2,509	8,709	1,068	503	642	1,078
1940	2,147	6,787	4,002	3,862	1,593	1,723	720	3,817	632	167	3,289	1,809
1941	2,746	1,961	4,209	5,688	699	1,308	3,569	456	371	118	107	622
1942	569	3,320	5,829	1,539	2,935	2,387	723	2,039	2,063	1,300	1,865	4,203
1943	7,899	5,117	6,584	4,989	1,361	2,136	6,660	655	852	210	389	937
1944	5,384	7,889	11,250	7,976	2,373	507	3,978	1,805	1,610	6,402	2,036	3,247
1945	3,569	8,238	3,845	2,123	1,535	448	3,086	1,902	21,630	1,971	1,175	8,318
1946	7,529	10,410	2,751	2,809	5,110	2,652	3,965	3,279	1,107	2,108	2,143	1,707
1947	9,667	2,100	4,607	4,291	943	585	685	514	3,261	1,610	6,874	2,044
1948	4,023	13,070	6,719	5,426	1,872	1,825	944	1,654	509	2,126	9,188	8,583
1949	5,656	6,730	3,518	3,562	5,815	1,018	3,196	5,939	2,576	3,302	4,748	2,257

Table 2.3-6 (Sheet 2 of 3)
Monthly Mean Streamflow Measurements for the Cape Fear River at the Lillington Gauging Station (USGS 02102500)

Year	Monthly Mean Streamflow, in cfs											
	January	February	March	April	May	June	July	August	September	October	November	December
1950	3,000	2,504	4,092	1,507	4,838	1,525	4,525	915	777	899	629	2,181
1951	1,440	2,025	3,209	5,891	922	1,249	592	743	170	115	353	3,274
1952	4,412	6,246	15,020	3,934	2,427	990	512	2,713	6,583	604	4,291	2,595
1953	8,533	9,656	9,353	3,980	1,681	1,689	522	254	525	164	175	1,804
1954	10,600	2,819	4,957	4,209	1,906	690	373	279	150	4,872	1,002	3,482
1955	1,935	6,768	3,340	3,750	1,056	478	1,419	4,684	4,690	2,067	1,018	671
1956	688	6,705	5,787	3,775	2,259	1,079	2,055	666	2,042	3,492	1,796	3,916
1957	1,818	9,604	6,793	3,040	1,716	3,536	1,401	2,244	2,006	2,373	7,981	5,577
1958	8,434	6,533	5,504	9,901	8,605	1,275	1,580	1,085	300	691	540	2,634
1959	3,101	5,552	3,469	10,650	1,721	2,140	3,793	1,913	2,911	6,529	3,050	3,597
1960	5,108	17,170	10,140	9,480	2,861	995	1,066	2,092	1,046	859	567	921
1961	1,634	9,985	6,249	6,706	3,613	2,075	1,211	2,399	444	179	312	2,579
1962	10,010	6,747	6,968	8,709	960	3,693	2,189	870	590	494	4,655	4,391
1963	5,358	5,958	10,030	1,776	1,427	990	662	430	471	379	2,078	2,937
1964	6,784	7,660	5,099	6,375	1,005	750	1,007	2,243	3,909	7,518	1,263	5,122
1965	2,838	7,521	9,565	3,036	1,454	4,447	8,841	2,329	1,005	1,212	667	545
1966	2,068	8,933	8,732	1,582	3,549	1,102	424	969	878	494	577	1,154
1967	1,697	5,311	1,688	1,195	1,600	592	543	4,380	872	394	441	5,197
1968	7,549	1,630	4,635	1,597	1,607	1,234	989	322	96	535	1,480	1,535
1969	2,643	6,425	7,478	4,064	1,224	2,737	1,232	2,964	1,933	2,106	546	2,345
1970	1,949	6,873	4,448	5,480	2,181	571	701	2,887	376	552	2,424	1,613
1971	5,471	8,964	7,252	3,857	5,106	1,168	728	3,055	1,242	9,412	2,907	3,037
1972	4,093	8,188	2,612	3,594	5,190	4,708	1,297	1,313	662	1,759	5,669	10,470
1973	6,303	10,900	8,826	11,440	3,045	6,062	3,509	1,605	432	268	313	2,411
1974	6,403	6,929	3,407	4,122	4,837	1,762	836	2,272	4,258	587	674	4,034
1975	12,300	6,919	13,790	4,119	3,179	1,842	12,220	1,244	4,359	2,030	2,402	2,774
1976	5,712	3,774	2,468	1,433	1,464	3,610	495	295	221	1,549	760	4,947
1977	4,696	1,708	8,301	3,739	700	466	253	385	2,171	2,042	1,608	3,007
1978	15,350	4,069	7,639	5,155	10,630	2,458	1,833	2,211	832	416	603	2,564
1979	9,502	11,170	10,600	5,970	4,479	3,845	1,003	612	6,015	1,961	6,283	1,779

Table 2.3-6 (Sheet 3 of 3)
Monthly Mean Streamflow Measurements for the Cape Fear River at the Lillington Gauging Station (USGS 02102500)

Year	Monthly Mean Streamflow, in cfs											
	January	February	March	April	May	June	July	August	September	October	November	December
1980	6,387	3,426	10,110	4,220	2,349	2,114	1,349	325	368	531	822	820
1981	754	4,445	1,613	1,134	647	852	2,505	1,956	1,603	1,356	655	2,458
1982	6,865	7,398	6,934	3,222	3,641	12,509	2,288	1,864	691	980	1,001	4,408
1983	3,342	10,110	12,170	8,917	3,482	1,502	879	634	653	669	1,388	8,595
1984	10,060	11,570	13,350	11,010	3,583	2,683	5,351	5,082	723	705	711	954
1985	3,304	10,010	2,211	969	1,324	884	1,319	5,447	1,135	792	7,919	4,376
1986	1,373	1,860	4,016	985	824	702	654	1,796	696	640	683	1,408
1987	6,720	5,891	11,300	8,246	1,686	824	817	726	938	726	778	1,148
1988	4,390	2,927	1,628	2,138	1,055	734	680	831	864	1,281	2,147	885
1989	1,552	5,683	15,160	6,253	7,784	2,992	3,454	2,590	1,318	6,442	2,567	5,637
1990	5,679	9,055	4,456	5,619	5,669	1,831	658	643	596	5,393	1,337	3,333
1991	10,470	2,117	6,772	5,433	2,014	1,288	1,333	1,097	905	728	846	882
1992	2,962	2,535	4,083	4,392	1,198	3,686	1,428	1,085	643	971	4,377	3,713
1993	9,110	4,210	15,709	11,670	1,643	864	707	728	671	637	724	1,312
1994	3,399	5,494	8,369	4,778	983	1,045	1,091	1,530	1,036	791	653	723
1995	5,073	8,561	5,800	1,006	937	5,782	5,694	1,496	1,344	5,931	7,377	2,623
1996	6,982	6,425	5,250	3,185	2,770	1,350	827	1,744	13,919	3,829	1,765	4,220
1997	4,730	6,388	5,001	4,061	5,716	1,515	3,483	889	774	685	1,194	2,070
1998	11,750	16,440	14,900	6,373	3,356	986	607	645	673	621	522	812
1999	4,488	3,176	2,882	2,029	2,141	551	604	673	8,181	5,431	1,330	2,061
2000	3,922	6,843	3,859	3,648	1,286	622	1,531	1,080	2,186	1,059	713	746
2001	707	1,786	4,521	4,946	670	2,403	1,283	1,213	684	644	592	612
2002	2,805	1,617	1,749	1,547	642	584	360	274	772	4,735	6,127	7,756
2003	2,819	7,135	14,180	14,779	5,516	6,522	4,325	7,075	4,902	1,170	1,277	3,500
2004	1,406	4,614	3,174	1,885	1,947	1,034	1,074	2,687	5,373	ND	ND	ND
Mean of Monthly Streamflows (cfs)	5,178	6,294	6,441	4,782	2,597	1,997	2,058	1,970	2,270	1,979	1,996	3,046

Notes:
cfs = cubic feet per second
ND = no data available for the given time period

Source: Reference 2.3-041

Table 2.3-7 (Sheet 1 of 2) Yearly Peak Streamflow Measurements for the Cape Fear River at the Lillington Gauging Station (USGS 02102500)

Cape Fear River Monitoring Station
Harnett County
USGS Station Identification #: 02102500
Hydrologic Unit Code: 3030004
Latitude: 35° 24' 22"
Longitude: -78° 48' 48"
Drainage Area: 3,464.0 mile^2

Year	Date	Streamflow (cfs)
1924	October 1, 1924	49,200
1925	January 12, 1925	43,700
1926	February 4, 1926	25,800
1927	December 5, 1927	37,300
1928	September 20, 1928	83,300
1929	October 3, 1929	96,100
1930	February 5, 1930	24,000
1931	April 7, 1931	24,800
1932	March 7, 1932	47,700
1933	January 10, 1933	13,200
1934	December 2, 1934	37,300
1935	September 6, 1935	30,100
1936	April 8, 1936	62,900
1937	January 21, 1937	32,400
1938	July 27, 1938	38,300
1939	August 29, 1939	42,400
1940	February 8, 1940	28,100
1941	April 6, 1941	23,600
1942	February 18, 1942	25,900
1943	January 19, 1943	36,200
1944	October 1, 1944	56,300
1945	September 19, 1945	140,000
1946	February 11, 1946	48,900
1947	January 21, 1947	34,400
1948	February 15, 1948	47,000
1949	August 29, 1949	37,400
1950	May 15, 1950	28,600
1951	April 9, 1951	32,400
1952	March 5, 1952	71,500
1953	February 16, 1953	40,900
1954	January 23, 1954	52,600
1955	September 4, 1955	39,400
1956	March 17, 1956	42,800
1957	November 26, 1957	44,600
1958	April 30, 1958	35,000
1959	April 13, 1959	34,600

Table 2.3-7 (Sheet 2 of 2)
Yearly Peak Streamflow Measurements for the Cape Fear River at the Lillington Gauging Station (USGS 02102500)

Year	Date	Streamflow (cfs)
1960	April 6, 1960	44,600
1961	February 24, 1961	31,600
1962	January 8, 1962	48,600
1963	March 7, 1963	40,100
1964	October 6, 1964	44,600
1965	July 28, 1965	39,500
1966	March 1, 1966	42,800
1967	December 29, 1967	25,100
1968	January 15, 1968	32,200
1969	February 3, 1969	29,300
1970	February 18, 1970	32,000
1971	March 4, 1971	40,800
1972	December 16, 1972	40,700
1973	February 3, 1973	50,400
1974	September 8, 1974	22,000
1975	July 16, 1975	45,000
1976	January 28, 1976	17,500
1977	January 11, 1977	23,400
1978	April 27, 1978	33,700
1979	February 26, 1979	46,600
1980	March 22, 1980	25,800
1981	February 12, 1981	20,200
1982	June 11, 1982	31,300
1983	March 19, 1983	28,200
1984	March 29, 1984	29,600
1985	November 22, 1985	25,700
1986	August 21, 1986	13,500
1987	March 1, 1987	33,500
1988	November 2, 1988	14,400
1989	March 24, 1989	24,200
1990	October 25, 1990	21,600
1991	January 12, 1991	24,600
1992	February 5, 1982	17,100
1993	April 6, 1993	29,900
1994	March 3, 1994	27,800
1995	February 17, 1995	26,800
1996	September 6, 1996	41,400
1997	July 25, 1997	23,600
1998	March 20, 1998	38,000
1999	September 16, 1999	25,000
2000	February 1, 2000	13,800
2001	April 5, 2001	16,000
2002	October 12, 2002	16,800
2003	April 11, 2003	38,300
2004	September 9, 2004	16,200
2005	March 18, 2005	14,300

Notes:
cfs = cubic feet per second

Source: Reference 2.3-032

Table 2.3-8
Monthly Mean Measurements for the Cape Fear River at the Lillington Gauging Station (USGS 02102500)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.183	2.938	4.685
1997	4.948	5.596	ND	ND	4.854	2.599	3.38	1.959	ND	1.737	2.235	3.008
1998	8.245	10.297	9.236	5.88	3.979	2.086	1.625	1.68	1.703	ND	1.499	1.802
1999	4.489	3.833	ND	ND	ND	1.542	1.626	ND	ND	5.242	2.408	3.109
2000	ND	6.246	4.588	ND	2.25	1.652	2.469	2.201	3.241	2.056	1.784	1.817
2001	1.769	2.699	4.534	4.454	1.705	3.184	2.256	2.218	1.721	1.679	1.612	1.637
2002	3.227	2.631	2.827	2.493	1.686	1.591	1.184	ND	1.57	4.078	5.386	6.251
2003	3.392	5.972	9.289	9.318	4.838	5.629	4.417	ND	4.666	2.282	2.424	3.919
2004	2.56	4.753	3.79	2.903	2.81	2.155	2.157	3.329	4.842	2.879	2.745	4.122
2005	3.979	3.581	6.007	4.468	2.103	2.307	2.029	2.229	1.596	1.426	ND	4.084
2006	3.149	2.519	2.208	2.6	2.364	ND	3.104	1.724	2.049	ND	ND	ND
Mean of Monthly Gauge Height	3.97	4.81	5.31	4.59	2.95	2.53	2.42	2.19	2.67	2.84	2.56	3.44

Notes:

No incomplete data are used for statistical calculation.
Measurements are in feet.
Gauge datum 104.62 feet above sea level NGVD29.

ND = no data available for the given time period

Source: Reference 2.3-041

Table 2.3-9
Water Level Elevations of the Auxiliary and Main Reservoirs

Year	Auxiliary Reservoir			Main Reservoir		
	MAX	MIN	MEAN	MAX	MIN	MEAN
2001	252.78	249.10	251.79	222.14	218.93	219.90
2002	252.31	250.98	251.70	221.24	217.77	219.56
2003	252.45	251.39	251.90	222.57	212.69	220.48
2004	252.20	251.27	251.85	221.01	213.77	220.24
2005	252.26	250.28	251.72	221.15	217.39	219.34
2006[b]	252.63	250.28	251.83	223.80	217.39	219.21
2001-2006	252.78	249.10	251.80	223.80	212.69	219.79

Notes:
a) All measurements are in feet NGVD29.

b) 2006 data are through July 9th.

Table 2.3-10
USDA Soil Summary

Soil Name	Depth (in.)	USDA Texture	Unified Classification	Fragments > 10 Inches (%)	Fragments 3 – 10 Inches (%)	Sieve No. 200 (%)	Organic Matter[(a)] (%)	Available Water Capacity[(b)] (in./in.)	Moist Bulk Density[(c)] ($gram/cm^3$)	Porosity[(d)] (cm^3/cm^3)	Saturated Hydraulic Conductivity[(e)] (cm/sec)
Creedmoor	0-8	Fine sandy loam	SC-SM, SM	0	0-3	30-49	0.5-2.0	0.10-0.14	1.55-1.70	0.36-0.42	1.4E-03 to 4.2E-03
	8-14	Clay loam, Sandy clay loam, Silty clay loam	CL	0	0-3	60-80	0.0-0.5	0.13-0.15	1.45-1.65	0.38-0.45	1.4E-04 to 4.0E-04
	14-35	Clay, Sandy clay, Silty clay	CH	0	0-3	70-95	0.0-0.5	0.13-0.15	1.30-1.50	0.43-0.51	1.0E-06 to 4.2E-05
	35-83	Sandy clay loam, Silty clay loam, Sandy loam	CL-ML, ML, SC, SM	0	0-5	45-90	0.0-0.5	0.10-0.14	1.60-1.95	0.26-0.40	1.0E-06 to 4.2E-05
	83-99	Unweathered bedrock	---	---	---	---	---	0.00-0.01	---	---	0 to 4.2E-05
The parent material consists of residuum weathered from shale and siltstone and/or mudstone and/or sandstone. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Shrink-swell potential is moderate.											
Mayodan	0-9	Sandy Loam	ML, SM	0	0-5	30-70	0.5-2.0	0.11-0.17	1.40-1.65	0.38-0.47	1.4E-03 to 4.2E-03
	9-35	Clay, Clay loam, Sandy clay, Sandy clay loam, Silty clay, Silty clay loam	CL	0	0-2	50-98	0.5-1.0	0.12-0.22	1.30-1.40	0.47-0.51	4.0E-04 to 1.4E-03
	35-44	Clay, Clay loam, Sandy clay, Sandy clay loam, Silty clay, Silty clay loam	CH, CL, MH, ML	0	0-2	50-98	0.0-0.5	0.12-0.18	1.25-1.55	0.42-0.53	4.0E-04 to 1.4E-03
	44-65	Clay loam, Sandy clay loam, Silty clay loam	CL	0	0-2	50-98	0.0-0.2	0.12-0.22	1.30-1.40	0.47-0.51	4.0E-04 to 1.4E-03
	65-75	Weathered bedrock	---	---	---	---	---	---	---	---	---
The parent material consists of residuum weathered from mudstone and/or shale and siltstone and/or sandstone. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Shrink-swell potential is low.											
White Store	0-6	Sandy loam	CL-ML, ML	0	0-3	56-76	0.5-2.0	0.14-0.16	1.30-1.65	0.38-0.51	4.0E-04 to 1.4E-03
	6-35	Clay	CH	0	0-3	80-98	0.0-0.5	0.15-0.17	1.15-1.35	0.49-0.57	1.0E-06 to 4.2E-05
	35-53	Clay loam, Loam, Sandy loam	CL, ML	0	0-3	55-85	0.0-0.5	0.13-0.17	1.15-1.35	0.49-0.57	4.2E-05 to 1.4E-04
	53-60	Weathered bedrock	---	---	---	---	---	0.00-0.01	---	---	0 to 1.4E-04
The parent material consists of residuum weathered from mica schist and/or metamorphic rock. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Shrink-swell potential is very high.											

Notes:

a) Organic matter increases the available water capacity. Each 1 percent of organic matter adds about 1.5 percent to available water capacity.

b) Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. Water storage capacity is given in inches of water per inch of soil for each soil layer.

c) Moist bulk density is the weight of soil (ovendry) per unit volume. The moist bulk density of a soil indicated the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration.

d) Porosity was calculated using the following equation: Porosity = 1 - (Bulk Density / Particle Density), where particle density is assumed to equal 2.65 grams/cm^3 (Maidment, 1993).

e) Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated coil transmit water.

--- = no data available

Source: Reference 2.3-045 except where noted.

Table 2.3-11
Slug Test Results Data Reduction

	Hydraulic Conductivity (feet/day) Minimum	Maximum	Average
Shallow Monitoring Wells:	0.1	5.4	2.1
Bedrock Monitoring Wells:	0.002	0.8	0.1

Well ID	Test Type	Fully or Partially Penetrating Well[a]	Well Screen Diameter (ft)	Borehole Diameter (ft)	Depth to Top of Screen (ft BTOC)	Depth to Bottom of Screen (ft BTOC)	Measured Total Depth[b] (ft BTOC)	Depth to Static Water Level[c] (ft BTOC)	Saturated Aquifer Thickness[d] (ft)	Is water level in the well screen?	Hydraulic Conductivity [e] [f] (cm/sec)	Hydraulic Conductivity (ft/day)
MWA-1S	Out	*Fully*	0.17	0.50	12.3	17.26	17.51	12.60	*4.7*	Yes	8.0E-04	2.3
MWA-1D[g]	Out	*Partially*	0.17	0.50	38.6	68.55	68.80	34.79	*33.8*	No	3.8E-06	0.01
MWA-2S	Out	*Partially*	0.17	0.50	15.6	30.55	30.80	9.85	*20.7*	No	1.9E-03	5.4
MWA-2D	Out	*Partially*	0.17	0.50	49.7	79.70	79.95	11.08	*68.6*	No	8.6E-07	0.002
MWA-3S	Out	*Fully*	0.17	0.50	9.9	14.86	15.11	11.94	*2.9*	Yes	4.1E-04	1.2
MWA-3D	Out	*Partially*	0.17	0.50	34.6	64.59	64.84	14.23	*50.4*	No	3.9E-06	0.01
MWA-4S	Out	*Partially*	0.17	0.44	12.0	17.01	17.26	9.44	*7.6*	No	2.0E-04	0.6
MWA-4D	Out	*Partially*	0.17	0.44	27.1	67.08	67.33	8.50	*58.6*	No	7.7E-06	0.02
MWA-5S	Out	*Partially*	0.17	0.50	19.8	34.80	35.05	14.08	*20.7*	No	5.1E-05	0.1
MWA-5D	Out	*Partially*	0.17	0.50	44.8	84.81	85.06	13.93	*70.9*	No	3.0E-04	0.8
MWA-6S	Out	*Fully*	0.17	0.50	20.6	35.63	35.88	27.00	*8.6*	Yes	8.1E-04	2.3
MWA-7S	Out	*Fully*	0.17	0.50	15.7	30.65	30.90	21.80	*8.9*	Yes	5.2E-04	1.5
MWA-8D	Out	*Partially*	0.17	0.50	38.4	68.40	68.65	23.25	*45.2*	No	6.1E-05	0.2
MWA-9D	Out	*Partially*	0.17	0.50	30.6	60.56	60.81	0.00	*60.6*	No	2.8E-05	0.08
MWA-10S	Out	*Fully*	0.17	0.50	12.1	22.08	22.33	17.59	*4.5*	Yes	1.3E-03	3.6
MWA-10D	Out	*Partially*	0.17	0.50	38.0	67.95	68.20	18.35	*49.6*	No	7.4E-06	0.02

Notes:
a) Fully penetrating means the entire saturated aquifer was screened.

b) Total well depth = length of casing + length of screen + 3-inch sump.

c) Depth-to-groundwater measurements were collected on September 11, 2006 through September 13, 2006.

d) Saturated Aquifer Thickness = depth to bottom of screen - depth to static water level.

e) Pressure heads were measured using a MiniTroll Pro, manufactured by In-Situ Inc.

f) AquiferWin32 software (developed by Environmental Simulations, Inc., Version 3, 1999) and the Bouwer & Rice, 1976 method were used.

g) MWA-1D was not fully recharged since completion of development activities.

BTOC = below top-of-casing

Source: Calculation HAG-0000-7XC-001

Table 2.3-12
Groundwater Linear Flow Velocity

*Seepage Velocity [v_x] = ((Hydraulic Conductivity [K] * Hydraulic Gradient [dH/dL])/Effective Porosity [n_e])*
*Darcy Flux [Q] = Hydraulic Conductivity [K] * Hydraulic Gradient [dH/dL] * Cross-sectional Area [A]*

Monitoring Wells			Hydraulic Conductivity[a] [*K*] (feet/day)	Water Level Gauging Date	Water Level – Up Gradient Well (feet NGVD29)	Water Level – Down Gradient Well (feet NGVD29)	Water Level Change [*dH*] (feet)	Distance Between Wells [*dL*] (feet)	Hydraulic Gradient [*dH/dL*] (feet/feet)	Effective Porosity [n_e]	Seepage Velocity [v_x] (feet/day)	Cross-sectional Area (ft^2)	Darcy Flux or Velocity ($feet^3$/day)
Surficial Aquifer													
MWA-3S	to	MWA-6S	5.4	28-Aug-06	257.12	238.61	18.51	1305	0.0142	0.1	0.8	1	7.7E-02
MWA-3S	to	MWA-5S	5.4	28-Aug-06	257.12	250.06	7.06	740	0.0095	0.1	0.5	1	5.2E-02
MWA-7S	to	MWA-9S	5.4	28-Aug-06	270.41	241.57	28.84	1346	0.0214	0.1	1.2	1	1.2E-01
MWA-8S	to	MWA-9S	5.4	28-Aug-06	257.08	241.57	15.51	574	0.0270	0.1	1.5	1	1.5E-01
Bedrock Aquifer													
MWA-3D	to	MWA-5D	0.8	28-Aug-06	253.86	249.80	4.06	748	0.0054	0.05	0.09	1	4.6E-03
MWA-7D	to	MWA-9D	0.8	28-Aug-06	268.29	247.98	20.31	1329	0.0153	0.05	0.3	1	1.3E-02
MWA-8D	to	MWA-9D	0.8	28-Aug-06	248.04	247.98	0.06	581	0.0001	0.05	0.002	1	8.7E-05

Notes:
a) Hydraulic conductivity estimates are maximum values derived from Table 2.3-11, Slug Test Results Data Reduction.

Sources: Reference 2.3-046, Reference 2.3-047, and Reference 2.3-048

Table 2.3-13 (Sheet 1 of 2)
Summary of Piezometer and Monitoring Well Construction Details

Well ID	Surficial or Bedrock Aquifer	Northing (NAD27)	Easting (NAD27)	Ground Elevation (feet NGVD29)	Top of Casing (TOC) Elevation (feet NGVD29)	Flush / Stick-up	Height from TOC to Ground Surface (feet)	Depth, Top of Screen (feet BTOC)	Depth, Bottom of Screen (feet BTOC)	Measured Total Depth[a] (feet BTOC)	Riser Material	Riser Diameter (inch)	Screen Length (feet)	Borehole Log/ Completion Form Available?	Date Installed
HAR 2 and HAR 3 Monitoring Wells															
MWA-1S	Surficial	686565.2	2012706.8	263.70	266.31	Stick-up	2.6	12.3	17.3	17.5	Sch. 40 PVC	2	5	Y / Y	08/02/2006
MWA-1D	Bedrock	686572.8	2012703.0	263.88	266.22	Stick-up	2.3	38.6	68.6	68.8	Sch. 40 PVC	2	30	Y / Y	08/03/2006
MWA-2S	Surficial	686443.8	2011686.0	261.09	263.05	Stick-up	2.0	15.6	30.6	30.8	Sch. 40 PVC	2	15	Y / Y	07/31/2006
MWA-2D	Bedrock	686452.2	2011682.3	260.59	262.88	Stick-up	2.3	49.7	79.7	80.0	Sch. 40 PVC	2	30	Y / Y	08/01/2006
MWA-3S	Surficial	686910.2	2012316.3	266.30	268.67	Stick-up	2.4	9.9	14.9	15.1	Sch. 40 PVC	2	5	Y / Y	08/15/2006
MWA-3D	Bedrock	686907.7	2012307.5	266.29	268.46	Stick-up	2.2	34.6	64.6	64.8	Sch. 40 PVC	2	30	Y / Y	08/15/2006
MWA-4S	Surficial	687126.4	2012812.9	260.64	263.30	Stick-up	2.7	12.0	17.0	17.3	Sch. 40 PVC	2	5	Y / Y	07/20/2006
MWA-4D	Bedrock	687118.2	2012815.1	260.64	263.03	Stick-up	2.4	27.1	67.1	67.3	Sch. 40 PVC	2	40	Y / Y	07/20/2006
MWA-5S	Surficial	687189.6	2013000.5	261.92	264.15	Stick-up	2.2	19.8	34.8	35.1	Sch. 40 PVC	2	15	Y / Y	08/08/2006
MWA-5D	Bedrock	687195.6	2012997.0	261.92	264.25	Stick-up	2.3	44.8	84.8	85.1	Sch. 40 PVC	2	40	Y / Y	08/07/2006
MWA-6S	Surficial	687568.1	2013443.0	263.14	265.52	Stick-up	2.4	20.6	35.6	35.9	Sch. 40 PVC	2	15	Y / Y	08/08/2006
MWA-7S	Surficial	687499.6	2011203.7	287.23	290.29	Stick-up	3.1	15.7	30.7	30.9	Sch. 40 PVC	2	15	Y / Y	08/09/2006
MWA-7D	Bedrock	687503.7	2011213.5	287.07	290.04	Stick-up	3.0	50.7	80.7	81.0	Sch. 40 PVC	2	30	Y / Y	08/09/2006
MWA-8S	Surficial	687763.3	2011928.4	268.28	271.21	Stick-up	2.9	12.9	17.9	18.2	Sch. 40 PVC	2	5	Y / Y	08/17/2006
MWA-8D	Bedrock	687757.7	2011918.6	268.21	271.18	Stick-up	3.0	38.4	68.4	68.7	Sch. 40 PVC	2	30	Y / Y	08/16/2006
MWA-9S	Surficial	687996.6	2012453.3	246.92	249.78	Stick-up	2.9	8.7	13.7	14.0	Sch. 40 PVC	2	5	Y / Y	08/11/2006
MWA-9D	Bedrock	687998.1	2012446.3	246.91	249.94	Stick-up	3.0	30.6	60.6	60.8	Sch. 40 PVC	2	30	Y / Y	08/11/2006
MWA-10S	Surficial	688247.9	2011681.6	266.68	269.37	Stick-up	2.7	12.1	22.1	22.3	Sch. 40 PVC	2	10	Y / Y	08/14/2006
MWA-10D	Bedrock	688250.1	2011672.9	267.28	270.19	Stick-up	2.9	38.0	68.0	68.2	Sch. 40 PVC	2	30	Y / Y	08/14/2006
MWA-11S	Surficial	688614.8	2012942.5	239.95	242.65	Stick-up	2.7	12.3	17.3	17.6	Sch. 40 PVC	2	5	Y / Y	07/28/2006
Plant Area Wells and Piezometers															
LP-2	Bedrock	687233.8	2012113.0	258.43	260.80	Stick-up	2.4	----	----	120.7	Sch. 40 PVC	2	----	N / N	----
LP-5	Bedrock	684993.0	2011066.7	260.34	263.70	Stick-up	3.4	----	----	88.4	Sch. 40 PVC	2	----	N / N	----
LP-6	Bedrock	685482.4	2012163.2	261.27	264.24	Stick-up	3.0	----	----	115.3	Sch. 40 PVC	2	----	N / N	----
LP-7	Bedrock	686282.8	2013330.6	261.33	263.10	Stick-up	1.8	----	----	119.3	Sch. 40 PVC	2	----	N / N	----
LP-9	Bedrock	685625.1	2014893.6	254.37	257.88	Stick-up	3.5	----	----	119.4	Sch. 40 PVC	2	----	N / N	----
LP-13 / GW-57	Bedrock	683769.0	2012029.1	259.39	262.11	Stick-up	2.7	----	----	122.1	Sch. 40 PVC	2	----	N / N	----
LP-16	Bedrock	684624.4	2014268.2	259.23	261.20	Stick-up	2.0	----	----	134.7	Sch. 40 PVC	2	----	N / N	----
W-5	Bedrock	688035.3	2012589.4	244.46	245.04	Stick-up	0.6	----	----	193.0	Steel	6	----	N / N	----
W-5A	Bedrock	684191.1	2011069.5	264.76	266.82	Stick-up	2.1	----	----	251.7	Steel	6	----	N / N	----
W-8A / GW-58	Bedrock	683947.1	2010951.7	259.40	260.86	Stick-up	1.5	----	----	200.0	Steel	6	----	N / N	----
W-9A / GW-60	Bedrock	684463.4	2015452.1	231.31	233.42	Stick-up	2.1	----	----	180.5	Steel	6	----	N / N	----
W-12	Bedrock	683780.7	2012076.6	258.66	260.51	Stick-up	1.8	----	----	253.3	Steel	6	----	N / N	----
W-13 / GW-59	Bedrock	688101.6	2013527.7	246.91	250.52	Stick-up	3.6	----	----	312.0	Steel	6	----	N / N	----
W-14	Bedrock	686188.5	2010477.0	270.63	271.44	Stick-up	0.8	----	----	173.0	Steel	6	----	N / N	----
W-15	Bedrock	688321.5	2013374.1	239.85	241.72	Stick-up	1.9	----	----	127.2	Steel	6	----	N / N	----
WAD-1 / GW-39	Bedrock	681636.4	2011487.9	263.56	264.11	Stick-up	0.6	----	----	189.4	Steel	6	----	----	----
MWA-12	Surficial	684465.5	2013884.5	260.07	262.50	Stick-up	2.4	32.8	52.8	53.04	Sch. 40 PVC	2	20	Y / Y	08/22/2006

Table 2.3-13 (Sheet 2 of 2)
Summary of Piezometer and Monitoring Well Construction Details

Well ID	Surficial or Bedrock Aquifer	Northing (NAD27)	Easting (NAD27)	Ground Elevation (feet NGVD29)	Top of Casing (TOC) Elevation (feet NGVD29)	Flush / Stick-up	Height from TOC to Ground Surface (feet)	Depth, Top of Screen (feet BTOC)	Depth, Bottom of Screen (feet BTOC)	Measured Total Depth[(a)] (feet BTOC)	Riser Material	Riser Diameter (inch)	Screen Length (feet)	Borehole Log/ Completion Form Available?	Date Installed
Landfill Area Monitoring Wells															
MW-1 (LF)	Bedrock	689656.5	2011798.3	276.96	278.75	Stick-up	1.8	87.0	97.0	96.8	Sch. 40 PVC	2	10.0	N / Y	11/14/1986
MW-2 (LF)	Bedrock	689005.2	2011447.7	270.10	272.59	Stick-up	2.5	30.0	40.0	41.6	Sch. 40 PVC	2	10.0	N / Y	11/18/1986
MW-3 (LF)	Bedrock	688886.7	2010621.5	278.43	280.63	Stick-up	2.2	47.0	57.0	58.7	Sch. 40 PVC	2	10.0	N / Y	11/24/1986
MW-6 (LF)	Bedrock	689887.7	2011953.3	254.62	256.82	Stick-up	2.2	53.5	68.5	70.9	Sch. 40 PVC	2	15.0	Y / Y	12/19/2003
MW-7 (LF)	Bedrock	689707.8	2011435.7	273.48	275.21	Stick-up	1.7	38.0	53.0	55.1	Sch. 40 PVC	2	15.0	Y / Y	12/19/2003
Auxiliary Dam Area Piezometers															
ADP-1	Surficial	----	----	----	----	Stick-up	----	10.0	20	----	Sch. 40 PVC	1.5	10	N / Y	06/25/1981
ADP-2	Surficial	----	----	----	----	Stick-up	----	20.0	45	----	Sch. 40 PVC	1.5	25	N / Y	06/23/1981
ADP-3	Surficial	----	----	----	----	Stick-up	----	30.0	60	----	Sch. 40 PVC	1.5	30	N / Y	06/17/1981
ADP-4	Surficial	----	----	----	----	Stick-up	----	30.0	60	----	Sch. 40 PVC	1.5	30	N / N	----
ADP-5	Surficial	683844.5	2008733.8	260.17	263.41	Stick-up	3.2	22.0	45	47.1	Sch. 40 PVC	1.5	23	N / Y	06/04/1981
ADP-6	Surficial	683844.1	2009133.5	260.22	263.29	Stick-up	3.1	22.0	40	42.2	Sch. 40 PVC	1.5	18	N / Y	06/03/1981
ADP-7	Surficial	683844.8	2009533.6	260.12	263.66	Stick-up	3.5	10.0	20	23.2	Sch. 40 PVC	1.5	10	N / Y	06/17/1981
ADP-8	Surficial	----	----	----	----	Stick-up	----	45.0	65	----	Sch. 40 PVC	1.5	20	N / Y	06/25/1981
ADP-9	Surficial	----	----	----	----	Stick-up	----	45.0	65	----	Sch. 40 PVC	1.5	20	N / Y	06/23/1981
ADP-10	Bedrock	----	----	----	----	Stick-up	----	75.0	95	----	Sch. 40 PVC	1.5	20	N / Y	06/16/1981
ADP-11	Bedrock	----	----	----	----	Stick-up	----	75.0	95	----	Sch. 40 PVC	1.5	20	N / Y	06/11/1981
ADP-12	Bedrock	683843.9	2008743.7	259.95	263.27	Stick-up	3.3	70.0	90	91.6	Sch. 40 PVC	1.5	20	N / N	----
ADP-13	Bedrock	683844.3	2009543.8	260.34	263.59	Stick-up	3.2	40.0	60	51.9	Sch. 40 PVC	1.5	20	N / N	----
ADP-14	Bedrock	----	----	----	----	Stick-up	----	20.0	40	----	Sch. 40 PVC	1.5	20	N / Y	11/14/1980
ADP-15	Bedrock	----	----	----	----	Stick-up	----	20.0	40	----	Sch. 40 PVC	1.5	20	N / Y	11/13/1980
ADP-16	Bedrock	----	----	----	----	Stick-up	----	20.0	40	----	Sch. 40 PVC	1.5	20	N / Y	11/20/1980
ADP-17	Bedrock	----	----	----	----	Stick-up	----	20.0	40	----	Sch. 40 PVC	1.5	20	N / Y	11/20/1980
ADP-18	Bedrock	----	----	----	----	Stick-up	----	20.0	40	----	Sch. 40 PVC	1.5	20	N / Y	11/21/1980
ADP-19	Bedrock	----	----	----	----	Stick-up	----	20.0	40	----	Sch. 40 PVC	1.5	20	N / Y	11/26/1980
ADP-20	Both	----	----	----	----	Stick-up	----	20.0	40	----	Sch. 40 PVC	1.5	20	N / Y	06/30/1981
ADP-21	----	----	----	----	----	Stick-up	----	15.0	35	----	Sch. 40 PVC	1.5	20	N / N	----
ADP-23	Bedrock	683753.7	2009696.2	254.15	257.51	Stick-up	3.4	15.0	35	36.6	Sch. 40 PVC	1.5	20	N / Y	11/07/1980
ADP-21A	Both	683610.0	2009086.4	238.12	241.27	Stick-up	3.1	----	----	47.5	Sch. 40 PVC	1.5	----	N / Y	06/30/1981
Sludge Application Wells															
MW-1 (SA)	----	685928.1	2011307.4	260.02	261.51	Stick-up	1.5	8.5	23.5	23.8	Sch. 40 PVC	2	15	N / Y	05/31/1995
MW-2 (SA)	----	685234.8	2011112.9	260.55	263.01	Stick-up	2.5	20.0	35	37.5	Sch. 40 PVC	2	15	Y / Y	05/26/1995
MW-3 (SA)	----	684375.1	2011566.1	259.45	262.23	Stick-up	2.8	20	35	37.3	Sch. 40 PVC	2	15	N / Y	05/26/1995

Notes:
a) Measured in the field on August 28, 2006, by CH2M HILL.

BTOC = below top-of-casing
--- = no data available

Table 2.3-14 (Sheet 1 of 3)
Summary of Groundwater Levels within the Plant Site

Well Identification	Ground Elevation (feet NGVD29)	Top of Casing (TOC) Elevation (feet NGVD29)	Groundwater Surface Elevation				
			June 6/7, 2006	August 28, 2006	November 27, 2006	February 28, 2007	May 1, 2007
HAR 2 and HAR 3 Monitoring Wells							
MWA-1S	263.70	266.31	NA	253.31	253.08	254.03	255.09
MWA-1D	263.88	266.22	NA	222.05(a)	250.38	252.43	253.40
MWA-2S	261.09	263.05	NA	253.06	258.17	258.65	254.11
MWA-2D	260.59	262.88	NA	252.12	251.68	251.78	251.89
MWA-3S	266.30	268.67	NA	257.12	256.60	260.19	258.03
MWA-3D	266.29	268.46	NA	253.86	256.21	256.67	254.53
MWA-4S	260.64	263.30	NA	253.76	254.07	256.45	254.85
MWA-4D	260.64	263.03	NA	255.62	256.93	258.62	256.42
MWA-5S	261.92	264.15	NA	250.06	253.37	254.81	252.11
MWA-5D	261.92	264.25	NA	249.80	252.47	253.14	251.56
MWA-6S	263.14	265.52	NA	238.61	238.62	238.29	237.95
MWA-7S	287.23	290.29	NA	270.41	268.99	269.95	271.13
MWA-7D	287.07	290.04	NA	268.29	268.09	269.66	269.74
MWA-8S	268.28	271.21	NA	257.08	256.06	255.45	257.06
MWA-8D	268.21	271.18	NA	248.04	249.28	251.50	249.28
MWA-9S	246.92	249.78	NA	241.57	244.09	244.65	243.51
MWA-9D	246.91	249.94	NA	247.98	247.70	249.38	248.59
MWA-10S	266.68	269.37	NA	251.36	251.18	260.00	258.99
MWA-10D	267.28	270.19	NA	252.28	252.09	254.43	252.73
MWA-11S	239.95	242.65	NA	227.11	225.43	232.69	231.46
Plant Area Wells and Piezometers							
LP-2	258.43	260.80	257.40	254.65	258.88	258.70	255.46
LP-5	260.34	263.70	248.94	246.18	246.88	252.39	249.03
LP-6	261.27	264.24	245.24	246.31	246.70	246.42	246.12

Table 2.3-14 (Sheet 2 of 3)
Summary of Groundwater Levels within the Plant Site

Well Identification	Ground Elevation (feet NGVD29)	Top of Casing (TOC) Elevation (feet NGVD29)	Groundwater Surface Elevation				
			June 6/7, 2006	August 28, 2006	November 27, 2006	February 28, 2007	May 1, 2007
LP-7	261.33	263.10	244.20	246.44	245.74	245.52	245.91
LP-9	254.37	257.88	223.76	223.18	224.81	223.87	223.44
LP-13	259.39	262.11	238.61	234.30	237.39	239.41	238.30
LP-16	259.23	261.20	226.20	227.07	227.64	227.33	226.96
W-5	244.46	245.04	243.41	242.07	243.33	243.94	242.71
W-5A	264.76	266.82	240.92	239.57	239.63	241.97	241.01
W-8A	259.40	260.86	239.91	238.42	238.47	240.89	239.87
W-9A	231.31	233.42	220.17	219.32	220.91	220.43	219.79
W-12	258.66	260.51	238.51	237.17	237.30	239.27	238.18
W-13	246.91	250.52	226.92	226.00	226.40	227.78	227.44
W-14	270.63	271.44	252.61	251.44	251.82	253.04	252.16
W-15	239.85	241.72	227.92	NA	227.46	229.80	228.88
WAD-1	263.56	264.11	235.46	234.04	234.45	236.41	235.42
MWA-12	260.07	262.50	NA	235.94	236.50	235.62	234.80
Landfill Area Monitoring Wells							
MW-1	276.96	278.75	250.80	249.11	250.02	254.28	252.58
MW-2	270.10	272.59	260.62	259.75	260.12	260.90	259.99
MW-3	278.43	280.63	260.95	260.07	259.81	261.66	260.70
MW-6	254.62	256.82	250.01	248.41	249.26	253.55	251.80
MW-7	273.48	275.21	275.21	275.16	274.71	>275.21[b]	N/A
Auxiliary Dam Area Piezometers							
ADP-5	260.17	263.41	236.79	236.73	237.39	237.45	236.53
ADP-6	260.22	263.29	235.26	235.24	236.09	236.16	235.04
ADP-7	260.12	263.66	242.86	246.39	246.36	243.58	242.36
ADP-12	259.95	263.27	224.71	224.24	225.21	224.73	224.42

Table 2.3-14 (Sheet 3 of 3)
Summary of Groundwater Levels within the Plant Site

Well Identification	Ground Elevation (feet NGVD29)	Top of Casing (TOC) Elevation (feet NGVD29)	Groundwater Surface Elevation June 6/7, 2006	August 28, 2006	November 27, 2006	February 28, 2007	May 1, 2007
ADP-13	260.34	263.59	238.42	238.66	237.58	237.62	237.88
ADP-23	254.15	257.51	236.81	236.89	235.60	235.91	236.51
ADP-21A	238.12	241.27	218.12	218.81	219.25	219.44	218.48
Sludge Application Wells							
MW-1 (SA)	260.02	261.51	248.96	246.49	247.01	250.93	248.61
MW-2 (SA)	260.55	263.01	249.46	247.15	246.21	250.99	249.28
MW-3 (SA)	259.45	262.23	240.38	240.34	240.31	242.67	241.65

Notes:
a) MWA-1D water level elevation as measured on August 28, 2006, is incorrect due to influences of prior development activities.

b) Water level in MW-7 exceeded the top of casing and therefore created artesian conditions.

c) Elevation units are feet NGVD29.

N/A = not applicable

Table 2.3-15 (Sheet 1 of 2)
Summary of Groundwater Vertical Gradients within the HAR Site

Well Identification	Top of Casing (TOC) Elevation (feet NGVD29)	Depth to Well Screen (feet BTOC)	Screen Length (feet)	Depth to Water (feet BTOC)	Bottom of Screen to Top of Screen (L:H) (feet/feet)	(up/down)	Top of Screen to Top of Screen (H:H) (feet/feet)	(up/down)	Mid-point of Screen to Mid-point of Screen (M:M) (feet/feet)	(up/down)	Bottom of Screen to Bottom of Screen (L:L) (feet/feet)	(up/down)	Top of Screen to Bottom of Screen (H:L) (feet/feet)	(up/down)
							August 28, 2006							
MWA-1S	266.31	12.26	5	13.00	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MWA-1D	266.22	38.55	30	--- [a]										
MWA-2S	263.05	15.55	15	9.99	0.01	Down	0.03	Down	0.02	Down	0.02	Down	0.05	Down
MWA-2D	262.88	49.70	30	10.76										
MWA-3S	268.67	9.86	5	11.55	0.06	Down	0.14	Down	0.09	Down	0.07	Down	0.16	Down
MWA-3D	268.46	34.59	30	14.60										
MWA-4S	263.30	12.01	5	9.54	0.03	Up	0.12	Up	0.06	Up	0.04	Up	0.18	Up
MWA-4D	263.03	27.08	40	7.41										
MWA-5S	264.15	19.80	15	14.09	0.004	Down	0.01	Down	0.01	Down	0.01	Down	0.03	Down
MWA-5D	264.25	44.81	40	14.45										
MWA-7S	290.29	15.65	15	19.88	0.03	Down	0.07	Down	0.05	Down	0.04	Down	0.10	Down
MWA-7D	290.04	50.71	30	21.75										
MWA-8S	271.21	12.92	5	14.13	0.17	Down	0.37	Down	0.24	Down	0.18	Down	0.44	Down
MWA-8D	271.18	38.40	30	23.14										
MWA-9S	249.78	8.74	5	8.21	0.12	Up	0.30	Up	0.19	Up	0.14	Up	0.38	Up
MWA-9D	249.94	30.56	30	1.96										
MWA-10S	269.37	12.08	10	18.01	0.02	Up	0.05	Up	0.03	Up	0.02	Up	0.06	Up
MWA-10D	270.19	37.95	30	17.91										
							November 27, 2006							
MWA-1S	266.31	12.26	5	13.23	0.05	Down	0.11	Down	0.07	Down	0.05	Down	0.13	Down
MWA-1D	266.22	38.55	30	15.84										
MWA-2S	263.05	15.55	15	4.88	0.10	Down	0.19	Down	0.16	Down	0.13	Down	0.34	Down
MWA-2D	262.88	49.70	30	11.20										
MWA-3S	268.67	9.86	5	12.07	0.01	Down	0.02	Down	0.01	Down	0.01	Down	0.02	Down
MWA-3D	268.46	34.59	30	12.25										
MWA-4S	263.30	12.01	5	9.23	0.05	Up	0.19	Up	0.09	Up	0.06	Up	0.28	Up
MWA-4D	263.03	27.08	40	6.10										
MWA-5S	264.15	19.80	15	10.78	0.01	Down	0.04	Down	0.02	Down	0.02	Down	0.09	Down
MWA-5D	264.25	44.81	40	11.78										
MWA-7S	290.29	15.65	15	21.30	0.02	Down	0.03	Down	0.02	Down	0.02	Down	0.04	Down
MWA-7D	290.04	50.71	30	21.95										
MWA-8S	271.21	12.92	5	15.15	0.13	Down	0.29	Down	0.18	Down	0.13	Down	0.33	Down
MWA-8D	271.18	38.40	30	21.90										
MWA-9S	249.78	8.74	5	5.69	0.07	Up	0.17	Up	0.11	Up	0.08	Up	0.22	Up
MWA-9D	249.94	30.56	30	2.24										
MWA-10S	269.37	12.08	10	18.19	0.02	Up	0.05	Up	0.03	Up	0.02	Up	0.06	Up
MWA-10D	270.19	37.95	30	18.10										
							February 28, 2007							
MWA-1S	266.31	12.26	5	12.28	0.03	Down	0.06	Down	0.04	Down	0.03	Down	0.07	Down
MWA-1D	266.22	38.55	30	13.79										
MWA-2S	263.05	15.55	15	4.40	0.11	Down	0.20	Down	0.16	Down	0.14	Down	0.36	Down
MWA-2D	262.88	49.70	30	11.10										
MWA-3S	268.67	9.86	5	8.48	0.06	Down	0.14	Down	0.09	Down	0.07	Down	0.18	Down
MWA-3D	268.46	34.59	30	11.79										
MWA-4S	263.30	12.01	5	6.85	0.04	Up	0.14	Up	0.07	Up	0.04	Up	0.21	Up
MWA-4D	263.03	27.08	40	4.41										
MWA-5S	264.15	19.80	15	9.34	0.03	Down	0.07	Down	0.04	Down	0.03	Down	0.17	Down
MWA-5D	264.25	44.81	40	11.11										
MWA-7S	290.29	15.65	15	20.34	0.005	Down	0.009	Down	0.007	Down	0.006	Down	0.01	Down
MWA-7D	290.04	50.71	30	20.38										
MWA-8S	271.21	12.92	5	15.76	0.08	Down	0.17	Down	0.11	Down	0.08	Down	0.19	Down
MWA-8D	271.18	38.40	30	19.68										

Table 2.3-15 (Sheet 2 of 2)
Summary of Groundwater Vertical Gradients within the HAR Site

Well Identification	Top of Casing (TOC) Elevation (feet NGVD29)	Depth to Well Screen (feet BTOC)	Screen Length (feet)	Depth to Water (feet BTOC)	Bottom of Screen to Top of Screen (L:H)		Top of Screen to Top of Screen (H:H)		Mid-point of Screen to Mid-point of Screen (M:M)		Bottom of Screen to Bottom of Screen (L:L)		Top of Screen to Bottom of Screen (H:L)	
					(feet/feet)	(up/down)	(feet/feet)	(up/down)	(feet/feet)	(up/down)	(feet/feet)	(up/down)	(feet/feet)	(up/down)
MWA-9S	249.78	8.74	5	5.13	0.09	Up	0.22	Up	0.14	Up	0.10	Up	0.28	Up
MWA-9D	249.94	30.56	30	0.56										
MWA-10S	269.37	12.08	10	9.37	0.10	Down	0.22	Down	0.16	Down	0.12	Down	0.37	Down
MWA-10D	270.19	37.95	30	15.76										

May 27, 2007

Well Identification	Top of Casing (TOC) Elevation (feet NGVD29)	Depth to Well Screen (feet BTOC)	Screen Length (feet)	Depth to Water (feet BTOC)	Bottom of Screen to Top of Screen (L:H)		Top of Screen to Top of Screen (H:H)		Mid-point of Screen to Mid-point of Screen (M:M)		Bottom of Screen to Bottom of Screen (L:L)		Top of Screen to Bottom of Screen (H:L)	
					(feet/feet)	(up/down)	(feet/feet)	(up/down)	(feet/feet)	(up/down)	(feet/feet)	(up/down)	(feet/feet)	(up/down)
MWA-1S	266.31	12.26	5	11.2	0.03	Down	0.06	Down	0.04	Down	0.03	Down	0.08	Down
MWA-1D	266.22	38.55	30	12.82										
MWA-2S	263.05	15.55	15	8.94	0.03	Down	0.06	Down	0.05	Down	0.05	Down	0.11	Down
MWA-2D	262.88	49.70	30	10.99										
MWA-3S	268.67	9.86	5	10.64	0.06	Down	0.14	Down	0.09	Down	0.07	Down	0.18	Down
MWA-3D	268.46	34.59	30	13.93										
MWA-4S	263.30	12.01	5	8.45	0.03	Up	0.10	Up	0.05	Up	0.03	Up	0.15	Up
MWA-4D	263.03	27.08	40	6.61										
MWA-5S	264.15	19.80	15	12.04	0.01	Down	0.02	Down	0.01	Down	0.01	Down	0.06	Down
MWA-5D	264.25	44.81	40	12.69										
MWA-7S	290.29	15.65	15	19.16	0.02	Down	0.04	Down	0.03	Down	0.03	Down	0.07	Down
MWA-7D	290.04	50.71	30	20.30										
MWA-8S	271.21	12.92	5	14.15	0.14	Down	0.32	Down	0.21	Down	0.15	Down	0.38	Down
MWA-8D	271.18	38.40	30	21.90										
MWA-9S	249.78	8.74	5	6.27	0.10	Up	0.23	Up	0.15	Up	0.11	Up	0.30	Up
MWA-9D	249.94	30.56	30	1.35										
MWA-10S	269.37	12.08	10	10.38	0.11	Down	0.25	Down	0.18	Down	0.14	Down	0.42	Down
MWA-10D	270.19	37.95	30	17.46										

Notes:
a) MWA-1D water level elevation as measured on August 28, 2006, is incorrect due to influences of prior development activities.

BTOC = below top-of-casing

Source: Vertical gradients calculated using the USEPA online tools for site assessment calculation: Reference 2.3-049.

Table 2.3-16
HAR Water Flow Summary

Flow Description	Flow Volume[(a)]
Estimated Mean Annual Flow in Cape Fear River at Buckhorn Dam (1982 – 2005)	1,392,719 gpm (3103 cfs)
Estimated 7Q10 in Cape Fear River at Buckhorn Dam (1982 – 2005)	171,453 gpm (382 cfs)
Assuming 20% of 7Q10 is available during drought periods. Available Makeup Rate from Cape Fear River	34,291 gpm (76.4 cfs)
Total or maximum lake makeup flow withdrawal from Cape Fear River	60,000 gpm (133.68 cfs)
Cape Fear Makeup Pumphouse capacity	3 pumps having 20,000 gpm (44.56 cfs) capacity each
Normal water withdrawal from Harris Reservoir (HAR 2 and HAR 3): *(Cooling Tower makeup water + raw water use + Service Water Tower makeup water + demineralization makeup water)*	42,074 gpm (93.74 cfs)
Normal consumptive water use from Harris Reservoir, which includes (HAR 2 and HAR 3): *(Cooling Tower makeup water + raw water use + Service Water Tower makeup water + demineralization makeup water) – (sanitary discharge + demineralization water discharge + Cooling Tower blowdown + Service Tower blowdown)*	28,122 gpm (62.66 cfs)
Cooling Tower blowdown water returned to Harris Reservoir (HAR 2 and HAR 3)	13,200 gpm (29.04 cfs) normal operation 26,400 gpm (58 cfs) max.
Service Water Tower blowdown returned to Harris Reservoir (HAR 2 and HAR 3)	317 gpm (< 1 cfs) normal operation 500 gpm (1 cfs) max.
Approximate flow over the Main Dam (min. flow needed to manage water quality for operation of HNP, HAR 2, and HAR 3).	8940 gpm (20 cfs) min.

Notes:
a) All flows are approximate and are subject to change based on future analyses.

Table 2.3-17
Public Water Supply Users within 9.7 Kilometers (6 Miles) of the HAR Site

Surface Water Type:	**2**
Groundwater Under the Direct Influence of Surface Water Type:	**0**
Groundwater Type:	**5**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	Address	City	State	Zip	Work Phone
Non-Transient Non-Community	Surface	HARRIS WTP	Treatment Plant	Permanent	0392992	CP&L-HARRIS NUCLEAR WTP	1,200	ROBERT J DUNCAN OR MANAGER NOW	PO BOX 165	NEW HILL	NC	27562	NA
Community	Ground	PLANT #1	WellHouse	Permanent	0392271	JAMES REST HOME	51	RANDY MCMILLAN OR MANAGER NOW	PO BOX 70	NEW HILL	NC	27562	919-362-8856
Community	Ground	PLANT #2	WellHouse	Permanent	0392271	JAMES REST HOME	51	RANDY MCMILLAN OR MANAGER NOW	PO BOX 70	NEW HILL	NC	27562	919-362-8856
Community	Ground	WELL #2	WellHouse	Permanent	0392078	LAKE SPRINGS S/D	42	REID CAMPBELL OR MANAGER NOW	PO BOX 4889	CARY	NC	27519	919-467-7854
Community	Ground	WELL #1	WellHouse	Permanent	0392078	LAKE SPRINGS S/D	42	REID CAMPBELL OR MANAGER NOW	PO BOX 4889	CARY	NC	27519	919-467-7854
Non-Transient Non-Community	Surface	ALLIED SIG WTP	Treatment Plant	Permanent	0319414	HONEYWELL INTERNATION AL INC	700	MICHAEL M BORCHERS OR MGR NOW	PO BOX 166	MONCURE	NC	27559	919-545-3154
Community	Ground	PLANT #1	Treatment Plant	Permanent	0319125	CAPE FEAR PARK	70	JOHN POTEAT OR MGR NOW	PO BOX 16474	CHAPEL HILL	NC	27514	919-542-2530

Source: Reference 2.3-011

Table 2.3-18 (Sheet 1 of 4)
Public Water Supply Users within 16 Kilometers (10 Miles) of the HAR Site

Public Water Supply	Source Type	Public Water Supply ID	Source Code	System Name	Source Name	City	State	Zip	County
Surface Water Users (S):	**5**								
Groundwater Users (G):	**83**								
Community	S	353010	S01	Sanford, City of	Cape Fear River	Sanford	NC	27330	Lee
Community	S	392020	S01	Cary, Town of	Jordon Lake	Apex	NC	27502	Wake
Non-Transient, Non-Community	S	392992	S01	CP&L-Harris Nuclear WTP	Harris Lake	New Hill	NC	27562	Wake
Non-Transient, Non-Community	S	392992	S02	CP&L-Harris Nuclear WTP	Harris Lake Aux Reserv	New Hill	NC	27562	Wake
Non-Transient, Non-Community	S	319414	S01	Honeywell International Inc	Haw River	Moncure	NC	27559	Chatham
Transient, Non-Community	G	392454	W01	Wilbon Community Mart	Well #1	Holly Springs	NC	27540	Wake
Transient, Non-Community	G	392660	W01	New Hill Community Store	Well #1	New Hill	NC	27562	Wake
Transient, Non-Community	G	392669	W01	Myrtles Grill	Well #1	New Hill	NC	27562	Wake
Transient, Non-Community	G	4392439	W01	Adam’s Place	Well #1	Fuquay Varina	NC	27526	Wake
Transient, Non-Community	G	4392505	W01	Tee To Green Driving Range	Well #1	Apex	NC	27502	Wake
Transient, Non-Community	G	4392529	W01	C Mini Mart #46	Well #1	Cary	NC	27519	Wake
Transient, Non-Community	G	4392622	W01	Knight’s Play Golf Center	Well #1	Apex	NC	27502	Wake
Transient, Non-Community	G	319457	S01	Wilsonville General Store	Well #1	Apex	NC	27502	Chatham
Transient, Non-Community	G	319470	S01	Jordan Lake Dam	Well #1	Moncure	NC	27559	Chatham
Transient, Non-Community	G	343510	W01	Camp Agape	Well #1	Fuquay Varina	NC	27526	Harnett
Transient, Non-Community	G	319428	S01	Seaforth Campground	Well #1	Apex	NC	27502	Chatham
Transient, Non-Community	G	319428	S02	Seaforth Campground	Well #2	Apex	NC	27502	Chatham
Transient, Non-Community	G	319456	W01	Bells Baptist Church	Well #1	Apex	NC	27502	Chatham
Transient, Non-Community	G	319479	W01	New Elam Christian Church	Well #1	New Hill	NC	27562	Chatham
Transient, Non-Community	G	4392446	W01	St Bernadettes Catholic Church	Well #1	Fuquay Varina	NC	27526	Wake
Transient, Non-Community	G	392448	W01	Olive Chapel Baptist Church	Well #1	Apex	NC	27502	Wake
Transient, Non-Community	G	319462	S01	Fat Junior #2 Grill	Well #1	New Hill	NC	27562	Chatham
Transient, Non-Community	G	4392458	W01	Wake Co Fire Training Facility	Well #1	New Hill	NC	27562	Wake
Transient, Non-Community	G	319433	S01	New Hope Overlook	Well #1	Pittsboro	NC	27312	Chatham
Transient, Non-Community	G	4392521	W01	Harris Lake County Park Well 2	Well #2	Raleigh	NC	27602	Wake

Table 2.3-18 (Sheet 2 of 4)
Public Water Supply Users within 16 Kilometers (10 Miles) of the HAR Site

Public Water Supply	Source Type	Public Water Supply ID	Source Code	System Name	Source Name	City	State	Zip	County
Transient, Non-Community	G	4392628	W01	New Life Community Church	Well #1	Fuquay Varina	NC	27526	Wake
Transient, Non-Community	G	392672	W01	Pleasant Plains Baptist	Well #1	Apex	NC	27502	Wake
Transient, Non-Community	G	4392520	W01	Harris Lake County Park Well 1	Well #1	Raleigh	NC	27602	Wake
Transient, Non-Community	G	319424	W01	Crosswinds Marina	Well #1	Apex	NC	27502	Chatham
Transient, Non-Community	G	319463	S01	Community Store (Grill)	Well #1	Moncure	NC	27559	Chatham
Transient, Non-Community	G	392453	W01	Bazzel Creek Baptist Church	Well #1	Fuquay Varina	NC	27526	Wake
Campground	G	319425	PC8	Parkers Creek State Park	Well #8	Pittsboro	NC	27502	Chatham
Campground	G	319425	PC6	Parkers Creek State Park	Well #6	Pittsboro	NC	27502	Chatham
Campground	G	319426	S01	Vista Point State Park	Well #1	Pittsboro	NC	27502	Chatham
Campground	G	319427	W15	Poplar Point Rec Area	Well #15	Apex	NC	27502	Chatham
Campground	G	319427	W17	Poplar Point Rec Area	Well #17	Apex	NC	27502	Chatham
Campground	G	319427	W20	Poplar Point Rec Area	Well #20	Apex	NC	27502	Chatham
Campground	G	319427	W22	Poplar Point Rec Area	Well #22	Apex	NC	27502	Chatham
Campground	G	319427	W23	Poplar Point Rec Area	Well #23	Apex	NC	27502	Chatham
Campground	G	319138	W32	Crosswinds Campground	Well #32	Apex	NC	27502	Chatham
Campground	G	319138	W33	Crosswinds Campground	Well #33	Apex	NC	27502	Chatham
Community	G	392078	LS1	Lake Springs S/D	Well #1	Fuquay-Varina	NC	27519	Wake
Community	G	392078	LS2	Lake Springs S/D	Well #2	Fuquay-Varina	NC	27519	Wake
Community	G	392080	SR1	Saddle Run S/D	Well #1	Fuquay Varina	NC	27526	Wake
Community	G	392080	SR2	Saddle Run S/D	Well #2	Fuquay Varina	NC	27526	Wake
Community	G	392080	SR3	Saddle Run S/D	Well #3	Fuquay Varina	NC	27526	Wake
Community	G	392080	SF1	Saddle Run S/D	Sunset Forest Well #4	Fuquay Varina	NC	27526	Wake
Community	G	392080	ST2	Saddle Run S/D	Stansted Well #2	Fuquay Varina	NC	27526	Wake

Table 2.3-18 (Sheet 3 of 4)
Public Water Supply Users within 16 Kilometers (10 Miles) of the HAR Site

Public Water Supply	Source Type	Public Water Supply ID	Source Code	System Name	Source Name	City	State	Zip	County
Community	G	392092	W01	Country Creek S/D	Well #1	Fuquay-Varina	NC	27526	Wake
Community	G	392092	W02	Country Creek S/D	Well #2	Fuquay-Varina	NC	27526	Wake
Community	G	392217	NG1	Northgate S/D	Northgate Well #1	Fuquay Varina	NC	27526	Wake
Community	G	392129	001	Fairview Wooded Acres MH S/ D	Well #1	Holly Springs	NC	27607	Wake
Community	G	392129	002	Fairview Wooded Acres MH S/ D	Well #2	Holly Springs	NC	27607	Wake
Community	G	392129	003	Fairview Wooded Acres MH S/ D	Well #3	Holly Springs	NC	27607	Wake
Community	G	392224	W01	Sunset Lake MHP	Well #1	Raleigh	NC	27603	Wake
Community	G	392271	W02	James Rest Home	Well #2	New Hill	NC	27562	Wake
Community	G	392271	W01	James Rest Home	Well #1	New Hill	NC	27562	Wake
Community	G	392322	001	Kilt Valley Estates	Well #1	Holly Springs	NC	27540	Wake
Community	G	392330	001	Briarwood Farms I	Well #1	Apex	NC	27502	Wake
Community	G	392361	HA1	Swift Creek Master System	Hallmark #1	Cary	NC	27519	Wake
Community	G	392361	HA2	Swift Creek Master System	Hallmark #2	Cary	NC	27519	Wake
Community	G	392361	HO3	Swift Creek Master System	Hollybrook #3	Cary	NC	27519	Wake
Community	G	392361	HO4	Swift Creek Master System	Hollybrook #4	Cary	NC	27519	Wake
Community	G	392383	BR3	Briarwood/Kildaire	Briarwood #3	Raleigh	NC	27606	Wake
Community	G	392383	BR4	Briarwood/Kildaire	Briarwood #4	Raleigh	NC	27606	Wake
Community	G	392399	W02	Myrtlewood/Summercrest I & II	Well #2	Apex	NC	27607	Wake
Community	G	392383	KI1	Briarwood/Kildaire	Kildaire #1	Raleigh	NC	27606	Wake
Community	G	392383	KI2	Briarwood/Kildaire	Kildaire #2	Raleigh	NC	27606	Wake
Community	G	392383	BR2	Briarwood/Kildaire	Briarwood #2	Raleigh	NC	27606	Wake
Community	G	392395	W01	Twin Lake Farm S/D	Well #1	Fuquay-Varina	NC	27526	Wake
Community	G	392395	W02	Twin Lake Farm S/D	Well #2	Fuquay-Varina	NC	27526	Wake
Community	G	392399	W01	Myrtlewood/Summercrest I & II	Well #1	Apex	NC	27607	Wake
Community	G	4092040	HD1	Hopson Downs S/D	Well #3	Holly Springs	NC	27502	Wake
Community	G	4092040	HD2	Hopson Downs S/D	Well #4	Holly Springs	NC	27502	Wake

Table 2.3-18 (Sheet 4 of 4)
Public Water Supply Users within 16 Kilometers (10 Miles) of the HAR Site

Public Water Supply	Source Type	Public Water Supply ID	Source Code	System Name	Source Name	City	State	Zip	County
Community	G	4392114	OL1	Olde Mills Lake S/D	Well #1 Olde Mills Lake	Holly Springs	NC	27540	Wake
Community	G	4392164	BP2	Brayton Park S/D	Well #2	Holly Springs	NC	27540	Wake
Community	G	4392164	BP1	Brayton Park S/D	Well #1	Holly Springs	NC	27540	Wake
Community	G	4392229	HG1	Harmony Glen S/D	Well #1	Cary	NC	27502	Wake
Community	G	4092001	CH3	Fair Oaks S/D	Well #3	Holly Springs	NC	27502	Wake
Community	G	4092001	CH2	Fair Oaks S/D	Well #2	Holly Springs	NC	27502	Wake
Community	G	4092001	CH1	Fair Oaks S/D	Well #1	Holly Springs	NC	27502	Wake
Community	G	4092005	ME5	Merion S/D	Well #5	Apex	NC	27502	Wake
Community	G	4092005	ME2	Merion S/D	Well #2	Apex	NC	27502	Wake
Community	G	319124	W01	Country Estates MHP	Well #1	Apex	NC	27502	Chatham
Non-Transient, Non-Community	G	4392434	W01	The New School Inc	Well #1	Holly Springs	NC	27540	Wake
Non-Transient, Non-Community	G	319490	A01	Builders First Source	Well A	Apex	NC	27502	Chatham
Non-Transient, Non-Community	G	319490	B01	Builders First Source	Well B	Apex	NC	27502	Chatham
Non-Transient, Non-Community	G	319490	C01	Builders First Source	Well C	Apex	NC	27502	Chatham

Source: Reference 2.3-011

Table 2.3-19 (Sheet 1 of 4)
Public Water Supply Users within 16 Kilometers (10 Miles) of the HAR Site by Water Type

Surface Water Type:	**4**
Groundwater Under the Direct Influence of Surface Water Type:	**0**
Groundwater Type:	**54**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	Population	City	State	Zip
Community	Surface	Sanford WTP	Treatment Plant	Permanent	0353010	33,503	Sanford	NC	27330
Community	Surface	Chatham Co WTP	Treatment Plant	Permanent	0319126	7947	Pittsboro	NC	27312
Non-Transient, Non-Community	Surface	Harris WTP	Treatment Plant	Permanent	0392992	1200	New Hill	NC	27562
Non-Transient, Non-Community	Surface	Allied Sig WTP	Treatment Plant	Permanent	0319414	700	Moncure	NC	27559
Campground	Ground	Well #23	Well House	Permanent	0319427	900	Apex	NC	27502
Campground	Ground	Well #20	Well House	Permanent	0319427	900	Apex	NC	27502
Campground	Ground	Well #22	Well House	Permanent	0319427	900	Apex	NC	27502
Campground	Ground	Well #15	Well House	Permanent	0319427	900	Apex	NC	27502
Campground	Ground	Well #17	Well House	Permanent	0319427	900	Apex	NC	27502
Campground	Ground	Well #1	Well House	Permanent	0319426	241	Apex	NC	27502
Campground	Ground	Storage Fac	Storage	Permanent	0319425	264	Apex	NC	27502
Campground	Ground	Central Trtmt Pl	Treatment Plant	Permanent	0319138	470	Apex	NC	27502
Community	Ground	Well #1	Well House	Permanent	4392229	1	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392164	128	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4392164	128	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	4392114	96	Cary	NC	27519
Community	Ground	Well #5	Well House	Permanent	4092005	84	Cary	NC	27519

Table 2.3-19 (Sheet 2 of 4)
Public Water Supply Users within 16 Kilometers (10 Miles) of the HAR Site by Water Type

Surface Water Type:	**4**
Groundwater Under the Direct Influence of Surface Water Type:	**0**
Groundwater Type:	**54**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	Population	City	State	Zip
Community	Ground	Well #1	Well House	Permanent	4092001	25	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4092001	25	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392399	107	Raleigh	NC	27607
Community	Ground	Plant #1	Well House	Permanent	0392395	157	Raleigh	NC	27606
Community	Ground	Plant #1	Well House	Permanent	0392383	419	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392383	419	Cary	NC	27519
Community	Ground	Plant #3	Well House	Permanent	0392383	419	Cary	NC	27519
Community	Ground	Plant #5	Well House	Permanent	0392383	419	Cary	NC	27519
Community	Ground	Plant #4	Well House	Permanent	0392383	419	Cary	NC	27519
Community	Ground	Hallmark #1	Well House	Permanent	0392361	688	Cary	NC	27519
Community	Ground	Hallmark #4	Well House	Permanent	0392361	688	Cary	NC	27519
Community	Ground	Hallmark #3	Well House	Permanent	0392361	688	Cary	NC	27519
Community	Ground	Hallmark #2	Well House	Permanent	0392361	688	Cary	NC	27519
Community	Ground	Hollybrook #2	Well House	Permanent	0392361	688	Cary	NC	27519
Community	Ground	Hollybrook #1	Well House	Permanent	0392361	688	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392330	107	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392322	76	Cary	NC	27519

Table 2.3-19 (Sheet 3 of 4)
Public Water Supply Users within 16 Kilometers (10 Miles) of the HAR Site by Water Type

Surface Water Type:	**4**
Groundwater Under the Direct Influence of Surface Water Type:	**0**
Groundwater Type:	**54**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	Population	City	State	Zip
Community	Ground	Plant #1	Well House	Permanent	0392271	51	New Hill	NC	27562
Community	Ground	Plant #2	Well House	Permanent	0392271	51	New Hill	NC	27562
Community	Ground	Plant #1	Well House	Permanent	0392224	60	Raleigh	NC	27603
Community	Ground	Plant #1	Well House	Permanent	0392217	81	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392129	325	Raleigh	NC	27607
Community	Ground	Well #3	Well House	Permanent	0392129	325	Raleigh	NC	27607
Community	Ground	Well #2	Well House	Permanent	0392129	325	Raleigh	NC	27607
Community	Ground	Plant #2	Well House	Permanent	0392092	172	Raleigh	NC	27603
Community	Ground	Plant #1	Well House	Permanent	0392092	172	Raleigh	NC	27603
Community	Ground	Well #3	Well House	Permanent	0392080	325	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392080	325	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392080	325	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392078	42	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392078	42	Cary	NC	27519
Community	Ground	Plant #1	Treatment Plant	Permanent	0319125	70	Chapel Hill	NC	27514

Table 2.3-19 (Sheet 4 of 4)
Public Water Supply Users within 16 Kilometers (10 Miles) of the HAR Site by Water Type

Surface Water Type:	**4**
Groundwater Under the Direct Influence of Surface Water Type:	**0**
Groundwater Type:	**54**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	Population	City	State	Zip
Community	Ground	Plant #2	Well House	Permanent	0319124	70	Apex	NC	27502
Community	Ground	Plant #1	Well House	Permanent	0319124	70	Apex	NC	27502
Non-Transient, Non-Community	Ground	Well #1	Well House	Permanent	4392434	200	Raleigh	NC	27606
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0392448	25	Apex	NC	27502
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0319492	70	Siler City	NC	27344
Transient, Non-Community	Ground	Well #1	Pumping Facility	Permanent	0319429	30	Apex	NC	27502
Transient, Non-Community	Ground	Plant #1	Well House	Permanent	0319428	75	Apex	NC	27502
Transient, Non-Community	Ground	Well	Well House	Permanent	0319424	100	Apex	NC	27502
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0319420	100	Apex	NC	27502

Source: Reference 2.3-011

Table 2.3-20 (Sheet 1 of 3)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Users (S):	**7**								
Groundwater Users (G):	**105**								
Public Water Supply	**Source Type**	**Public Water Supply ID**	**Source Code**	**System Name**	**Source Name**	**City**	**State**	**Zip**	**County**
Community	S	343045	S01	Harnett Co Dept of Public Util	Cape Fear River	Lillington	NC	27546	Harnett
Community	S	353010	S01	Sanford, City of	Cape Fear River	Sanford	NC	27330	Lee
Community	S	392020	S01	Cary, Town of	Jordon Lake	Apex	NC	27502	Wake
Non-Transient, Non-Community	S	353130	S01	Gold Kist Water System Deep River Sanford	Deep River	Sanford	NC	27330	Lee
Non-Transient, Non-Community	S	392992	S01	CP&L-Harris Nuclear WTP	Harris Lake	New Hill	NC	27562	Wake
Non-Transient, Non-Community	S	392992	S02	CP&L-Harris Nuclear WTP	Harris Lake Aux Reserv	New Hill	NC	27562	Wake
Non-Transient, Non-Community	S	319414	S01	Honeywell International Inc	Haw River	Moncure	NC	27559	Chatham
Non-Transient, Non-Community	G	332590	W01	Montessori Middle School	Well #1	Durham	NC	27703	Durham
Non-Transient, Non-Community	G	368469	W01	United Parcel Service	Well #1	Chapel Hill	NC	27516	orange
Non-Transient, Non-Community	G	392272	W01	Babes & Kids Creative Center	Well #1	Apex	NC	27539	Wake
Non-Transient, Non-Community	G	392720	W03	Angus Barn	Well #3	Raleigh	NC	27628	Wake
Non-Transient, Non-Community	G	392720	W05	Angus Barn	Well #5	Raleigh	NC	27628	Wake
Non-Transient, Non-Community	G	392720	W06	Angus Barn	Well #6	Raleigh	NC	27628	Wake
Non-Transient, Non-Community	G	392720	W01	Angus Barn	Well #1	Raleigh	NC	27628	Wake
Non-Transient, Non-Community	G	392720	W02	Angus Barn	Well #2	Raleigh	NC	27628	Wake
Non-Transient, Non-Community	G	392774	S01	Hilltop Christian School	Well #1	Fuquay Varina	NC	27526	Wake
Non-Transient, Non-Community	G	392880	W01	Bergen Brunswig	Well #1	Raleigh	NC	27613	Wake
Non-Transient, Non-Community	G	392880	W02	Bergen Brunswig	Well #2	Raleigh	NC	27613	Wake
Non-Transient, Non-Community	G	392892	W01	Water Garden office Complex	Well #1	Raleigh	NC	27612	Wake
Non-Transient, Non-Community	G	392980	W01	NC Products-South Raleigh Plt	Well #1	Raleigh	NC	27611	Wake
Non-Transient, Non-Community	G	4392404	001	West Lake Middle School	Well #1	Apex	NC	27505	Wake
Non-Transient, Non-Community	G	4392409	S01	Honey Bee’s Creative Center	Well #1	Raleigh	NC	27606	Wake
Non-Transient, Non-Community	G	4392412	W01	Good Honey Bears Daycare	Well #1	Garner	NC	27529	Wake
Non-Transient, Non-Community	G	4392420	W01	Thompson’s Daycare & Preschool	Well #1	Garner	NC	27529	Wake
Non-Transient, Non-Community	G	4392431	W01	Metro Industrial Park	Well #1	Raleigh	NC	27617	Wake
Transient, Non-Community	G	351925	S01	Lanes Seafood And Steak House	Well #1	Angier	NC	27501	Johnston
Transient, Non-Community	G	353428	W01	Central Baptist Temple	Well #1	Sanford	NC	27330	Lee
Transient, Non-Community	G	368423	S01	Antioch Baptist Church	Well #1	Chapel Hill	NC	27516	Orange
Transient, Non-Community	G	368444	S01	Mt Moriah Baptist Church	Well #1	Durham	NC	27707	Orange
Transient, Non-Community	G	368459	S01	Terrells Creek Baptist Church	Well #1	Chapel Hill	NC	27516	Orange
Transient, Non-Community	G	368480	W01	Fiesta Grill	Well #1	Chapel Hill	NC	27516	Orange
Transient, Non-Community	G	392416	W01	White Oak Baptist Church	Well #1	Apex	NC	27502	Wake
Transient, Non-Community	G	392420	W01	Carpenters Texaco	Well #1	Morrisville	NC	27560	Wake
Transient, Non-Community	G	392427	W01	Triangle Brick Company	Well #1	Durham	NC	27713	Wake
Transient, Non-Community	G	392454	W01	Wilbon Community Mart	Well #1	Holly Springs	NC	27540	Wake
Transient, Non-Community	G	392460	W01	Hardee Mart	Well #1	Raleigh	NC	27606	Wake
Transient, Non-Community	G	392609	001	Wentworth Christian Church	Well #1	Raleigh	NC	27603	Wake
Transient, Non-Community	G	392614	W01	Wootens Chapel Fwb	Well #1	Raleigh	NC	27603	Wake
Transient, Non-Community	G	392660	W01	New Hill Community Store	Well #1	New Hill	NC	27562	Wake

Table 2.3-20 (Sheet 2 of 3)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Users (S): 7
Groundwater Users (G): 105

Public Water Supply	Source Type	Public Water Supply ID	Source Code	System Name	Source Name	City	State	Zip	County
Transient, Non-Community	G	392669	W01	Myrtles Grill	Well #1	New Hill	NC	27562	Wake
Transient, Non-Community	G	392810	W01	Hickory Grove Ucc	Well #1	Raleigh	NC	27613	Wake
Transient, Non-Community	G	392587	W01	Fellowship Baptist Church	Well #1	Willow Springs	NC	27592	Wake
Transient, Non-Community	G	392591	W01	Hidden Valley Country Club	Well #1	Willow Springs	NC	27592	Wake
Transient, Non-Community	G	392597	W01	Mt Pleasant Presbyterian Ch	Well #1	Willow Springs	NC	27592	Wake
Transient, Non-Community	G	392597	W02	Mt Pleasant Presbyterian Ch	Well #2	Willow Springs	NC	27592	Wake
Transient, Non-Community	G	392598	W01	New Hope Presbyterian Church	Well #1	Willow Springs	NC	27592	Wake
Transient, Non-Community	G	392759	W01	Faith Bible Fellowship	Well #1	Raleigh	NC	27606	Wake
Transient, Non-Community	G	392786	W01	Pleasant Hill Ucc	Well #1	Raleigh	NC	27603	Wake
Transient, Non-Community	G	392787	W01	Macedonia Umc	Well #1	Cary	NC	27511	Wake
Transient, Non-Community	G	392806	W01	New Bethel Baptist Church	Well #1	Garner	NC	27529	Wake
Transient, Non-Community	G	392924	W01	Popular Springs Ch of Christ	Well #1	Raleigh	NC	27603	Wake
Transient, Non-Community	G	392951	S02	Springfield Baptist Church	Well #2	Garner	NC	27610	Wake
Campground	G	319138	W33	Crosswinds Campground	Well #33	Apex	NC	27502	Chatham
Campground	G	319427	W15	Poplar Point Rec Area	Well #15	Apex	NC	27502	Chatham
Campground	G	319427	W17	Poplar Point Rec Area	Well #17	Apex	NC	27502	Chatham
Campground	G	319138	W32	Crosswinds Campground	Well #32	Apex	NC	27502	Chatham
Campground	G	319427	W20	Poplar Point Rec Area	Well #20	Apex	NC	27502	Chatham
Campground	G	319427	W22	Poplar Point Rec Area	Well #22	Apex	NC	27502	Chatham
Campground	G	319427	W23	Poplar Point Rec Area	Well #23	Apex	NC	27502	Chatham
Campground	G	319425	PC6	Parkers Creek State Park	Well #6	Pittsboro	NC	27502	Chatham
Campground	G	319425	PC8	Parkers Creek State Park	Well #8	Pittsboro	NC	27502	Chatham
Campground	G	319426	S01	Vista Point State Park	Well #1	Pittsboro	NC	27502	Chatham
Community	G	332130	S01	Triangle Apartments	Well #1	Durham	NC	27705	Durham
Community	G	332130	S02	Triangle Apartments	Well #2	Durham	NC	27705	Durham
Community	G	332441	S02	Ellison Rest Home	Well #2	Durham	NC	27713	Durham
Community	G	351150	W01	Dupree's MHP	Well #1	Willow Springs	NC	27592	Johnston
Community	G	351154	W01	Dutchess Downs Mh S/D	Well #1	Clayton	NC	27629	Johnston
Community	G	351154	W02	Dutchess Downs Mh S/D	Well #2	Clayton	NC	27629	Johnston
Community	G	351156	W01	Garner Estates Mh S/D	Well #1	Garner	NC	27529	Johnston
Community	G	351156	W02	Garner Estates Mh S/D	Well #2	Garner	NC	27529	Johnston
Community	G	351161	00W	Utley MHP	Well #1	Garner	NC	27529	Johnston
Community	G	351164	W01	Dupree's Court	Well #1	Willow Springs	NC	27592	Johnston
Community	G	351186	CS2	Creekstone S/D	Well #2	Clayton	NC	27520	Johnston
Community	G	351186	CS3	Creekstone S/D	Well #3	Clayton	NC	27520	Johnston
Community	G	351190	IX2	South Hills Ix	Well #2	Clayton	NC	27520	Johnston
Community	G	351413	W01	Glen Echo Mobile Estates MHP	Well #1	Garner	NC	27529	Johnston
Community	G	332106	W01	Whispering Pines MHP	Well #1	Durham	NC	27703	Durham
Community	G	332106	W02	Whispering Pines MHP	Well #2	Durham	NC	27703	Durham
Community	G	332106	W03	Whispering Pines MHP	Well #3	Durham	NC	27703	Durham

Table 2.3-20 (Sheet 3 of 3)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Users (S): 7
Groundwater Users (G): 105

Public Water Supply	Source Type	Public Water Supply ID	Source Code	System Name	Source Name	City	State	Zip	County
Community	G	332106	W04	Whispering Pines MHP	Well #4	Durham	NC	27703	Durham
Community	G	343030	W01	Campbell University WTR System	Well #1-Quansit Hut	Buies Creek	NC	27506	Harnett
Community	G	343030	W02	Campbell University WTR System	Well #2-Tennis Court	Buies Creek	NC	27506	Harnett
Community	G	343030	W03	Campbell University WTR System	Well #3-Campbelltown	Buies Creek	NC	27506	Harnett
Community	G	343030	W07	Campbell University WTR System	Well #7-Horse Barn	Buies Creek	NC	27506	Harnett
Community	G	343030	W08	Campbell University WTR System	Well #8-Golf Course	Buies Creek	NC	27506	Harnett
Community	G	343030	W09	Campbell University WTR System	Well #9-Pool	Buies Creek	NC	27506	Harnett
Community	G	343030	W10	Campbell University WTR System	Well #10-Faculty	Buies Creek	NC	27506	Harnett
Community	G	343030	W11	Campbell University WTR System	Well #11-Keith Hills	Buies Creek	NC	27506	Harnett
Community	G	351104	CH1	Country Hills S/D	Well #1	Garner	NC	27519	Johnston
Community	G	351104	CH2	Country Hills S/D	Well #2	Garner	NC	27519	Johnston
Community	G	351104	CH3	Country Hills S/D	Well #3	Garner	NC	27519	Johnston
Community	G	351167	SL1	Shadow Lakes S/D	Well #1	Clayton	NC	27519	Johnston
Community	G	351168	SH2	Southhills/Southwoods S/D	Southhills #2	Clayton	NC	27520	Johnston
Community	G	351168	SH3	Southhills/Southwoods S/D	Southhills #3	Clayton	NC	27520	Johnston
Community	G	351168	SH4	Southhills/Southwoods S/D	Southhills #4	Clayton	NC	27520	Johnston
Community	G	351168	SH5	Southhills/Southwoods S/D	Pleasant Woods #5	Clayton	NC	27520	Johnston
Community	G	351168	SW1	Southhills/Southwoods S/D	Southwoods #1	Clayton	NC	27520	Johnston
Community	G	351176	001	Cleveland MHP	Well #1	Garner	NC	27529	Johnston
Community	G	351176	002	Cleveland MHP	Well #2	Garner	NC	27529	Johnston
Community	G	351184	SF1	Southfort S/D	Well #1	Clayton	NC	27520	Johnston
Community	G	351185	SG1	Southgate S/D	Southgate #1	Clayton	NC	27520	Johnston
Community	G	351185	SG2	Southgate S/D	Southgate #2	Clayton	NC	27520	Johnston
Community	G	351186	CS1	Creekstone S/D	Well #1	Clayton	NC	27520	Johnston
Community	G	353015	W01	Broadway, Town of	Well #1	Broadway	NC	27505	Lee
Community	G	353015	W02	Broadway, Town of	Well #2	Broadway	NC	27505	Lee
Community	G	353101	S04	Carolina Trace Water System	Well #4	Sanford	NC	27330	Lee
Community	G	353101	S16	Carolina Trace Water System	Well #16	Sanford	NC	27330	Lee
Community	G	353119	W01	Convalescent Center of Lee Co	Well #1	Sanford	NC	27330	Lee
Community	G	353122	PH1	Pine Village MHP	Well #1	Sanford	NC	27330	Lee
Community	G	353122	PH2	Pine Village MHP	Well #2	Sanford	NC	27330	Lee
Community	G	353123	W01	Quail Ridge Water System	Well #1	Sanford	NC	27330	Lee
Community	G	353123	W02	Quail Ridge Water System	Well #2	Sanford	NC	27330	Lee

Source: Reference 2.3-011

Table 2.3-21 (Sheet 1 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Surface	OWASA WTP	Treatment Plant	Permanent	0368010	Orange Water & Sewer Authority	65000	Ed Kerwin Or Manager Now	Carrboro	NC	27510
Community	Surface	Lee County WTP	Treatment Plant	Permanent	0353130	Lee County WTR TRTMT PLT	780	Dale Betts Or Manager Now	Sanford	NC	27330
Community	Surface	Sanford WTP	Treatment Plant	Permanent	0353010	Sanford, City Of	33503	Heather Thomas Or Manager Now	Sanford	NC	27330
Community	Surface	Harnett Co WTP	Treatment Plant	Permanent	0343045	Harnett Co Dept Of Public Util	50000	Gary Averitte Or Manager Now	Lillington	NC	27546
Community	Surface	Chatham Co WTP	Treatment Plant	Permanent	0319126	Chatham Co Water System	7947	Ron Singleton Or Manager Now	Pittsboro	NC	27312
Community	Surface	Goldston GLF WTP	Treatment Plant	Permanent	0319025	Goldston-Gulf Sanitary Dist	1250	Ronald M Bollinger Or Mgr Now	Goldston	NC	27252
Community	Surface	Pittsboro WTP	Treatment Plant	Permanent	0319015	Pittsboro, Town Of	3048	Mike Smith Or Manager Now	Pittsboro	NC	27312
Non-Transient, Non-Community	Surface	Harris WTP	Treatment Plant	Permanent	0392992	CP&L-Harris Nuclear WTP	1200	Robert J Duncan Or Manager Now	New Hill	NC	27562
Non-Transient, Non-Community	Surface	Allied SIG WTP	Treatment Plant	Permanent	0319414	Honeywell International Inc	700	Michael M Borchers Or Mgr Now	Moncure	NC	27559
Community	Ground Water Under Direct Influence of Surface Water	Well #1	Well House	Permanent	0368190	Sturbridge S/D	53	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground Water Under Direct Influence of Surface Water	Wells #1 & 1A	Treatment Plant	Permanent	0368182	The Trails S/D	224	John Poteat Or Mgr Now	Chapel Hill	NC	27514
Community	Ground Water Under Direct Influence of Surface Water	Storage Bldg	Storage	Permanent	0332130	Triangle Apartments	87	Bill Goss Or Manager Now	Durham	NC	27704
Campground	Ground	Plant #1	Well House	Permanent	0392089	College Park	90	Larry Martin Or Mgr Now	Raleigh	NC	27610
Campground	Ground	Well #23	Well House	Permanent	0319427	Poplar Point Rec Area	900	Pete Mitchell Or Manager Now	Apex	NC	27502
Campground	Ground	Well #20	Well House	Permanent	0319427	Poplar Point Rec Area	900	Pete Mitchell Or Manager Now	Apex	NC	27502
Campground	Ground	Well #22	Well House	Permanent	0319427	Poplar Point Rec Area	900	Pete Mitchell Or Manager Now	Apex	NC	27502
Campground	Ground	Well #15	Well House	Permanent	0319427	Poplar Point Rec Area	900	Pete Mitchell Or Manager Now	Apex	NC	27502
Campground	Ground	Well #17	Well House	Permanent	0319427	Poplar Point Rec Area	900	Pete Mitchell Or Manager Now	Apex	NC	27502

Table 2.3-21 (Sheet 2 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Campground	Ground	Well #1	Well House	Permanent	0319426	Vista Point State Park	241	Peter Mitchell Or Manager Now	Apex	NC	27502
Campground	Ground	Storage Fac	Storage	Permanent	0319425	Parkers Creek State Park	264	Peter Mitchell Or Manager Now	Apex	NC	27502
Campground	Ground	Central Trmt Pl	Treatment Plant	Permanent	0319138	Crosswinds Campground	470	Pete Mitchell Or Manager Now	Apex	NC	27502
Community	Ground	Well #1	Well House	Permanent	4392233	Monterey S/D	25	Joel Clarke Or Manager Now	Garner	NC	27529
Community	Ground	Well #1	Well House	Permanent	4392229	Harmony Glen S/D	1	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4392225	Kendall Hill S/D	25	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #8	Well House	Permanent	4392216	Sawyer's Mill S/D	96	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #4	Well House	Permanent	4392216	Sawyer's Mill S/D	96	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #4	Well House	Permanent	4392214	Ivory Hills S/D	25	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392211	Grissom Farm S/D	3	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392192	Bailey's Landing S/D	20	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #3	Well House	Permanent	4392188	Jamison Park S/D	115	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	4392188	Jamison Park S/D	115	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392188	Jamison Park S/D	115	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392187	Ridgeview S/D	25	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392186	Willow Hills S/D	25	Stewart Adcock Or Manager Now	Fuquay Varina	NC	27526
Community	Ground	Lane Ridge #1	Well House	Permanent	4392183	Old Stage Place	140	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Old Stage #1	Well House	Permanent	4392183	Old Stage Place	140	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #4	Well House	Permanent	4392181	Stevens Oaks	175	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #5	Well House	Permanent	4392181	Stevens Oaks	175	Reid Campbell Or Manager Now	Cary	NC	27519

Table 2.3-21 (Sheet 3 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Well #1	Well House	Permanent	4392172	Crooked Creek S/D	125	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4392169	Hillington West S/D	110	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392169	Hillington West S/D	110	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #4	Well House	Permanent	4392169	Hillington West S/D	110	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392164	Brayton Park S/D	128	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4392164	Brayton Park S/D	128	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392163	Foxmoor S/D	155	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4392163	Foxmoor S/D	155	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392160	Tyler Farms S/D	85	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4392158	Worthington S/D	112	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #3	Well House	Permanent	4392157	Wilders Ridge S/D	195	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392157	Wilders Ridge S/D	195	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4392157	Wilders Ridge S/D	195	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #4	Well House	Permanent	4392151	Stoney Creek S/D	123	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Holland Ridge	Well House	Permanent	4392150	Holland Master System	328	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Lake Rand Well	Well House	Permanent	4392150	Holland Master System	328	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Greenfield Manr	Well House	Permanent	4392150	Holland Master System	328	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Holland Meadows	Well House	Deactivate	4392150	Holland Master System	328	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Whittingham	Well House	Deactivate	4392150	Holland Master System	328	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392147	Laurel Grove S/D	87	Reid Campbell Or Manager Now	Cary	NC	27519

Table 2.3-21 (Sheet 4 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Well #2	Well House	Permanent	4392145	Bradford S/D	74	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392142	Forrest Glen Master	207	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4392142	Forrest Glen Master	207	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392141	Southern Trace S/D	25	Luci Crosby Or Manager Now	Zebulon	NC	27597
Community	Ground	Plant #3	Well House	Permanent	4392140	Royal Senter Ridge S/D	350	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	4392140	Royal Senter Ridge S/D	350	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant 1	Well House	Permanent	4392140	Royal Senter Ridge S/D	350	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #4	Well House	Permanent	4392140	Royal Senter Ridge S/D	350	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392139	Millstone Landing S/D	45	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	4392135	Jordan Ridge S/D	99	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	4392134	Wynstone S/D	102	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	4392132	South Lake S/D	53	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	4392131	Olde South Trace Sub	75	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant 2	Well House	Permanent	4392129	Broadhurst S/D	122	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4392128	Eagle Creek S/D	211	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #3	Well House	Permanent	4392128	Eagle Creek S/D	211	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392128	Eagle Creek S/D	211	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	4392124	Oaklyn S/D	97	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	4392124	Oaklyn S/D	97	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	4392122	Oak Chase S/D	160	Reid Campbell Or Manager Now	Cary	NC	27519

Table 2.3-21 (Sheet 5 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Plant #1	Well House	Permanent	4392122	Oak Chase S/D	160	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	4392120	South Mountain S/D	160	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	4392120	South Mountain S/D	160	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1 (CRKWD)	Well House	Permanent	4392119	Heatherstone West S/D	245	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392119	Heatherstone West S/D	245	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant SW2	Well House	Permanent	4392118	Southwyck S/D	114	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant SW1	Well House	Permanent	4392118	Southwyck S/D	114	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	4392114	Olde Mills Lake S/D	96	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	4392112	Brookstone S/D	200	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1 OFF-L	Treatment Plant	Other	4392112	Brookstone S/D	200	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	4392111	Kenwood Meadows S/D	80	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4392105	Hunt Farms S/D	89	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	4392102	Sedgemoor S/D	241	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	4392102	Sedgemoor S/D	241	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #3	Well House	Permanent	4392102	Sedgemoor S/D	241	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	4392101	Ridgebrook Bluff S/D	143	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant 1	Well House	Permanent	4392101	Ridgebrook Bluff S/D	143	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Holland Meadows	Well House	Permanent	4092039	Whittingham Master System	493	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Whittingham	Well House	Permanent	4092039	Whittingham Master System	493	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	4092006	Autumn Crest Farm S/D	25	Reid Campbell Or Manager Now	Cary	NC	27519

Table 2.3-21 (Sheet 6 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	9
Groundwater Under the Direct Influence of Surface Water Type:	3
Groundwater Type:	431

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Well #5	Well House	Permanent	4092005	Merion S/D	84	Reid Campbell Or Manager Now	CARY	NC	27519
Community	Ground	Wells #1 & #2	Treatment Plant	Permanent	4092004	Wimberly Place MHP	48	Don Maynor Or Manager Now	BENSON	NC	27504
Community	Ground	Well #1	Well House	Permanent	4092001	Fair Oaks S/D	25	Reid Campbell Or Manager Now	CARY	NC	27519
Community	Ground	Well #2	Well House	Permanent	4092001	Fair Oaks S/D	25	Reid Campbell Or Manager Now	CARY	NC	27519
Community	Ground	Well #4	Well House	Permanent	4019004	Colvard Farms S/D	25	Chad Leinbach Or Manager Now	CHAPEL HILL	NC	27514
Community	Ground	Plant #1	Well House	Permanent	0392399	Myrtlewood/ Summercrest I & II	107	Saundra Landes Or Manager Now	RALEIGH	NC	27607
Community	Ground	Well #1	Well House	Permanent	0392398	Turner Farms V	342	Reid Campbell Or Manager Now	CARY	NC	27519
Community	Ground	Well #3	Well House	Permanent	0392398	Turner Farms V	342	Reid Campbell Or Manager Now	CARY	NC	27519
Community	Ground	Well #4	Well House	Permanent	0392398	Turner Farms V	342	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392397	6angston Estates S/D	152	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392395	Twin Lake Farm S/D	157	Joe Thompson Or Mgr Now	Raleigh	NC	27606
Community	Ground	Plant #1	Well House	Permanent	0392391	Dunallie Downs S/D	54	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392390	Indian Creek Overlook	431	Don Maynor Or Manager Now	Benson	NC	27504
Community	Ground	Plant #2	Well House	Permanent	0392388	Woods Of Ashbury	104	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392388	Woods Of Ashbury	104	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392387	Weekend Retreat/Southern Oaks	280	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392387	Weekend Retreat/Southern Oaks	280	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392385	Oak Hollow S/D	105	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392383	Briarwood/ Kildaire	419	Reid Campbell Or Manager Now	Cary	NC	27519

Table 2.3-21 (Sheet 7 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Plant #2	Well House	Permanent	0392383	Briarwood/ Kildaire	419	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #3	Well House	Permanent	0392383	Briarwood/ Kildaire	419	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #5	Well House	Permanent	0392383	Briarwood/ Kildaire	419	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #4	Well House	Permanent	0392383	Briarwood/ Kildaire	419	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Wedgewood Sqr 1	Well House	Permanent	0392381	Wedgewood Square S/D	70	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Crooked Brook 1	Well House	Permanent	0392381	Wedgewood Square S/D	70	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392376	Hampton Ridge S/D	435	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392376	Hampton Ridge S/D	435	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392375	Twin Creeks S/D	115	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392375	Twin Creeks S/D	115	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Heritage Point	Well House	Permanent	0392373	Bayleaf/Stonebridge	8462	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Shannon Woods 1	Well House	Permanent	0392373	Bayleaf/Stonebridge	8462	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392370	Middle Creek Acres S/D	30	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392369	Kings Ridge S/D	180	Molly Ryals Or Manager Now	Raleigh	NC	27603
Community	Ground	Plant #1	Well House	Permanent	0392369	Kings Ridge S/D	180	Molly Ryals Or Manager Now	Raleigh	NC	27603
Community	Ground	Plant #4	Well House	Permanent	0392367	Paynes Landing	37	Gary Prior Or Manager Now	Garner	NC	27529
Community	Ground	Plant #1	Well House	Permanent	0392366	Rolling Meadow S/D	47	Saundra Landes Or Manager Now	Raleigh	NC	27607
Community	Ground	Plant #1	Well House	Permanent	0392365	Woodway S/D	86	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392364	Hanover Downs S/D	49	Saundra Landes Or Manager Now	Raleigh	NC	27607
Community	Ground	Plant #1	Well House	Permanent	0392363	Meadow Ridge S/D	112	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392363	Meadow Ridge S/D	112	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Hallmark #1	Well House	Permanent	0392361	Swift Creek Master System	688	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Hallmark #4	Well House	Permanent	0392361	Swift Creek Master System	688	Reid Campbell Or Manager Now	Cary	NC	27519

Table 2.3-21 (Sheet 8 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Hallmark #3	Well House	Permanent	0392361	Swift Creek Master System	688	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Hallmark #2	Well House	Permanent	0392361	Swift Creek Master System	688	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Hollybrook #2	Well House	Permanent	0392361	Swift Creek Master System	688	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Hollybrook #1	Well House	Permanent	0392361	Swift Creek Master System	688	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392358	Belle Ridge S/D	135	Reid Campbell Or Manager Now	CARY	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392358	Belle Ridge S/D	135	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #3	Well House	Other	0392357	West Oaks S/D	605	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392357	West Oaks S/D	605	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Springfield #1	Well House	Permanent	0392357	West Oaks S/D	605	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Springfield #2	Well House	Permanent	0392357	West Oaks S/D	605	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392357	West Oaks S/D	605	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Willowbluffs #1	Well House	Permanent	0392355	Middle Creek Master	520	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Willowbluffs #2	Well House	Permanent	0392355	Middle Creek Master	520	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Willowbluffs #3	Well House	Permanent	0392355	Middle Creek Master	520	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Springhaven #1	Well House	Permanent	0392355	Middle Creek Master	520	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Middle Creek W#1	Well House	Permanent	0392355	Middle Creek Master	520	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #3	Well House	Permanent	0392353	Windsor Oaks	235	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392353	Windsor Oaks	235	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392353	Windsor Oaks	235	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392352	Gentle Slope Subdivision	34	John D Jones Or Mgr Now	Raleigh	NC	27603
Community	Ground	Well #1	Well House	Permanent	0392350	Robinfield Estates S/D	116	Saundra Landes Or Manager Now	Raleigh	NC	27607
Community	Ground	Well #1	Well House	Permanent	0392349	Richardson Mobile Estates	62	R E Richardson Or Manager Now	Garner	NC	27529
Community	Ground	Well #2	Well House	Permanent	0392345	Mill Run MHP	376	Envirolink	Bailey	NC	27807
Community	Ground	Well #1	Well House	Permanent	0392345	Mill Run MHP	376	Envirolink	Bailey	NC	27807
Community	Ground	Plant #1	Well House	Permanent	0392344	Auburn Estates	98	W Jack Poole Or Manager Now	Raleigh	NC	27610
Community	Ground	Plant #2	Well House	Permanent	0392338	Southwood-Surry Ridge S/D	340	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #3	Well House	Permanent	0392338	Southwood-Surry Ridge S/D	340	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392338	Southwood-Surry Ridge S/D	340	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392337	Wesley Woods	84	Reid Campbell Or Manager Now	Cary	NC	27519

Table 2.3-21 (Sheet 9 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Plant #1	Well House	Permanent	0392336	Woodbrook S/D	49	Reid Campbell Or Mgr Now	Cary	NC	27519
Community	Ground	Windhaven W#1	Well House	Permanent	0392335	Windhaven S/D	268	Reid Campbell Or Mgr Now	Cary	NC	27519
Community	Ground	Windhaven S W#1	Well House	Permanent	0392335	Windhaven S/D	268	Reid Campbell Or Mgr Now	Cary	NC	27519
Community	Ground	Windhaven S W#2	Well House	Permanent	0392335	Windhaven S/D	268	Reid Campbell Or Mgr Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392332	Hickory Haven S/D	34	D M Blalock Or Manager Now	Willow Springs	NC	27592
Community	Ground	Well #5	Well House	Permanent	0392331	Turner Farms III & IV	599	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #4	Well House	Permanent	0392331	Turner Farms III & IV	599	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #6	Well House	Permanent	0392331	Turner Farms III & IV	599	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392330	Briarwood Farms I	107	Reid Campbell Or Mgr Now	Cary	NC	27519
Community	Ground	WELLS #1,2,3,4	Well House	Permanent	0392323	Altice Estates S/D	233	Saundra Landes Or Manager Now	Raleigh	NC	27607
Community	Ground	Plant #1	Well House	Permanent	0392322	Kilt Valley Estates	76	Reid Campbell Or Mgr Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392321	Blue Skies Mh Living	185	Johnny Buffaloe Or Manager Now	Raleigh	NC	27606
Community	Ground	Plant #1	Well House	Permanent	0392321	Blue Skies Mh Living	185	Johnny Buffaloe Or Manager Now	Raleigh	NC	27606
Community	Ground	Well #1	Well House	Permanent	0392319	Swift Ridge S/D	92	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392315	Willow Winds S/D	50	Reid Campbell Or Mgr Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392314	Kensington Meadows S/D	93	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392313	Country Ridge S/D	59	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392313	Country Ridge S/D	59	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392311	Mobile Hill Estates #2	32	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392308	Squire Estates S/D	82	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392307	Lee's Long-Term Care	40	John D Jones Or Manager Now	Raleigh	NC	27603
Community	Ground	Well #1	Well House	Permanent	0392303	Mobile Hill Estate #3	105	Luci Crosby Or Manager Now	Zebulon	NC	27597
Community	Ground	Well #1	Well House	Permanent	0392298	Stonehenge S/D	1799	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #6	Well House	Permanent	0392298	Stonehenge S/D	1799	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #7	Well House	Permanent	0392298	Stonehenge S/D	1799	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #4	Well House	Permanent	0392298	Stonehenge S/D	1799	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Wildwd Grn #1	Well House	Permanent	0392298	Stonehenge S/D	1799	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Brandon #10/#11	Well House	Permanent	0392298	Stonehenge S/D	1799	Reid Campbell Or Manager Now	Cary	NC	27519

Table 2.3-21 (Sheet 10 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Well #3	Well House	Permanent	0392298	Stonehenge S/D	1799	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Wildwd Grn #2	Well House	Permanent	0392298	Stonehenge S/D	1799	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392294	Lakewood Estates	96	Reid Campbell Or Mgr Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392294	Lakewood Estates	96	Reid Campbell Or Mgr Now	Cary	NC	27519
Community	Ground	Well #1 (GLENDL)	Well House	Permanent	0392293	Glendale Master System	584	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #3 (ROLLWD)	Well House	Permanent	0392293	Glendale Master System	584	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #4 (BRIGHT)	Well House	Permanent	0392293	Glendale Master System	584	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #5 (PEBBLE)	Well House	Permanent	0392293	Glendale Master System	584	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2 (CHARI)	Well House	Permanent	0392293	Glendale Master System	584	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #9 WV2	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #27 OC3	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #6 HA6	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #22 BB6	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #19 W13	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #3 HA1&2	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #21 BB1	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #12 WV6	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #4 HA3&4	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #11 WV5	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #7 HA7	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #13 WV7	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #20 HA8	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #14 WV8	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #17 W11	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #15 WV9	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #8 WV1	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #18 W12	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519

Table 2.3-21 (Sheet 11 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type: 9
Groundwater Under the Direct Influence of Surface Water Type: 3
Groundwater Type: 431

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Plant #5 HA5	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #16 W10	Well House	Other	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #10 WV4	Well House	Permanent	0392291	Leesville Master	3559	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392280	Turner Farms S/D	123	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392280	Turner Farms S/D	123	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392274	Trinity Farms S/D	42	Luci Crosby Or Manager Now	Zebulon	NC	27597
Community	Ground	Plant #1	Well House	Permanent	0392271	James Rest Home	51	Randy Mcmillan Or Manager Now	New Hill	NC	27562
Community	Ground	Plant #2	Well House	Permanent	0392271	James Rest Home	51	Randy Mcmillan Or Manager Now	New Hill	NC	27562
Community	Ground	Well #1	Well House	Permanent	0392263	Legend Hills S/D	81	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #3	Well House	Permanent	0392257	Nottingham Forest S/D	410	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392257	Nottingham Forest S/D	410	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392257	Nottingham Forest S/D	410	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #3	Well House	Permanent	0392253	Lynnhaven-Crowsdale	648	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392253	Lynnhaven-Crowsdale	648	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392253	Lynnhaven-Crowsdale	648	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #4	Well House	Permanent	0392253	Lynnhaven-Crowsdale	648	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392251	Cambridge S/D	280	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392251	Cambridge S/D	280	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #3	Well House	Permanent	0392250	Deerfield Park S/D	430	Gary Prior Or Mgr Now	Garner	NC	27529
Community	Ground	Well #1	Well House	Permanent	0392250	Deerfield Park S/D	430	Gary Prior Or Mgr Now	Garner	NC	27529
Community	Ground	Well #2	Well House	Permanent	0392250	Deerfield Park S/D	430	Gary Prior Or Mgr Now	Garner	NC	27529
Community	Ground	Plant #1	Well House	Permanent	0392247	Rolling Acres S/D	57	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392240	NC Center For Mature Adults	50	Faiger Blackwell Or Mgr Now	Burlington	NC	27216
Community	Ground	Well #1	Well House	Permanent	0392237	Timberburg Hills	25	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392224	Sunset Lake MHP	60	John D Jones Or Manager Now	RALEIGH	NC	27603
Community	Ground	WELLS #1A &1B	Well House	Permanent	0392219	Roundtree S/D	86	Reid Campbell Or Manager Now	CARY	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392219	Roundtree S/D	86	Reid Campbell Or Manager Now	CARY	NC	27519

Table 2.3-21 (Sheet 12 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Plant #1	Well House	Permanent	0392217	Northgate S/D	81	Reid Campbell Or Manager Now	CARY	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392213	Colonial Heights-Meadow brook	77	Reid Campbell Or Manager Now	CARY	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392212	Burnette's MHP	84	John D Jones Or Mgr Now	RALEIGH	NC	27603
Community	Ground	Plant #1	Well House	Permanent	0392206	Hanna's Garden	60	Mike Keshk Or Manager Now	CARY	NC	27511
Community	Ground	Well #1	Well House	Permanent	0392200	W & L Trailer Haven	75	Jinx Pollard Or Manager Now	RALEIGH	NC	27603
Community	Ground	Plant #1	Well House	Permanent	0392196	Green Level Trailer Park	32	Saundra Landes Or Manager Now	RALEIGH	NC	27607
Community	Ground	Well #1	Well House	Permanent	0392195	Cloverbrook MHP	60	Luci Crosby Or Manager Now	ZEBULON	NC	27597
Community	Ground	Plant #3	Well House	Permanent	0392190	Southside MHP	285	Luncie Mcneil Or Manager Now	FUQUAY-VARINA	NC	27526
Community	Ground	Plant #2	Well House	Permanent	0392190	Southside MHP	285	Luncie Mcneil Or Manager Now	Fuquay-Varina	NC	27526
Community	Ground	Plant #1	Well House	Permanent	0392190	Southside MHP	285	Luncie Mcneil Or Manager Now	Fuquay-Varina	NC	27526
Community	Ground	Plant #1	Well House	Permanent	0392187	Sander's MHP	45	Darrell Wiggins Or Mgr Now	Garner	NC	27607
Community	Ground	Plant #1	Well House	Permanent	0392186	Royal Acres S/D	67	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392179	Pleasant Grove MHP	177	John D Jones Or Mgr Now	Raleigh	NC	27603
Community	Ground	Plant #1	Well House	Permanent	0392179	Pleasant Grove MHP	177	John D Jones Or Mgr Now	Raleigh	NC	27603
Community	Ground	Well #1	Well House	Permanent	0392178	Plantation MHP	120	Buck Rowland Or Manager Now	Willow Springs	NC	27592
Community	Ground	Plant #1	Well House	Permanent	0392177	Pineview Estates	93	John Gensinger Or Mgr Now	Raleigh	NC	27602
Community	Ground	Plant #1	Well House	Permanent	0392172	Oak Ridge Valley	69	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392168	Neuse Woods MH S/D	298	Joel Clarke Or Manager Now	Charlotte	NC	28224
Community	Ground	Well #1	Well House	Permanent	0392168	Neuse Woods MH S/D	298	Joel Clarke Or Manager Now	Charlotte	NC	28224
Community	Ground	Plant #2	Well House	Permanent	0392166	Mobile Hill Estates I	91	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392166	Mobile Hill Estates I	91	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392164	Middleton MH Court	54	Betty Middleton Or Manager Now	Garner	NC	27529
Community	Ground	Plant #1	Well House	Permanent	0392163	Riverview North	166	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392163	Riverview North	166	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392160	Medfield Estates S/D	731	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #7	Well House	Permanent	0392160	Medfield Estates S/D	731	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #6	Well House	Permanent	0392160	Medfield Estates S/D	731	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #4	Well House	Permanent	0392160	Medfield Estates S/D	731	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #3	Well House	Permanent	0392160	Medfield Estates S/D	731	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392151	Lakeview Estates MHP	125	J C Britt Or Mgr Now	Raleigh	NC	27603
Community	Ground	Plant #1	Well House	Permanent	0392150	Lakeside Estates	58		Holly Springs	NC	27540

Table 2.3-21 (Sheet 13 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	Address	City	State	Zip
Community	Ground	Plant #1	Well House	Permanent	0392149	Lake Wheeler MHP	161	Jinx Pollard Or Manager Now	3305 B Durham Dr	Raleigh	NC	27603
Community	Ground	Well #1	Well House	Permanent	0392147	Johnson & Son MHP	90	Anne Johnson Or Mgr Now	5917 Swales Way	Raleigh	NC	27603
Community	Ground	Well #1	Well House	Permanent	0392145	Hunt's MHP	45	George R Hunt Or Manager Now	10629 Jordan Rd	Raleigh	NC	27623
Community	Ground	Plant #1	Well House	Permanent	0392141	Parrish Meadows S/D	53	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392129	Fairview Wooded Acres MH S/D	325	Saundra Landes Or Manager Now	7406-F Chapel Hill Rd	Raleigh	NC	27607
Community	Ground	Well #3	Well House	Permanent	0392129	Fairview Wooded Acres MH S/D	325	Saundra Landes Or Manager Now	7406-F Chapel Hill Rd	Raleigh	NC	27607
Community	Ground	Well #2	Well House	Permanent	0392129	Fairview Wooded Acres MH S/D	325	Saundra Landes Or Manager Now	7406-F Chapel Hill Rd	Raleigh	NC	27607
Community	Ground	Well #1	Well House	Permanent	0392128	Emerald Village S/D	120	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392119	White Oak Village	101	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Wells #1 & #2	Well House	Permanent	0392117	Steeplechase S/D	99	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Well #3	Well House	Permanent	0392116	Colonial Heights-Malibu S/D	270	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392116	Colonial Heights-Malibu S/D	270	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Well #2	Well House	Emergency	0392116	Colonial Heights-Malibu S/D	270	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392113	Horseshoe Mobile Estates	270	Gerald Barfield Or Manager Now	5807 Horseshoe Dr	Raleigh	NC	27603
Community	Ground	Well #2	Well House	Permanent	0392113	Horseshoe Mobile Estates	270	Gerald Barfield Or Manager Now	5807 Horseshoe Dr	Raleigh	NC	27603
Community	Ground	Wells #1 & #2	Well House	Permanent	0392112	Carriage Hills S/D	75	Leon Neal Or Manager Now	3506 Carriage Dr	Raleigh	NC	27612
Community	Ground	Well #1	Well House	Permanent	0392111	Camelot S/D	600	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392111	Camelot S/D	600	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Well #3	Well House	Permanent	0392111	Camelot S/D	600	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Well #4	Well House	Permanent	0392111	Camelot S/D	600	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392108	Dallas Acres	149	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392108	Dallas Acres	149	Reid Campbell Or Manager Now	PO Box 4889	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392107	Buffalo MHP	229	Luci Crosby Or Manager Now	7536 NC Hwy 39 South	Zebulon	NC	27597
Community	Ground	Plant #3	Well House	Permanent	0392107	Buffalo MHP	229	Luci Crosby Or Manager Now	7536 NC Hwy 39 South	Zebulon	NC	27597
Community	Ground	Plant #3	Well House	Permanent	0392102	All Star MHP	536	John Buffaloe Jr Or Manager	5538 Fayetteville Rd	Raleigh	NC	27603
Community	Ground	Plant #1	Well House	Other	0392102	All Star MHP	536	John Buffaloe Jr Or Manager	5538 Fayetteville Rd	Raleigh	NC	27603
Community	Ground	Plant #2	Well House	Permanent	0392102	All Star MHP	536	John Buffaloe Jr Or Manager	5538 Fayetteville Rd	Raleigh	NC	27603
Community	Ground	Plant #1	Well House	Permanent	0392099	Jordan Woods S/D	70	Joel Clarke Or Mgr Now	PO Box 240908	Charlotte	NC	28224
Community	Ground	Plant #1	Well House	Permanent	0392095	Amherst S/D	298	Joel Clarke Or Mgr Now	PO Box 240908	Charlotte	NC	28224

Table 2.3-21 (Sheet 14 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Plant #2	Well House	Permanent	0392092	Country Creek S/D	172	Wade Temple Or Manager Now	Raleigh	NC	27603
Community	Ground	Plant #1	Well House	Permanent	0392092	Country Creek S/D	172	Wade Temple Or Manager Now	Raleigh	NC	27603
Community	Ground	Well #1	Well House	Permanent	0392091	Little John Acres	63	Gary Prior Or Mgr Now	Garner	NC	27529
Community	Ground	Plant #1	Well House	Permanent	0392090	Yates Mill Run S/D	178	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392090	Yates Mill Run S/D	178	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #3	Well House	Permanent	0392087	Stagecoach S/D	280	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392087	Stagecoach S/D	280	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392087	Stagecoach S/D	280	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0392085	Myatt Mill S/D	91	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0392085	Myatt Mill S/D	91	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #3	Well House	Permanent	0392080	Saddle Run S/D	325	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392080	Saddle Run S/D	325	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392080	Saddle Run S/D	325	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0392078	Lake Springs S/D	42	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0392078	Lake Springs S/D	42	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0368192	Timberidge MHP	56	Thomas Braxton Or Mgr Now	Chapel Hill	NC	27516
Community	Ground	Wells #3 #4 #5	Well House	Permanent	0368188	Bingham Woods MHP	180	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground	Well #2	Well House	Deactivate	0368188	Bingham Woods MHP	180	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground	Sedgefield #1	Well House	Permanent	0368185	Stoneridge Master	688	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Stoneridge #4	Well House	Permanent	0368185	Stoneridge Master	688	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Stoneridge #3	Well House	Other	0368185	Stoneridge Master	688	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Creekwood #1	Well House	Permanent	0368185	Stoneridge Master	688	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Stoneridge #1	Well House	Permanent	0368185	Stoneridge Master	688	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant 1	Well House	Permanent	0368184	Spring Hill MHP	79	Tom Pritchard Or Manager Now	Chapel Hill	NC	27516
Community	Ground	Plant #2	Well House	Permanent	0368179	Northwood S/D	120	Bill Goss Or Manager Now	Durham	NC	27704
Community	Ground	Plant #1	Well House	Permanent	0368179	Northwood S/D	120	Bill Goss Or Manager Now	Durham	NC	27704
Community	Ground	Plant #1	Treatment Plant	Permanent	0368174	The Ranch MHP	77	Michael Loy Or Mgr Now	Chapel Hill	NC	27514
Community	Ground	Well #1	Well House	Permanent	0368164	Morris Grove Heights	33	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground	Well #3	Treatment Plant	Permanent	0368160	Riley's MHP	65	Thomas Braxton Or Mgr Now	Chapel Hill	NC	27516

Table 2.3-21 (Sheet 15 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Well #1	Well House	Permanent	0368145	Robinswood S/D	340	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0368145	Robinswood S/D	340	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0368144	Foxboro Estates	56	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #3	Well House	Permanent	0368144	Foxboro Estates	56	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well D	Well House	Permanent	0368119	Homestead MHP	105	Len Fuqua Or Mgr Now	Hillsborough	NC	27278
Community	Ground	Well A & B	Well House	Permanent	0368119	Homestead MHP	105	Len Fuqua Or Mgr Now	Hillsborough	NC	27278
Community	Ground	Plant #1	Treatment Plant	Permanent	0368118	Hill Top MHP	70	Len Fuqua Or Mgr Now	Hillsborough	NC	27278
Community	Ground	Well #1	Well House	Permanent	0368116	Wildcat Creek S/D	102	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Treatment House	Well House	Permanent	0368105	Birchwood MHP	312	Jay Murray Or Manager Now	Durham	NC	27703
Community	Ground	Well #3	Well House	Permanent	0353127	Winding Creek Farms S/D	137	Bill Vila Or Manager Now	Sanford	NC	27331
Community	Ground	Well #1	Well House	Permanent	0353127	Winding Creek Farms S/D	137	Bill Vila Or Manager Now	Sanford	NC	27331
Community	Ground	Plant 1	Well House	Permanent	0353126	Creekwood S/D	64	Bill Vila Or Manager Now	Sanford	NC	27330
Community	Ground	Wells #1 and #2	Treatment Plant	Permanent	0353123	Quail Ridge Water System	305	John Johanson Or Manager Now	Carthage	NC	28327
Community	Ground	Plant #2	Well House	Permanent	0353122	Pine Village MHP	411	Bill Vila Or Manager Now	Sanford	NC	27331
Community	Ground	Plant #1	Well House	Permanent	0353122	Pine Village MHP	411	Bill Vila Or Manager Now	Sanford	NC	27331
Community	Ground	Well #1	Well House	Permanent	0353119	Convalescent Center Of Lee Co	103	Bonnie Marsh Or Mgr Now	Sanford	NC	27330
Community	Ground	Plant #16	Well House	Permanent	0353101	Carolina Trace Water System	2432	Wayman Mcdaniel Or Mgr Now	Garner	NC	27529
Community	Ground	Plant #4	Well House	Permanent	0353101	Carolina Trace Water System	2432	Wayman Mcdaniel Or Mgr Now	Garner	NC	27529
Community	Ground	Plant #2	Well House	Permanent	0353015	Broadway, Town Of	1476	Bob Stevenson Or Town Manager	Broadway	NC	27505
Community	Ground	Plant #1	Well House	Permanent	0353015	Broadway, Town Of	1476	Bob Stevenson Or Town Manager	Broadway	NC	27505
Community	Ground	Plant 1	Treatment Plant	Permanent	0351413	Glen Echo Mobile Estates Mhp	65	Solon Smith Or Mgr Now	Henderson	NC	27536
Community	Ground	Well #1	Well House	Other	0351192	Creekside Place S/D	86	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0351190	South Hills IX	53	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0351186	Creekstone S/D	500	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	WELLS #2 & #3	Well House	Permanent	0351186	Creekstone S/D	500	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0351185	Southgate S/D	150	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0351185	Southgate S/D	150	Reid Campbell Or Manager Now	Cary	NC	27519

Table 2.3-21 (Sheet 16 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Plant #1	Well House	Permanent	0351184	Southfort S/D	125	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0351176	Cleveland MHP	125	Jeff Lee Or Manager Now	Garner	NC	27529
Community	Ground	Southhills #3	Well House	Permanent	0351168	Southhills/South woods S/D	569	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Southhills #2	Well House	Permanent	0351168	Southhills/South woods S/D	569	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Pleasant Woods5	Well House	Permanent	0351168	Southhills/South woods S/D	569	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Southhills #4	Well House	Permanent	0351168	Southhills/South woods S/D	569	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Southwoods #1	Well House	Permanent	0351168	Southhills/South woods S/D	569	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant 1	Well House	Permanent	0351167	Shadow Lakes S/D	107	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0351164	Dupree's Court	48	Sylvia Ashworth Or Manager Now	Fuquay-Varina	NC	27526
Community	Ground	Plant 1	Well House	Permanent	0351161	Utley Mhp	81	John Dee Jones Or Mgr Now	Raleigh	NC	27603
Community	Ground	Plant 1	Well House	Permanent	0351156	Garner Estates Mh S/D	114	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #2	Well House	Permanent	0351154	Dutchess Downs Mh S/D	193	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Plant #1	Well House	Permanent	0351154	Dutchess Downs MH S/D	193	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #1	Well House	Permanent	0351150	Dupree's MHP	69	Sylvia Ashworth Or Manager Now	Fuquay-Varina	NC	27526
Community	Ground	Well #1	Well House	Permanent	0351104	Country Hills S/D	140	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #2	Well House	Permanent	0351104	Country Hills S/D	140	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #3	Well House	Permanent	0351104	Country Hills S/D	140	Reid Campbell Or Manager Now	Cary	NC	27519
Community	Ground	Well #10	Well House	Permanent	0343030	Campbell University Wtr System	4039	Kenneth D Flowers Or Mgr Now	Buies Creek	NC	27506
Community	Ground	Well #3	Well House	Permanent	0343030	Campbell University Wtr System	4039	Kenneth D Flowers Or Mgr Now	Buies Creek	NC	27506
Community	Ground	Well #1	Well House	Permanent	0343030	Campbell University Wtr System	4039	Kenneth D Flowers Or Mgr Now	Buies Creek	NC	27506
Community	Ground	Well #2	Well House	Permanent	0343030	Campbell University Wtr System	4039	Kenneth D Flowers Or Mgr Now	Buies Creek	NC	27506
Community	Ground	Well #8	Well House	Permanent	0343030	Campbell University Wtr System	4039	Kenneth D Flowers Or Mgr Now	Buies Creek	NC	27506
Community	Ground	Well #11	Well House	Permanent	0343030	Campbell University Wtr System	4039	Kenneth D Flowers Or Mgr Now	Buies Creek	NC	27506
Community	Ground	Well #7	Well House	Permanent	0343030	Campbell University Wtr System	4039	Kenneth D Flowers Or Mgr Now	Buies Creek	NC	27506

Table 2.3-21 (Sheet 17 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Community	Ground	Well #9	Well House	Permanent	0343030	Campbell University Wtr System	4039	Kenneth D Flowers Or Mgr Now	Buies Creek	NC	27506
Community	Ground	Well #6	Well House	Deactivate	0343030	Campbell University Wtr System	4039	Kenneth D Flowers Or Mgr Now	Buies Creek	NC	27506
Community	Ground	Well #1	Well House	Permanent	0319137	North Chatham Utilities	180	Luther Thomas Harden	Durham	NC	27705
Community	Ground	Well #2	Well House	Permanent	0319137	North Chatham Utilities	180	Luther Thomas Harden	Durham	NC	27705
Community	Ground	Well #1	Well House	Permanent	0319136	Lake Jordan MHP	121	A H Stone Or Manager Now	Chapel Hill	NC	27514
Community	Ground	Plant #1	Well House	Permanent	0319135	Woodbridge S/D	133	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground	Well #1	Well House	Permanent	0319134	Polks Trail S/D	70	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground	Plant #1	Well House	Permanent	0319133	Mansfield Condominiums	41	J T Goss Or Manager Now	Durham	NC	27704
Community	Ground	Plant #1	Well House	Permanent	0319132	Cedar Terrace Apartments	154	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground	Plant #1	Well House	Permanent	0319130	Cedar Village II	100	Jean J Williams Or Mgr Now	Chapel Hill	NC	27510
Community	Ground	Plant #1	Well House	Permanent	0319128	Cedar Lake Apts	84	Bill Goss Or Manager Now	Durham	NC	27704
Community	Ground	Plant #1	Treatment Plant	Permanent	0319125	Cape Fear Park	70	John Poteat Or Mgr Now	Chapel Hill	NC	27514
Community	Ground	Plant #2	Well House	Permanent	0319124	Country Estates MHP	70	Vossie Lee Horton Or Mgr	Apex	NC	27502
Community	Ground	Plant #1	Well House	Permanent	0319124	Country Estates MHP	70	Vossie Lee Horton Or Mgr	Apex	NC	27502
Community	Ground	Well #1	Well House	Permanent	0319123	Polks Landing S/D	382	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground	Plant #1	Well House	Permanent	0319120	Park & Stay MHP	120	Bill Goss Or Manager Now	Durham	NC	27704
Community	Ground	Well #2	Well House	Permanent	0319110	Beechwood Cove S/D	143	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground	Well #1	Well House	Permanent	0319110	Beechwood Cove S/D	143	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground	Plant #3	Well House	Deactivate	0319104	CHATHAM S/D	360	NEIL PHILLIPS OR MANAGER NOW	Greensboro	NC	27425
Community	Ground	Plant #1	Well House	Deactivate	0319104	CHATHAM S/D	360	Neil Phillips Or Manager Now	Greensboro	NC	27425
Community	Ground	Plant #1	Well House	Permanent	0319103	Cedar Village I	45	Mrs Harold Williams Or Mgr Now	Chapel Hill	NC	27510
Non-Transient, Non-Community	Ground	Well #1	Well House	Permanent	4392434	The New School Inc	200	Lars Godwin Or Manager Now	Raleigh	NC	27606
Non-Transient, Non-Community	Ground	Well #1	Well House	Permanent	4392420	Thompson's Daycare & Preschool	29	Ronnie Thompson Or Manger Now	Garner	NC	27529
Non-Transient, Non-Community	Ground	Plant #1	Well House	Permanent	4392404	West Lake Middle School	1299	Frank Koontz Or Manager Now	Raleigh	NC	27610
Non-Transient, Non-Community	Ground	Plant #1	Well House	Permanent	0392980	Nc Products-South Raleigh Plt	76	Claude Moon Or Mgr Now	Raleigh	NC	27611
Non-Transient, Non-Community	Ground	Well #3/Storage	Storage	Permanent	0392720	Angus Barn	100	Greg Aardal Or Manager Now	Raleigh	NC	27628
Non-Transient, Non-Community	Ground	Grade Sch Well	Well House	Deactivate	0368470	Emerson Waldorf Sch-Grade Sch	210	Chad Leinbach Or Manager Now	Chapel Hill	NC	27516

Table 2.3-21 (Sheet 18 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Non-Transient, Non-Community	Ground	Well #3	Well House	Permanent	0368470	Emerson Waldorf Sch-Grade Sch	210	Chad Leinbach Or Manager Now	Chapel Hill	NC	27516
Non-Transient, Non-Community	Ground	Well #1	Well House	Permanent	0332590	Montessori Middle School	60	Chad Leinbach Or Manager Now	Chapel Hill	NC	27514
Non-Transient, Non-Community	Ground	Well #1	Well House	Permanent	0319438	Family Wellness/ Recovery Cntr	25	Marcia Mandel Or Manager Now	Chapel Hill	NC	27515
Non-Transient, Non-Community	Ground	Well #2	Well House	Permanent	0319437	Camp Royall Autism Society	80	David Yell Or Manager Now	Moncure	NC	27559
Non-Transient, Non-Community	Ground	Well #1	Well House	Permanent	0319437	Camp Royall Autism Society	80	David Yell Or Manager Now	Moncure	NC	27559
Non-Transient, Non-Community	Ground	Plant #1	Well House	Permanent	0319432	Three Springs Boy's Camp	62	Francis Wilmoth Or Mgr Now	Siler City	NC	27344
Non-Transient, Non-Community	Ground	Plant #1	Treatment Plant	Permanent	0319431	Auldern Academy	68	Francis Wilmoth Or Mgr Now	Siler City	NC	27344
Transient, Non-Community	Ground	Well #1	Well House	Permanent	4392444	Crowder District Park	200	Lisa Ash Or Mgr Now	Apex	NC	27502
Transient, Non-Community	Ground	Well #1	Well House	Permanent	4392435	Mount Auburn Training Center	50	Glenn Blackley Or Manager Now	Raleigh	NC	27602
Transient, Non-Community	Ground	Well #1	Well House	Permanent	4392421	Sutton's BBQ	30	Peggy Walters Or Mgr Now	Willow Springs	NC	27592
Transient, Non-Community	Ground	Plant #1	Treatment Plant	Permanent	4392418	Triangle Brick-Carpenter Plant	25	Tom Justice Or Manager Now	Durham	NC	27713
Transient, Non-Community	Ground	Well #2	Well House	Permanent	4392402	Lake Wheeler Park	100	Jan Harris	Raleigh	NC	27607
Transient, Non-Community	Ground	Well #1	Well House	Permanent	4392402	Lake Wheeler Park	100	Jan Harris	Raleigh	NC	27607
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0392927	Mt Herman Christian Church	200	Mike Spear Or Pastor Now	Garner	NC	27529
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0392759	Faith Bible Fellowship	90	Carolton Roberts Or Pastor Now	Raleigh	NC	27606
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0392587	Fellowship Baptist Church	300	Rev Jay Waggoner Or Pastor Now	Willow Springs	NC	27592
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0392448	Olive Chapel Baptist Church	25	Sandy Williams Or Pastor Now	Apex	NC	27502
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0392429	Edwards Grocery & Hardware	150	Brian Stevens Or Mgr Now	Raleigh	NC	27606
Transient, Non-Community	Ground	Plant #1	Well House	Permanent	0392427	Triangle Brick Company	25	Thomas Justice Or Manager Now	Durham	NC	27713
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0368471	New Life Aqueduct Center	50	Tom Tyson Or Manager Now	Chapel Hill	NC	27516
Transient, Non-Community	Ground	Plant #1	Treatment Plant	Permanent	0368463	White Cross Recreation Asso	70	Thomas Braxton Or Mgr Now	Chapel Hill	NC	27516
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0353415	Palomino Motel	100	Duran Johnson Or Mgr Now	Sanford	NC	27330
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0319492	Lighthouse Fwb Church	70	Larry Ness Or Pastor Now	Siler City	NC	27344
Transient, Non-Community	Ground	Plant #1	Well House	Deactivate	0319454	The Old Place	154	Tommy Estridge Or Manager Now	Bennett	NC	27208
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0319440	Craig's General Store	25	Craig Farrell Or Manager Now	Apex	NC	27520
Transient, Non-Community	Ground	Well #1	Pumping Facility	Permanent	0319429	Jordan Lake Sra-Oper/Maint	30	Mike Seigh Or Manager Now	Apex	NC	27502

Table 2.3-21 (Sheet 19 of 19)
Public Water Supply Users within 40 Kilometers (25 Miles) of the HAR Site

Surface Water Type:	**9**
Groundwater Under the Direct Influence of Surface Water Type:	**3**
Groundwater Type:	**431**

Public Water Supply Type	Water Type	Source Name	Function	Availability	Public Water Supply ID	System Name	Population	Responsible	City	State	Zip
Transient, Non-Community	Ground	Plant #1	Well House	Permanent	0319428	Seaforth Campground	75	Pete Mitchell Or Mgr Now	Apex	NC	27502
Transient, Non-Community	Ground	Well	Well House	Permanent	0319424	Crosswinds Marina	100	Albert C Urquhart Or Mgr	Apex	NC	27502
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0319420	Crosswinds Boat Ramp	100	Mike Seigh Or Park Supt	Apex	NC	27502
Transient, Non-Community	Ground	Well #1	Well House	Permanent	0319404	Meronies Methodist Church	80	Duane Hart Or Pastor Now	Bear Creek	NC	27207

Source: Reference 2.3-011

Table 2.3-22 (Sheet 1 of 2)
USGS County Water Use Data — North Carolina 2000

	Units	All Counties within 16 km (10 mi.) of the HAR Site				Additional Counties within 40 km (25 mi.) of the HAR Site					Additional Counties within 80 km (50 mi.) of the HAR Site																
		Chatham	Harnett	Lee	Wake	Alamance	Durham	Johnston	Moore	Orange	Caswell	Cumberland	Franklin	Granville	Guilford	Hoke	Montgomery	Nash	Person	Randolph	Richmond	Robeson	Sampson	Scotland	Vance	Wayne	Wilson
Federal Information Processing Standards (FIPS)		37037	37085	37105	37183	37001	37063	37101	37125	37135	37033	37051	37069	37077	37081	37093	37123	37127	37145	37151	37153	37155	37163	37165	37181	37191	37195
State		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
State FIPS Code		37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
County FIPS Code		037	085	105	183	001	063	101	125	135	033	051	069	077	081	093	123	127	145	151	153	155	163	165	181	191	195
Year		2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Total Population of County	Thousands	49.33	91.03	49.04	627.85	130.80	223.31	121.97	74.77	118.23	23.50	302.96	47.26	48.50	421.05	33.65	26.82	87.42	35.62	130.45	46.56	123.34	60.16	36.00	42.95	113.33	73.81
Public Supply																											
Total Population Served	Thousands	22.59	85.91	29.44	538.83	68.12	166.66	48.63	42.71	90.45	2.76	258.41	10.53	17.38	265.74	24.44	17.50	68.05	8.75	63.35	34.21	81.08	21.80	23.25	20.40	89.68	48.08
Ground-water Withdrawals, Fresh Coded	Mgal/day	0.16	0.31	0.33	4.93	0.26	0.34	1.35	3.09	0.52	0.07	4.85	0.28	0.13	0.79	1.50	0.09	0.81	0.02	0.67	0.00	11.58	2.63	4.48	0.07	5.76	0.57
Surface-water Withdrawals, Fresh Coded	Mgal/day	4.57	9.69	6.89	67.83	17.91	30.13	5.54	3.88	12.44	0.24	34.88	2.06	2.60	55.86	0.00	2.77	14.90	3.62	6.87	7.35	8.82	0.00	0.00	5.26	6.26	8.31
Total Withdrawals, Fresh	Mgal/day	4.73	10.00	7.22	72.76	18.17	30.47	6.89	6.97	12.96	0.31	39.73	2.34	2.73	56.65	1.50	2.86	15.71	3.64	7.54	7.35	20.40	2.63	4.48	5.33	12.02	8.88
Domestic Water Use																											
Self-Supplied Population	Thousands	26.74	5.12	19.60	89.02	62.68	56.65	73.34	32.06	27.78	20.74	44.55	36.73	31.12	155.31	9.21	9.32	19.37	26.87	67.10	12.35	42.26	38.36	12.75	22.55	23.65	25.73
Ground-water Withdrawals, Fresh Coded	Mgal/day	1.87	0.36	1.37	6.23	4.39	3.97	5.13	2.24	1.94	1.45	3.12	2.57	2.18	10.87	0.64	0.65	1.36	1.88	4.70	0.86	2.96	2.69	0.89	1.58	1.66	1.80
Surface-water Withdrawals, Fresh Coded	Mgal/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Withdrawals, Fresh	Mgal/day	1.87	0.36	1.37	6.23	4.39	3.97	5.13	2.24	1.94	1.45	3.12	2.57	2.18	10.87	0.64	0.65	1.36	1.88	4.70	0.86	2.96	2.69	0.89	1.58	1.66	1.80
Industrial Water Use																											
Ground-water Withdrawals, Fresh Coded	Mgal/day	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.02	0.00	1.35	1.06	0.15	0.00	0.00	0.00
Total Withdrawals, Ground-water	Mgal/day	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.02	0.00	1.35	1.06	0.15	0.00	0.00	0.00
Surface-water Withdrawals, Fresh Coded	Mgal/day	0.47	1.07	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.74	0.00	0.00	0.00
Total Withdrawals, Surface-water	Mgal/day	0.47	1.07	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.74	0.00	0.00	0.00
Total Withdrawals, Fresh	Mgal/day	0.49	1.07	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.45	0.00	0.00	0.00	0.02	0.00	1.35	1.06	3.89	0.00	0.00	0.00
Total Withdrawals	Mgal/day	0.49	1.07	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.45	0.00	0.00	0.00	0.02	0.00	1.35	1.06	3.89	0.00	0.00	0.00
Irrigation																											
Irrigation, acres irrigated, sprinkler	Thousands	0.70	3.58	1.17	7.66	2.09	1.20	2.79	6.16	1.34	1.64	3.18	3.29	2.63	4.21	0.31	0.59	15.72	1.43	1.80	1.18	2.13	8.96	1.40	1.87	2.39	3.45
Irrigation, acres irrigated, microirrigation	Thousands	0.18	0.06	0.01	0.05	0.00	0.00	0.05	0.03	0.01	0.00	0.02	0.03	0.05	0.10	0.00	0.15	0.31	0.03	0.01	0.02	0.03	0.45	0.00	0.02	0.30	0.06
Irrigation, acres irrigated, total	Thousands	0.88	3.64	1.18	7.71	2.09	1.20	2.84	6.19	1.35	1.64	3.20	3.32	2.68	4.31	0.31	0.74	16.03	1.46	1.81	1.20	2.16	9.41	1.40	1.89	2.69	3.51
Irrigation, ground-water withdrawals, fresh	Mgal/day	0.15	0.82	0.31	3.54	0.00	0.47	1.13	3.42	0.52	1.47	0.99	0.07	0.23	1.00	0.23	0.27	1.38	0.14	0.46	0.21	0.92	1.65	0.52	0.00	1.20	1.59
Irrigation, surface-water withdrawals, fresh	Mgal/day	1.33	3.26	1.76	10.59	3.62	2.70	3.34	10.27	1.47	0.00	3.98	3.06	2.21	8.96	0.57	0.82	12.27	1.22	3.15	1.19	2.09	6.59	1.57	1.92	2.41	3.64
Irrigation, total withdrawals, fresh	Mgal/day	1.48	4.08	2.07	14.13	3.62	3.17	4.47	13.69	1.99	1.47	4.97	3.13	2.44	9.96	0.80	1.09	13.65	1.36	3.61	1.40	3.01	8.24	2.09	1.92	3.61	5.23

Table 2.3-22 (Sheet 2 of 2)
USGS County Water Use Data — North Carolina 2000

	Units	All Counties within 16 km (10 mi.) of the HAR Site				Additional Counties within 40 km (25 mi.) of the HAR Site					Additional Counties within 80 km (50 mi.) of the HAR Site																
		Chatham	Harnett	Lee	Wake	Alamance	Durham	Johnston	Moore	Orange	Caswell	Cumberland	Franklin	Granville	Guilford	Hoke	Montgomery	Nash	Person	Randolph	Richmond	Robeson	Sampson	Scotland	Vance	Wayne	Wilson
Livestock Water Use																											
Ground-water Withdrawals, Fresh Coded	Mgal/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.04	0.00
Total Withdrawals, Fresh	Mgal/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.04	0.00
Livestock Water Use (Stock)																											
Ground-water Withdrawals, Fresh Coded	Mgal/day	3.03	2.28	0.57	0.12	0.38	0.03	2.11	1.82	0.24	0.14	0.53	0.13	0.05	0.04	0.21	0.64	1.17	0.08	3.41	1.76	2.89	10.71	0.93	0.01	2.01	0.18
Surface-water Withdrawals, Fresh Coded	Mgal/day	0.98	0.24	0.14	0.00	0.35	0.01	0.11	1.79	0.06	0.01	0.06	0.37	0.15	0.30	0.05	1.52	0.14	0.06	2.28	0.96	0.34	0.00	0.17	0.02	1.99	0.02
Total Withdrawals, Fresh	Mgal/day	4.01	2.52	0.71	0.12	0.73	0.04	2.22	3.61	0.30	0.15	0.59	0.50	0.20	0.34	0.26	2.16	1.31	0.14	5.69	2.72	3.23	10.71	1.10	0.03	4.00	0.20
Thermoelectric Power Water Use (All Fuel Types)																											
Surface-water Withdrawals, Fresh Coded	Mgal/day	352.00	0.00	0.00	34.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1052.20	0.00	0.00	6.80	0.00	0.00	0.00	20.59	0.00
Total Withdrawals, Surface-water	Mgal/day	352.00	0.00	0.00	34.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1052.20	0.00	0.00	6.80	0.00	0.00	0.00	20.59	0.00
Total Withdrawals, Fresh	Mgal/day	352.00	0.00	0.00	34.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1052.20	0.00	0.00	6.82	0.00	0.00	0.00	20.59	0.00
Total Withdrawals	Mgal/day	352.00	0.00	0.00	34.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1052.20	0.00	0.00	6.82	0.00	0.00	0.00	20.59	0.00
Thermoelectric Power Once-Through																											
Surface-water Withdrawals, Fresh Coded	Mgal/day	352.00	0.00	0.00	34.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1052.20	0.00	0.00	6.80	0.00	0.00	0.00	20.59	0.00
Total Withdrawals, Surface-water	Mgal/day	352.00	0.00	0.00	34.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1052.20	0.00	0.00	6.80	0.00	0.00	0.00	20.59	0.00
Thermoelectric Power Closed-Loop																											
Ground-water Withdrawals, Fresh Coded	Mgal/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Total Withdrawals, Fresh	Mgal/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Total Withdrawals	Mgal/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Totals																											
Total Ground-water Withdrawals, Fresh Coded	Mgal/day	5.23	3.77	2.58	14.82	5.03	4.81	9.72	10.57	3.22	3.13	9.49	3.05	2.59	12.70	2.78	1.65	4.72	2.12	9.26	2.83	19.72	18.81	6.97	1.66	10.67	4.14
Total Withdrawals, Ground-water	Mgal/day	5.23	3.77	2.58	14.82	5.03	4.81	9.72	10.57	3.22	3.13	9.49	3.05	2.59	12.70	2.78	1.65	4.72	2.12	9.26	2.83	19.72	18.81	6.97	1.66	10.67	4.14
Total Surface-water Withdrawals, Fresh Coded	Mgal/day	359.35	14.26	8.79	113.00	22.11	32.84	8.99	15.94	13.97	0.25	38.92	5.49	4.96	66.37	0.87	5.11	27.31	1057.10	12.30	9.50	18.05	6.59	5.48	7.20	31.25	11.97
Total Withdrawals, Surface-water	Mgal/day	359.35	14.26	8.79	113.00	22.11	32.84	8.99	15.94	13.97	0.25	38.92	5.49	4.96	66.37	0.87	5.11	27.31	1057.10	12.30	9.50	18.05	6.59	5.48	7.20	31.25	11.97
Total Withdrawals, Fresh	Mgal/day	364.58	18.03	11.37	127.82	27.14	37.65	18.71	26.51	17.19	3.38	48.41	8.54	7.55	79.07	3.65	6.76	32.03	1059.22	21.56	12.33	37.77	25.40	12.45	8.86	41.92	16.11
Total Withdrawals	Mgal/day	364.58	18.03	11.37	127.82	27.14	37.65	18.71	26.51	17.19	3.38	48.41	8.54	7.55	79.07	3.65	6.76	32.03	1059.22	21.56	12.33	37.77	25.40	12.45	8.86	41.92	16.11

Source: Reference 2.3-029

Table 2.3-23 (Sheet 1 of 4)
1997 and 2010 Cape Fear River Population and Water Use as Reported by Local Water Supply Plan (LWSP) Systems

Water Systems by County	Water Source or Supplier	Year-round Service Population 1997	Year-round Service Population 2010	Average Daily Demand (mgd) 1997	Average Daily Demand (mgd) 2010	Available Supply (mgd) 1997	Available Supply (mgd) 2010	Demand as % of Supply[b] 1997	Demand as % of Supply[b] 2010
ALAMANCE									
GREEN LEVEL[a]	GRAHAM MEBANE	1536	1705	0.107	0.119	0.132	0.132	81%	90%
OSSIPEE SD[a]	Bedrock Wells	300	425	0.024	0.034	0.03	0.53	80%	6%
ALAMANCE	BURLINGTON	257	313	0.033	0.04	0.5	0.5	7%	8%
BURLINGTON	Lake Mackintosh / Stoney Creek	43200	51967	14.517	18.227	48	48	30%	38%
ELON COLLEGE	Bedrock Wells / BURLINGTON	5045	5710	0.47	0.562	1.123	1.123	42%	50%
GRAHAM	Graham-Mebane Lake / BURLINGTON	11725	14250	7.158	8.211	12	12	60%	68%
HAW RIVER	BURLINGTON / GRAHAM	2183	3345	0.695	0.761	1.8	2.4	39%	32%
MEBANE	GRAHAM MEBANE	5100	11359	1.749	2.83	4	4	44%	71%
BLADEN									
BLADEN CO WD - 701 NORTH	Upper Cape Fear Aquifer	1240	2136	0.067	0.116	0.144	0.144	47%	81%
BLADEN CO WD - EAST ARCADIA	Upper Cape Fear Aquifer	496	1368	0.05	0.139	0.198	0.198	25%	70%
BLADEN CO WD - WHITE OAK	Black Creek Aquifer	1400	2860	0.063	0.129	0.31	0.31	20%	37%
ELIZABETHTOWN	Lower Cape Fear & Upper Cape Fear Aquifers	4181	4602	0.901	0.933	1.368	1.368	66%	68%
WHITE LAKE (s)	Black Creek & Upper Cape Fear Aquifers	1010	1085	0.411	0.575	0.95	0.95	43%	61%
BRUNSWICK									
NORTH BRUNSWICK WSA (LELAND SD)[a]	BRUNSWICK CO	3464	5000	0.494	0.561	1	1	49%	56%
BRUNSWICK CO (s)	LCFWSA	61959	83175	17.3	23.9	27.418	27.418	63%	87%
CASWELL BEACH (s)	BRUNSWICK CO	220	400	0.121	0.389	0.26	0.26	47%	150%
HOLDEN BEACH (s)	BRUNSWICK CO	910	2060	0.353	1.121	0.822	0.822	43%	136%
LONG BEACH WATER (s)	BRUNSWICK CO	4789	6797	1.044	1.514	1.32	1.32	79%	115%
NAVASSA	N BRUNSWICK SD	520	590	0.047	0.122	0.133	0.133	35%	92%
OCEAN ISLE BEACH (s)	BRUNSWICK CO	689	1057	0.386	1.171	0.92	0.92	42%	128%
SHALLOTTE	BRUNSWICK CO	1250	1380	0	0	0	0	65%	70%
SOUTHPORT	BRUNSWICK CO / Peedee Aquifer	5124	6756	0.607	0.801	0.771	1.116	79%	72%
SUNSET BEACH (s)	BRUNSWICK CO	1908	2350	0.501	1.358	1.085	1.085	46%	125%
YAUPON BEACH (s)	BRUNSWICK CO / Peedee Aquifer	891	1048	0.186	0.26	0.425	0.425	44%	61%
CHATHAM									
CHATHAM CO E	SANFORD	680	1218	0.069	0.116	0.3	1.8	23%	6%
CHATHAM CO N	Jordan Lake	5860	13163	0.759	3.149	6	12	13%	26%
CHATHAM CO SW	SILER CITY / GOLDSTON GULF SD	1793	4218	0.279	0.668	0.55	2.05	51%	33%
GOLDSTON-GULF SD	Deep River	1000	1257	0.387	0.458	2.2	2.2	18%	21%
PITTSBORO	Haw River	2022	3350	0.707	1.042	7.6	7.6	9%	14%
SILER CITY	Rocky River	5541	6929	2.8	3.4	3.8	5.8	72%	59%
COLUMBUS									
RIEGELWOOD SD	Cape Fear River	323	400	0.593	0.564	1	1	59%	56%
CUMBERLAND									
FALCON	DUNN	695	797	0.474	0.489	0.2	0.2	11%	13%
FAYETTEVILLE	Big Cross Cr./ Glenville Lake / Cape Fear River	159225	286500	27.809	47.936	92	92	30%	52%
FT BRAGG WTP	Little River	65000	65000	7.56	7.56	20	20	38%	38%
GODWIN	FALCON	203	237	0.012	0.0141	0.04	0.04	30%	35%

Table 2.3-23 (Sheet 2 of 4)
1997 and 2010 Cape Fear River Population and Water Use as Reported by Local Water Supply Plan (LWSP) Systems

		Year-round Service Population		Average Daily Demand (mgd)		Available Supply (mgd)		Demand as % of Supply(2)	
Water Systems by County	**Water Source or Supplier**	**1997**	**2010**	**1997**	**2010**	**1997**	**2010**	**1997**	**2010**
HOPE MILLS	FAYETTEVILLE	10433	14750	0.838	1.2	1.33	1.33	63%	90%
LINDEN	HARNETT CO	800	950	0.058	0.073	0.1	0.1	58%	73%
SPRING LAKE	Surficial Aquifer / FAYETTEVILLE	12050	15375	0.99	1.27	0.757	1.4	131%	90%
STEDMAN	Surficial & Upper Cape Fear Aquifers	668	887	0.108	0.089	0.157	0.157	69%	57%
WADE	Surficial Aquifer / Bedrock Wells	457	532	0.035	0.0611	0.11	0.204	32%	30%
DUPLIN (in proposed Central Coastal Plain Capacity Use Area)									
ALBERTSON WSD	Black Creek Aquifer / DUPLIN CO	1047	1259	0.141	0.1653	0.287	0.287	49%	57%
BEULAVILLE	Peedee & Black Creek Aquifers	1210	1263	0.136	0.151	0.396	0.396	34%	38%
CALYPSO	Upper Cape Fear Aquifer	487	460	0.105	0.106	0.317	0.317	33%	33%
CHINQUAPIN WA	Black Creek & Peedee Aquifers	3800	4500	0.233	0.4	0.648	0.648	36%	62%
DUPLIN CO COMBINED	Black Creek Aquifer / DUBLIN	3976	15079	0.4707	1.682	1.66	2.862	0%	0%
FAISON	Black Crk & U C Fear Aquifers / DUPLIN CO	752	712	0.576	0.594	0.702	0.702	82%	85%
GREENEVERS	Peedee & Black Creek Aquifers	981	1054	0.088	0.095	0.36	0.36	24%	26%
KENANSVILLE	Black Creek Aquifer	1026	1050	0.199	0.233	0.423	0.423	47%	55%
MAGNOLIA	Black Creek Aquifer	815	874	0.092	0.097	0.45	0.45	20%	22%
ROSE HILL	Black Creek Aquifer	1510	1708	0.316	0.36	0.792	0.792	40%	45%
TEACHEY	WALLACE	484	360	0.03	0.034	0.035	0.035	85%	96%
WALLACE	Peedee & Black Creek Aquifers	3386	3642	2.529	0.455	2.531	2.531	100%	18%
WARSAW	Black Creek & Upper Cape Fear Aquifers	3292	3643	0.444	0.463	0.396	0.58	112%	80%
GUILFORD									
GIBSONVILLE[a]	Bedrock Wells/BURLINGTON	3799	5815	0.399	0.576	1.131	1.381	35%	42%
GREENSBORO	Lake Higgins, Lake Brandt, Lake Townsend	199000	214000	40.3	50.482	36	71	112%	71%
HIGH POINT	City Lake, Oak Hollow Lake	71160	80063	15.519	22.277	21.44	31.44	72%	71%
JAMESTOWN	GREENSBORO / HIGH POINT	4329	6000	0.409	0.547	1.1	2.2	37%	25%
HARNETT									
ANGIER	HARNETT CO	3010	4114	0.349	0.508	2.02	2.02	17%	25%
COATS	HARNETT CO	1800	1900	0.13	0.184	0.72	0.72	22%	26%
DUNN	Cape Fear River	9731	12561	4.643	5.56	8	8	58%	70%
ERWIN	Swift Textiles Reservoir	4265	5373	0.619	0.739	1.5	1.5	41%	49%
HARNETT CO	Cape Fear River / DUNN/JOHNSTON CO	65000	101970	10.05	18.23	13.3	13.3	76%	137%
LILLINGTON	HARNETT CO	3003	4341	0.478	0.742	1.3	1.3	37%	57%
JOHNSTON									
BENSON	DUNN / JOHNSTON CO	4000	5175	1.77	1.98	1.72	1.72	103%	115%
LEE									
BROADWAY	Bedrock Wells / SANFORD	1070	1246	0.093	0.111	0.096	0.162	97%	68%
LEE CO	Deep River	145	213	0.756	0.854	1.5	1.5	50%	57%
LEE CO WSD I	SANFORD	1870	7166	0.179	0.574	2	2	9%	29%
SANFORD	Cape Fear River	21608	33000	8.18	10.3	12.6	12.6	65%	82%
MOORE									
CAMERON	Bedrock Wells	391	524	0.049	0.064	0.109	0.134	45%	48%
CARTHAGE	WTP Pond /Nick's Creek	2175	2400	0.3	0.49	0.5	0.5	60%	98%
MOORE CO (HYLAND HILLS - NIAGRA)	Bedrock Wells	267	277	0.021	0.0222	0.032	0.032	57%	69%
MOORE CO (PINEHURST)	Bedrock Wells/SOUTHERN PINES	7746	13019	1.61	3.492	2.417	4.999	67%	70%

Table 2.3-23 (Sheet 3 of 4)
1997 and 2010 Cape Fear River Population and Water Use
as Reported by Local Water Supply Plan (LWSP) Systems

Water Systems by County	Water Source or Supplier	Year-round Service Population 1997	Year-round Service Population 2010	Average Daily Demand (mgd) 1997	Average Daily Demand (mgd) 2010	Available Supply (mgd) 1997	Available Supply (mgd) 2010	Demand as % of Supply(2) 1997	Demand as % of Supply(2) 2010
MOORE CO (SEVEN LAKES)	Bedrock Wells	2685	4163	0.314	0.479	0.341	0.773	92%	62%
MOORE CO (VASS)	Little River	736	1000	0.094	0.1255	1.45	1.45	6%	9%
ROBBINS	Bear Cr./Cabin Cr./Brooks Res.	1950	2074	0.822	0.826	1.5	1.5	55%	55%
NEW HANOVER									
APPLE VALLEY	Peedee, Castle Hayne, & Surficial Aquifers	199	254	0.122	0.158	0.166	0.166	73%	95%
BRICKSTONE - MARSH OAKS	Peedee, Castle Hayne, & Surficial Aquifers	535	683	0.059	0.076	0.216	0.216	27%	36%
CAROLINA BEACH	Castle Hayne & Surficial Aquifers	4643	5468	0.841	0.99	0.89	1.322	94%	75%
FIGURE EIGHT ISLAND	Peedee Aquifer	125	169	0.4	0.532	0.564	0.564	71%	94%
KURE BEACH	Surficial & Peedee Aquifers	1251	1518	0.493	0.598	0.396	0.396	124%	151%
LOWER CAPE FEAR WSA	Cape Fear River	0	0	41.15	51.15	50	50	82%	102%
MONTEREY HEIGHTS	Peedee, Castle Hayne, & Surficial Aquifers	1095	1325	0.101	0.117	0.242	0.242	42%	48%
MURRAYVILLE	Peedee, Castle Hayne, & Surficial Aquifers	7671	10548	1.212	1.67	2.916	2.916	42%	57%
NEW HANOVER CO AIRPORT	WILMINGTON	0	0	0.019	0.024	0.025	0.025	75%	95%
NEW HANOVER CO FLEMINGTON	Surficial Aquifer	187	239	0.283	0.32	0.432	0.432	66%	74%
PRINCE GEORGE	Peedee, Castle Hayne, & Surficial Aquifers	596	760	0.052	0.068	0.18	0.18	29%	38%
RUNNYMEADE	Peedee, Castle Hayne, & Surficial Aquifers	728	929	0.052	0.068	0.144	0.144	36%	47%
WALNUT HILLS	Peedee, Castle Hayne, & Surficial Aquifers	781	997	0.072	0.094	0.148	0.148	48%	63%
WESTBAY	Peedee, Castle Hayne, & Surficial Aquifers	644	822	0.039	0.051	0.648	0.648	6%	8%
WILMINGTON	LCFWSA / Cape Fear River	66686	73200	12.336	19.853	40.5	45.85	30%	43%
WRIGHTSVILLE BEACH	Surficial Aquifer	3146	3580	1.374	1.554	1.222	1.222	112%	127%
ONSLOW (in proposed Central Coastal Plain Capacity Use Area)									
HOLLY RIDGE[(a)]	ONSLOW CO	723	870	0.09	0.108	0.09	0.09	100%	120%
CAMP LEJEUNE - Combined	Castle Hayne & Surficial Aquifers / ONSLOW CO	68700	68700	6.547	6.547	15.582	15.582	42%	42%
JACKSONVILLE	Peedee & Black Creek Aquifers	32489	38175	4.01	4.503	3.448	3.448	117%	132%
NW ONSLOW WATER	Peedee Aquifer	1000	1137	0.085	0.108	0.216	0.216	39%	50%
ONSLOW CO	Black Creek, Peedee, Castle Hayne, & Surficial Aquifers	81041	115000	6.07	9.455	9.286	13.286	64%	70%
RICHLANDS	Black Creek Aquifer	1250	2048	0.174	0.212	0.324	0.324	54%	65%
ORANGE									
OWASA	University Lake / Cane Creek	65000	80300	8.978	11.693	10.4	20.4	86%	57%
PENDER									
BURGAW	Peedee & Black Creek Aquifers	3519	4682	0.449	0.65	0.81	0.81	55%	80%
SURF CITY	Peedee Aquifer	910	1162	0.407	0.488	0.63	0.936	65%	52%
TOPSAIL BEACH	Peedee Aquifer	450	650	0.324	0.459	0.497	0.497	65%	92%
RANDOLPH									
ARCHDALE	HIGH POINT / DAVIDSON WS	8500	15000	0.564	1.359	1	2.75	56%	49%
FRANKLINVILLE	RAMSEUR	831	1200	0.047	0.065	0.09	0.09	52%	73%
LIBERTY	Bedrock Wells	2200	2598	0.297	0.3452	0.365	0.581	82%	59%
RAMSEUR	Sandy Creek	2524	2970	0.628	0.904	6.6	6.6	10%	14%
RANDLEMAN	Polecat Creek / ASHEBORO	3526	4398	1.226	1.51	2.5	3.5	49%	43%
ROCKINGHAM									
REIDSVILLE	Troublesome Cr./Lake Reidsville	14085	15200	3.36	8.058	19	19	18%	42%
ROCKINGHAM CO	REIDSVILLE	0	2082	0	0.176	0	0.55	0%	32%

Table 2.3-23 (Sheet 4 of 4)
1997 and 2010 Cape Fear River Population and Water Use
as Reported by Local Water Supply Plan (LWSP) Systems

Water Systems by County	Water Source or Supplier	Year-round Service Population 1997	Year-round Service Population 2010	Average Daily Demand (mgd) 1997	Average Daily Demand (mgd) 2010	Available Supply (mgd) 1997	Available Supply (mgd) 2010	Demand as % of Supply(2) 1997	Demand as % of Supply(2) 2010
SAMPSON									
AUTRYVILLE	STEDMAN	400	457	0.037	0.042	0.04	0.04	94%	104%
CLINTON	Black Creek, U Cape Fear, & L Cape Fear Aquifers	9211	11461	1.836	2.962	2.221	3.034	83%	98%
GARLAND	Black Creek & Upper Cape Fear Aquifers	766	950	0.094	0.614	0.173	0.569	55%	108%
HARRELLS WC	Black Creek Aquifer	1134	1306	0.097	0.113	0.306	0.306	32%	37%
NEWTON GROVE	Black Creek Aquifer	614	820	0.091	0.146	0.244	0.244	37%	60%
ROSEBORO	Black Creek & Upper Cape Fear Aquifers	1617	1842	0.297	0.329	0.54	0.54	55%	62%
SALEMBURG	Surficial Aquifer	660	763	0.12	0.14	0.24	0.24	50%	58%
SAMPSON CO WSD I	CLINTON / ROSEBORO / TURKEY / AUTRYVILLE	2988	3416	0.134	0.194	0.22	0.22	61%	88%
SAMPSON CO WSD II	CLINTON / DUNN / GARLAND	0	7425	0	0.919	0	1.6	0%	57%
TURKEY	Upper Cape Fear Aquifer	290	340	0.071	0.071	0.432	0.432	16%	16%
WAKE									
APEX	Jordan Lake	12000	58398	1.795	5.58	3.68	9.2	49%	61%
CARY	Jordan Lake / RALEIGH	82700	120900	11.99	11.77	15.82	18.57	76%	63%
FUQUAY-VARINA	HARNETT CO / GARNER	6249	18268	0.719	2.192	1.75	1.75	41%	125%
HOLLY SPRINGS	APEX	5492	35000	0.518	4.3	0.75	5	69%	86%
MORRISVILLE	CARY	2200	18700	0.46	3.8	1	3	46%	126%
WAYNE (in proposed Central Coastal Plain Capacity Use Area)									
MOUNT OLIVE	Upper Cape Fear Aquifer	6200	6755	1.183	1.432	1.872	1.872	63%	76%
WEST MOUNT OLIVE	MOUNT OLIVE	875	937	0.078	0.086	0.081	0.113	96%	76%

Notes:
a) 1997 LWSP not submitted -1992 data used in analysis.

b) Demand as % of supply is based on seasonal demands.

mgd = million gallons per day

Source: Reference 2.3-029

Table 2.3-24
Estimated Uses for Water within the Cape Fear River Basin

County	Estimated use in 2030 (mgd)	Estimated use in 2050 (mgd)
Orange	N/A	18.4
Durham	46.3	51
Chatham	19.3	34.2
Lee	20	37.5
Wake	38.1	41.6
Moore	N/A	10.8
Harnett	N/A	21.3
Cumberland	N/A	76
Rockingham	N/A	4.3
Guilford/Randolph	N/A	91.5
Alamance	N/A	35
Brunswick and New Hanover	N/A	73.4
Bladen	N/A	73.4

Source: Reference 2.3-050

Table 2.3-25
Location and Distance of Nearest Residences Relative to the HAR Site[a]

Sector	Distance from HAR Site[b] (miles)	Private Water Well (Yes/No)	Number of Wells	Total Depth (feet)	Screened Lithology of Well	In Use? (Yes/No)	Usage for Well Water
North	1.9	Yes	1	105	Bedrock	Yes	Drinking
North-Northeast	1.8	Yes	1	75	Bedrock	Yes	Drinking
Northeast	2.3	Yes	---	---	---	---	---
East-Northeast	1.8	Yes	3	(Two) 250 / (One) 150	---	Yes	Drinking and Farm Use
East	2	Yes	1	300	Bedrock	Yes	Drinking
	2.1	Yes	2	(Two) 360	Bedrock	Yes	Drinking
East-Southeast	3	Yes	1	---	Bedrock	Yes	Drinking
	5	Yes	---	---	---	---	---
Southeast	3	Yes	---	---	---	---	---
	4.5	Yes	1	310	Bedrock	Yes	Drinking
South-Southeast	4.6	Yes	---	---	---	---	---
	4.6	Yes	---	---	---	---	---
South	5.6	Yes	---	---	---	---	---
South-Southwest	4	Yes	---	---	---	---	---
Southwest	2.9	Yes	---	---	---	---	---
West-Southwest	4.3	Yes	---	---	---	---	---
West	2.7	Yes	1	---	Bedrock	Yes	Drinking
	2.8	Yes	---	---	---	---	---
West-Northwest	2.5	Yes	---	---	---	---	---
Northwest	2	Yes	1	160	Bedrock	Yes	Drinking
North-Northwest	1.2	Yes	---	---	---	---	---
	1.5	Yes	---	---	---	---	---

Notes:
a) Information was collected during the 2006 HNP Land Use Census Survey for HNP.

b) Original distances and sectors were measured using HNP as the centerpoint. New distances were calculated from the center of the HAR site.

--- = no data available

Table 2.3-26 (Sheet 1 of 4)
Field Parameters from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
2/18/1957	N/A	6.8	75	N/A
8/15/1957	N/A	7.3	112	N/A
2/3/1958	N/A	6.7	72	N/A
3/21/1958	N/A	6.6	94	N/A
9/3/1958	N/A	6.5	117	N/A
3/7/1960	N/A	6.8	67	N/A
8/29/1960	N/A	6	74	N/A
9/28/1960	N/A	7	140	N/A
11/1/1960	N/A	6.6	150	N/A
12/1/1960	N/A	6.6	150	N/A
1/3/1961	N/A	6.5	130	N/A
2/2/1961	N/A	6.9	118	N/A
2/22/1961	N/A	6.9	52	N/A
3/1/1961	N/A	6.5	61	N/A
3/31/1961	N/A	6.6	74	N/A
5/1/1961	N/A	7.4	92	N/A
6/1/1961	N/A	7.5	115	N/A
7/3/1961	N/A	7.3	82	N/A
8/1/1961	N/A	7.4	130	N/A
8/15/1961	N/A	6.9	110	N/A
9/1/1961	N/A	6.2	60	N/A
10/3/1961	N/A	6.9	156	N/A
11/2/1961	N/A	6.8	268	N/A
11/30/1961	N/A	7.1	318	N/A
1/3/1962	N/A	6.2	83	N/A
2/2/1962	N/A	6.5	60	N/A
2/12/1962	N/A	6.7	95	N/A
3/1/1962	N/A	6.8	69	N/A
3/4/1962	N/A	6.8	69	N/A
4/3/1962	N/A	6.4	56	N/A
5/1/1962	N/A	6.4	92	N/A
6/4/1962	N/A	6.6	187	N/A
7/2/1962	N/A	6.1	66	N/A
8/1/1962	N/A	6.3	82	N/A
8/6/1962	N/A	7	140	N/A
9/1/1962	N/A	6.5	130	N/A
9/5/1962	N/A	6.5	130	N/A
10/2/1962	N/A	6.9	138	N/A
11/1/1962	N/A	7.2	184	N/A
12/3/1962	N/A	6.5	92	N/A
1/2/1963	N/A	6.4	64	N/A
2/5/1963	N/A	6.3	74	N/A
3/4/1963	N/A	6.3	70	N/A
4/1/1963	N/A	6.7	85	N/A

Table 2.3-26 (Sheet 2 of 4)
Field Parameters from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
5/1/1963	N/A	7.4	115	N/A
6/3/1963	N/A	6.8	130	N/A
7/1/1963	N/A	7.4	165	N/A
7/31/1963	N/A	7	160	N/A
9/3/1963	N/A	6.6	165	N/A
9/5/1963	N/A	6.7	92	N/A
1/5/1966	N/A	6.7	206	10.6
2/6/1966	N/A	6.4	113	0.6
3/8/1966	N/A	6.4	52	7.8
4/4/1966	N/A	7.5	122	16.1
5/7/1966	N/A	6.5	98	21.7
6/6/1966	N/A	6.7	107	22.2
7/9/1966	N/A	6.3	183	29.4
8/2/1966	N/A	6.7	221	25.6
8/26/1966	N/A	6.3	169	22.2
9/19/1966	N/A	6.5	172	20.6
6/19/1968	6.9	6.2	113	25
10/14/1968	N/A	6.7	471	N/A
10/16/1968	7.6	14.8	465	23
2/3/1969	11	12.8	81	7
7/14/1969	6.3	6.9	138	27
8/18/1969	6.8	7.3	160	26
9/22/1969	9	13.8	154	20
10/23/1969	8.5	7.3	178	18
11/21/1969	13	7.2	285	5
12/24/1969	11.7	13.5	362	11
1/15/1970	14.5	7.3	162	3.9
2/27/1970	10.9	14.2	100	7
3/23/1970	11.5	12.7	181	9
4/20/1970	7.8	6.9	93	19.5
5/25/1970	8.2	8.4	150	28
6/15/1970	8.8	8.6	240	28
7/23/1970	7.2	13.6	280	25.6
8/17/1970	6.1	6.4	100	23.3
9/21/1970	9.4	8.1	225	29.2
10/20/1970	7.8	6.7	200	17.2
11/17/1970	N/A	7.4	120	13
12/10/1970	10.4	14.1	380	12.6
1/25/1971	10.3	13	231	6.4
2/16/1971	12.3	7.3	80	5.9
3/24/1971	11.7	7	105	10.2
4/26/1971	9.5	13.4	265	18.2
6/3/1971	6.2	6.7	100	19.5
6/25/1971	6.9	6.7	170	27.8

Table 2.3-26 (Sheet 3 of 4)
Field Parameters from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
4/24/1972	9.2	13.2	115	20
10/9/1972	8.6	13.1	85	20
1/16/1973	13.3	12.7	132	5
10/15/1974	11.6	9.1	170	20.5
1/8/1975	N/A	8.2	92	7.5
1/12/1975	10	6.5	63	11.5
1/14/1975	N/A	6.4	53	8
1/15/1975	12	6.6	53	6
1/17/1975	N/A	6.2	63	7
1/23/1975	13	6.1	60	5.5
5/13/1975	7.5	7.1	126	21
6/17/1975	9.1	8.1	125	26
7/13/1975	N/A	7.2	106	29
7/14/1975	8.1	6.1	42	23
7/18/1975	8.2	6	48	21
7/21/1975	N/A	6.2	57	
7/29/1975	6.4	6.9	81	24
8/26/1975	7.7	7.4	130	30
9/23/1975	8	6.6	100	22.7
9/24/1975	8.1	6.6	65	21.5
9/25/1975	8.7	6.6	56	20.5
9/26/1975	8.6	6.5	57	21.3
9/29/1975	9	6.9	70	19
12/23/1975	14.1	6.7	126	4
2/9/1976	13.1	6.8	90	6
3/18/1976	11.2	6.8	92	10
4/19/1976	9.1	7.3	142	21
5/17/1976	8.4	6.8	110	20.5
6/4/1976	8.6	6.5	90	19
7/20/1976	12.6	8.9	155	25.5
7/29/1976	8	8	160	29.5
10/11/1976	6.1	6.9	160	16
10/6/1982	7.5	6.5	175	23
12/9/1982	10	6.3	155	11.5
12/13/1982	12.1	7	82	8
12/14/1982	12.6	6.8	90	7.5
2/16/1983	13.8	6.7	65	5
3/22/1983	10.7	6.6	70	12
5/12/1983	8.3	6.4	85	20.5
8/10/1983	6.3	7	128	29
9/7/1983	7.7	7	176	30.5
9/27/1983	9.5	7.3	197	18.5

Table 2.3-26 (Sheet 4 of 4)
Field Parameters from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
Number of Events	63	130	130	78
MAX[(a)]	14.5	14.8	471	30.5
MIN	6.1	6	42	0.6
Mean	9.5	N/A[(b)]	130.3	17.0
NC Water Quality Standard	5.0 mg/L	6.0-9.0	N/A	See note[(c)]

Notes:
a) Data reported by the USGS include values that are unusually high and appear to be erroneous. However, all values in the USGS data set are included in the table.

b) Average pH values cannot be calculated.

c) Temperature: not to exceed 2.8 degrees C (5.04 degrees F) above the natural water temperature, and in no case exceed 29 degrees C (84.2 degrees F) for mountain and upper piedmont waters and 32 degrees C (86.9 degrees F) for lower piedmont and coastal waters. The temperature for trout waters shall not be increased by more than 0.5 degrees C (0.9 degrees F) due to the discharge of heated liquids, but in no case to exceed 20 degrees C (68 degrees F).

µS/cm = microSiemens per centimeter
C = Celsius
F = Fahrenheit
mg/L = milligrams per liter
N/A = not available

Source: Reference 2.3-051

Table 2.3-27 (Sheet 1 of 3)
Summary of Metals Analyses from USGS Station 02102500 — Cape Fear River at Lillington, NC

		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Chromium (unfiltered)	Copper (filtered)	Copper (unfiltered)	Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Manganese (unfiltered)	Mercury (filtered)	Mercury (unfiltered)	Nickel (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Zinc (unfiltered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	50	7	7	1000	1000	25	N/A	N/A	N/A	0.01	0.01	88	N/A	N/A	50	50	N/A
Sample Date	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L
2/18/1957		N/A	N/A	N/A	N/A	4.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A	1.2	5.9	N/A	N/A	18
8/15/1957		N/A	N/A	N/A	N/A	5.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.6	N/A	N/A	N/A	N/A	N/A	2	13	N/A	N/A	24
2/3/1958		N/A	N/A	N/A	N/A	3.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.3	N/A	N/A	N/A	N/A	N/A	1	7.4	N/A	N/A	17
3/21/1958		N/A	N/A	N/A	N/A	5.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.9	N/A	N/A	N/A	N/A	N/A	1.1	9	N/A	N/A	21
9/3/1958		N/A	N/A	N/A	N/A	5.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	N/A	N/A	N/A	N/A	N/A	2.6	13	N/A	N/A	22
3/7/1960		N/A	N/A	N/A	N/A	3.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.8	N/A	N/A	N/A	N/A	N/A	0.9	6.1	N/A	N/A	17
8/29/1960		N/A	N/A	N/A	N/A	3.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	2	5.9	N/A	N/A	17
9/28/1960		N/A	N/A	N/A	N/A	6.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.9	N/A	N/A	N/A	N/A	N/A	2.6	16	N/A	N/A	28
11/1/1960		N/A	N/A	N/A	N/A	6.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.4	N/A	N/A	N/A	N/A	N/A	3	20	N/A	N/A	31
12/1/1960		N/A	N/A	N/A	N/A	7.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.4	N/A	N/A	N/A	N/A	N/A	2.9	22	N/A	N/A	32
1/3/1961		N/A	N/A	N/A	N/A	6.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.8	N/A	N/A	N/A	N/A	N/A	2.4	14	N/A	N/A	28
2/2/1961		N/A	N/A	N/A	N/A	6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.2	N/A	N/A	N/A	N/A	N/A	1.7	12	N/A	N/A	28
2/22/1961		N/A	N/A	N/A	N/A	3.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.3	N/A	N/A	N/A	N/A	N/A	1.5	3.8	N/A	N/A	13
3/1/1961		N/A	N/A	N/A	N/A	4.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.9	N/A	N/A	N/A	N/A	N/A	1.6	4.4	N/A	N/A	18
3/31/1961		N/A	N/A	N/A	N/A	4.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.2	N/A	N/A	N/A	N/A	N/A	1.2	5.8	N/A	N/A	21
5/1/1961		N/A	N/A	N/A	N/A	5.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.3	N/A	N/A	N/A	N/A	N/A	1.4	9.1	N/A	N/A	24
6/1/1961		N/A	N/A	N/A	N/A	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.7	N/A	N/A	N/A	N/A	N/A	1.6	13	N/A	N/A	26
7/3/1961		N/A	N/A	N/A	N/A	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.9	N/A	N/A	N/A	N/A	N/A	1.8	8.6	N/A	N/A	20
8/1/1961		N/A	N/A	N/A	N/A	7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.8	N/A	N/A	N/A	N/A	N/A	2.5	15	N/A	N/A	29
8/15/1961		N/A	N/A	N/A	N/A	6.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.3	N/A	N/A	N/A	N/A	N/A	2.8	13	N/A	N/A	25
9/1/1961		N/A	N/A	N/A	N/A	3.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	2	4.1	N/A	N/A	16
10/3/1961		N/A	N/A	N/A	N/A	5.7	N/A	N/A	N/A	N/A	N/A	10	N/A	2.9	N/A	N/A	N/A	N/A	N/A	2.7	20	N/A	N/A	26
11/2/1961		N/A	N/A	N/A	N/A	8.6	N/A	N/A	N/A	N/A	N/A	30	N/A	4.1	N/A	N/A	N/A	N/A	N/A	4.4	39	N/A	N/A	38
11/30/1961		N/A	N/A	N/A	N/A	9.1	N/A	N/A	N/A	N/A	N/A	110	N/A	3.8	N/A	N/A	N/A	N/A	N/A	5.2	53	N/A	N/A	38
1/3/1962		N/A	N/A	N/A	N/A	4.8	N/A	N/A	N/A	N/A	N/A	170	N/A	2	N/A	N/A	N/A	N/A	N/A	1.7	7.9	N/A	N/A	20
2/2/1962		N/A	N/A	N/A	N/A	3.5	N/A	N/A	N/A	N/A	N/A	40	N/A	1.8	N/A	N/A	N/A	N/A	N/A	1.4	5	N/A	N/A	16
2/12/1962		N/A	N/A	N/A	N/A	4.8	N/A	N/A	N/A	N/A	N/A	50	N/A	2.2	N/A	N/A	N/A	N/A	N/A	1.4	8.6	N/A	N/A	21
3/1/1962		N/A	N/A	N/A	N/A	4.7	N/A	N/A	N/A	N/A	N/A	50	N/A	1.4	N/A	N/A	N/A	N/A	N/A	1.4	5.2	N/A	N/A	18
3/4/1962		N/A	N/A	N/A	N/A	4.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	N/A	N/A	N/A	N/A	N/A	1.4	5.2	N/A	N/A	18
4/3/1962		N/A	N/A	N/A	N/A	3.6	N/A	N/A	N/A	N/A	N/A	80	N/A	1.8	N/A	N/A	N/A	N/A	N/A	1.8	4	N/A	N/A	16
5/1/1962		N/A	N/A	N/A	N/A	5.6	N/A	N/A	N/A	N/A	N/A	20	N/A	1.8	N/A	N/A	N/A	N/A	N/A	1.5	9.2	N/A	N/A	21
6/4/1962		N/A	N/A	N/A	N/A	8.2	N/A	N/A	N/A	N/A	N/A	30	N/A	3	N/A	N/A	N/A	N/A	N/A	2.7	26	N/A	N/A	32
7/2/1962		N/A	N/A	N/A	N/A	4.8	N/A	N/A	N/A	N/A	N/A	30	N/A	1.5	N/A	N/A	N/A	N/A	N/A	1.9	5.6	N/A	N/A	18
8/1/1962		N/A	N/A	N/A	N/A	4.6	N/A	N/A	N/A	N/A	N/A	40	N/A	1.5	N/A	N/A	N/A	N/A	N/A	1.9	9.8	N/A	N/A	18
8/6/1962		N/A	N/A	N/A	N/A	7.3	N/A	N/A	N/A	N/A	N/A	40	N/A	2.7	N/A	N/A	N/A	N/A	N/A	2.4	19	N/A	N/A	29
9/1/1962		N/A	N/A	N/A	N/A	6	N/A	N/A	N/A	N/A	N/A	20	N/A	2.1	N/A	N/A	N/A	N/A	N/A	2.6	17	N/A	N/A	24
9/5/1962		N/A	N/A	N/A	N/A	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	N/A	N/A	N/A	N/A	N/A	2.6	17	N/A	N/A	24
10/2/1962		N/A	N/A	N/A	N/A	7.4	N/A	N/A	N/A	N/A	N/A	40	N/A	2.4	N/A	N/A	N/A	N/A	N/A	2.9	17	N/A	N/A	28
11/1/1962		N/A	N/A	N/A	N/A	8.1	N/A	N/A	N/A	N/A	N/A	10	N/A	3.2	N/A	N/A	N/A	N/A	N/A	3.3	25	N/A	N/A	33
12/3/1962		N/A	N/A	N/A	N/A	5	N/A	N/A	N/A	N/A	N/A	70	N/A	2.8	N/A	N/A	N/A	N/A	N/A	1.8	7.8	N/A	N/A	24
1/2/1963		N/A	N/A	N/A	N/A	5.1	N/A	N/A	N/A	N/A	N/A	50	N/A	1.5	N/A	N/A	N/A	N/A	N/A	1.3	4.8	N/A	N/A	19
2/5/1963		N/A	N/A	N/A	N/A	5.1	N/A	N/A	N/A	N/A	N/A	70	N/A	2	N/A	N/A	N/A	N/A	N/A	1.2	6.7	N/A	N/A	21

Table 2.3-27 (Sheet 2 of 3)
Summary of Metals Analyses from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Chromium (unfiltered)	Copper (filtered)	Copper (unfiltered)	Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Manganese (unfiltered)	Mercury (filtered)	Mercury (unfiltered)	Nickel (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Zinc (unfiltered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	50	7	7	1000	1000	25	N/A	N/A	N/A	0.01	0.01	88	N/A	N/A	50	50	N/A
	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L
3/4/1963		N/A	N/A	N/A	N/A	4.2	N/A	N/A	N/A	N/A	N/A	10	N/A	1.9	N/A	N/A	N/A	N/A	N/A	1.1	6.6	N/A	N/A	18
4/1/1963		N/A	N/A	N/A	N/A	4.8	N/A	N/A	N/A	N/A	N/A	10	N/A	2.1	N/A	N/A	N/A	N/A	N/A	1.2	8	N/A	N/A	21
5/1/1963		N/A	N/A	N/A	N/A	6.3	N/A	N/A	N/A	N/A	N/A	10	N/A	2.5	N/A	N/A	N/A	N/A	N/A	2.7	13	N/A	N/A	26
6/3/1963		N/A	N/A	N/A	N/A	6.6	N/A	N/A	N/A	N/A	N/A	10	N/A	2.2	N/A	N/A	N/A	N/A	N/A	3.3	16	N/A	N/A	26
7/1/1963		N/A	N/A	N/A	N/A	7.1	N/A	N/A	N/A	N/A	N/A	10	N/A	2.5	N/A	N/A	N/A	N/A	N/A	3.5	23	N/A	N/A	28
7/31/1963		N/A	N/A	N/A	N/A	7.3	N/A	N/A	N/A	N/A	N/A	0	N/A	2.6	N/A	N/A	N/A	N/A	N/A	4.6	22	N/A	N/A	28
9/3/1963		N/A	N/A	N/A	N/A	6.4	N/A	N/A	N/A	N/A	N/A	20	N/A	2.4	N/A	N/A	N/A	N/A	N/A	5.6	23	N/A	N/A	26
9/5/1963		N/A	N/A	N/A	N/A	4.1	N/A	N/A	N/A	N/A	N/A	10	N/A	1.5	N/A	N/A	N/A	N/A	N/A	2.1	11	N/A	N/A	16
1/5/1966		N/A	N/A	N/A	N/A	8.7	N/A	N/A	N/A	N/A	N/A	20	N/A	2.9	N/A	N/A	N/A	N/A	N/A	3.2	30	N/A	N/A	34
2/6/1966		N/A	N/A	N/A	N/A	6.5	N/A	N/A	N/A	N/A	N/A	120	N/A	2.1	N/A	N/A	N/A	N/A	N/A	1.6	11	N/A	N/A	25
3/8/1966		N/A	N/A	N/A	N/A	4	N/A	N/A	N/A	N/A	N/A	70	N/A	1.1	N/A	N/A	N/A	N/A	N/A	1.2	3.4	N/A	N/A	14
4/4/1966		N/A	N/A	N/A	N/A	6.3	N/A	N/A	20	N/A	N/A	60	N/A	1.9	N/A	0	N/A	N/A	0	1.5	15	10	N/A	24
5/7/1966		N/A	N/A	N/A	N/A	6.2	N/A	N/A	20	N/A	N/A	90	0	1.8	N/A	10	N/A	N/A	0	1.6	9.5	0	N/A	23
6/6/1966		N/A	N/A	N/A	N/A	7.1	N/A	N/A	20	N/A	N/A	30	N/A	1.7	N/A	0	N/A	N/A	N/A	1.8	10	10	N/A	25
7/9/1966		N/A	N/A	N/A	N/A	7.5	N/A	N/A	N/A	N/A	N/A	20	N/A	2.8	N/A	N/A	N/A	N/A	N/A	2.8	24	N/A	N/A	30
8/2/1966		N/A	N/A	N/A	N/A	6.9	N/A	N/A	N/A	N/A	N/A	0	N/A	2.4	N/A	N/A	N/A	N/A	N/A	3.4	32	N/A	N/A	27
8/26/1966		N/A	N/A	N/A	N/A	6.4	N/A	N/A	N/A	N/A	N/A	30	N/A	2.4	N/A	N/A	N/A	N/A	N/A	3.3	19	N/A	N/A	26
9/19/1966		N/A	N/A	N/A	N/A	5.2	N/A	N/A	N/A	N/A	N/A	20	N/A	1.3	N/A	N/A	N/A	N/A	N/A	3.5	26	N/A	N/A	18
6/19/1968		N/A	N/A	N/A	N/A	5.5	N/A	N/A	N/A	N/A	360	N/A	N/A	2.2	N/A	N/A	N/A	N/A	N/A	2.2	12	N/A	N/A	22
10/14/1968		N/A	N/A	N/A	N/A	11	N/A	N/A	N/A	N/A	20	N/A	N/A	3.9	N/A	N/A	N/A	N/A	N/A	7.4	82	N/A	N/A	44
10/16/1968		N/A	N/A	N/A	N/A	7.5	N/A	N/A	N/A	N/A	0	N/A	N/A	4	N/A	N/A	N/A	N/A	N/A	5.1	71	N/A	N/A	36
2/3/1969		N/A	N/A	N/A	N/A	4.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	N/A	N/A	N/A	N/A	N/A	1.5	7.2	N/A	N/A	20
9/22/1969		N/A	N/A	0	N/A	4	N/A	0	0	N/A	N/A	N/A	0	1.4	N/A	10	N/A	N/A	N/A	2.8	9.4	10	N/A	N/A
12/24/1969		N/A	N/A	N/A	N/A	5.8	N/A	N/A	N/A	N/A	50	N/A	N/A	3.5	N/A	N/A	N/A	N/A	N/A	4.2	22	N/A	N/A	29
3/23/1970		N/A	N/A	N/A	N/A	5.3	N/A	N/A	N/A	N/A	100	N/A	N/A	2.1	N/A	N/A	N/A	N/A	N/A	1.7	7.8	N/A	N/A	22
4/20/1970		N/A	N/A	N/A	N/A	5.6	N/A	N/A	N/A	N/A	130	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	1.7	8	N/A	N/A	22
7/23/1970		N/A	N/A	0	N/A	5.8	N/A	0	0	N/A	N/A	N/A	0	2.8	0	N/A	N/A	N/A	N/A	3.2	16	N/A	N/A	26
12/10/1970		N/A	N/A	N/A	N/A	8.7	N/A	N/A	N/A	N/A	50	N/A	N/A	3.2	N/A	N/A	N/A	N/A	N/A	3.2	25	N/A	N/A	35
1/25/1971		N/A	N/A	N/A	N/A	5.9	N/A	N/A	N/A	N/A	120	N/A	N/A	2.3	N/A	N/A	N/A	N/A	N/A	2	12	N/A	N/A	25
4/26/1971		N/A	N/A	N/A	N/A	7.1	N/A	N/A	N/A	N/A	0	N/A	N/A	3.2	N/A	N/A	N/A	N/A	N/A	2.2	14	N/A	N/A	31
4/24/1972		10	N/A	50	N/A	7.4	N/A	50	N/A	N/A	50	N/A	N/A	2.1	N/A	N/A	N/A	0.5	N/A	1.7	12	50	N/A	27
10/9/1972		N/A	N/A	N/A	N/A	4.9	N/A	N/A	N/A	N/A	10	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	2.6	8.9	N/A	N/A	20
1/16/1973		10	N/A	40	N/A	6.2	50	N/A	N/A	N/A	10	N/A	N/A	2.9	N/A	N/A	N/A	0.5	N/A	1.9	14	N/A	N/A	28
10/15/1974		2	2	N/A	N/A	10	20	N/A	N/A	20	130	N/A	N/A	3.5	10	40	0.5	0.5	N/A	3.3	21	N/A	N/A	39
1/8/1975		N/A	N/A	N/A	N/A	4.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.2	N/A	N/A	N/A	N/A	N/A	1.7	8.1	N/A	N/A	21
1/12/1975		1	1	N/A	2	4	2	80	N/A	30	260	N/A	N/A	1.8	10	500	0.5	0.5	N/A	2.3	4	N/A	70	17
1/14/1975		1	1	N/A	N/A	3.6	2	20	N/A	N/A	150	N/A	2	1.8	10	150	0.5	0.5	N/A	2	3.3	N/A	20	16
1/15/1975		N/A	N/A	N/A	N/A	4.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.6	N/A	N/A	N/A	N/A	N/A	2	3	N/A	N/A	18
1/17/1975		1	2	2	N/A	4.4	2	20	N/A	N/A	150	N/A	2	2	20	110	0.5	0.5	N/A	2.2	3.7	N/A	20	19
1/23/1975		N/A	N/A	N/A	N/A	4.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.5	N/A	N/A	N/A	N/A	N/A	1.9	5.2	N/A	N/A	21
5/13/1975		N/A	N/A	N/A	N/A	7.5	N/A	20	2	N/A	160	N/A	N/A	3.1	N/A	N/A	N/A	N/A	N/A	2.2	13	20	20	32
6/17/1975		N/A	N/A	N/A	N/A	10	2	20	N/A	N/A	120	N/A	N/A	3.1	N/A	N/A	N/A	N/A	N/A	2.5	14	N/A	20	38

Table 2.3-27 (Sheet 3 of 3)
Summary of Metals Analyses from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Chromium (unfiltered)	Copper (filtered)	Copper (unfiltered)	Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Manganese (unfiltered)	Mercury (filtered)	Mercury (unfiltered)	Nickel (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Zinc (unfiltered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	50	7	7	1000	1000	25	N/A	N/A	N/A	0.01	0.01	88	N/A	N/A	50	50	N/A
	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L
7/13/1975		N/A	N/A	N/A	N/A	5.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.5	N/A	N/A	N/A	N/A	N/A	2.9	10	N/A	N/A	24
7/14/1975		N/A	N/A	N/A	N/A	3.1	2	20	N/A	20	180	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	2.1	2.6	N/A	60	12
7/18/1975		N/A	N/A	N/A	N/A	4	N/A	20	N/A	N/A	170	N/A	N/A	1.6	N/A	N/A	N/A	N/A	N/A	2.2	2.7	N/A	30	17
7/21/1975		N/A	N/A	N/A	N/A	4.6	N/A	20	40	180	160	N/A	N/A	1.9	N/A	N/A	N/A	N/A	N/A	2.4	3.5	N/A	100	19
7/29/1975		N/A	N/A	N/A	N/A	6.5	N/A	20	N/A	N/A	380	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	2.5	5.2	N/A	20	24
8/26/1975		N/A	N/A	N/A	N/A	6.5	N/A	20	N/A	N/A	130	N/A	N/A	2.6	N/A	N/A	N/A	N/A	N/A	3.5	14	N/A	30	27
9/23/1975		N/A	N/A	N/A	N/A	5.9	2	20	N/A	N/A	190	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A	2.8	9.7	N/A	30	21
9/24/1975		N/A	N/A	N/A	N/A	4.8	N/A	20	N/A	10	190	N/A	N/A	1.7	N/A	N/A	N/A	N/A	N/A	2.5	4.8	N/A	30	19
9/25/1975		N/A	N/A	N/A	N/A	4.5	N/A	20	N/A	10	220	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A	2.8	3.3	N/A	20	17
9/26/1975		N/A	N/A	N/A	N/A	4.4	N/A	20	N/A	N/A	190	N/A	N/A	1.2	N/A	N/A	N/A	N/A	N/A	2.2	3.2	N/A	50	16
9/29/1975		N/A	N/A	N/A	N/A	5.2	N/A	20	N/A	N/A	220	N/A	N/A	1.7	N/A	N/A	N/A	N/A	N/A	2.5	5.2	N/A	20	20
12/23/1975		N/A	N/A	N/A	N/A	5.8	N/A	20	N/A	N/A	340	N/A	N/A	2.3	N/A	N/A	N/A	N/A	N/A	2.1	14	N/A	20	24
2/9/1976		N/A	N/A	N/A	N/A	4.7	N/A	20	N/A	N/A	170	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A	1.6	7.4	N/A	N/A	18
3/18/1976		N/A	N/A	N/A	N/A	4.2	N/A	20	N/A	N/A	250	N/A	N/A	2.2	N/A	N/A	N/A	N/A	N/A	1.5	7.9	N/A	20	20
4/19/1976		N/A	N/A	N/A	N/A	7.9	N/A	20	N/A	N/A	240	N/A	N/A	2.5	N/A	N/A	N/A	N/A	N/A	2.2	17	N/A	20	30
5/17/1976		N/A	N/A	N/A	N/A	5.1	N/A	20	N/A	N/A	240	N/A	N/A	2.2	N/A	N/A	N/A	N/A	N/A	2.4	13	N/A	20	22
6/4/1976		N/A	N/A	N/A	N/A	3.5	N/A	30	N/A	10	170	N/A	N/A	1.8	N/A	N/A	N/A	N/A	N/A	2.7	8.8	20	20	16
7/20/1976		N/A	N/A	N/A	N/A	5	N/A	20	N/A	N/A	140	N/A	N/A	2.4	N/A	N/A	N/A	N/A	N/A	3	19	30	50	22
7/29/1976		N/A	N/A	N/A	N/A	5.3	N/A	30	N/A	N/A	80	N/A	N/A	3.7	N/A	N/A	N/A	N/A	N/A	3.3	21	20	30	28
10/6/1982		1	2	1	N/A	7.2	N/A	N/A	N/A	N/A	N/A	N/A	1	3.4	N/A	N/A	0.2	0.1	N/A	3.5	23	N/A	N/A	32
12/9/1982		1	1	1	N/A	7.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.2	N/A	N/A	0.1	0.1	N/A	3.3	15	N/A	N/A	33
12/13/1982		1	1	1	1	6.1	1	10	N/A	N/A	290	N/A	N/A	2.5	110	180	0.1	0.1	N/A	3	9.1	N/A	30	26
12/14/1982		1	1	1	N/A	5.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.3	N/A	N/A	0.3	0.1	N/A	3.1	8.1	N/A	N/A	N/A
2/16/1983		1	1	1	1	3.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	0.1	N/A	1.8	4.2	N/A	N/A	N/A
3/22/1983		1	1	1	10	4.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.8	N/A	N/A	0.1	0.1	N/A	1.7	4.1	N/A	N/A	N/A
5/12/1983		1	1	1	N/A	5	1	10	N/A	N/A	540	N/A	N/A	2.4	80	100	0.1	0.1	N/A	1.8	9	N/A	50	N/A
8/10/1983		N/A	1	N/A	N/A	7.2	N/A	10	N/A	N/A	N/A	N/A	N/A	3	N/A	380	N/A	0.1	N/A	2.5	13	N/A	N/A	N/A
9/7/1983		1	2	1	1	7.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.4	N/A	N/A	0.1	0.1	N/A	3.7	24	N/A	N/A	N/A
9/27/1983		N/A	N/A	N/A	N/A	6.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A	N/A	N/A	N/A	4	26	N/A	N/A	N/A
Number of Events		14	13	13	5	113	10	29	7	7	38	37	6	113	7	11	11	15	2	113	113	9	24	105
MAX		10	2	50	10	11	50	80	40	180	540	170	2	4.1	110	500	0.5	0.5	0	7.4	82	50	100	44
MIN		1	1	0	1	3.1	1	0	0	10	0	0	0	1.1	0	0	0.1	0.1	0	0.9	2.6	0	20	12
Mean		2.4	1.3	7.7	3.0	5.8	8.4	21.4	14.6	40.0	167	40.5	0.8	2.3	34.3	135	0.3	0.3	0.0	2.4	13.6	18.9	33.3	23.9

Notes:
µg/L = micrograms per liter
µS/cm = microSiemens per centimeter
C = Celsius
mg/L = milligrams per liter
N/A = not available

Source: Reference 2.3-051

Table 2.3-28 (Sheet 1 of 7)
Water Chemistry from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Total nitrogen (unfiltered)	Total nitrogen (unfiltered) as nitrate	Organic nitrogen (filtered)	Organic nitrogen (unfiltered)	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Silica (filtered)	Sulfate (filtered)	Chloride (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
2/18/1957	N/A	N/A	N/A	1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14	4.2	5.6
8/15/1957	N/A	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.2	8.1	12
2/3/1958	N/A	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14	7.1	5
3/21/1958	N/A	N/A	N/A	0.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	3.1	7.5
9/3/1958	N/A	N/A	N/A	1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	7.4	8.8
3/7/1960	N/A	N/A	N/A	0.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14	2.4	5.3
8/29/1960	N/A	N/A	N/A	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	5.4	5.6
9/28/1960	N/A	N/A	N/A	1.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	8.4	13
11/1/1960	N/A	N/A	N/A	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	11	17
12/1/1960	N/A	N/A	N/A	2.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.6	8.4	18
1/3/1961	N/A	N/A	N/A	4.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	9.4	12
2/2/1961	N/A	N/A	N/A	2.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14	8.2	11
2/22/1961	N/A	N/A	N/A	3.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.6	6.4	3.7
3/1/1961	N/A	N/A	N/A	1.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.4	8.8	4.2
3/31/1961	N/A	N/A	N/A	0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11	6.8	5.9
5/1/1961	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	8	8
6/1/1961	N/A	N/A	N/A	1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	6.8	11
7/3/1961	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11	8.4	7.8
8/1/1961	N/A	N/A	N/A	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	7.6	13

Table 2.3-28 (Sheet 2 of 7)
Water Chemistry from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Total nitrogen (unfiltered)	Total nitrogen (unfiltered) as nitrate	Organic nitrogen (filtered)	Organic nitrogen (unfiltered)	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Silica (filtered)	Sulfate (filtered)	Chloride (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
8/15/1961	N/A	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	5.8	11
9/1/1961	N/A	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.8	3.6	5.3
10/3/1961	N/A	N/A	0.4	0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.1	8.4	17
11/2/1961	N/A	N/A	0.4	0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.8	14	33
11/30/1961	N/A	N/A	2	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11	18	42
1/3/1962	N/A	N/A	1.3	1.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	8.8	8.7
2/2/1962	N/A	N/A	0.7	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	7.6	5.7
2/12/1962	N/A	N/A	1.8	1.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	5.6	8.5
3/1/1962	N/A	N/A	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	8.4	5
3/4/1962	N/A	N/A	N/A	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	8.4	5
4/3/1962	N/A	N/A	0.6	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.5	6.8	4.1
5/1/1962	N/A	N/A	0.5	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.7	5.4	7.4
6/4/1962	N/A	N/A	0.8	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11	11	19
7/2/1962	N/A	N/A	0.2	0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.1	5.6	4.5
8/1/1962	N/A	N/A	0.5	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.3	6.2	8.2
8/6/1962	N/A	N/A	0.6	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	10	15
9/1/1962	N/A	N/A	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.9	8.8	15
9/5/1962	N/A	N/A	N/A	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.9	8.8	15
10/2/1962	N/A	N/A	1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.5	9.8	15
11/1/1962	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.4	12	20
12/3/1962	N/A	N/A	0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	8.4	8.5

Table 2.3-28 (Sheet 3 of 7)
Water Chemistry from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Total nitrogen (unfiltered)	Total nitrogen (unfiltered) as nitrate	Organic nitrogen (filtered)	Organic nitrogen (unfiltered)	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Silica (filtered)	Sulfate (filtered)	Chloride (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1/2/1963	N/A	N/A	1.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.4	8.2	4.9
2/5/1963	N/A	N/A	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11	8	6.5
3/4/1963	N/A	N/A	1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	8.2	6.2
4/1/1963	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11	5.6	7.5
5/1/1963	N/A	N/A	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.2	8	8.9
6/3/1963	N/A	N/A	2.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	8.8	13
7/1/1963	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.5	10	17
7/31/1963	N/A	N/A	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.3	12	17
9/3/1963	N/A	N/A	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.3	13	18
9/5/1963	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.4	9	11
1/5/1966	N/A	N/A	2.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.8	11	23
2/6/1966	N/A	N/A	1.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	5.2	13
3/8/1966	N/A	N/A	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.4	6.8	4
4/4/1966	N/A	N/A	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.7	5.8	12
7/9/1966	N/A	N/A	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.6	10	21
8/2/1966	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.6	12	25
8/26/1966	N/A	N/A	0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	14	19
9/19/1966	N/A	N/A	0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.9	14	25
6/19/1968	N/A	N/A	2.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.73	N/A	N/A	N/A	N/A	N/A	12	8.8	11
10/14/1968	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A	2.6	40	71

Table 2.3-28 (Sheet 4 of 7)
Water Chemistry from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Total nitrogen (unfiltered)	Total nitrogen (unfiltered) as nitrate	Organic nitrogen (filtered)	Organic nitrogen (unfiltered)	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Silica (filtered)	Sulfate (filtered)	Chloride (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
10/16/1968	N/A	N/A	0.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.01	N/A	N/A	N/A	N/A	N/A	7.1	23	110
2/3/1969	N/A	N/A	2.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.35	N/A	N/A	N/A	N/A	N/A	9.6	12	7.2
9/22/1969	N/A	N/A	2.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.1	N/A	7.8	5.2	8.3
10/23/1969	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/21/1969	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/24/1969	N/A	N/A	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	12	15	24
1/15/1970	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3/23/1970	N/A	N/A	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.53	N/A	N/A	N/A	N/A	N/A	10	11	5.8
4/20/1970	N/A	N/A	2.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.18	N/A	N/A	N/A	N/A	N/A	12	11	8.3
7/23/1970	N/A	N/A	2.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	11	16
8/17/1970	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
9/21/1970	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/20/1970	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/17/1970	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/10/1970	N/A	N/A	2.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.5	N/A	N/A	N/A	N/A	N/A	14	13	21
1/25/1971	N/A	N/A	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.61	N/A	N/A	N/A	N/A	N/A	12	11	13
2/16/1971	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3/24/1971	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4/26/1971	N/A	N/A	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.47	N/A	N/A	N/A	N/A	N/A	5.8	9.2	13
6/3/1971	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**Table 2.3-28 (Sheet 5 of 7)
Water Chemistry from USGS Station 02102500 — Cape Fear River at Lillington, NC**

Sample Date	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Total nitrogen (unfiltered)	Total nitrogen (unfiltered) as nitrate	Organic nitrogen (filtered)	Organic nitrogen (unfiltered)	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Silica (filtered)	Sulfate (filtered)	Chloride (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
6/25/1971	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4/24/1972	N/A	N/A	N/A	N/A	0.77	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	6.9	10	10
10/9/1972	N/A	N/A	1.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.17	N/A	8.8	9.8	8.6
1/16/1973	N/A	N/A	4.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.23	N/A	15	10	19
10/15/1974	0.01	0.01	N/A	N/A	N/A	N/A	0.2	0.18	1.3	5.7	0.5	1.1	0.64	0.21	0.21	0.23	0.37	N/A	2.9	15	15
1/8/1975	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.5	11	7.1
1/12/1975	0.1	0.16	N/A	N/A	N/A	N/A	0.38	0.5	2.5	11	0.51	1.8	0.18	0.06	0.17	0.07	0.62	N/A	8	7.9	4.6
1/14/1975	0.04	0.07	N/A	N/A	N/A	N/A	0.31	0.31	1.3	5.6	0.37	0.89	0.15	0.05	0.09	0.06	0.24	N/A	7.5	8.1	3.8
1/15/1975	0.04	0.06	N/A	N/A	N/A	N/A	0.33	0.3	1	4.6	0.31	0.67	0.12	0.04	0.09	0.06	0.19	N/A	7.3	8.4	3.4
1/17/1975	0.08	0.1	N/A	N/A	N/A	N/A	0.36	0.37	1.1	4.8	0.38	0.61	0.15	0.05	0.1	0.06	0.19	N/A	8.9	8.8	3.8
1/23/1975	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	10	9.6	5.1
5/13/1975	0.01	0.01	N/A	N/A	N/A	N/A	0.8	0.81	1.4	6.1	0.41	0.57	0.49	0.16	0.17	0.2	0.24	N/A	13	11	10
6/17/1975	0.01	0.01	N/A	N/A	N/A	N/A	0.54	0.53	1.2	5.4	1.2	0.68	0.4	0.13	0.14	0.18	0.23	N/A	11	11	9.6
7/13/1975	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	11	11	7.1
7/14/1975	0.04	0.16	N/A	N/A	N/A	N/A	0.36	0.78	2.3	10	0.31	1.3	0.12	0.04	0.14	0.06	0.48	N/A	5.2	5.4	2.3
7/18/1975	0.01	0.08	N/A	N/A	N/A	N/A	0.28	0.29	0.86	3.8	0.59	0.49	0.12	0.04	0.09	0.06	0.15	N/A	6.8	6.4	2.5
7/21/1975	0.01	0.07	N/A	N/A	N/A	N/A	0.4	0.42	1.1	4.9	0.34	0.61	0.15	0.05	0.09	0.07	0.15	N/A	8.1	6.7	2.9
7/29/1975	0.08	0.09	N/A	N/A	N/A	N/A	0.25	0.25	1.1	4.6	0.61	0.71	0.15	0.05	0.08	0.06	0.19	N/A	10	6.4	4.7
8/26/1975	0.01	0.01	N/A	N/A	N/A	N/A	0.71	0.69	1.3	5.6	0.49	0.56	0.64	0.21	0.26	0.25	0.28	N/A	8.8	11	11

Table 2.3-28 (Sheet 6 of 7)
Water Chemistry from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Total nitrogen (unfiltered)	Total nitrogen (unfiltered) as nitrate	Organic nitrogen (filtered)	Organic nitrogen (unfiltered)	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Silica (filtered)	Sulfate (filtered)	Chloride (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
9/23/1975	0.08	0.08	N/A	N/A	N/A	N/A	0.72	0.72	1.4	6.2	0.41	0.59	0.4	0.13	0.18	0.15	0.27	N/A	11	9.4	7.9
9/24/1975	0.07	0.1	N/A	N/A	N/A	N/A	0.42	0.43	1.7	7.7	0.46	1.2	0.31	0.1	0.17	0.12	0.45	N/A	9.1	6.6	4.9
9/25/1975	0.07	0.1	N/A	N/A	N/A	N/A	0.37	0.43	1.6	7.2	0.48	1.1	0.25	0.08	0.09	0.09	0.35	N/A	7.6	6.5	3.9
9/26/1975	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.7	7	4
9/29/1975	0.05	0.07	N/A	N/A	N/A	N/A	0.38	0.39	1.1	4.7	0.5	0.6	0.21	0.07	0.11	0.1	0.18	N/A	10	7.9	4.4
12/23/1975	0.02	0.06	N/A	N/A	N/A	N/A	0.71	0.71	1.1	4.9	0.37	0.33	0.64	0.21	0.26	0.24	0.29	N/A	12	11	11
2/9/1976	0.05	0.06	N/A	N/A	0.48	0.02	0.5	0.5	0.92	4.1	0.35	0.36	0.21	0.07	0.1	0.08	0.13	N/A	12	9.7	6.6
3/18/1976	0.04	0.06	N/A	N/A	0.48	0.03	0.51	0.51	1.3	5.7	0.6	0.72	0.31	0.1	0.13	0.1	0.21	N/A	10	7.6	7.7
4/19/1976	0.01	0.01	N/A	N/A	0.42	0.01	0.54	0.43	1.1	4.9	0.56	0.67	0.61	0.2	0.2	0.21	0.28	N/A	7.8	12	12
5/17/1976	0.16	0.2	N/A	N/A	0.72	0.04	0.76	0.76	1.7	7.6	0.33	0.76	0.43	0.14	0.19	0.18	0.36	N/A	9.2	9.8	10
6/4/1976	0.08	0.11	N/A	N/A	1.1	0.08	1.2	1.2	2.6	12	0.56	1.3	0.28	0.09	0.21	0.13	0.46	N/A	10	7.3	7.1
7/20/1976	0.03	0.01	N/A	N/A	0.01	0.01	0.06	0.02	0.43	1.9	0.48	0.4	0.46	0.15	0.15	0.22	0.2	N/A	1.4	14	14
7/29/1976	0.01	0.01	N/A	N/A	0.02	0.01	0.01	0.02	0.45	2	0.52	0.43	0.34	0.11	0.11	0.14	0.15	N/A	9.2	14	13
10/11/1976	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/6/1982	0.06	0.04	N/A	N/A	0.76	0.04	0.81	0.8	1.7	7.5	0.54	0.86	0.37	0.12	0.13	0.15	0.14	0.43	10	19	14
12/9/1982	0.1	0.08	N/A	N/A	0.97	0.03	0.97	1	1.6	7.1	0.6	0.52	0.46	0.15	0.16	0.18	0.22	0.67	12	16	10
12/13/1982	0.13	0.11	N/A	N/A	0.77	0.03	0.74	0.8	1.4	6.2		0.49	0.31	0.1	0.17	0.21	0.27	0.83	11	10	9.6
12/14/1982	0.13	0.21	N/A	N/A	0.74	0.06	0.75	0.8	2.1	9.3	0.47	1.1	0.28	0.09	0.23	0.11	0.45	1.4	12	12	7.2
2/16/1983	0.13	0.29	N/A	N/A	0.52	0.08	0.49	0.6	1.6	7.1	0.27	0.71	0.21	0.07	0.22	0.07	0.38	1.2	7.2	9	5.2

Table 2.3-28 (Sheet 7 of 7)
Water Chemistry from USGS Station 02102500 — Cape Fear River at Lillington, NC

Sample Date	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Total nitrogen (unfiltered)	Total nitrogen (unfiltered) as nitrate	Organic nitrogen (filtered)	Organic nitrogen (unfiltered)	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Silica (filtered)	Sulfate (filtered)	Chloride (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
3/22/1983	0.06	0.1	N/A	N/A	0.46	0.04	0.47	0.5	1.1	4.9	0.44	0.5	0.18	0.06	0.11	0.06	0.14	0.43	9.2	12	4.4
5/12/1983	0.05	0.05	N/A	N/A	N/A	0.01	0.47	0.5	N/A	N/A	N/A	N/A	N/A	0.06	0.07	0.07	0.08	0.25	8.4	10	6.6
8/10/1983	N/A	0.01	N/A	N/A	N/A	0.01	N/A	0.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.3	13	9.7
9/7/1983	0.03	0.01	N/A	N/A	N/A	0.02	1	1.1	N/A	N/A	N/A	N/A	N/A	0.19	0.19	0.16	0.19	0.58	7.5	20	17
9/27/1983	N/A	0.06	N/A	N/A	N/A	0.01	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	0.04	N/A	0.06	0.18	4.6	25	18
Number of Events	32	34	49	35	14	17	32	34	30	30	29	30	40	32	33	32	37	9	111	111	111
MAX	0.16	0.29	4.9	4.2	1.1	0.08	1.2	1.2	2.6	12	1.2	1.8	3.5	0.21	0.26	0.25	0.62	1.4	15	40	110
MIN	0.01	0.01	0	0.2	0.01	0.01	0.01	0.02	0.43	1.9	0.27	0.33	0.01	0.04	0.04	0.06	0.06	0.18	1.4	2.4	2.3
Mean	0.1	0.1	1.3	1.2	0.6	0.0	0.5	0.5	1.4	6.1	0.5	0.8	0.5	0.1	0.1	0.1	0.3	0.7	9.2	9.9	12.1
NC Water Quality Standards	N/A	N/A	10000	10000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	250	230

Notes:
C = Celsius
mg/L = milligrams per liter
N/A = not available

Source: Reference 2.3-051

**Table 2.3-29 (Sheet 1 of 4)
Field Parameters from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC**

Sample Date	Dissolved Oxygen (mg/L)	pH (Standard Units)	Specific Conductance (µS/cm)	Temperature (degrees C)
09/27/68	7.6	7.4	N/A	29
07/18/69	6.6	6.9	N/A	31
10/10/69	7.2	5.4	N/A	20
07/30/70	9.6	8.6	N/A	32
12/16/70	10.8	6.5	N/A	7
07/01/71	9.2	8.2	N/A	34
07/21/71	9.4	7.6	N/A	31
08/23/71	6.4	6.3	N/A	27
05/30/72	7.8	7	N/A	28
08/10/72	6.4	6.7	N/A	28
10/31/72	4	6.4	N/A	12
11/16/72	9.4	8.3	N/A	13
07/31/73	11.8	8.5	N/A	30
03/16/92	9.6	7.02	123	11
04/23/92	8.4	6.78	76	19
05/21/92	8.4	7.1	150	22.5
06/22/92	6.4	6.9	N/A	22
07/27/92	6.9	6.9	244	29
08/05/92	6.6	6.7	150	27
09/17/92	9.5	7.8	192	27
10/13/92	7	6.9	208	19
11/19/92	7	6.8	82	9
12/28/92	11.6	6.5	50	6
01/25/93	12.4	N/A	35	7
02/18/93	11.9	6.5	59	8
03/30/93	10.6	7	52	13
04/27/93	8.4	7	66	17
05/17/93	7.2	7.1	109	24
06/24/93	12	9.4	207	28
07/27/93	8.5	7.6	242	30
08/18/93	13.1	9	205	29
09/20/93	4.8	7	230	25
10/18/93	6.3	7.1	194	19
11/11/93	8.1	7.2	190	13
02/09/94	12.2	6.7	63	7
03/22/94	10.2	7.1	72	13
04/19/94	9.5	7	88	19
05/24/94	10.6	8.3	150	22
06/21/94	10.8	8.7	143	30
07/20/94	10.8	8.9	314	30
08/10/94	12.4	9.3	189	29
09/22/94	7.4	7	150	22
10/18/94	8.2	7.1	145	19
11/29/94	9.9	7.1	265	12
12/20/94	10.4	7	208	10
01/10/95	12.2	6.8	131	6
02/06/95	10.8	7	104	6
03/23/95	9.5	7.27	98	13
04/27/95	7.8	7.25	162	19
05/17/95	7.1	7.25	193	25
06/22/95	7.2	7.23	117	23
08/15/95	9.5	9.3	180	31
09/18/95	4	6.7	150	23

**Table 2.3-29 (Sheet 2 of 4)
Field Parameters from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC**

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
10/31/95	10	6.71	82	16.1
12/15/95	12	6.87	100	5.1
01/23/96	6.9	6.2	78	5.2
02/22/96	12.6	6.2	98	6
03/28/96	9	7.2	78	9.3
04/18/96	9.6	7.5	101	15
05/29/96	5.9	7	133	22.1
06/25/96	10	9.1	158	30.1
07/18/96	6.8	7.5	175	28.5
08/22/96	8.7	7	170	28
09/26/96	7.2	6.1	89	22.9
10/15/96	9.7	7.2	90	17
11/20/96	1	7.3	115	10
12/18/96	10.6	7.2	89	8.1
01/30/97	12.2	7.5	79	5.9
02/27/97	10.8	7.2	82	9.9
03/31/97	9	6.8	79	16
04/30/97	9.4	6.8	49	14.3
05/22/97	7.8	7.5	111	22.4
06/30/97	10.2	8.8	125	28
07/18/97	10.4	9.1	169	30.8
07/31/97	5.3	7.3	149	24.3
08/19/97	7.9	7.5	163	29.3
09/08/97	10.5	8.1	205	26
09/29/97	6.4	6.9	160	21.5
10/15/97	8.1	7.4	175	22
11/17/97	10.4	7.2	90	10
12/11/97	10.4	6.7	115	8
01/14/98	11.2	7.5	91	10
02/10/98	12.6	6.7	69	7
03/03/98	10.8	6.8	70	11
04/15/98	10.1	6.8	85	16.9
05/27/98	6.3	7.3	120	24.5
06/11/98	12.8	9.1	152	28
07/29/98	8.5	8.9	178	31.8
08/31/98	12.3	9.8	257	31.6
09/28/98	15.3	9.4	255	27.8
10/28/98	14.7	9.1	242	19.7
11/29/98	12.9	9	253	15.5
12/28/98	12.3	7.1	135	5.9
01/27/99	11.7	6.9	78	10.6
02/17/99	10.3	7	131	11.1
03/23/99	11.2	7.1	108	10.9
04/29/99	7.4	7	144	17.4
05/24/99	10.6	8.2	158	22.6
06/24/99	14.3	9.3	186	28
07/27/99	11.3	9	263	30.2
08/17/99	11.9	9	236	30.1
09/29/99	8.5	6.6	63	21.3
10/18/99	7.3	6.7	109	18.5
11/01/99	10.4	7.2	129	18
12/02/99	9.9	7	11	9.9

Table 2.3-29 (Sheet 3 of 4)
Field Parameters from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
02/21/00	12.6	7.1	101	8
03/15/00	11.4	6.9	128	11
04/26/00	8.8	6.9	120	18
05/22/00	8.4	6.8	138	25
06/14/00	8.4	7.1	120	25
07/30/00	6	6.6	150	25
08/30/00	7.2	7	25	26
09/13/00	6	6.8	115	25
10/10/00	5	7	140	16
11/29/00	6.9	7.1	200	10
01/03/01	11.7	6.9	240	4
02/01/01	13.7	7	250	8
04/16/01	8.6	7	120	17
05/21/01	11.5	7	210	23
06/25/01	8.6	7	130	27
07/11/01	6	7	190	25
08/02/01	6.7	7.2	180	25
10/04/01	15.3	9.4	205	24.1
10/31/01	13.9	8.9	212	18
11/28/01	10	9.4	191	17.7
12/17/01	11.1	7.4	268	8.3
01/15/02	12.8	6.6	254	5.8
02/20/02	12.2	7.3	154	9.7
03/07/02	11.3	7.6	196	8.3
04/08/02	9.2	6.8	150	15.4
05/07/02	15.7	9.5	187	23.6
06/19/02	6.8	8.8	250	27.9
07/10/02	7.4	8.7	239	30
08/21/02	12.4	8.9	337	31.3
09/09/02	9	7.8	156	27
10/16/02	8.6	6.2	90	19.2
11/25/02	12.3	6.8	123	11.7
12/12/02	13.1	6.9	145	6.8
01/21/03	12.9	6.9	117	4.1
02/26/03	12.6	5.9	124	7.3
03/12/03	12.4	7.1	103	9.5
04/28/03	9.9	7.1	85	16
05/27/03	8.9	6.1	71	18.9
06/11/03	7.8	7.2	75	22.2
07/10/03	5.9	7	97	25.9
08/21/03	9.5	7.1	105	27.3
09/10/03	11.1	7.1	104	24.7
10/20/03	11.1	6.8	132	19.5
11/13/03	7.6	7.2	159	15.7
12/15/03	13.9	7	124	6.4
01/28/04	11.7	7	155	3
02/19/04	14.6	6.8	120	5
03/18/04	10.3	6.7	147	10
04/21/04	8.8	6.7	147	18.4
05/18/04	10.1	6.7	146	27.1
06/15/04	8.3	7.3	193	27
07/27/04	6.4	6.4	193	29.2

Table 2.3-29 (Sheet 4 of 4)
Field Parameters from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
08/24/04	4.3	5.9	126	25.7
09/16/04	6.3	6.9	121	24.6
10/12/04	8.7	6.8	126	21
11/22/04	9.7	6.6	162	13
12/08/04	11.3	6.4	142	11.5
01/05/05	12.8	6.6	149	6.9
02/14/05	12.3	7.2	143	7.2
03/16/05	10.9	6.7	122	9.7
04/12/05	9.5	7.4	120	16.5
05/11/05	9.4	8.1	165	22.4
06/20/05	7.5	7.8	160	26.9
07/19/05	7.5	8.4	192	31.6
08/18/05	5	7	162	28.6
09/27/05	7.2	7.9	198	28
10/18/05	7.1	7.2	242	21.3
11/14/05	10.4	7.2	266	18.6
12/07/05	10.2	7	101	8.9
01/19/06	12.8	7.4	141	11.1
02/15/06	12.1	7.1	161	10.1
03/09/06	9.9	7.6	180	14.2
04/20/06	7.2	7.3	184	18.2
05/23/06	7.2	7.1	172	22.7
06/09/06	8	6.9	200	23.8
07/11/06	6	6.4	124	26.2
08/08/06	N/A	6.5	158	29.3
09/19/06	6.3	6.6	174	25.1
10/26/06	7.8	6.4	197	17.6
11/29/06	12.4	6.4	114	10.4
12/18/06	N/A	6.8	139	7.7

Notes:
µS/cm = microSiemens per centimeter
C = Celsius
mg/L = milligrams per liter
N/A = not available

Source: Reference 2.3-052

Table 2.3-30 (Sheet 1 of 6)
Summary of Metals Analyses from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	**N/A**	**10**	**2**	**N/A**	**50**	**7**	**1000**	**25**	**N/A**	**N/A**	**0.01**	**88**	**N/A**	**N/A**	**50**
	Unit:	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**μg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
09/27/68		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/18/69		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/10/69		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/30/70		4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/16/70		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
12/16/70		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
07/01/71		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/21/71		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/23/71		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
12/16/71		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
01/11/72		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A
02/10/72		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
03/13/72		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
04/10/72		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
05/30/72		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
07/27/72		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.5	N/A	N/A	N/A	N/A
08/10/72		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
10/31/72		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
11/16/72		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
07/31/73		6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
03/16/92		26	ND	ND	N/A	ND	4	1700	ND	N/A	93	ND	ND	N/A	N/A	ND
04/23/92		76	ND	ND	N/A	ND	13	6900	ND	N/A	200	ND	ND	N/A	N/A	ND
05/21/92		N/A	ND	ND	N/A	ND	2	620	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/22/92		3	ND	ND	N/A	ND	3	1300	ND	N/A	180	ND	ND	N/A	N/A	ND
07/27/92		N/A	ND	ND	N/A	ND	5	330	ND	N/A	61	ND	ND	N/A	N/A	ND
08/05/92		N/A	ND	ND	N/A	ND	11	930	ND	3.3	140	ND	11	N/A	N/A	ND

Table 2.3-30 (Sheet 2 of 6)
Summary of Metals Analyses from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	**N/A**	**10**	**2**	**N/A**	**50**	**7**	**1000**	**25**	**N/A**	**N/A**	**0.01**	**88**	**N/A**	**N/A**	**50**
	Unit:	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**μg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
09/17/92		N/A	ND	ND	N/A	ND	7	310	ND	N/A	96	ND	ND	N/A	N/A	ND
10/13/92		N/A	ND	ND	N/A	ND	5	150	ND	N/A	51	ND	ND	N/A	N/A	ND
11/19/92		N/A	ND	ND	N/A	ND	11	1300	ND	N/A	92	ND	ND	N/A	N/A	ND
12/28/92		N/A	ND	ND	N/A	ND	5	1300	ND	N/A	66	ND	ND	N/A	N/A	ND
01/25/93		N/A	ND	ND	N/A	ND	5	2800	ND	N/A	79	ND	ND	N/A	N/A	ND
02/18/93		N/A	ND	ND	N/A	ND	7	2600	ND	N/A	82	ND	ND	N/A	N/A	ND
03/30/93		N/A	ND	ND	N/A	ND	11	2600	ND	N/A	86	ND	ND	N/A	N/A	10
04/27/93		N/A	ND	ND	N/A	ND	7	2100	ND	N/A	120	ND	ND	N/A	N/A	ND
05/17/93		N/A	ND	ND	N/A	ND	6	1700	ND	N/A	180	ND	ND	N/A	N/A	ND
06/24/93		N/A	ND	ND	N/A	ND	4	350	ND	N/A	51	ND	ND	N/A	N/A	ND
07/27/93		N/A	ND	ND	N/A	ND	3	230	ND	N/A	43	ND	ND	N/A	N/A	ND
08/18/93		N/A	ND	ND	N/A	ND	4	1100	ND	N/A	250	ND	ND	N/A	N/A	ND
09/20/93		N/A	ND	ND	N/A	ND	2	1300	ND	N/A	1100	ND	ND	N/A	N/A	ND
10/18/93		N/A	ND	ND	N/A	ND	5	270	ND	2.9	95	ND	ND	N/A	N/A	ND
11/11/93		N/A	ND	ND	N/A	ND	3	200	ND	N/A	89	ND	ND	N/A	N/A	ND
02/09/94		N/A	ND	ND	N/A	ND	5	2200	ND	N/A	69	ND	ND	N/A	N/A	ND
03/22/94		N/A	ND	ND	N/A	ND	4	1500	ND	N/A	120	ND	ND	N/A	N/A	ND
04/19/94		N/A	ND	ND	N/A	ND	4	3600	ND	N/A	110	ND	ND	N/A	N/A	37
05/24/94		N/A	ND	ND	N/A	ND	4	410	ND	N/A	50	ND	ND	N/A	N/A	ND
06/21/94		N/A	ND	ND	N/A	ND	8	430	ND	N/A	48	ND	ND	N/A	N/A	ND
07/20/94		N/A	ND	ND	N/A	ND	4	180	ND	N/A	41	ND	ND	N/A	N/A	ND
08/10/94		N/A	ND	ND	N/A	ND	5	100	ND	N/A	19	ND	ND	N/A	N/A	ND
09/22/94		N/A	ND	ND	N/A	ND	ND	860	ND	N/A	350	ND	ND	N/A	N/A	ND
10/18/94		N/A	ND	ND	N/A	ND	3	630	ND	N/A	51	ND	ND	N/A	N/A	N/A
11/29/94		N/A	ND	ND	N/A	ND	5	480	ND	N/A	71	ND	ND	N/A	N/A	ND
12/20/94		N/A	ND	ND	N/A	ND	4	620	ND	N/A	63	ND	ND	N/A	N/A	ND

Table 2.3-30 (Sheet 3 of 6)
Summary of Metals Analyses from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	**N/A**	**10**	**2**	**N/A**	**50**	**7**	**1000**	**25**	**N/A**	**N/A**	**0.01**	**88**	**N/A**	**N/A**	**50**
	Unit:	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**μg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
01/10/95		N/A	ND	ND	N/A	ND	13	2000	ND	N/A	68	ND	ND	N/A	N/A	11
02/06/95		N/A	ND	ND	N/A	ND	3	1300	ND	N/A	42	ND	ND	N/A	N/A	ND
03/23/95		N/A	ND	ND	N/A	ND	19	360	ND	N/A	46	ND	ND	N/A	N/A	ND
04/27/95		N/A	ND	ND	N/A	ND	11	620	ND	N/A	150	ND	ND	N/A	N/A	22
05/17/95		N/A	ND	ND	N/A	ND	5	560	ND	N/A	58	ND	ND	N/A	N/A	ND
06/22/95		N/A	ND	ND	N/A	ND	3	730	ND	N/A	100	ND	ND	N/A	N/A	20
08/15/95		N/A	ND	ND	N/A	ND	5	250	ND	N/A	69	ND	ND	N/A	N/A	15
09/18/95		N/A	ND	ND	N/A	ND	5	520	ND	N/A	320	ND	ND	N/A	N/A	ND
10/31/95		N/A	ND	ND	N/A	ND	6	4800	ND	N/A	110	ND	ND	N/A	N/A	44
11/30/95		N/A	ND	ND	N/A	ND	3	880	ND	N/A	77	ND	ND	N/A	N/A	15
12/15/95		N/A	ND	ND	N/A	ND	37	950	ND	N/A	71	ND	ND	N/A	N/A	ND
01/23/96		N/A	ND	ND	N/A	ND	11	5100	ND	N/A	120	ND	ND	N/A	N/A	31
02/22/96		N/A	ND	ND	N/A	ND	5	1900	ND	N/A	110	ND	ND	N/A	N/A	21
03/28/96		N/A	ND	ND	N/A	ND	3	1500	ND	N/A	150	ND	ND	N/A	N/A	27
04/18/96		N/A	ND	ND	N/A	ND	3	550	ND	N/A	120	ND	ND	N/A	N/A	32
05/29/96		N/A	ND	ND	N/A	ND	4	530	ND	N/A	190	ND	ND	N/A	N/A	23
06/25/96		N/A	ND	ND	N/A	ND	4	470	ND	N/A	63	ND	ND	N/A	N/A	29
07/18/96		N/A	ND	ND	N/A	ND	4	340	ND	N/A	130	ND	ND	N/A	N/A	31
08/22/96		N/A	ND	ND	N/A	ND	2	680	ND	N/A	110	ND	ND	N/A	N/A	18
09/26/96		N/A	ND	ND	N/A	ND	4	980	ND	N/A	160	ND	ND	N/A	N/A	67
10/15/96		N/A	ND	ND	N/A	ND	3	1700	ND	N/A	130	ND	ND	N/A	N/A	ND
11/20/96		N/A	ND	ND	N/A	ND	3	590	ND	N/A	63	ND	ND	N/A	N/A	24
12/18/96		N/A	ND	ND	N/A	ND	4	760	ND	N/A	79	ND	ND	N/A	N/A	28
01/30/97		N/A	ND	ND	N/A	ND	4	670	ND	N/A	70	ND	ND	N/A	N/A	17
02/27/97		N/A	ND	ND	N/A	ND	ND	830	ND	N/A	64	ND	ND	N/A	N/A	ND

Table 2.3-30 (Sheet 4 of 6)
Summary of Metals Analyses from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
03/31/97		N/A	ND	ND	N/A	ND	3	950	ND	N/A	88	ND	ND	N/A	N/A	58
04/30/97		N/A	ND	ND	N/A	ND	10	3500	ND	N/A	160	ND	ND	N/A	N/A	29
05/22/97		N/A	ND	ND	N/A	ND	8	700	ND	N/A	76	ND	ND	N/A	N/A	20
06/30/97		N/A	ND	ND	N/A	ND	4	390	ND	N/A	62	ND	ND	N/A	N/A	60
07/31/97		N/A	ND	ND	N/A	ND	6.2	1800	ND	N/A	830	ND	ND	N/A	N/A	53
09/08/97		N/A	ND	ND	N/A	ND	4.1	300	ND	N/A	130	ND	ND	N/A	N/A	150
09/29/97		N/A	ND	ND	N/A	ND	12	910	ND	N/A	100	ND	ND	N/A	N/A	23
10/15/97		N/A	ND	ND	N/A	ND	ND	240	ND	N/A	71	ND	ND	N/A	N/A	26
11/17/97		N/A	ND	ND	N/A	ND	4.9	1200	ND	N/A	47	ND	ND	N/A	N/A	20
12/11/97		N/A	ND	ND	N/A	ND	7.8	600	ND	N/A	66	ND	ND	N/A	N/A	12
01/14/98		N/A	ND	ND	N/A	ND	2.5	1100	ND	N/A	78	ND	ND	N/A	N/A	14
02/10/98		N/A	ND	ND	N/A	ND	3.5	930	ND	N/A	67	ND	ND	N/A	N/A	ND
03/03/98		N/A	ND	ND	N/A	ND	3	1600	ND	N/A	84	ND	ND	N/A	N/A	12
04/15/98		N/A	ND	ND	N/A	ND	3.2	1500	ND	N/A	110	ND	ND	N/A	N/A	ND
05/27/98		N/A	ND	ND	N/A	ND	6.6	1100	ND	N/A	75	ND	ND	N/A	N/A	22
06/11/98		N/A	ND	ND	N/A	ND	4.8	460	ND	N/A	110	ND	ND	N/A	N/A	40
07/29/98		N/A	ND	ND	N/A	ND	ND	300	ND	N/A	77	ND	ND	N/A	N/A	13
08/31/98		N/A	ND	ND	N/A	ND	5	510	ND	N/A	96	ND	ND	N/A	N/A	27
09/28/98		N/A	ND	ND	N/A	ND	3.3	180	ND	N/A	68	ND	ND	N/A	N/A	37
10/28/98		N/A	ND	ND	N/A	ND	13	150	ND	N/A	54	ND	ND	N/A	N/A	10
11/29/98		N/A	ND	ND	N/A	ND	12	250	ND	N/A	69	ND	ND	N/A	N/A	35
12/28/98		N/A	ND	ND	N/A	ND	5	1200	ND	N/A	48	ND	ND	N/A	N/A	16
01/27/99		N/A	ND	ND	N/A	ND	5	3500	ND	N/A	170	ND	ND	N/A	N/A	15
02/17/99		N/A	ND	ND	N/A	ND	3.1	990	ND	N/A	72	ND	ND	N/A	N/A	12
03/23/99		N/A	ND	ND	N/A	ND	15	2400	ND	N/A	92	ND	ND	N/A	N/A	24
04/29/99		N/A	ND	ND	N/A	ND	2.5	690	ND	N/A	150	ND	ND	N/A	N/A	ND

Table 2.3-30 (Sheet 5 of 6)
Summary of Metals Analyses from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	**N/A**	**10**	**2**	**N/A**	**50**	**7**	**1000**	**25**	**N/A**	**N/A**	**0.01**	**88**	**N/A**	**N/A**	**50**
	Unit:	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**μg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
05/24/99		N/A	ND	ND	N/A	ND	3.3	610	ND	N/A	100	ND	ND	N/A	N/A	ND
06/24/99		N/A	ND	ND	N/A	ND	3.7	310	ND	N/A	110	ND	ND	N/A	N/A	ND
07/27/99		N/A	ND	ND	N/A	ND	2.5	200	ND	N/A	42	ND	ND	N/A	N/A	ND
08/17/99		N/A	ND	ND	N/A	ND	5.1	120	ND	N/A	34	ND	ND	N/A	N/A	ND
09/29/99		N/A	ND	ND	N/A	ND	5.2	810	ND	N/A	56	ND	ND	N/A	N/A	ND
10/18/99		N/A	ND	ND	N/A	ND	5.4	1000	ND	N/A	81	ND	ND	N/A	N/A	ND
11/01/99		N/A	ND	ND	N/A	ND	2.9	720	ND	N/A	89	ND	ND	N/A	N/A	ND
12/02/99		N/A	ND	ND	N/A	ND	5.3	1100	ND	N/A	110	ND	ND	N/A	N/A	ND
02/14/00		N/A	ND	ND	N/A	ND	4.8	2900	ND	N/A	91	ND	ND	N/A	N/A	13
03/15/00		N/A	ND	ND	N/A	ND	4.3	660	ND	N/A	85	ND	ND	N/A	N/A	ND
04/26/00		N/A	ND	ND	N/A	ND	ND	880	ND	N/A	81	ND	ND	N/A	N/A	ND
05/22/00		N/A	ND	ND	N/A	ND	5.8	1100	ND	N/A	110	ND	ND	N/A	N/A	11
06/14/00		N/A	ND	ND	N/A	ND	2.3	230	ND	N/A	47	ND	ND	N/A	N/A	ND
07/30/00		N/A	ND	ND	N/A	ND	6	1100	ND	N/A	120	ND	ND	N/A	N/A	22
08/30/00		N/A	ND	ND	N/A	ND	ND	660	ND	N/A	110	ND	ND	N/A	N/A	ND
05/21/01		N/A	ND	ND	N/A	ND	4.1	380	ND	N/A	87	ND	ND	N/A	N/A	13
08/02/01		N/A	ND	ND	N/A	ND	2.7	270	ND	N/A	90	ND	ND	N/A	N/A	15
11/28/01		N/A	ND	ND	N/A	ND	2.5	140	ND	N/A	61	ND	ND	N/A	N/A	ND
02/20/02		N/A	ND	ND	N/A	ND	2.1	1000	ND	N/A	120	ND	ND	N/A	N/A	11
05/07/02		N/A	ND	ND	N/A	ND	2.5	220	ND	N/A	74	ND	ND	N/A	N/A	ND
08/21/02		N/A	ND	ND	N/A	ND	4.7	250	ND	N/A	87	ND	ND	N/A	N/A	ND
11/25/02		N/A	ND	ND	N/A	ND	3.7	1000	ND	N/A	87	ND	ND	N/A	N/A	12
02/26/03		N/A	ND	ND	N/A	ND	5.3	1400	ND	N/A	88	ND	ND	N/A	N/A	ND
05/27/03		N/A	ND	ND	N/A	ND	6.5	3000	ND	N/A	96	ND	ND	N/A	N/A	11
08/21/03		N/A	ND	ND	N/A	ND	4.4	1300	ND	N/A	280	ND	ND	N/A	N/A	ND
11/13/03		N/A	ND	ND	N/A	ND	3.6	970	ND	N/A	130	ND	ND	N/A	N/A	ND

Table 2.3-30 (Sheet 6 of 6)
Summary of Metals Analyses from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	**N/A**	**10**	**2**	**N/A**	**50**	**7**	**1000**	**25**	**N/A**	**N/A**	**0.01**	**88**	**N/A**	**N/A**	**50**
	Unit:	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**	**mg/L**	**mg/L**	**mg/L**
03/18/04		N/A	ND	ND	N/A	ND	2.7	1600	ND	N/A	160	ND	ND	N/A	N/A	ND
06/15/04		N/A	ND	ND	N/A	ND	4.9	620	ND	N/A	79	ND	ND	N/A	N/A	12
09/16/04		N/A	ND	ND	N/A	ND	2.8	1100	ND	N/A	170	ND	ND	N/A	N/A	ND
12/08/04		N/A	ND	ND	N/A	ND	2.7	960	ND	N/A	110	ND	ND	N/A	N/A	ND
03/16/05		N/A	ND	ND	N/A	ND	2.6	750	ND	N/A	87	ND	ND	N/A	N/A	ND
06/20/05		N/A	ND	ND	N/A	ND	2.5	590	ND	N/A	190	ND	ND	N/A	N/A	ND
09/27/05		N/A	ND	ND	N/A	ND	2.2	220	ND	N/A	93	ND	ND	N/A	N/A	ND
12/07/05		N/A	ND	ND	N/A	ND	8.4	4700	ND	N/A	160	ND	ND	N/A	N/A	15
03/09/06		N/A	ND	ND	N/A	ND	2.7	490	ND	N/A	80	ND	ND	N/A	N/A	24
06/09/06		N/A	ND	ND	N/A	ND	3.4	540	ND	N/A	320	ND	ND	N/A	N/A	ND
09/19/06		N/A	ND	ND	N/A	ND	3	730	ND	N/A	110	ND	ND	N/A	N/A	ND
12/18/06		N/A	ND	ND	N/A	ND	2.9	1200	ND	N/A	110	ND	ND	N/A	N/A	ND

Notes:
mg/L = milligrams per liter
N/A = not available
ND = no data

Source: Reference 2.3-052

Table 2.3-31 (Sheet 1 of 4)
Water Chemistry Data from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
07/31/73		N/A	0.07	0.6	0.49	0.41	N/A	N/A
03/16/92		10	0.06	0.4	0.72	0.13	0.04	N/A
04/23/92		5	0.2	0.7	0.42	0.38	0.05	N/A
05/21/92		14	0.08	0.6	0.64	0.09	0.02	N/A
06/22/92		10	0.12	0.6	0.6	0.15	0.04	N/A
07/27/92		21	0.07	0.7	0.77	0.15	N/A	N/A
08/05/92		10	0.04	0.6	0.51	0.19	N/A	N/A
09/17/92		19	0.06	0.5	0.03	0.09	N/A	N/A
10/13/92		20	0.05	0.6	0.79	10	N/A	N/A
11/19/92		13	0.11	0.6	0.6	0.16	N/A	N/A
12/28/92		13	0.08	0.4	0.7	0.14	N/A	N/A
01/25/93		7	0.13	0.4	0.61	0.17	N/A	N/A
02/18/93		10	0.25	0.6	0.81	0.24	N/A	N/A
03/30/93		6	0.11	0.5	0.45	0.18	N/A	N/A
04/27/93		7	0.11	0.4	0.56	0.12	N/A	N/A
05/17/93		9	0.11	0.5	0.64	0.15	N/A	N/A
06/24/93		20	0.05	0.5	0.1	0.12	N/A	N/A
07/27/93		18	0.04	0.7	0.01	0.11	N/A	N/A
08/18/93		18	0.01	0.4	ND	0.18	N/A	N/A
09/20/93		21	0.27	0.6	0.48	0.13	N/A	N/A
10/18/93		26	0.08	0.5	0.55	0.05	N/A	N/A
11/11/93		36	0.1	0.5	0.91	0.14	N/A	N/A
02/09/94		12	0.18	0.5	0.69	0.12	N/A	N/A
03/22/94		11	0.11	0.6	0.61	0.09	N/A	N/A
04/19/94		7	0.09	0.5	0.62	0.13	N/A	N/A
05/24/94		14	0.01	0.4	0.49	0.07	N/A	N/A
06/21/94		10	0.07	0.7	ND	0.07	N/A	N/A
07/20/94		27	ND	0.7	ND	0.05	N/A	N/A
08/10/94		11	0.05	0.7	0.19	0.15	N/A	N/A
09/22/94		16	0.17	0.6	0.47	0.14	N/A	N/A
10/18/94		19	0.06	0.5	0.59	0.1	N/A	N/A
11/29/94		32	0.07	0.6	0.92	0.13	N/A	N/A
12/20/94		23	0.1	0.4	1	0.13	N/A	N/A
01/10/95		13	0.11	0.8	1.4	0.28	N/A	N/A
02/06/95		13	0.1	0.5	0.77	0.13	N/A	N/A
03/23/95		11	0.1	0.3	0.54	0.13	N/A	N/A
04/27/95		20	0.11	0.6	0.65	1.4	N/A	N/A
05/17/95		22	0.04	0.6	0.51	0.65	N/A	N/A
06/22/95		10	0.12	0.4	0.61	0.17	N/A	N/A
08/15/95		22	0.02	0.5	ND	0.09	N/A	N/A
09/18/95		11	0.08	0.4	0.59	0.1	N/A	N/A
10/31/95		11	0.06	0.5	0.49	0.21	N/A	N/A
11/30/95		12	0.03	0.5	0.83	0.1	N/A	N/A

Table 2.3-31 (Sheet 2 of 4)
Water Chemistry Data from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
12/15/95		10	0.07	0.4	0.84	0.13	N/A	N/A
01/23/96		10	0.15	0.5	0.62	0.24	N/A	N/A
02/22/96		13	0.14	0.6	0.75	0.2	N/A	N/A
03/28/96		10	0.06	0.4	0.62	0.13	N/A	N/A
04/18/96		11	0.07	0.2	0.47	0.1	N/A	N/A
05/29/96		12	0.09	0.4	0.75	0.12	N/A	N/A
06/25/96		13	0.05	0.7	0.09	0.13	N/A	N/A
07/18/96		16	0.02	0.4	ND	0.08	N/A	N/A
08/22/96		18	0.04	0.5	0.7	0.17	N/A	N/A
09/26/96		8	0.07	0.5	0.19	0.05	N/A	N/A
10/15/96		9	0.08	0.4	0.44	0.09	N/A	N/A
11/20/96		16	0.08	0.5	0.74	0.08	N/A	N/A
12/18/96		11	0.06	0.4	0.66	0.08	N/A	N/A
01/30/97		12	0.04	0.6	0.61	0.09	N/A	N/A
02/27/97		10	0.03	0.3	0.6	0.04	N/A	N/A
03/31/97		9	0.06	0.3	0.52	0.09	N/A	N/A
04/30/97		4	0.07	0.7	0.49	0.39	N/A	N/A
05/22/97		9	0.02	0.2	0.48	0.08	N/A	N/A
06/30/97		15	ND	0.5	0.21	0.11	N/A	N/A
07/18/97		N/A	0.01	0.4	ND	0.07	N/A	N/A
07/31/97		11	0.35	0.8	0.28	0.17	N/A	N/A
08/19/97		N/A	ND	0.6	ND	0.35	N/A	N/A
09/08/97		18	ND	0.4	ND	0.04	N/A	N/A
09/29/97		17	0.12	0.5	0.77	0.16	N/A	N/A
10/15/97		16	ND	0.4	0.22	0.07	N/A	N/A
11/17/97		13	0.01	0.4	0.7	0.18	N/A	N/A
12/11/97		16	0.04	0.3	0.77	0.08	N/A	N/A
01/14/98		12	0.07	0.5	0.54	0.12	N/A	N/A
02/10/98		8	0.08	0.3	0.39	0.12	N/A	N/A
03/03/98		8	0.09	0.2	0.47	0.06	N/A	N/A
04/15/98		7	0.06	0.4	0.41	0.11	N/A	N/A
05/27/98		10	0.07	0.2	0.96	0.16	N/A	N/A
06/11/98		11	0.05	0.4	0.33	0.11	N/A	N/A
07/29/98		15	0.01	0.3	ND	0.06	N/A	N/A
08/31/98		25	ND	0.6	ND	0.11	N/A	N/A
09/28/98		23	ND	0.4	0.03	0.08	N/A	N/A
10/28/98		20	ND	0.5	0.29	0.08	N/A	N/A
11/29/98		25	0.01	0.5	0.45	0.09	N/A	N/A
12/28/98		12	0.13	0.6	1.3	0.28	N/A	N/A
01/27/99		6	0.11	0.7	0.58	0.22	N/A	N/A
02/17/99		13	0.16	0.4	0.81	0.09	N/A	N/A
03/23/99		10	0.06	0.4	0.65	0.19	N/A	N/A
04/29/99		12	0.2	0.4	0.34	0.12	N/A	N/A
05/24/99		13.5	ND	0.3	0.62	0.1	N/A	N/A

Table 2.3-31 (Sheet 3 of 4)
Water Chemistry Data from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
06/24/99		16	ND	0.6	ND	0.13	N/A	N/A
07/27/99		28	ND	0.5	0.01	0.1	N/A	N/A
08/17/99		19	0.13	0.4	0.02	0.05	N/A	N/A
09/29/99		3.92	0.06	0.6	0.37	0.37	N/A	N/A
10/18/99		9.52	0.07	0.8	0.67	0.24	N/A	N/A
11/01/99		9.61	ND	0.3	0.45	0.14	N/A	N/A
12/02/99		14.07	0.06	0.5	0.54	0.11	N/A	N/A
02/14/00		11.73	0.1	0.6	0.66	0.21	N/A	N/A
03/15/00		9.31	0.05	0.9	0.24	0.05	N/A	N/A
04/26/00		9.18	0.06	0.4	0.34	0.06	N/A	N/A
05/22/00		11	0.03	0.4	0.16	0.12	N/A	N/A
06/14/00		16	3.5	10	0.14	10	N/A	N/A
07/30/00		17	0.17	0.8	0.27	0.09	N/A	N/A
08/30/00		15	ND	0.7	0.04	0.14	N/A	N/A
09/13/00		N/A	0.03	0.3	0.55	0.23	N/A	N/A
10/09/00		10	0.06	0.5	0.37	0.08	N/A	N/A
11/29/00		N/A	0.02	0.5	0.62	0.16	N/A	N/A
01/03/01		N/A	0.39	0.7	0.79	0.14	N/A	N/A
02/01/01		N/A	ND	ND	1.4	ND	N/A	N/A
05/21/01		N/A	ND	ND	ND	ND	N/A	N/A
06/25/01		N/A	0.16	N/A	0.02	0.16	N/A	N/A
07/11/01		N/A	0.44	0.75	0.01	0.04	N/A	N/A
06/11/03		N/A	0.07	0.55	0.36	0.18	N/A	N/A
07/10/03		N/A	0.13	0.65	0.43	0.14	N/A	N/A
08/21/03		N/A	0.12	0.73	0.57	0.17	N/A	N/A
09/10/03		N/A	0.06	0.59	0.3	0.12	N/A	N/A
10/20/03		N/A	0.02	0.55	0.77	0.23	N/A	N/A
11/13/03		N/A	0.04	0.53	0.72	0.14	N/A	N/A
12/15/03		N/A	0.08	0.64	1	0.22	N/A	N/A
01/28/04		N/A	ND	0.44	0.94	0.11	N/A	N/A
02/19/04		N/A	0.05	0.56	0.65	0.29	N/A	N/A
03/18/04		N/A	0.07	0.6	0.58	0.12	N/A	N/A
04/21/04		N/A	0.09	0.58	0.46	0.13	N/A	N/A
05/18/04		N/A	ND	0.93	0.24	0.12	N/A	N/A
06/15/04		N/A	ND	1	0.73	0.24	N/A	N/A
07/27/04		N/A	ND	0.81	0.22	0.1	N/A	N/A
08/24/04		N/A	0.13	0.81	0.45	0.13	N/A	N/A
09/16/04		N/A	0.06	0.66	0.32	0.12	N/A	N/A
10/12/04		N/A	ND	0.83	0.27	0.16	N/A	N/A
11/22/04		N/A	0.08	0.72	0.91	0.37	N/A	N/A
12/08/04		N/A	0.05	0.7	0.7	0.09	N/A	N/A
01/05/05		N/A	0.06	0.64	1	0.11	N/A	N/A
02/14/05		N/A	0.06	0.82	0.83	0.12	N/A	N/A
03/16/05		N/A	0.03	0.59	0.67	0.12	N/A	N/A

Table 2.3-31 (Sheet 4 of 4)
Water Chemistry Data from DWQ Station B6160000 — Cape Fear River at NC 42 near Corinth, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
04/12/05		N/A	0.08	0.67	0.47	0.11	N/A	N/A
05/11/05		N/A	ND	0.64	0.67	0.12	N/A	N/A
06/20/05		N/A	ND	0.88	0.55	0.15	N/A	N/A
07/19/05		N/A	ND	0.93	0.28	0.18	N/A	N/A
08/18/05		N/A	0.04	0.66	0.5	0.14	N/A	N/A
09/27/05		N/A	ND	0.59	0.22	0.08	N/A	N/A
10/18/05		N/A	ND	0.65	0.51	0.1	N/A	N/A
11/14/05		N/A	ND	0.68	0.07	0.1	N/A	N/A
12/07/05		N/A	0.09	1	0.87	0.36	N/A	N/A
01/19/06		N/A	0.04	0.58	0.77	0.12	N/A	N/A
02/15/06		N/A	ND	0.52	0.79	0.17	N/A	N/A
03/09/06		N/A	ND	0.6	0.65	0.13	N/A	N/A
04/20/06		N/A	0.12	0.78	0.51	0.13	N/A	N/A
05/23/06		N/A	ND	0.68	0.78	0.14	N/A	N/A
06/09/06		N/A	ND	0.81	0.44	0.12	N/A	N/A
07/11/06		N/A	0.11	0.77	0.29	0.11	N/A	N/A
08/08/06		N/A	0.06	0.88	0.45	0.19	N/A	N/A
09/19/06		N/A	0.05	0.65	0.63	0.14	N/A	N/A
10/26/06		N/A	ND	0.65	0.64	0.1	N/A	N/A
11/29/06		N/A	0.08	0.72	0.35	0.1	N/A	N/A
12/18/06		N/A	0.06	0.51	0.93	0.1	N/A	N/A

Notes:
mg/L = milligrams per liter
N/A = not available
ND = no data

Source: Reference 2.3-052

**Table 2.3-32 (Sheet 1 of 8)
Field Parameters from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC**

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
07/24/68	7.3	6.2	N/A	29
08/15/68	4.2	8.7	N/A	28
09/27/68	6.2	7.1	N/A	23
07/17/69	6.9	7.4	N/A	31
10/22/69	9.2	7.1	N/A	23
05/20/70	7.8	6.8	N/A	24
09/09/70	7.2	7.5	N/A	28
11/16/70	8.8	6.5	N/A	15
03/29/71	10.3	6.2	N/A	11
07/06/71	7.3	7	N/A	28
10/11/71	8.1	6.2	N/A	20
05/30/72	11.2	6.1	N/A	29
08/10/72	6.2	6.3	N/A	27
09/28/72	6.8	7	N/A	26
10/05/72	7.9	6.3	N/A	21
10/09/72	8.6	6.7	N/A	20
10/18/72	8.2	6.2	N/A	19
10/26/72	8.7	6.4	N/A	18
11/20/72	10.6	8.1	N/A	10
11/28/72	11.3	6	N/A	8
12/06/72	11.1	6.1	N/A	13
12/13/72	10	6.1	N/A	12
07/30/73	7.2	6.7	N/A	31
11/28/73	7.9	7	N/A	20
01/08/74	11.1	7.5	N/A	8
02/27/74	11	7	N/A	7
03/21/74	9.3	7.1	N/A	13
04/23/74	8.5	6.6	N/A	19
05/30/74	7.1	N/A	N/A	21
06/12/74	8.2	7.1	110	28
06/25/74	8.8	6.9	N/A	27
07/02/74	7.4	N/A	130	28
07/11/74	6.9	N/A	N/A	29
07/30/74	7.3	N/A	N/A	30
09/12/74	7.2	6.6	40	25
11/13/74	8.3	6.7	160	14
11/21/74	9.6	6.5	50	12
11/21/74	9.6	6.5	50	13
12/10/74	11.6	6.3	40	6
12/30/74	10.3	6	30	15
01/09/75	9.6	6.2	60	11
01/15/75	9	6.3	35	7
01/20/75	10.3	6.2	50	7
01/20/75	10.2	6.2	45	6
01/28/75	9.1	6.4	50	11
01/31/75	9.6	6.1	20	13
02/06/75	10.1	6.4	40	10
02/10/75	11.6	6.3	50	6
02/18/75	11.4	7.2	60	13
02/26/75	11.8	7.5	50	10
03/04/75	11.4	7	35	8
03/10/75	9.9	6.6	60	9
03/18/75	10.6	6.2	35	8

Table 2.3-32 (Sheet 2 of 8)
Field Parameters from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
03/24/75	11.6	6.2	45	15
04/02/75	9.8	7.6	55	18
04/09/75	10.1	6.8	70	15
04/16/75	10.6	7.3	80	15
04/24/75	9.8	6.9	90	20
05/07/75	8.2	6.7	40	21
05/12/75	8.8	6.6	120	22
05/20/75	8.5	6.8	40	20
06/10/75	12.6	6.7	50	24
06/12/75	9.2	7	78	24
07/07/75	7.2	N/A	180	25
08/05/75	9	6.5	80	29
08/25/75	7.2	6.7	160	32
09/03/75	9.1	7.2	180	28
10/02/75	8.8	7.1	N/A	20
02/11/76	10.4	6.2	70	13
03/03/76	10	7	120	20
04/08/76	10	6.7	100	18
05/06/76	9.6	7.1	190	23
06/07/76	N/A	6.6	90	21
07/14/76	9.2	7.2	160	27
08/13/76	8	7.6	230	28
09/10/76	8.8	8.6	250	27
10/11/76	6.1	6.9	160	16
11/03/76	8.8	6.2	80	10
12/06/76	8.3	6.4	90	8
01/06/77	9.4	6.4	60	5
02/03/77	10.6	6.9	80	3
03/03/77	10.6	6.7	70	12
04/07/77	9.8	6.6	70	15
05/04/77	7.6	7.1	130	24
06/08/77	8	7.1	180	23
07/12/77	6.1	N/A	N/A	29
08/11/77	8.7	9.3	280	32
09/14/77	7	6.7	130	24
10/03/77	7.7	7	130	20
11/01/77	7.6	6.7	100	15
12/01/77	6.1	7	140	11
01/13/78	12.3	6.8	70	4
02/06/78	12.8	7.1	50	3
04/03/78	9.2	6.3	77	14
05/04/78	10	7.1	50	13.3
06/05/78	7.4	7.2	114	24.7
07/06/78	6.8	7.2	124	25
08/01/78	6.4	7.6	142	28
09/05/78	7.6	7.1	126	25
10/02/78	8.2	6.1	151	20
11/01/78	9.4	N/A	188	15
12/04/78	10.1	N/A	148	15
01/04/79	12	N/A	71	5
02/26/79	11.6	6.8	28	7
03/01/79	11.8	6.8	35	8
04/10/79	9.2	6.4	59	15

Table 2.3-32 (Sheet 3 of 8)
Field Parameters from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
05/01/79	8.6	6.9	81	17
06/06/79	7.9	6.1	59	21
07/09/79	8.7	6.2	150	23
08/01/79	6.6	6.6	150	29
09/04/79	7.2	6.4	170	27
10/02/79	8.3	6.5	110	23
11/01/79	7.2	6.6	150	18
12/05/79	11.6	6.8	90	10
01/08/80	10.1	6.4	90	8
02/12/80	11.1	6.1	70	4
03/11/80	9.6	7.3	70	11
04/10/80	10.4	6.3	90	10
05/06/80	9.5	6.7	140	11
06/03/80	7.8	6.3	110	25
07/08/80	6.4	5.7	130	28
08/12/80	7	N/A	190	29
09/03/80	6.7	8.3	300	29
10/08/80	12.4	5.9	200	18
11/04/80	10	7.4	170	16
12/11/80	9.2	6.6	110	13
01/29/81	12	6.6	202	7
02/03/81	11.8	6.5	175	5
03/16/81	10.6	6.76	134	12
04/08/81	8.6	6.97	134	20
05/12/81	8.5	6.5	205	21
06/03/81	7.3	6.97	166	24
07/23/81	6.2	6.81	118	25
08/26/81	7.4	6.99	107	24
09/16/81	7.2	6.93	100	25
10/13/81	8.3	6.98	145	17
11/09/81	9.5	6.85	100	17
12/28/81	10.3	7.03	70	9
01/26/82	11.2	5.68	30	5
02/09/82	11.2	5.62	40	7
03/11/82	10.8	7.17	40	12
04/06/82	9.4	7.27	80	13
05/04/82	9.6	6.55	47	16
06/09/82	9.2	5.63	40	22
07/27/82	6.2	6.6, 6.95	120	25
08/24/82	8.4	6.48	90	20
09/08/82	9.8	7.24	120	22
10/07/82	7	7.45	180	22
11/03/82	8.4	6.8	110	19
12/02/82	8.4	6.89	130	14
01/05/83	8.6	6.31	50	8
02/07/83	12	7.38	50	8
03/08/83	9.5	6.83	55	18
04/12/83	8.6	6.46	70	17
05/05/83	8.6	7.13	72	21
06/02/83	7.8	6.88	80	22
07/05/83	6.4	6.66	110	30
08/02/83	7.8	7.16	74	31
09/01/83	6.8	7.11	180	29

Table 2.3-32 (Sheet 4 of 8)
Field Parameters from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
11/03/83	10.2	6.96	152	17
12/14/83	9	6.08	45	14
01/10/84	11.8	6.43	48	8
02/01/84	12.2	6.4	50	6
03/14/84	10	6.62	60	15
04/18/84	7.8	6.61	68	17
05/24/84	5.9	6.88	90	25
06/18/84	6.7	6.58	138	29
07/24/84	6.8	6.89	76	27
08/14/84	6.2	6.74	88	27
09/12/84	6.6	7.03	130	24
10/16/84	7.3	7	155	21
11/14/84	11	6.95	186	12
12/06/84	10.4	6.71	171	9
01/16/85	11.8	6.95	83	6
02/06/85	11.6	7.2	61	7
03/11/85	9.4	6.7, 7.01	100	12
04/18/85	8	6.8, 7.34	56	19
05/21/85	6.4	6.5, 7.24	120	24
06/10/85	6.2	7.11, 7.5	147	26
07/09/85	6.4	6.9, 7.24	149	27
08/13/85	5.4	6.8, 6.85	128	28
09/16/85	7.4	6.8, 6.9	104	22
10/09/85	8.4	6.73, 6.9	137	22
11/07/85	7	6.2, 6.8	72	18
12/09/85	10.2	6.4, 6.88	90	11
01/20/86	10.4	6.7, 7.13	104	10
02/24/86	10.8	7.1, 7.4	117	10
03/04/86	11	7.1, 7.6	117	10
04/03/86	8.2	7.3, 7.5	11	19
05/07/86	7.9	7.3, 7.5	150	25
06/18/86	6.3	7.4, 7.5	200	26
07/30/86	6	7.1, 7.5	200	27
08/26/86	6.1	6.5, 6.9	77	26
09/04/86	6.8	6.7, 7.1	153	26
10/29/86	8.2	7	224	16
12/03/86	8.7	7	282	11
01/28/87	11	7.1	104	7
02/26/87	10.6	6.1	69	6
03/26/87	9.5	6.8	100	13
04/28/87	6.4	6	71	16
05/22/87	6.6	6.6	98	23
06/23/87	6	7.1	135	25
07/30/87	6.5	6.8	80	24
08/24/87	5.2	7	166	24
09/16/87	6.5	6.9	100	23
10/26/87	9.4	7.2	160	15
11/17/87	9.2	7.2	182	15
12/08/87	10.8	6.9	177	7
01/19/88	11.4	6.4	140	5
02/25/88	11.6	7.2	116	7
03/23/88	10.4	6.8	141	11
04/21/88	8.5	6.4	102	15

Table 2.3-32 (Sheet 5 of 8)
Field Parameters from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
05/26/88	6.9	6.9	100	21
06/07/88	6.4	7.3	180	25
07/28/88	7.2	7.1	207	28
09/08/88	6.5	7.4	138	22
09/19/88	7	7	182	24
10/18/88	8.2	6.2	90	19
11/29/88	9.8	6.5	163	10
12/06/88	10.8	7.6	130	9
01/09/89	10.4	7.7	156	9
02/16/89	11	7.5	162	14
03/16/89	11.6	7.4	119	10
04/27/89	7.6	6.9	94	23
05/30/89	7.6	7.1	110	25
06/20/89	6.7	7.1	140	25
07/18/89	7.2	6.7	68	23
08/14/89	6.5	6.8	123	25
09/06/89	6.8	7.2	152	24
10/11/89	8.4	7.1	112	19
11/27/89	10.2	7.2	122	10
12/28/89	11.5	6.6	99	4
01/24/90	10.2	7.1	98	10
02/15/90	10.2	7.1	98	14
03/14/90	9	7.2	106	16
04/04/90	9.6	6.9	96	15
05/08/90	8.5	7	132	20
06/20/90	7.4	6.6	125	25
07/11/90	6.7	7.5	184	29
08/16/90	6.7	7.3	200	25
09/12/90	6.6	7.6	233	26
10/17/90	7.1	6.9	132	20
11/15/90	10	6.8	102	11
12/13/90	10.9	7	119	9
01/31/91	10.8	6.5	90	8
04/16/91	8.8	6.9	108	18
05/16/91	7.2	6.5	120	25
06/06/91	7.8	7.3	143	22
07/22/91	7.8	7.4	171	30
08/19/91	6.4	7	212	26
10/09/91	8.4	7	172	19
11/06/91	10.1	7	250	11
12/04/91	9.8	7.2	256	11
01/23/92	11.4	7.3	137	10
02/20/92	11.6	7.1	172	9
03/18/92	10.8	6.9	128	11
04/14/92	11	7.1	134	19
05/12/92	9	6.9	121	20
06/03/92	9.2	8.4	173	24
07/21/92	8.1	8	169	28
08/11/92	8.4	7.7	175	28
09/23/92	6.4	7	198	23
10/13/92	7.8	6.6	185	19
11/17/92	10.2	6.9	160	11
12/02/92	10.3	6.6	134	11

Table 2.3-32 (Sheet 6 of 8)
Field Parameters from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
01/20/93	11.8	6.2	109	7
02/10/93	11.8	6.7	109	7
04/12/93	9.8	6.6	85	14
05/18/93	7.8	6.7	120	23
06/15/93	7.3	6.7	173	25
07/29/93	8.2	6.8	205	31
08/30/93	7.9	6.6	205	28
09/16/93	7.4	6.5	230	26
11/01/93	10.3	6.3	217	12
11/18/93	9	7.27	25	16
02/24/94	11	7.1	9	N/A
03/14/94	N/A	7.05	135	16
04/07/94	7.2	6.87	116	17
05/11/94	8.5	5.83	147	22.5
06/14/94	6.4	5.56	95	28
07/28/94	7.4	7.34	157	26
08/03/94	6.5	8.54	194	28
09/19/94	7.8	7.23	160	22
10/11/94	9.8	6.68	215	18.5
11/17/94	8.8	5.71	260	13.9
12/15/94	9.5	7.36	266	10.7
01/26/95	11.2	7	135	7.5
02/02/95	10.6	6.92	125	7
03/22/95	10	6.98	131	14
04/13/95	12	7.1	143	19
05/03/95	7.3	7.16	201	19
06/23/95	6.9	8.88	105	24
07/17/95	5.5	7.14	119	31
08/17/95	6.9	7.4	182	29
09/19/95	9.2	7.4	135	25
10/18/95	8.2	6.8	88	18
11/16/95	9.3	6.9	70	10
12/13/95	11.2	7.4	95	6
02/26/96	11.1	6.77	139	11
03/14/96	12.4	5.52	142	10
05/08/96	6	7.37	138	20
06/04/96	7.4	7.19	160	25
07/26/96	6	6.85	156	27
08/23/96	8.7	8.19	20702([a])	28
09/17/96	9.8	6.78	92	27
10/11/96	7.8	2.3	121	16.4
11/15/96	10.2	6.76	240	7.5
12/13/96	10	6.7	170	9
01/17/97	5	7.1	181	5
02/10/97	9.5	6.8	182	8.5
03/03/97	8.8	6.7	175	15
04/03/97	9.2	6.4	147	16.5
05/06/97	9.5	7	N/A	17.5
06/11/97	8	6.9	159	22.5
08/14/97	7.6	7.7	149	30.8
09/15/97	8.9	7.4	218	27
11/06/97	9.5	7.3	198	14
12/02/97	10.1	7.3	134	10

Table 2.3-32 (Sheet 7 of 8)
Field Parameters from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
01/07/98	12	7.3	154	8
02/13/98	12.8	6.9	101	7
03/04/98	11	7	90	10
04/07/98	9.7	6.7	83	16
05/04/98	8.5	6.9	90	21
06/19/98	6.8	7.3	161	28
07/15/98	7.5	7.5	174	29
08/11/98	5.9	7.2	184	28
09/14/98	6.9	7.2	176	27
10/13/98	6.8	6.9	231	21
11/09/98	9.4	6.8	240	15
12/01/98	9.5	6.9	255	15
01/12/99	10.5	6.6	133	6
02/17/99	9.9	7.4	124	11.9
03/22/99	9.9	6.9	80	12.1
04/21/99	8.8	7.4	128	20
05/18/99	7.3	6.9	102	22
06/03/99	7.4	7	149	26.8
09/08/99	6.6	6.7	84	23.1
09/28/99	7.3	7	115	22.2
10/18/99	7.9	7.6	74	19
11/08/99	9.1	6.9	109	14.2
12/01/99	9.7	6.5	146	11.5
01/20/00	11.7	6.4	108	6
02/02/00	12.4	6.9	91	2
03/02/00	11.1	6.3	117	10
04/03/00	9.1	6.3	109	15
05/02/00	8.9	6.8	116	16
06/06/00	5.4	6.5	164	23
07/06/00	5.3	6.7	191	28
08/08/00	5.6	7.1	147	29
09/20/00	6.2	7.1	160	24
10/02/00	6.7	6.4	138	20
11/08/00	6.8	6.8	202	18
12/13/00	9.2	7.3	252	8
01/17/01	10.8	7.1	235	8.5
02/06/01	9.4	7.1	225	8.7
04/11/01	8.2	7.1	128	16.3
05/02/01	6	7.2	138	20
06/07/01	5.4	7	159	23
07/12/01	6.4	7.1	156	28.8
08/02/01	5.3	7.2	167	26.5
09/10/01	5.7	6.9	170	27.8
10/04/01	6.5	7.1	198	21.5
11/01/01	7.5	7.3	203	17.1
12/13/01	7.8	6.9	208	14.5
01/14/02	10.8	7.1	234	6.5
02/05/02	10.4	6.7	132	6.7
03/11/02	10.1	7.1	176	11
04/18/02	5.4	7	138	25.1
05/02/02	6.4	7	174	24.3
06/11/02	6.4	7.8	223	27.8
07/22/02	6.1	7.3	269	30

Table 2.3-32 (Sheet 8 of 8)
Field Parameters from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
08/01/02	4.8	7.1	238	29.6
09/04/02	6.7	6.9	159	24.7
10/03/02	7.6	7.4	173	27.5
11/18/02	9.2	6.6	97	12.3
12/17/02	12.2	7	87	6.6
01/14/03	11.6	7.2	103	6.2
02/12/03	13.1	7.2	120	6.3
03/13/03	11.5	7.2	105	10.6
04/07/03	9.3	7.1	94	13.6
05/01/03	7.8	6.8	84	20.6
06/05/03	6.7	6.9	92	21.5
07/10/03	5.6	6.8	92	26.6
03/30/04	9.2	6.5	126	15
08/18/04	6.4	6.8	156	24.5
09/07/04	5.7	6.3	121	26.1
10/27/04	7.3	6.4	162	18.3
11/29/04	9.3	6.3	140	12.3
12/14/04	10.2	6.8	94	9.8
01/18/05	10.6	5.9	83	7.2
02/14/05	11.1	6.5	146	8.6
03/14/05	12	6.9	122	10.1
04/18/05	10	6.4	91	15.3
05/12/05	7.5	7.4	152	23.7
06/14/05	5.6	6.2	115	26.4
07/07/05	7.3	6.6	161	30.4
08/04/05	5.2	6.8	129	28.8
10/17/05	7.6	7	220	19.5
11/29/05	10.4	6.3	219	15
12/15/05	11.4	6.6	117	6.8
01/19/06	11.1	6.7	137	8.5
02/16/06	11.6	6.9	144	10.2
03/16/06	9.9	6.7	157	14.3
04/25/06	7.5	6.3	165	20.4
05/17/06	7.3	5.9	149	20.9
06/07/06	6.9	6.5	175	23.6
07/26/06	5.8	6.2	134	28.1
08/15/06	6.9	7	151	28.4
09/27/06	7.4	6.3	174	23.3
10/23/06	7.6	7.2	174	18.1
11/14/06	8.7	6.4	135	14
12/13/06	N/A	N/A	114	9.7

Notes:
a) value is not verified and suspected to be incorrect

μS/cm = microSiemens per centimeter
C = Celsius
mg/L = milligrams per liter
N/A = not available

Source: Reference 2.3-052

Table 2.3-33 (Sheet 1 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

	Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
Sample Date / Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
07/24/68	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/15/68	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/27/68	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/17/69	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/22/69	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/20/70	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/16/70	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
03/29/71	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/06/71	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/11/71	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/16/71	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
01/11/72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
02/10/72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
03/13/72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
04/10/72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
05/30/72	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
07/27/72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
08/10/72	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
09/28/72	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.6	N/A	N/A	N/A	N/A
10/05/72	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.5	N/A	N/A	N/A	N/A
10/09/72	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.4	N/A	N/A	N/A	N/A
10/18/72	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
10/26/72	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.1	N/A	N/A	N/A	N/A
11/15/72	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/16/72	N/A	N/A	ND	N/A	ND	N/A	N/A	ND	N/A	N/A	ND	N/A	N/A	N/A	1000
11/20/72	0	N/A	ND	N/A	ND	N/A	N/A	ND	N/A	N/A	ND	N/A	N/A	N/A	910
11/28/72	0	N/A	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	N/A	N/A	N/A	980

Table 2.3-33 (Sheet 2 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
12/06/72		0	N/A	ND	N/A	ND	N/A	N/A	ND	N/A	N/A	ND	N/A	N/A	N/A	900
12/13/72		0	N/A	ND	N/A	ND	ND	N/A	ND	N/A	N/A	3.3	N/A	N/A	N/A	870
07/30/73		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
11/28/73		65	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/08/74		0	20	ND	N/A	ND	ND	950	N/A	N/A	120	ND	N/A	N/A	N/A	ND
02/27/74		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/21/74		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04/23/74		0	10	ND	N/A	ND	ND	800	ND	N/A	130	ND	N/A	N/A	N/A	ND
05/30/74		N/A	40	ND	N/A	ND	ND	1400	ND	N/A	120	ND	N/A	N/A	N/A	ND
06/12/74		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/25/74		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/10/74		N/A	40	ND	N/A	N/A	ND	11000	ND	N/A	360	0.5	N/A	N/A	N/A	ND
07/07/75		N/A	30	N/A	N/A	ND	ND	460	ND	N/A	N/A	N/A	ND	N/A	N/A	ND
10/02/75		N/A	30	N/A	N/A	ND	ND	2300	ND	N/A	140	0.8	N/A	N/A	N/A	ND
03/03/76		N/A	ND	ND	N/A	ND	ND	810	ND	N/A	60	ND	ND	N/A	N/A	ND
06/07/76		N/A	ND	ND	N/A	ND	ND	6100	ND	N/A	100	ND	N/A	N/A	N/A	ND
09/10/76		N/A	20	ND	N/A	ND	ND	1700	ND	N/A	100	ND	ND	N/A	N/A	ND
12/06/76		N/A	ND	ND	N/A	ND	ND	1200	ND	N/A	50	35	N/A	N/A	N/A	ND
03/03/77		0	ND	ND	N/A	ND	ND	1800	ND	N/A	60	0.8	N/A	N/A	N/A	ND
04/07/77		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/04/77		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/08/77		0	10	ND	N/A	ND	ND	500	ND	N/A	ND	0.6	N/A	N/A	N/A	ND
08/11/77		28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/14/77		0	ND	ND	N/A	ND	ND	800	ND	N/A	160	0.8	ND	N/A	N/A	ND
10/03/77		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/01/77		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/01/77		0	ND	ND	N/A	ND	ND	1000	ND	N/A	50	0.8	ND	N/A	N/A	60

Table 2.3-33 (Sheet 3 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
Sample Date	**Unit:**	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
01/13/78		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/06/78		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04/03/78		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/04/78		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/05/78		0	ND	ND	N/A	ND	100	400	ND	N/A	80	1.4	N/A	N/A	N/A	ND
07/06/78		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/01/78		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/05/78		0	ND	ND	N/A	ND	ND	1100	ND	N/A	270	ND	N/A	N/A	N/A	ND
10/02/78		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/04/78		N/A	10	ND	N/A	ND	50	1000	200	N/A	80	ND	N/A	N/A	N/A	ND
02/26/79		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/01/79		0	ND	ND	N/A	ND	ND	1200	ND	N/A	100	ND	N/A	N/A	N/A	ND
04/10/79		0	ND	ND	N/A	ND	ND	1300	ND	N/A	170	ND	N/A	N/A	N/A	ND
05/01/79		0	ND	ND	N/A	ND	ND	1400	ND	N/A	150	0.8	N/A	N/A	N/A	50
06/06/79		0	ND	ND	N/A	ND	ND	5000	ND	N/A	130	ND	N/A	N/A	N/A	60
08/01/79		N/A	ND	ND	N/A	ND	40	900	ND	N/A	150	ND	N/A	N/A	N/A	ND
09/04/79		N/A	ND	ND	N/A	ND	ND	600	ND	N/A	80	ND	N/A	N/A	N/A	ND
10/02/79		N/A	ND	ND	N/A	ND	40	1500	200	N/A	110	ND	N/A	N/A	N/A	ND
11/01/79		28	ND	ND	N/A	ND	ND	700	300	N/A	ND	ND	N/A	N/A	N/A	60
12/05/79		38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/08/80		30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/12/80		14	ND	ND	N/A	ND	ND	1300	ND	N/A	60	ND	N/A	N/A	N/A	ND
03/11/80		38	ND	ND	N/A	ND	50	1800	ND	N/A	80	0.8	N/A	N/A	N/A	ND
04/10/80		28	ND	ND	N/A	ND	ND	1200	ND	N/A	120	0.6	N/A	N/A	N/A	ND
05/06/80		42	ND	ND	N/A	ND	ND	700	ND	N/A	70	ND	N/A	N/A	N/A	ND
06/03/80		36	ND	ND	N/A	ND	ND	900	100	N/A	60	ND	N/A	N/A	N/A	ND
07/08/80		25	ND	ND	N/A	ND	ND	800	ND	N/A	80	ND	N/A	N/A	N/A	ND

Table 2.3-33 (Sheet 4 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
Sample Date	**Unit:**	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
09/03/80		N/A	ND	ND	N/A	ND	ND	ND	ND	N/A	ND	ND	N/A	N/A	N/A	110
10/08/80		41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/04/80		47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/11/80		29	ND	ND	N/A	ND	ND	600	ND	N/A	ND	N/A	N/A	N/A	N/A	ND
01/29/81		33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/03/81		38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/16/81		37	ND	ND	N/A	ND	ND	1600	ND	N/A	300	ND	ND	N/A	N/A	ND
04/08/81		33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/12/81		59	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/03/81		N/A	ND	ND	N/A	ND	ND	800	ND	N/A	90	1.1	N/A	N/A	N/A	ND
08/26/81		19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/16/81		N/A	ND	ND	N/A	ND	ND	900	ND	N/A	60	N/A	N/A	N/A	N/A	ND
10/13/81		24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/28/81		N/A	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
03/11/82		N/A	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/06/82		24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/09/82		41	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	0.3	ND	N/A	N/A	ND
07/27/82		17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/24/82		13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/08/82		29	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	N/A	ND	N/A	N/A	ND
10/07/82		26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/03/82		23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/02/82		35	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	0.2	ND	N/A	N/A	ND
01/05/83		6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/07/83		18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/08/83		12	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/12/83		22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 2.3-33 (Sheet 5 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
05/05/83		18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/02/83		13	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/05/83		28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/02/83		33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/01/83		44	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
11/03/83		36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/14/83		13	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	50
01/10/84		8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/01/84		12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/14/84		7	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/18/84		13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/24/84		22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/18/84		12	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/24/84		9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/14/84		13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/12/84		15	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/16/84		40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/14/84		40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/06/84		29	ND	ND	N/A	ND	ND	800	ND	N/A	N/A	ND	ND	N/A	N/A	ND
01/16/85		26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/06/85		13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/11/85		23	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	0.5	ND	N/A	N/A	40
04/18/85		33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/21/85		28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/10/85		30	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	50
07/09/85		29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/13/85		27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 2.3-33 (Sheet 6 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

	Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
Sample Date / **Unit:**	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
09/16/85	29	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/09/85	31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/07/85	20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/09/85	25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/20/86	32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/24/86	31	N/A	ND	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	11	N/A	N/A	N/A
03/04/86	30	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/03/86	26	N/A	ND	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	ND	N/A	N/A	N/A
05/07/86	35	N/A	ND	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	ND	N/A	N/A	N/A
06/18/86	39	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/30/86	38	N/A	ND	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	ND	N/A	N/A	N/A
08/26/86	17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/26/86	N/A	N/A	ND	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	ND	N/A	N/A	N/A
09/04/86	30	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/29/86	44	N/A	ND	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	ND	N/A	N/A	N/A
12/03/86	42	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
01/28/87	20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/26/87	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/26/87	19	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/28/87	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/22/87	22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/23/87	33	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/30/87	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/24/87	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/16/87	26	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	24
10/26/87	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/17/87	45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 2.3-33 (Sheet 7 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
Sample Date	**Unit:**	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
12/08/87		36	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
01/19/88		21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/25/88		27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/23/88		28	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/21/88		23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/26/88		35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/07/88		40	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/28/88		24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/08/88		0, 25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/19/88		0, 34	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/18/88		0, 39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/29/88		0, 31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/06/88		0, 28	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
01/09/89		0, 35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/16/89		0, 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/16/89		0, 28	ND	ND	N/A	ND	4	1300	ND	N/A	95	ND	ND	N/A	N/A	ND
04/27/89		0, 24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/30/89		0, 23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/20/89		0, 31	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/18/89		0, 15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/14/89		0, 26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/06/89		0, 28	ND	ND	N/A	ND	7	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/11/89		0, 25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/27/89		0, 27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/28/89		0, 24	ND	ND	N/A	ND	2	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
01/24/90		0, 24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/15/90		0, 26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 2.3-33 (Sheet 8 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
03/14/90		0, 25	ND	ND	N/A	ND	3	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/04/90		0, 24	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/08/90		0, 25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/20/90		0, 28	ND	ND	N/A	ND	6	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/11/90		0, 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/16/90		0, 41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/12/90		0, 43	ND	ND	N/A	ND	5	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/17/90		0, 25	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/15/90		0, 33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/13/90		0, 26	ND	ND	N/A	ND	5	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
01/31/91		0, 19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04/16/91		0, 22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/16/91		0, 28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/06/91		0, 36	ND	ND	N/A	ND	5	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/22/91		0, 32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/19/91		0, 34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/09/91		0, 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/06/91		0, 47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/04/91		50	ND	ND	N/A	ND	9	N/A	ND	N/A	N/A	ND	11	N/A	N/A	29
01/23/92		0, 27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/20/92		0, 33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/18/92		0, 28	ND	ND	N/A	ND	6	1400	ND	N/A	79	ND	ND	N/A	N/A	ND
04/14/92		0, 29	ND	ND	N/A	ND	4	630	ND	N/A	50	ND	ND	N/A	N/A	ND
05/12/92		0, 26	ND	ND	N/A	ND	4	1100	ND	N/A	74	ND	ND	N/A	N/A	ND
06/03/92		0, 35	ND	ND	N/A	ND	3	550	ND	N/A	62	ND	ND	N/A	N/A	ND
07/21/92		0, 38	ND	ND	N/A	ND	4	300	ND	N/A	76	ND	ND	N/A	N/A	ND
08/11/92		0, 35	ND	ND	N/A	ND	5	460	ND	N/A	80	ND	ND	N/A	N/A	ND

Table 2.3-33 (Sheet 9 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
09/23/92		0, 36	ND	ND	N/A	ND	4	580	ND	N/A	100	ND	ND	N/A	N/A	ND
10/13/92		30	ND	ND	N/A	ND	8	400	ND	N/A	41	ND	ND	N/A	N/A	ND
11/17/92		0, 26	ND	ND	N/A	ND	7	1900	ND	N/A	130	ND	ND	N/A	N/A	ND
12/02/92		0, 22	ND	ND	N/A	ND	8	1400	ND	N/A	98	ND	ND	N/A	N/A	ND
01/20/93		0, 18	ND	ND	N/A	ND	4	1400	ND	N/A	62	ND	ND	N/A	N/A	ND
02/10/93		0, 19	ND	ND	N/A	ND	3	890	ND	N/A	48	ND	ND	N/A	N/A	ND
04/12/93		0, 9	ND	ND	N/A	ND	6	3100	ND	N/A	82	ND	ND	N/A	N/A	ND
05/18/93		0, 19	ND	ND	N/A	ND	5	1300	ND	N/A	99	ND	ND	N/A	N/A	ND
06/15/93		0, 27	ND	ND	N/A	ND	7	550	ND	N/A	64	ND	ND	N/A	N/A	ND
07/29/93		0, 31	ND	ND	N/A	ND	6	630	ND	N/A	110	ND	ND	N/A	N/A	ND
08/30/93		0, 35	ND	ND	N/A	ND	5	720	ND	N/A	60	ND	ND	N/A	N/A	ND
09/16/93		0, 38	ND	ND	N/A	ND	5	360	ND	N/A	93	ND	ND	N/A	N/A	ND
11/01/93		0, 36	ND	ND	N/A	ND	4	260	ND	N/A	36	ND	ND	N/A	N/A	ND
11/18/93		N/A	ND	2	N/A	ND	ND	750	ND	N/A	170	ND	ND	N/A	N/A	ND
02/24/94		N/A	ND	ND	N/A	ND	4	1600	ND	N/A	91	ND	ND	N/A	N/A	ND
04/07/94		N/A	ND	ND	N/A	ND	14	1500	ND	N/A	98	ND	ND	N/A	N/A	160
05/11/94		N/A	ND	ND	N/A	ND	6	1600	ND	N/A	160	ND	ND	N/A	N/A	11
06/14/94		N/A	ND	ND	N/A	ND	9	1300	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/28/94		N/A	ND	ND	N/A	ND	5	260	ND	N/A	260	ND	ND	N/A	N/A	19
08/03/94		N/A	ND	ND	N/A	ND	11	1000	ND	N/A	120	ND	ND	N/A	N/A	ND
09/19/94		N/A	ND	ND	N/A	ND	5	290	ND	N/A	38	ND	ND	N/A	N/A	ND
10/11/94		N/A	ND	ND	N/A	ND	4	210	ND	N/A	33	ND	ND	N/A	N/A	ND
11/17/94		N/A	ND	ND	N/A	ND	3	540	ND	N/A	62	ND	ND	N/A	N/A	ND
12/15/94		N/A	ND	ND	N/A	ND	6	550	ND	N/A	42	ND	ND	N/A	N/A	ND
01/26/95		N/A	ND	ND	N/A	ND	9	1100	ND	N/A	68	ND	ND	N/A	N/A	ND
02/02/95		N/A	ND	ND	N/A	ND	18	720	ND	N/A	56	ND	ND	N/A	N/A	ND
03/22/95		N/A	ND	ND	N/A	ND	4	560	ND	N/A	N/A	ND	ND	N/A	N/A	ND

Table 2.3-33 (Sheet 10 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
Sample Date	**Unit:**	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
04/13/95		N/A	ND	ND	N/A	ND	5	850	ND	N/A	100	ND	ND	N/A	N/A	19
05/03/95		N/A	ND	ND	N/A	ND	11	1200	ND	N/A	120	ND	ND	N/A	N/A	ND
06/23/95		N/A	ND	ND	N/A	ND	21	1200	ND	N/A	140	ND	ND	N/A	N/A	16
07/17/95		N/A	ND	ND	N/A	ND	9	890	ND	N/A	120	ND	ND	N/A	N/A	44
08/17/95		N/A	ND	ND	N/A	ND	3	650	ND	N/A	93	ND	ND	N/A	N/A	140
09/19/95		N/A	ND	ND	N/A	ND	5	510	ND	N/A	95	ND	ND	N/A	N/A	24
10/18/95		N/A	ND	ND	N/A	ND	5	1100	ND	N/A	87	ND	ND	N/A	N/A	21
11/16/95		N/A	ND	ND	N/A	ND	5	2100	ND	N/A	110	ND	ND	N/A	N/A	22
12/13/95		N/A	ND	ND	N/A	ND	5	1400	ND	N/A	67	ND	ND	N/A	N/A	17
02/26/96		N/A	ND	ND	N/A	ND	6	730	ND	N/A	79	ND	ND	N/A	N/A	19
03/14/96		N/A	ND	ND	N/A	ND	6	850	ND	N/A	71	ND	ND	N/A	N/A	18
05/08/96		N/A	ND	ND	N/A	ND	5	360	ND	N/A	67	ND	ND	N/A	N/A	25
06/04/96		N/A	ND	ND	N/A	ND	4	670	ND	N/A	110	ND	ND	N/A	N/A	13
07/26/96		N/A	ND	ND	N/A	ND	8	1300	ND	N/A	170	ND	ND	N/A	N/A	21
08/23/96		N/A	ND	ND	N/A	ND	5	1200	ND	N/A	200	ND	ND	N/A	N/A	15
09/17/96		N/A	ND	ND	N/A	ND	5	1900	ND	N/A	180	ND	ND	N/A	N/A	21
10/11/96		N/A	ND	ND	N/A	ND	6	2400	ND	N/A	130	ND	ND	N/A	N/A	14
11/15/96		N/A	ND	ND	N/A	ND	11	640	ND	N/A	74	ND	ND	N/A	N/A	40
12/13/96		N/A	ND	ND	N/A	ND	3	850	ND	N/A	74	ND	ND	N/A	N/A	20
01/17/97		N/A	ND	ND	N/A	ND	12	1700	ND	N/A	130	ND	ND	N/A	N/A	18
02/10/97		N/A	ND	ND	N/A	ND	11	590	ND	N/A	63	ND	ND	N/A	N/A	31
03/03/97		N/A	ND	ND	N/A	ND	3	600	ND	N/A	51	ND	ND	N/A	N/A	16
04/03/97		N/A	ND	ND	N/A	ND	3	1200	ND	N/A	95	ND	ND	N/A	N/A	26
05/06/97		N/A	ND	ND	N/A	ND	4	920	ND	N/A	110	ND	ND	N/A	N/A	14
06/11/97		N/A	ND	ND	N/A	ND	ND	490	ND	N/A	90	ND	ND	N/A	N/A	13
08/14/97		N/A	ND	ND	N/A	ND	8.2	680	ND	N/A	140	ND	ND	N/A	N/A	64
09/15/97		N/A	ND	ND	N/A	ND	5.1	540	ND	N/A	130	ND	ND	N/A	N/A	55

Table 2.3-33 (Sheet 11 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
10/07/97		N/A	ND	ND	N/A	ND	4.8	610	ND	N/A	100	ND	ND	N/A	N/A	25
11/06/97		N/A	ND	ND	N/A	ND	12	450	ND	N/A	79	ND	ND	N/A	N/A	41
12/02/97		N/A	ND	ND	N/A	ND	15	920	ND	N/A	82	ND	ND	N/A	N/A	52
01/07/98		N/A	ND	ND	N/A	ND	3.4	1200	ND	N/A	64	ND	ND	N/A	N/A	ND
02/13/98		N/A	ND	ND	N/A	ND	4.7	1700	ND	N/A	83	ND	ND	N/A	N/A	27
03/04/98		N/A	ND	ND	N/A	ND	2.1	1500	ND	N/A	110	ND	ND	N/A	N/A	11
04/07/98		N/A	ND	ND	N/A	ND	4.5	1500	ND	N/A	110	ND	ND	N/A	N/A	10
05/04/98		N/A	ND	ND	N/A	ND	5	1500	ND	N/A	110	ND	ND	N/A	N/A	13
06/19/98		N/A	ND	ND	N/A	ND	5	800	ND	N/A	110	ND	ND	N/A	N/A	78
07/15/98		N/A	ND	ND	N/A	ND	6.3	470	ND	N/A	110	ND	ND	N/A	N/A	12
08/11/98		N/A	ND	ND	N/A	ND	4.2	1200	ND	N/A	120	ND	ND	N/A	N/A	20
09/14/98		N/A	ND	ND	N/A	ND	6.9	540	ND	N/A	110	ND	ND	N/A	N/A	33
10/13/98		N/A	ND	ND	N/A	ND	7.4	540	ND	N/A	95	ND	ND	N/A	N/A	ND
11/09/98		N/A	ND	ND	N/A	ND	8.7	200	ND	N/A	50	ND	ND	N/A	N/A	13
12/01/98		N/A	ND	ND	N/A	ND	5.6	210	ND	N/A	51	ND	ND	N/A	N/A	ND
01/12/99		N/A	ND	ND	N/A	ND	5.5	2200	ND	N/A	68	ND	ND	N/A	N/A	10
02/17/99		N/A	ND	ND	N/A	ND	3.1	1100	ND	N/A	82	ND	ND	N/A	N/A	ND
03/22/99		N/A	ND	ND	N/A	ND	5.9	3900	ND	N/A	130	ND	ND	N/A	N/A	16
04/21/99		N/A	ND	ND	N/A	ND	4.6	500	ND	N/A	76	ND	ND	N/A	N/A	ND
05/18/99		N/A	ND	ND	N/A	ND	3.2	1200	ND	N/A	84	ND	ND	N/A	N/A	ND
06/03/99		N/A	ND	ND	N/A	ND	5.3	410	ND	N/A	91	ND	ND	N/A	N/A	ND
09/08/99		N/A	ND	ND	N/A	ND	9.2	570	ND	N/A	100	ND	ND	N/A	N/A	ND
09/28/99		N/A	ND	ND	N/A	ND	2.7	700	ND	N/A	130	ND	ND	N/A	N/A	ND
10/18/99		N/A	ND	ND	N/A	ND	ND	2000	ND	N/A	190	ND	ND	N/A	N/A	ND
11/08/99		N/A	ND	ND	N/A	ND	5.6	850	ND	N/A	73	ND	ND	N/A	N/A	ND
12/01/99		N/A	ND	ND	N/A	ND	3.9	1000	ND	N/A	66	ND	ND	N/A	N/A	ND
01/20/00		N/A	ND	ND	N/A	ND	9.5	1300	ND	N/A	71	ND	ND	N/A	N/A	18

Table 2.3-33 (Sheet 12 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
02/02/00		N/A	ND	ND	N/A	ND	3.9	2000	ND	N/A	91	ND	ND	N/A	N/A	19
03/02/00		N/A	ND	ND	N/A	ND	8.8	1100	ND	N/A	80	ND	ND	N/A	N/A	12
04/03/00		N/A	ND	ND	N/A	ND	5.3	1000	ND	N/A	120	ND	ND	N/A	N/A	ND
05/02/00		N/A	ND	ND	N/A	ND	2.2	1700	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/06/00		N/A	ND	ND	N/A	ND	3.7	790	ND	N/A	160	ND	ND	N/A	N/A	ND
07/06/00		N/A	ND	ND	N/A	ND	6.1	600	ND	N/A	150	ND	ND	N/A	N/A	ND
08/08/00		N/A	ND	ND	N/A	ND	5.3	1200	ND	N/A	150	ND	ND	N/A	N/A	ND
11/08/00		N/A	ND	ND	N/A	ND	3.8	230	ND	N/A	55	ND	ND	N/A	N/A	ND
02/06/01		N/A	ND	ND	N/A	ND	5	880	ND	N/A	71	ND	ND	N/A	N/A	11
05/02/01		N/A	ND	ND	N/A	ND	4.4	570	ND	N/A	66	ND	ND	N/A	N/A	ND
08/02/01		N/A	ND	ND	N/A	ND	3.7	630	ND	N/A	110	ND	ND	N/A	N/A	ND
11/01/01		N/A	ND	ND	N/A	ND	4.3	210	ND	N/A	73	ND	ND	N/A	N/A	ND
02/05/02		N/A	ND	ND	N/A	ND	4	1100	ND	N/A	84	ND	ND	N/A	N/A	ND
05/02/02		N/A	ND	ND	N/A	ND	6.1	380	ND	N/A	100	ND	ND	N/A	N/A	ND
08/01/02		N/A	ND	ND	N/A	ND	6.9	2800	ND	N/A	200	ND	ND	N/A	N/A	12
11/18/02		N/A	ND	ND	N/A	ND	7	1900	ND	N/A	230	ND	ND	N/A	N/A	19
02/12/03		N/A	ND	ND	N/A	ND	5.3	1500	ND	N/A	93	ND	ND	N/A	N/A	ND
05/01/03		N/A	ND	ND	N/A	ND	4.2	1200	ND	N/A	110	ND	ND	N/A	N/A	ND
08/18/04		N/A	ND	ND	N/A	ND	3.8	1900	ND	N/A	420	ND	ND	N/A	N/A	ND
11/29/04		N/A	ND	ND	N/A	ND	5.4	1300	ND	N/A	110	ND	ND	N/A	N/A	ND
02/14/05		N/A	ND	ND	N/A	ND	2.9	730	ND	N/A	76	ND	ND	N/A	N/A	ND
05/12/05		N/A	ND	ND	N/A	ND	3	560	ND	N/A	72	ND	ND	N/A	N/A	ND
08/04/05		N/A	ND	ND	N/A	ND	4.1	1200	ND	N/A	130	ND	ND	N/A	N/A	ND
11/29/05		N/A	ND	ND	N/A	ND	4.5	970	ND	N/A	120	ND	ND	N/A	N/A	17

Table 2.3-33 (Sheet 13 of 13)
Summary of Metals Analyses from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
02/16/06		N/A	ND	ND	N/A	ND	3.3	710	ND	N/A	70	ND	ND	N/A	N/A	11
05/17/06		N/A	ND	ND	N/A	ND	4.1	1500	ND	N/A	130	ND	ND	N/A	N/A	14
08/15/06		N/A	ND	ND	N/A	ND	3.5	850	ND	N/A	100	ND	ND	N/A	N/A	ND
11/14/06		N/A	ND	ND	N/A	ND	3.5	890	ND	N/A	110	ND	ND	N/A	N/A	16

Notes:

mg/L = milligrams per liter
N/A = not available
ND = no data

Source: Reference 2.3-052

Table 2.3-34 (Sheet 1 of 6)
Water Chemistry Data from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
09/28/72		N/A	0.05	0.5	0.97	0.55	N/A	N/A
01/08/74		N/A	0.22	0.5	0.54	0.23	N/A	N/A
04/23/74		N/A	ND	0.3	0.62	0.23	N/A	0.11
05/30/74		N/A	N/A	0.4	0.81	0.31	N/A	N/A
12/10/74		N/A	N/A	N/A	0.55	0.49	N/A	N/A
07/07/75		N/A	0.07	0.5	0.23	0.4	N/A	0.32
10/02/75		N/A	ND	0.6	0.24	0.16	N/A	0.1
03/03/76		N/A	ND	0.3	0.66	0.2	N/A	N/A
06/07/76		N/A	0.14	0.6	1.3	0.37	N/A	N/A
09/10/76		N/A	ND	0.7	ND	0.44	0.34	N/A
12/06/76		N/A	0.28	0.7	0.89	0.36	N/A	N/A
01/06/77		N/A	0.2	0.5	0.74	0.2	N/A	N/A
02/03/77		N/A	0.38	0.6	0.6	0.21	N/A	N/A
03/03/77		N/A	0.21	0.8	0.54	0.25	N/A	N/A
04/07/77		N/A	0.12	0.6	0.59	0.3	N/A	N/A
05/04/77		N/A	ND	0.4	0.85	0.23	N/A	N/A
06/08/77		N/A	0.06	0.6	1.5	0.49	N/A	N/A
09/14/77		N/A	0.22	0.8	1	0.31	N/A	N/A
12/01/77		N/A	0.14	0.5	1.4	0.45	N/A	N/A
06/05/78		N/A	ND	0.6	0.68	0.21	N/A	N/A
09/05/78		N/A	0.06	0.5	0.95	0.37	N/A	N/A
12/04/78		N/A	0.18	0.7	1.5	0.49	0.38	N/A
03/01/79		N/A	0.05	0.6	0.36	0.17	ND	N/A
04/10/79		N/A	0.06	0.5	0.44	0.15	0.05	N/A
05/01/79		N/A	0.08	0.6	0.7	0.2	0.06	N/A
06/06/79		N/A	0.05	0.9	0.56	0.32	0.07	N/A
08/01/79		N/A	0.08	0.5	1.2	0.28	0.18	N/A
09/04/79		N/A	ND	0.5	1.3	N/A	0.32	N/A
10/02/79		N/A	0.05	0.4	0.67	N/A	0.13	N/A
11/01/79		N/A	ND	0.4	0.8	N/A	0.23	N/A
02/12/80		N/A	0.17	0.5	0.58	0.17	0.08	N/A
03/11/80		N/A	0.09	0.6	0.6	0.17	0.07	N/A
04/10/80		N/A	0.05	0.3	0.67	N/A	0.07	N/A
05/06/80		N/A	ND	0.4	0.94	N/A	0.14	N/A
06/03/80		N/A	ND	0.5	1.2	N/A	0.1	N/A
07/08/80		N/A	ND	0.4	0.97	0.21	0.12	N/A
08/12/80		N/A	0.07	0.4	0.29	0.13	0.08	N/A
09/03/80		N/A	ND	0.6	0.47	0.23	0.17	N/A
10/08/80		N/A	ND	0.5	1.5	0.41	0.36	N/A
11/04/80		N/A	ND	1	1.9	0.6	0.54	N/A
12/11/80		N/A	ND	0.4	0.95	0.27	0.18	N/A
01/29/81		N/A	0.49	1	1.4	0.55	0.44	N/A
02/03/81		N/A	0.4	0.9	1	0.47	0.39	N/A

Table 2.3-34 (Sheet 2 of 6)
Water Chemistry Data from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
03/16/81		N/A	ND	0.4	0.99	0.3	0.11	N/A
04/08/81		N/A	0.15	0.5	0.82	0.23	0.16	N/A
05/12/81		N/A	0.06	0.6	1	0.29	0.21	N/A
06/03/81		N/A	0.16	0.6	1	0.35	0.28	N/A
07/23/81		N/A	0.06	0.5	0.76	0.27	0.18	N/A
08/26/81		N/A	ND	0.5	0.67	0.2	0.11	N/A
09/16/81		N/A	0.05	0.9	0.74	0.21	0.1	N/A
10/13/81		N/A	0.06	0.7	0.43	0.16	0.1	N/A
11/09/81		N/A	ND	0.6	0.7	0.23	0.1	N/A
12/28/81		N/A	0.27	0.8	0.53	0.24	0.1	N/A
01/26/82		N/A	0.27	0.7	0.58	0.18	0.09	N/A
02/09/82		N/A	0.16	0.6	0.55	0.18	0.05	N/A
03/11/82		N/A	0.12	0.6	0.54	0.17	0.05	N/A
04/06/82		N/A	0.05	0.5	0.46	0.21	0.05	N/A
05/04/82		N/A	0.07	0.5	0.65	0.19	0.09	N/A
06/09/82		N/A	ND	1	0.4	0.23	ND	N/A
07/27/82		N/A	0.05	0.6	0.73	0.16	0.05	N/A
08/24/82		N/A	ND	0.6	0.78	0.15	0.05	N/A
09/08/82		N/A	ND	1.7	0.75	0.13	ND	N/A
10/07/82		N/A	0.03	0.6	0.86	0.14	0.07	N/A
11/03/82		N/A	0.09	0.5	1.1	0.25	0.17	N/A
12/02/82		N/A	0.02	0.3	0.81	0.15	N/A	N/A
01/05/83		N/A	0.09	0.6	0.81	0.17	0.06	N/A
02/07/83		N/A	0.07	0.5	0.48	0.25	0.04	N/A
03/08/83		N/A	0.14	0.7	0.56	0.33	0.09	N/A
04/12/83		N/A	0.06	0.4	0.55	0.16	0.05	N/A
05/05/83		N/A	0.04	0.4	0.46	0.09	0.04	N/A
06/02/83		N/A	0.06	0.4	0.75	0.12	0.04	N/A
07/05/83		N/A	0.11	0.4	1	0.21	0.05	N/A
08/02/83		N/A	0.04	0.4	0.81	0.19	0.03	N/A
09/01/83		N/A	0.04	0.5	0.97	0.18	0.03	N/A
11/03/83		N/A	0.05	0.5	1.5	0.28	0.22	N/A
12/14/83		N/A	0.06	0.6	0.5	0.21	0.07	N/A
01/10/84		N/A	0.18	0.6	0.68	0.59	0.05	N/A
02/01/84		N/A	0.14	0.4	0.59	0.12	0.04	N/A
03/14/84		N/A	0.06	0.3	0.47	0.13	0.04	N/A
04/18/84		N/A	0.06	0.4	0.41	0.14	0.04	N/A
05/24/84		N/A	0.05	0.3	0.56	0.11	0.03	N/A
06/18/84		N/A	0.11	0.3	0.49	0.1	0.03	N/A
07/24/84		N/A	0.05	0.4	0.36	0.15	0.05	N/A
08/14/84		N/A	0.12	0.4	0.47	0.15	0.05	N/A
09/12/84		N/A	0.04	0.4	0.61	0.11	0.03	N/A
10/16/84		N/A	0.02	0.7	0.74	0.14	0.09	N/A

Table 2.3-34 (Sheet 3 of 6)
Water Chemistry Data from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
11/14/84		N/A	0.04	0.6	0.74	0.19	0.13	N/A
12/06/84		N/A	0.13	0.6	0.91	0.35	0.25	N/A
03/11/85		N/A	0.06	0.4	0.6	0.12	0.05	N/A
06/10/85		N/A	0.07	0.4	0.89	0.24	0.16	N/A
09/16/85		N/A	0.02	0.3	0.33	0.1	0.04	N/A
12/09/85		N/A	0.05	1.2	0.59	0.1	0.04	N/A
03/04/86		N/A	0.02	0.3	0.66	0.15	0.09	N/A
06/18/86		N/A	0.02	0.6	0.35	0.18	0.13	N/A
09/04/86		N/A	0.06	0.5	0.69	0.17	0.1	N/A
03/18/92		10	0.04	0.3	0.63	0.11	N/A	N/A
04/14/92		12	0.05	0.4	0.31	0.06	N/A	N/A
05/12/92		10	0.05	0.4	0.59	0.11	N/A	N/A
06/03/92		14	0.04	0.5	0.48	0.07	N/A	N/A
07/21/92		13	0.02	0.6	0.14	0.08	N/A	N/A
08/11/92		12	0.04	0.6	0.29	0.11	N/A	N/A
09/23/92		18	0.06	0.6	0.27	0.07	N/A	N/A
10/13/92		17	0.08	0.6	1	0.03	N/A	N/A
11/17/92		14	0.13	0.5	0.64	0.17	N/A	N/A
12/02/92		12	0.1	0.4	0.44	0.11	N/A	N/A
01/20/93		10	0.04	0.4	0.61	0.1	N/A	N/A
02/10/93		10	0.01	0.4	0.72	0.09	N/A	N/A
04/12/93		6	0.06	0.4	0.44	0.14	N/A	N/A
05/18/93		9	0.06	0.3	0.64	0.12	N/A	N/A
06/15/93		15	0.06	0.4	0.49	0.09	N/A	N/A
07/29/93		19	0.1	0.4	0.27	0.1	N/A	N/A
08/30/93		17	0.02	0.5	0.55	0.13	N/A	N/A
09/16/93		20	ND	0.4	0.8	0.12	N/A	N/A
11/01/93		22	0.07	0.4	0.53	0.12	N/A	N/A
11/18/93		29	0.03	0.4	0.7	0.12	N/A	N/A
02/24/94		12	0.04	1.2	0.72	0.06	N/A	N/A
03/14/94		9	0.07	0.4	0.55	0.08	N/A	N/A
04/07/94		10	0.15	0.4	0.55	0.07	N/A	N/A
05/11/94		14	0.07	0.4	0.94	0.13	N/A	N/A
06/14/94		5	0.03	0.5	0.5	0.11	N/A	N/A
07/28/94		14	0.12	0.5	0.35	0.11	N/A	N/A
08/03/94		14	0.11	0.7	0.58	0.2	N/A	N/A
09/19/94		14	0.12	0.6	0.59	0.13	N/A	N/A
10/11/94		20	0.04	0.4	0.41	0.06	N/A	N/A
11/17/94		23	0.07	0.5	0.5	0.17	N/A	N/A
12/15/94		24	0.09	0.5	1.2	0.13	N/A	N/A
01/26/95		13	0.09	0.4	0.58	0.1	N/A	N/A
02/02/95		12	0.2	0.4	0.73	0.12	N/A	N/A
03/22/95		8	0.09	0.4	0.55	0.12	N/A	N/A

Table 2.3-34 (Sheet 4 of 6)
Water Chemistry Data from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date		Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
04/13/95		14	0.04	0.3	0.33	0.08	N/A	N/A
05/03/95		17	0.05	0.5	0.53	0.14	N/A	N/A
06/23/95		9	0.1	0.4	0.6	0.19	N/A	N/A
07/17/95		6	0.06	0.4	0.55	0.13	N/A	N/A
08/17/95		16	0.02	0.5	0.42	0.09	N/A	N/A
09/19/95		12	0.06	0.3	0.56	0.09	N/A	N/A
10/18/95		8	ND	0.4	0.52	0.15	N/A	N/A
11/16/95		7	0.07	0.4	0.45	0.16	N/A	N/A
12/13/95		13	0.04	0.4	0.95	0.12	N/A	N/A
02/26/96		12	0.24	0.5	0.72	0.12	N/A	N/A
03/14/96		12	0.4	0.4	0.67	0.13	N/A	N/A
05/08/96		N/A	0.13	0.4	0.59	0.12	N/A	N/A
06/04/96		13	0.04	0.3	0.84	0.09	N/A	N/A
07/26/96		14	0.05	0.4	0.21	0.11	N/A	N/A
08/23/96		16	0.06	0.4	0.84	0.13	N/A	N/A
09/17/96		7	0.01	0.5	0.32	0.13	N/A	N/A
10/11/96		8	0.08	0.4	0.58	0.21	N/A	N/A
11/15/96		14	0.08	0.4	0.7	0.07	N/A	N/A
12/13/96		8	0.07	0.5	0.56	0.11	N/A	N/A
01/17/97		10	0.05	0.4	0.62	0.14	N/A	N/A
02/10/97		10	0.06	0.2	0.66	0.07	N/A	N/A
03/03/97		10	0.04	0.3	0.76	0.09	N/A	N/A
04/03/97		9	0.04	0.3	0.57	0.08	N/A	N/A
05/06/97		6	0.03	0.4	0.37	0.08	N/A	N/A
06/11/97		10	ND	0.4	0.66	0.07	N/A	N/A
08/14/97		11	ND	0.4	0.18	0.11	N/A	N/A
09/15/97		22	ND	0.4	0.5	0.08	N/A	N/A
10/07/97		15	ND	0.5	0.59	0.09	N/A	N/A
11/06/97		19	0.04	0.2	0.63	0.06	N/A	N/A
12/02/97		14	0.06	0.4	0.72	0.14	N/A	N/A
01/07/98		12	0.03	0.2	0.74	0.12	N/A	N/A
02/13/98		9	ND	0.5	0.44	0.07	N/A	N/A
03/04/98		8	0.1	0.2	0.49	0.09	N/A	N/A
04/07/98		7	0.04	0.2	0.38	0.1	N/A	N/A
05/04/98		8	0.01	0.2	0.57	0.09	N/A	N/A
06/19/98		15	ND	0.4	0.79	0.1	N/A	N/A
07/15/98		15	0.04	0.3	0.14	0.06	N/A	N/A
08/11/98		16	ND	0.4	0.19	0.07	N/A	N/A
09/14/98		17	ND	0.4	0.57	0.08	N/A	N/A
10/13/98		26	ND	0.5	0.66	0.1	N/A	N/A
11/09/98		23	0.05	0.3	0.45	0.07	N/A	N/A
12/01/98		25	ND	0.5	0.48	0.04	N/A	N/A
01/12/99		11	0.13	1.8	1	0.17	N/A	N/A

Table 2.3-34 (Sheet 5 of 6)
Water Chemistry Data from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
02/17/99		11.5	0.01	0.3	0.8	0.21	N/A	N/A
03/22/99		8	0.02	0.4	0.5	0.26	N/A	N/A
04/21/99		11.27	0.03	0.3	0.41	0.07	N/A	N/A
05/18/99		8	0.03	0.3	0.53	0.13	N/A	N/A
06/03/99		13.5	0.01	0.4	0.35	0.09	N/A	N/A
09/08/99		6.37	0.24	0.5	0.61	0.26	N/A	N/A
09/28/99		8.33	0.25	0.4	0.33	0.6	N/A	N/A
10/18/99		7.14	0.1	0.6	0.09	0.07	N/A	N/A
11/08/99		10	ND	0.4	0.47	0.14	N/A	N/A
12/01/99		14.07	0.02	0.6	0.56	0.12	N/A	N/A
01/20/00		10	0.07	0.5	0.54	0.09	N/A	N/A
02/02/00		9.54	0.49	0.5	0.71	0.22	N/A	N/A
03/02/00		9.8	0.08	0.4	0.49	0.07	N/A	N/A
04/03/00		10.29	ND	1.1	0.46	0.07	N/A	N/A
05/02/00		10	0.02	0.4	0.69	0.09	N/A	N/A
06/06/00		16	0.1	0.4	0.18	0.1	N/A	N/A
07/06/00		18	0.03	0.5	0.42	0.11	N/A	N/A
08/08/00		16	0.1	0.5	0.56	0.15	N/A	N/A
09/20/00		N/A	ND	0.4	0.63	0.23	N/A	N/A
10/02/00		N/A	0.03	0.4	0.4	0.1	N/A	N/A
11/08/00		N/A	0.09	0.4	0.16	0.1	N/A	N/A
12/13/00		N/A	0.17	0.4	0.8	0.18	N/A	N/A
01/17/01		N/A	0.05	0.7	0.88	0.15	N/A	N/A
02/06/01		N/A	ND	ND	1.3	ND	N/A	N/A
05/02/01		N/A	ND	ND	0.36	ND	N/A	N/A
06/07/01		N/A	ND	N/A	0.49	0.11	N/A	N/A
07/12/01		N/A	0.82	1.1	0.36	0.14	N/A	N/A
08/02/01		N/A	0.15	0.65	0.37	0.1	N/A	N/A
09/10/01		N/A	ND	0.55	0.34	0.12	N/A	N/A
10/04/01		N/A	ND	0.52	0.37	0.1	N/A	N/A
11/01/01		N/A	0.24	0.82	0.28	0.05	N/A	N/A
12/13/01		N/A	0.13	0.75	0.47	0.09	N/A	N/A
01/14/02		N/A	0.02	0.51	1.4	0.18	N/A	N/A
02/05/02		N/A	0.1	0.54	0.88	0.12	N/A	N/A
03/11/02		N/A	ND	0.56	0.96	0.09	N/A	N/A
04/18/02		N/A	0.03	0.58	0.5	0.11	N/A	N/A
05/02/02		N/A	0.1	0.52	0.5	0.1	N/A	N/A
06/11/02		N/A	0.04	0.46	0.06	0.04	N/A	N/A
07/22/02		N/A	0.02	0.46	0.15	0.09	N/A	N/A
08/01/02		N/A	0.05	0.57	0.3	0.11	N/A	N/A
09/04/02		N/A	0.15	0.6	1.4	0.23	N/A	N/A
10/03/02		N/A	0.02	0.52	0.37	0.11	N/A	N/A
11/18/02		N/A	0.02	0.64	0.6	0.35	N/A	N/A

Table 2.3-34 (Sheet 6 of 6)
Water Chemistry Data from DWQ Station B6370000 — Cape Fear River at US 401 at Lillington, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
12/17/02		N/A	0.06	0.44	0.5	0.17	N/A	N/A
01/14/03		N/A	0.03	0.41	0.79	0.12	N/A	N/A
02/12/03		N/A	0.12	0.56	0.68	0.14	N/A	N/A
03/13/03		N/A	0.02	0.54	0.5	0.09	N/A	N/A
04/07/03		N/A	0.05	0.43	0.45	0.12	N/A	N/A
05/01/03		N/A	0.03	0.48	0.47	0.09	N/A	N/A
06/05/03		N/A	0.03	0.49	0.49	0.13	N/A	N/A
07/10/03		N/A	0.04	0.54	0.5	0.13	N/A	N/A
03/30/04		N/A	ND	0.44	0.58	0.11	N/A	N/A
08/18/04		N/A	0.28	0.93	0.82	0.23	N/A	N/A
09/07/04		N/A	0.03	0.56	0.57	0.1	N/A	N/A
10/27/04		N/A	0.07	0.57	0.71	0.11	N/A	N/A
11/29/04		N/A	0.03	0.66	0.83	0.16	N/A	N/A
12/14/04		N/A	0.07	0.75	0.57	0.19	N/A	N/A
01/18/05		N/A	0.07	0.95	0.81	0.2	N/A	N/A
02/14/05		N/A	0.04	0.7	0.81	0.1	N/A	N/A
03/14/05		N/A	0.03	0.67	0.65	0.11	N/A	N/A
04/18/05		N/A	0.04	0.62	0.55	0.16	N/A	N/A
05/12/05		N/A	0.02	0.48	0.56	0.1	N/A	N/A
06/14/05		N/A	0.04	0.73	0.68	0.16	N/A	N/A
07/07/05		N/A	ND	0.77	0.03	0.11	N/A	N/A
08/04/05		N/A	0.05	0.61	0.51	0.14	N/A	N/A
10/17/05		N/A	ND	0.69	0.75	0.14	N/A	N/A
11/29/05		N/A	0.04	0.56	0.93	0.15	N/A	N/A
12/15/05		N/A	0.11	0.5	0.79	0.17	N/A	N/A
01/19/06		N/A	0.04	0.45	0.82	0.09	N/A	N/A
02/16/06		N/A	ND	0.38	0.65	0.08	N/A	N/A
03/16/06		N/A	ND	0.54	0.49	0.07	N/A	N/A
04/25/06		N/A	0.14	0.68	0.72	0.16	N/A	N/A
05/17/06		N/A	0.02	0.69	0.75	0.15	N/A	N/A
06/07/06		N/A	0.02	0.48	0.44	0.08	N/A	N/A
07/26/06		N/A	0.02	0.51	0.39	0.12	N/A	N/A
08/15/06		N/A	ND	0.56	0.61	0.12	N/A	N/A
09/27/06		N/A	ND	0.56	0.41	0.07	N/A	N/A
10/23/06		N/A	0.04	0.63	0.64	0.11	N/A	N/A
11/14/06		N/A	0.05	0.83	0.58	0.16	N/A	N/A
12/13/06		N/A	0.03	0.61	0.79	0.09	N/A	N/A

Notes:

mg/L = milligrams per liter
N/A = not available
ND = no data

Source: Reference 2.3-052

Table 2.3-35 (Sheet 1 of 8)
Summary of Water Chemistry Data from Buckhorn Creek and Cape Fear River from 1978 – 1983

Parameter		Buckhorn Creek (Station BK2)	Cape Fear River (Station D2)
Temperature (degrees C)			
	Number of Events	71	71
	MAX	30	31
	MIN	1.3	2.9
NC Water Quality Standard — See note [a]	Mean	16.4	17.5
pH			
	Number of Events	68	67
	MAX	8.6	8.6
	MIN	6	5.4
NC Water Quality Standard – 6.0-9.0 standard units	Mean	N/A	N/A
Dissolved Oxygen (mg/L)			
	Number of Events	69	69
	MAX	13	13.8
	MIN	4.3	3.3
NC Water Quality Standard – 5.0 mg/L	Mean	8.6	9.1
Specific Conductance (µS/cm)			
	Number of Events	54	53
	MAX	180	370
	MIN	0	12
NC Water Quality Standard – N/A	Mean	60.6	146.3
Secchi Disk Transparency Depth (m)			
	Number of Events	35	32
	MAX	1	0.8
	MIN	<0.1	<0.1
NC Water Quality Standard – N/A	Mean	0.3	0.5
Total Alkalinity (as CaCO3) (mg/L)			
	Number of Events	70	71
	MAX	39	65
	MIN	2.7	5
NC Water Quality Standard – N/A	Mean	17.8	25.3
Chloride (mg/L)			
	Number of Events	29	29
	MAX	11.3	23.4
	MIN	3	3.2
NC Water Quality Standard – 230 mg/L	Mean	5.4	9.0
Conductivity (µmho/cm)			
	Number of Events	71	71
	MAX	105	335
	MIN	35.5	20
NC Water Quality Standard – N/A	Mean	68.1	127.6
Hardness (calc. as CaCO3) (mg/L)			
	Number of Events	71	70
	MAX	35.5	42
	MIN	<2	9

Table 2.3-35 (Sheet 2 of 8)
Summary of Water Chemistry Data from Buckhorn Creek and Cape Fear River from 1978 – 1983

Parameter		Buckhorn Creek (Station BK2)	Cape Fear River (Station D2)
NC Water Quality Standard – 100 mg/L	Mean	20.5	28.7
Ammonia (mg/L)			
	Number of Events	53	53
	MAX	1.3	0.62
	MIN	<0.02	0.02
NC Water Quality Standard – N/A	Mean	0.07	0.1
Total Nitrogen (mg/L)			
	Number of Events	71	71
	MAX	3.41	3.7
	MIN	<0.01	0.07
NC Water Quality Standard – N/A	Mean	0.3	0.7
Nitrate (mg/L)			
	Number of Events	63	65
	MAX	0.46	1.9
	MIN	<0.01	<0.05
NC Water Quality Standard – 10 mg/L	Mean	0.1	0.6
Total Organic Compounds (TOC)			
	Number of Events	68	69
	MAX	13	20.3
	MIN	<0.02	2.6
NC Water Quality Standard – N/A	Mean	5.6	7.8
Chemical Oxygen Demand (COD) (mg/L)			
	Number of Events	29	29
	MAX	68.4	68.4
	MIN	4.3	3.9
NC Water Quality Standard – N/A	Mean	19.7	20.7
Dissolved Organic Carbon (mg/L)			
	Number of Events	10	8
	MAX	12	9.3
	MIN	3.1	6
NC Water Quality Standard – N/A	Mean	6.5	7.4
Total Phosphate (mg/L)			
	Number of Events	12	22
	MAX	0.07	0.36
	MIN	0.01	0.09
NC Water Quality Standard – N/A	Mean	0.02	0.2
Total Phosphorus (mg/L)			
	Number of Events	58	47
	MAX	0.13	1.12
	MIN	<0.01	<0.01
NC Water Quality Standard – N/A	Mean	0.03	0.3
Total Dissolved Phosphate (mg/L)			
	Number of Events	12	10
	MAX	0.04	0.142

Table 2.3-35 (Sheet 3 of 8)
Summary of Water Chemistry Data from Buckhorn Creek and Cape Fear River from 1978 – 1983

Parameter		Buckhorn Creek (Station BK2)	Cape Fear River (Station D2)
	MIN	0.001	0.01
NC Water Quality Standard – N/A	Mean	0.01	0.08
Dissolved Molybdate Reactive Phosphate (mg/L)			
	Number of Events	12	10
	MAX	0.035	0.2
	MIN	<0.002	0.019
NC Water Quality Standard – N/A	Mean	0.0	0.08
Total Orthophosphate (as P) (mg/L)			
	Number of Events	57	59
	MAX	0.1	0.71
	MIN	<0.01	<0.01
NC Water Quality Standard – N/A	Mean	0.01	0.16
Dissolved Silica (as $Si0_2$) (mg/L)			
	Number of Events	29	29
	MAX	20	20
	MIN	3.1	<1
NC Water Quality Standard – N/A	Mean	9.1	7.9
Total Dissolved Solids (TDS) at 180 degrees C (mg/L)			
	Number of Events	35	35
	MAX	3941	345
	MIN	70	106
NC Water Quality Standard – 500 mg/L	Mean	376.3	193.9
Total Volatile Solids at 550 degrees C (mg/L)			
	Number of Events	29	29
	MAX	701	188
	MIN	33	46
NC Water Quality Standard – N/A	Mean	136.3	116.2
Total Solids at 103 degrees C (mg/L)			
	Number of Events	24	24
	MAX	140	390
	MIN	58	79
NC Water Quality Standard – N/A	Mean	80.8	139.7
Total Solids at 130 degrees C (mg/L)			
	Number of Events	11	12
	MAX	94	171
	MIN	40	109
NC Water Quality Standard – N/A	Mean	72.5	137.3
Total Suspended Solids at 103 degrees C (mg/L)			
	Number of Events	71	71
	MAX	1928	260
	MIN	<1	3
NC Water Quality Standard – N/A	Mean	88.7	31.8

Table 2.3-35 (Sheet 4 of 8) Summary of Water Chemistry Data from Buckhorn Creek and Cape Fear River from 1978 – 1983

Parameter		Buckhorn Creek (Station BK2)	Cape Fear River (Station D2)
Total Dissolved Solids at 103 degrees C (mg/L)			
	Number of Events	12	12
	MAX	92	135
	MIN	8	51
NC Water Quality Standard – 500 mg/L	Mean	53.3	98.0
Total Dissolved Solids at 180 degrees C (mg/L)			
	Number of Events	38	29
	MAX	316	235
	MIN	22	66
NC Water Quality Standard – 500 mg/L	Mean	115.7	137.7
Total Dissolved Solids at 180 degrees C (.45 micron filter) (mg/L)			
	Number of Events	29	38
	MAX	287	231
	MIN	36	40
NC Water Quality Standard – 500 mg/L	Mean	123.8	127.0
Sulfate (mg/L)			
	Number of Events	69	70
	MAX	56	31
	MIN	<1	4.1
NC Water Quality Standard – 250 mg/L	Mean	5.6	12.3
Chloride (mg/L)			
	Number of Events	11	11
	MAX	5.6	21
	MIN	3.6	3.8
NC Water Quality Standard – 230 mg/L	Mean	4.6	9.8
Turbidity (NTU)			
	Number of Events	71	71
	MAX	350	271
	MIN	3.3	2.5
NC Water Quality Standard – 50, 25	Mean	36.5	37.0
Total Arsenic (mg/L)			
	Number of Events	47	59
	MAX	0.02	0.01
	MIN	<0.0001	<0.001
NC Water Quality Standard – 0.01	Mean	0.01	0.006
Dissolved Arsenic (mg/L)			
	Number of Events	17	11
	MAX	0.01	0.001
	MIN	<0.001	<0.001
NC Water Quality Standard – 0.01	Mean	0.01	0.001

**Table 2.3-35 (Sheet 5 of 8)
Summary of Water Chemistry Data from Buckhorn Creek and Cape Fear River from 1978 – 1983**

Parameter		Buckhorn Creek (Station BK2)	Cape Fear River (Station D2)
Total Cadmium (mg/L)			
	Number of Events	36	36
	MAX	0.01	0.01
	MIN	<0.001	<0.001
NC Water Quality Standard – 0.2	Mean	0.004	0.004
Total Chromium (mg/L)			
	Number of Events	30	30
	MAX	0.05	0.05
	MIN	<0.005	<0.005
NC Water Quality Standard – 0.5	Mean	0.03	0.003
Total Hexavalent Chromium (mg/L)			
	Number of Events	29	29
	MAX	0.05	0.05
	MIN	<0.05	<0.05
NC Water Quality Standard – 0.5	Mean	0.05	0.05
Total Mercury (µg/L)			
	Number of Events	59	59
	MAX	0.002	0.003
	MIN	0.0001	<0.0001
NC Water Quality Standard – 0.012	Mean	0.0005	0.0005
Total Aluminum (mg/L)			
	Number of Events	59	59
	MAX	46.1	9.3
	MIN	0.04	0.09
NC Water Quality Standard – N/A	Mean	2.5	0.9
Dissolved Aluminum (mg/L)			
	Number of Events	12	12
	MAX	0.09	0.24
	MIN	0.01	<0.01
NC Water Quality Standard – N/A	Mean	0.05	0.08
Total Calcium (mg/L)			
	Number of Events	59	59
	MAX	8.48	12.4
	MIN	<0.001	2
NC Water Quality Standard – N/A	Mean	4.5	6.6
Dissolved Calcium (mg/L)			
	Number of Events	12	11
	MAX	5.1	9.2
	MIN	3.4	3
NC Water Quality Standard – N/A	Mean	4.2	5.9

Table 2.3-35 (Sheet 6 of 8) Summary of Water Chemistry Data from Buckhorn Creek and Cape Fear River from 1978 – 1983

Parameter		Buckhorn Creek (Station BK2)	Cape Fear River (Station D2)
Total Copper (mg/L)			
	Number of Events	59	59
	MAX	0.06	0.05
	MIN	<0.001	0.002
NC Water Quality Standard – 0.007	Mean	0.03	0.03
Dissolved Copper (mg/L)			
	Number of Events	9	10
	MAX	0.006	0.01
	MIN	<0.001	0.001
NC Water Quality Standard – 0.007	Mean	0.003	0.005
Total Iron (mg/L)			
	Number of Events	59	59
	MAX	93.5	7.33
	MIN	0.005	0.26
NC Water Quality Standard – 1.0	Mean	4.0	1.4
Dissolved Iron (mg/L)			
	Number of Events	35	12
	MAX	0.49	0.68
	MIN	<0.05	<0.05
NC Water Quality Standard – 1.0	Mean	0.13	0.18
Total Lead (mg/L)			
	Number of Events	11	59
	MAX	0.002	0.05
	MIN	<0.002	<0.002
NC Water Quality Standard – 0.025	Mean	0.002	0.003
Dissolved Lead (mg/L)			
	Number of Events	5	8
	MAX	0.004	0.004
	MIN	0.002	0.002
NC Water Quality Standard – N/A	Mean	0.0	0.0
Total Magnesium (mg/L)			
	Number of Events	59	59
	MAX	4.64	4.13
	MIN	0.93	1.37
NC Water Quality Standard – N/A	Mean	2.0	2.8
Dissolved Magnesium (mg/L)			
	Number of Events	12	11
	MAX	2.3	3.6
	MIN	1.4	1.4
NC Water Quality Standard – N/A	Mean	1.8	2.6
Total Manganese (mg/L)			
	Number of Events	59	59
	MAX	2	2.2
	MIN	<0.02	<0.02

Table 2.3-35 (Sheet 7 of 8)
Summary of Water Chemistry Data from Buckhorn Creek and Cape Fear River from 1978 – 1983

Parameter		Buckhorn Creek (Station BK2)	Cape Fear River (Station D2)
NC Water Quality Standard – 0.200	Mean	0.2	0.2
Dissolved Manganese (mg/L)			
	Number of Events	12	12
	MAX	0.54	1.6
	MIN	0.03	<0.02
NC Water Quality Standard – 0.200	Mean	0.2	0.2
Total Nickel (mg/L)			
	Number of Events	59	59
	MAX	0.05	0.07
	MIN	<0.01	<0.01
NC Water Quality Standard – 0.088	Mean	0.04	0.04
Dissolved Nickel (mg/L)			
	Number of Events	3	8
	MAX	0.01	0.02
	MIN	<0.01	<0.01
NC Water Quality Standard – N/A	Mean	0.01	0.01
Dissolved Potassium (mg/L)			
	Number of Events	12	12
	MAX	2.6	4.7
	MIN	1.5	0.48
NC Water Quality Standard – N/A	Mean	1.9	2.6
Total Selenium (mg/L)			
	Number of Events	59	59
	MAX	0.01	0.01
	MIN	<0.001	<0.001
NC Water Quality Standard – 0.005	Mean	0.01	0.01
Total Sodium (mg/L)			
	Number of Events	59	59
	MAX	24	44.6
	MIN	3.5	3.8
NC Water Quality Standard – N/A	Mean	6.4	14.5
Dissolved Sodium (mg/L)			
	Number of Events	12	11
	MAX	6.8	27
	MIN	4	3.4
NC Water Quality Standard – N/A	Mean	5.1	12.7
Total Zinc (mg/L)			
	Number of Events	59	59
	MAX	0.33	0.13
	MIN	<0.02	<0.02
NC Water Quality Standard – 0.050	Mean	0.04	0.04
Dissolved Zinc (mg/L)			
	Number of Events	2	3
	MAX	0.02	<0.02

**Table 2.3-35 (Sheet 8 of 8)
Summary of Water Chemistry Data from Buckhorn Creek and Cape Fear River from 1978 – 1983**

Parameter		Buckhorn Creek (Station BK2)	Cape Fear River (Station D2)
	MIN	<0.02	<0.02
NC Water Quality Standard – 0.050	Mean	0.02	<0.02

Notes:
a) Temperature: not to exceed 2.8 degrees C (5.04 degrees F) above the natural water temperature, and in no case exceed 29 degrees C (84.2 degrees F) for mountain and upper piedmont waters and 32 degrees C (86.9 degrees F) for lower piedmont and coastal waters. The temperature for trout waters shall not be increased by more than 0.5 degrees C (0.9 degrees F) due to the discharge of heated liquids, but in no case to exceed 20 degrees C (68 degrees F).

μg/L = micrograms per liter
μmho/cm = micromhos per centimeter
μS/cm = microSiemens per centimeter
C = Celsius
F = Fahrenheit
mg/L = milligrams per liter
N/A = not available

Sources: Reference 2.3-053, Reference 2.3-054, Reference 2.3-055, Reference 2.3-056, Reference 2.3-057, and Reference 2.3-058

Table 2.3-36 (Sheet 1 of 3)
Field Parameters from USGS Station 02098198 — Haw River below B. Everett Jordan Dam, Moncure, NC

Sample Date	Dissolved Oxygen (µg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
04/01/1980	10.1	6.6	87	13
06/04/1980	7.3	7	174	28
07/28/1980	6.2	6.5	129	26
10/14/1980	8.5	7.1	230	14
12/09/1980	11.3	7.6	169	8.5
02/13/1981	12.8	7.5	88	6.5
02/20/1981	12.2	7.9	132	8.5
02/21/1981	11.6	6.6	109	10.5
02/23/1981	10.3	6.4	107	11.5
05/12/1981	7.5	7.3	230	19.5
06/22/1981	6.5	6.6	144	28.5
07/06/1981	8.5	6.2	72	23
07/07/1981	6.8	6.3	86	25
07/14/1981	12	7.1	121	32
10/07/1981	5.7	7.2	146	20
10/27/1981	N/A	6.3	144	N/A
10/28/1981	10.8	5.6	102	15
01/04/1982	13.1	6.4	67	5.5
03/31/1982	10.8	7.1	120	13
06/04/1982	8.6	6.2	88	23
06/05/1982	9.1	6.4	71	22
06/11/1982	8.2	6.4	75	22
08/26/1982	3.7	6.2	135	23.5
11/18/1982	11	6.4	180	11
12/13/1982	10.1	7.2	149	10
02/16/1983	14.1	6.8	88	4.5
03/21/1983	12.2	6.7	74	11
05/03/1983	9.8	6.6	88	15.5
08/10/1983	4.9	6.3	142	25
09/07/1983	5.8	6.2	164	26.5
09/28/1983	8	6.4	250	22.5
10/24/1983	9.6	6.9	232	18
11/29/1983	9.4	6.4	114	11
12/14/1983	12	5.4	92	10
01/24/1984	14.9	6.8	104	4
02/29/1984	13.4	6.8	76	7
03/12/1984	12.9	6	70	9
03/27/1984	11	6.8	81	12.5
04/11/1984	9.5	6.8	72	14

Table 2.3-36 (Sheet 2 of 3)
Field Parameters from USGS Station 02098198 —
Haw River below B. Everett Jordan Dam, Moncure, NC

Sample Date	Dissolved Oxygen (µg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
04/25/1984	13.5	6.6	95	14
05/16/1984	7.9	5.9	95	17
05/31/1984	7.7	6.2	120	19
06/19/1984	6.8	6.8	98	22
06/27/1984	6.8	6.3	105	22
07/11/1984	8.2	6.6	136	25
07/26/1984	8.2	6.7	100	25
08/20/1984	5.3	6	98	24
09/26/1984	8.9	6.6	132	24.5
10/31/1984	7.4	6.4	128	22
11/14/1984	9.3	6.8	175	17
12/17/1984	12.3	5.7	140	6
01/30/1985	13.2	6.6	125	4
02/26/1985	13.7	6.7	109	7.5
03/28/1985	9.8	6.3	165	11
04/30/1985	9.8	8.5	154	22
05/15/1985	9.2	7	184	23.5
06/10/1985	8.1	7.2	153	24.5
07/29/1985	6.5	6.3	175	24
08/28/1985	7.1	6.4	105	24.5
09/24/1985	8.5	7.2	135	25
11/05/1985	7.6	6.7	180	18
12/20/1988	13	7.4	197	5
04/05/1989	11	6.7	93	13.5
08/09/1989	N/A	7.2	130	N/A
09/18/1989	6.5	6.9	141	25.5
10/23/1989	10.2	7.1	128	11
04/17/1990	10.6	7.4	112	15.5
08/13/1990	7.4	7.2	216	28.5
10/15/1990	6.8	7.1	120	22
04/03/1991	10	7	63	15
08/05/1992	6.7	6.9	155	27
11/19/1992	9.8	6.3	79	10
04/27/1993	9.6	7.1	72	16
08/18/1993	6.6	7.1	190	25
04/19/1994	9.7	7.1	99	18
08/10/1994	6.6	7.3	146	27
10/24/1994	8.9	7.4	NA	18
04/27/1995	8.7	6.9	160	17

Table 2.3-36 (Sheet 3 of 3)
Field Parameters from USGS Station 02098198 —
Haw River below B. Everett Jordan Dam, Moncure, NC

Sample Date	Dissolved Oxygen (µg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
09/09/2004	8.7	7	110	23.9
Number of Events	77	79	78	77
MAX	14.9	8.5	250	32
MIN	3.7	5.4	63	4
Mean	9.3	N/A[a]	127.2	17.5
NC Water Quality Standards	5.0 mg/L	6.0 – 9.0	N/A	See Note [b]

Notes:
a) Average pH values cannot be calculated.

b) Temperature: not to exceed 2.8 degrees C (5.04 degrees F) above the natural water temperature, and in no case exceed 29 degrees C (84.2 degrees F) for mountain and upper piedmont waters and 32 degrees C (86.9 degrees F) for lower piedmont and coastal waters. The temperature for trout waters shall not be increased by more than 0.5 degrees C (0.9 degrees F) due to the discharge of heated liquids, but in no case to exceed 20 degrees C (68 degrees F).

µS/cm = microSiemens per centimeter
C = Celsius
F = Fahrenheit
mg/L = milligrams per liter
N/A = not available

Source: Reference 2.3-035

Table 2.3-37 (Sheet 1 of 4)
Analytical Results for Metals from USGS Station 02098198 — Haw River below B. Everett Jordan Dam, Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Copper (unfiltered)	Iron (filtered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	7	7	1000	25	N/A	N/A	0.012	N/A	N/A	50	N/A
	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L	mg/L	µg/L	mg/L
04/01/1980		N/A	N/A	N/A	N/A	5.6	N/A	N/A	N/A	280	0	2.4	N/A	N/A	1.7	6.9	0	24
06/04/1980		N/A	N/A	N/A	N/A	8.5	N/A	N/A	N/A	230	0	3.6	N/A	N/A	2.9	20	N/A	36
07/28/1980		N/A	N/A	N/A	N/A	7.1	N/A	N/A	N/A	160	N/A	2.8	N/A	N/A	3.7	13	N/A	29
10/14/1980		N/A	N/A	N/A	N/A	8.5	N/A	N/A	N/A	110	N/A	3.3	N/A	N/A	5.6	31	N/A	35
12/09/1980		N/A	N/A	N/A	N/A	10	N/A	N/A	N/A	130	N/A	3.2	N/A	N/A	4.1	22	N/A	38
02/13/1981		N/A	N/A	N/A	N/A	5.3	N/A	N/A	20	480	N/A	2.3	N/A	N/A	3.4	7.8	N/A	23
02/20/1981		N/A	N/A	N/A	N/A	6.8	N/A	N/A	20	540	N/A	3.2	N/A	N/A	3.1	19	10	30
02/21/1981		N/A	N/A	N/A	N/A	6.1	N/A	N/A	N/A	N/A	N/A	2.8	N/A	N/A	2.8	11	N/A	27
02/23/1981		N/A	N/A	N/A	N/A	6.6	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A	2.5	10	N/A	29
05/12/1981		N/A	N/A	N/A	N/A	9.4	0	N/A	N/A	250	0	3.8	N/A	N/A	5.1	37	N/A	39
06/22/1981		N/A	N/A	N/A	N/A	7.6	N/A	N/A	N/A	1300	0	3.2	N/A	N/A	5.2	14	N/A	32
07/06/1981		N/A	N/A	N/A	N/A	4.1	0	N/A	N/A	120	N/A	1.6	N/A	N/A	3.6	5.7	N/A	17
07/07/1981		N/A	N/A	N/A	N/A	4.4	0	N/A	N/A	180	N/A	1.8	N/A	N/A	4.1	6.9	10	18
07/14/1981		N/A	N/A	N/A	N/A	6.1	N/A	N/A	N/A	10	N/A	2.8	N/A	N/A	3.7	14	4	27
10/07/1981		3	2	1	N/A	7.9	N/A	20	20	530	1	3.3	N/A	0.1	4.8	20	4	33
10/27/1981		N/A	N/A	N/A	N/A	7.2	N/A	N/A	N/A	N/A	N/A	2.9	N/A	N/A	4.9	19	N/A	30
10/28/1981		1	1	1	N/A	5.2	N/A	N/A	N/A	N/A	N/A	2.1	N/A	0.1	4.4	7.9	N/A	22

Table 2.3-37 (Sheet 2 of 4)
Analytical Results for Metals from USGS Station 02098198 — Haw River below B. Everett Jordan Dam, Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Copper (unfiltered)	Iron (filtered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Hardness (as calcium carbonate)
	NC Standard:	**10**	**10**	**2.0**	**2.0**	**N/A**	**50**	**7**	**7**	**1000**	**25**	**N/A**	**N/A**	**0.012**	**N/A**	**N/A**	**50**	**N/A**
	Unit:	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**
01/04/1982		N/A	1	N/A	N/A	5.2	N/A	N/A	20	N/A	N/A	2.3	N/A	N/A	2.3	5.7	N/A	22
03/31/1982		3	3	1	1	7	N/A	N/A	N/A	N/A	N/A	2.9	N/A	0.2	2	9.9	N/A	29
06/04/1982		1	1	1	1	5.7	N/A	N/A	N/A	N/A	N/A	2.3	190	0.1	2.3	5.9	N/A	24
06/05/1982		N/A	N/A	N/A	N/A	5	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	2.4	4.3	N/A	21
06/11/1982		N/A	1	N/A	N/A	5.3	N/A	N/A	N/A	N/A	N/A	2.1	N/A	N/A	2.6	5.4	N/A	22
08/26/1982		1	1	1	N/A	7.7	N/A	N/A	N/A	N/A	N/A	2.7	N/A	0.1	2.7	7.9	N/A	30
11/18/1982		1	1	1	N/A	8.2	N/A	N/A	N/A	N/A	N/A	3.3	N/A	0.3	3.9	20	N/A	34
12/13/1982		1	1	1	N/A	8	N/A	N/A	N/A	N/A	1	3.3	N/A	0.1	3.5	15	N/A	34
02/16/1983		1	1	1	1	5.4	N/A	N/A	N/A	N/A	N/A	2.2	N/A	N/A	2.1	6.9	N/A	N/A
03/21/1983		1	1	1	10	5.1	N/A	N/A	N/A	70	N/A	2.2	60	0.1	1.9	5.1	N/A	22
05/03/1983		1	1	1	N/A	6.1	1	N/A	N/A	230	N/A	2.7	100	N/A	2	7.8	10	N/A
08/10/1983			1		N/A	7.8	N/A	N/A	N/A	N/A	N/A	2.8	N/A	N/A	2.4	12	N/A	N/A
09/07/1983		3	4	1	N/A	8.1	N/A	N/A	N/A	N/A	N/A	3.1	N/A	0.2	3.2	19	N/A	N/A
09/28/1983		N/A	N/A	N/A	N/A	7.3	N/A	N/A	N/A	N/A	N/A	3.8	N/A	N/A	5	40	N/A	N/A
10/24/1983		1	1	1	N/A	7.6	N/A	N/A	N/A	N/A	N/A	3.2	N/A	0.1	4.4	32	N/A	N/A
11/29/1983		1	1	1	N/A	6.6	N/A	N/A	N/A	N/A	N/A	2.6	N/A	0.1	3.2	10	N/A	N/A
12/14/1983		1	1	1	N/A	5.5	N/A	N/A	N/A	N/A	N/A	2.4	N/A	0.1	2.3	7.5	N/A	N/A

Table 2.3-37 (Sheet 3 of 4)
Analytical Results for Metals from USGS Station 02098198 — Haw River below B. Everett Jordan Dam, Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Copper (unfiltered)	Iron (filtered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Hardness (as calcium carbonate)
	NC Standard:	**10**	**10**	**2.0**	**2.0**	**N/A**	**50**	**7**	**7**	**1000**	**25**	**N/A**	**N/A**	**0.012**	**N/A**	**N/A**	**50**	**N/A**
	Unit:	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**
01/24/1984		1	1	1	1	5.4	N/A	N/A	N/A	N/A	N/A	2.3	N/A	0.1	2.2	9.7	N/A	N/A
02/29/1984		1	2		N/A	4.4	N/A	N/A	N/A	N/A	N/A	1.8	N/A	0.1	1.8	5.1	N/A	N/A
03/12/1984		1	1	1	N/A	4.6	N/A	N/A	N/A	N/A	N/A	1.9	N/A	0.1	1.8	5.7	N/A	N/A
04/25/1984		1	1	1	N/A	5.3	N/A	N/A	N/A	N/A	N/A	2.3	N/A	0.1	1.8	7.8	N/A	N/A
05/31/1984		1	1	1	1	7.1	N/A	N/A	N/A	N/A	N/A	2.8	N/A	0.1	2.4	11	N/A	N/A
06/27/1984		1	2		N/A	6.3	1	N/A	N/A	1,800	N/A	2.3	1,900	N/A	2.1	7.8	N/A	N/A
07/26/1984		1	1	1	N/A	6	N/A	N/A	N/A	N/A	N/A	2.2	N/A	0.1	2.5	6.9	N/A	N/A
08/20/1984		1	1	N/A	1	6.4	N/A	N/A	N/A	N/A	N/A	2.3	N/A	0.1	2.4	5.9	N/A	N/A
09/26/1984		1	1	N/A	N/A	7	1	N/A	N/A	60	N/A	2.8	220	N/A	2.9	13	3	N/A
10/31/1984		N/A	1	N/A	N/A	6.7	N/A	N/A	N/A	N/A	N/A	2.7	N/A	N/A	2.7	13	N/A	N/A
11/14/1984		N/A	1	N/A	1	7.7	N/A	N/A	N/A	N/A	N/A	3.1	N/A	N/A	3.6	21	N/A	N/A
12/17/1984		N/A	1	N/A	1	7.5	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A	3.5	12	N/A	N/A
01/30/1985		N/A	1	N/A	1	7.4	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A	2.7	14	N/A	N/A
02/26/1985		N/A	1	N/A	1	6.4	N/A	N/A	4	N/A	N/A	2.6	N/A	N/A	2.2	9.3	N/A	N/A
03/28/1985		N/A	1	N/A	N/A	8.3	N/A	N/A	N/A	N/A	N/A	3.3	N/A	N/A	2.3	17	N/A	N/A
04/30/1985		N/A	1	N/A	1	7.4	N/A	N/A	N/A	N/A	N/A	3.2	N/A	N/A	2.8	16	N/A	N/A
05/15/1985		N/A	1	N/A	1	7.8	N/A	N/A	6	N/A	N/A	3.2	N/A	N/A	2.9	20	N/A	N/A

Table 2.3-37 (Sheet 4 of 4)
Analytical Results for Metals from USGS Station 02098198 — Haw River below B. Everett Jordan Dam, Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Copper (unfiltered)	Iron (filtered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Hardness (as calcium carbonate)
	NC Standard:	**10**	**10**	**2.0**	**2.0**	**N/A**	**50**	**7**	**7**	**1000**	**25**	**N/A**	**N/A**	**0.012**	**N/A**	**N/A**	**50**	**N/A**
	Unit:	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**µg/L**	**mg/L**	**µg/L**	**µg/L**	**mg/L**	**mg/L**	**µg/L**	**mg/L**
06/10/1985		N/A	1	N/A	1	7	N/A	N/A	3	N/A	N/A	2.9	N/A	N/A	3.2	17	N/A	N/A
07/29/1985		N/A	2	N/A	1	8.5	N/A	N/A	4	N/A	N/A	3.3	N/A	N/A	3.6	22	N/A	N/A
08/28/1985		N/A	1	N/A	1	5.9	N/A	N/A	4	N/A	N/A	2.4	N/A	N/A	3	8.7	N/A	N/A
09/24/1985		N/A	1	N/A	2	6.8	N/A	N/A	4	N/A	N/A	2.8	N/A	N/A	3.2	13	N/A	29
09/09/2004		N/A	1	N/A	0.05	6.21	N/A	N/A	4.5	N/A	N/A	2.55	N/A	N/A	3.95	10	N/A	N/A
Number of Events		**23**	**39**	**19**	**18**	**56**	**6**	**1**	**11**	**17**	**6**	**56**	**5**	**19**	**56**	**56**	**7**	**27**
MAX		**3**	**4**	**1**	**10**	**10**	**1**	**20**	**20**	**1,800**	**1**	**3.8**	**1,900**	**0.3**	**5.6**	**40**	**10**	**39**
MIN		**1**	**1**	**1**	**0.05**	**4.1**	**0**	**20**	**3**	**10**	**0**	**1.6**	**60**	**0.1**	**1.7**	**4.3**	**0**	**17**
Mean		**1.3**	**1.2**	**1.0**	**1.5**	**6.7**	**0.5**	**20**	**10.0**	**381.2**	**0.3**	**2.7**	**494.0**	**0.1**	**3.1**	**13.3**	**5.9**	**28.0**

Notes:
N/A = Not Available

Source: Reference 2.3-035

Table 2.3-38 (Sheet 1 of 3)
Water Chemistry from USGS Station 02098198 — Haw River below B. Everett Jordan Dam, Moncure, NC

Sample Date	Ammonia plus organic nitrogen as nitrogen mg/L	Ammonia as nitrogen mg/L	Total nitrogen mg/L	Total nitrogen as nitrate mg/L	Nitrate as nitrogen mg/L	Nitrite as nitrogen mg/L	Nitrite plus nitrate as nitrogen mg/L	Orthophosphate as phosphorus mg/L	Phosphorus (filtered) mg/L	Phosphorus (unfiltered) mg/L	Phosphorus (unfiltered) as phosphate mg/L	Chloride mg/L	Silica (filtered) mg/L	Sulfate mg/L
04/01/1980	0.46	0.06	0.99	4.4	0.51	0.02	0.53	0.08	0.07	0.12	0.37	6	11	11
06/04/1980	0.91	0.06	2.1	9.3	1.2	0.02	1.2	0.22	N/A	0.06	0.18	12	14	17
07/28/1980	0.64	0.04	1.8	8.1	1.2	0.04	1.2	0.2	0.14	0.3	0.92	8.8	12	13
10/14/1980	0.77	0.08	2.8	12	2	0.02	2	0.61	0.59	0.68	2.1	19	13	27
12/09/1980	0.67	0.03	2.6	11	1.9	0.03	1.9	0.51	0.5	0.57	1.7	18	6.9	25
02/13/1981	1.9	0.47	2.6	11	0.55	0.12	0.67	0.39	0.06	0.46	1.4	8.2	11	13
02/20/1981	1.7	0.4	2.6	11	0.81	0.04	0.85	0.38	0.32	0.81	2.5	12	15	19
02/21/1981	1.2	0.43	1.8	8.1	0.55	0.07	0.62	0.25	0.13	0.38	1.2	8.7	13	13
02/23/1981	0.73	0.16	1.4	6.3	0.64	0.05	0.69	0.17	0.19	0.29	0.89	8.3	14	13
05/12/1981	1.2	0.15	4.2	19	2.9	0.06	3	0.58	0.55	0.75	2.3	20	12	24
06/22/1981	1.4	0.07	3	13	1.6	0.04	1.6	0.33	0.29	0.4	1.2	12	14	13
07/06/1981	1.4	0.3	2.1	9.2	0.61	0.06	0.67	0.16	0.1	0.26	0.8	5.3	6.5	7.8
07/07/1981	1.2	0.17	1.8	7.7	0.5	0.05	0.55	0.17	0.15	0.25	0.77	6.5	7.1	10
07/14/1981	0.9	0.01	1.4	6.3	0.51	0.01	0.52	0.19	0.11	0.19	0.58	9.7	N/A	16
10/07/1981	0.93	0.15	1.6	7	0.63	0.02	0.65	0.29	0.27	0.32	0.98	12	11	18
10/27/1981	0.6	0.06	1.2	5.1	0.55	0.01	0.56	0.19	0.22	0.26	0.8	12	7.1	18
10/28/1981	2	0.1	2.5	11	0.48	0.03	0.51	0.15	0.21	0.32	0.98	7.4	7.6	10
01/04/1982	0.84	0.14	1.4	6.2	N/A	N/A	0.55	N/A	N/A	0.17	0.52	6.5	9.9	8.7
03/31/1982	0.71	0.12	1.4	6.3	0.68	0.03	0.71	0.17	0.13	0.19	0.58	8.2	12	13
06/04/1982	0.5	0.16	1	4.4	N/A	N/A	0.5	N/A	0.09	0.19	0.58	5.7	8.9	9
06/05/1982	1.2	0.19	1.9	8.4	N/A	N/A	0.7	N/A	0.11	0.36	1.1	4.2	8.7	7
06/11/1982	1.2	0.15	1.7	7.5	N/A	N/A	0.5	N/A	0.08	0.22	0.67	4.9	9.1	10
08/26/1982	2.3	1.1	2.6	12	0.24	0.07	0.31	0.3	0.19	0.35	1.1	9.3	11	9
11/18/1982	0.7	0.13	1.6	7.1	0.87	0.03	0.9	0.22	0.17	0.27	0.83	14	12	20
12/13/1982	1.1	0.16	2	8.9	0.87	0.03	0.9	0.17	0.16	0.23	0.71	9.4	12	12
02/16/1983	0.9	0.34	1.5	6.6	0.53	0.07	0.6	0.23	0.09	0.27	0.83	7.9	10	10

Table 2.3-38 (Sheet 2 of 3)
Water Chemistry from USGS Station 02098198 — Haw River below B. Everett Jordan Dam, Moncure, NC

Sample Date	Ammonia plus organic nitrogen as nitrogen mg/L	Ammonia as nitrogen mg/L	Total nitrogen mg/L	Total nitrogen as nitrate mg/L	Nitrate as nitrogen mg/L	Nitrite as nitrogen mg/L	Nitrite plus nitrate as nitrogen mg/L	Orthophosphate as phosphorus mg/L	Phosphorus (filtered) mg/L	Phosphorus (unfiltered) mg/L	Phosphorus (unfiltered) as phosphate mg/L	Chloride mg/L	Silica (filtered) mg/L	Sulfate mg/L
03/21/1983	0.7	0.2	1.3	5.8	0.55	0.05	0.6	0.14	0.07	0.18	0.55	4.6	8.6	13
05/03/1983	0.6	0.11	N/A	N/A	N/A	0.02	0.4	0.04	0.04	0.08	0.25	6	7.9	12
08/10/1983	1.7	0.01	N/A	N/A	N/A	0.01	0.2	N/A	N/A	N/A	N/A	9	9	13
09/07/1983	1.4	1.1	N/A	N/A	N/A	0.04	0.2	0.22	0.01	0.05	0.15	12	7.9	18
09/28/1983	1.1	0.09	N/A	N/A	N/A	0.04	1	0.21	N/A	0.22	0.67	21	7.8	31
10/24/1983	1.1	0.11	N/A	N/A	N/A	0.04	1	0.19	N/A	0.29	0.89	20	5.8	30
11/29/1983	1.1	0.22	N/A	N/A	N/A	0.03	0.6	0.16	N/A	0.25	0.77	8.6	11	19
12/14/1983	0.6	0.48	N/A	N/A	N/A	0.03	0.6	0.12	N/A	0.14	0.43	6.8	10	16
01/24/1984	1.3	0.19	N/A	N/A	N/A	0.03	0.6	0.08	N/A	0.11	0.34	5.9	7.4	15
02/29/1984	0.9	0.16	N/A	N/A	N/A	0.11	0.5	0.11	N/A	0.13	0.4	5	9.3	9.6
03/12/1984	0.8	0.15	N/A	N/A	N/A	0.03	0.5	0.01	N/A	0.11	0.34	5.8	8.5	12
03/27/1984	0.9	N/A	N/A	N/A	N/A	N/A	1.2	N/A	N/A	0.12	0.37	N/A	N/A	N/A
04/11/1984	0.9	N/A	N/A	N/A	N/A	N/A	0.4	N/A	N/A	0.1	0.31	N/A	N/A	N/A
04/25/1984	0.7	0.09	N/A	N/A	N/A	0.03	0.5	0.1	N/A	0.13	0.4	6.5	10	12
05/16/1984	2.5	N/A	N/A	N/A	N/A	N/A	0.6	N/A	N/A	0.11	0.34	N/A	N/A	N/A
05/31/1984	2.5	0.32	N/A	N/A	N/A	0.03	0.7	0.11	N/A	0.14	0.43	7.8	12	14
06/19/1984	1.7	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	0.11	0.34	N/A	N/A	N/A
06/27/1984	1.5	0.76	N/A	N/A	N/A	0.02	0.2	0.18	0.16	0.21	0.65	6	8.9	9.1
07/11/1984	1.6	N/A	N/A	N/A	N/A	N/A	0.5	N/A	N/A	0.23	0.71	N/A	N/A	N/A
07/26/1984	0.7	0.28	N/A	N/A	N/A	0.03	0.3	0.08	N/A	0.14	0.43	5.5	9.8	10
08/20/1984	1.3	0.47	N/A	N/A	N/A	0.03	0.3	0.13	N/A	0.2	0.62	5.8	8.5	13
09/26/1984	0.7	0.17	N/A	N/A	N/A	0.02	0.4	0.06	0.08	0.09	0.28	9.3	8.8	16
10/31/1984	0.7	0.37	N/A	N/A	N/A	0.02	0.3	0.05	N/A	0.29	N/A	10	7.2	13
11/14/1984	0.5	0.3	N/A	N/A	N/A	0.02	0.8	0.17	N/A	0.27	N/A	14	8.3	20
12/17/1984	0.9	0.39	N/A	N/A	N/A	0.02	0.7	0.22	0.17	0.25	N/A	9.9	11	15
01/30/1985	0.3	0.22	N/A	N/A	N/A	0.02	0.9	0.2	N/A	0.28	N/A	11	13	16

Table 2.3-38 (Sheet 3 of 3)
Water Chemistry from USGS Station 02098198 — Haw River below B. Everett Jordan Dam, Moncure, NC

Sample Date	Ammonia plus organic nitrogen as nitrogen mg/L	Ammonia as nitrogen mg/L	Total nitrogen mg/L	Total nitrogen as nitrate mg/L	Nitrate as nitrogen mg/L	Nitrite as nitrogen mg/L	Nitrite plus nitrate as nitrogen mg/L	Orthophosphate as phosphorus mg/L	Phosphorus (filtered) mg/L	Phosphorus (unfiltered) mg/L	Phosphorus (unfiltered) as phosphate mg/L	Chloride mg/L	Silica (filtered) mg/L	Sulfate mg/L
02/26/1985	1.4	0.18	N/A	N/A	N/A	0.03	0.6	0.14	0.14	0.6	N/A	8.4	11	14
03/28/1985	0.8	0.14	N/A	N/A	N/A	0.03	0.7	0.15	N/A	0.22	N/A	10	10	18
04/30/1985	1	0.1	N/A	N/A	N/A	0.02	0.2	0.08	N/A	N/A	N/A	12	5.8	20
05/15/1985	0.5	0.1	N/A	N/A	N/A	0.1	0.2	0.1	N/A	0.14	N/A	13	5.6	25
06/10/1985	1	0.24	N/A	N/A	N/A	0.03	0.6	0.11	N/A	0.13	0.4	10	6.8	21
07/29/1985	1.1	0.51	N/A	N/A	N/A	0.15	0.6	0.23	N/A	0.29	0.89	13	8.1	22
08/28/1985	0.9	0.2	N/A	N/A	N/A	0.02	0.3	0.08	0.07	0.16	0.49	7.6	7.6	8.6
09/24/1985	0.8	0.04	1	4.4	N/A	0.01	0.2	0.08	N/A	0.1	0.31	9.7	6.5	14
11/05/1985	0.6	0.16	1.2	5.3	0.59	0.01	0.6	0.13	N/A	0.13	0.4	N/A	N/A	N/A
08/05/1992	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/09/2004	0.93	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.23	N/A	8.05	10.3	9.1
Number of Events	**62**	**56**	**29**	**29**	**24**	**52**	**61**	**51**	**32**	**60**	**52**	**56**	**55**	**56**
MAX	**2.5**	**1.1**	**4.2**	**19**	**2.9**	**0.15**	**3**	**0.61**	**0.59**	**0.81**	**2.5**	**21**	**15**	**31**
MIN	**0.3**	**0.01**	**0.99**	**4.4**	**0.24**	**0.01**	**0.2**	**0.01**	**0.01**	**0.05**	**0.15**	**4.2**	**5.6**	**7**
Mean	**1.06**	**0.23**	**1.9**	**8.36**	**0.89**	**0.04**	**0.68**	**0.19**	**0.18**	**0.25**	**0.75**	**9.61**	**9.66**	**15.1**
NC Water Quality Standards	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**230**		**250**

Notes:
N/A = not available

Source: Reference 2.3-035

Table 2.3-39 (Sheet 1 of 9)
Field Parameters from DWQ Station B4050000 —
Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
09/13/73	7.5	7.5	N/A	24
09/19/73	7.5	7.4	N/A	23
09/27/73	9.5	7.8	N/A	24
10/18/73	9.3	7.5	N/A	16
10/24/73	8.3	6.9	N/A	18
10/31/73	8.1	7.6	N/A	13
11/09/73	9	7.3	N/A	13
11/30/73	10.1	7.5	N/A	11
12/07/73	9.7	7.4	N/A	8
12/13/73	10.4	7.2	N/A	6
01/10/74	11.4	6.9	N/A	10
01/24/74	9.6	7.2	N/A	15
02/07/74	10.3	6.8	N/A	10
02/15/74	10.1	7.1	N/A	7
02/22/74	9	7	N/A	11
03/01/74	10.4	7.1	N/A	9.5
03/05/74	10.3	7.2	N/A	18
03/15/74	11.2	7.5	N/A	10
03/15/74	7.7	6.8	N/A	20
03/22/74	10.5	7	N/A	10
03/26/74	10.6	N/A	N/A	10
04/03/74	8.5	6.8	N/A	17
04/09/74	9.4	6.9	N/A	13.5
04/19/74	8.6	7.1	N/A	17
04/22/74	9	7.2	N/A	18
05/01/74	8.5	7.6	N/A	23.5
05/08/74	8.5	7.4	N/A	19.5
05/23/74	6.7	7	N/A	21
05/30/74	7.6	7.1	N/A	20
06/06/74	8	7.4	N/A	23
06/13/74	8.4	N/A	N/A	23.5
06/21/74	8.1	7.5	N/A	23
06/26/74	8.1	7.4	N/A	22
07/12/74	7.4	N/A	N/A	26
07/18/74	7.4	8.3	N/A	28
07/23/74	7	7.6	N/A	22
08/01/74	7	8.1	400	29
08/08/74	8.2	7	N/A	21
08/14/74	8.4	6.8	N/A	27
08/15/74	4.9	7.2	N/A	24
08/22/74	6.9	7.4	200	25
08/27/74	6.9	7.4	232	27
09/05/74	8.2	N/A	N/A	20.5
09/12/74	8.1	6.5	N/A	25
09/17/74	8.8	7.3	N/A	23.5
09/26/74	9.3	7.7	150	17
09/30/74	8.2	7.7	220	19
10/09/74	8.1	7.2	185	17
10/16/74	8.1	8.2	260	20
10/21/74	8	N/A	N/A	11
11/12/74	10	N/A	180	12
12/10/74	11.8	7.1	54	5
12/19/74	10.6	7.1	N/A	6

Table 2.3-39 (Sheet 2 of 9)
Field Parameters from DWQ Station B4050000 —
Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
12/30/74	9.4	7.2	90	11
01/07/75	11	7.3	N/A	6
01/13/75	11	6.8	58	10
01/22/75	7.8	6.6	N/A	5.5
01/22/75	10.4	6.7	N/A	6
01/28/75	11.4	7.3	N/A	9
02/03/75	10.8	7	70	7
02/13/75	11.3	7.3	70	8
02/19/75	10.1	7	80	10.5
02/24/75	9.6	7.2	109	13
03/03/75	10.2	7.2	80	7
03/13/75	8.3	7.2	80	11
03/18/75	11.4	N/A	45	8
04/24/75	7.5	7.2	98	18.5
06/04/75	7.8	6.9	95	23
06/12/75	8.5	7.6	150	26
06/18/75	7	6.6	180	21
07/25/75	6.4	6.4	70	22
08/08/75	8.5	N/A	N/A	26
08/26/75	6.8	6.4	N/A	26
09/02/75	7.1	6.4	N/A	24
09/15/75	8	6.6	175	21
09/26/75	9.3	7	100	20
10/01/75	7.9	6.9	70	19
10/06/75	7.9	6.8	190	21
10/20/75	9.7	7.7	110	16
11/18/75	11	5.9	100	9
12/15/75	11.7	7.9	175	10
01/21/76	15.5	5.8	75	4
02/17/76	11.1	6.9	125	12
03/01/76	9.4	6.8	150	16
04/13/76	9.4	6.5	110	17
05/23/76	5.8	6.5	180	22
06/02/76	5.9	6.2	160	22
07/14/76	7.2	7.2	270	26
08/09/76	7.5	6.3	110	26
09/20/76	5.5	7.2	450	25
10/12/76	8.7	6.2	100	17
11/17/76	7.9	6.8	110	9
12/02/76	8.7	6.8	80	7
01/18/77	12.4	6.5	70	0
02/16/77	11.8	7	140	4
03/02/77	9.7	2.7	80	9
04/04/77	9	7	110	17
05/05/77	8.3	7.2	32	25
06/07/77	7.7	8.7	160	22
07/11/77	8.1	8.9	150	28
08/08/77	8.5	8.2	480	30
09/07/77	8.9	7.9	400	26
10/05/77	8.6	6.4	290	19
11/02/77	8.1	6.4	105	16
01/18/78	11.2	6.6	80	3
03/13/78	10.2	7	60	9

Table 2.3-39 (Sheet 3 of 9) Field Parameters from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
04/11/78	8.4	6.5	70	19
05/15/78	7.8	5.7	50	16
07/13/78	8.1	6.4	180	23
08/18/78	5.5	6.7	150	26
09/11/78	6	6.4	145	25
10/05/78	8.2	7.4	85	18
11/06/78	9.3	7.6	300	14
12/19/78	18.5	6.9	100	5
01/16/79	15.5	6.9	70	2
02/14/79	15.5	7	100	0
03/07/79	12.5	6.7	70	10
04/24/79	10.4	7.3	N/A	20
05/16/79	9.4	N/A	N/A	19.5
06/18/79	8.6	N/A	N/A	24
07/16/79	6.8	7.3	N/A	27
08/20/79	28	7.9	N/A	28
09/19/79	8.4	7.2	N/A	21.5
10/25/79	10.8	6.9	N/A	13.5
11/29/79	9.6	6.7	N/A	12
12/11/79	12.8	7.3	140	4
01/22/80	12.4	6.8	79	10
02/13/80	11.6	6.9	12000	2
03/25/80	11	7.2	90	15
04/14/80	9.4	7.1	100	17
05/12/80	9.4	7.2	185	20.5
06/20/80	7.8	7.6	180	23
07/28/80	7.1	7	150	26
08/04/80	8.2	7.2	190	30
09/17/80	7	7.6	280	25
10/20/80	9.2	7.1	105	20
11/14/80	11.2	8.4	155	8
01/15/81	13.2	7.51, 7.6	221	2
02/19/81	11	6.5	60000	15
03/26/81	11.2	7.2, 7.33	170	11
04/09/81	8.8	6.7	150	16
05/21/81	8.6	6.1	204	15
06/08/81	6.2	7.1, 7.55	150	28
07/21/81	5.8	6.9, 7.11	180	25
08/06/81	7.6	6.9, 7.07	120	25
09/10/81	8.3	6.4, 7.36	85	22
10/21/81	7.7	7.28	198	20
11/18/81	10.5	7.4	211	9
12/17/81	12.4	7.02	158	3
01/22/82	12.8	6.66	140	N/A
02/10/82	13.4	6.75	101	5
06/21/82	8.5	6.83	88	23
07/15/82	7.6	6.7	117	24
08/16/82	7.5	5.68, 6.7	110	25
09/14/82	6.5	6.2, 6.6	180	24
10/06/82	6.9	6.1	168	21
11/09/82	11	6	105	12
12/14/82	12.8	6.7	80	6
01/19/83	12.6	6.6	85	5

**Table 2.3-39 (Sheet 4 of 9)
Field Parameters from DWQ Station B4050000 —
Haw River below B. Everett Jordan Dam near Moncure, NC**

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
02/08/83	12	6.9	85	6
03/10/83	11.8	6.7	75	13
04/18/83	11.7	6.8	60	14
05/11/83	9.5	6.7	75	19
06/08/83	7.6	6.6	105	22
07/12/83	7	6.3	121	22
08/23/83	5.8	6.7	171	28
09/23/83	9.6	6.5	150	21
10/04/83	7	7	200	18
11/02/83	10	6.9	148	12
12/07/83	11	6.8	65	8
01/10/84	13	7.2	40	2
02/09/84	12.1	6.9	95	2
03/14/84	12	7.4	52	8
04/12/84	11.6	7.2	58	10
05/23/84	9.4	6.8	80	23
06/13/84	7.7	7.2	85	25
07/11/84	7.4	7.1	121	24
08/21/84	7.1	7	85	24
09/25/84	8.2	7.3	112	22
10/30/84	7.5	6.9	105	20
11/26/84	12	7.2	130	6
12/14/84	12.6	7.6	78	7
01/11/85	11	N/A	70	8
02/20/85	12.8	7.1	61	5
03/26/85	11	7	105	12
04/23/85	9	7.1	112	22
05/17/85	8.4	7.3	153	21
06/13/85	8.4	7.1	150	23
07/30/85	7.4	6.8	140	25
08/20/85	7	6.9	85	24
09/23/85	9.2	7.2	112	23
10/28/85	9.3	7	150	20
11/19/85	10.3	7.1	112	16
12/13/85	12.7	6.7	70	10
01/22/86	13.2	7.3	101	6
02/24/86	12	7.4	40	9
03/13/86	11.6	6.7	107	12
04/17/86	10.1	7	124	13
05/16/86	10.1	7.7	166	20
06/17/86	8.4	9	214	26
08/27/86	N/A	7.2	195	N/A
10/23/86	8.7	6.9	205	16
11/10/86	8.5	6.8	138	16
12/03/86	10.2	6.5	135	12
01/22/87	10.4	6.5	65	6
02/26/87	12	6.1	82	6
03/31/87	11.4	6.9	82	10
04/08/87	11	6.5	98	12
05/18/87	10.5	6.2	95	19
07/07/87	6.2	7.3	200	29
09/24/87	7.1	7.3	159	25
10/15/87	8.6	6.85	183	18

Table 2.3-39 (Sheet 5 of 9)
Field Parameters from DWQ Station B4050000 —
Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
11/16/87	11.7	6.8	264	12
12/14/87	10.2	6.75	233	9
01/25/88	13.8	6.85	76	4
02/22/88	11.6	7.25	124	6
03/15/88	11.7	6.9	166	10
04/21/88	10.2	6.55	178	15
05/26/88	7.5	6.93	160	18
06/16/88	7.8	7.45	190	23
07/11/88	8.2	7.31	107	26
09/12/88	7.4	7.24	249	24
10/13/88	6.4	7.15	242	18
11/28/88	9.8	7.18	182	11
12/20/88	13	7.39	197	5
01/20/89	12.2	7.23	138	7
02/22/89	8	6.7	110	8
03/23/89	11.2	6.7	124	10
04/05/89	11	6.72	93	13.5
05/10/89	9.9	7	66	17.5
06/01/89	6.9	7.11	142	23.5
07/11/89	6.6	6.9	135	24
08/08/89	6.2	7.1	132	29
09/18/89	6.5	6.89	141	25.5
10/23/89	10.2	7.08	128	11
11/07/89	9.8	7.08	162	15
12/13/89	11.4	6.89	132	5.5
01/04/90	15.2	6.8	121	4
02/07/90	11.6	7.19	112	10
03/07/90	11.6	7.38	104	11
04/17/90	10.6	7.38	112	15.5
05/07/90	9.3	7.08	105	20
06/06/90	7.1	6.73	121	22.5
07/11/90	5.8	7.5	184	29
08/13/90	7.4	7.27	216	28.5
09/12/90	6.3	6.91	190	27.5
10/15/90	6.8	7.1	120	22
11/07/90	8.8	6.93	132	16
12/04/90	10.6	7.03	165	11.5
04/03/91	10	7.04	81	15
05/14/91	7.5	6.79	129	18
06/19/91	6.9	6.87	156	22.5
07/10/91	6.1	6.98	149	26
08/15/91	5.6	6.77	247	26.5
09/16/91	8	6.74	243	26.5
10/17/91	8	7.16	112	19
11/07/91	8.8	7.13	214	15.5
12/11/91	9.8	7.17	160	12.5
01/02/92	11.2	7.31	140	7.5
02/06/92	11.4	6.81	151	7.5
03/16/92	10.8	7.41	141	12
04/22/92	9.4	7.19	235	14.5
05/12/92	N/A	N/A	143	N/A
06/25/92	9.1	7.2	144	23
07/27/92	7.3	7.3	190	28

Table 2.3-39 (Sheet 6 of 9)
Field Parameters from DWQ Station B4050000 —
Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
08/05/92	6.7	6.9	155	27
09/17/92	6.7	7.3	200	25
10/13/92	8.9	7.2	225	19
11/19/92	9.8	6.3	79	10
12/28/92	11.8	6.7	64	7
01/25/93	12.4	6.5	45	7
02/18/93	11.9	6.8	62	8
03/30/93	9.8	7.1	50	11
04/27/93	9.6	7.1	72	16
05/17/93	8.4	7	99	19
06/24/93	7.3	N/A	184	26
07/27/93	5.7	7.1	259	29
08/18/93	6.6	7.1	190	25
09/20/93	5.7	7.1	230	25
10/18/93	8.8	7.2	216	20
11/15/93	10.2	7.1	179	14
02/09/94	12.8	7	64	7
03/22/94	11.2	7.2	78	12
04/19/94	9.7	7.1	99	18
05/24/94	8.5	7	150	21
06/21/94	7.2	6.9	260	27
07/20/94	5.9	7.1	254	28
08/10/94	6.6	7.3	146	27
09/22/94	8.1	7.1	168	23
10/18/94	8.8	N/A	194	18
11/29/94	10.8	7.2	267	13
12/20/94	11	7.3	247	10
01/10/95	12.9	7.1	249	7
02/06/95	12.4	7.5	131	6
03/23/95	10.3	7.4	92	10.5
04/27/95	8.7	6.86	160	17
05/17/95	7.7	6.85	209	21
06/22/95	7.2	7.33	170	24.8
08/10/95	6.4	7.28	222	27
09/18/95	6.3	6.9	145	25
10/31/95	10.9	6.85	89	16.4
12/27/95	12.9	6.8	100	5
01/23/96	6.5	6.4	81	4.8
02/22/96	11.4	6.7	100	5.2
03/28/96	11	7.4	81	10
04/18/96	10.4	7.2	119	13
05/29/96	7.8	7	149	20
06/25/96	6.6	7	175	27.8
07/29/96	6.5	7.1	237	28.1
08/22/96	6.5	6.9	163	27
09/26/96	6.5	6.2	90	23
10/15/96	10	7.3	95	17.3
11/20/96	10.7	7.5	129	9.9
12/18/96	11.3	7.3	90	8.2
01/30/97	11.6	7.6	81	6
02/27/97	11.2	7.3	88	8.9
03/31/97	9.6	6.8	87	15.9
04/30/97	11	7.1	70	14.9

Table 2.3-39 (Sheet 7 of 9) Field Parameters from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
05/22/97	7.5	7.5	130	22
06/30/97	7	7.2	118	26.3
07/31/97	7.9	7.2	171	24.2
09/29/97	7.9	7.3	210	23.5
10/15/97	7.2	7.3	170	22
11/17/97	10.2	7.6	175	13
12/11/97	11.6	7.6	145	8
01/14/98	11.1	7.5	100	10
02/10/98	12	6.8	69	7
03/03/98	10.2	6.9	75	10.5
04/15/98	10.8	6.9	90	16
05/27/98	8	7.6	128	23.5
06/11/98	7.1	7.4	180	23
07/29/98	5.2	7.3	187	29.5
08/31/98	6.5	7.1	220	26.5
09/28/98	6.1	7.1	245	25.2
10/28/98	9.2	7.3	256	18.3
11/29/98	9.1	7.5	263	14.1
12/28/98	10.7	7.3	266	8.3
01/27/99	12.7	7.1	91	10.7
02/17/99	11	7.2	178	9.6
03/22/99	12.6	7.5	168	10.5
04/29/99	8.6	7	174	17
05/24/99	8.7	7.4	155	22.2
06/24/99	8.3	7.5	217	23.8
07/27/99	7.3	8.3	242	28.7
08/17/99	6.2	7.6	233	29
09/29/99	7.6	6.8	107	21.3
10/18/99	7.1	7	197	19
11/02/99	6.9	7	133	16.8
12/02/99	11.2	6.8	132	12.5
02/14/00	14.6	6.9	137	8
03/15/00	12	7.1	132	12
04/26/00	9.7	7	124	16
05/22/00	7.5	7.4	137	24
06/14/00	7	6.9	140	28
07/30/00	8.8	7.2	50	22
08/30/00	3.2	7.2	200	21
09/13/00	7.2	7.1	120	25
10/09/00	6.8	6.9	120	20
11/29/00	10.2	7.3	80	8
12/27/00	14.5	6.2	280	2
02/01/01	14.5	7.2	100	6
04/16/01	9.1	7	80	18
05/21/01	7.8	7	200	21
06/25/01	8.1	7	200	24
07/11/01	6	7	202	28
08/02/01	8.9	7	220	28
10/05/01	7.6	7.2	205	21.7
10/31/01	9.1	7.2	213	16.6
11/29/01	8.8	7	210	14.1
12/17/01	9.9	7.1	253	8.1
01/14/02	12.8	7.6	297	4.9

**Table 2.3-39 (Sheet 8 of 9)
Field Parameters from DWQ Station B4050000 —
Haw River below B. Everett Jordan Dam near Moncure, NC**

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
02/20/02	11.3	6.6	164	8.8
03/07/02	11.6	7.8	203	8.6
04/08/02	9.7	6.4	177	15.1
05/07/02	9.2	7.2	197	20.5
06/19/02	7.1	7.5	225	26
07/10/02	5.1	7	249	27.4
08/21/02	5.2	7.1	311	28.5
09/10/02	6	8.4	236	25.6
10/16/02	8.9	6.2	92	19.4
11/25/02	10.8	6.5	137	12.1
12/12/02	13.3	6.9	143	5.6
01/21/03	12.9	6.8	121	5
02/26/03	12.9	6	132	7.2
03/12/03	12.3	6.7	106	9.3
04/28/03	9.3	7	85	15.8
05/27/03	9.5	6.2	78	19
06/11/03	8.7	7.1	75	22.1
07/10/03	7.3	6.6	104	24.1
08/21/03	9.5	6.9	112	26.3
09/10/03	10.2	7	107	25.5
10/20/03	11.9	6.8	154	18.6
11/13/03	8.6	7.1	144	16.5
12/15/03	14.9	7.1	147	5.2
01/28/04	12.3	7	156	4
02/19/04	10.8	6.6	187	6
03/18/04	10.8	6.5	170	11
04/21/04	10.2	6.8	123	14.7
05/18/04	8.2	6.6	160	22.8
06/15/04	6.3	6.5	217	25.4
07/27/04	4.7	6.3	200	27.6
08/24/04	6.3	6.2	164	27.1
09/16/04	7	7.2	126	24.4
10/12/04	8.2	6.8	138	22
11/22/04	10.2	6.5	158	13
12/08/04	11.4	6.6	149	12
01/05/05	13.2	6.5	142	6.1
02/14/05	13.3	6.8	159	6.1
03/16/05	11	6.8	136	9.1
04/12/05	9.6	7.4	132	16.6
05/11/05	9.3	7.3	166	19.5
06/20/05	7.2	8.8	176	27.3
07/19/05	6.5	6.6	193	27.8
08/26/05	6	N/A	185	28.9
09/27/05	5.5	7.2	197	26.4
10/18/05	6.8	7.2	263	21.4
11/14/05	10.8	7.2	258	15.8
12/07/05	9.8	7.1	173	9.5
01/19/06	14.3	7.6	164	8.6
02/15/06	12.7	7.2	185	7.1
03/09/06	11.6	7.5	186	10.1
04/20/06	9	N/A	203	15
05/23/06	8.4	7.2	198	19.5
06/09/06	7.4	6.6	208	20.3

Table 2.3-39 (Sheet 9 of 9)
Field Parameters from DWQ Station B4050000 —
Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
07/11/06	6.8	6.5	137	24.5
08/08/06	N/A	6.3	184	25.4
09/19/06	6.6	6.5	199	24.8
10/26/06	8.3	6.4	214	17.2
12/18/06	N/A	6.8	180	7.7

Notes:
µS/cm = microSiemens per centimeter
C = Celsius
mg/L = milligrams per liter
N/A = not available

Source: Reference 2.3-052

Table 2.3-40 (Sheet 1 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
08/07/73		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
12/07/73		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/13/73		N/A	N/A	N/A	N/A	ND	130	750	N/A	N/A	200	ND	N/A	N/A	N/A	ND
01/24/74		0	40	ND	N/A	ND	ND	1700	ND	N/A	200	10	N/A	N/A	N/A	ND
02/07/74		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/15/74		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/08/74		N/A	20	ND	N/A	ND	ND	1500	ND	N/A	120	ND	N/A	N/A	N/A	ND
08/01/74		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/14/74		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/17/74		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/30/74		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/04/75		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/12/75		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/26/75		N/A	N/A	ND	N/A	ND	ND	1500	ND	N/A	140	N/A	N/A	N/A	N/A	ND
09/02/75		N/A	N/A	ND	N/A	ND	ND	1100	ND	N/A	150	N/A	ND	N/A	N/A	ND
10/01/75		N/A	30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	ND	N/A	N/A	N/A	N/A
12/15/75		N/A	ND	ND	N/A	ND	ND	1000	ND	N/A	60	ND	N/A	N/A	N/A	ND
03/01/76		N/A	ND	ND	N/A	ND	50	1000	ND	N/A	70	ND	ND	N/A	N/A	ND
05/23/76		N/A	ND	ND	N/A	ND	ND	1900	ND	N/A	290	ND	N/A	N/A	N/A	ND
08/09/76		N/A	20	ND	N/A	ND	ND	1400	ND	N/A	210	1.1	N/A	N/A	N/A	ND
11/17/76		N/A	ND	ND	11	ND	ND	650	ND	N/A	60	0.9	N/A	N/A	N/A	ND
02/16/77		N/A	ND	ND	8.6	ND	ND	800	ND	N/A	80	ND	ND	N/A	N/A	ND
05/05/77		N/A	N/A	ND	N/A	ND	ND	900	ND	4.1	N/A	ND	N/A	N/A	N/A	ND
06/07/77		1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/08/77		N/A	ND	ND	N/A	ND	N/A	400	ND	N/A	140	ND	N/A	N/A	N/A	ND
11/02/77		N/A	ND	ND	N/A	ND	ND	1000	ND	N/A	550	ND	ND	N/A	N/A	120
05/15/78		N/A	ND	ND	N/A	ND	ND	1500	ND	1.8	N/A	ND	N/A	N/A	N/A	340

Table 2.3-40 (Sheet 2 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
08/18/78		N/A	ND	ND	N/A	ND	ND	2000	100	N/A	1080	ND	ND	N/A	N/A	220
11/06/78		N/A	ND	ND	N/A	ND	ND	700	ND	N/A	90	ND	N/A	N/A	N/A	ND
12/19/78		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/16/79		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/14/79		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
03/07/79		0	ND	ND	N/A	ND	ND	1200	ND	N/A	80	ND	N/A	N/A	N/A	ND
04/24/79		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/18/79		N/A	ND	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.6	N/A	N/A	N/A	N/A
07/16/79		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/20/79		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/19/79		0	ND	ND	N/A	ND	ND	1400	ND	N/A	230	ND	N/A	N/A	N/A	ND
10/25/79		0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/29/79		N/A	ND	ND	N/A	ND	ND	1800	ND	N/A	130	0.5	N/A	N/A	N/A	ND
03/25/80		N/A	ND	ND	N/A	ND	ND	1300	200	N/A	70	ND	N/A	N/A	N/A	ND
06/20/80		N/A	ND	ND	N/A	ND	ND	1300	ND	N/A	220	ND	N/A	N/A	N/A	ND
09/17/80		N/A	ND	ND	N/A	ND	ND	600	ND	N/A	150	ND	N/A	N/A	N/A	ND
02/19/81		N/A	ND	ND	N/A	ND	ND	8000	ND	N/A	480	ND	ND	N/A	N/A	ND
05/21/81		43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
06/08/81		N/A	ND	ND	N/A	ND	ND	1700	ND	N/A	380	ND	N/A	N/A	N/A	ND
09/10/81		N/A	ND	ND	N/A	ND	ND	1300	ND	N/A	80	ND	ND	N/A	N/A	ND
10/21/81		48	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/18/81		41	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
12/17/81		42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/22/82		31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/10/82		24	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/21/82		26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/15/82		36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 2.3-40 (Sheet 3 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
08/16/82	12	ND	ND	N/A	ND	ND	N/A	100	N/A	N/A	ND	ND	N/A	N/A	ND
10/06/82	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/09/82	19	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
12/14/82	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/19/83	23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/08/83	27	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
03/10/83	20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04/18/83	17	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/11/83	25	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/08/83	31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/12/83	42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/23/83	55	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	20
09/23/83	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/04/83	45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/02/83	38	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
12/07/83	19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/10/84	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/09/84	12	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	40
03/14/84	19	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04/12/84	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/23/84	25	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/13/84	30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/11/84	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/21/84	29	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
09/25/84	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/30/84	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/26/84	56	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND

Table 2.3-40 (Sheet 4 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
12/14/84		36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/20/85		110	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
03/26/85		44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/17/85		41	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/13/85		35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/30/85		37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/20/85		22	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
09/23/85		35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/28/85		42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/19/85		37	ND	ND	N/A	ND	30	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
12/13/85		29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/22/86		53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/24/86		38	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
03/13/86		37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/16/86		0, 52	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/17/86		41, 9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/27/86		0, 39	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/23/86		55	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/10/86		42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/22/87		15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/26/87		N/A	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	19
04/08/87		22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/18/87		N/A	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
09/24/87		0, 31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/15/87		0, 37	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
11/16/87		0, 44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12/14/87		0, 37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 2.3-40 (Sheet 5 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
01/25/88		0, 18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/22/88		0, 31	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
03/15/88		0, 35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04/21/88		0, 29	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/26/88		0, 37	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/16/88		0, 36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/11/88		0, 42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/12/88		0, 52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/13/88		0, 39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/28/88		0, 35	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	13
12/20/88		0, 42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/20/89		0, 39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/22/89		0, 55	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	15
03/23/89		0, 30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04/05/89		16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/10/89		25	ND	ND	5.5	ND	4	540	ND	2.3	110	ND	ND	ND	8	ND
06/01/89		32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/11/89		38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/08/89		30	ND	ND	6.5	ND	3	580	ND	3	73	ND	ND	ND	13	ND
09/18/89		35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/23/89		28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/07/89		39	ND	ND	N/A	ND	4	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
12/13/89		31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/04/90		22	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/07/90		34	ND	ND	N/A	ND	6	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
03/07/90		30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04/17/90		32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 2.3-40 (Sheet 6 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
05/07/90		25	ND	ND	N/A	ND	11	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	25
06/06/90		30	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/11/90		43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/13/90		46	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
09/12/90		43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/15/90		28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/07/90		32	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	13
12/04/90		36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
04/03/91		18	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
05/14/91		31	ND	ND	N/A	ND	ND	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/19/91		42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
07/10/91		37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/15/91		48	ND	ND	N/A	ND	3	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
09/16/91		47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/17/91		33	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/07/91		42	ND	ND	N/A	ND	ND	N/A	20	N/A	N/A	ND	ND	N/A	N/A	14
12/11/91		35	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
01/02/92		32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/06/92		32	ND	ND	N/A	ND	3	N/A	ND	N/A	N/A	ND	ND	N/A	N/A	ND
03/16/92		30	ND	ND	N/A	ND	3	1600	ND	3.2	76	ND	ND	N/A	N/A	ND
04/22/92		34	ND	ND	N/A	ND	4	420	ND	N/A	81	ND	ND	N/A	N/A	ND
06/25/92		4	ND	ND	N/A	ND	2	ND	17	N/A	ND	ND	ND	N/A	N/A	ND
07/27/92		N/A	ND	ND	N/A	ND	5	450	ND	42	N/A	ND	ND	N/A	N/A	ND
08/05/92		N/A	ND	ND	N/A	ND	4	380	ND	2.7	N/A	ND	ND	N/A	N/A	ND
09/17/92		N/A	N/A	ND	N/A	ND	3	320	ND	N/A	96	ND	ND	N/A	N/A	ND
10/13/92		N/A	ND	ND	N/A	ND	3	120	ND	N/A	27	ND	ND	N/A	N/A	ND
11/19/92		N/A	ND	ND	N/A	ND	7	1600	ND	N/A	86	ND	ND	N/A	N/A	ND

Table 2.3-40 (Sheet 7 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
12/28/92		N/A	ND	ND	N/A	ND	8	1000	ND	N/A	170	ND	ND	N/A	N/A	ND
01/25/93		N/A	ND	ND	N/A	ND	5	3200	ND	N/A	84	ND	ND	N/A	N/A	ND
02/18/93		N/A	ND	ND	N/A	ND	5	2300	ND	N/A	75	ND	ND	N/A	N/A	ND
03/30/93		N/A	ND	ND	N/A	ND	5	3700	ND	N/A	85	ND	ND	N/A	N/A	ND
04/27/93		N/A	ND	ND	N/A	ND	11	2300	ND	N/A	120	ND	ND	N/A	N/A	ND
05/17/93		N/A	ND	ND	N/A	ND	6	800	ND	N/A	220	ND	ND	N/A	N/A	ND
06/24/93		N/A	ND	ND	N/A	ND	5	400	ND	N/A	140	ND	ND	N/A	N/A	ND
07/27/93		N/A	ND	ND	N/A	ND	3	380	ND	N/A	140	ND	ND	N/A	N/A	ND
08/18/93		N/A	ND	ND	N/A	ND	3	3100	ND	N/A	1200	ND	ND	N/A	N/A	ND
09/20/93		N/A	ND	ND	N/A	ND	4	1600	ND	N/A	760	ND	ND	N/A	N/A	ND
10/18/93		N/A	ND	ND	N/A	ND	4	400	ND	N/A	150	ND	ND	N/A	N/A	ND
11/15/93		N/A	ND	ND	N/A	ND	5	120	ND	N/A	42	ND	ND	N/A	N/A	ND
02/09/94		N/A	ND	ND	N/A	ND	5	2000	ND	N/A	66	ND	ND	N/A	N/A	ND
03/22/94		N/A	ND	ND	N/A	ND	5	1800	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/19/94		N/A	ND	ND	N/A	ND	3	2600	ND	N/A	99	ND	ND	N/A	N/A	23
05/24/94		N/A	ND	ND	N/A	ND	4	510	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/21/94		N/A	N/A	ND	N/A	ND	3	460	ND	N/A	140	N/A	ND	N/A	N/A	ND
07/20/94		N/A	ND	ND	N/A	ND	6	640	ND	N/A	220	ND	ND	N/A	N/A	ND
08/10/94		N/A	ND	ND	N/A	ND	4	320	ND	N/A	60	ND	ND	N/A	N/A	ND
09/22/94		N/A	ND	ND	N/A	ND	ND	590	ND	N/A	270	ND	ND	N/A	N/A	ND
10/18/94		N/A	ND	ND	N/A	ND	4	730	ND	N/A	89	ND	ND	N/A	N/A	13
11/29/94		N/A	ND	ND	N/A	ND	17	470	ND	N/A	90	ND	ND	N/A	N/A	13
12/20/94		N/A	ND	ND	N/A	ND	5	450	ND	N/A	82	ND	ND	N/A	N/A	ND
01/10/95		N/A	ND	ND	N/A	ND	13	640	ND	N/A	57	ND	ND	N/A	N/A	15
02/06/95		N/A	ND	ND	N/A	ND	35	1000	ND	N/A	60	ND	ND	N/A	N/A	ND
03/23/95		N/A	ND	ND	N/A	ND	7	550	ND	N/A	79	ND	ND	N/A	N/A	ND
04/27/95		N/A	ND	ND	N/A	ND	3	960	ND	N/A	390	ND	ND	N/A	N/A	34

Table 2.3-40 (Sheet 8 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
05/17/95		N/A	ND	ND	N/A	ND	4	190	ND	N/A	66	ND	ND	N/A	N/A	ND
06/22/95		N/A	ND	ND	N/A	ND	3	420	ND	N/A	130	ND	ND	N/A	N/A	21
08/10/95		N/A	ND	ND	N/A	ND	7	710	ND	N/A	N/A	ND	ND	N/A	N/A	20
09/18/95		N/A	ND	ND	N/A	ND	4	640	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/31/95		N/A	ND	ND	N/A	ND	5	3900	ND	N/A	82	ND	ND	N/A	N/A	15
11/30/95		N/A	ND	ND	N/A	ND	3	980	ND	N/A	160	ND	ND	N/A	N/A	52
12/27/95		N/A	ND	ND	N/A	ND	3	920	ND	N/A	N/A	ND	ND	N/A	N/A	14
01/23/96		N/A	ND	ND	N/A	ND	9	5100	ND	N/A	100	ND	ND	N/A	N/A	26
02/22/96		N/A	ND	ND	N/A	ND	4	1300	ND	N/A	110	ND	ND	N/A	N/A	23
03/28/96		N/A	ND	ND	N/A	ND	5	1000	ND	N/A	110	ND	ND	N/A	N/A	21
04/18/96		N/A	ND	ND	N/A	ND	3	600	ND	N/A	180	ND	ND	N/A	N/A	ND
05/29/96		N/A	ND	ND	N/A	ND	3	360	ND	N/A	260	ND	ND	N/A	N/A	15
06/25/96		N/A	ND	ND	N/A	ND	4	390	ND	N/A	100	ND	ND	N/A	N/A	42
07/29/96		N/A	ND	ND	N/A	ND	3	280	ND	N/A	130	ND	ND	N/A	N/A	150
08/22/96		N/A	ND	ND	N/A	ND	ND	350	ND	N/A	47	ND	ND	N/A	N/A	10
09/26/96		N/A	ND	ND	N/A	ND	3	860	ND	N/A	170	ND	ND	N/A	N/A	91
10/15/96		N/A	ND	ND	N/A	ND	5	1500	ND	N/A	140	ND	ND	N/A	N/A	16
11/20/96		N/A	ND	ND	N/A	ND	4	830	ND	N/A	100	ND	ND	N/A	N/A	95
12/18/96		N/A	ND	ND	N/A	ND	6	1200	ND	N/A	98	ND	ND	N/A	N/A	28
01/30/97		N/A	ND	ND	N/A	ND	3	600	ND	N/A	77	ND	ND	N/A	N/A	16
02/27/97		N/A	ND	ND	N/A	ND	ND	890	ND	N/A	89	ND	ND	N/A	N/A	ND
03/31/97		N/A	ND	ND	N/A	ND	ND	640	ND	N/A	77	ND	ND	N/A	N/A	33
04/30/97		N/A	ND	ND	N/A	ND	18	2400	ND	N/A	170	ND	ND	N/A	N/A	20
05/22/97		N/A	ND	ND	N/A	ND	10	350	ND	N/A	73	ND	ND	N/A	N/A	22
06/30/97		N/A	ND	ND	N/A	ND	2.8	390	ND	N/A	110	ND	ND	N/A	N/A	36
07/31/97		N/A	ND	ND	N/A	ND	3.4	2000	ND	N/A	1200	ND	ND	N/A	N/A	52
09/08/97		N/A	ND	ND	N/A	ND	5.4	440	ND	N/A	270	ND	ND	N/A	N/A	120

Table 2.3-40 (Sheet 9 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
09/29/97		N/A	ND	ND	N/A	ND	ND	280	ND	N/A	140	ND	ND	N/A	N/A	18
10/15/97		N/A	ND	ND	N/A	ND	ND	160	ND	N/A	51	ND	ND	N/A	N/A	24
11/17/97		N/A	ND	ND	N/A	ND	2.3	180	ND	N/A	57	ND	ND	N/A	N/A	21
12/11/97		N/A	ND	ND	N/A	ND	4.7	580	ND	N/A	75	ND	ND	N/A	N/A	15
01/14/98		N/A	ND	ND	N/A	ND	4.1	700	ND	N/A	68	ND	ND	N/A	N/A	14
02/10/98		N/A	ND	ND	N/A	ND	ND	740	ND	N/A	59	ND	ND	N/A	N/A	ND
03/03/98		N/A	ND	ND	N/A	ND	5.3	2000	ND	N/A	170	ND	ND	N/A	N/A	15
04/15/98		N/A	ND	ND	N/A	ND	2.3	2700	ND	N/A	290	ND	ND	N/A	N/A	17
05/27/98		N/A	ND	ND	N/A	ND	5.4	510	ND	N/A	N/A	ND	ND	N/A	N/A	18
06/11/98		N/A	ND	ND	N/A	ND	3.5	380	ND	N/A	96	ND	ND	N/A	N/A	34
07/29/98		N/A	ND	ND	N/A	ND	ND	520	ND	N/A	380	ND	ND	N/A	N/A	19
08/31/98		N/A	ND	ND	N/A	ND	8.7	1800	ND	N/A	1000	ND	ND	N/A	N/A	43
09/28/98		N/A	ND	ND	N/A	ND	2.3	750	ND	N/A	520	ND	ND	N/A	N/A	40
10/28/98		N/A	ND	ND	N/A	ND	5.8	710	ND	N/A	160	ND	ND	N/A	N/A	12
11/29/98		N/A	ND	ND	N/A	ND	3.5	370	ND	N/A	95	ND	ND	N/A	N/A	26
12/28/98		N/A	ND	ND	N/A	ND	ND	500	ND	N/A	45	ND	ND	N/A	N/A	ND
01/27/99		N/A	ND	ND	N/A	ND	5	3800	ND	N/A	180	ND	ND	N/A	N/A	13
02/17/99		N/A	ND	ND	N/A	ND	ND	1100	ND	N/A	150	ND	ND	N/A	N/A	13
03/22/99		N/A	ND	ND	N/A	ND	5.6	1300	ND	N/A	85	ND	ND	N/A	N/A	21
04/29/99		N/A	ND	ND	N/A	ND	ND	840	ND	N/A	330	ND	ND	N/A	N/A	ND
05/24/99		N/A	ND	ND	N/A	ND	ND	370	ND	N/A	100	ND	ND	N/A	N/A	ND
06/24/99		N/A	ND	ND	N/A	ND	ND	280	ND	N/A	140	ND	ND	N/A	N/A	ND
07/27/99		N/A	ND	ND	N/A	ND	2.2	260	ND	N/A	120	ND	ND	N/A	N/A	ND
08/17/99		N/A	ND	ND	N/A	ND	5.1	390	ND	N/A	270	ND	ND	N/A	N/A	ND
09/29/99		N/A	ND	ND	N/A	ND	6.1	3500	ND	N/A	150	ND	ND	N/A	N/A	11
10/18/99		N/A	ND	ND	N/A	ND	2.7	890	ND	N/A	230	ND	ND	N/A	N/A	ND
11/02/99		N/A	ND	ND	N/A	ND	2.2	520	ND	N/A	75	ND	ND	N/A	N/A	ND

Table 2.3-40 (Sheet 10 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
12/02/99		N/A	ND	ND	N/A	ND	4.7	1000	ND	N/A	91	ND	ND	N/A	N/A	ND
03/15/00		N/A	ND	ND	N/A	ND	2.7	770	ND	N/A	120	ND	ND	N/A	N/A	ND
04/26/00		N/A	ND	ND	N/A	ND	6.3	6300	ND	N/A	260	ND	ND	N/A	N/A	15
05/22/00		N/A	ND	ND	N/A	ND	2.5	260	ND	N/A	65	ND	ND	N/A	N/A	12
06/14/00		N/A	ND	ND	N/A	ND	5.3	320	ND	N/A	91	ND	ND	N/A	N/A	21
07/30/00		N/A	ND	ND	N/A	ND	4.4	840	ND	N/A	360	ND	ND	N/A	N/A	24
08/30/00		N/A	ND	ND	N/A	ND	ND	250	ND	N/A	130	ND	ND	N/A	N/A	ND
05/21/01		N/A	ND	ND	N/A	ND	2.7	430	ND	N/A	130	ND	ND	N/A	N/A	23
08/02/01		N/A	ND	ND	N/A	ND	ND	490	ND	N/A	240	ND	ND	N/A	N/A	ND
11/29/01		N/A	ND	ND	N/A	ND	ND	220	ND	N/A	110	ND	ND	N/A	N/A	ND
02/20/02		N/A	ND	ND	N/A	ND	ND	1200	ND	N/A	110	ND	ND	N/A	N/A	10
05/07/02		N/A	ND	ND	N/A	ND	ND	190	ND	N/A	61	ND	ND	N/A	N/A	ND
08/21/02		N/A	ND	ND	N/A	ND	ND	210	ND	N/A	180	ND	ND	N/A	N/A	ND
11/25/02		N/A	ND	ND	N/A	ND	3.3	850	ND	N/A	93	ND	ND	N/A	N/A	19
02/26/03		N/A	ND	ND	N/A	ND	5.1	1100	ND	N/A	74	ND	ND	N/A	N/A	ND
05/27/03		N/A	ND	ND	N/A	ND	5.9	3000	ND	N/A	75	ND	ND	N/A	N/A	ND
08/21/03		N/A	ND	ND	N/A	ND	3.7	1700	ND	N/A	870	ND	ND	N/A	N/A	ND
11/13/03		N/A	ND	ND	N/A	ND	3	650	ND	N/A	130	ND	ND	N/A	N/A	ND
03/18/04		N/A	ND	ND	N/A	ND	ND	750	ND	N/A	150	ND	ND	N/A	N/A	ND
06/15/04		N/A	ND	ND	N/A	ND	ND	360	ND	N/A	210	ND	ND	N/A	N/A	15
09/16/04		N/A	ND	ND	N/A	ND	2.2	1100	ND	N/A	230	ND	ND	N/A	N/A	14
12/08/04		N/A	ND	ND	N/A	ND	3.5	730	ND	N/A	130	ND	ND	N/A	N/A	19
03/16/05		N/A	ND	ND	N/A	ND	ND	640	ND	N/A	130	ND	ND	N/A	N/A	ND
06/20/05		N/A	ND	ND	N/A	ND	ND	290	ND	N/A	140	ND	ND	N/A	N/A	ND
09/27/05		N/A	ND	ND	N/A	ND	ND	180	ND	N/A	170	ND	ND	N/A	N/A	ND
12/07/05		N/A	ND	ND	N/A	ND	5.7	3300	ND	N/A	240	ND	ND	N/A	N/A	15
03/09/06		N/A	ND	ND	N/A	ND	2.4	580	ND	N/A	59	ND	ND	N/A	N/A	25

Table 2.3-40 (Sheet 11 of 11)
Summary of Metals Analyses from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
06/09/06		N/A	ND	ND	N/A	ND	ND	700	ND	N/A	880	ND	ND	N/A	N/A	11
09/19/06		N/A	ND	ND	N/A	ND	ND	250	ND	N/A	69	ND	ND	N/A	N/A	ND
12/18/06		N/A	ND	ND	N/A	ND	2.4	980	ND	N/A	190	ND	ND	N/A	N/A	ND

Notes:
mg/L = milligrams per liter
N/A = not available
ND = no data

Source: Reference 2.3-052

**Table 2.3-41 (Sheet 1 of 6)
Water Chemistry Data from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC**

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
08/07/73		N/A	ND	0.3	0.37	N/A	N/A	N/A
12/13/73		N/A	0.17	1.5	N/A	1.5	N/A	N/A
01/24/74		N/A	0.07	0.5	0.5	0.2	N/A	N/A
05/08/74		N/A	N/A	0.8	1.1	0.61	N/A	N/A
08/26/75		N/A	0.05	7.2	1.3	0.7	N/A	0.5
09/02/75		N/A	ND	0.7	0.23	0.62	N/A	0.52
12/15/75		N/A	0.07	0.4	0.89	0.43	N/A	0.33
03/01/76		N/A	0.4	1	1.7	0.75	N/A	0.59
05/23/76		N/A	0.14	0.7	1.3	0.55	0.42	N/A
08/09/76		N/A	0.05	0.9	0.91	1.5	1.3	N/A
11/17/76		N/A	5.2	1.7	0.61	N/A	1.2	N/A
01/18/77		N/A	N/A	0.6	0.49	0.21	0.12	N/A
02/16/77		N/A	1.6	2.1	0.92	0.72	0.6	N/A
03/02/77		N/A	N/A	0.8	0.51	0.3	0.18	N/A
04/04/77		N/A	N/A	0.5	0.98	0.39	0.27	N/A
05/05/77		N/A	N/A	0.8	2.5	0.67	0.52	N/A
08/08/77		N/A	N/A	0.8	1.3	1.1	1.1	N/A
11/02/77		N/A	N/A	0.6	0.41	0.32	0.16	N/A
05/15/78		N/A	N/A	0.6	0.47	0.24	0.08	N/A
08/18/78		N/A	0.07	0.7	0.28	0.32	0.08	N/A
11/06/78		N/A	ND	1.5	2.3	1.5	1.3	N/A
03/07/79		N/A	0.17	0.6	0.51	0.19	0.07	N/A
06/18/79		N/A	0.12	0.9	0.97	0.37	0.16	N/A
09/19/79		N/A	0.05	0.6	1.4	0.38	0.25	N/A
11/29/79		N/A	0.06	0.6	0.45	0.27	0.12	N/A
03/25/80		N/A	ND	0.4	0.6	0.15	0.05	N/A
06/20/80		N/A	ND	0.9	1.2	0.54	0.31	N/A
09/17/80		N/A	0.05	0.7	1.7	0.65	0.53	N/A
02/19/81		N/A	0.21	0.9	1	0.58	0.13	N/A
06/08/81		N/A	0.05	0.9	2	0.7	0.37	N/A
09/10/81		N/A	0.1	0.8	0.52	0.24	0.09	N/A
10/21/81		N/A	0.11	0.9	0.86	0.39	0.25	N/A
11/18/81		N/A	ND	0.4	0.99	0.32	0.24	N/A
12/17/81		N/A	0.32	1.1	1.3	0.51	0.44	N/A
01/22/82		N/A	0.41	0.9	0.68	0.21	0.12	N/A
02/10/82		N/A	0.17	0.6	0.56	0.17	0.06	N/A
06/21/82		N/A	0.15	1	0.36	0.19	0.06	N/A
07/15/82		N/A	0.36	0.8	0.62	0.23	0.06	N/A
08/16/82		N/A	0.27	1	0.44	0.21	ND	N/A
09/14/82		N/A	0.66	1.2	0.27	0.2	ND	N/A
10/06/82		N/A	0.2	0.7	0.7	0.16	0.07	N/A
11/09/82		N/A	0.12	0.6	0.72	0.24	0.13	N/A
12/14/82		N/A	0.12	0.7	0.69	0.29	0.1	N/A
01/19/83		N/A	0.1	0.7	0.76	0.15	0.07	N/A

Table 2.3-41 (Sheet 2 of 6)
Water Chemistry Data from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
02/08/83		N/A	0.19	0.6	0.8	0.22	0.11	N/A
03/10/83		N/A	0.11	0.5	0.52	0.2	0.06	N/A
04/18/83		N/A	0.1	0.7	0.36	0.23	0.04	N/A
05/11/83		N/A	0.13	0.4	0.44	0.09	ND	N/A
06/08/83		N/A	0.34	0.9	0.49	0.12	0.01	N/A
07/12/83		N/A	0.87	1.3	0.26	0.35	0.01	N/A
08/23/83		N/A	1.3	2.7	0.09	0.41	0.01	N/A
09/23/83		N/A	0.06	0.5	0.44	0.09	0.05	N/A
10/04/83		N/A	0.09	0.6	0.8	0.22	0.12	N/A
11/02/83		N/A	0.12	0.6	1	0.24	0.12	N/A
12/07/83		N/A	0.19	0.9	0.53	0.26	0.1	N/A
01/10/84		N/A	0.18	0.6	0.64	0.14	0.07	N/A
02/09/84		N/A	0.31	0.6	0.69	0.19	0.1	N/A
03/14/84		N/A	0.13	0.6	0.5	0.15	0.05	N/A
04/12/84		N/A	0.11	0.5	0.47	0.22	0.09	N/A
05/23/84		N/A	0.26	0.7	0.45	0.11	0.04	N/A
06/13/84		N/A	0.55	0.9	0.19	0.1	0.01	N/A
07/11/84		N/A	0.53	1.1	0.47	0.26	0.04	N/A
08/21/84		N/A	0.42	0.8	0.24	0.21	0.02	N/A
09/25/84		N/A	0.14	0.6	0.51	0.1	0.02	N/A
10/30/84		N/A	0.21	0.6	0.32	0.15	0.03	N/A
11/26/84		N/A	0.05	0.5	1	0.3	0.23	N/A
12/14/84		N/A	0.15	0.6	0.68	0.28	0.17	N/A
02/20/85		N/A	0.13	0.5	0.56	0.18	0.08	N/A
05/17/85		N/A	0.16	0.7	0.29	0.17	0.07	N/A
08/20/85		N/A	0.21	0.7	0.5	0.22	0.09	N/A
11/19/85		N/A	0.31	0.5	0.61	0.19	0.12	N/A
02/24/86		N/A	0.08	0.5	0.72	0.22	0.13	N/A
05/16/86		N/A	0.14	0.6	0.29	0.13	0.07	N/A
08/27/86		N/A	0.25	0.7	0.46	0.31	0.2	N/A
09/24/87		N/A	0.12	0.8	0.3	0.18	0.09	N/A
10/15/87		N/A	0.32	0.9	0.23	0.1	0.02	N/A
11/16/87		N/A	0.06	0.7	1.3	0.54	0.46	N/A
12/14/87		N/A	0.25	0.8	1.3	0.45	0.35	N/A
01/25/88		N/A	0.23	0.5	0.7	0.21	0.1	N/A
02/22/88		N/A	0.36	0.7	0.72	0.15	0.07	N/A
03/15/88		N/A	0.12	0.5	0.98	0.17	0.09	N/A
04/21/88		N/A	0.11	0.5	0.61	0.18	0.08	N/A
05/26/88		N/A	0.29	0.6	0.34	0.1	0.05	N/A
06/16/88		N/A	0.11	0.6	0.27	0.11	0.04	N/A
07/11/88		N/A	0.14	0.6	0.1	0.09	0.02	N/A
09/12/88		N/A	0.41	0.9	0.61	0.17	0.06	N/A
10/13/88		N/A	0.09	0.7	0.71	0.15	0.06	N/A
11/28/88		N/A	0.11	0.6	0.89	0.16	0.08	N/A

Table 2.3-41 (Sheet 3 of 6)
Water Chemistry Data from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date		Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
12/20/88		N/A	0.15	0.5	1.2	0.22	0.12	N/A
01/20/89		N/A	0.21	0.6	1.2	0.2	0.12	N/A
02/22/89		N/A	0.04	0.5	0.64	0.18	N/A	N/A
03/23/89		N/A	0.15	0.6	0.71	0.2	0.04	N/A
04/05/89		N/A	0.06	0.4	0.48	0.11	0.03	N/A
05/10/89		N/A	0.19	0.7	0.26	0.1	N/A	N/A
06/01/89		N/A	0.12	0.5	0.3	0.1	N/A	N/A
07/11/89		N/A	0.49	1.2	0.24	0.18	N/A	N/A
08/08/89		N/A	0.03	0.5	0.16	0.06	N/A	N/A
09/18/89		N/A	0.26	0.6	0.25	0.17	0.02	N/A
10/23/89		N/A	0.13	0.6	0.55	0.15	0.07	N/A
11/07/89		N/A	0.11	0.8	0.63	0.12	0.04	N/A
12/13/89		N/A	0.08	0.4	1.1	0.15	0.07	N/A
01/04/90		N/A	0.26	0.5	0.97	0.14	0.06	N/A
02/07/90		N/A	0.07	0.4	0.63	0.09	0.02	N/A
03/07/90		N/A	0.05	0.4	0.55	0.09	0.01	N/A
04/17/90		N/A	0.04	0.4	0.69	0.14	0.04	N/A
05/07/90		N/A	0.18	0.6	0.55	0.15	0.05	N/A
06/06/90		N/A	0.09	0.6	0.6	0.1	0.03	N/A
07/11/90		N/A	0.1	0.5	0.3	0.08	ND	N/A
08/13/90		N/A	0.18	0.5	0.32	0.09	0.03	N/A
09/12/90		N/A	0.12	0.6	0.45	0.07	0.02	N/A
10/15/90		N/A	0.16	0.5	0.82	0.24	0.09	N/A
11/07/90		N/A	0.17	0.5	0.71	0.1	0.04	N/A
12/04/90		N/A	0.07	0.4	0.95	0.1	0.04	N/A
04/03/91		N/A	0.03	0.4	0.42	0.12	ND	N/A
05/14/91		N/A	0.19	0.5	0.46	0.05	ND	N/A
06/19/91		N/A	0.57	1	0.24	0.23	0.01	N/A
07/10/91		N/A	0.69	0.9	0.32	0.21	ND	N/A
08/15/91		N/A	0.66	1.2	0.44	0.17	ND	N/A
09/16/91		N/A	0.31	0.8	0.34	0.07	0.02	N/A
10/17/91		N/A	0.14	0.6	0.51	0.1	ND	N/A
11/07/91		N/A	0.02	0.6	0.74	0.09	0.021	N/A
12/11/91		N/A	0.09	0.7	1.2	0.15	0.06	N/A
01/02/92		N/A	0.1	0.6	1.3	0.13	0.04	N/A
02/06/92		N/A	0.16	0.4	0.92	0.07	0.03	N/A
03/16/92		12	0.9	0.5	0.68	0.1	0.02	N/A
04/22/92		15	0.22	0.7	0.58	0.1	0.02	N/A
06/25/92		12	0.15	0.7	0.43	0.12	0.03	N/A
07/27/92		16	0.13	0.6	0.47	0.14	N/A	N/A
08/05/92		13	0.11	0.6	0.29	0.1	N/A	N/A
09/17/92		18	0.12	0.8	0.32	0.09	N/A	N/A
10/13/92		20	0.07	0.7	0.57	0.14	N/A	N/A
11/19/92		11	0.13	0.4	0.58	0.16	N/A	N/A

Table 2.3-41 (Sheet 4 of 6)
Water Chemistry Data from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
12/28/92		14	0.13	0.4	0.62	0.1	N/A	N/A
01/25/93		8	0.22	0.6	0.61	0.18	N/A	N/A
02/18/93		11	0.32	0.8	0.88	0.18	N/A	N/A
03/30/93		6	0.12	0.6	0.45	0.16	N/A	N/A
04/27/93		7	0.13	0.4	0.51	0.12	N/A	N/A
05/17/93		9	0.2	0.6	0.38	0.09	N/A	N/A
06/24/93		15	0.11	0.5	0.22	0.07	N/A	N/A
07/27/93		27	0.12	0.5	0.5	0.13	N/A	N/A
08/18/93		13	0.69	1.2	0.22	0.27	N/A	N/A
09/20/93		21	0.7	1.1	0.37	0.17	N/A	N/A
10/18/93		21	0.1	0.5	0.59	0.06	N/A	N/A
11/15/93		26	0.12	0.6	0.81	0.14	N/A	N/A
02/09/94		13	0.21	0.5	0.62	0.1	N/A	N/A
03/22/94		12	0.17	0.4	0.64	0.11	N/A	N/A
04/19/94		9	0.12	0.5	0.61	0.1	N/A	N/A
05/24/94		22	0.1	0.5	0.51	0.05	N/A	N/A
06/21/94		22	0.1	0.6	0.4	0.09	N/A	N/A
07/20/94		19	0.11	0.5	0.12	0.08	N/A	N/A
08/10/94		12	0.11	0.5	0.35	0.12	N/A	N/A
09/22/94		16	0.19	1.4	0.28	0.09	N/A	N/A
10/18/94		22	0.16	0.8	0.71	0.12	N/A	N/A
11/29/94		28	0.08	0.6	0.91	0.13	N/A	N/A
12/20/94		24	0.12	0.4	0.84	0.1	N/A	N/A
01/10/95		24	0.03	0.7	1.1	0.15	N/A	N/A
02/06/95		14	0.17	0.6	0.68	0.13	N/A	N/A
03/23/95		11	0.16	0.5	0.36	0.1	N/A	N/A
04/27/95		18	0.31	0.6	0.47	0.11	N/A	N/A
05/17/95		21	0.11	0.6	0.59	0.09	N/A	N/A
06/22/95		13	0.12	0.5	0.28	0.08	N/A	N/A
08/10/95		14	0.23	0.8	0.08	0.11	N/A	N/A
09/18/95		11	0.3	0.7	0.32	0.09	N/A	N/A
10/31/95		8	0.14	0.5	0.46	0.17	N/A	N/A
11/30/95		12	0.09	0.4	0.75	0.09	N/A	N/A
12/27/95		12	0.18	0.5	0.9	0.06	N/A	N/A
01/23/96		12	0.16	0.5	0.63	0.2	N/A	N/A
02/22/96		14	0.22	0.7	0.79	0.18	N/A	N/A
03/28/96		11	0.06	0.4	0.56	0.11	N/A	N/A
04/18/96		11	0.1	0.3	0.57	0.1	N/A	N/A
05/29/96		12	0.16	0.4	0.74	0.09	N/A	N/A
06/25/96		12	0.09	0.6	0.4	0.07	N/A	N/A
07/29/96		22	0.1	0.5	0.41	0.14	N/A	N/A
08/22/96		16	0.09	0.6	0.29	0.05	N/A	N/A
09/26/96		9	0.07	0.5	0.15	0.04	N/A	N/A
10/15/96		9	0.08	0.4	0.38	0.06	N/A	N/A

Table 2.3-41 (Sheet 5 of 6)
Water Chemistry Data from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
11/20/96		15	0.08	0.3	0.61	0.09	N/A	N/A
12/18/96		10	0.08	0.3	0.59	0.08	N/A	N/A
01/30/97		11	0.05	0.5	0.53	0.07	N/A	N/A
02/27/97		10	0.05	0.4	0.47	0.03	N/A	N/A
03/31/97		9	0.04	0.4	0.52	0.09	N/A	N/A
04/30/97		5	0.06	0.5	0.4	0.17	N/A	N/A
05/22/97		10	0.01	0.4	0.29	0.07	N/A	N/A
06/30/97		12	0.05	0.9	0.23	0.06	N/A	N/A
07/31/97		12	0.52	1	0.16	0.17	N/A	N/A
09/08/97		28	0.12	0.5	0.21	0.06	N/A	N/A
09/29/97		18	0.07	0.4	0.52	0.07	N/A	N/A
10/15/97		16	0.01	0.4	0.26	0.05	N/A	N/A
11/17/97		23	0.04	0.2	0.84	0.08	N/A	N/A
12/11/97		N/A	0.06	0.3	0.93	0.08	N/A	N/A
01/14/98		13	0.07	0.3	0.53	0.12	N/A	N/A
02/10/98		8	0.08	0.3	0.38	0.1	N/A	N/A
03/03/98		8	0.11	0.3	0.5	0.08	N/A	N/A
04/15/98		8	0.1	0.2	0.35	0.12	N/A	N/A
05/27/98		10	0.05	0.2	0.36	0.03	N/A	N/A
06/11/98		14	0.13	0.3	0.58	0.07	N/A	N/A
07/29/98		16	0.14	0.4	0.05	0.07	N/A	N/A
08/31/98		19	0.55	0.9	0.1	0.14	N/A	N/A
09/28/98		20	0.26	0.6	0.21	0.09	N/A	N/A
10/28/98		24	0.12	0.5	0.48	0.1	N/A	N/A
11/29/98		24	0.06	0.5	0.68	0.07	N/A	N/A
12/28/98		24	0.1	0.6	1.3	0.12	N/A	N/A
01/27/99		8	0.13	0.7	0.52	0.2	N/A	N/A
02/17/99		16.5	0.04	0.4	0.95	0.11	N/A	N/A
03/22/99		15	0.04	0.4	0.7	0.11	N/A	N/A
04/29/99		14	0.26	0.5	0.47	0.08	N/A	N/A
05/24/99		13	ND	0.5	0.41	0.08	N/A	N/A
06/24/99		19	0.05	0.5	0.26	0.08	N/A	N/A
07/27/99		22	0.05	0.4	0.16	0.11	N/A	N/A
08/17/99		22	0.12	0.6	ND	0.07	N/A	N/A
09/29/99		6.37	0.06	0.4	0.58	0.24	N/A	N/A
10/18/99		15.71	0.15	1.2	0.83	0.17	N/A	N/A
11/02/99		10.09	ND	0.5	0.43	0.08	N/A	N/A
12/02/99		13.59	0.23	0.6	0.54	0.1	N/A	N/A
03/15/00		9.31	0.08	1.2	0.23	0.05	N/A	N/A
04/26/00		10.2	0.03	0.3	0.25	0.04	N/A	N/A
05/22/00		12.24	0.09	0.4	0.11	0.04	N/A	N/A
06/14/00		14	0.09	0.6	0.16	0.06	N/A	N/A
07/30/00		16	0.24	1.1	0.2	0.07	N/A	N/A
08/30/00		N/A	0.05	0.7	0.18	0.08	N/A	N/A

Table 2.3-41 (Sheet 6 of 6)
Water Chemistry Data from DWQ Station B4050000 — Haw River below B. Everett Jordan Dam near Moncure, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
09/13/00		N/A	0.02	0.4	0.45	0.06	N/A	N/A
10/09/00		N/A	0.05	0.5	0.11	0.03	N/A	N/A
11/29/00		N/A	0.05	0.8	0.37	0.09	N/A	N/A
01/03/01		24	0.46	0.6	0.78	0.11	N/A	N/A
02/01/01		N/A	ND	1	0.2	ND	N/A	N/A
05/21/01		N/A	ND	ND	0.59	ND	N/A	N/A
06/25/01		N/A	0.13	0.9	0.01	0.03	N/A	N/A
07/11/01		N/A	1.1	0.91	0.01	0.01	N/A	N/A

Notes:
mg/L = milligrams per liter
N/A = not available
ND = no data

Source: Reference 2.3-052

Table 2.3-42 (Sheet 1 of 5)
Field Parameters from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
06/13/1955	N/A	6.4	85	N/A
08/29/1955	N/A	6.5	55	N/A
03/07/1957	N/A	6.7	54	N/A
08/09/1957	N/A	6.4	68	N/A
03/04/1958	N/A	6.2	52	N/A
08/20/1958	N/A	6.5	87	N/A
02/24/1959	N/A	6.6	65	N/A
09/22/1959	N/A	6.7	73	N/A
03/16/1960	N/A	7	57	N/A
08/31/1960	N/A	6.5	52	N/A
02/14/1961	N/A	6.6	62	N/A
09/18/1961	N/A	7.2	88	N/A
10/01/1961	N/A	7.1	132	N/A
11/01/1961	N/A	7.8	153	N/A
12/01/1961	N/A	7.6	155	N/A
12/19/1961	N/A	6.5	74	N/A
01/01/1962	N/A	7.1	81	N/A
01/07/1962	N/A	6.8	58	N/A
01/18/1962	N/A	6.7	70	N/A
02/01/1962	N/A	7.1	69	N/A
03/01/1962	N/A	6.9	62	N/A
04/01/1962	N/A	7.2	60	N/A
05/01/1962	N/A	7	90	N/A
05/30/1962	N/A	7.2	120	N/A
06/01/1962	N/A	7.2	107	N/A
06/06/1962	N/A	7	58	N/A
07/01/1962	N/A	7	53	N/A
07/06/1962	N/A	6.5	74	N/A
07/16/1962	N/A	7.3	95	N/A
08/01/1962	N/A	7.5	111	N/A
09/01/1962	N/A	7.6	140	N/A
10/01/1962	N/A	6.9	160	N/A
10/08/1962	N/A	6.8	100	N/A
10/24/1962	N/A	6.7	110	N/A
11/01/1962	N/A	7.2	130	N/A
11/09/1962	N/A	6.8	74	N/A
12/01/1962	N/A	6.9	73	N/A
01/01/1963	N/A	7	62	N/A
02/01/1963	N/A	7.1	64	N/A
03/01/1963	N/A	6.5	66	N/A
03/15/1963	N/A	7.2	100	N/A
03/16/1963	N/A	6.6	64	N/A
04/01/1963	N/A	7.4	89	N/A
05/01/1963	N/A	7.2	110	N/A
06/01/1963	N/A	7.2	81	N/A
06/09/1963	N/A	6.7	115	N/A
07/01/1963	N/A	7.4	130	N/A
08/01/1963	N/A	6.8	88	N/A
09/01/1963	N/A	6.4	120	N/A
09/04/1963	N/A	7.7	165	N/A
10/01/1963	N/A	7.1	135	N/A
10/15/1963	N/A	4.3	240	N/A

Table 2.3-42 (Sheet 2 of 5)
Field Parameters from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (μS/cm)	Temperature (degrees C)
10/16/1963	N/A	6.8	170	N/A
11/01/1963	N/A	7.3	180	N/A
11/07/1963	N/A	7.2	97	N/A
12/01/1963	N/A	6.7	83	N/A
01/01/1964	N/A	7	67	N/A
02/01/1964	N/A	7.2	59	N/A
03/01/1964	N/A	7.5	69	N/A
04/01/1964	N/A	7.4	62	N/A
05/01/1964	N/A	7.1	96	N/A
06/01/1964	N/A	6.8	110	N/A
07/01/1964	N/A	7.1	82	N/A
07/16/1964	N/A	7.5	130	N/A
07/17/1964	N/A	7	79	N/A
08/01/1964	N/A	6.5	70	N/A
09/01/1964	N/A	6.4	64	N/A
10/01/1964	N/A	6.5	61	N/A
11/01/1964	N/A	6.9	100	N/A
12/01/1964	N/A	6.6	87	N/A
01/01/1965	N/A	6.2	93	N/A
02/01/1965	N/A	6.7	68	N/A
03/01/1965	N/A	6.9	65	N/A
03/18/1965	N/A	3.6	180	N/A
03/21/1965	N/A	6.9	64	N/A
04/01/1965	N/A	7.1	83	N/A
05/01/1965	N/A	6.6	82	N/A
06/01/1965	N/A	7.6	120	N/A
06/16/1965	N/A	6.9	65	N/A
07/01/1965	N/A	6.8	68	N/A
08/01/1965	N/A	7	66	N/A
08/21/1965	N/A	7.2	90	N/A
09/01/1965	N/A	6.7	130	N/A
09/13/1965	N/A	6.6	82	N/A
06/19/1968	8.2	13.6	103	N/A
10/24/1968	8.6	12.9	129	N/A
02/05/1969	11	12.1	61	9
06/15/1970	7.8	7.6	120	24.7
02/17/1976	13.2	5.9	70	13
10/02/1981	10.1	6.9	115	21.5
10/27/1981	N/A	6.1	112	N/A
10/28/1981	7.7	5.8	102	14.5
01/04/1982	12.4	6.2	68	6
03/31/1982	8.7	6.8	90	14
06/04/1982	9	7	65	22
06/05/1982	8.7	6.3	60	21
06/11/1982	8.4	6.1	47	20.5
08/26/1982	6.5	6.6	105	25
11/18/1982	9.8	6.2	145	9.5
12/13/1982	11.5	6.7	85	7.5
12/14/1982	12.7	6.7	88	6
02/15/1983	13.2	6.9	68	5
03/21/1983	11	6.3	50	13
05/03/1983	8.2	6.5	75	20

Table 2.3-42 (Sheet 3 of 5)
Field Parameters from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
09/07/1983	3.3	6.9	211	27.5
09/28/1983	10.2	6.5	200	19.5
08/14/2002	5.5	7.6	367	27.4
08/20/2002	7.1	7.6	352	30.8
08/27/2002	4.6	7.1	359	26.5
09/04/2002	7.9	6.8	104	23.5
09/11/2002	5.8	6.9	168	24.7
09/17/2002	7	6.8	114	24.1
09/25/2002	6	7.1	149	23.1
10/01/2002	6.1	7	218	23.5
10/07/2002	7	7.2	208	25.4
10/12/2002	8	6.3	81	19.8
10/15/2002	8.4	6.4	97	18.5
10/22/2002	7.4	7.8	101	15.2
10/29/2002	8.5	8.4	132	14.6
11/05/2002	8.8	7.1	116	12.2
11/12/2002	9.2	7.4	134	14.4
11/19/2002	8.2	6.4	81	11.5
11/26/2002	10.8	7.3	103	8.6
12/03/2002	11.3	6.7	104	6.4
12/09/2002	11.8	5.7	92	3.9
12/17/2002	12.6	6	79	6.2
01/08/2003	11.9	7.4	97	5.5
01/14/2003	12.5	7.3	101	4.5
01/21/2003	13.7	7.2	123	2.5
01/30/2003	13	6.9	141	2.4
02/05/2003	12.6	7	134	5.8
02/11/2003	11.7	6.8	93	5.2
02/21/2003	11.8	6.8	89	5.2
02/25/2003	11.3	6.3	82	8.4
03/06/2003	11.8	6.8	89	5.2
03/21/2003	10.9	6.4	51	10.3
03/24/2003	10.1	6	57	12.1
04/01/2003	10.3	6.4	81	12
04/08/2003	10.1	6.6	83	13.9
04/10/2003	11.8	6.3	51	9.8
04/15/2003	9.7	6.1	64	13.4
04/22/2003	9.8	6.9	90	16.1
05/02/2003	8.8	7	112	19.5
05/09/2003	8.7	6.7	80	18.8
05/14/2003	8.1	7.1	111	21.7
05/28/2003	8.7	6.6	73	18.8
06/02/2003	8.8	6.8	84	18.9
06/13/2003	8.4	6.9	88	23.4
06/20/2003	8.2	6.6	74	22.2
06/24/2003	8.5	6.9	96	22.6
07/03/2003	8.4	6.6	88	23.6
07/10/2003	7.2	7	91	27.4
07/16/2003	7.6	7.1	132	26.5
07/23/2003	7	7.1	110	26.8
07/29/2003	8.1	7.3	144	27.8
08/05/2003	8	6.8	67	24.5
08/27/2003	8	6.6	104	26.6

Table 2.3-42 (Sheet 4 of 5)
Field Parameters from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
09/03/2003	7.2	7	130	26.4
09/12/2003	8.3	6.8	95	21.9
09/17/2003	8.4	7.6	114	22.9
09/24/2003	8.5	7.1	92	21.9
10/01/2003	8.8	7.3	80	18.4
10/07/2003	9.3	7.4	103	17.9
10/15/2003	9.4	7.6	133	18.4
10/20/2003	10.2	7.8	145	16.7
10/31/2003	10.8	7.4	142	15.6
11/12/2003	10.7	7.6	142	14.4
11/21/2003	10.8	7.5	147	12.8
11/28/2003	12.1	7.5	176	11.8
12/11/2003	11.9	7.1	99	9.1
12/23/2003	14.9	7.2	117	4.6
01/06/2004	11.8	7.6	127	8.3
01/20/2004	13.2	7.4	144	3.8
02/03/2004	13.1	7.5	155	3.1
02/18/2004	12.5	7.2	102	5.6
03/08/2004	11.4	7.3	111	13.1
03/18/2004	11.3	7.2	121	12.1
03/30/2004	10.4	7.5	123	14.3
04/13/2004	9.9	7.1	134	14.9
05/12/2004	8.4	7.3	114	23.3
05/27/2004	6.6	7.6	159	27.4
06/10/2004	7.9	7.3	197	26.1
06/22/2004	7.6	7.5	205	26.2
07/09/2004	7	7.3	169	28.5
07/15/2004	7.5	7.7	170	29.7
07/20/2004	7.2	7.3	180	27
07/27/2004	7	7.3	214	28.8
07/30/2004	6.6	7.3	242	26.6
08/03/2004	7	7.3	144	27.5
08/06/2004	7.9	7.3	227	26.7
08/10/2004	7.4	7.5	218	26.1
08/15/2004	7.7	7.2	122	22.4
Number of Events	**107**	**192**	**192**	**105**
MAX	**14.9**	**13.6**	**367**	**30.8**
MIN	**3.3**	**3.6**	**47**	**2.4**
Mean	**9.3**	**N/A** [(a)]	**109.7**	**17.1**
NC Water Quality Standards	**5.0 mg/L**	**6.0 – 9.0**	**N/A**	**See note** [(b)]

Table 2.3-42 (Sheet 5 of 5)
Field Parameters from USGS Station 02102000 — Deep River at Moncure, NC

Notes:
a) Average pH values cannot be calculated.

b) Temperature: not to exceed 2.8 degrees C (5.04 degrees F) above the natural water temperature, and in no case exceed 29 degrees C (84.2 degrees F) for mountain and upper piedmont waters and 32 degrees C (86.9 degrees F) for lower piedmont and coastal waters. The temperature for trout waters shall not be increased by more than 0.5 degrees C (0.9 degrees F) due to the discharge of heated liquids, but in no case to exceed 20 degrees C (68 degrees F).

μS/cm = microSiemens per centimeter
C = Celsius
F = Fahrenheit
mg/L = milligrams per liter
N/A = not available

Source: Reference 2.3-036

Table 2.3-43 (Sheet 1 of 7)
Analytical Results for Metals from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Zinc (unfiltered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	7	1000	1000	25	N/A	N/A	0.01	88	N/A	N/A	50	50	N/A
	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L
06/13/1955		N/A	N/A	N/A	N/A	5.2	N/A	N/A	N/A	N/A	N/A	1.6	N/A	N/A	N/A	2	6.9	N/A	N/A	20
08/29/1955		N/A	N/A	N/A	N/A	3.8	N/A	N/A	N/A	N/A	N/A	1	N/A	N/A	N/A	1.5	3.5	N/A	N/A	13
03/07/1957		N/A	N/A	N/A	N/A	3.7	N/A	N/A	N/A	N/A	N/A	0.7	N/A	N/A	N/A	1.3	4.4	N/A	N/A	12
08/09/1957		N/A	N/A	N/A	N/A	4.4	N/A	N/A	N/A	N/A	N/A	1.7	N/A	N/A	N/A	2	5	N/A	N/A	18
03/04/1958		N/A	N/A	N/A	N/A	3.4	N/A	N/A	N/A	N/A	N/A	1.6	N/A	N/A	N/A	1	4	N/A	N/A	15
08/20/1958		N/A	N/A	N/A	N/A	6	N/A	N/A	N/A	N/A	N/A	2.2	N/A	N/A	N/A	1.8	8.4	N/A	N/A	24
02/24/1959		N/A	N/A	N/A	N/A	4.8	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	1.1	5.2	N/A	N/A	18
09/22/1959		N/A	N/A	N/A	N/A	5.7	N/A	N/A	N/A	N/A	N/A	2.3	N/A	N/A	N/A	1.7	5.1	N/A	N/A	24
03/16/1960		N/A	N/A	N/A	N/A	4.3	N/A	N/A	N/A	N/A	N/A	1.1	N/A	N/A	N/A	0.9	4.6	N/A	N/A	15
08/31/1960		N/A	N/A	N/A	N/A	3.2	N/A	N/A	N/A	N/A	N/A	1.6	N/A	N/A	N/A	2.2	3.4	N/A	N/A	14
02/14/1961		N/A	N/A	N/A	N/A	4.2	N/A	N/A	N/A	N/A	N/A	1.7	N/A	N/A	N/A	1.6	4.5	N/A	N/A	18
09/18/1961		N/A	N/A	N/A	N/A	5	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A	N/A	1.9	7.9	N/A	N/A	25
10/01/1961		N/A	N/A	N/A	N/A	8.2	N/A	N/A	N/A	10	N/A	2.8	N/A	N/A	N/A	2.6	13	N/A	N/A	32
11/01/1961		N/A	N/A	N/A	N/A	8.9	N/A	N/A	N/A	30	N/A	3.2	N/A	N/A	N/A	3	16	N/A	N/A	35
12/01/1961		N/A	N/A	N/A	N/A	7.7	N/A	N/A	N/A	60	N/A	2.9	N/A	N/A	N/A	3.4	17	N/A	N/A	31
12/19/1961		N/A	N/A	N/A	N/A	4.2	N/A	N/A	N/A	40	N/A	2.4	N/A	N/A	N/A	2	5.5	N/A	N/A	20
01/01/1962		N/A	N/A	N/A	N/A	5.5	N/A	N/A	N/A	80	N/A	2	N/A	N/A	N/A	2	6	N/A	N/A	22

Table 2.3-43 (Sheet 2 of 7)
Analytical Results for Metals from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Zinc (unfiltered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	7	1000	1000	25	N/A	N/A	0.01	88	N/A	N/A	50	50	N/A
	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L
01/07/1962		N/A	N/A	N/A	N/A	4.3	N/A	N/A	N/A	10	N/A	1	N/A	N/A	N/A	1.5	3.9	N/A	N/A	15
01/18/1962		N/A	N/A	N/A	N/A	4.5	N/A	N/A	N/A	50	N/A	1.9	N/A	N/A	N/A	1.2	5.9	N/A	N/A	19
02/01/1962		N/A	N/A	N/A	N/A	4.8	N/A	N/A	N/A	70	N/A	1.8	N/A	N/A	N/A	1	5.2	N/A	N/A	20
03/01/1962		N/A	N/A	N/A	N/A	4.6	N/A	N/A	N/A	50	N/A	1.3	N/A	N/A	N/A	1	4.4	N/A	N/A	16
04/01/1962		N/A	N/A	N/A	N/A	4.9	N/A	N/A	N/A	40	N/A	1.2	N/A	N/A	N/A	0.9	5.2	N/A	N/A	17
05/01/1962		N/A	N/A	N/A	N/A	6	N/A	N/A	N/A	0	N/A	2.2	N/A	N/A	N/A	1	8.6	N/A	N/A	24
05/30/1962		N/A	N/A	N/A	N/A	8.3	N/A	N/A	N/A	40	N/A	1.8	N/A	N/A	N/A	2.1	12	N/A	N/A	28
06/01/1962		N/A	N/A	N/A	N/A	6.7	N/A	N/A	N/A	40	N/A	2.7	N/A	N/A	N/A	1.7	11	N/A	N/A	28
06/06/1962		N/A	N/A	N/A	N/A	4.4	N/A	N/A	N/A	60	N/A	1.6	N/A	N/A	N/A	1.7	3.8	N/A	N/A	18
07/01/1962		N/A	N/A	N/A	N/A	4	N/A	N/A	N/A	40	N/A	1.6	N/A	N/A	N/A	1.6	3.7	N/A	N/A	16
07/06/1962		N/A	N/A	N/A	N/A	4.6	N/A	N/A	N/A	70	N/A	2.2	N/A	N/A	N/A	1.6	5.6	N/A	N/A	20
07/16/1962		N/A	N/A	N/A	N/A	6.6	N/A	N/A	N/A	70	N/A	2.5	N/A	N/A	N/A	1.5	7.9	N/A	N/A	27
08/01/1962		N/A	N/A	N/A	N/A	7	N/A	N/A	N/A	10	N/A	3	N/A	N/A	N/A	2	12	N/A	N/A	30
09/01/1962		N/A	N/A	N/A	N/A	6.9	N/A	N/A	N/A	70	N/A	2.6	N/A	N/A	N/A	3.2	18	N/A	N/A	28
10/01/1962		N/A	N/A	N/A	N/A	7.4	N/A	N/A	N/A	0	N/A	2.9	N/A	N/A	N/A	3.4	22	N/A	N/A	30
10/08/1962		N/A	N/A	N/A	N/A	6.9	N/A	N/A	N/A	80	N/A	1.9	N/A	N/A	N/A	3	10	N/A	N/A	25
10/24/1962		N/A	N/A	N/A	N/A	6.7	N/A	N/A	N/A	10	N/A	2.6	N/A	N/A	N/A	3	13	N/A	N/A	28

Table 2.3-43 (Sheet 3 of 7)
Analytical Results for Metals from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Zinc (unfiltered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	7	1000	1000	25	N/A	N/A	0.01	88	N/A	N/A	50	50	N/A
	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L
11/01/1962		N/A	N/A	N/A	N/A	7.7	N/A	N/A	N/A	0	N/A	2.7	N/A	N/A	N/A	3.2	16	N/A	N/A	30
11/09/1962		N/A	N/A	N/A	N/A	5.2	N/A	N/A	N/A	10	N/A	1.9	N/A	N/A	N/A	2.4	5.9	N/A	N/A	21
12/01/1962		N/A	N/A	N/A	N/A	4.7	N/A	N/A	N/A	10	N/A	1.8	N/A	N/A	N/A	1.7	5.6	N/A	N/A	20
01/01/1963		N/A	N/A	N/A	N/A	4.6	N/A	N/A	N/A	60	N/A	1.5	N/A	N/A	N/A	1.4	5.3	N/A	N/A	18
02/01/1963		N/A	N/A	N/A	N/A	4.6	N/A	N/A	N/A	40	N/A	1.3	N/A	N/A	N/A	1.5	5.7	N/A	N/A	17
03/01/1963		N/A	N/A	N/A	N/A	3.8	N/A	N/A	N/A	30	N/A	1.6	N/A	N/A	N/A	1	5.2	N/A	N/A	16
03/15/1963		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20
03/16/1963		N/A	N/A	N/A	N/A	3.4	N/A	N/A	N/A	40	N/A	2	N/A	N/A	N/A	1.3	5.5	N/A	N/A	17
04/01/1963		N/A	N/A	N/A	N/A	5.1	N/A	N/A	N/A	90	N/A	2.3	N/A	N/A	N/A	1.4	8.3	N/A	N/A	22
05/01/1963		N/A	N/A	N/A	N/A	6.1	N/A	N/A	N/A	130	N/A	2.3	N/A	N/A	N/A	1.5	9.6	N/A	N/A	24
06/01/1963		N/A	N/A	N/A	N/A	5	N/A	N/A	N/A	60	N/A	1.9	N/A	N/A	N/A	1.3	7.8	N/A	N/A	20
06/09/1963		N/A	N/A	N/A	N/A	6.2	N/A	N/A	N/A	80	N/A	2.5	N/A	N/A	N/A	1.8	11	N/A	N/A	26
07/01/1963		N/A	N/A	N/A	N/A	6.1	N/A	N/A	N/A	20	N/A	3.1	N/A	N/A	N/A	1.6	15	N/A	N/A	28
08/01/1963		N/A	N/A	N/A	N/A	5.1	N/A	N/A	N/A	40	N/A	2	N/A	N/A	N/A	2	9.7	N/A	N/A	21
09/01/1963		N/A	N/A	N/A	N/A	5.1	N/A	N/A	N/A	70	N/A	2.6	N/A	N/A	N/A	2.1	13	N/A	N/A	24
09/04/1963		N/A	N/A	N/A	N/A	5.9	N/A	N/A	N/A	50	N/A	3.6	N/A	N/A	N/A	2.7	21	N/A	N/A	30
10/01/1963		N/A	N/A	N/A	N/A	6.2	N/A	N/A	N/A	70	N/A	2	N/A	N/A	N/A	3.2	18	N/A	N/A	24
10/15/1963		N/A	N/A	N/A	N/A	7.6	N/A	N/A	N/A	N/A	N/A	2.7	N/A	N/A	N/A	N/A	24	N/A	N/A	30

Table 2.3-43 (Sheet 4 of 7)
Analytical Results for Metals from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Zinc (unfiltered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	7	1000	1000	25	N/A	N/A	0.01	88	N/A	N/A	50	50	N/A
	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L
10/16/1963		N/A	N/A	N/A	N/A	7.4	N/A	N/A	N/A	30	N/A	2.4	N/A	N/A	N/A	3.5	21	N/A	N/A	28
11/01/1963		N/A	N/A	N/A	N/A	7.7	N/A	N/A	N/A	40	N/A	2.7	N/A	N/A	N/A	4.4	22	N/A	N/A	30
11/07/1963		N/A	N/A	N/A	N/A	6.4	N/A	N/A	N/A	140	N/A	1.3	N/A	N/A	N/A	2.9	9.1	N/A	N/A	21
12/01/1963		N/A	N/A	N/A	N/A	5.5	N/A	N/A	N/A	80	N/A	1.8	N/A	N/A	N/A	2	7.1	N/A	N/A	20
01/01/1964		N/A	N/A	N/A	N/A	4.3	N/A	N/A	N/A	60	N/A	1.8	N/A	N/A	N/A	1.2	5.3	N/A	N/A	18
02/01/1964		N/A	N/A	N/A	N/A	4	N/A	N/A	N/A	50	N/A	2.2	N/A	N/A	N/A	1.1	4.9	N/A	N/A	19
03/01/1964		N/A	N/A	N/A	N/A	5.1	N/A	N/A	N/A	30	N/A	1.4	N/A	N/A	N/A	1	5.4	N/A	N/A	18
04/01/1964		N/A	N/A	N/A	N/A	4.3	N/A	N/A	N/A	80	N/A	1.7	N/A	N/A	N/A	1.1	4.6	N/A	N/A	18
05/01/1964		N/A	N/A	N/A	N/A	7.2	N/A	N/A	N/A	10	N/A	1.7	N/A	N/A	N/A	1.4	9.4	N/A	N/A	25
06/01/1964		N/A	N/A	N/A	N/A	6.3	N/A	N/A	N/A	40	N/A	2.7	N/A	N/A	N/A	1.8	12	N/A	N/A	27
07/01/1964		N/A	N/A	N/A	N/A	4.8	N/A	N/A	N/A	10	N/A	1.7	N/A	N/A	N/A	2.2	7.4	N/A	N/A	19
07/16/1964		N/A	N/A	N/A	N/A	7	N/A	N/A	N/A	N/A	N/A	2.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	26
07/17/1964		N/A	N/A	N/A	N/A	5.6	N/A	N/A	N/A	60	N/A	1.3	N/A	N/A	N/A	2	6.9	N/A	N/A	20
08/01/1964		N/A	N/A	N/A	N/A	4.3	N/A	N/A	N/A	80	N/A	1.8	N/A	N/A	N/A	1.8	5.9	N/A	N/A	18
09/01/1964		N/A	N/A	N/A	N/A	4.5	N/A	N/A	N/A	10	N/A	1.5	N/A	N/A	N/A	1.7	5.6	N/A	N/A	17
10/01/1964		N/A	N/A	N/A	N/A	5	N/A	N/A	N/A	50	N/A	1.8	N/A	N/A	N/A	1.4	4.5	N/A	N/A	20
11/01/1964		N/A	N/A	N/A	N/A	8.3	N/A	N/A	N/A	60	N/A	0.9	N/A	N/A	N/A	1.6	9.5	N/A	N/A	25

Table 2.3-43 (Sheet 5 of 7)
Analytical Results for Metals from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Zinc (unfiltered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	7	1000	1000	25	N/A	N/A	0.01	88	N/A	N/A	50	50	N/A
	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L
12/01/1964		N/A	N/A	N/A	N/A	5.3	N/A	N/A	N/A	80	N/A	2	N/A	N/A	N/A	2.4	8	N/A	N/A	22
01/01/1965		N/A	N/A	N/A	N/A	6.1	N/A	N/A	N/A	80	N/A	2.6	N/A	N/A	N/A	1.1	9.3	N/A	N/A	26
02/01/1965		N/A	N/A	N/A	N/A	4.8	N/A	N/A	N/A	60	N/A	1.8	N/A	N/A	N/A	1.3	5.8	N/A	N/A	20
03/01/1965		N/A	N/A	N/A	N/A	4.6	N/A	N/A	N/A	190	N/A	1.2	N/A	N/A	N/A	1	5	N/A	N/A	16
03/18/1965		N/A	N/A	N/A	N/A	6.1	N/A	N/A	N/A	120	N/A	1.9	N/A	N/A	N/A	1	4.1	N/A	N/A	23
03/21/1965		N/A	N/A	N/A	N/A	4.7	N/A	N/A	N/A	70	N/A	2	N/A	N/A	N/A	0.8	5.7	N/A	N/A	20
04/01/1965		N/A	N/A	N/A	N/A	5.3	N/A	N/A	N/A	130	N/A	2.7	N/A	N/A	N/A	1	6.5	N/A	N/A	24
05/01/1965		N/A	N/A	N/A	N/A	6.6	N/A	N/A	N/A	60	N/A	1.6	N/A	N/A	N/A	2	8.2	N/A	N/A	23
06/01/1965		N/A	N/A	N/A	N/A	6.2	N/A	N/A	N/A	50	N/A	2.9	N/A	N/A	N/A	2.1	12	N/A	N/A	28
06/16/1965		N/A	N/A	N/A	N/A	4.9	N/A	N/A	N/A	80	N/A	2.2	N/A	N/A	N/A	1.7	4.9	N/A	N/A	21
07/01/1965		N/A	N/A	N/A	N/A	6	N/A	N/A	N/A	100	N/A	1.2	N/A	N/A	N/A	1.5	5.5	N/A	N/A	20
08/01/1965		N/A	N/A	N/A	N/A	5.2	N/A	N/A	N/A	130	N/A	2.1	N/A	N/A	N/A	1.5	5.7	N/A	N/A	22
08/21/1965		N/A	N/A	N/A	N/A	6.1	N/A	N/A	N/A	100	N/A	2.1	N/A	N/A	N/A	2	8.8	N/A	N/A	24
09/01/1965		N/A	N/A	N/A	N/A	6.8	N/A	N/A	N/A	110	N/A	2.2	N/A	N/A	N/A	2.1	14	N/A	N/A	26
09/13/1965		N/A	N/A	N/A	N/A	5.9	N/A	N/A	N/A	120	N/A	1.7	N/A	N/A	N/A	3.6	7.2	N/A	N/A	22
06/19/1968		N/A	N/A	N/A	N/A	5.4	N/A	N/A	70	N/A	N/A	3	N/A	N/A	N/A	1.8	9.6	N/A	N/A	26
10/24/1968		N/A	N/A	N/A	N/A	5.3	N/A	N/A	90	N/A	N/A	2.6	N/A	N/A	N/A	2.3	16	N/A	N/A	24

Table 2.3-43 (Sheet 6 of 7)
Analytical Results for Metals from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Zinc (unfiltered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	7	1000	1000	25	N/A	N/A	0.01	88	N/A	N/A	50	50	N/A
	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L
02/05/1969		N/A	N/A	N/A	N/A	3.9	N/A	N/A	820	N/A	N/A	1.9	N/A	N/A	N/A	1.2	4.4	N/A	N/A	18
10/02/1981		1	2	1	N/A	7.7	1	N/A	530	N/A	1	3.6	20	0.1	N/A	3.3	13	4	40	34
10/27/1981		N/A	N/A	N/A	N/A	4.9	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	2.9	7.6	N/A	N/A	20
10/28/1981		1	2	1	N/A	5.6	N/A	N/A	N/A	N/A	N/A	2.3	N/A	0.1	N/A	4	13	N/A	N/A	23
01/04/1982		N/A	1	N/A	N/A	4.2	N/A	N/A	N/A	N/A	N/A	1.8	N/A	N/A	N/A	2.4	4.1	N/A	60	18
03/31/1982		3	3	1	N/A	5.4	N/A	N/A	N/A	N/A	N/A	2.4	N/A	0.2	N/A	1.2	8.5	N/A	N/A	23
06/04/1982		N/A	N/A	N/A	N/A	5.1	N/A	N/A	N/A	N/A	N/A	2.2	N/A	N/A	N/A	2.3	4.5	N/A	N/A	22
06/05/1982		3	4	1	1	4.4	N/A	N/A	N/A	N/A	N/A	1.6	40	0.1	N/A	2.1	3.2	N/A	N/A	18
06/11/1982		1	2	1	N/A	3.7	N/A	N/A	N/A	N/A	N/A	1.4	N/A	0.1	N/A	2.4	1.9	N/A	N/A	15
08/26/1982		1	1	N/A	N/A	5.9	N/A	N/A	N/A	N/A	N/A	2.3	N/A	0.2	N/A	2.3	8.5	N/A	N/A	24
11/18/1982		1	1	1	1	7.4	N/A	N/A	N/A	N/A	N/A	3	N/A	0.2	N/A	3.4	13	N/A	N/A	31
12/13/1982		1	1	1	1	5.2	1	N/A	740	N/A	N/A	2	50	0.1	N/A	3	6.7	20	60	21
12/14/1982		1	1	1	1	5.2	N/A	N/A	N/A	N/A	N/A	2.3	N/A	0.1	N/A	3.2	6.7	N/A	N/A	22
02/15/1983		1	1		N/A	3.6	N/A	N/A	N/A	N/A	N/A	1.8	N/A		N/A	1.8	3.9	N/A	N/A	16
03/21/1983		1	1	1	10	3.5	1	N/A	160	N/A	N/A	1.5	40	0.1	N/A	1.5	2.9	N/A	10	15
05/03/1983		1	1	1	N/A	5.1	1	N/A	300	N/A	N/A	2.2	30	N/A	N/A	1.5	7.9	20	30	N/A
09/07/1983		3	5	1	N/A	7.9	N/A	N/A	N/A	N/A	N/A	4	N/A	N/A	N/A	4.6	30	N/A	N/A	N/A

Table 2.3-43 (Sheet 7 of 7)
Analytical Results for Metals from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date		Arsenic (filtered)	Arsenic (unfiltered)	Cadmium (filtered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (filtered)	Copper (filtered)	Iron (filtered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Potassium (filtered)	Sodium (filtered)	Zinc (filtered)	Zinc (unfiltered)	Hardness (as calcium carbonate)
	NC Standard:	10	10	2.0	2.0	N/A	50	7	1000	1000	25	N/A	N/A	0.01	88	N/A	N/A	50	50	N/A
	Unit:	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	mg/L
09/28/1983		N/A	N/A	N/A	N/A	6.1	N/A	N/A	N/A	N/A	N/A	3.2	N/A	N/A	N/A	4.9	32	N/A	N/A	N/A
10/12/2002		1.1	N/A	0.04	N/A	4.79	0.8	4.4	409	N/A	0.24	1.72	94.5	0.02	N/A	N/A	5.08	3.1	N/A	N/A
03/06/2003		0.3	N/A	0.04	N/A	3.94	0.8	2	198	N/A	0.11	1.77	34	0.02	0.69	N/A	4.28	3.6	N/A	N/A
03/21/2003		0.6	N/A	0.04	N/A	3.82	0.8	3.6	437	N/A	0.25	1.53	42.2	0.02	0.76	N/A	3	7.7	N/A	N/A
04/10/2003		0.5	N/A	0.03	N/A	3.86	0.8	3.4	222	N/A	0.15	1.62	18.6	0.01	0.86	N/A	2.95	6.5	N/A	N/A
07/03/2003		0.8	N/A	0.04	N/A	6.14	0.8	3.4	293	N/A	0.33	2.47	11.1	0.02	0.99	N/A	5.69	2.1	N/A	N/A
07/20/2004		1	N/A	0.04	N/A	8.55	0.8	2.5	276	N/A	0.12	4.07	76.2	0.02	1.22	N/A	16.6	1.8	N/A	N/A
07/27/2004		1	N/A	0.02	N/A	9.97	0.6	2.2	186	N/A	0.08	5.14	58.7	0.02	1.4	N/A	20.3	1.3	N/A	N/A
07/30/2004		0.9	N/A	0.02	N/A	10.9	0.8	2.5	97	N/A	0.06	4.62	48.1	0.02	1.54	N/A	24.6	1.7	N/A	N/A
08/03/2004		0.9	N/A	0.02	N/A	7.76	0.8	2.3	228	N/A	0.1	3.32	47.9	0.02	0.94	N/A	11.7	1.2	N/A	N/A
08/15/2004		1	N/A	0.04	N/A	7.12	0.8	3.6	415	N/A	0.19	2.78	49.4	N/A	1.21	N/A	8.46	1.9	N/A	N/A
Number of Events		**23**	**14**	**21**	**5**	**113**	**14**	**10**	**17**	**69**	**11**	**113**	**15**	**19**	**9**	**101**	**112**	**13**	**5**	**101**
MAX		**3**	**5**	**1**	**10**	**10.9**	**1**	**4.4**	**820**	**190**	**1**	**5.14**	**94.5**	**0.2**	**1.54**	**4.9**	**32**	**20**	**60**	**35**
MIN		**0.3**	**1**	**0.02**	**1**	**3.2**	**0.6**	**2**	**70**	**0**	**0.06**	**0.7**	**11.1**	**0.01**	**0.69**	**0.8**	**1.9**	**1.2**	**10**	**12**
Mean		**1.2**	**1.9**	**0.5**	**2.8**	**5.6**	**0.8**	**3.0**	**322**	**58.6**	**0.2**	**2.2**	**44.0**	**0.1**	**1.1**	**2.0**	**9.0**	**5.8**	**40.0**	**22.1**

Notes:
N/A = not available

Source: Reference 2.3-036

Table 2.3-44 (Sheet 1 of 7)
Water Chemistry Data from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Ammonia plus organic nitrogen (filtered) as nitrogen	Ammonia plus organic nitrogen (unfiltered) as nitrogen	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Nitrite (filtered) as nitrogen	Nitrite (unfiltered) as nitrogen	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphate (unfiltered)	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Chloride (filtered)	Silica (filtered)	Sulfate (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
06/13/1955	N/A	N/A	N/A	N/A	N/A	2.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.2	9.5	4.2
08/29/1955	N/A	N/A	N/A	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.8	11	4.5
03/07/1957	N/A	N/A	N/A	N/A	N/A	1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.8	12	3.3
08/09/1957	N/A	N/A	N/A	N/A	N/A	2.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.9	9.3	4.1
03/04/1958	N/A	N/A	N/A	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.5	10	4.2
08/20/1958	N/A	N/A	N/A	N/A	N/A	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	9.5	4
02/24/1959	N/A	N/A	N/A	N/A	N/A	1.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.8	12	5.9
09/22/1959	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.9	15	2.1
03/16/1960	N/A	N/A	N/A	N/A	N/A	1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	9.8	2
08/31/1960	N/A	N/A	N/A	N/A	N/A	2.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4	7.7	3.8
02/14/1961	N/A	N/A	N/A	N/A	N/A	3.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.9	N/A	3.9
09/18/1961	N/A	N/A	N/A	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.6	3.3	1
10/01/1961	N/A	N/A	N/A	N/A	0.8	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	3.4	4.6
11/01/1961	N/A	N/A	N/A	N/A	0.7	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14	4.7	5.6
12/01/1961	N/A	N/A	N/A	N/A	0.9	0.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16	8.4	9.2
12/19/1961	N/A	N/A	N/A	N/A	1.8	1.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6	10	8
01/01/1962	N/A	N/A	N/A	N/A	1.9	1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.2	11	6.2
01/07/1962	N/A	N/A	N/A	N/A	1.8	1.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.8	8.5	7
01/18/1962	N/A	N/A	N/A	N/A	1.4	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.5	11	6.2
02/01/1962	N/A	N/A	N/A	N/A	1.4	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.3	12	6.2
03/01/1962	N/A	N/A	N/A	N/A	1.7	1.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.3	10	5.6
04/01/1962	N/A	N/A	N/A	N/A	1.5	1.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.3	11	4.8
05/01/1962	N/A	N/A	N/A	N/A	3.2	3.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6	7	3.4
05/30/1962	N/A	N/A	N/A	N/A	3.7	3.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	3.3	4.8
06/01/1962	N/A	N/A	N/A	N/A	3.1	3.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9	8	4.8
06/06/1962	N/A	N/A	N/A	N/A	2.9	2.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3.4	10	4.8
07/01/1962	N/A	N/A	N/A	N/A	1.4	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.7	8.4	5
07/06/1962	N/A	N/A	N/A	N/A	1.9	1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.7	15	5.4
07/16/1962	N/A	N/A	N/A	N/A	1.6	1.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6.9	7.7	6.4

Table 2.3-44 (Sheet 2 of 7)
Water Chemistry Data from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Ammonia plus organic nitrogen (filtered) as nitrogen	Ammonia plus organic nitrogen (unfiltered) as nitrogen	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Nitrite (filtered) as nitrogen	Nitrite (unfiltered) as nitrogen	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphate (unfiltered)	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Chloride (filtered)	Silica (filtered)	Sulfate (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
08/01/1962	N/A	N/A	N/A	N/A	2.9	2.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.1	7.8	5
09/01/1962	N/A	N/A	N/A	N/A	1.6	1.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	8.1	8
10/01/1962	N/A	N/A	N/A	N/A	2.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24	10	9
10/08/1962	N/A	N/A	N/A	N/A	1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	8.5	6.2
10/24/1962	N/A	N/A	N/A	N/A	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	12	5.7	7.4
11/01/1962	N/A	N/A	N/A	N/A	0.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	16	8.4	8.8
11/09/1962	N/A	N/A	N/A	N/A	1.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6	9.3	8.4
12/01/1962	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5	10	7.6
01/01/1963	N/A	N/A	N/A	N/A	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4	9.7	6.6
02/01/1963	N/A	N/A	N/A	N/A	2.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.5	11	7
03/01/1963	N/A	N/A	N/A	N/A	2.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.5	9.9	6.2
03/15/1963	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	6	N/A	N/A
03/16/1963	N/A	N/A	N/A	N/A	2.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.6	11	3.8
04/01/1963	N/A	N/A	N/A	N/A	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.2	9.2	5.2
05/01/1963	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.6	11	6.2
06/01/1963	N/A	N/A	N/A	N/A	1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	7.2	12	7.2
06/09/1963	N/A	N/A	N/A	N/A	2.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9.3	9.9	6.8
07/01/1963	N/A	N/A	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14	7.8	5.8
08/01/1963	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8	6	7
09/01/1963	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	14	7.3	7.2
09/04/1963	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	22	6.6	10
10/01/1963	N/A	N/A	N/A	N/A	2.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A	17	7.8	7.8
10/15/1963	N/A	N/A	N/A	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	32	N/A	N/A
10/16/1963	N/A	N/A	N/A	N/A	1.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A	24	6.1	9
11/01/1963	N/A	N/A	N/A	N/A	2.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.8	N/A	N/A	N/A	25	3.5	8.8
11/07/1963	N/A	N/A	N/A	N/A	2.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	N/A	N/A	N/A	9.5	8.8	9.6
12/01/1963	N/A	N/A	N/A	N/A	2.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A	8	9.7	7.6
01/01/1964	N/A	N/A	N/A	N/A	1.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	5.8	11	7.2
02/01/1964	N/A	N/A	N/A	N/A	1.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	4	10	7.6

Table 2.3-44 (Sheet 3 of 7)
Water Chemistry Data from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Ammonia plus organic nitrogen (filtered) as nitrogen	Ammonia plus organic nitrogen (unfiltered) as nitrogen	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Nitrite (filtered) as nitrogen	Nitrite (unfiltered) as nitrogen	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphate (unfiltered)	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Chloride (filtered)	Silica (filtered)	Sulfate (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
03/01/1964	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A	4.6	11	6.2
04/01/1964	N/A	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	5.1	11	5.2
05/01/1964	N/A	N/A	N/A	N/A	0.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	8.4	8.8	5.4
06/01/1964	N/A	N/A	N/A	N/A	2.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A	10	8.9	6.4
07/01/1964	N/A	N/A	N/A	N/A	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	6.6	9.2	6
07/16/1964	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	13	11	N/A
07/17/1964	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	5	11	7.4
08/01/1964	N/A	N/A	N/A	N/A	1.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	5	8.6	3.8
09/01/1964	N/A	N/A	N/A	N/A	0.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	5.8	10	6.4
10/01/1964	N/A	N/A	N/A	N/A	3.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A	5.3	10	5.6
11/01/1964	N/A	N/A	N/A	N/A	1.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	N/A	N/A	N/A	9.5	12	7
12/01/1964	N/A	N/A	N/A	N/A	6.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.5	N/A	N/A	N/A	8.6	14	7.4
01/01/1965	N/A	N/A	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A	9.3	14	1.6
02/01/1965	N/A	N/A	N/A	N/A	1.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	6.8	12	8
03/01/1965	N/A	N/A	N/A	N/A	1.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	5.2	12	7.6
03/18/1965	N/A	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	6.2	10	42
03/21/1965	N/A	N/A	N/A	N/A	2.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	5.7	10	7.2
04/01/1965	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	6.4	11	N/A
05/01/1965	N/A	N/A	N/A	N/A	0.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	7.3	10	5.8
06/01/1965	N/A	N/A	N/A	N/A	2.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.3	N/A	N/A	N/A	11	9.1	4
06/16/1965	N/A	N/A	N/A	N/A	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	5.3	10	7
07/01/1965	N/A	N/A	N/A	N/A	1.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.1	N/A	N/A	N/A	5.8	11	7.8
08/01/1965	N/A	N/A	N/A	N/A	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.2	N/A	N/A	N/A	4.7	13	5.4
08/21/1965	N/A	N/A	N/A	N/A	1.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.24	N/A	N/A	N/A	8.2	12	5.2
09/01/1965	N/A	N/A	N/A	N/A	2.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.27	N/A	N/A	N/A	16	11	6
09/13/1965	N/A	N/A	N/A	N/A	0.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.38	N/A	N/A	N/A	6.5	10	5.8
06/19/1968	N/A	N/A	N/A	N/A	2.2	N/A	N/A	N/A	N/A	N/A	N/A	0.57	N/A	N/A	0.06	N/A	N/A	N/A	10	10	7.6
10/24/1968	N/A	N/A	N/A	N/A	3.8	N/A	N/A	N/A	N/A	N/A	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A	18	9.2	13
02/05/1969	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A	N/A	0.06	N/A	N/A	N/A	N/A	N/A	N/A	4.6	8.6	10

Table 2.3-44 (Sheet 4 of 7)
Water Chemistry Data from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Ammonia plus organic nitrogen (filtered) as nitrogen	Ammonia plus organic nitrogen (unfiltered) as nitrogen	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Nitrite (filtered) as nitrogen	Nitrite (unfiltered) as nitrogen	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphate (unfiltered)	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Chloride (filtered)	Silica (filtered)	Sulfate (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
06/15/1970	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
02/17/1976	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/02/1981	1.1	1.8	0.02	0.02	N/A	N/A	N/A	0.35	0.37	N/A	0.01	0.49	0.16	0.18	N/A	0.19	0.2	0.61	12	10	11
10/27/1981	0.88	0.77	0.03	0.03	N/A	N/A	0.23	0.25	0.25	N/A	0.02	0.34	0.11	0.13	N/A	0.14	0.19	0.58	7.8	5.5	10
10/28/1981	0.54	1.1	0.07	0.08	N/A	N/A	0.42	0.43	0.45	N/A	0.03	0.28	0.09	0.13	N/A	0.11	0.29	0.89	9.3	6	12
01/04/1982	N/A	1.3	N/A	0.23	N/A	N/A	N/A	N/A	0.72	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.29	0.89	5.3	8.1	8.3
03/31/1982	1.5	5.2	0.08	0.03	N/A	N/A	N/A	0.59	0.55	N/A	0.01	0.4	0.13	0.14	N/A	0.12	0.16	0.49	7.2	9.3	11
06/04/1982	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	4.5	9.8	6
06/05/1982	0.5	1.4	0.05	0.14	N/A	N/A	N/A	0.61	0.7	N/A	N/A	N/A	N/A	N/A	N/A	0.1	0.3	0.92	3.5	7.5	5
06/11/1982	2.1	2.3	0.07	0.19	N/A	N/A	N/A	0.58	0.7	N/A	N/A	N/A	N/A	N/A	N/A	0.09	0.24	0.74	3	6.1	8
08/26/1982	N/A	0.4	N/A	0.03	N/A	N/A	0.82	0.85	0.83	N/A	0.01	0.49	0.16	0.18	N/A	0.16	0.19	0.58	9.2	13	9
11/18/1982	N/A	0.6	0.04	0.05	N/A	N/A	0.88	0.81	0.9	N/A	0.02	0.71	0.23	0.26	N/A	0.27	0.25	0.77	9.1	14	14
12/13/1982	N/A	1	0.13	0.19	N/A	N/A	0.84	0.81	0.9	N/A	0.06	0.25	0.08	0.21	N/A	0.24	0.33	1	8.1	11	8
12/14/1982	0.7	1.5	0.14	0.23	N/A	N/A	0.94	0.92	1	N/A	0.06	0.31	0.1	0.24	N/A	0.12	0.43	1.3	7	10	10
02/15/1983	0.5	0.5	0.1	0.21	N/A	N/A	0.54	0.55	0.6	N/A	0.06	0.31	0.1	0.21	N/A	0.11	0.46	1.4	4.6	7.7	8
03/21/1983	0.4	2.2	0.09	0.11	N/A	N/A	0.35	0.37	0.4	N/A	0.05	0.21	0.07	0.13	N/A	0.07	0.13	0.4	4.1	6.4	12
05/03/1983	0.3	0.2	0.04	0.04	N/A	N/A	N/A	0.49	0.5	N/A	0.01	N/A	0.09	0.1	N/A	0.09	0.11	0.34	6.1	11	10
09/07/1983	0.3	0.3	0.04	0.01	N/A	N/A	N/A	0.52	0.5	N/A	0.02	N/A	0.22	0.23	N/A	0.22	0.21	0.64	23	6.2	19
09/28/1983	N/A	0.7	N/A	0.02	N/A	N/A	N/A	N/A	0.4	N/A	0.01	N/A	N/A	0.22	N/A	N/A	0.21	0.64	22	4.8	22
08/14/2002	N/A	0.63	0.02	N/A	N/A	N/A	N/A	0.18	N/A	0.01	N/A	N/A	0.57	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/20/2002	N/A	0.68	0.02	N/A	N/A	N/A	N/A	0.47	N/A	0.01	N/A	N/A	0.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
08/27/2002	N/A	0.81	0.07	N/A	N/A	N/A	N/A	0.34	N/A	0.01	N/A	N/A	0.81	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/04/2002	N/A	0.96	0.13	N/A	N/A	N/A	N/A	1.14	N/A	0.02	N/A	N/A	0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/11/2002	N/A	0.79	0.05	N/A	N/A	N/A	N/A	2.14	N/A	0.03	N/A	N/A	0.47	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/17/2002	N/A	0.68	0.02	N/A	N/A	N/A	N/A	0.91	N/A	0.01	N/A	N/A	0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
09/25/2002	N/A	0.62	0.02	N/A	N/A	N/A	N/A	0.67	N/A	0.01	N/A	N/A	0.21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/01/2002	N/A	0.6	0.02	N/A	N/A	N/A	N/A	1.82	N/A	0.01	N/A	N/A	0.52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/07/2002	N/A	0.55	0.02	N/A	N/A	N/A	N/A	0.92	N/A	0.01	N/A	N/A	0.39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/12/2002	N/A	2.7	0.16	N/A	N/A	N/A	N/A	1.2	N/A	0.02	N/A	N/A	0.14	N/A	N/A	N/A	N/A	N/A	6.09	N/A	6.8

Table 2.3-44 (Sheet 5 of 7)
Water Chemistry Data from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Ammonia plus organic nitrogen (filtered) as nitrogen	Ammonia plus organic nitrogen (unfiltered) as nitrogen	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Nitrite (filtered) as nitrogen	Nitrite (unfiltered) as nitrogen	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphate (unfiltered)	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Chloride (filtered)	Silica (filtered)	Sulfate (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
10/15/2002	N/A	1.2	0.18	N/A	N/A	N/A	N/A	1.09	N/A	0.02	N/A	N/A	0.13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/22/2002	N/A	0.7	0.06	N/A	N/A	N/A	N/A	0.86	N/A	0.01	N/A	N/A	0.12	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10/29/2002	N/A	0.64	0.02	N/A	N/A	N/A	N/A	1.22	N/A	0.01	N/A	N/A	0.16	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/05/2002	N/A	0.9	0.02	N/A	N/A	N/A	N/A	0.93	N/A	0.01	N/A	N/A	0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/12/2002	N/A	0.75	0.02	N/A	N/A	N/A	N/A	1.08	N/A	0.01	N/A	N/A	0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
11/19/2002	N/A	0.91	0.03	N/A	N/A	N/A	N/A	0.59	N/A	0.01	N/A	N/A	0.12	N/A	N/A	N/A	0.22	N/A	N/A	N/A	N/A
11/26/2002	N/A	0.53	0.01	N/A	N/A	N/A	N/A	0.88	N/A	0.01	N/A	N/A	0.1	N/A	N/A	N/A	0.13	N/A	N/A	N/A	N/A
12/03/2002	N/A	0.48	0.01	N/A	N/A	N/A	N/A	1.15	N/A	0	N/A	N/A	0.13	N/A	N/A	N/A	0.17	N/A	N/A	N/A	N/A
12/09/2002	N/A	0.8	0.05	N/A	N/A	N/A	N/A	0.91	N/A	0.01	N/A	N/A	0.1	N/A	N/A	N/A	0.17	N/A	N/A	N/A	N/A
12/17/2002	N/A	0.63	0.05	N/A	N/A	N/A	N/A	0.72	N/A	0.01	N/A	N/A	0.07	N/A	N/A	N/A	0.15	N/A	N/A	N/A	N/A
01/08/2003	N/A	0.5	0.04	N/A	N/A	N/A	N/A	0.79	N/A	0.01	N/A	N/A	0.11	N/A	N/A	N/A	0.18	N/A	N/A	N/A	N/A
01/14/2003	N/A	0.39	0.03	N/A	N/A	N/A	N/A	0.99	N/A	0.01	N/A	N/A	0.1	N/A	N/A	N/A	0.14	N/A	N/A	N/A	N/A
01/21/2003	N/A	0.33	0.01	N/A	N/A	N/A	N/A	1.17	N/A	0.01	N/A	N/A	0.09	N/A	N/A	N/A	0.12	N/A	N/A	N/A	N/A
01/30/2003	N/A	0.35	0.01	N/A	N/A	N/A	N/A	1.73	N/A	0.01	N/A	N/A	0.22	N/A	N/A	N/A	0.25	N/A	N/A	N/A	N/A
02/05/2003	N/A	0.75	0.3	N/A	N/A	N/A	N/A	0.96	N/A	0.02	N/A	N/A	0.11	N/A	N/A	N/A	0.16	N/A	N/A	N/A	N/A
02/11/2003	N/A	0.52	0.05	N/A	N/A	N/A	N/A	0.69	N/A	0.01	N/A	N/A	0.05	N/A	N/A	N/A	0.12	N/A	N/A	N/A	N/A
02/21/2003	N/A	0.6	0.05	N/A	N/A	N/A	N/A	0.74	N/A	0.01	N/A	N/A	0.09	N/A	N/A	N/A	0.17	N/A	N/A	N/A	N/A
02/25/2003	N/A	0.82	0.09	N/A	N/A	N/A	N/A	0.57	N/A	0.01	N/A	N/A	0.05	N/A	N/A	N/A	0.19	N/A	N/A	N/A	N/A
03/06/2003	N/A	1	0.03	N/A	N/A	N/A	N/A	0.46	N/A	0.01	N/A	N/A	0.07	N/A	N/A	N/A	0.3	N/A	4.71	N/A	5.9
03/21/2003	N/A	1.7	0.1	N/A	N/A	N/A	N/A	0.39	N/A	0.01	N/A	N/A	0.13	N/A	N/A	N/A	0.54	N/A	3.31	N/A	4.8
03/24/2003	N/A	0.7	0.07	N/A	N/A	N/A	N/A	0.35	N/A	0.01	N/A	N/A	0.05	N/A	N/A	N/A	0.16	N/A	N/A	N/A	N/A
04/01/2003	N/A	1.3	0.06	N/A	N/A	N/A	N/A	0.64	N/A	0.01	N/A	N/A	0.09	N/A	N/A	N/A	0.19	N/A	N/A	N/A	N/A
04/08/2003	N/A	0.81	0.05	N/A	N/A	N/A	N/A	0.46	N/A	0.01	N/A	N/A	0.06	N/A	N/A	N/A	0.21	N/A	N/A	N/A	N/A
04/10/2003	N/A	1	0.07	N/A	N/A	N/A	N/A	0.33	N/A	0.01	N/A	N/A	0.12	N/A	N/A	N/A	0.3	N/A	3.17	N/A	5
04/15/2003	N/A	0.7	0.11	N/A	N/A	N/A	N/A	0.39	N/A	0.01	N/A	N/A	0.05	N/A	N/A	N/A	0.12	N/A	N/A	N/A	N/A
04/22/2003	N/A	0.39	0.02	N/A	N/A	N/A	N/A	0.66	N/A	0	N/A	N/A	0.06	N/A	N/A	N/A	0.08	N/A	N/A	N/A	N/A
05/02/2003	N/A	0.44	0.02	N/A	N/A	N/A	N/A	0.86	N/A	0.01	N/A	N/A	0.1	N/A	N/A	N/A	0.13	N/A	N/A	N/A	N/A
05/09/2003	N/A	0.85	0.07	N/A	N/A	N/A	N/A	0.58	N/A	0.01	N/A	N/A	0.11	N/A	N/A	N/A	0.19	N/A	N/A	N/A	N/A
05/14/2003	N/A	0.55	0.01	N/A	N/A	N/A	N/A	0.81	N/A	0.01	N/A	N/A	0.14	N/A	N/A	N/A	0.18	N/A	N/A	N/A	N/A

Table 2.3-44 (Sheet 6 of 7)
Water Chemistry Data from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Ammonia plus organic nitrogen (filtered) as nitrogen	Ammonia plus organic nitrogen (unfiltered) as nitrogen	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Nitrite (filtered) as nitrogen	Nitrite (unfiltered) as nitrogen	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphate (unfiltered)	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Chloride (filtered)	Silica (filtered)	Sulfate (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
05/28/2003	N/A	0.77	0.05	N/A	N/A	N/A	N/A	0.47	N/A	0.01	N/A	N/A	0.1	N/A	N/A	N/A	0.21	N/A	N/A	N/A	N/A
06/02/2003	N/A	0.65	0.02	N/A	N/A	N/A	N/A	0.57	N/A	0.01	N/A	N/A	0.08	N/A	N/A	N/A	0.18	N/A	N/A	N/A	N/A
06/13/2003	N/A	0.68	0.02	N/A	N/A	N/A	N/A	0.53	N/A	0.01	N/A	N/A	0.13	N/A	N/A	N/A	0.22	N/A	N/A	N/A	N/A
06/20/2003	N/A	1.1	0.06	N/A	N/A	N/A	N/A	0.51	N/A	0.01	N/A	N/A	0.11	N/A	N/A	N/A	0.31	N/A	N/A	N/A	N/A
06/24/2003	N/A	0.71	0.02	N/A	N/A	N/A	N/A	0.78	N/A	0.01	N/A	N/A	0.15	N/A	N/A	N/A	0.24	N/A	N/A	N/A	N/A
07/03/2003	N/A	1.1	0.06	N/A	N/A	N/A	N/A	0.58	N/A	0.01	N/A	N/A	0.16	N/A	N/A	N/A	0.41	N/A	7.55	N/A	5.3
07/10/2003	N/A	0.55	0.02	N/A	N/A	N/A	N/A	0.78	N/A	0.01	N/A	N/A	0.16	N/A	N/A	N/A	0.23	N/A	N/A	N/A	N/A
07/16/2003	N/A	0.58	0.02	N/A	N/A	N/A	N/A	0.8	N/A	0	N/A	N/A	0.1	N/A	N/A	N/A	0.18	N/A	N/A	N/A	N/A
07/23/2003	N/A	0.59	0.02	N/A	N/A	N/A	N/A	0.88	N/A	0.01	N/A	N/A	0.14	N/A	N/A	N/A	0.21	N/A	N/A	N/A	N/A
07/29/2003	N/A	0.61	0.02	N/A	N/A	N/A	N/A	1.3	N/A	0.01	N/A	N/A	0.16	N/A	N/A	N/A	0.26	N/A	N/A	N/A	N/A
08/05/2003	N/A	0.88	0.06	N/A	N/A	N/A	N/A	0.46	N/A	0.01	N/A	N/A	0.13	N/A	N/A	N/A	0.27	N/A	N/A	N/A	N/A
08/27/2003	N/A	0.51	0.02	N/A	N/A	N/A	N/A	0.7	N/A	0	N/A	N/A	0.11	N/A	N/A	N/A	0.19	N/A	N/A	N/A	N/A
09/03/2003	N/A	0.62	0.03	N/A	N/A	N/A	N/A	1.19	N/A	0.01	N/A	N/A	0.12	N/A	N/A	N/A	0.23	N/A	N/A	N/A	N/A
09/12/2003	N/A	0.57	0.02	N/A	N/A	N/A	N/A	0.72	N/A	0	N/A	N/A	0.16	N/A	N/A	N/A	0.24	N/A	N/A	N/A	N/A
09/17/2003	N/A	0.51	0.02	N/A	N/A	N/A	N/A	0.81	N/A	0	N/A	N/A	0.14	N/A	N/A	N/A	0.23	N/A	N/A	N/A	N/A
09/24/2003	N/A	1.2	0.02	N/A	N/A	N/A	N/A	0.53	N/A	0	N/A	N/A	0.1	N/A	N/A	N/A	0.41	N/A	N/A	N/A	N/A
10/01/2003	N/A	0.61	0.02	N/A	N/A	N/A	N/A	0.58	N/A	0	N/A	N/A	0.13	N/A	N/A	N/A	0.23	N/A	N/A	N/A	N/A
10/07/2003	N/A	0.5	0.01	N/A	N/A	N/A	N/A	0.79	N/A	0	N/A	N/A	0.13	N/A	N/A	N/A	0.21	N/A	N/A	N/A	N/A
10/15/2003	N/A	0.34	0.01	N/A	N/A	N/A	N/A	0.91	N/A	0	N/A	N/A	0.1	N/A	N/A	N/A	0.15	N/A	N/A	N/A	N/A
10/20/2003	N/A	0.47	0.01	N/A	N/A	N/A	N/A	1.18	N/A	0	N/A	N/A	0.15	N/A	N/A	N/A	0.2	N/A	N/A	N/A	N/A
10/31/2003	N/A	0.45	0.01	N/A	N/A	N/A	N/A	0.82	N/A	0	N/A	N/A	0.07	N/A	N/A	N/A	0.11	N/A	N/A	N/A	N/A
11/12/2003	N/A	0.45	0.01	N/A	N/A	N/A	N/A	0.88	N/A	0	N/A	N/A	0.14	N/A	N/A	N/A	0.19	N/A	N/A	N/A	N/A
11/21/2003	N/A	0.47	0.01	N/A	N/A	N/A	N/A	0.95	N/A	0	N/A	N/A	0.11	N/A	N/A	N/A	0.18	N/A	N/A	N/A	N/A
11/28/2003	N/A	0.44	0.01	N/A	N/A	N/A	N/A	1.58	N/A	0	N/A	N/A	0.24	N/A	N/A	N/A	0.33	N/A	N/A	N/A	N/A
12/11/2003	N/A	1.6	0.1	N/A	N/A	N/A	N/A	1.27	N/A	0.01	N/A	N/A	0.17	N/A	N/A	N/A	0.46	N/A	N/A	N/A	N/A
12/23/2003	N/A	0.54	0.02	N/A	N/A	N/A	N/A	1.07	N/A	0.01	N/A	N/A	0.09	N/A	N/A	N/A	0.16	N/A	N/A	N/A	N/A
01/06/2004	N/A	0.31	0.01	N/A	N/A	N/A	N/A	1.23	N/A	0	N/A	N/A	0.09	N/A	N/A	N/A	0.14	N/A	N/A	N/A	N/A
01/20/2004	N/A	0.36	0.01	N/A	N/A	N/A	N/A	1.08	N/A	0	N/A	N/A	0.07	N/A	N/A	N/A	0.13	N/A	N/A	N/A	N/A
02/03/2004	N/A	0.36	0.01	N/A	N/A	N/A	N/A	1.12	N/A	0	N/A	N/A	0.05	N/A	N/A	N/A	0.09	N/A	N/A	N/A	N/A

Table 2.3-44 (Sheet 7 of 7)
Water Chemistry Data from USGS Station 02102000 — Deep River at Moncure, NC

Sample Date	Ammonia plus organic nitrogen (filtered) as nitrogen	Ammonia plus organic nitrogen (unfiltered) as nitrogen	Ammonia (filtered) as nitrogen	Ammonia (unfiltered) as nitrogen	Nitrate (filtered)	Nitrate (unfiltered)	Nitrate (unfiltered) as nitrogen	Nitrite plus nitrate (filtered) as nitrogen	Nitrite plus nitrate (unfiltered) as nitrogen	Nitrite (filtered) as nitrogen	Nitrite (unfiltered) as nitrogen	Orthophosphate (filtered)	Orthophosphate (filtered) as phosphorus	Orthophosphate (unfiltered) as phosphorus	Phosphate (unfiltered)	Phosphorus (filtered)	Phosphorus (unfiltered)	Phosphorus (unfiltered) as phosphate	Chloride (filtered)	Silica (filtered)	Sulfate (filtered)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
02/18/2004	N/A	0.52	0.03	N/A	N/A	N/A	N/A	0.79	N/A	0.01	N/A	N/A	0.06	N/A	N/A	N/A	0.12	N/A	N/A	N/A	N/A
03/08/2004	N/A	0.49	0.02	N/A	N/A	N/A	N/A	0.8	N/A	0.01	N/A	N/A	0.08	N/A	N/A	N/A	0.15	N/A	N/A	N/A	N/A
03/18/2004	N/A	0.74	0.04	N/A	N/A	N/A	N/A	0.79	N/A	0.01	N/A	N/A	0.06	N/A	N/A	N/A	0.14	N/A	N/A	N/A	N/A
03/30/2004	N/A	0.38	0.01	N/A	N/A	N/A	N/A	0.64	N/A	0	N/A	N/A	0.07	N/A	N/A	N/A	0.12	N/A	N/A	N/A	N/A
04/13/2004	N/A	0.43	0.03	N/A	N/A	N/A	N/A	0.55	N/A	0	N/A	N/A	0.08	N/A	N/A	N/A	0.11	N/A	N/A	N/A	N/A
05/12/2004	N/A	0.6	0.02	N/A	N/A	N/A	N/A	1.07	N/A	0.01	N/A	N/A	0.13	N/A	N/A	N/A	0.21	N/A	N/A	N/A	N/A
05/27/2004	N/A	0.42	0.03	N/A	N/A	N/A	N/A	0.71	N/A	0.01	N/A	N/A	0.14	N/A	N/A	N/A	0.21	N/A	N/A	N/A	N/A
06/10/2004	N/A	0.57	0.02	N/A	N/A	N/A	N/A	1.52	N/A	0.01	N/A	N/A	0.23	N/A	N/A	N/A	0.31	N/A	N/A	N/A	N/A
06/22/2004	N/A	0.5	0.02	N/A	N/A	N/A	N/A	1.4	N/A	0.01	N/A	N/A	0.35	N/A	N/A	N/A	0.4	N/A	N/A	N/A	N/A
07/09/2004	N/A	0.6	0.01	N/A	N/A	N/A	N/A	1.26	N/A	0.01	N/A	N/A	0.2	N/A	N/A	N/A	0.26	N/A	N/A	N/A	N/A
07/15/2004	N/A	0.6	0.02	N/A	N/A	N/A	N/A	1.01	N/A	0.01	N/A	N/A	0.24	N/A	N/A	N/A	0.31	N/A	N/A	N/A	N/A
07/20/2004	N/A	0.59	0.01	N/A	N/A	N/A	N/A	1.03	N/A	0.01	N/A	N/A	0.32	N/A	N/A	N/A	0.39	N/A	16	N/A	13.6
07/27/2004	N/A	0.57	0.02	N/A	N/A	N/A	N/A	1.4	N/A	0.01	N/A	N/A	0.33	N/A	N/A	N/A	0.39	N/A	22.5	N/A	16.7
07/30/2004	N/A	0.68	0.04	N/A	N/A	N/A	N/A	1.96	N/A	0.01	N/A	N/A	0.35	N/A	N/A	N/A	0.43	N/A	27.2	N/A	19.5
08/03/2004	N/A	0.58	0.02	N/A	N/A	N/A	N/A	0.82	N/A	0.01	N/A	N/A	0.22	N/A	N/A	N/A	0.29	N/A	13.2	N/A	9.9
08/06/2004	N/A	0.73	0.03	N/A	N/A	N/A	N/A	1.61	N/A	0.02	N/A	N/A	0.24	N/A	N/A	N/A	0.33	N/A	N/A	N/A	N/A
08/10/2004	N/A	0.58	0.03	N/A	N/A	N/A	N/A	1.68	N/A	0.01	N/A	N/A	0.3	N/A	N/A	N/A	0.35	N/A	N/A	N/A	N/A
08/15/2004	N/A	1.4	0.41	N/A	N/A	N/A	N/A	0.81	N/A	0.01	N/A	N/A	0.21	N/A	N/A	N/A	0.33	N/A	10.1	N/A	9.2
Number of Events	**11**	**102**	**99**	**16**	**73**	**31**	**8**	**100**	**16**	**86**	**13**	**13**	**98**	**13**	**33**	**14**	**87**	**16**	**114**	**101**	**110**
MAX	**2.1**	**5.2**	**0.41**	**0.23**	**38**	**3.7**	**0.94**	**2.14**	**1**	**0.03**	**0.06**	**1**	**0.81**	**0.26**	**0.8**	**0.27**	**0.54**	**1.4**	**32**	**15**	**42**
MIN	**0.3**	**0.2**	**0.01**	**0.01**	**0.2**	**0.6**	**0.23**	**0.18**	**0.25**	**0**	**0.01**	**0.06**	**0.05**	**0.1**	**0**	**0.07**	**0.08**	**0.34**	**2.7**	**3.3**	**1**
Mean	**0.8**	**0.8**	**0.0**	**0.1**	**2.3**	**1.9**	**0.6**	**0.9**	**0.6**	**0.0**	**0.0**	**0.4**	**0.2**	**0.2**	**0.2**	**0.1**	**0.2**	**0.8**	**8.8**	**9.4**	**7.5**
NC Water Quality Standard	**N/A**	**N/A**	**N/A**	**N/A**	**10000**	**10000**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**230**	**N/A**	**250**

Notes:
N/A = not available

Source: Reference 2.3-036

Table 2.3-45 (Sheet 1 of 3)
Field Parameters from DWQ Station B6050000 — Deep River at CSX RR Bridge near Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
03/16/92	9.6	7.25	98	10
04/23/92	8.6	6.83	67	19
05/21/92	9.4	7.2	140	22
06/22/92	7.3	6.9	86	23
07/27/92	5.4	7	323	27
08/05/92	5.2	6.7	134	27
09/17/92	7.9	6.9	191	25
10/13/92	7.4	6.6	247	16
11/19/92	9.2	6.1	59	10
12/28/92	11.6	5.9	39	6
01/25/93	12.2	N/A	31	7
02/18/93	12	6	33	7
03/30/93	10.2	6.9	44	12
04/27/93	8.9	7.2	66	16
05/17/93	7	7.2	105	24
06/24/93	7.4	7.3	229	27
07/27/93	6.7	7.3	243	28
08/19/93	7	7.7	233	28
09/20/93	7.3	7.5	339	25
10/18/93	9.8	7.8	258	18
11/15/93	10.4	7.2	175	13
02/09/94	11.4	6.9	61	9
03/22/94	10.4	7.1	66	14
04/18/94	7.8	7	73	18
05/24/94	8.7	7.5	163	23
06/21/94	6.7	6.7	175	28
07/20/94	7.9	7.6	330	30
08/10/94	6.8	7	128	26
09/22/94	8.2	7.1	110	21
10/18/94	8	7.1	208	17
11/29/94	11.6	7.1	241	10
12/20/94	11.4	7.1	181	8
01/10/95	12.4	6.9	112	5
02/06/95	11.4	6.9	112	5
03/23/95	8.4	7.2	89	14
04/27/95	7.9	7.25	150	19
05/17/95	7.5	6.7	172	24
06/22/95	8	7.26	118	21.1
08/10/95	7.9	7.5	220	27
09/14/95	8.8	7.9	115	27
10/31/95	8.8	6.42	62	14.2
12/15/95	11.7	6.68	81	4.1
01/23/96	6.4	5.6	63	3.9
02/22/96	11.8	6.3	72	7.2
03/28/96	9.8	7.3	72	9.9
04/18/96	8.1	7.3	90	16
05/29/96	6.4	7.1	122	21.9
06/25/96	6	7	152	29.9
07/18/96	7.4	N/A	155	27.8
08/22/96	6.2	6.7	162	26
09/26/96	6.9	6.2	81	20.9
10/15/96	8.8	7	72	15
11/20/96	10.3	7.3	114	9

**Table 2.3-45 (Sheet 2 of 3)
Field Parameters from DWQ Station B6050000 —
Deep River at CSX RR Bridge near Moncure, NC**

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
12/18/96	11.2	7.1	108	7.8
01/30/97	11.2	7.3	73	5.9
02/27/97	10.6	N/A	80	9.9
03/31/97	8.8	6.7	80	15.9
05/22/97	7.6	7.3	115	27.4
06/30/97	6.7	6.9	131	27.8
07/31/97	6.7	7.3	89	25
09/08/97	9	7	170	24.4
09/29/97	7.8	7.3	90	20
10/15/97	7.7	7.2	150	21
11/17/97	11.2	7.2	70	9
12/11/97	10.9	7.6	80	7.5
01/14/98	10.2	7.4	N/A	9
02/10/98	11.8	6.7	51	7.5
03/03/98	9.8	6.8	65	11.3
04/15/98	10.4	6.9	75	17
05/27/98	6.3	7	95	24
06/11/98	8.1	7.5	130	24
07/29/98	6.1	7.7	228	28.5
08/31/98	7.9	8.1	211	29
09/28/98	9.9	7.4	269	25.7
10/28/98	10.4	7.5	198	15.5
11/29/98	9.8	7.6	273	12
12/28/98	12.5	7	108	5.5
01/27/99	11.5	6.7	70	10.4
02/17/99	10.6	7	123	9.6
03/23/99	10.9	7	85	11.5
04/29/99	8.4	7.3	145	15.7
05/24/99	7.5	7.2	150	25.2
06/24/99	8.6	7.6	159	25.4
07/27/99	7.5	7.5	300	29.8
08/17/99	6.1	7.2	183	28.9
09/29/99	8	6.7	70	20.8
10/18/99	8.9	6.9	94	18
11/02/99	8.9	6.9	113	15.9
12/02/99	10.1	7	145	8.1
02/21/00	12.6	7.1	88	8
03/15/00	11	7.3	124	13
04/26/00	8.8	7.1	120	17
05/22/00	8	6.8	123	24
06/14/00	6.1	6.7	215	28
07/30/00	6	7	130	25
08/30/00	7	7.2	250	26
09/13/00	6.8	7	140	25
10/09/00	8.6	7.1	130	17
11/29/00	7.3	7	110	10
01/03/01	13	7	190	3
02/01/01	11.4	7	230	8
04/16/01	7.4	6.8	120	16
05/21/01	5.7	7	210	19
06/25/01	7.6	7	90	26
07/11/01	6	7	250	26

Table 2.3-45 (Sheet 3 of 3)
Field Parameters from DWQ Station B6050000 — Deep River at CSX RR Bridge near Moncure, NC

Sample Date	Dissolved Oxygen (mg/L)	pH (standard units)	Specific Conductance (µS/cm)	Temperature (degrees C)
08/02/01	7.8	7.4	220	25
10/04/01	9.5	7.9	217	21.3
10/31/01	10.4	7.4	269	13.2
11/28/01	8.4	7.4	366	15
12/17/01	11.6	7.6	381	7.1
01/15/02	13.8	6.7	219	3.7
02/20/02	12.5	7	138	8.2
03/07/02	10.9	7.7	170	7.9
04/08/02	9.3	6.8	102	14.7
05/07/02	9.2	7.7	183	22.7
06/19/02	7	8.1	303	27.8
07/10/02	5.7	7.4	312	29
08/21/02	6.6	7	346	30.2
09/09/02	6	6.7	124	25.2
10/16/02	8.4	6.2	86	18.2
11/25/02	12.4	6.8	102	9.9
12/12/02	13	6.7	290	6

Notes:

µS/cm = microSiemens per centimeter
C = Celsius
mg/L = milligrams per liter
N/A = not available

Source: Reference 2.3-052

Table 2.3-46 (Sheet 1 of 4)
Summary of Metals Analyses from DWQ Station B6050000 — Deep River at CSX RR Bridge near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
03/16/92		23	ND	ND	N/A	ND	4	1500	ND	N/A	33	ND	ND	N/A	N/A	ND
04/23/92		8	ND	ND	N/A	ND	14	6300	11	N/A	180	ND	ND	N/A	N/A	ND
05/21/92		N/A	ND	ND	N/A	ND	ND	670	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/22/92		2	ND	ND	N/A	ND	3	1500	ND	N/A	59	ND	ND	N/A	N/A	ND
07/27/92		N/A	ND	ND	N/A	ND	5	380	ND	N/A	30	ND	ND	N/A	N/A	ND
08/05/92		N/A	ND	ND	N/A	ND	5	1100	ND	N/A	81	ND	ND	N/A	N/A	ND
09/17/92		N/A	ND	ND	N/A	ND	5	330	ND	N/A	44	ND	ND	N/A	N/A	ND
10/13/92		N/A	ND	ND	N/A	ND	6	380	ND	N/A	51	ND	ND	N/A	N/A	ND
11/19/92		N/A	ND	ND	N/A	ND	6	1200	ND	N/A	39	ND	ND	N/A	N/A	ND
12/28/92		N/A	ND	ND	N/A	ND	4	1300	ND	N/A	27	ND	ND	N/A	N/A	ND
01/25/93		N/A	ND	ND	N/A	ND	4	2700	ND	N/A	N/A	ND	ND	N/A	N/A	ND
02/18/93		N/A	ND	ND	N/A	ND	8	2300	ND	N/A	55	ND	ND	N/A	N/A	ND
03/30/93		N/A	ND	ND	N/A	ND	5	2500	ND	N/A	44	ND	ND	N/A	N/A	ND
04/27/93		N/A	ND	ND	N/A	ND	4	1200	ND	N/A	40	ND	ND	N/A	N/A	ND
05/17/93		N/A	ND	ND	N/A	ND	6	1200	ND	N/A	51	ND	ND	N/A	N/A	ND
06/24/93		N/A	ND	ND	N/A	ND	4	380	ND	N/A	38	ND	ND	N/A	N/A	ND
07/27/93		N/A	ND	ND	N/A	ND	3	360	ND	N/A	40	ND	ND	N/A	N/A	ND
08/19/93		N/A	ND	ND	N/A	ND	3	270	ND	N/A	N/A	ND	ND	N/A	N/A	ND
09/20/93		N/A	ND	ND	N/A	ND	3	120	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/18/93		N/A	ND	ND	N/A	ND	3	76	ND	N/A	N/A	ND	ND	N/A	N/A	ND
11/15/93		N/A	ND	ND	N/A	ND	5	170	ND	N/A	N/A	ND	ND	N/A	N/A	ND
02/09/94		N/A	ND	ND	N/A	ND	5	1400	ND	N/A	N/A	ND	ND	N/A	N/A	13
03/22/94		N/A	ND	ND	N/A	ND	3	970	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/18/94		N/A	ND	ND	N/A	ND	5	4500	ND	N/A	N/A	ND	ND	N/A	N/A	ND
05/24/94		N/A	ND	ND	N/A	ND	4	690	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/21/94		N/A	ND	ND	N/A	ND	4	880	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/20/94		N/A	ND	ND	N/A	ND	4	300	ND	N/A	N/A	ND	ND	N/A	N/A	ND

Table 2.3-46 (Sheet 2 of 4)
Summary of Metals Analyses from DWQ Station B6050000 — Deep River at CSX RR Bridge near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
08/10/94		N/A	ND	ND	N/A	ND	6	540	ND	N/A	N/A	ND	ND	N/A	N/A	ND
09/22/94		N/A	ND	ND	N/A	ND	3	980	ND	N/A	50	ND	ND	N/A	N/A	ND
10/18/94		N/A	ND	ND	N/A	ND	4	420	ND	N/A	N/A	ND	ND	N/A	N/A	ND
11/29/94		N/A	ND	ND	N/A	ND	7	530	ND	N/A	N/A	ND	ND	N/A	N/A	ND
12/20/94		N/A	ND	ND	N/A	ND	4	680	ND	N/A	N/A	ND	ND	N/A	N/A	ND
01/10/95		N/A	ND	ND	N/A	ND	15	2100	ND	N/A	N/A	ND	ND	N/A	N/A	ND
02/06/95		N/A	ND	ND	N/A	ND	8	1200	ND	N/A	N/A	ND	ND	N/A	N/A	ND
03/23/95		N/A	ND	ND	N/A	ND	10	260	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/27/95		N/A	ND	ND	N/A	ND	9	720	ND	N/A	N/A	ND	ND	N/A	N/A	14
05/17/95		N/A	ND	ND	N/A	ND	5	760	ND	N/A	N/A	ND	ND	N/A	N/A	63
06/22/95		N/A	ND	ND	N/A	ND	3	910	ND	N/A	N/A	ND	ND	N/A	N/A	20
08/10/95		N/A	ND	ND	N/A	ND	10	430	ND	N/A	N/A	ND	ND	N/A	N/A	18
09/14/95		N/A	ND	ND	N/A	ND	4	620	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/31/95		N/A	ND	ND	N/A	ND	6	3600	ND	N/A	N/A	ND	ND	N/A	N/A	27
11/30/95		N/A	ND	ND	N/A	ND	3	760	ND	N/A	N/A	ND	ND	N/A	N/A	35
12/15/95		N/A	ND	ND	N/A	ND	9	1200	ND	N/A	N/A	ND	ND	N/A	N/A	ND
01/23/96		N/A	ND	ND	N/A	ND	8	3000	ND	N/A	N/A	ND	ND	N/A	N/A	18
02/22/96		N/A	ND	ND	N/A	ND	5	1800	ND	N/A	59	ND	ND	N/A	N/A	23
03/28/96		N/A	ND	ND	N/A	ND	2	1000	ND	N/A	47	ND	ND	N/A	N/A	64
04/18/96		N/A	ND	ND	N/A	ND	5	930	ND	N/A	64	ND	ND	N/A	N/A	80
05/29/96		N/A	ND	2	N/A	ND	6	1200	ND	N/A	64	ND	ND	N/A	N/A	15
06/25/96		N/A	ND	ND	N/A	ND	4	1100	ND	N/A	60	ND	ND	N/A	N/A	32
07/18/96		N/A	ND	ND	N/A	ND	4	1000	ND	N/A	53	ND	ND	N/A	N/A	10
08/22/96		N/A	ND	ND	N/A	ND	4	1000	ND	N/A	61	ND	ND	N/A	N/A	30
09/26/96		N/A	ND	ND	N/A	ND	5	1300	ND	N/A	62	ND	ND	N/A	N/A	26
10/15/96		N/A	ND	ND	N/A	ND	6	1700	ND	N/A	48	0.4	ND	N/A	N/A	ND
11/20/96		N/A	ND	ND	N/A	ND	3	700	ND	N/A	25	ND	ND	N/A	N/A	12

Table 2.3-46 (Sheet 3 of 4)
Summary of Metals Analyses from DWQ Station B6050000 — Deep River at CSX RR Bridge near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
12/18/96		N/A	ND	ND	N/A	ND	13	840	ND	N/A	33	ND	ND	N/A	N/A	38
01/30/97		N/A	ND	ND	N/A	ND	10	840	ND	N/A	32	ND	ND	N/A	N/A	18
02/27/97		N/A	ND	ND	N/A	ND	3	550	ND	N/A	30	ND	ND	N/A	N/A	13
03/31/97		N/A	ND	ND	N/A	ND	3	1000	ND	N/A	40	ND	ND	N/A	N/A	83
05/22/97		N/A	ND	ND	N/A	ND	6	670	ND	N/A	39	ND	ND	N/A	N/A	19
06/30/97		N/A	ND	ND	N/A	ND	5.2	390	ND	N/A	64	ND	ND	N/A	N/A	33
07/31/97		N/A	ND	ND	N/A	ND	6.4	1200	ND	N/A	100	ND	ND	N/A	N/A	100
09/08/97		N/A	ND	ND	N/A	ND	3.7	350	ND	N/A	32	ND	ND	N/A	N/A	160
09/29/97		N/A	ND	ND	N/A	ND	11	1500	ND	N/A	23	ND	ND	N/A	N/A	18
10/15/97		N/A	ND	ND	N/A	ND	2.7	800	ND	N/A	75	ND	ND	N/A	N/A	17
11/17/97		N/A	ND	ND	N/A	ND	5.5	510	ND	N/A	25	ND	ND	N/A	N/A	24
12/11/97		N/A	ND	ND	N/A	ND	6.4	740	ND	N/A	27	ND	ND	N/A	N/A	13
01/14/98		N/A	ND	ND	N/A	ND	4.7	670	ND	N/A	N/A	ND	ND	N/A	N/A	28
02/10/98		N/A	ND	ND	N/A	ND	2	730	ND	N/A	N/A	ND	ND	N/A	N/A	ND
03/03/98		N/A	ND	ND	N/A	ND	2.2	700	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/15/98		N/A	ND	ND	N/A	ND	2	890	ND	N/A	38	ND	ND	N/A	N/A	10
05/27/98		N/A	ND	ND	N/A	ND	9.7	2900	ND	N/A	N/A	ND	ND	N/A	N/A	24
06/11/98		N/A	ND	ND	N/A	ND	5.6	880	ND	N/A	N/A	ND	ND	N/A	N/A	34
07/29/98		N/A	ND	ND	N/A	ND	2.1	290	ND	N/A	N/A	ND	ND	N/A	N/A	17
08/31/98		N/A	ND	ND	N/A	ND	3.7	220	ND	N/A	N/A	ND	ND	N/A	N/A	34
09/28/98		N/A	ND	ND	N/A	ND	3.9	270	ND	N/A	N/A	ND	ND	N/A	N/A	35
10/28/98		N/A	ND	ND	N/A	ND	8.1	370	ND	N/A	N/A	ND	ND	N/A	N/A	ND
11/29/98		N/A	ND	ND	N/A	ND	4.7	3000	ND	N/A	N/A	ND	ND	N/A	N/A	18
12/28/98		N/A	ND	ND	N/A	ND	5.1	1400	ND	N/A	N/A	ND	ND	N/A	N/A	ND
01/27/99		N/A	ND	ND	N/A	ND	5	2600	ND	N/A	N/A	ND	ND	N/A	N/A	13
02/17/99		N/A	ND	ND	N/A	ND	2.7	740	ND	N/A	N/A	ND	ND	N/A	N/A	ND
03/23/99		N/A	ND	ND	N/A	ND	7.6	2500	ND	N/A	N/A	ND	ND	N/A	N/A	17

Table 2.3-46 (Sheet 4 of 4)
Summary of Metals Analyses from DWQ Station B6050000 — Deep River at CSX RR Bridge near Moncure, NC

Sample Date		Alkalinity, Carbonate as $CaCO_3$	Arsenic (unfiltered)	Cadmium (unfiltered)	Calcium (filtered)	Chromium (unfiltered)	Copper (unfiltered)	Iron (unfiltered)	Lead (filtered)	Magnesium (filtered)	Manganese (unfiltered)	Mercury (unfiltered)	Nickel (filtered)	Silver (unfiltered)	Sodium (filtered)	Zinc (unfiltered)
	NC Standard:	N/A	10	2	N/A	50	7	1000	25	N/A	N/A	0.01	88	N/A	N/A	50
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L
04/29/99		N/A	ND	ND	N/A	ND	2.7	760	ND	N/A	N/A	ND	ND	N/A	N/A	ND
05/24/99		N/A	ND	ND	N/A	ND	2.8	960	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/24/99		N/A	ND	ND	N/A	ND	2.2	410	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/27/99		N/A	ND	ND	N/A	ND	2.8	300	ND	N/A	N/A	ND	ND	N/A	N/A	ND
08/17/99		N/A	ND	ND	N/A	ND	3.5	300	ND	N/A	N/A	ND	ND	N/A	N/A	ND
09/29/99		N/A	ND	ND	N/A	ND	5.1	2100	ND	N/A	N/A	ND	ND	N/A	N/A	ND
10/18/99		N/A	ND	ND	N/A	ND	11	2100	ND	N/A	N/A	ND	ND	N/A	N/A	20
11/02/99		N/A	ND	ND	N/A	ND	2.5	970	ND	N/A	N/A	ND	ND	N/A	N/A	ND
12/02/99		N/A	ND	ND	N/A	ND	6.4	830	ND	N/A	N/A	ND	ND	N/A	N/A	ND
02/14/00		N/A	ND	ND	N/A	ND	5.2	3500	ND	N/A	N/A	ND	ND	N/A	N/A	15
03/15/00		N/A	ND	ND	N/A	ND	3.6	1500	ND	N/A	N/A	ND	ND	N/A	N/A	ND
04/26/00		N/A	ND	ND	N/A	ND	6	6200	ND	N/A	N/A	0.44	ND	N/A	N/A	18
05/22/00		N/A	ND	ND	N/A	ND	ND	850	ND	N/A	N/A	ND	ND	N/A	N/A	ND
06/14/00		N/A	ND	ND	N/A	ND	ND	470	ND	N/A	N/A	ND	ND	N/A	N/A	ND
07/30/00		N/A	ND	ND	N/A	ND	5.6	450	ND	N/A	46	ND	ND	N/A	N/A	42
08/30/00		N/A	ND	ND	N/A	ND	3.8	340	ND	N/A	N/A	ND	ND	N/A	N/A	ND
05/21/01		N/A	ND	ND	N/A	ND	2.9	410	ND	N/A	61	ND	ND	N/A	N/A	21
08/02/01		N/A	ND	ND	N/A	ND	2.4	170	ND	N/A	36	ND	ND	N/A	N/A	610
11/28/01		N/A	ND	ND	N/A	ND	2.4	130	ND	N/A	23	ND	ND	N/A	N/A	ND
02/20/02		N/A	ND	ND	N/A	ND	2.3	960	ND	N/A	31	ND	ND	N/A	N/A	12
05/07/02		N/A	ND	ND	N/A	ND	2.2	400	ND	N/A	33	ND	ND	N/A	N/A	ND
08/21/02		N/A	ND	ND	N/A	ND	ND	120	ND	N/A	53	ND	ND	N/A	N/A	ND
11/25/02		N/A	ND	ND	N/A	ND	4.5	1000	ND	N/A	32	ND	ND	N/A	N/A	14

Notes:
mg/L = milligrams per liter
N/A = not available
ND = no data
Source: Reference 2.3-052

Table 2.3-47 (Sheet 1 of 3)
Water Chemistry Data from DWQ Station B6050000 — Deep River at CSX RR Bridge near Moncure, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
03/16/92		N/A	0.04	0.4	0.62	0.14	0.05	N/A
04/23/92		N/A	0.2	0.9	0.41	0.39	0.05	N/A
05/21/92		N/A	0.07	0.5	0.88	0.13	0.07	N/A
06/22/92		N/A	0.07	0.5	0.69	0.18	0.07	N/A
07/27/92		N/A	0.08	0.7	2.3	0.33	N/A	N/A
08/05/92		N/A	0.04	0.5	0.65	0.23	N/A	N/A
09/17/92		N/A	0.05	0.5	0.06	0.17	N/A	N/A
10/13/92		N/A	0.05	0.8	1.9	0.12	N/A	N/A
11/19/92		N/A	0.09	0.4	0.91	0.22	N/A	N/A
12/28/92		N/A	0.02	0.3	0.78	0.18	N/A	N/A
01/25/93		N/A	0.01	0.5	0.57	0.15	N/A	N/A
02/18/93		N/A	0.14	0.7	0.64	0.29	N/A	N/A
03/30/93		N/A	0.07	0.6	0.49	0.16	N/A	N/A
04/27/93		N/A	0.06	0.4	0.62	0.11	N/A	N/A
05/17/93		N/A	0.06	0.4	0.89	0.18	N/A	N/A
06/24/93		N/A	0.06	0.3	1	0.17	N/A	N/A
07/27/93		N/A	0.04	0.3	0.39	0.21	N/A	N/A
08/19/93		N/A	0.01	0.5	0.08	0.16	N/A	N/A
09/20/93		N/A	0.06	0.4	0.19	0.19	N/A	N/A
10/18/93		N/A	0.06	0.5	0.03	0.14	N/A	N/A
11/15/93		N/A	0.05	0.5	0.76	0.28	N/A	N/A
02/09/94		N/A	0.18	0.7	0.81	0.12	N/A	N/A
03/22/94		N/A	0.02	0.3	0.54	0.11	N/A	N/A
04/18/94		N/A	0.12	0.6	0.63	0.21	N/A	N/A
05/24/94		N/A	0.03	0.4	0.67	0.14	N/A	N/A
06/21/94		N/A	0.09	0.5	0.95	0.17	N/A	N/A
07/20/94		N/A	ND	0.4	0.5	0.2	N/A	N/A
08/10/94		N/A	0.08	0.5	0.96	0.24	N/A	N/A
09/22/94		N/A	0.07	0.7	0.64	0.23	N/A	N/A
09/29/94		N/A	0.06	0.6	0.64	0.25	N/A	N/A
10/18/94		N/A	0.06	0.6	1.1	0.12	N/A	N/A
11/29/94		N/A	0.02	0.4	1.1	0.15	N/A	N/A
12/20/94		N/A	0.07	0.4	1.2	0.17	N/A	N/A
01/10/95		N/A	0.09	0.8	1.1	0.28	N/A	N/A
02/06/95		N/A	0.09	0.4	1	0.15	N/A	N/A
03/23/95		N/A	0.09	0.3	0.67	0.11	N/A	N/A
04/27/95		N/A	0.05	1.2	0.89	0.23	N/A	N/A
05/17/95		N/A	0.05	0.6	0.87	0.16	N/A	N/A
06/22/95		N/A	0.13	0.5	0.86	0.24	N/A	N/A
08/10/95		N/A	0.02	0.5	0.58	0.14	N/A	N/A
09/14/95		N/A	0.03	0.4	0.43	0.16	N/A	N/A
10/31/95		N/A	0.11	0.6	0.51	0.25	N/A	N/A
11/30/95		N/A	0.02	0.4	0.74	0.12	N/A	N/A

Table 2.3-47 (Sheet 2 of 3)
Water Chemistry Data from DWQ Station B6050000 — Deep River at CSX RR Bridge near Moncure, NC

Sample Date		Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
	Unit:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
12/15/95		N/A	ND	0.3	0.77	0.15	N/A	N/A
01/23/96		N/A	0.21	0.5	0.68	0.18	N/A	N/A
02/22/96		11	0.03	0.5	0.76	0.2	N/A	N/A
03/28/96		10	0.03	0.3	0.66	0.12	N/A	N/A
04/18/96		9	0.01	0.3	0.33	0.1	N/A	N/A
05/29/96		12	0.09	0.5	0.74	0.14	N/A	N/A
06/25/96		14	0.07	0.5	0.85	0.23	N/A	N/A
07/18/96		16	0.02	0.5	0.26	0.12	N/A	N/A
08/22/96		20	0.06	0.6	1.6	0.31	N/A	N/A
09/26/96		10	0.05	0.4	0.55	0.12	N/A	N/A
10/15/96		6	0.06	0.4	0.61	0.14	N/A	N/A
11/20/96		15	0.08	0.4	1.1	0.16	N/A	N/A
12/18/96		16	0.04	0.3	1.2	0.13	N/A	N/A
01/30/97		12	0.04	0.4	0.9	0.1	N/A	N/A
02/27/97		10	0.07	0.3	0.76	0.09	N/A	N/A
03/31/97		9	0.03	0.3	0.6	0.1	N/A	N/A
05/22/97		12	ND	0.2	0.45	0.08	N/A	N/A
06/30/97		19	ND	0.9	0.54	0.26	N/A	N/A
07/31/97		N/A	0.03	0.5	0.6	0.16	N/A	N/A
09/08/97		18	ND	0.3	0.07	0.11	N/A	N/A
09/29/97		8	0.07	0.4	0.82	0.26	N/A	N/A
10/15/97		16	ND	0.3	0.28	0.25	N/A	N/A
11/17/97		12	0.01	0.3	0.76	0.22	N/A	N/A
12/11/97		12	0.02	0.2	0.61	0.08	N/A	N/A
01/14/98		N/A	0.09	0.6	0.64	0.13	N/A	N/A
02/10/98		N/A	0.11	0.2	0.56	0.09	N/A	N/A
03/03/98		N/A	0.07	0.2	0.58	0.09	N/A	N/A
04/15/98		6	ND	0.2	0.43	0.11	N/A	N/A
05/27/98		N/A	0.12	0.3	1.1	0.21	N/A	N/A
06/11/98		N/A	0.05	0.1	0.76	0.14	N/A	N/A
07/29/98		N/A	0.01	0.2	0.14	0.13	N/A	N/A
08/31/98		N/A	ND	0.3	0.12	0.18	N/A	N/A
09/28/98		N/A	ND	0.6	0.21	0.13	N/A	N/A
10/28/98		N/A	0.11	0.3	0.47	0.26	N/A	N/A
11/29/98		N/A	0.01	0.3	1.3	0.12	N/A	N/A
12/28/98		N/A	0.12	0.7	1.4	0.29	N/A	N/A
01/27/99		N/A	0.09	0.6	0.75	0.17	N/A	N/A
02/17/99		N/A	ND	0.4	1	0.11	N/A	N/A
03/23/99		N/A	0.04	0.6	0.62	0.23	N/A	N/A
04/29/99		N/A	0.05	0.4	0.41	0.24	N/A	N/A
05/24/99		N/A	ND	0.3	0.83	0.28	N/A	N/A
06/24/99		N/A	ND	0.3	0.21	0.26	N/A	N/A
07/27/99		N/A	0.03	0.5	1	0.81	N/A	N/A

Table 2.3-47 (Sheet 3 of 3)
Water Chemistry Data from DWQ Station B6050000 — Deep River at CSX RR Bridge near Moncure, NC

Sample Date	Unit:	Chloride	Nitrogen, Ammonia as NH_3	Nitrogen, Kjeldahl	Nitrogen, Nitrite (NO_2) + Nitrate (NO_3) as N	Phosphorus as P	Phosphorus, Orthophosphate as P	Phosphorus, Orthophosphate as PO_4
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
08/17/99		N/A	0.06	0.6	ND	0.37	N/A	N/A
09/29/99		3.92	0.03	0.5	0.38	0.26	N/A	N/A
10/18/99		N/A	0.03	1.1	0.46	0.21	N/A	N/A
11/02/99		N/A	ND	0.2	0.68	0.24	N/A	N/A
12/02/99		N/A	ND	0.5	0.9	0.21	N/A	N/A
02/14/00		N/A	0.07	0.6	0.67	0.26	N/A	N/A
03/15/00		N/A	ND	0.5	0.21	0.14	N/A	N/A
04/26/00		N/A	0.11	0.4	0.69	0.7	N/A	N/A
05/22/00		N/A	0.17	0.4	0.49	0.32	N/A	N/A
06/14/00		N/A	0.04	0.6	0.53	0.24	N/A	N/A
07/30/00		33	0.08	0.8	1.3	0.35	N/A	N/A
08/30/00		N/A	0.02	0.8	0.61	0.58	N/A	N/A
09/13/00		N/A	0.05	0.6	0.98	0.38	N/A	N/A
10/09/00		N/A	0.06	0.8	0.86	0.36	N/A	N/A
02/01/01		N/A	0.89	ND	1.6	ND	N/A	N/A
05/21/01		N/A	ND	ND	1.3	0.5	N/A	N/A
06/25/01		N/A	0.13	N/A	0.01	0.02	N/A	N/A
07/11/01		N/A	0.65	1.6	0.01	0.02	N/A	N/A

Notes:

mg/L = milligrams per liter
N/A = not available
ND = no data

Source: Reference 2.3-052

Table 2.3-48 (Sheet 1 of 4)
Summary of Water Chemistry Data from Harris Reservoir, 1990 – 2004

Parameter		E2 Surface	E2 Bottom	H2	P2	S2
Total Alkalinity (as CaCO3) (mg/L)						
	Number of Events	50	52	56	56	50
	MAX	23	78	20	19	23
	MIN	7	7.9	4.7	7.1	3.8
NC Water Quality Standards – N/A	Mean[(a)]	13.0	22.2	12.2	12.1	12.1
Hardness (cal. as CaCO3) (mg/L)						
	Number of Events	50	52	56	56	50
	MAX	57	27	20	20	22
	MIN	13	13	12	3.1	11
NC Water Quality Standards – 100	Mean	17.0	18.4	15.8	15.7	16.1
Chloride (mg/L)						
	Number of Events	50	52	56	55	50
	MAX	14	14	13	13	14
	MIN	3	3.1	2.8	2.9	2.3
NC Water Quality Standards – 250	Mean	9.2	9.2	8.5	8.8	8.6
Total Sulfate (mg/L)						
	Number of Events	50	52	56	56	50
	MAX	18	18	17	18	17
	MIN	4	<1	4	5	5
NC Water Quality Standards – 250	Mean	12.8	11.4	11.8	12.2	11.4
Total Calcium (mg/L)						
	Number of Events	50	52	56	56	50
	MAX	25	6	4.6	4.7	5.2
	MIN	2.3	2.6	2.2	2.3	2.4
NC Water Quality Standards – N/A	Mean	4.0	4.1	3.5	3.4	3.6
Total Magnesium (mg/L)						
	Number of Events	50	52	56	56	50
	MAX	2.2	3	2.2	2.1	2.2
	MIN	1	1.4	1.1	1	1
NC Water Quality Standards – N/A	Mean	1.8	2.0	1.7	1.8	1.7
Total Sodium (mg/L)						
	Number of Events	50	52	56	56	50
	MAX	15	16	14	14	14
	MIN	6.8	6.7	6.3	6.6	3.9
NC Water Quality Standards – N/A	Mean	10.3	10.6	9.9	9.9	9.5
Total Nitrogen (mg/L)						
	Number of Events	62	70	74	74	68
	MAX	1	7.3	1.1	0.9	1.5
	MIN	0.29	0.28	<0.05	<0.05	<0.1
NC Water Quality Standards – N/A	Mean	0.6	1.2	0.6	0.6	0.6

Table 2.3-48 (Sheet 2 of 4)
Summary of Water Chemistry Data from Harris Reservoir, 1990 – 2004

Parameter		E2 Surface	E2 Bottom	H2	P2	S2
Total Ammonia Nitrogen (NH3-N) (mg/L)						
	Number of Events	55	63	67	67	67
	MAX	0.22	4.6	0.16	0.19	0.24
	MIN	<0.02	0.02	<0.02	<0.02	<0.02
NC Water Quality Standards – N/A	Mean	0.1	0.6	0.05	0.05	0.05
Total Nitrate + Nitrite-N (mg/L)						
	Number of Events	55	63	67	67	67
	MAX	0.36	0.4	0.25	0.22	0.33
	MIN	<0.02	<0.02	0.01	<0.02	<0.02
NC Water Quality Standards – N/A	Mean	0.1	0.05	0.05	0.05	0.05
Total Phosphorus (mg/L)						
	Number of Events	62	70	74	74	68
	MAX	0.12	1.3	0.2	0.075	0.074
	MIN	0.017	0.023	0.013	0.016	0.011
NC Water Quality Standards – N/A	Mean	0.04	0.1	0.04	0.029	0.034
Total Organic Carbon (TOC) (mg/L)						
	Number of Events	50	52	56	56	50
	MAX	10	12	9	9	10
	MIN	4.5	4.8	4.6	4.6	1.8
NC Water Quality Standards – N/A	Mean	7.2	7.8	7.0	7.2	7.5
Turbidity (NTU)						
	Number of Events	62	70	74	74	68
	MAX	17	34	15	11	76
	MIN	0.6	0.6	1	0.8	1
NC Water Quality Standards –50, 25	Mean	3.1	7.5	3.8	3.1	9.4
Total Solids (mg/L)						
	Number of Events	61	69	73	73	67
	MAX	100	160	94	180	170
	MIN	<10	7	29	16	<20
NC Water Quality Standards – N/A	Mean	67	76.5	64.6	68.9	73.9
Total Dissolved Solids (TDS) (mg/L)						
	Number of Events	49	57	61	62	62
	MAX	100	140	92	130	128
	MIN	<10	27	10	23	12
NC Water Quality Standards – 500	Mean	65.0	74.5	57.8	62.0	64.6
Total Suspended Solids (mg/L)						
	Number of Events	60	68	72	73	67
	MAX	29	38	35	18	28
	MIN	<1	<1	<1	<1	<1
NC Water Quality Standards – N/A	Mean	5.1	7.1	5.5	4.5	7.0

Table 2.3-48 (Sheet 3 of 4)
Summary of Water Chemistry Data from Harris Reservoir, 1990 – 2004

Parameter		E2 Surface	E2 Bottom	H2	P2	S2
Total Aluminum (µg/L)						
	Number of Events	50	52	56	55	46
	MAX	210	490	380	210	1500
	MIN	<20	<20	<20	<20	<20
NC Water Quality Standards – N/A	Mean	66.8	92.9	84.4	61.6	235.7
Total Arsenic (µg/L)						
	Number of Events	30	36	36	32	30
	MAX	1	3	<1	<1	1
	MIN	<1	<1	<1	<1	<1
NC Water Quality Standards – 10	Mean	1.0	1.1	1.0	1.0	1.0
Total Cadmium (µg/L)						
	Number of Events	50	52	56	52	50
	MAX	<0.5	<0.5	<0.5	<0.5	<0.5
	MIN	<0.1	<0.1	<0.1	<0.1	<0.1
NC Water Quality Standards – 2.0	Mean	0.3	0.2	0.3	0.3	0.3
Total Chromium (µg/L)						
	Number of Events	18	24	24	24	18
	MAX	<2	<2	<2	<2	<2
	MIN	<2	<2	<2	<2	<2
NC Water Quality Standards – 50	Mean	<2.0	<2.0	<2.0	<2.0	<2.0
Total Copper (µg/L)						
	Number of Events	50	52	56	56	50
	MAX	<10	25	<10	<10	<10
	MIN	<1	<1	0.7	<1	<1
NC Water Quality Standards – 7	Mean	2.6	3.6	2.1	2.2	2.1
Total Mercury (µg/L)						
	Number of Events	50	52	56	56	50
	MAX	<0.2	0.45	<0.2	<0.2	<0.2
	MIN	<0.02	<0.05	<0.05	<0.05	<0.05
NC Water Quality Standards – 0.012	Mean	0.1	0.1	0.1	0.1	0.1
Total Nickel (µg/L)						
	Number of Events	18	24	24	24	18
	MAX	<5	6.8	<5	<5	<5
	MIN	<5	<5	<5	<5	<5
NC Water Quality Standards – 88	Mean	<5.0	5.1	<5.0	<5.0	<5.0
Total Lead (µg/L)						
	Number of Events	18	24	24	24	18
	MAX	<1	1.3	<1	1.2	<1
	MIN	<1	<1	<1	<1	<1
NC Water Quality Standards – 25	Mean	<1.0	1.0	<1.0	1.0	<1.0

Table 2.3-48 (Sheet 4 of 4)
Summary of Water Chemistry Data from Harris Reservoir, 1990 – 2004

Parameter		E2 Surface	E2 Bottom	H2	P2	S2
Total Selenium (µg/L)						
	Number of Events	30	36	36	36	30
	MAX	<1	<1	<1	3	1
	MIN	<1	<1	<1	<1	<1
NC Water Quality Standards – 5	Mean	<1.0	<1.0	<1.0	1.1	1.0
Total Zinc (µg/L))						
	Number of Events	30	35	35	35	29
	MAX	40	30	20	30	<20
	MIN	<20	<20	<10	20	<10
NC Water Quality Standards – 50	Mean	21.7	21.5	19.7	20.3	19.7
Total Nitrogen : Total Phosphorus						
	Number of Events	16	12	15	12	16
	MAX	27.3	20.3	31	34	32.5
	MIN	11.3	4	14	17	7.8
NC Water Quality Standards – N/A	Mean	17.7	11.7	20.9	22.2	20.0
Chlorophyll *a* (µg/L)[(b)]						
	Number of Events	52	0	52	52	52
	MAX	48.5	N/A	86.8	38.6	51.2
	MIN	3	N/A	4.8	3.6	1.2
NC Water Quality Standards – 40	Mean	15.0	N/A	17.4	14.1	10.3

Notes:

a) Mean values for parameters with data that were reported less than the reporting limit were calculated by using the reporting limits as the value (e.g., <1.0 = 1.0 to calculate the mean).

b) Only maximum, minimum, and mean data were available for chlorophyll *a* from 1995 to 2004. The mean values for chlorophyll a were calculated by averaging the means values for each year.

N/A = not available

Sources: Reference 2.3-059, Reference 2.3-060, Reference 2.3-061, Reference 2.3-062, Reference 2.3-063, Reference 2.3-064, Reference 2.3-065, Reference 2.3-066, Reference 2.3-067, Reference 2.3-068, Reference 2.3-069, Reference 2.3-070, Reference 2.3-071, Reference 2.3-072, and Reference 2.3-073

Table 2.3-49 (Sheet 1 of 6)
Summary of Temperature Data from Harris Reservoir, 1990 – 2004

		January				February				March			
Station	Depth (m)	#	MIN	MAX	MEAN	#	MIN	MAX	MEAN	#	MIN	MAX	MEAN
E2	0.2	13	5.1	10.5	8.0	2	7.9	9.2	8.6	5	8.7	14.0	10.7
	1	13	5.1	10.5	7.9	3	5.6	7.9	7.0	5	8.7	13.7	10.5
	2	13	5.0	10.5	7.8	3	5.6	7.9	7.0	5	8.6	12.7	10.2
	3	13	5.0	10.3	7.7	3	5.6	7.9	7.0	5	8.6	11.5	9.9
	4	13	5.0	10.1	7.7	3	5.5	7.9	7.0	5	8.6	11.1	9.8
	5	13	0.5	10.0	6.9	3	5.0	7.9	6.8	5	8.5	11.0	9.7
	6	13	5.0	9.7	7.5	3	5.0	7.5	6.8	5	8.5	10.9	9.7
	7	13	4.9	9.7	7.4	3	5.0	7.8	6.7	5	8.5	10.9	9.7
	8	13	4.9	9.6	7.4	3	4.9	7.8	6.7	5	8.4	10.8	9.6
	9	13	4.9	9.5	7.3	3	4.9	7.8	6.7	5	8.4	10.8	9.6
	10	13	4.9	9.5	7.3	3	4.9	7.8	6.7	5	8.4	10.8	9.6
	11	13	4.9	9.5	7.3	3	4.9	7.7	6.7	5	8.3	10.7	9.4
	12	13	4.9	9.4	7.3	3	4.9	7.7	6.7	5	8.2	10.7	9.4
	13	12	4.9	9.4	7.3	2	4.9	7.6	6.3	4	8.0	10.7	9.1
	14	11	4.9	9.4	7.2	1	4.9	4.9	4.9	2	7.9	9.2	8.6
	15	9	4.8	9.4	7.3	1	4.9	4.9	4.9				
	16	6	4.9	9.4	7.2								
	17	2	5.0	9.3	7.2								
H2	0.2	13	4.1	11.3	8.0	3	5.4	9.2	7.6	5	9.8	15.4	12.4
	1	13	4.0	11.1	7.9	3	5.3	7.9	6.9	5	9.4	15.0	11.6
	2	13	4.0	11.1	7.7	3	5.3	7.4	6.7	5	9.4	13.9	11.2
	3	13	4.0	11.0	7.6	3	5.3	7.4	6.6	5	9.3	11.7	10.7
	4	13	4.0	10.2	7.4	3	5.3	7.4	6.6	5	9.3	11.2	10.5
	5	13	4.0	9.8	7.2	3	5.3	7.4	6.6	5	9.2	10.8	10.3
	6	13	4.0	9.8	7.2	3	5.2	7.4	6.6	5	8.4	10.7	9.8
	7	12	4.0	9.8	7.2	2	7.1	7.4	7.3	5	8.2	10.6	9.6
	8	10	4.0	9.8	6.9					4	8.2	10.5	9.6
	9	4	6.1	9.8	8.4								
P2	0.2	13	4.5	10.5	7.6	3	4.9	7.8	6.8	5	9.4	15.7	11.5
	1	13	4.5	10.5	7.6	3	4.9	7.8	6.8	5	9.4	15.0	11.2
	2	13	4.5	10.4	7.6	3	4.9	7.7	6.7	5	9.3	13.5	10.8
	3	13	4.5	10.0	7.5	3	4.9	7.7	6.6	5	9.3	11.7	10.4
	4	13	4.5	10.0	7.4	3	4.8	7.7	6.6	5	9.2	11.2	10.3
	5	12	4.4	10.0	7.2	3	4.8	7.7	6.6	5	9.7	10.7	10.2
	6	13	4.4	10.0	7.2	3	4.8	7.7	6.6	5	9.2	10.7	10.1
	7	13	4.4	10.0	7.3	3	4.8	7.7	6.6	5	9.1	10.7	9.9
	8	12	4.4	10.0	7.1	3	4.8	7.7	6.6	4	9.1	10.6	9.8
	9	4	4.4	9.9	7.8					1	10.6	10.6	10.6
	10	1	9.9	9.9	9.9								
S2	0.2	13	3.0	11.3	7.4	3	4.8	7.5	6.5	5	10.3	16.6	12.7
	1	13	3.0	11.4	7.3	3	4.8	7.5	6.4	5	10.3	15.6	12.0
	2	13	3.0	11.4	7.2	3	4.8	7.5	6.2	5	10.3	12.9	11.3
	3	13	2.9	10.8	7.1	3	4.8	7.4	6.2	5	10.3	12.0	10.9
	4	8	3.0	10.7	7.2	1	4.8	4.8	4.8	5	10.1	12.0	10.9
	5	6	3.3	10.6	6.2	1	4.8	4.8	4.8	2	10.0	11.9	11.0
	6												

Table 2.3-49 (Sheet 2 of 6)
Summary of Temperature Data from Harris Reservoir, 1990 – 2004

Station	Depth (m)	April #	April MIN	April MAX	April MEAN	May #	May MIN	May MAX	May MEAN	June #	June MIN	June MAX	June MEAN
E2	0.2	3	12.8	15.3	13.8	13	19.1	29.6	22.3	3	20.7	26.7	24.2
	1	3	11.8	15.2	13.3	12	17.7	27.9	21.3	3	20.3	26.7	23.9
	2	3	11.4	15.2	13.1	13	16.8	27.1	20.5	3	19.9	26.4	23.5
	3	3	11.4	15.1	13.1	13	16.6	26.1	19.9	3	19.4	26.2	22.9
	4	3	11.4	15.0	13.0	13	16.5	23.1	19.3	3	18.7	25.4	21.6
	5	3	11.3	14.8	12.8	13	16.1	21.4	18.7	3	18.3	23.0	20.0
	6	3	11.3	14.8	12.7	13	15.6	20.0	17.9	3	17.6	20.9	18.9
	7	3	11.3	14.7	12.6	13	15.5	20.0	17.4	3	17.3	20.0	18.4
	8	3	11.3	14.3	12.5	13	15.3	19.8	16.8	3	16.8	19.6	17.9
	9	3	11.2	14.3	12.4	13	14.7	17.8	16.1	3	15.9	19.5	17.3
	10	3	11.2	14.2	12.4	13	13.9	17.0	15.6	3	15.5	18.2	16.6
	11	3	11.2	13.4	12.1	13	13.2	16.3	15.1	3	15.1	18.0	16.3
	12	3	11.1	11.7	11.4	13	12.7	16.1	14.3	3	14.3	16.6	15.1
	13	2	11.1	11.3	11.2	12	12.0	15.9	13.7	3	12.7	13.9	13.3
	14	1	10.2	10.2	10.2	9	11.8	14.8	13.4	2	13.0	13.2	13.1
	15					7	12.1	14.5	13.2	1	12.2	12.2	12.2
	16					6	11.9	14.3	13.0				
	17					3	11.3	14.1	13.0				
H2	0.2	3	12.4	17.5	14.5	13	18.7	29.7	22.9	3	22.1	25.9	24.5
	1	3	12.0	17.2	13.8	13	16.8	29.6	22.3	3	22.1	25.8	24.4
	2	3	11.5	16.9	13.5	12	16.7	29.1	21.8	3	22.1	25.7	24.1
	3	3	11.4	16.3	13.0	13	16.5	25.5	20.6	3	22.0	22.9	22.4
	4	3	11.1	15.9	12.8	13	15.9	22.8	19.1	3	20.4	22.1	21.4
	5	3	10.8	15.2	12.5	13	15.7	21.5	18.2	3	17.8	19.9	19.1
	6	3	10.4	13.0	11.6	13	15.5	20.1	17.1	3	17.3	19.4	18.6
	7	2	10.3	11.3	10.8	13	15.0	18.5	16.4	1	17.3	17.3	17.3
	8	1	11.2	11.2	11.2	11	14.9	18.1	16.1				
	9					4	15.2	17.2	15.9				
P2	0.2	3	11.4	16.2	13.3	13	18.2	29.1	22.2	3	21.3	24.6	23.4
	1	3	11.5	16.2	13.1	13	16.7	29.0	21.9	3	21.3	24.6	23.4
	2	3	11.5	16.2	13.1	13	16.5	28.7	21.6	3	21.0	24.5	23.2
	3	3	11.4	16.2	13.0	13	16.4	28.3	21.1	3	20.7	23.9	22.1
	4	3	11.4	16.2	13.0	13	16.2	23.7	20.0	3	19.1	23.1	20.9
	5	3	11.3	16.2	13.0	13	16.0	23.7	18.7	3	18.1	21.1	19.9
	6	3	11.3	16.1	12.9	13	15.8	23.5	17.8	3	17.7	19.8	18.5
	7	3	11.2	16.1	12.9	13	15.5	20.2	16.9	3	17.1	19.5	18.0
	8	3	11.0	14.2	12.1	13	15.0	18.5	16.3	3	16.1	18.9	17.3
	9	1	11.0	11.0	11.0	6	14.7	17.8	16.2				
	10					4	14.6	16.3	15.7				
S2	0.2	3	10.1	17.6	13.6	13	18.6	29.7	22.7	3	21.7	25.5	23.9
	1	3	10.2	17.6	13.1	13	17.2	29.6	22.2	3	21.7	25.5	23.9
	2	3	10.2	17.5	12.8	13	15.6	29.2	21.6	3	21.4	24.4	23.4
	3	3	10.2	17.4	12.7	13	14.9	27.9	20.5	3	19.1	23.7	22.1
	4	3	9.5	17.4	12.4	7	15.5	23.8	19.1	3	18.6	22.3	20.5
	5	1	9.4	9.4	9.4	5	16.8	21.0	18.9	1	19.9	19.9	19.9
	6	1	9.4	9.4	9.4								

Table 2.3-49 (Sheet 3 of 6)
Summary of Temperature Data from Harris Reservoir, 1990 – 2004

Station	Depth (m)	July #	July MIN	July MAX	July MEAN	August #	August MIN	August MAX	August MEAN	September #	September MIN	September MAX	September MEAN
E2	0.2	13	28.5	31.4	29.3	3	28.1	29.6	28.8	5	25.9	30.3	27.7
	1	13	27.9	30.2	29.0	3	28.0	29.3	28.7	5	25.7	29.5	27.5
	2	13	27.4	30.2	28.4	3	27.9	28.9	28.4	5	25.5	29.4	27.4
	3	13	25.6	30.2	27.5	3	27.8	27.9	27.9	5	25.3	29.3	27.1
	4	12	23.7	29.5	26.1	3	25.5	27.3	26.7	5	24.8	27.7	26.3
	5	13	12.3	26.4	23.3	3	22.0	26.2	23.6	5	23.4	27.6	25.3
	6	13	20.4	23.8	22.0	3	21.1	24.5	22.4	5	22.7	25.8	24.4
	7	13	18.4	22.7	20.8	3	20.3	23.1	21.3	5	21.9	24.9	23.8
	8	13	17.6	21.0	19.7	3	19.0	22.6	20.3	5	21.3	24.0	22.9
	9	13	16.9	20.3	18.9	3	18.1	21.2	19.2	5	19.5	23.1	21.3
	10	13	16.4	19.4	18.1	3	17.3	20.1	18.4	5	18.0	23.1	20.0
	11	13	15.6	18.8	17.2	3	16.1	18.7	17.2	5	16.8	21.9	18.5
	12	13	14.5	17.3	16.1	3	15.2	17.2	15.9	5	15.2	18.2	16.3
	13	13	13.4	16.4	15.1	3	14.2	15.5	14.7	4	14.5	17.6	15.6
	14	9	13.2	16.0	14.7	3	13.7	14.6	14.0	2	14.0	14.8	14.4
	15	6	12.8	15.9	14.6	1	13.4	13.4	13.4				
	16	5	14.2	15.7	14.6	1	13.0	13.0	13.0				
	17	1	14.4	14.4	14.4								
H2	0.2	13	28.5	31.6	30.3	3	28.2	30.2	29.4	5	25.7	30.2	27.6
	1	13	13.4	31.1	28.5	3	28.1	30.2	29.4	5	25.7	30.2	27.6
	2	13	17.2	31.2	28.6	3	28.0	29.6	29.0	5	25.5	29.6	27.3
	3	13	25.6	29.0	27.8	3	27.8	29.3	28.4	5	25.3	29.3	26.9
	4	13	22.7	27.7	25.6	3	27.3	27.8	27.6	5	25.0	27.8	26.4
	5	13	20.1	26.8	23.3	3	22.5	25.5	24.4	5	22.5	27.0	24.8
	6	13	19.4	23.2	21.3	3	20.8	25.5	22.4	5	20.8	26.1	23.9
	7	13	18.4	21.4	20.2	2	19.7	19.7	19.7	4	19.7	24.7	22.6
	8	12	18.0	20.9	19.7	1	19.3	19.3	19.3	2	21.9	22.3	22.1
	9	5	19.0	20.4	19.6					1	22.0	22.0	22.0
P2	0.2	13	27.6	31.0	29.5	3	27.6	29.8	28.9	5	24.9	28.9	27.0
	1	13	27.4	31.0	29.4	3	27.6	29.8	28.9	5	24.8	28.9	26.9
	2	13	27.2	31.0	29.3	3	27.6	29.7	28.9	5	24.7	28.8	26.8
	3	13	26.9	30.4	28.7	3	27.6	29.5	28.5	5	24.6	28.7	26.7
	4	13	22.8	28.6	26.4	3	27.3	28.8	27.9	5	24.6	28.5	26.4
	5	13	20.1	28.4	23.6	3	23.4	26.6	24.9	5	24.6	27.1	25.8
	6	13	19.4	26.0	21.9	3	21.4	25.2	22.9	5	23.4	26.2	24.5
	7	13	18.6	22.2	20.6	3	20.0	23.3	21.1	5	21.4	24.2	22.9
	8	13	18.2	21.5	19.6	3	18.8	21.6	19.9	4	20.6	23.5	22.0
	9	4	17.5	20.1	18.9								
	10	1	18.4	18.4	18.4								
S2	0.2	13	27.5	31.4	29.8	2	29.5	29.8	29.7	5	25.0	28.6	26.8
	1	13	26.9	31.4	29.7	3	28.1	29.8	29.1	5	25.0	28.6	26.7
	2	13	26.8	31.4	29.5	3	27.9	29.7	29.0	5	23.8	28.4	26.1
	3	13	25.9	29.8	28.3	3	27.7	28.6	28.0	5	22.5	28.4	25.6
	4	12	23.9	27.9	26.7	3	27.2	28.1	27.6	3	21.9	25.6	24.3
	5	5	22.7	27.1	25.4								
	6												

Table 2.3-49 (Sheet 4 of 6)
Summary of Temperature Data from Harris Reservoir, 1990 – 2004

Station	Depth (m)	October #	October MIN	October MAX	October MEAN	November #	November MIN	November MAX	November MEAN	December #	December MIN	December MAX	December MEAN
E2	0.2	3	20.5	22.0	21.4	13	14.6	18.1	16.4	3	10.7	13.2	12.4
	1	3	20.5	22.0	21.3	13	14.5	17.9	16.2	3	10.8	13.2	12.4
	2	3	20.5	22.0	21.3	13	14.3	17.5	16.1	3	10.8	12.9	12.2
	3	3	20.5	22.0	21.3	13	14.3	17.4	16.1	3	10.7	12.9	12.0
	4	3	20.5	22.0	21.3	13	14.2	17.3	16.0	3	10.7	12.9	12.0
	5	3	20.5	22.0	21.3	13	14.2	17.3	16.0	3	10.7	12.9	12.0
	6	3	20.5	22.0	21.3	13	14.2	17.3	15.9	3	10.7	12.9	12.0
	7	3	20.5	21.9	21.3	13	14.2	17.3	15.9	3	10.7	12.9	12.0
	8	3	20.5	21.9	21.3	13	14.2	17.3	15.9	3	10.7	12.9	12.0
	9	3	20.5	21.7	21.2	13	14.2	17.3	15.9	3	10.7	12.9	12.0
	10	3	20.5	21.3	21.0	13	14.2	17.2	15.9	3	10.7	12.9	12.0
	11	3	20.0	21.3	20.6	13	14.1	17.2	15.9	3	10.7	12.9	12.0
	12	3	16.7	21.2	19.5	13	14.1	17.2	15.9	3	10.7	12.9	12.0
	13	2	19.2	20.5	19.9	10	14.1	17.2	15.8	2	10.6	12.8	11.7
	14	1	15.2	15.2	15.2	9	14.1	17.2	15.7				
	15					5	14.2	16.8	15.4				
	16					4	14.2	16.8	15.1				
	17					1	14.6	14.6	14.6				
H2	0.2	3	20.3	21.6	21.1	13	14.3	18.3	16.5	3	9.5	12.7	11.5
	1	3	20.3	21.6	21.1	13	14.3	18.2	16.4	3	9.5	12.7	11.5
	2	3	20.3	21.6	21.1	13	14.0	17.8	16.1	3	9.5	12.5	11.4
	3	3	20.3	21.6	21.1	13	13.9	17.6	15.9	3	9.5	12.3	11.3
	4	3	20.3	21.5	21.0	13	13.9	17.3	15.8	3	9.5	12.3	11.3
	5	3	20.3	21.5	20.9	13	13.9	17.2	15.7	3	9.5	12.3	11.3
	6	3	20.3	21.5	20.9	13	13.8	17.1	15.6	3	9.5	12.2	11.3
	7	1	20.3	20.3	20.3	12	13.2	17.1	15.4	1	9.4	9.4	9.4
	8					12	12.7	17.0	15.3	1	9.4	9.4	9.4
	9					6	13.3	16.5	14.7				
P2	0.2	3	20.2	21.4	20.8	13	14.3	18.1	16.3	3	9.9	12.4	11.6
	1	3	20.3	21.5	20.9	13	14.3	18.0	16.2	3	9.9	12.4	11.6
	2	3	20.2	21.4	20.8	13	14.1	17.9	16.1	3	9.9	12.5	11.6
	3	3	20.2	21.4	20.8	13	14.0	17.8	16.0	3	9.9	12.4	11.5
	4	3	20.3	21.4	20.8	13	14.0	17.7	15.9	3	9.9	12.4	11.5
	5	3	20.3	21.4	20.8	13	14.0	17.4	15.8	3	9.9	12.4	11.5
	6	3	20.3	21.3	20.8	13	14.0	17.3	15.7	3	9.9	12.3	11.5
	7	3	20.3	21.2	20.8	13	13.9	17.0	15.6	3	9.9	17.7	13.3
	8	3	20.3	21.2	20.8	13	13.8	17.0	15.6	3	9.8	12.3	11.4
	9					4	14.0	16.6	14.7				
	10												
S2	0.2	3	19.0	20.1	19.4	13	12.2	18.0	15.0	3	7.6	11.6	9.8
	1	3	18.8	20.1	19.3	13	12.2	17.9	15.0	3	7.6	11.6	9.8
	2	3	18.7	20.0	19.2	13	12.2	17.8	14.7	3	7.6	11.5	9.7
	3	3	18.4	19.9	19.0	13	12.2	17.1	14.4	3	7.6	11.4	9.7
	4	1	18.6	18.6	18.6	7	12.0	16.7	13.9	3	7.5	11.2	9.7
	5					2	11.7	12.0	11.9				
	6												

Table 2.3-49 (Sheet 5 of 6)
Summary of Temperature Data from Harris Reservoir, 1990 – 2004

Station	Depth (m)	Annual Average #	MIN	MAX
E2	0.2	79	16.9	20.8
	1	79	16.4	20.3
	2	80	16.1	20.1
	3	80	15.9	19.7
	4	79	15.4	19.1
	5	80	13.6	18.4
	6	80	14.4	17.5
	7	80	14.0	17.2
	8	80	13.7	16.8
	9	80	13.3	16.4
	10	80	13.0	16.0
	11	80	12.6	15.5
	12	80	11.9	14.7
	13	69	11.6	14.1
	14	50	11.2	12.7
	15	30	10.6	12.4
	16	22	11.6	13.8
	17	7	11.3	13.1
H2	0.2	80	16.6	21.1
	1	80	15.1	20.9
	2	79	15.3	20.5
	3	80	15.9	19.5
	4	80	15.4	18.7
	5	80	14.3	17.9
	6	80	13.8	17.2
	7	68	13.6	15.6
	8	54	13.3	15.4
	9	20	15.1	17.2
P2	0.2	80	16.2	20.5
	1	80	16.1	20.4
	2	80	16.0	20.2
	3	80	15.9	19.8
	4	80	15.3	19.1
	5	79	14.7	18.6
	6	80	14.3	18.0
	7	80	13.9	17.5
	8	77	13.5	16.4
	9	20	12.0	14.3
	10	6	14.3	14.9
S2	0.2	79	15.8	20.6
	1	80	15.5	20.6
	2	80	15.2	20.1
	3	80	14.7	19.5
	4	56	14.4	18.3
	5	23	12.3	14.6
	6	1	9.4	9.4

Table 2.3-49 (Sheet 6 of 6)
Summary of Temperature Data from Harris Reservoir, 1990 – 2004

Notes:

= Events
N/A = not available

Sources: Reference 2.3-059, Reference 2.3-060, Reference 2.3-061, Reference 2.3-062, Reference 2.3-063, Reference 2.3-064, Reference 2.3-065, Reference 2.3-066, Reference 2.3-067, Reference 2.3-068, Reference 2.3-069, Reference 2.3-070, Reference 2.3-071, Reference 2.3-072, and Reference 2.3-073

Table 2.3-50 (Sheet 1 of 2)
Summary of Dissolved Oxygen Data from Harris Reservoir, 1990 – 2004

Station	Depth (m)	January Events	January MIN	January MAX	January MEAN	May Events	May MIN	May MAX	May MEAN	July Events	July MIN	July MAX	July MEAN	November Events	November MIN	November MAX	November MEAN
E2	0.2	13.0	5.7	12.8	10.7	13.0	6.0	12.1	9.3	13.0	6.1	9.9	8.2	13.0	6.3	8.8	7.4
	1	13.0	5.7	12.8	10.6	13.0	5.8	12.4	9.2	13.0	6.0	10.0	7.9	13.0	6.0	8.2	7.1
	2	13.0	5.7	12.8	10.5	13.0	5.2	12.6	8.9	13.0	1.9	10.1	6.8	13.0	5.5	8.2	6.8
	3	13.0	5.8	12.1	10.4	13.0	4.2	12.1	7.8	13.0	0.3	8.9	4.9	13.0	5.6	8.2	6.7
	4	13.0	5.7	12.1	10.3	13.0	3.0	10.4	6.6	13.0	0.2	7.5	3.0	12.0	5.4	8.0	6.6
	5	13.0	5.7	12.1	10.3	13.0	0.5	9.2	5.8	13.0	0.2	1.7	0.9	13.0	5.3	8.0	6.5
	6	13.0	5.6	12.1	10.1	13.0	0.4	8.4	5.0	13.0	0.1	1.1	0.4	13.0	5.1	8.0	6.5
	7	13.0	5.6	12.1	10.0	13.0	0.3	8.4	4.5	13.0	0.1	3.0	0.7	13.0	5.2	7.9	6.4
	8	13.0	5.6	12.1	9.9	13.0	0.2	8.3	4.0	13.0	0.0	2.3	0.6	13.0	4.9	7.9	6.4
	9	13.0	5.5	12.1	9.8	13.0	0.2	8.3	3.6	13.0	0.0	2.8	0.6	13.0	4.8	7.9	6.3
	10	13.0	5.5	12.1	9.8	13.0	0.1	8.3	3.3	13.0	0.0	3.5	0.7	13.0	4.7	7.8	6.3
	11	13.0	5.5	12.1	9.7	13.0	0.1	8.3	3.1	13.0	0.0	3.7	0.6	13.0	4.5	7.8	6.2
	12	13.0	5.4	12.1	9.6	13.0	0.1	8.2	2.5	13.0	0.0	3.8	0.6	13.0	2.3	7.8	5.7
	13	12.0	5.4	12.1	9.5	12.0	0.1	8.1	2.0	13.0	0.0	4.0	0.6	10.0	3.1	7.8	5.9
	14	11.0	5.3	12.1	9.5	9.0	0.1	4.3	1.4	9.0	0.0	0.8	0.2	9.0	1.8	7.8	5.8
	15	9.0	7.7	11.9	9.9	7.0	0.0	5.0	1.5	6.0	0.0	0.2	0.1	5.0	4.7	7.8	6.6
	16	6.0	6.3	11.4	9.6	6.0	0.0	1.9	0.5	5.0	0.0	0.2	0.1	4.0	6.5	7.8	7.0
	17	2.0	8.7	11.0	9.9	N/A	N/A	N/A	N/A	1.0	0.1	0.1	0.1	1.0	0.6	0.6	0.6
H2	0.2	13.0	8.3	13.0	11.3	13.0	6.6	11.7	9.3	13.0	6.6	10.1	8.2	13.0	7.3	11.2	8.6
	1	13.0	8.0	13.0	11.1	13.0	7.1	12.2	9.4	13.0	6.5	10.3	8.1	13.0	7.1	11.0	8.4
	2	13.0	7.6	13.0	11.0	13.0	6.8	12.2	8.8	13.0	5.9	10.0	7.4	13.0	6.9	10.8	8.1
	3	13.0	7.3	13.0	10.8	13.0	6.5	10.6	7.9	13.0	0.3	17.0	5.3	13.0	5.0	10.0	7.7
	4	13.0	7.2	13.0	10.6	13.0	2.7	9.8	5.5	13.0	0.2	14.0	2.2	13.0	4.7	8.4	7.3
	5	13.0	7.1	13.0	10.2	13.0	0.8	8.8	3.9	13.0	0.2	3.5	0.8	13.0	4.3	8.3	7.0
	6	13.0	6.8	12.9	10.1	13.0	0.2	8.7	2.7	12.0	0.0	4.0	0.6	13.0	4.0	8.3	6.6
	7	12.0	6.8	12.8	10.0	13.0	0.1	8.6	2.2	12.0	0.0	4.2	0.6	12.0	3.5	8.2	6.5
	8	10.0	6.6	12.5	10.2	11.0	0.1	8.4	2.0	11.0	0.0	4.1	0.6	12.0	2.5	7.7	6.1
	9	4.0	5.7	10.0	8.1	4.0	0.1	2.8	1.1	5.0	0.1	1.2	0.4	6.0	3.9	7.6	6.2
P2	0.2	13.0	6.4	12.5	10.9	13.0	7.4	11.4	9.2	13.0	6.8	10.0	8.1	13.0	6.9	10.8	8.4
	1	13.0	6.3	12.4	10.8	13.0	7.5	11.4	9.3	13.0	6.2	10.1	8.0	13.0	6.9	10.6	8.3
	2	13.0	6.3	12.3	10.8	13.0	7.4	11.4	9.1	13.0	5.1	9.8	7.8	13.0	6.8	10.3	8.2
	3	13.0	6.3	12.3	10.7	13.0	7.3	11.4	8.5	13.0	2.2	9.7	6.8	13.0	6.8	9.7	8.0
	4	13.0	6.3	12.3	10.7	13.0	3.6	11.4	7.5	13.0	0.2	9.5	3.9	13.0	6.7	9.5	7.8
	5	13.0	6.2	12.2	10.6	13.0	1.5	11.2	6.2	13.0	0.0	7.2	1.6	13.0	6.7	9.4	7.6
	6	13.0	6.2	12.2	10.4	13.0	1.3	10.9	5.4	13.0	0.0	7.1	0.9	13.0	5.5	9.1	7.3
	7	13.0	6.2	12.2	10.4	13.0	0.4	10.7	4.2	13.0	0.0	7.0	0.9	13.0	4.0	9.0	6.9
	8	12.0	6.2	12.2	10.3	13.0	0.2	10.5	3.6	13.0	0.0	6.8	0.9	13.0	3.7	8.5	6.7

Table 2.3-50 (Sheet 2 of 2)
Summary of Dissolved Oxygen Data from Harris Reservoir, 1990 – 2004

		January				May				July				November			
Station	**Depth (m)**	**Events**	**MIN**	**MAX**	**MEAN**	**Events**	**MIN**	**MAX**	**MEAN**	**Events**	**MIN**	**MAX**	**MEAN**	**Events**	**MIN**	**MAX**	**MEAN**
	9	4.0	9.0	11.9	10.6	6.0	0.5	11.4	5.5	4.0	0.0	0.2	0.1	4.0	4.9	7.6	6.5
	10	1.0	7.0	7.0	7.0	4.0	0.3	11.4	6.4	1.0	0.0	0.0	0.0				
S2	0.2	13.0	6.0	12.9	10.4	13.0	6.5	10.6	8.6	13.0	4.9	10.2	7.8	13.0	7.5	10.8	9.1
	1	13.0	5.9	12.9	10.1	13.0	6.0	10.8	8.4	13.0	4.2	10.4	7.6	13.0	7.0	10.7	8.9
	2	13.0	5.9	12.9	10.0	13.0	4.7	10.2	7.6	13.0	3.7	11.0	7.4	13.0	5.6	10.5	8.6
	3	13.0	5.9	12.9	9.8	13.0	1.0	9.5	5.3	13.0	0.4	7.6	3.1	13.0	5.4	10.0	8.2
	4	8.0	5.9	12.9	9.9	8.0	0.1	6.4	3.5	12.0	0.1	3.2	0.8	7.0	3.8	9.9	7.3
	5	6.0	5.9	12.9	10.1	5.0	0.2	4.8	2.4	5.0	0.0	0.5	0.3	2.0	5.1	7.5	6.3

Notes:

a) All units are milligrams per liter.

N/A = not available

Sources: Reference 2.3-059, Reference 2.3-060, Reference 2.3-061, Reference 2.3-062, Reference 2.3-063, Reference 2.3-064, Reference 2.3-065, Reference 2.3-066, Reference 2.3-067, Reference 2.3-068, Reference 2.3-069, Reference 2.3-070, Reference 2.3-071, Reference 2.3-072, and Reference 2.3-073

Table 2.3-51 (Sheet 1 of 2)
Summary of Specific Conductance Data from Harris Reservoir, 1990 – 2004

	Depth	January				May				July				November			
Station	(m)	Events	MIN	MAX	MEAN	Events	MIN	MAX	MEAN	Events	MIN	MAX	MEAN	Events	MIN	MAX	MEAN
E2	0.2	13.0	56.0	96.0	75.8	13.0	65.0	171.0	88.3	13.0	62.0	125.0	95.1	12.0	57.0	107.0	85.8
	1	13.0	56.0	96.0	75.8	13.0	65.0	122.0	84.8	13.0	64.0	124.0	94.8	12.0	59.0	107.0	85.7
	2	13.0	56.0	96.0	75.5	13.0	66.0	119.0	83.5	13.0	65.0	123.0	94.2	12.0	60.0	106.0	85.6
	3	13.0	56.0	96.0	75.4	13.0	65.0	119.0	83.2	13.0	66.0	122.0	94.4	12.0	61.0	107.0	85.3
	4	13.0	56.0	96.0	75.5	13.0	65.0	118.0	83.5	13.0	66.0	121.0	98.2	12.0	60.0	107.0	85.3
	5	13.0	56.0	96.0	75.6	13.0	65.0	118.0	83.2	13.0	81.0	121.0	103.6	12.0	60.0	107.0	85.3
	6	13.0	56.0	96.0	75.3	13.0	65.0	121.0	84.4	13.0	90.0	141.0	114.4	12.0	60.0	107.0	85.3
	7	13.0	56.0	96.0	75.2	13.0	65.0	124.0	84.8	13.0	97.0	144.0	115.6	12.0	60.0	107.0	85.3
	8	13.0	56.0	96.0	75.2	13.0	66.0	124.0	85.6	13.0	94.0	142.0	113.4	12.0	59.0	107.0	85.1
	9	13.0	56.0	96.0	75.1	13.0	66.0	121.0	85.8	13.0	92.0	141.0	110.3	12.0	59.0	107.0	85.1
	10	13.0	56.0	96.0	75.0	13.0	66.0	119.0	85.3	13.0	89.0	136.0	108.8	12.0	59.0	107.0	85.0
	11	13.0	56.0	96.0	75.0	13.0	66.0	118.0	85.0	13.0	90.0	134.0	109.3	12.0	59.0	107.0	85.3
	12	13.0	56.0	96.0	74.9	13.0	67.0	117.0	86.8	13.0	96.0	141.0	115.3	12.0	59.0	107.0	85.1
	13	12.0	56.0	93.0	73.0	12.0	70.0	118.0	92.3	13.0	101.0	152.0	124.8	10.0	74.0	109.0	88.3
	14	11.0	56.0	93.0	73.6	9.0	71.0	122.0	95.3	9.0	108.0	158.0	131.4	9.0	74.0	104.0	88.2
	15	9.0	56.0	93.0	76.3	7.0	72.0	124.0	100.6	6.0	128.0	183.0	145.0	5.0	74.0	104.0	84.6
	16	6.0	67.0	89.0	75.2	6.0	75.0	126.0	103.0	5.0	135.0	199.0	163.6	4.0	74.0	104.0	85.3
	17	2.0	75.0	83.0	79.0	3.0	84.0	129.0	101.3	1.0	171.0	171.0	171.0	1.0	92.0	92.0	92.0
H2	0.2	13.0	52.0	92.0	69.9	13.0	64.0	120.0	83.6	13.0	65.0	126.0	94.9	13.0	54.0	104.0	83.5
	1	13.0	52.0	88.0	69.3	13.0	64.0	118.0	83.1	13.0	65.0	126.0	94.6	13.0	57.0	104.0	83.5
	2	13.0	50.0	85.0	68.8	13.0	64.0	117.0	82.1	13.0	65.0	123.0	93.7	13.0	55.0	103.0	82.6
	3	13.0	50.0	85.0	68.7	13.0	65.0	117.0	81.8	13.0	66.0	122.0	92.8	13.0	56.0	103.0	81.8
	4	13.0	49.0	85.0	68.6	13.0	64.0	117.0	81.9	13.0	70.0	116.0	91.5	13.0	54.0	103.0	81.5
	5	13.0	49.0	84.0	68.5	13.0	65.0	116.0	82.8	13.0	80.0	125.0	101.2	13.0	55.0	103.0	81.6
	6	13.0	49.0	84.0	68.5	13.0	64.0	117.0	83.5	13.0	88.0	133.0	109.5	13.0	55.0	105.0	81.4
	7	13.0	49.0	84.0	68.5	13.0	65.0	120.0	84.8	13.0	95.0	136.0	114.2	12.0	54.0	100.0	79.3
	8	10.0	49.0	82.0	66.7	11.0	70.0	126.0	87.8	12.0	101.0	138.0	119.4	12.0	51.0	100.0	79.2
	9	4.0	67.0	82.0	73.3	4.0	71.0	128.0	90.0	5.0	105.0	139.0	122.8	6.0	67.0	95.0	79.5
P2	0.2	13.0	54.0	89.0	71.4	13.0	67.0	122.0	84.3	13.0	68.0	127.0	95.0	13.0	58.0	103.0	82.7
	1	13.0	54.0	87.0	71.5	13.0	67.0	121.0	84.1	13.0	69.0	127.0	95.1	13.0	59.0	103.0	83.0
	2	13.0	52.0	87.0	71.2	13.0	67.0	119.0	83.7	13.0	69.0	125.0	94.8	13.0	58.0	102.0	82.8
	3	12.0	53.0	87.0	70.9	13.0	66.0	118.0	83.2	13.0	35.0	122.0	90.0	13.0	57.0	102.0	82.5
	4	13.0	53.0	87.0	71.1	13.0	65.0	118.0	82.7	13.0	72.0	122.0	95.9	13.0	57.0	103.0	82.3
	5	13.0	53.0	86.0	71.2	13.0	35.0	119.0	79.5	13.0	76.0	130.0	102.5	13.0	57.0	103.0	82.0
	6	13.0	53.0	86.0	71.0	13.0	65.0	118.0	83.5	13.0	77.0	132.0	106.2	13.0	57.0	103.0	82.0
	7	13.0	53.0	86.0	70.9	12.0	34.0	119.0	80.8	13.0	80.0	133.0	108.4	13.0	56.0	103.0	81.8
	8	12.0	53.0	86.0	69.7	13.0	34.0	121.0	83.8	13.0	80.0	137.0	114.3	13.0	56.0	103.0	81.9

Table 2.3-51 (Sheet 2 of 2)
Summary of Specific Conductance Data from Harris Reservoir, 1990 – 2004

Station	Depth (m)	January Events	January MIN	January MAX	January MEAN	May Events	May MIN	May MAX	May MEAN	July Events	July MIN	July MAX	July MEAN	November Events	November MIN	November MAX	November MEAN
	9	4.0	54.0	79.0	67.5	6.0	34.0	106.0	75.7	3.0	116.0	143.0	132.0	4.0	69.0	101.0	84.5
	10	1.0	79.0	79.0	79.0	4.0	76.0	91.0	84.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
S2	0.2	13.0	41.0	105.0	69.8	13.0	54.0	123.0	80.3	13.0	60.0	127.0	94.8	13.0	50.0	106.0	80.2
	1	12.0	38.0	105.0	68.7	13.0	54.0	121.0	80.1	13.0	62.0	127.0	94.5	13.0	50.0	106.0	79.8
	2	12.0	38.0	105.0	68.8	13.0	54.0	120.0	79.6	13.0	62.0	128.0	94.1	13.0	45.0	106.0	79.2
	3	12.0	39.0	105.0	69.1	13.0	54.0	124.0	81.2	13.0	64.0	183.0	99.6	13.0	44.0	112.0	79.8
	4	8.0	39.0	105.0	69.0	8.0	54.0	125.0	75.3	12.0	76.0	202.0	109.1	7.0	44.0	121.0	89.6
	5	6.0	39.0	103.0	65.7	5.0	56.0	109.0	75.2	5.0	104.0	121.0	113.6	2.0	44.0	140.0	92.0

Notes:

a) All units are microSiemens per centimeter.

N/A = not available

Sources: Reference 2.3-059, Reference 2.3-060, Reference 2.3-061, Reference 2.3-062, Reference 2.3-063, Reference 2.3-064, Reference 2.3-065, Reference 2.3-066, Reference 2.3-067, Reference 2.3-068, Reference 2.3-069, Reference 2.3-070, Reference 2.3-071, Reference 2.3-072, and Reference 2.3-073

Table 2.3-52 (Sheet 1 of 2)
Summary of pH Data from Harris Reservoir, 1990 – 2004

Station	Depth (m)	January			May			July			November		
		Events	MIN	MAX	Events	MIN	MAX	Events	MIN	MAX	Events	MIN	MAX
E2	0.2	13.0	6.3	8.3	13.0	6.2	9.0	13.0	6.6	8.9	13.0	6.5	7.5
	1	13.0	6.4	8.3	13.0	6.2	9.3	13.0	6.6	8.9	13.0	6.5	7.5
	2	13.0	6.4	8.3	13.0	6.0	9.2	13.0	6.6	8.9	13.0	6.5	7.4
	3	13.0	6.5	7.8	13.0	5.8	8.5	13.0	6.4	8.7	13.0	6.5	7.4
	4	13.0	6.5	7.7	13.0	5.8	8.1	13.0	6.2	8.4	13.0	6.5	7.4
	5	12.0	6.5	7.6	13.0	5.7	8.0	13.0	5.9	8.1	13.0	6.4	7.4
	6	13.0	6.4	7.5	13.0	5.7	8.0	13.0	5.9	7.8	13.0	6.4	7.4
	7	13.0	6.3	7.4	12.0	5.7	7.9	13.0	6.0	7.7	13.0	6.4	7.4
	8	13.0	6.5	7.4	12.0	5.7	7.8	13.0	6.1	7.5	13.0	6.4	7.4
	9	13.0	6.4	7.4	13.0	5.7	7.7	13.0	6.1	7.4	13.0	6.4	7.4
	10	13.0	6.4	7.4	13.0	5.7	7.7	13.0	6.0	7.4	13.0	6.4	7.4
	11	13.0	6.4	7.4	13.0	5.7	7.6	13.0	6.0	7.4	13.0	5.8	7.4
	12	12.0	6.4	7.4	13.0	5.8	7.6	13.0	6.0	7.4	13.0	6.4	7.3
	13	12.0	6.4	7.4	12.0	5.9	7.4	13.0	6.0	7.3	10.0	6.4	7.0
	14	11.0	6.4	7.4	9.0	6.2	7.3	9.0	6.0	7.2	9.0	6.4	7.1
	15	9.0	6.4	7.4	7.0	6.3	7.3	6.0	6.2	7.2	5.0	6.4	7.0
	16	6.0	6.5	7.2	6.0	6.2	7.2	5.0	6.1	7.1	4.0	6.4	7.0
	17	2.0	6.6	6.9	3.0	6.3	7.4	1.0	6.4	6.4	N/A	N/A	N/A
H2	0.2	13.0	6.0	8.1	13.0	6.9	9.1	13.0	6.8	8.6	13.0	6.7	7.5
	1	13.0	6.3	8.0	13.0	6.8	9.1	13.0	6.8	8.7	13.0	6.6	7.5
	2	13.0	6.3	7.9	13.0	6.7	8.3	13.0	6.7	8.7	13.0	6.6	7.5
	3	13.0	6.3	7.8	13.0	6.3	7.8	13.0	5.8	8.6	13.0	6.5	7.4
	4	13.0	6.3	7.7	13.0	6.0	7.6	13.0	5.8	8.2	13.0	6.5	7.4
	5	13.0	6.3	7.5	13.0	5.8	7.4	13.0	5.8	8.1	13.0	6.4	7.3
	6	13.0	6.3	7.4	13.0	5.8	7.3	13.0	5.9	7.8	13.0	6.3	7.3
	7	12.0	6.3	7.7	12.0	5.8	7.2	13.0	6.0	7.5	12.0	6.6	7.2
	8	10.0	6.3	7.4	10.0	5.8	7.1	12.0	6.0	7.2	12.0	6.5	7.2
	9	4.0	6.6	7.0	4.0	6.2	7.0	5.0	6.1	6.6	6.0	6.4	7.0

Table 2.3-52 (Sheet 2 of 2)
Summary of pH Data from Harris Reservoir, 1990 – 2004

Station	Depth (m)	January			May			July			November		
		Events	MIN	MAX	Events	MIN	MAX	Events	MIN	MAX	Events	MIN	MAX
P2	0.2	13.0	6.0	7.7	13.0	6.1	8.7	13.0	6.7	8.7	13.0	6.6	7.5
	1	13.0	6.0	7.7	13.0	6.1	8.7	13.0	6.7	8.8	13.0	6.6	7.5
	2	13.0	6.0	7.7	13.0	6.1	8.5	13.0	6.7	8.7	13.0	6.6	7.5
	3	13.0	6.0	7.7	13.0	6.2	8.3	13.0	5.9	8.4	12.0	6.6	7.5
	4	13.0	6.1	7.7	13.0	6.2	8.1	13.0	5.7	7.9	13.0	6.7	7.5
	5	13.0	6.1	7.7	13.0	6.0	7.9	13.0	5.8	7.7	13.0	6.7	7.5
	6	13.0	6.1	7.7	13.0	5.9	7.7	13.0	5.9	7.5	13.0	6.7	7.6
	7	13.0	6.1	7.7	12.0	5.8	7.7	13.0	5.9	7.1	13.0	6.6	7.5
	8	11.0	6.1	7.7	12.0	5.8	7.6	13.0	6.1	7.0	13.0	6.6	7.6
	9	4.0	6.5	7.6	6.0	6.0	7.6	4.0	6.3	6.7	4.0	6.6	7.1
	10	1.0	6.5	6.5	4.0	6.0	6.9	1.0	6.2	6.2	N/A	N/A	N/A
S2	0.2	13.0	5.8	7.7	13.0	5.9	7.8	13.0	6.2	8.7	13.0	6.5	7.8
	1	13.0	5.8	7.7	13.0	5.9	7.8	13.0	6.2	8.7	13.0	6.4	7.8
	2	13.0	5.8	7.7	13.0	5.9	7.7	13.0	6.2	8.3	13.0	6.4	7.8
	3	13.0	5.9	7.7	13.0	5.9	7.3	13.0	5.6	7.9	13.0	6.4	7.5
	4	8.0	6.1	7.6	8.0	5.8	7.1	12.0	5.6	7.5	7.0	6.4	7.2
	5	6.0	6.1	7.6	5.0	5.6	7.0	5.0	5.9	7.3	2.0	6.3	6.4

Notes:

N/A= not available

Sources: Reference 2.3-059, Reference 2.3-060, Reference 2.3-061, Reference 2.3-062, Reference 2.3-063, Reference 2.3-064, Reference 2.3-065, Reference 2.3-066, Reference 2.3-067, Reference 2.3-068, Reference 2.3-069, Reference 2.3-070, Reference 2.3-071, Reference 2.3-072, and Reference 2.3-073

Table 2.3-53 (Sheet 1 of 2)
Summary of Secchi Disk Transparency Depths from Harris Reservoir, 1990 – 2004

Year	Month	E2	H2	P2	S2
1990	January	2	1.8	1.6	1.5
	March	1	1	1.3	0.7
	May	2	2.2	1.9	1.2
	July	2	1.5	1.6	1
	September	2	1.9	1.3	0.9
	November	2	1.3	1.2	1.6
1991	January	2	0.6	1.3	0.3
	March	2	1.3	1.5	0.8
	May	1	1.7	1.8	1.1
	July	2	1.5	1.7	1.3
	September	2	1.7	2	1.6
	November	2	1.1	1.1	1.4
1994	January	2	1.4	1.8	0.8
	February	1	1.3	1.9	1
	March	1	0.7	1	0.3
	April	1	1.1	1	0.4
	May	2	1.7	1.3	0.8
	June	2	1.9	1.6	1.8
	July	1	1.5	1.7	2
	August	3	2.3	2.7	2.6
	September	1	1.7	1.1	1.2
	October	1	1.5	1.3	3.3
	November	2	1.5	1.6	2.3
	December	1	1.8	1.3	4.5
1997	January	2	1.9	1.3	0.8
	May	2	1.2	1.3	0.5
	July	1	1.2	1.3	1.3
	November	1	1.4	1.5	1.9
1998	January	1	1	1	N/A
	May	1	1.1	1	0.6
	July	2	1.4	1.8	1.8
	November	1	1.4	1.1	1.4
1999	January	1	0.7	1.2	0.8
	May	2	1.8	0.9	N/A
	July	2	1.7	1.6	1.8
	November	2	1.4	1.5	1.4
2000	January	2	1.6	1.2	0.8
	May	2	1.4	1.8	0.8
	July	2	1.7	1.7	2
	November	2	1.5	1.5	2.5
2001	January	1	1.8	1.5	1.8
	May	1	1.4	1.2	0.9
	July	2	1.2	1.2	1.1
	November	2	1.6	1.7	2
2002	January	2	1.2	1.2	1.4
	May	2	1.7	1.8	1.2
	July	2	1.6	1.7	1.7
	November	2	1.5	1.9	1.8
2003	January	1.4	1.8	1.5	1.2
	May	1.6	1.4	1.6	1.2
	July	1.5	1.5	1.6	1.8
	November	1.4	1.4	1.1	1.9

Table 2.3-53 (Sheet 2 of 2) Summary of Secchi Disk Transparency Depths from Harris Reservoir, 1990 – 2004

Year	Month	E2	H2	P2	S2
2004	January	2.1	2	1.6	1.9
	May	1	1.1	1	1
	July	1.5	1.9	2.4	1.5
	November	1	1.1	1.1	2.7
	MAX	**2.7**	**2.3**	**2.7**	**4.5**
	MIN	**1**	**0.6**	**0.9**	**0.3**
	MEAN	**1.6**	**1.5**	**1.5**	**1.4**

Notes:
All units are in meters.

N/A = not available

Sources: Reference 2.3-059, Reference 2.3-060, Reference 2.3-061, Reference 2.3-062, Reference 2.3-063, Reference 2.3-064, Reference 2.3-065, Reference 2.3-066, Reference 2.3-067, Reference 2.3-068, Reference 2.3-069, Reference 2.3-070, Reference 2.3-071, Reference 2.3-072, and Reference 2.3-073

Table 2.3-54
Groundwater Analytical Data

		Station ID:	Well No. W-2	Well No. W-4	Well No. W-7A	MWA-4D		MWA-4S		MWA-7D		MWA-7S		MWA-9D		MWA-9S	
		Sample Date:	Mar-73	Mar-73	Mar-73	9/12/2006	1/18/2007	9/12/2006	1/18/2007	9/12/2006	1/18/2007	9/12/2006	1/18/2007	9/12/2006	1/18/2007	9/12/2006	1/18/2007
Parameter	Unit	NC Standard															
Total dissolved solids (residue, filterable)	mg/L	500	N/A	N/A	N/A	347	317	389	376	366	309	417	393	664	659	558	887
Total suspended solids	mg/L	N/A	N/A	N/A	N/A	4	<4.0	65.2	252	11.2	10.4	1,430	117	5.2	33.6	3,090	189
Chloride (as Cl)	mg/L	250	23	22	21	54.9	50.4	22.3	17.8	34	30.5	74.3	83.8	245	260	116	90.6
Fluoride	mg/L	2.0	<0.10	<0.10	<0.10	0.2	0.21	0.22	0.18	0.14	0.11	0.24	0.20	0.27	0.27	1.3	0.89
Sulfate	mg/L	250	N/A	N/A	N/A	9.3	8.8	51.2	52.3	9.5	9.1	18.2	15.2	8.1	6.1	51.7	304
Alkalinity, total (as $CaCO_3$)	mg/L	N/A	107	134	140	222	214	244	268	206	204	208	197	234	246	206	210
Nitrogen, ammonia (as N)	mg/L	N/A	N/A	N/A	N/A	0.05	<0.20	0.05	<0.20	0.26	0.28	0.05	<0.20	0.05	<0.20	0.13 J	<0.20
Nitrogen, Kjeldahl, total	mg/L	N/A	N/A	N/A	N/A	0.5	<2.0	0.5	<2.0	0.5	1.0	1.7 J	1.1	0.5	<2.0	1 J	0.73
Nitrogen, nitrate-nitrite	mg/L	11	N/A	N/A	N/A	0.25	<0.75	0.25 J	0.30	0.25	<0.75	0.25	<0.75	0.25	<0.75	0.25	0.73
phosphorus, total	mg/L	N/A	N/A	N/A	N/A	0.11	0.070	0.24	0.38	0.3	0.51	2.5	1.3	0.056 J	0.059	0.64	0.38
Sulfide	mg/L	N/A	N/A	N/A	N/A	0.8	<2.5	1.8 J	<2.5	0.8	<2.5	0.8	<2.5	0.8	<2.5	0.8	<2.5
Total organic carbon	mg/L	N/A	N/A	N/A	N/A	0.628 J	1.1	1.31	2.5	4.01	4.5	5.76	6.4	1.04	2	7.62	7.0
Bicarbonate	mg/L	N/A	N/A	N/A	N/A	N/A	214	N/A	268	N/A	204	N/A	197	N/A	246	N/A	210
Orthophosphate	mg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.25	N/A	0.44	N/A	0.20	N/A	0.024	N/A	0.077
BOD	mg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<2.0	N/A	2.5	N/A	<6.0	N/A	<2.0	N/A	<6.0
COD	mg/L	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<40	N/A	<40	N/A	189	N/A	<40	N/A	107
Arsenic	µg/L	50	<10	<10	<10	6.7 J	8.3	3	3.0	12.2	12.3	3	3.0	3.1 J	3.0	3 J	3.0
Boron	µg/L	315	N/A	N/A	N/A	19.4 J	23.2	13.7 J	13.4	18.2 J	19.0	12.6 J	14.0	24.5 J	24.4	33.9	19.4
Cadmium	µg/L	1.75	<10	<10	<10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Calcium	µg/L	N/A	14,800	21,000	26,500	40,900	39,600	56,100	63,400	52,400	49,700	51,100	52,300	61,200	67,800	13,000	20,800
Chromium, total	µg/L	50	N/A	N/A	N/A	2	2.0	2	2.0	2	2.1	2	2.0	2	3.1	7.3 J	3.7
Copper	µg/L	1000	<50	<50	<50	5	5.0	5	5.0	5	8.4	5	6.1	5	5.9	5	7.5
Iron	µg/L	300	130	350	950	30	43.1	36 J	485	765	600	115	56.8	145	385	8,350	2,600
Lead	µg/L	15	<50	<50	<50	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	4.5	1.5
Magnesium	µg/L	N/A	7,500	11,000	15,400	18,300	16,700	23,200	25,000	14,400	12,300	18,600	20,100	40,900	44,400	9,560	17,500
Manganese	µg/L	50	240	380	290	55.7	57.8	71.4	30.2	724	649	96.8	14.8	384	443	113	37.2
Mercury	µg/L	1.05	N/A	N/A	N/A	N/A	0.080	N/A	0.08	N/A	0.080	N/A	0.080	N/A	0.080	N/A	0.080
Nickel	µg/L	100	N/A	N/A	N/A	5	5.0	5	5.0	5	5.0	5	5.0	5	5.0	5	5.0
Potassium	µg/L	N/A	2,000	1,600	1,100	3,230 J	3,040	1,490 J	1,450	2,430 J	4,790	1,010 J	1,000	3,890 J	4,150	4,920 J	2,590
Sodium	µg/L	N/A	35,000	30,000	19,000	54,400	52,900	39,600	39,900	36,700	34,300	52,100	56,100	109,000	119,000	141,000	248,000
Zinc	µg/L	1050	400	100	<50	8.5 J	5.0	5	5.0	15.8 J	21.0	5	8.3	5	5.6	11.4 J	7.2
Hardness (calc. as $CaCO_3$)	mg/L	N/A	72	106	136	177	136	236	261	190	175	204	213	321	352	72	124
pH		6.5 -8.5	7.3	7.9	7.9	7.93	7.74	7.42	7.61	7.31	7.76	7.02	7.32	7.2	7.71	7.49	7.62
Conductivity	mS/cm	N/A	N/A	N/A	N/A	0.506	0.409	0.519	0.451	0.426	0.380	0.534	0.566	1.028	0.941	0.713	0.947
Dissolved Oxygen	mg/L	N/A	N/A	N/A	N/A	4.89	11.85	4.46	10.78	3.3	12.81	7.73	11.02	5.1	11.64	6.84	11.27
Temperature	°C	N/A	N/A	N/A	N/A	18.94	11.6	19.38	12.11	17.3	14.08	17.09	15.31	19.75	13.38	20.86	11.62
Turbidity	NTU	N/A	N/A	N/A	N/A	4.4	7.6	3.8	35.6	8.3	6.2	4.8	110	7.2	8.8	180	35.8

Notes:

µg/L = micrograms per liter
J = estimated value
mg/L = milligrams per liter
mS/cm = milliSiemens per centimeter
N/A = not available
NTU = nephelometric turbidity unit

Sources: Reference 2.3-014, Reference 2.3-074, and Reference 2.3-075

Table 2.3-55 (Sheet 1 of 3)
North Carolina 303(d) Listed Streams for Chatham, Harnett, Lee, and Wake Counties

County	Assessment Unit	Stream	Impaired Use	Category or Reason for listing	Potential Source(s)	Miles or Acres
CHATHAM	16-(37.3)	HAW RIVER (from a point 0.5 mile downstream of US Hwy 64 to approximately 1.0 mile below US Hwy 64)	AL	Chlorophyll a, High pH	MS4 NPDES, Impervious Surface, agriculture, WWTP NPDES	53.2 acres
CHATHAM	16-(37.5)	Haw River (B. Everett Jordan Lake below normal pool elevation, from approximately 1.0 mile below U.S. Hwy. 64 to dam at B. Everett Jordan Lake)	AL, FC	Chlorophyll a, High pH, Fish Advisory — mercury	WWTP NPDES, Impervious, agriculture, MS4 NPDES	1,392.3 acres
CHATHAM	16-30-(1.5)	Collins Creek (from a point 0.8 miles downstream of Orange County SR 1005 to Haw River)	AL	Impaired biological integrity	Agriculture	3.7 miles
CHATHAM	16-34-(0.7)	Dry Creek (from a point 0.3 miles downstream of Chatham County SR 1506 to Haw River)	AL	Impaired biological integrity	Land Clearing, unknown	10.1 miles
CHATHAM	16-38-(3)a	Robeson Creek (from a point 0.7 mile downstream of Chatham County SR 2159 to Pitsboro Lake)	AL	Impaired biological integrity	Impervious surface, agriculture	0.9 miles
CHATHAM	16-38-(3)b	Robeson Creek (Pitsboro Lake)	AL	Aquatic weeds	WWTP NPDES, impervious surface	16.7 acres
CHATHAM	16-38-(3)c	Robeson Creek (From Pittsboro Lake to UT across from SR 1951)	AL	Impaired biological integrity	WWTP NPDES, impervious surface, ND land app site	2.4 miles
CHATHAM	16-38-(5)	Robeson Creek (from a point 0.3 mile upstream of mouth to B. Everett Jordan Lake, Haw River)	AL	Impaired biological integrity	Unknown	0.7 miles
CHATHAM	16-41-(0.5)	New Hope River Arm of B. Everett Jordan Lake (below normal pool elevation) (From source at confluence of Morgan Creek and New Hope Creek Arm of B. Everett Jordan Lake (a east-west line across the southern tip of the formed peninsula) to Chatham County)	AL	Chlorophyll a	WWTP NPDES, MS4 NPDES	1,199.8 acres
CHATHAM	16-41-(3.5)a	New Hope River Arm of B. Everett Jordan Lake (below normal pool elevation, from Chatham County SR 1008 to Haw River arm of B. Everett Jordan Lake, Haw River)	AL	Chlorophyll a	WWTP NPDES, MS4 NPDES	5,673.3 acres
CHATHAM	16-41-1-(14)	New Hope Creek (including New Hope Creek Arm of New Hope River Arm of B. Everett Jordan Lake, from a point 0.8 mile downstream of Durham County SR 1107 to confluence with Morgan Creek Arm of New Hope River Arm of B. Everett Jordan Lake)	AL	Chlorophyll a	WWTP NPDES, MS4 NPDES	1,415.7 acres
CHATHAM	16-41-1-17-(0.7)b1	Northeast Creek (from Durham Triangle WWTP to Kit Creek)	AL, REC	Fecal Colifom, Turbidity	MS4 NPDES	3.3 miles
CHATHAM	16-41-1-17-(0.7)b2	Northeast Creek (from Kit Creek to a point 0.5 mile downstream of Panther Creek)	O, AL	Fecal Colifom, Turbidity	MS4 NPDES	3.2 miles
CHATHAM	16-41-1-17-(4)	Northeast Creek (from source to a point 2.0 miles upstream of NC Hwy. 54)	AL	Impaired biological integrity	Unknown	1.2 miles
CHATHAM	16-41-2-(5.5)b	Morgan Creek (from Meeting of the Waters to Chatham County SR 1726)	AL	Impaired biological integrity	MS4 NPDES	4.1 miles
CHATHAM	16-41-2-(9.5)	Morgan Creek (including the Morgan Creek Arm of New Hope River Arm of B. Everett Jordan Lake, from Chatham County SR 1726 to New Hope Creek Arm of New Hope River Arm of B. Everett Jordan Lake)	AL	Chlorophyll a	MS4 NPDES, WWTP NPDES	836.2 acres

Table 2.3-55 (Sheet 2 of 3)
North Carolina 303(d) Listed Streams for Chatham, Harnett, Lee, and Wake Counties

County	Assessment Unit	Stream	Impaired Use	Category or Reason for listing	Potential Source(s)	Miles or Acres
CHATHAM	17-(32.5)a	DEEP RIVER				
CHATHAM	17-(43.5)	DEEP RIVER (from a point 0.4 mile upstream of Rocky Branch to Cape Fear (junction with Haw River))	FC	Fish advisory — Mercury	Unknown	6.0 miles
CHATHAM	17-43-10a	Loves Creek (from source to Chatham Avenue)	AL	Impaired biological integrity	MS4 NPDES	3.3 miles
CHATHAM	17-43-10b	Loves Creek (from Chatham Avenue to Siler City WWTP)	AL	Impaired biological integrity	MS4 NPDES	2.5 miles
CHATHAM	17-43-10c	Loves Creek (from Siler City WWTP to Rocky River)	AL	Impaired biological integrity	WWTP NPDES, MS4 NPDES	0.4 miles
CHATHAM	17-43-13a	Tick Creek (from source to US 421)	AL	Impaired biological integrity	Unknown	8.2 miles
CHATHAM	18-(1)	CAPE FEAR RIVER (from junction of Haw River and Deep River to a point 0.5 mile upstream of NC Hwy 42)	AL	Chlorophyll a	Unknown	3.2 miles
CHATHAM	18-(4.5)a	CAPE FEAR RIVER (From a point 0.5 mile upstream of NC Hwy 42 to NC Hwy 42)	AL	Chlorophyll a	Unknown	0.5 miles
CHATHAM	18-5-(1)a	Gulf Creek (from source to clay pit below SR 1924)	AL	Impaired biological integrity	Unknown	3.6 miles
CHATHAM	18-5-(1)b	Gulf Creek (from clay pit below SR 1924 to a point 0.2 mile upstream of mouth)	AL	Impaired biological integrity	Unknown	2.7 miles
CHATHAM	18-5-(2)	Gulf Creek (from a point 0.2 mile upstream of mouth to Cape Fear River)	AL	Impaired biological integrity	Unknown	0.3 miles
HARNETT	18-16-(0.7)a	Neills Creek (Neals Creek) (from a point 0.3 mile upstream of Wake-Harnett County Line to SR 1441)	AL	Impaired biological integrity	MS4 NPDES, Agriculture, Impervious surface, Pasture	2.0 miles
HARNETT	18-16-(0.7)b	Neills Creek (Neals Creek) (from SR 1441 to Kenneth Creek)	AL	Impaired biological integrity	Pasture, Impervious surface, MS4 NPDES, Agriculture	1.3 miles
HARNETT	18-16-(0.7)c1	Neills Creek (Neals Creek) (from Kenneth Creek to 0.4 miles upstream of US 401)	AL	Impaired biological integrity	Unknown	6.7 miles
HARNETT	18-16-1-(2)	Kenneth Creek (from Wake-Harnett County Line to Neils Creek)	AL	Impaired biological integrity	Impervious surface, WWTP NPDES	3.9 miles
HARNETT	18-18-1-(2)	East Buies Creek (from a point 0.2 mile downstream of NC Hwy 55 to Buies Creek)	AL	Standard violation: Low dissolved oxygen	Unknown	6.2 miles
LEE	17-40	Big Buffalo Creek (from Source to Deep River)	AL	Impaired biological integrity	MS4 NPDES	8.0 miles
LEE	18-4-(2)	Lick Creek (from dam at Olhams Lake to Cape Fear River)	AL	Standard violation: Low dissolved oxygen	MS4 NPDES	10.3 miles
WAKE	18-16-(0.3)	Neills Creek (Neals Creek) (from source to a point 0.3 mile upstream of Wake-Harnett County Line)	AL	Impaired biological integrity	Pasture, Agriculture, MS4 NPDES, Impervious surface	2.6 miles
WAKE	27-24a	Toms Creek (Mill Creek) (from source to Browns Lake)	O	Impaired biological integrity	Unknown	1.6 miles
WAKE	27-24b	Toms Creek (Mill Creek) (from Browns Lake to Neuse River)	AL	Impaired biological integrity	Package Plants (Small Flows), Non-urban development	1.5 miles
WAKE	27-25-(1)	Perry Creek (Greshams Lake) (from source to dam at Greshams Lake)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	2.4 miles
WAKE	27-25-(2)	Perry Creek (from dam at Greshams Lake to Neuse River)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	2.5 miles
WAKE	27-33-(1)	Crabtree Creek (from source to backwaters of Crabtree Lake)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	5.1 miles
WAKE	27-33-(10)b	Crabtree Creek (from mouth of Hairsnipe Creek to 2.75 miles upstream of Neuse River)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	10.9 miles

Table 2.3-55 (Sheet 3 of 3)
North Carolina 303(d) Listed Streams for Chatham, Harnett, Lee, and Wake Counties

County	Assessment Unit	Stream	Impaired Use	Category or Reason for listing	Potential Source(s)	Miles or Acres
WAKE	27-33-(3.5)a	Crabtree Creek (Crabtree Lake) (from backwaters of Crabtree Lake to Cary WWTP)	O	Impaired biological integrity	Urban Runoff/Storm Sewers	6.8 miles
WAKE	27-33-(3.5)b	Crabtree Creek (Crabtree Lake) (from Cary WWTP to mouth of Richlands Creek)	O, O	Standard violation: Low dissolved oxygen, Standard violation: Turbidity	Land Development, Urban Runoff/Storm Sewers	5.4 miles
WAKE	27-33-11	Richlands Creek (from source to Crabtree Creek)	AL	Impaired biological integrity	Construction	4.7 miles
WAKE	27-33-12-(1)	Hare Snipe Creek (Lake Lynn) (from source to dam at Lake Lynn)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	2.0 miles
WAKE	27-33-12-(2)	Hare Snipe Creek (from dam at Lake Lynn to Crabtree Creek)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	2.5 miles
WAKE	27-33-14a	Mine Creek (from source to Shelly Lake)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	3.3 miles
WAKE	27-33-14b	Mine Creek (from Shelly Lake to Crabtree Creek)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	1.5 miles
WAKE	27-33-18	Pigeon House Branch (from source to Crabtree Creek)	AL, O, O	Impaired biological integrity, Action level violation: Copper, Standard violation: Fecal Coliform	Industrial Permitted, Urban Runoff/Storm Sewers	2.9 miles
WAKE	27-33-20	Marsh Creek (from source to Crabtree Creek)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	6.2 miles
WAKE	27-33-5	Black Creek (from source to Crabtree Lake, Crabtree Cr.)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	3.6 miles
WAKE	27-33-8	Reedys Creek (Reedy Creek Lake) (from source to Crabtree Creek)	O	Aquatic Weeds (*Hydrilla* sp.)	Unknown	28.8 acres
WAKE	27-34-(1.7)	Walnut Creek (from dam at Lake Johnson to backwaters of Lake Raleigh)	O	Impaired biological integrity	Urban Runoff/Storm Sewers	1.4 miles
WAKE	27-34-(4)a	Walnut Creek (from dam at Lake Raleigh to UT 0.6 miles west of I-440)	O	Impaired biological integrity	Urban Runoff/Storm Sewers	6.4 miles
WAKE	27-43-(1)a	Swift Creek (from source to confluence with Williams Creek)	O	Impaired biological integrity	Land Development, Agriculture, Urban Runoff/Storm Sewers	2.6 miles
WAKE	27-43-(1)b	Swift Creek (from confluence with Williams Creek to backwaters of Lake Wheeler)	AL	Impaired biological integrity	Urban Runoff/Storm Sewers	5.5 miles
WAKE	27-43-15-(1)a	Middle Creek (from source to 0.8 miles south of US 1)	AL	Standard violation: Low dissolved oxygen	Urban Runoff/Storm Sewers	1.4 miles
WAKE	27-43-2	Williams Creek (from source to Swift Creek)	O	Impaired biological integrity	Urban Runoff/Storm Sewers, Construction	2.6 miles
WAKE	27-57-16-(2)	Buffalo Creek (from dam at Robertsons Pond to a point 200 feet upstream from West Haywood Street near Wendell)	O	Impaired biological integrity	Agriculture	5.8 miles

Notes:

AL = Aquatic Life
FC = Fish Consumption
NPDES = National Pollutant Discharge Elimination System
O = Overall
REC = Recreation

Source: Reference 2.3-076

2.4 ECOLOGICAL DESCRIPTION

The proposed Shearon Harris Nuclear Power Plant Units 2 and 3 (HAR) will be co-located with the existing Shearon Harris Nuclear Power Plant Unit 1 (HNP), currently owned by Carolina Power & Light Company (CP&L). CP&L is the licensee for the HNP and has merged with Florida Power Corporation to form Progress Energy, which operates in the Carolinas as PEC. The applicant and owner of the proposed units will be PEC. The two units will be referred to as the proposed Shearon Harris Nuclear Power Plant Unit 2 (HAR 2) and Unit 3 (HAR 3). The HAR site will be located northwest of the existing plant, on the same peninsula that extends into Harris Reservoir (Figure 2.4-1). The HAR site is located within Wake and Chatham counties. The HAR site is located in the extreme southwestern corner of Wake County, North Carolina (Reference 2.4-001). The Cape Fear River flows in a northwest to southeast direction approximately 11.3 km (7.0 mi.) south of the HAR site (Reference 2.4-002).

The ecological description provided in this section outlines information on the HAR site. The HAR site will include the footprint of the two proposed units, including the reactor buildings and generating facilities, and the associated exclusion zone. The HAR site will also include the area around the perimeter of Harris Lake, a Harris Lake makeup water system pipeline corridor from the Cape Fear River to Harris Lake and an area on the Cape Fear River where a new pumphouse and intake structure will be built. The “vicinity” describes a band or belt 9.7-km (6-mi.) wide surrounding the HAR site (Figure 2.0-6). The vicinity includes a much larger tract of land than the HAR site. The vicinity is located within four counties: Wake, Chatham, Harnett, and Lee. The “transmission corridors” and “off-site areas” describe areas outside the site boundary that may fall within the footprint of new or existing transmission lines. The “region” applies to the area within an 80-km (50-mi.) radius from the center point of the HAR power block footprint, excluding the site and vicinity.

Operation of HAR 2 and HAR 3 will require additional makeup water from Harris Reservoir. The construction and operation of an intake structure and pump-house are proposed on the Cape Fear River. A new Harris Lake makeup water system pipeline is proposed in a corridor from the pumphouse to Harris Reservoir and a new outfall structure would be constructed on Harris Reservoir. Water from the Cape Fear River would be used to increase the level of Harris Reservoir approximately 6 meters (m) (20 feet [ft.]) to provide adequate makeup water primarily for cooling tower operation for HAR 2 and HAR 3. This section will provide a description of the ecology present at each component of the proposed project involved in construction and operation.

The HAR site and vicinity are centered in a rural area. However, it is part of a region that has been experiencing rapid growth for more than 10 years. Several Interstate Highways intersect the region, and the economic centers of Raleigh, Durham, and Chapel Hill are also within the region's boundaries. The region also includes the most concentrated population areas of the State (ER Section 2.1).

The HAR site is composed of approximately 43.71 square kilometers (km^2) (16.88 square miles [$mi.^2$]), containing several sections with differing habitat types. These include the industrial plant site (178 ha [440 ac.]), Harris Reservoir (14.6 km^2 [5.6 $mi.^2$]), and the Auxiliary Reservoir (1.5 km^2 [0.6 mi^2]). An additional 283 ha (700 ac.) of the HAR site are leased to Wake County Fire Training Facility (8 ha [20 ac.]) and for Harris Lake County Park (275 ha [680 ac.]) (Figure 2.4-2). The remainder of the HAR site, 1835 ha (4535 ac.), is primarily forested and managed for timber production. (Reference 2.4-001) Adjacent to the HAR site, PEC also owns a 513-ha (1267-ac.) parcel of land used for long-term forest research by North Carolina State University (Reference 2.4-002).

Harris Lake was created to primarily provide cooling tower makeup water for the HAR, which first operated in 1987. Harris Reservoir was created by impounding Buckhorn Creek, a tributary of the Cape Fear River (Figure 2.4-3). Buckhorn Creek has five tributaries above the Harris Reservoir dam: Tom Jack Creek, Thomas Creek, Little White Oak Creek, White Oak Creek, and Cary Branch (Reference 2.4-001). The dam was completed in late 1980 and Harris Reservoir reached full-pool elevation of 67.1 m (220 ft.) National Geodetic Vertical Datum of 1929 (NGVD29) mean sea level (msl) in February 1983. The water level in Harris Reservoir is controlled by a spillway at the 67.1-m (220-ft.) NGVD29 elevation at the Main Dam. The main body of Harris Reservoir has a surface area of 14.6 km^2 (5.6 $mi.^2$), a maximum depth of 18 m (59 ft.), and a mean depth of approximately 5.3 m (17.4 ft.). The Auxiliary Reservoir lies immediately west of the developed portion of the HAR site (Reference 2.4-001 and Reference 2.4-002).

2.4.1 TERRESTRIAL ECOLOGY

2.4.1.1 Plant Site

The existing industrial portion of the site is located on a peninsula extending into Harris Reservoir. The HAR plant site is highly developed and consists of buildings, pavement, and maintained lawns. Little natural habitat remains in this area. Small fragmented woodlots are present in the industrial portion, but limited habitat is available. (Reference 2.4-001)

HAR 2 is on a mowed turf grass field with no other vegetation. HAR 3 is in an area recently clear-cut for timber harvest and subsequently replanted to loblolly pine. The young pines are less than 10 years old and there is substantial herbaceous vegetation growing among the young trees. (Reference 2.4-003)

2.4.1.2 Harris Reservoir Perimeter

The perimeter of Harris Reservoir and the surrounding area is heavily wooded. A recent land use coverage analysis indicates that more than 70 percent of the land contained in the watershed is forested. (Reference 2.4-004)

2.4.1.2.1 Habitat Description

Several teams of biologists conducted field investigations during August 2006 to characterize habitats occurring between elevations of 67 and 73.2 m (220 and 240 ft.) surrounding Harris Reservoir at the HAR site. The survey of the area was conducted to evaluate the ecology in the area that will be affected from the increased reservoir level. The habitats were characterized as a baseline in order to determine probable effects from raising the 73.2-m (220-ft.) elevation of the reservoir. A description of the habitats found during this field investigation is included within the following habitat description. (Reference 2.4-003) During these investigations, wetland areas associated with Harris Reservoir were investigated. This investigation was a qualitative assessment that followed Routine Level I wetland delineation procedures. This encompasses determination of wetland extents using aerial photography and topography (including using National Wetlands Inventory [NWI] information). This desktop analysis was then verified by during the field investigation.

Vegetation at most of the HAR site is typical of the eastern Piedmont province of North Carolina (Reference 2.4-005). According to the U.S. Nuclear Regulatory Commission’s (NRC’s) Final Environmental Statement related to the operation of Shearon Harris Nuclear Power Plant Units 1 and 2, forests at the HAR site are in various stages of ecological succession and consist of pine forest, hardwood forest, or pine-hardwood mixtures. Loblolly pine (*Pinus taeda*) dominates the pine forests, but longleaf pine (*P. palustris*), shortleaf pine (*P. echinata*), and Virginia pine (*P. virginiana*) are also found on-site. Mesic hardwood forests within the HAR site are found primarily in lowland areas along streams. Dominant lowland forest species include American elm (*Ulmus americana*), American sycamore (*Platanus occidentalis*), red maple (*Acer rubrum*), river birch (*Betula nigra*), and sweet gum (*Liquidambar styraciflua*). The majority of upland forests within the HAR site are a mixture of hickories (*Carya* spp.), oaks (*Quercus* spp.), and pines.

The land surrounding Harris Reservoir falling within the 67 and 73.2 m (220 and 240 ft.) elevation range consists primarily of forested land, with limited open areas for boat access, parking lots, limited sections of roadways, areas within Harris Lake County Park, the Wake County Fire Training Facility, and the utility transmission right-of-way (ROW). Boat access areas are not wooded and consist of gravel or partially paved areas with no vegetation. The forests surrounding Harris Reservoir consist of hardwood re-growth forest and loblolly pine plantation. Bottomland hardwood or alluvial forests occur where streams with relatively broad valleys extend away from Harris Reservoir (Reference 2.4-003).

The topography near the Main Dam is rather steep on both sides of the dam. The area to the south and west of Main Dam is forested and there is an old roadbed cut through this area that creates very steep slopes to either side of the roadbed. Forest is typically mixed pine-hardwood, giving way to sub-xeric (partially dry habitat) hardwoods on upper slope positions. To the east and north of the Main Dam, vegetation is similar to that on the other side of the dam, but this area was burned in early 2006, so the forest is more open, except where overgrown with fireweed (*Erechtites hieracifolia*) (Reference 2.4-003). Timber sales have been conducted by PEC's Land Management Division in the past. A timber inventory conducted in 2004 identified 1962 ha (4849 ac.) of land at the HAR site and vicinity suitable for thinning and harvest (Reference 2.4-006). PEC follows best management practices (BMPs) of the North Carolina Department of Environment and Natural Resources (NCDENR), Division of Forest Resources. The BMPs implemented at the HAR site include the establishment of Streamside Management Zones, buffer strips of vegetation (at least 15.2 m (50 ft.) wide on each side of the stream) adjacent to perennial and intermittent streams and water bodies (Reference 2.4-001).

2.4.1.2.2 Species Abundance and Distribution

2.4.1.2.2.1 Wildlife

The forested and wetland habitats at the HAR site support a variety of wildlife species typically found in the Piedmont region of North Carolina. Forested areas support many species of birds, mammals, amphibians, and reptiles.

Mammalian inhabitants include white-tailed deer (*Odocoileus virginianus*), bobcats (*Lynx rufus*), Virginia opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), eastern cottontail (*Sylvilagus floridanus*), gray squirrel (*Sciurus carolinensis*), red and gray foxes (*Vulpes vulpes* and *Urocyon cinereoargenteus*), eastern moles (*Scalopus aquaticus*), skunk (*Mephitidae* sp.), shrew (family *Soricidae*), and mice (family *Muridae*) (Reference 2.4-001). Amphibian inhabitants include toads and frogs (order *Anura*) (Reference 2.4-005 and Reference 2.4-001).

Songbirds typical of the Carolina Piedmont region, including American robins (*Turdus migratorius*), bluebirds (*Sialia* sp.), Carolina chickadees (*Parus carolinesis*), cardinals (family of *Cardinalidae*), rufous-sided towhees (*Piplio* sp.), sparrows (*Passer* sp.), and warblers (family *Parulidae*) likely live within wooded habitats throughout the HAR site. Predatory and scavenging birds within this area include hawks (*Buteo* sp.), owls (order *Strigiformes*), and vultures (family *Cathartidae*) (Reference 2.4-007).

Raptors that routinely migrate through the inland eastern United States include osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), northern harrier (*Circus cyaneus*), sharp-shinned hawk (*Accipiter striatus*), Cooper's hawk (*A. cooperii*), red-shouldered hawk (*Buteo lineatus*), broad-wing hawk (*B. platypterus*), red-tail hawk (*B. jamaicensis*), American kestrel (*Falco sparverius*), merlin (*F. columbarius*), and peregrine falcon (*F. peregrinus*) (Reference 2.4-008). Other raptors may occur as occasional migrants through the area, but these birds would be quite uncommon. While there may be year-round residents of the HAR site and vicinity for some of these species, migrants of all species could pass through the area in any given year.

The Audubon Society conducts annual Christmas bird counts; the most recent (2005-2006) data include sites with representative avian populations in immediate proximity to the HAR site. Counts at Jordan Lake and Raleigh identified 113 bird species inhabiting the area (Table 2.4-1). These counts were taken on January 1, 2006, thus reflecting presence during the winter season. The most frequently sighted birds at Jordan Lake (more than five birds per hour) include the double-crested cormorant (*Phalacrocorax auritus*), ring-billed gull (*Larus delawarensis*), American robin (*Turdus migratorius*), white-throated sparrow (*Zonotrichia albicollis*), and dark-eyed junco (*Junco hyemalis*). The most frequently sighted birds at the Raleigh site (more than five birds per hour) include the Canada goose (*Branta canadensis*), ring-billed gull, rock pigeon (*Columba livia*), American robin, European starling (*Sturnus vulgaris*), cedar waxwing (*Bombycilla cedrorum*), song sparrow (*Melospiza melodia*), dark-eyed junco, common grackle (*Quiscalus quiscula*), and brown-headed cowbird (*Molothrus ater*) (Reference 2.4-009).

Of the sighted bird species passing through the area, 101 are protected by the Migratory Bird Treaty Act; these species are listed in Table 2.4-1 (Reference 2.4-010).

Migratory species would be susceptible to impacts from disturbance during the period of the year that they use the HAR site. Migratory species that would occur in the HAR area include migratory bats, migratory waterfowl, neotropical migrant songbirds, and raptors (hawks, eagles, and falcons). More than 100 species of neotropical migrant songbirds occur in North Carolina and many of these may occur in the Piedmont region near the HAR site. Neotropical migrants may occur in the area either as summer residents or as seasonal migrants. Summer resident neotropical migrants would nest and reproduce at the HAR site and vicinity. Seasonal migrants do not nest in the area, but could stop to rest or forage in the area as part of their longer migratory journey. (Reference 2.4-011)

The southeastern myotis (*Myotis austroriparius*), silver-haired bat (*Lasionycteris noctivagans*), eastern red bat (*Lasiurus borealis*), and evening bat (*Nycticeus humeralis*) are migratory bat species that spend either summer or winter in the HAR site and vicinity. The hoary bat (*Lasiurus cinereus*) migrates through the HAR site and vicinity but does not occur there outside of the migration period. (Reference 2.4-012)

A heron rookery is also present in the southeastern portion of Harris Lake near Buckhorn Creek (Reference 2.4-003).

2.4.1.2.2.2 Hardwood Forests

Hardwood forests on the HAR site and in the vicinity are in various age conditions ranging from recently clear-cut areas (lacking almost all vegetation except for scattered seed trees and ruderal herbaceous plants), early successional (clear-cut areas with dense stands of shrubs, saplings, and ruderal herbaceous plants), early re-growth (relatively small trees with diameters averaging from 20.3 to 30.4 centimeters [cm] [8 to 12 inches {in.}] at breast height with closed canopy), and mature re-growth (large trees with diameters greater than 30.4 cm [12 in.] at breast height). Early and mature re-growth areas contain similar compositions of woody species, but the younger stands typically have a more vigorous groundcover. No areas surrounding Harris Reservoir appear to contain virgin timber and all appear to have historically been harvested or cleared (Reference 2.4-003).

Hardwood forests of three types occur around Harris Reservoir: Mesic Mixed Hardwood Forest – Piedmont Subtype; Dry-Mesic Oak-Hickory Forest; and Dry Oak-Hickory Forest. These three hardwood forest types are considered common in North Carolina and throughout the region (Reference 2.4-013).

Around Harris Reservoir, the Piedmont Subtype of Mesic Mixed Hardwood Forest is dominated by American beech (*Fagus grandifolia*), northern red oak (*Quercus rubra*), tulip poplar (*Liriodendron tulipifera*), and red maple. The understory is composed of flowering dogwood (*Cornus florida*), American holly (*Ilex opaca*), hophornbeam (*Ostrya virginiana),* and young trees of the overstory. Ground cover included strawberry bush (*Euonymus americana*), Christmas fern (*Polystichum acrostichoides*), little brown jugs (*Hexastylis arifolia*), and scattered grasses (*Dichanthelium* sp.). (Reference 2.4-003)

Dry-Mesic Oak-Hickory Forest was dominated by white oak (*Quercus alba*), northern red oak, black oak (*Quercus velutina*), sweet pignut hickory (*Carya ovalis*), and mockernut hickory (*Carya alba*). Loblolly pine, sweetgum, and tulip poplar were also common components of the overstory, although these species were never dominant in mature or late re-growth stands. Flowering dogwood and sourwood (*Oxydendrum arboreum*) were the major understory species. Blueberries (*Vaccinium* sp.), spotted wintergreen (*Chimaphila maculata*), rattlesnake plantain (*Goodyera pubescens*), poison ivy (*Toxicodendron radicans*), and grapes *(Vitis* sp.) composed much of the ground cover. (Reference 2.4-003)

Dry-Mesic Oak-Hickory Forest was limited to the northwestern portion of the HAR site and was dominated by white oak, southern red oak (*Quercus falcata*), and mockernut hickory. Loblolly pine and sweetgum occurred frequently, but were not dominant species. Flowering dogwood and sourwood were the major understory species. Blueberries, spotted wintergreen, goat rue (*Tephrosia virginiana*), poison ivy, and grapes composed much of the ground cover. (Reference 2.4-003)

Early successional areas were primarily dominated by a dense growth of sapling sweetgum, tulip poplar, red maple, and black cherry (*Prunus serotina*). Blackberries (*Rubus* spp.), wingstem (*Verbesina alternifolia*), horseweed (*Conyza canadensis*), and common and giant ragweed (*Ambrosia artemisiifolila* and *tridentata*) were also abundant within these areas. (Reference 2.4-003)

2.4.1.2.2.3 Loblolly Pine Plantations

Loblolly pine has been planted within the HAR site and vicinity in segments that have been logged and placed into timber production (Reference 2.4-001). Overstory communities of loblolly pine monoculture do not occur naturally in North Carolina, but loblolly pine can occur naturally as a component of other forest types (Reference 2.4-013). Loblolly stands range from those planted within the past 5 years to those in excess of 25 years of age. Loblolly pine is the only dominant tree in these areas, but in areas where timber management has not been implemented, young hardwood species including sweetgum, tulip poplar, red maple, and American sycamore have begun to establish beneath the pines. In young pine stands, blackberries and cat-briers (*Smilax* sp.) are frequently encountered. Occasionally on the HAR site and in the vicinity, there are small clusters of longleaf pine among the loblolly pines, either remnants of historic Piedmont longleaf pine communities or the result of seedling identification error at the tree nursery (Reference 2.4-014). Typically, plantation pine areas do not extend to the edge of Harris Reservoir; a strip of hardwood forest or pine/hardwood forest remains adjacent to the water's edge (Reference 2.4-003).

2.4.1.2.2.4 Alluvial Forest

Forests have developed in the alluvial floodplain in the vicinity of the HAR along some of the larger drainages that appear to experience frequent flood events, and are classified as Piedmont/Mountain alluvial forest. This forest type is common in North Carolina and throughout the region (Reference 2.4-013).

All of these forests contain open understories and extensive deposits of sand extending well beyond the stream channel. Typical overstory species included red maple, river birch (*Betula nigra*), tulip poplar, sweetgum, green ash (*Fraxinus pennsylvanica*), and bitternut hickory (*Carya cordiformis*). Sycamores occur along the channel, but typically do not extend away from the channel. Understory species include saplings of the overstory components and also boxelder (*Acer negundo*), American holly, and inland American hornbeam (*Carpinus caroliniana* var. *virginianum*). Ground cover included the shrubs pawpaw (*Asimina triloba*), hazelnut (*Corylus cornuta*), and spicebush (*Lindera benzoin*) as well as herbaceous plant and vines: wood oats (*Chasmanthium latifolium* and *C. laxum*), false nettle (*Boehmeria cylindrica*), Christmas fern, orange jewelweed (*Impatiens capensis*), cat-briers, poison ivy, Virginia creeper (*Parthenocissus quinquefolia*), and various grapes. (Reference 2.4-003)

2.4.1.2.2.5 Bottomland Forest

Bottomland forest areas are classified as Piedmont/Mountain bottomland forest (Reference 2.4-013). This forest type is considered rare or uncommon in North Carolina but common throughout the region around the HAR site (Reference 2.4-014).

These areas have more dense understories than the alluvial forest areas. Overstory species included cherrybark oak (*Quercus pagoda*), sugarberry (*Celtis laevigata*), naturally occurring loblolly pine, tulip poplar, green ash, and sweetgum. The understory consisted of sapling of the species in the overstory layer with the addition of boxelder, American holly, and inland American hornbeam. Ground cover was similar to the alluvial forests with the addition of extensive patches of giant cane (*Arundinaria gigantea*) and the presence of many types of sedge (*Carex* sp.) (Reference 2.4-003)

2.4.1.2.3 Areas of Significance

2.4.1.2.3.1 Natural Areas

PEC property in the vicinity of HAR site contains five areas that have been identified by the NCDENR as significant natural areas (Figure 2.4-4) (Reference 2.4-015). Small portions of three of these areas (Hollemans Crossroads slopes, Utley Creek slopes, and Jim Branch/Buckhorn Creek forests) lie within the 4371-ha (10,800-ac.) HAR site, and are briefly described below (Figure 2.4-4).

- The Hollemans Crossroads slopes are a series of narrow ridges and ravines along the edge of Harris Reservoir just north of Hollemans Crossroads and State Road 1130. Most of the slopes support mature hardwoods, and chalk maple (*Acer leucoderme*), which is rare in the eastern Piedmont but is common in this area. (Reference 2.4-015)

- The Utley Creek slopes are located immediately south of Utley Creek and east of Hollemans Crossroads slopes. Much of this area consists of mature hardwood forests along north-facing slopes, especially Dry Oak-Hickory Forest, which is not usually found in large stands in Wake County. Several slopes contain Virginia spiderwort (*Tradescantia virginiana*), which is rare in Wake County. (Reference 2.4-015)

- The Jim Branch/Buckhorn Creek forests lie approximately 3 km (2 mi.) south of the Hollemans Crossroads slopes. This natural area consists of two separate portions: slopes along Buckhorn Creek, and slopes along Jim Branch. Both areas contain mature mesic mixed hardwood forest and Dry-Mesic Oak-Hickory Forests. (Reference 2.4-015)

2.4.1.2.3.2 Research Area

The Harris Research Tract, a 513-ha (1267-ac.) parcel of PEC land in the vicinity of the HAR site, is used for long-term forest research by North Carolina State University (Reference 2.4-016). Through techniques such as selective cutting and controlled burning, a portion of the Harris Research Tract is being managed as longleaf pine savannah. Pine savannahs are characterized by an open canopy of longleaf pine (*Pinus palustris*) with a dense ground cover of herbs and shrubs, and have become rare in North Carolina. An experimental population of Michaux's sumac (*Rhus michauxii*), which is federally and State-listed as endangered, was transplanted in this area in 2001, and is being monitored by biologists from North Carolina State University (Reference 2.4-001).

2.4.1.2.3.3 Wildlife Management

Additionally, PEC has enrolled in the National Wild Turkey Federation's (NWTF) "Energy for Wildlife" program to integrate wildlife management activities into land management program decisions at the HAR site. For example, fire lanes are planted in a mix of vegetation species (e.g., millet, lespedeza sp., and clover) that provide forage opportunities for wildlife, and blue bird nest boxes have been erected throughout the area. (Reference 2.4-001) PEC actively engages in wildlife habitat enhancement at the HAR site and vicinity via its forest management practices. PEC owns other property adjacent to, but not a part of, the 4371-ha (10,800-ac.) HAR site. PEC's land holdings in the vicinity of the HAR site total approximately 9247 ha (22,850 ac.) (Reference 2.4-005). Land management practices, terrestrial habitat types, and associated wildlife species on the adjoining (approximately) 4856 ha (12,000 ac.) of PEC land are essentially congruent with those of the HAR site (Reference 2.4-001).

2.4.1.2.3.4 Wild Game Areas

PEC enrolled 5353 ha (13,227 ac.) within the region around the HAR site in the North Carolina Game Lands Program. These properties are known collectively as Shearon Harris Game Lands, and offer a variety of opportunities to the public for hunting deer, turkey, small game, and waterfowl. Shearon Harris Game Lands are open to hunting six days a week during hunting seasons for most species. (Reference 2.4-017) Additionally, waterfowl may be hunted three days a week (Reference 2.4-001).

2.4.1.2.4 Important Species

"Important species" described within this document are those species meeting the criteria described in NUREG-1555 and defined as follows:

- State or federally listed threatened, endangered, or species of concern.
- Federally proposed for listing or candidate threatened or endangered species.

- Commercially or recreationally valuable species.
- Species that are essential to the maintenance and survival of species that are rare and commercially or recreationally valuable.
- Species critical to the structure and function of the local terrestrial or aquatic ecosystem.
- Species that may serve as biological indicators to monitor the effects of the facilities on the terrestrial or aquatic ecosystem.

Although other species with specific designations in the State have the potential to exist within the HAR, the evaluation of impacts in this document will focus on those considered “important species” consistent with the previous definition.

PEC contacted the United States Fish and Wildlife Service (USFWS), North Carolina Wildlife Resources Commission (NCWRC), and North Carolina Natural Heritage Program (NCNHP) regarding the occurrence of state or federally listed species within the area. The response from NCWRC identified the presence of two bald eagle nests. One is located near Avent Ferry Road along the White Oak Creek arm of the reservoir and one is located on the southwest side of the Cape Fear River across from Buckhorn Dam. NCWRC did not identify any additional federally or state listed terrestrial species (Reference 2.4-018). The response from the USFWS identified the bald eagle, red-cockaded woodpecker, and Michaux’s sumac as federally listed terrestrial species with the potential to occur within the area (Reference 2.4-019). The bald eagle was removed from the federal list of threatened species in August 2007 (see discussion of the species below); however, the bald eagle will remain protected under the Endangered Species Act (ESA) through management guidelines for at least the next five years.

The HAR site does not contain any designated habitat areas for federally listed species. Table 2.4-2 lists federally and State-listed threatened and endangered species that are known to occur or historically have occurred in the four counties surrounding the HAR site (Wake, Chatham, Lee, and Harnett). Of the 12 federally listed species and one federal-candidate species recorded in these counties, three species (bald eagle, red-cockaded woodpecker, and Michaux’s sumac) have been confirmed in the terrestrial vicinity of the HAR site and only the bald eagle and Michaux’s sumac have been observed in recent years (Reference 2.4-001).

The southeastern myotis (*Myotis austroriparius*), a federally listed species of concern, has not been observed on-site or in the vicinity of the HAR. Although the bat historically migrated through the area, the species has not been observed within Wake County in the last 50 years. (Reference 2.4-014)

The federally and State-listed endangered harperella (*Ptilimnium nodosum*) historically inhabited Chatham County. However, it has not been observed in the county within recent years. Several federally listed species of concern may occur within the HAR vicinity. The southern hognose snake (*Heterodon simus*) is listed as obscure, with the last date of observation in Wake County unknown. Bachman's sparrow (*Aimophilia aestivalis*) historically inhabited Wake County and currently inhabits parts of Chatham County (Reference 2.4-014).

In 1998, PEC conducted a self-assessment that evaluated more than 50 sensitive plant and animal species that could occur in the vicinity of the HAR site (based on studies prepared by Pacific Northwest National Laboratory for the NRC and lists prepared by the USFWS and NCNHP) and evaluated potential threats to these species from activities at the HAR site (Reference 2.4-001).

The self-assessment identified one federally listed species that could potentially be affected by the HAR site operations, future facility expansion, or other activities: the red-cockaded woodpecker (*Picoides borealis*). Red-cockaded woodpeckers, federally listed as endangered, are found in mature pine forests (generally longleaf pine) with sparse understory vegetation. They typically do not forage more than 0.8 km (0.5 mi.) from their nest. Available habitat for red-cockaded woodpeckers within the county of Wake is low, and will likely not increase due to their habitat requirements (Reference 2.4-007). An active red-cockaded woodpecker colony was located near in the HAR site in the 1980s, but it was abandoned around 1987 (Reference 2.4-001). No evidence of red-cockaded woodpeckers in the area that will be inundated was found during surveys (Reference 2.4-003). It is unlikely that red-cockaded woodpeckers will re-colonize the area because no active clusters exist within 48.3 km (30 mi.) (Reference 2.4-015).

To ensure a thorough evaluation of protected species, the NCNHP database was searched for each of the four counties (Wake, Chatham, Lee, and Harnett) in the vicinity and region around the HAR site to determine whether any species considered rare or sensitive or classified as threatened or endangered by either North Carolina or the USFWS had the potential to use terrestrial habitats in or near the project area. All species known to occur in the four-county area were identified (Reference 2.4-014). Biologists conducted informal surveys for species that could occur in terrestrial habitats or wetlands and their potentially suitable habitat during field investigations conducted in August 2006. Those species with the potential to use terrestrial habitats in the four-county area around the HAR site are identified in Table 2.4-2 (Reference 2.4-003).

Bald eagles have been observed within the HAR site and vicinity. As a result of range-wide population recovery and continuing population increases, the USFWS removed the bald eagle from the federal list of threatened species in August 2007. However this species remains protected under the ESA through management guidelines that will be in place for at least the next 5 years. The bald eagle also is protected under the Migratory Bird Treaty Act of 1918 (16 U.S.C. §§ 703-712), as amended, and the Bald Eagle Protection Act of 1940

(16 U.S.C. §§ 668-668d), as amended. These acts severely restrict any possession or trade involving the species (Reference 2.4-020).

Bald eagles are occasionally seen around Harris Reservoir. An active bald eagle nest was discovered near Harris Reservoir during the 2004 and 2005 nesting season. The nest is located along the White Oak Creek arm of the reservoir on PEC property. (Reference 2.4-001)

Bald eagles have historically been found throughout the entire North American continent. They require habitat with open water, nesting areas, and adequate food availability. Bald eagles are able to live year-round in areas where their water source does not freeze during winter. Those living in areas where their water supply freezes migrate to warmer areas for the winter. (Reference 2.4-021)

An experimental population of Michaux's sumac, which is federally and State-listed as endangered, was transplanted in the Harris Research Tract in the vicinity of the HAR site in 2001, and is being monitored by botanists from North Carolina State University (Reference 2.4-001). The Michaux's sumac is not located within the area of inundation.

Occasionally, small clusters of longleaf pine occur among the loblolly pines, either remnants of historic Piedmont longleaf pine communities or the result of seedling identification error at the tree nursery (Reference 2.4-014).

2.4.1.2.5 Stressors

2.4.1.2.5.1 Invasive Species

Some of the alluvial forest areas have experienced infestations of Japanese honeysuckle (*Lonicera japonica*) and Nepal grass (*Microstegium vimineum*) ranging from moderate to severe. Hardwood forest areas were also found to contain invasive Nepal grass. Bottomland forest areas are additionally invaded by Chinese privet (*Ligustrum sinense*) (Reference 2.4-003).

2.4.1.2.5.2 Anthropogenic

Portions of the upland forests at the HAR site and vicinity are managed for timber production. After timber removal, areas are replanted with tree species appropriate to the terrain, soils, and drainage characteristics of a site. Harvested areas are typically replanted in loblolly pine. (Reference 2.4-001)

Timber harvest practices at the HAR site and vicinity follow BMPs of the NCDENR, Division of Forest Resources, including the establishment of Streamside Management Zones, buffer strips of vegetation adjacent to perennial and intermittent streams (at least 15.2 m [50 ft.] wide on each side of the stream), and water bodies such Harris Reservoir. Land management practices in these Streamside Management Zones that might affect water quality, fish, or other aquatic resources are closely monitored. (Reference 2.4-002)

Although the immediate watershed is forested, the Towns of Apex and Holly Springs to the HAR site's north and east, respectively, are rapidly developing and expanding. Because of this accelerated urban growth, particularly surrounding the Towns of Holly Springs, Fuquay-Varina, and Sanford, the amount of land in pasture, cultivated crops, and forest will likely continue to decrease while the amount of land committed to residential and commercial uses will increase. (Reference 2.4-001)

2.4.1.3 Harris Lake Makeup Water System Intake Structure and Pumphouse

A new intake structure and pumphouse will be required to move water from the Cape Fear River to Harris Reservoir to support the operation of the proposed power plants. The Harris Lake makeup water system pipeline corridor is discussed in Section 2.4.1.4. The intake structure will be constructed immediately upstream of the Buckhorn Dam within the Cape Fear River channel (Figure 2.4-5). The pumphouse will be on the northern bank of the Cape Fear River adjacent to the existing discharge canal of the Cape Fear Steam Electric Plant. The proposed makeup water pipeline will extend along the existing ROW to the shore of Harris Reservoir upstream of the dam. The Harris Lake Makeup Water System Intake Structure and pumphouse are discussed in greater detail in Section 2.4.2.

2.4.1.3.1 Habitat Description

Harris Reservoir and the proposed facilities along the Cape Fear River are located in an area where the piedmont transitions to the coastal plain. Vegetation in this area can be generally characterized into either Piedmont Bottomland Forest or Piedmont Swamp Forest. Both types of communities are generally characterized as areas that experience flooding at least occasionally and some for longer periods. Both community types also experience sedimentation from flooding, resulting in the input of nutrients and fertile soil. It is also common in both communities for flooding to result in stress or mortality on tree species (Reference 2.4-013).

Piedmont Swamp Forest Communities generally have canopies dominated by flood-tolerant species such as sweetgum, American Elm, willow oak (*Quercus phellos*), overcup oak (*Quercus lyrata*), and cherrybark oak. These swamp forest communities typically have lower diversity than other communities, containing only those species that are most tolerant of prolonged wet conditions. (Reference 2.4-013)

Piedmont Bottomland Forest Communities generally have canopies dominated by tulip poplar, sweetgum, cherrybark oak, sugarberry, and green ash. Bottomland forests are generally present in better-drained parts of the floodplain as compared to swamp forests (Reference 2.4-013). A mixture of both types of communities and remnants of each type of community are present along the riparian corridor of the Cape Fear River in the vicinity of the HAR site.

Wildlife species abundance and distribution are discussed in Subsection 2.4.1.2.2.1. Important species with the potential to occur in this area are identified in Subsection 2.4.1.2.4 and Table 2.4-2.

2.4.1.4 Harris Lake Makeup Water System Pipeline Corridor

The Harris Lake makeup water system pipeline corridor primarily follows the existing Fayetteville transmission line ROW approximately 4 km (2.6 mi.). The remaining portion of Harris Lake makeup water system pipeline corridor runs approximately 1.4 km (0.90 mi.) along Buckhorn Road, an existing access road and adjacent forested land to the proposed intake structure and pumphouse at the Cape Fear River. The corridor evaluated for the Harris Lake makeup water system pipeline was approximately 61 m (200 ft.) wide. The actual width of disturbance resulting from installation of the pipeline is expected to be less than 61 m (200 ft.).

The Harris Lake makeup water system pipeline corridor will run to a point on the western edge of Harris Reservoir (Figure 2.4-6). A new outfall structure will be constructed at the discharge point into Harris Reservoir. The shoreline is generally described in Subsection 2.4.1.2 and is typically forested with either hardwood forest or mixed pine-hardwood forest. Depending on slope and aspect, the hardwood forest ranges from mesic to sub-xeric forest communities.

Above the 73-meter (240-foot) elevation, there is a substantial amount of timber harvest by clear cutting either underway or recently completed in the general area along the Harris Lake makeup water system pipeline.

2.4.1.4.1 Habitat Description

The corridor will exist as an area within the Harris Reservoir perimeter habitat previously addressed in Subsection 2.4.1.2. Biologists further evaluated the area in August 2006 to assess resources along the proposed corridor for the Harris Lake makeup water system pipeline.

The proposed Harris Lake makeup water system pipeline ROW crosses two primary habitat types, old field community and forest. The existing transmission line ROW was cleared of woody vegetation beyond the sapling stage and is regularly maintained as an old field community. Dominant plants included blackberries, horseweed, planted introduced species: sericea lespedeza (*Lespedeza cuneata*), and a variety of grasses (*Paspalum* spp., *Festuca* spp., and *Lolium* spp.). Common ragweed, giant ragweed, and young red cedars (*Juniperus virginiana*) were also present (Reference 2.4-003).

The forested area adjacent to the roadway consisted of mixed-age hardwoods primarily composed of early re-growth (relatively small trees with diameter at breast height averaging 20.3 to 30.5 cm [8 to 12 in.] but with closed canopy), and mature re-growth (large trees with diameter at breast height greater than 30.5 cm

[12 in.]). Species present included those associated with a mixed mesic hardwood community. Green ash, slippery elm (*Ulmus rubra*), red maple (*Acer rubrum*), and sweetgum were dominant. Understory contained flowering dogwood, and young trees of the overstory components (Reference 2.4-003).

Species abundance and distribution are discussed in Subsection 2.4.1.2.2.1. Important species with the potential to occur in this area are identified in Subsection 2.4.1.2.4 and Table 2.4-2. In addition, Carolina grass-of-parnassus (*Parnassia caroliniana*) is an important vegetative species of interest with the potential to occur along the Harris Lake makeup water system pipeline (Reference 2.4-001).

2.4.1.4.2 Stressors

2.4.1.4.2.1 Invasive Species

One invasive and nuisance species, kudzu, was present in some forested areas near roads (Reference 2.4-003). Kudzu is an ornamental vine introduced from Asia for erosion control; it is prevalent throughout much of the eastern United States (Reference 2.4-022).

2.4.1.4.2.2 Anthropogenic

The Fayetteville transmission line ROW, in which the Harris Lake makeup water system pipeline corridor is proposed, is regularly maintained to clear woody vegetation. This is discussed in greater depth in Subsection 2.4.1.5.4 (Reference 2.4-001).

2.4.1.5 Transmission Lines

Seven 230-kV transmission lines (with corridor widths of 30.5 m [100 ft.], with few exceptions) presently connect the HNP to the PEC electrical grid through the existing switchyard (Figure 2.4-7). These seven transmission lines, along with an eighth line planned for 2011, will also connect HAR 2 through the HNP common expanded switchyard to the PEC electrical grid. The proposed routing of the transmission lines for HAR 2 is to use the existing HNP ROWs.

Three new 230-kV transmission lines will connect the HAR 3 switchyard to the PEC electrical grid. The proposed routing of the three new transmission lines for HAR 3 are being evaluated to be adjacent to or within the existing maintained transmission corridors from the HNP. Section 3.7 of this ER provides specific details on the transmission lines while Chapter 4 of the ER provides a discussion on the effects of the transmission lines on the terrestrial ecosystem.

Most corridors pass through land that is primarily agricultural and forest land. The areas are mostly remote, with low population densities. The longer lines cross numerous state and United States highways. Effect of these corridors on land usage is minimal; farmlands that have corridors passing through them generally continue to be used as farmland (Reference 2.4-001).

2.4.1.5.1 Habitat Description

The forest lands traversed by the existing transmission line corridors are characterized by those described in Subsections 2.4.1.2.2.2 and 2.4.1.3.1. The agricultural lands are representative of agricultural lands throughout the region, with major crops including hay, soybeans, and tobacco, and the establishment of the corridors has not significantly altered their use. Land use in the region around the HAR site is discussed in more detail in Section 2.2 (Land) and Section 2.5 (Socioeconomic Description) of the HAR Combined Operating License Application (COLA) ER.

2.4.1.5.2 Areas of Significance

The transmission corridors do not cross any state or federal parks, but do cross North Carolina Game Lands, which encircle the HAR site. The HNP-Fayetteville 230-kV line crosses both Shearon Harris and Chatham Game Lands south of the HAR site, while the Cape Fear North and South 230-kV lines cross the Shearon Harris and Chatham Game Lands southwest of the HAR site. The HNP-Erwin 230-kV line crosses Shearon Harris Game Lands east of the HAR site. The Apex/U.S. 1 230-kV line crosses Shearon Harris Game Lands northeast of the HAR site (Reference 2.4-001).

In 1993, PEC signed a Memorandum of Understanding (MOU) with the NCDENR to preserve and protect rare, threatened, and endangered species and sensitive natural areas occurring on transmission line ROWs. The company also follows best management practices for management of rare plants on PEC ROWs (Reference 2.4-023).

2.4.1.5.3 Important Species

The transmission corridors that connect the HNP to the regional grid contain designated habitat areas for federally listed species (Reference 2.4-001).

Red-cockaded woodpeckers are known to occur in mature longleaf pine forests crossed by the Harris-Fayetteville transmission corridor. Any activities involving removal of mature longleaf pine would require surveys for this species to ensure that no red-cockaded woodpeckers or cavity trees are impacted (Reference 2.4-001).

Carolina grass-of-parnassus (*Parnassia caroliniana*), a State-listed endangered species, occurs in wet savannahs on the Harris-Fayetteville transmission corridor. The eastern tiger salamander (*Ambystoma tigrinum*), which is State-listed as threatened, is known to occur about 91.4 m (300 ft.) from the Harris-Wake transmission corridor. The eastern tiger salamander inhabits burrows in sandy pinewoods near semi-permanent ponds in which it breeds (Reference 2.4-001).

The four-toed salamander (*Hemidactylium scutatum*), which is State-listed as a special concern species, has been recorded as breeding in vernal pools on private property outside PEC property south of the Harris Reservoir (Reference 2.4-015). This salamander inhabits bogs with mossy seepages or shallow pools. It has not been recorded at the HAR site or near HNP associated transmission corridors.

No other federally or State-listed threatened or endangered terrestrial species are known to occur at HAR or along its transmission corridors. PEC has procedures in place to protect endangered or threatened species, if they are encountered at the HAR site or along transmission corridors, and provides training for employees on these procedures (Reference 2.4-001).

2.4.1.5.4 Stressors

PEC uses a variety of methods to control vegetation in transmission corridors. Because transmission corridors traverse areas with different types of terrain and soils, PEC employs an Integrated Vegetation Management (IVM) approach that includes both mechanical and chemical control methods. Mechanical methods include pruning, felling, mowing, and hand trimming. Chemical controls include the use of tree growth regulators, which slow the growth of fast-growing trees under lines, and U.S. Environmental Protection Agency (USEPA)-approved herbicides, which control undesirable woody vegetation that reseeds or re-sprouts after mowing. Over time, the use of herbicides results in the growth of low-growing, non-woody plants, such as grasses and herbaceous plants that provide wildlife with food and cover (Reference 2.4-001).

2.4.2 AQUATIC ECOLOGY

2.4.2.1 Harris Reservoir

Harris Lake was created primarily to provide cooling tower makeup water for the HNP, which first operated in 1987. The Harris Reservoir was created by impounding Buckhorn Creek, a tributary of the Cape Fear River (Figure 2.4-3). Buckhorn Creek has five tributaries above the Harris Reservoir Dam: Tom Jack Creek, Thomas Creek, Little White Oak Creek, White Oak Creek, and Cary Branch (Reference 2.4-001). The Main Dam was completed in late 1980 and Harris Reservoir reached full-pool elevation of 67 m (220 ft.) msl in February 1983. The water level in the reservoir is controlled by a spillway at the 67-m (220-ft.) elevation in the Main Dam. The main body of Harris Reservoir has a surface area of 1677 ha (4145 ac.), a maximum depth of 18 m (59 ft.), and a mean depth of approximately 5.3 m (17.4 ft.). The Auxiliary Reservoir, which lies immediately west of the developed portion of the HAR site, has a surface area of approximately 132 ha (325 ac.) (Reference 2.4-002). The main body of Harris Reservoir has an average residence time of 28 months (Reference 2.4-001). The HAR 2 and HAR 3 will require raising elevation of Harris Reservoir by 6.1 m (20 ft.) from 67 m (220 ft.) to 73.2 m (240 ft.).

2.4.2.1.1 Habitat Description

From its headwaters east of the HAR site, near the Town of Fuquay-Varina, Buckhorn Creek flows in a southwesterly direction for most of its length, and then moves south toward its confluence with the Cape Fear River. Buckhorn Creek has five tributaries upstream of the Main Dam: Tom Jack Creek, Thomas Creek, Little White Oak Creek, White Oak Creek, and Cary Branch. Buckhorn Creek and its tributaries drain an area of 183.9 square km (71.0 $mi.^2$.) (Reference 2.4-002) (Figure 2.4-3). Flows in Buckhorn Creek experienced dramatic daily and seasonal fluctuations prior to the development of Harris Reservoir, but are now regulated by the Main Dam. Since completion of the dam, annual mean streamflow (measured at a USGS station 0.6 km [1 mi.] downstream of the dam) has ranged from 2.5 to 10.9 cubic m (26.4 to 117 cubic ft.) per second (Reference 2.4-001).

2.4.2.1.2 Water Quality

Harris Reservoir was classified by NCDENR's Division of Water Quality as eutrophic in the agency's most recent Basinwide Assessment Report. The reservoir was most recently sampled by the agency in 2003 (Reference 2.4-004). At that time, despite heavy rainfall in the watershed, Secchi depths were greater than 1 m (3 ft.) at all sampling sites. Fecal coliform bacteria concentrations were low. Total phosphorus concentrations were similar to those previously measured. Ammonia concentrations were consistently below detection level at all sites and these concentrations were the lowest ever observed. Aquatic macrophytes (e.g., *Hydrilla* sp.), were observed throughout Harris Reservoir. NCDENR classified Harris Reservoir as eutrophic, based on North Carolina Trophic State Index scores (which are, in turn, determined by algal densities, phosphorus concentrations, and water quality). Harris Reservoir has also consistently been classified as eutrophic in previous monitoring cycles (Reference 2.4-001 and Reference 2.4-004).

PEC has monitored water quality and biological communities in Harris Reservoir quarterly since the creation of the reservoir in the early 1980s, in order to evaluate the water body's health, track changes in water quality, document the appearance of non-native plants and animals, and assess the state of recreational fishery. Water quality (including temperature, dissolved oxygen, pH, and turbidity), water chemistry (including major nutrients and, until 2002, a suite of trace metals), and fish are sampled quarterly; aquatic vegetation is surveyed annually in the fall. The most recent monitoring report from 2004 confirms the latest NCDENR water quality findings presented in the preceding paragraph (Reference 2.4-002).

Harris Reservoir is a biologically productive reservoir, similar to several other impoundments in the Research Triangle area. Although it has many of the characteristics of eutrophic southeastern reservoirs (e.g., elevated nutrient concentrations, extensive growth of aquatic vegetation in shallows, and oxygen-deficient hypolimnetic water in summer), it also has characteristics of a mesotrophic reservoir, such as good water clarity and low turbidity (Reference 2.4-002).

In late spring 1989, chlorophyll *a* concentrations in excess of the water quality standard (40 micrograms per liter [μg/L]) were measured at monitoring stations in Harris Reservoir and the first reported algal bloom was observed. Increased nutrient loading from both point and non-point sources in the watershed over the 1986 to 1989 timeframe may have accelerated primary productivity. Nutrient concentrations in Harris Reservoir stabilized around 1995, at levels greater than those seen in the early- to mid-1980s, but typical of productive southeastern reservoirs (Reference 2.4-024). The last algal bloom was reported in 1998. Data from 2004 indicate that chlorophyll *a* concentrations have remained within North Carolina water quality standards (40 μg/L), with a mean of 12 μg/L (Reference 2.4-002). The reservoir continues to support a healthy aquatic community with these water quality conditions present.

The water quality of several of Harris Reservoir's inflowing tributaries and streams feeding the main tributaries (Buckhorn Creek, Norris Branch, Little White Oak Creek, White Oak Creek, Big Branch, Jim Branch, and Utley Creek) were also assessed by biologists in August 2006 (Figure 2.4-8). This sampling provided instantaneous values and did not include daily averages. It should be noted that these samples were taken in August during low flow conditions in the streams and are not indicative of year-round stream conditions. This sampling event provides a snapshot of conditions that can be used to gain a general understanding of the water quality in the streams at the time of sampling and not general trends in water quality.

Norris Branch joins with Cary Branch, Utley Creek joins with White Oak Creek, Jim Branch joins with the inflowing Buckhorn Creek, and Big Branch joins with Little White Oak Branch before entering Harris Reservoir. Temperature, pH, specific conductivity, and turbidity levels all fell within North Carolina State and federal standards (Table 2.4-3). Dissolved oxygen levels were within the State standard of 4.0 milligrams per liter (mg/L) for Buckhorn Creek, Norris Branch, Jim Branch, and Utley Creek but fell below the standard in Little White Oak Creek, White Oak Creek, and Big Branch. Lower dissolved oxygen values are allowed if they occur naturally, such as in swamp water, backwaters, and lake coves. The lentic state of these three stations probably caused the depletion of oxygen by algal respiration, aerobic bacteria and other biological processes, as occur in natural settings (Reference 2.4-003).

2.4.2.1.3 Species Abundance and Distribution

In the early and mid-1980s, prior to operation of HNP, shoreline electrofishing and rotenone samples indicated a Harris Reservoir fish population dominated by small (less than 350-millimeter (mm)) (13.8 in.) largemouth bass (*Micropterus salmoides*) and lepomids (sunfish of the genus *Lepomis*) (Reference 2.4-001).

PEC biologists began monitoring fish species via electrofishing in 1995. The sampling areas in Harris Lake are shown in Figure 2.4-9. The 2004 Environmental Monitoring Report reported the detection of 22 fish species collected on a quarterly basis, while over the 1995 to 2004 time period a total of 27 fish species have been detected. Two new species, the common carp (*Cyprinus carpio*) and white perch (*Morone americana*), which had been recently introduced to Harris Reservoir, were detected. Seventy-five percent of the fish detected were black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), largemouth bass, and redear sunfish (*Lepomis microlophus*); these species have consistently had the highest detection in the 10-year time period. The dominant species by weight include the common carp, gizzard shad (*Dorosoma cepedianum*), largemouth bass, and redear sunfish; with the exception of the common carp, these species have consistently made up the largest proportion by weight. Species distribution by sampling location is shown in Table 2.4-4 (Reference 2.4-002).

With the exception of the gizzard shad, these littoral-zone species are vulnerable to collection by electrofishing. As a consequence, other species that prefer open waters or deeper waters may have been under-represented in collections. Gizzard shad have less clear-cut habitat preferences and feeding strategies; they may graze on algae-covered rocks in littoral shallows or cruise the pelagic zone, feeding on phytoplankton and zooplankton (Reference 2.4-025).

The mean catch rates ranged from 149 to 357, with an average of 244 fish per hour. The 10-year reservoir average has ranged between 203 and 373 fish per hour. The catch rate variance among transects in 2004 was primarily a consequence of bluegill and shiner (coastal shiner, golden shiner, and unidentified shiner) abundance. The mean fish weight per hour ranged from 21.5 to 64.3 kilograms (kg) (47.4 to 141.8 pounds [lbs.]) per hour across transects, with an average of 34.0 kg (74.9 lbs.) per hour. The variance resulted from the abundance of largemouth bass and common carp as opposed to smaller fish in some transects (Reference 2.4-002).

Bluegill length-frequency distributions demonstrated strong young-of-year recruitment in 2004 and adequate numbers of older, larger fish were present in order to support recreational fishing. The mean weight was slightly lower than optimal, but is expected under high population density situations and is consistent with data from previous years. Based on electrofishing results, the length-frequency distribution of redear sunfish indicated low reproductive success, although the catch rate and presence of older, larger fish indicates a healthy redear sunfish population. As with bluegill, the average weight of redear sunfish was slightly below optimal, although it is consistent with a large population density and data from previous years. The average weight and length-frequency of largemouth bass indicated a healthy population, and is consistent with data from previous years (Reference 2.4-002).

Additional biological sampling of fish and benthic macroinvertebrates populations in the major reservoir tributaries was conducted in August 2006. Benthic macroinvertebrates were sampled at seven sampling stations following techniques from NCDWQ's Standard Operating Procedures. Collections were made upstream of road crossings. The sampled area was generally 100 m in length depending on the availability of habitat types, particularly riffles, and overlapped the 100-m habitat reach. Samples were collected using six sampling techniques and from which a composite sample was created: two riffle kicks, three sweep net bank jabs, one leaf pack sample, two rock/log washes, one sand kick, and visual collections. Samples were collected during this time of year in accordance with NCDENR Protocols that provide bioclassifications for expected values for summer (June – September) collections. Fish sampling was conducted following NCDENR protocols. Sample reach length was approximately 200 m at each station when habitat was available. The principal sampling method was backpack electrofishing, supplemented by seining. The unit sampling effort (i.e., time spent electroshocking and seining) varied from to 3 to 49 minutes depending on the accessibility and complexity of habitats present at each sampling reach. (Reference 2.4-003) This sampling effort presents a snapshot of the biological communities at the time of sampling. The sampling provided a synoptic assessment of water quality conditions of these tributaries utilizing the ecological integrity indicators of benthic macroinvertebrates and fish. This sampling followed standard operating procedures used by the NCDWQ to assess water quality conditions in North Carolina through the ecological integrity index scores for benthic macroinvertebrates (Ephemeroptera [mayflies], Plecoptera [stoneflies], and Trichoptera [caddisflies] taxa (EPT) and Biotic Index scores) and fish (North Carolina Index of Biotic Integrity or NCIBI). Benthic macroinvertebrates were sampled at each station and used to classify the ecological integrity of each tributary according to the two metrics; the EPT (Ephemeroptera [mayflies], Plecoptera [stoneflies], and Trichoptera [caddisflies] taxa and North Carolina Biotic Index (NCBI) criteria (Table 2.4-5).

Taxa richness of benthic macroinvertebrates by sampled tributaries was as follows:

Tributary	Number of Taxa
Buckhorn Creek	54
Jim Branch	47
Norris Branch	46
Little White Oak Creek	39
White Oak	32
Utley Creek	24
Big Branch	20

Buckhorn Creek scored the highest Biotic Index score, falling within the Good/Fair ecological condition, followed by Jim Branch and Utley Creek, which fell within the Fair category. The remaining four stations were rated Poor indicating degraded environmental conditions in these tributaries. These results indicate that, at the time of sampling, the habitat conditions at most stations are not conducive to supporting robust benthic macroinvertebrate communities because these tributaries experienced varying degrees of environmental stress at the time of sampling. This stress could result from low flow conditions at the time of sampling or nonpoint inputs from off-site upstream development. Sampling at a different time of year, when flow conditions were greater, would likely yield different results (Reference 2.4-003).

The North Carolina Index of Biotic Integrity (NCIBI) was used to evaluate the ecological health of fish communities. These scores are based on 12 metrics of fish community structures in the following five categories:

1. Species richness and composition.
2. Indicator species.
3. Trophic function.
4. Abundance and condition.
5. Reproductive function.

Twenty-one fish species and one hybrid were collected from the seven stations (Table 2.4-6). The greatest species richness was among basses and sunfishes (seven species), minnows (six species), and catfishes (three species). Bass and sunfish species included the sunfish hybrid (*Lepomis* sp.), redbreast sunfish (*L. auritus*), green sunfish (*L. cyanellus*), warmouth (*L. gulosus*), bluegill, redear sunfish, bluespotted sunfish (*Enneacanthus gloriosus*), and largemouth bass. The minnows included rosyside dace (*Clinostomus funduloides*), white shiner (*Luxilus albeosus*), bluehead chub (*Nocomis leptocephalus*), golden shiner (*Notemigonus crysoleucas*), spottail shiner (*Notropis hudsonius*), and creek chub (*Semotilus atromaculatus*). The catfish include yellow bullhead (*Ameiurus natalis*), flat bullhead (*A. platycephalus*), and margined madtom (*Noturus insignis*). (Reference 2.4-003)

The highest species richness was in the Buckhorn Creek and Norris Branch, while the Little White Oak Creek, Big Branch, and Jim Branch had the lowest. Buckhorn Creek was rated as good and Norris Branch was rated as good/fair. Little White Oak Creek, White Oak Creek, and Utley Creek were rated as fair, while Big Branch and Jim Branch were rated as poor. Other significant findings indicated no intolerant species were found at any station and that no darter species were found in four of the stations.

Harris Reservoir also provides limited marsh habitat in shallow backwaters. These marshes and adjacent shallows are used by migratory waterfowl such as Canada geese (*Branta canadensis*), mallards (*Anas platyrhynchos*), and wood ducks (*Aix sponsa*) during certain seasons. Wading birds such as great blue and green-backed herons (*Ardea herodias* and *Butorides virescens*) and egrets (family of *Ardeidae*) can also be seen during the summer. A great blue heron rookery, known to be active during recent breeding seasons, is located at the mouth of Jim Branch in the southeastern portion of Harris Reservoir

(Reference 2.4-001 and Reference 2.4-008). PEC biologists noted that the rookery was active in the spring of 2007.

2.4.2.1.4 Areas of Significance

PEC cooperates with the North Carolina Waterfowl Association to conserve and enhance waterfowl habitat around Harris Reservoir. Since 1983, 77 wood duck nest boxes have been installed around the shore of Harris Reservoir. PEC volunteers, in cooperation with the Western Wake Ducks Unlimited chapter and Harris Lake County Park, annually inspect and maintain the wood duck boxes to ensure their continued use (Reference 2.4-026).

In areas managed for timber harvest, streamside management zones have been established along all riparian zones (i.e., intermittent streams, open water shoreline, and wetlands). These zones act as buffers to protect surface water habitats from erosion and chemical applications (Reference 2.4-006).

2.4.2.1.5 Important Species

Harris Reservoir offers area anglers a variety of fishing opportunities. Anglers may pursue the reservoir's largemouth bass, which are both plentiful and in good condition, virtually year-round. They may fish for spawning black crappie in the early spring and bedding bluegill in the late spring. Bluegill and redear sunfish are available to anglers all summer and into the fall. Channel catfish are sought by most fishermen, but several other species of catfish are present and are occasionally caught (Reference 2.4-001).

Black crappie, largemouth bass, and bluegill are the species sought by most anglers. Bluegill is the species most often harvested. Studies of largemouth bass prior to 1987 showed slow growth for this recreationally important species. This slow growth was attributed to high population densities owing to several successive strong year classes produced in early impoundment and the subsequent high competitive interactions of those year classes. During 1988 and 1989, as Harris Reservoir productivity increased, growth of largemouth bass increased, with corresponding increases in prey fish species, and there was a shift to larger-sized bass (Reference 2.4-027). The introduction of threadfin shad (*Dorosoma petenense*) by North Carolina Wildlife Resources Commission (NCWRC) in 1987 also appeared to contribute to improved growth of largemouth bass (Reference 2.4-001).

PEC contacted the United States Fish and Wildlife Service (USFWS), North Carolina Wildlife Resources Commission (NCWRC), and North Carolina Natural Heritage Program (NCNHP) regarding the potential occurrence of any state or federally listed species within the area. The response from NCWRC identified the federally and state endangered Cape Fear shiner as historically occurring within the area. NCWRC also identified the Atlantic pigtoe, a federal species of concern and state endangered species; the yellow lampmussel, a federal species of concern and state species of special concern; the Carolina redhorse, a federal species of concern and state significantly rare species; and three state threatened mussel species: creeper (*Strophitus undulatus*), triangle floater (*Alasmidonta undulata*), and Roanoke slabshell (*Elliptio roanokensis*) as important aquatic species with the potential to occur within the area (Reference 2.4-018). The USFWS identified the Cape Fear shiner as having the potential to occur within the area (Reference 2.4-019).

The federally endangered Cape Fear shiner (*Notropis mekistocholas*) is a small minnow endemic to several tributaries of the Cape Fear River in Randolph, Moore, Lee, Hartnett, and Chatham counties (Reference 2.4-028). This species was collected in the Buckhorn Creek drainage in 1972 (Reference 2.4-001), but has not been subsequently detected in Buckhorn Creek or its tributaries. According to the NRC's Final Environmental Statement, one specimen was collected in the Cape Fear River downstream of the HNP site during pre-operational surveys of the river between 1972 and 1980. Since the advent of monitoring in the early 1980s, no Cape Fear shiners have been collected by CP&L or PEC biologists in Harris Reservoir (Reference 2.4-001).

The habitat for the dwarf wedgemussel *Alasmidonta heterodon* is composed of stable substrate of sand and/or fine gravel (Reference 2.4-029). They are often found burrowed into clay banks among the root systems of trees or associated with mixed substrates of cobble, gravel, and sand (Reference 2.4-030). Unionid mussel species require fish hosts for the glochidium life stage (a larval stage that is parasitic on the gills of fish). Two fish species are identified as hosts for the glochidia of the dwarf wedgemussel that would occur in waters around the HAR site: tessellated darter (*Etheostoma olmstedi*) and johnny darter (*Etheostoma nigrum*). The two darters inhabit sand/mud-bottomed pools. The habitat for the host darter species and the mussel is present in the streams that flow into the Cape Fear River; however, extant populations of the wedge mussel are not known from the Cape Fear basin and it is likely this mussel would not occur in this area. In addition, alkalinity, calcium, total hardness, and pH levels in Harris Reservoir are not optimal for mussel habitat (Reference 2.4-002).

A listing of threatened and endangered aquatic species found in Chatham and Wake counties is provided in Table 2.4-2 (Reference 2.4-028). In addition, important species discussed in Subsection 2.4.2.3.2 are applicable to this area.

2.4.2.1.6 Stressors

2.4.2.1.6.1 Invasive Species

The NRC's Final Environmental Statement for the operation of HNP noted that the nuisance aquatic plant hydrilla (*Hydrilla verticillata*) had been found in several Wake County impoundments and predicted it would colonize shallow portions of Harris Reservoir. Hydrilla was discovered in the White Oak Creek arm of Harris Reservoir in 1988, and by 1990 was the dominant aquatic plant of the littoral zone, displacing several native species (Reference 2.4-027). Grass carp (*Ctenopharyngodon idella*) were introduced into the Auxiliary Reservoir in the

1990s to control hydrilla, and appear to have been somewhat effective. A visual survey in 2004 detected no hydrilla in the Auxiliary Reservoir, but did detect some in the main intake canal. Creeping water primrose (*Ludwigia grandiflora* ssp. *hexapetala*), another non-native plant, appeared a year or so later and quickly established itself in Harris Reservoir. Neither species is unique to Harris Reservoir; both species are regarded as nuisance species by reservoir and pond managers. Neither of these nuisance aquatic plants has created operational problems for HNP (Reference 2.4-002).

Two additional species of invasive aquatic plants, water hyacinth (*Eichhohornia crassipes*), and water lettuce (*Pistia stratiotes*), were discovered in 2002 near the Hollemans Crossing boat ramp. Both are free-floating vascular plants native to South America imported for the ornamental pond trade. PEC personnel removed these plants and have not detected any in follow-up surveys (Reference 2.4-001).

2.4.2.1.6.2 Anthropogenic

Harris Reservoir developed a reputation as a producer of trophy largemouth bass in the early 1990s, leading to a marked increase in fishing pressure. The NCWRC carried out creel surveys on Harris Reservoir during a 12-month period from 1997 to 1998 to determine the level of fishing effort (pressure), angler preferences, and harvest rates. The estimated fishing effort over the 1997 to 1998 period was 188,948 hours (118 hours per hectare), indicating that Harris Reservoir was "heavily fished compared to other Piedmont reservoirs." Largemouth bass accounted for 67 percent of all fishing effort, followed by crappie, which accounted for 17 percent of all fishing effort. Although largemouth bass was the species pursued by most anglers, the black crappie was harvested at a rate almost 10 times that of largemouth bass, suggesting that this species is more easily caught and less likely to be released once caught (Reference 2.4-001).

In response to public complaints about the effect of this increased fishing pressure on the largemouth bass population, and on trophy-sized fish in particular, NCWRC in 2002 instituted a 40.6- to 50.8-cm (16- to 20-in.) slot limit on Harris Reservoir largemouth bass. This slot limit, in conjunction with the practice of catch and release, will likely assist Harris Reservoir in retaining its trophy fish status (Reference 2.4-001). According to current NCWRC regulations, this is the only fishing prohibition within Harris Lake. Additionally, no fish consumption advisories have been listed for Harris Lake (Reference 2.4-030).

Harris Reservoir has evolved from a moderately productive reservoir with relatively slow-growing game fish in the 1980s into a more productive reservoir with healthy populations of largemouth bass, bluegill, redear sunfish, crappie, and catfish. The reservoir has become more productive as a result of nutrient inputs from the watershed and from HNP that have increased primary and secondary productivity. Based on PEC and NCDENR monitoring, it appears that nutrient inputs have stabilized since the mid-1990s and Harris Reservoir currently supports a healthy, balanced biological community with thriving forage fish and game fish populations. The fish community is dominated by species native to the southeastern United States, such as largemouth bass, bluegill, redear sunfish, white catfish, and gizzard shad (Reference 2.4-001).

Nutrient concentrations in Harris Reservoir increased in the late 1980s (Reference 2.4-024). Prior to startup of the plant's cooling system in 1986, the reservoir was moderately productive. The reservoir became more biologically productive when HNP began discharging cooling tower blowdown (and low volumes of other National Pollutant Discharge Elimination System [NPDES]-permitted effluent) into the reservoir near the Main Dam via the cooling tower blowdown line (Reference 2.4-027). The NPDES-permitted discharges that flow into the reservoir from HNP, the Harris Energy & Environmental Center (HEEC), and the Town of Holly Springs' Wastewater Treatment Plant all contain, to one degree or another, nitrogen and phosphorus compounds that stimulate the growth of phytoplankton and aquatic macrophytes. Even after secondary treatment, wastewater treatment plant effluent contains these inorganic nutrients, which can accelerate eutrophication in natural waters and produce algae blooms (Reference 2.4-001). The eutrophic conditions have not adversely affected the biological community, as demonstrated by presented data. Additionally, no fish kills have been documented by the NCDWQ in the lake resulting from algal blooms that would suggest degraded water quality or habitat conditions.

PEC holds an NPDES permit for both HNP and the HEEC, located northeast of the plant on the Little White Oak Creek arm of the reservoir, and both facilities discharge to the reservoir. The reservoir also receives treated discharge from the Town of Holly Spring's wastewater treatment plant via Utley Creek (a tributary of White Oak Creek), which flows into Harris Reservoir's northeastern-most arm (Reference 2.4-001).

Toxics Release Inventory (TRI)-reported constituents released into Harris Reservoir from HNP include arsenic, barium, chromium, copper, lead, manganese, mercury, nickel, vanadium, and zinc for the years 1998 through 2004 (Reference 2.4-031). These releases have been minimal and have not adversely affected aquatic communities or water quality.

2.4.2.1.6.3 Biofouling

The Harris Reservoir was evaluated for evidence of quagga and zebra mussels (*Dreissena bugensis* and *polymorpha*), which are potential biofouling species in power plant operations. Alkalinity, calcium, total hardness, and pH levels in Harris Reservoir are not optimal for mussel habitat (Reference 2.4-002). No quagga or zebra mussels have been documented in the reservoir.

2.4.2.2 Harris Reservoir Perimeter up to 73-Meter (240-Foot) Contour

A field survey was conducted during the week of August 14, 2006, to characterize the habitats that occur between elevations 220 feet and 240 feet surrounding Harris Reservoir at the Shearon Harris Nuclear Plant in North Carolina (Reference 2.4-003). This effort included several teams of biologists that used a qualitative assessment following Routine Level I wetland delineation procedures. This methodology encompasses determination of wetland extents using aerial photography and topography (including using NWI information). To calculate wetland areas, the NWI information was used and verified during the field investigation.Detailed wetland delineations were initiated in November 2008 and finalized in December 2009. Verification visits by the USACE Wilmington Regulatory District and NCDWQ were held in 2008 and 2009. The final Jurisdictional Determination was approved by USACE in October 2010.

Areas along the perimeter of the Harris Reservoir and surrounding buffer zones, often wetlands, are generally retained in a natural state. Wetlands exist around the reservoir in areas where beaver activity has created impounded water, as well as in generally level areas occurring just above the 67-m (220-ft.) elevation (Appendix 2.4-1). At the 67-m (220-ft.) elevation contour, there are approximately 164 ha (404 ac.) of wetlands along the perimeter of the reservoir and near the dam. Wetland areas between the 67- and 73.2-m (220- and 240-ft.) contour that will be affected by Harris Reservoir's raised elevation are shown in Appendix 2.4-1 and described in Tables 2.4-7 and 2.4-8 (Reference 2.4-003). Approximately 81 ha (199 ac.) of wetlands occurring outside the current reservoir fringe would be inundated by increasing the pool level to 73.2 m (240 ft.).

Wetlands occurring in the zone between 67 m (220 ft.) and 73.2 m (240 ft.) elevation around Harris Reservoir include:

- Forested flatland — Forested flatlands are wooded wetlands that occur in the relatively broad stream valleys immediately upstream of Harris Reservoir (Reference 2.4-003).
- Beaver impoundments — Beaver impoundments are of two types: active and abandoned (Reference 2.4-003).
- Isolated roadbed wetlands — One isolated wetland was identified within an abandoned roadbed near the dam and spillway of Harris Reservoir. This wetland was contained entirely within the abandoned roadbed and road, and has no connection to the pool of Harris Reservoir (Reference 2.4-003).

In areas where gentle slopes or generally level benches occur at or just below the 67-m (220-ft.) contour, lacustrine littoral emergent wetlands occur periodically around the reservoir (Reference 2.4-003 and Reference 2.4-033). Such wetlands are not natural in North Carolina, occurring only in man-made impoundments (Reference 2.4-013).

Forested floodplains receive frequent overbank flooding and typically are dominated by river birch, black willow, swamp red maple (*Acer rubrum* var. *trilobum*), and green ash in the canopy layer. Buttonbush (*Cephalanthus* *occidentalis*) and hazel alder (*Alnus serrulata*) commonly occurred as shrubs, along with saplings of the overstory dominants. Soft rush (*Juncus effusus*), fringed sedge (*Carex crinita*), greater bladder sedge (*Carex intumescens*), longhair sedge (*Carex comosa*), three-ranked sedge (*Dulichium arundinaceum*), and the exotic Asian dayflower (*Murdannia keisak*) provide a dense groundcover in these wetlands. Woolgrass (*Scirpus cyperinus*) occurs frequently in more open areas. All forested flatlands are classified as palustrine forested wetlands according to the USFWS system (Reference 2.4-003 and Reference 2.4-033).

Active beaver impoundments contain riverine systems of standing water lacking emergent vegetation (permanently flooded impoundment) and also have fringing wetland vegetation typically containing buttonbush, hazel alder, soft rush, and woolgrass. These fringing areas are considered palustrine emergent or palustrine scrub-shrub wetlands depending on the dominant vegetation. Abandoned beaver impoundments are considered palustrine wetlands and all observed in the area surrounding Harris Reservoir are scrub-shrub wetlands (Reference 2.4-003).

These wetland areas typically are vegetated with broadleaf cat-tail (*Typha latifolia*), pepperweed (*Polygonum hydropiperoides*), lizard's tail (*Saururus cernuus*), woolgrass, and spike rushes (*Eleocharis obtusa*). Frequently Brazilian waterweed (*Ergeria densa*) occurs as a submerged component of these wetlands. River birch, buttonbush, and black willow commonly occur at the 67-m (220-ft.) contour (Reference 2.4-003).

An isolated roadbed wetland contained sedges, Asian dayflower, and extensive mats of sphagnum moss (*Sphagnum* sp.) (Reference 2.4-003).

In the area between the 67- and 73.2-m (220- and 240-ft.) contours surrounding Harris Reservoir, a total of 79 ha (196 ac.) of forested and scrub-shrub wetlands were determined to exist by biologists (Reference 2.4-003).

In the area surrounding Harris Reservoir, a total stream length of 45,425 m (149,033 linear ft.) is located between the 67- and 73.2–m (220- and 240-ft.) contours. This consists of approximately 18,697 m (61,343 linear ft.) of intermittent stream channels (Table 2.4-9), and 26,700 m (87,690 linear ft.) of perennial streams (Table 2.4-10) as shown in the site maps (Appendix 2.4-1). (Reference 2.4-040)

Important species with the potential to occur in this area are identified in Table 2.4-2 and are discussed in Subsection 2.4.2.3.2.

2.4.2.3 Cape Fear River

2.4.2.3.1 Habitat Description

The Cape Fear River is approximately 11 km (7 mi.) south of HNP, and flows in a northwest-to-southeast direction. The Harris Reservoir Main Dam, which is located 4 km (2.5 mi.) upstream of Buckhorn Creek's confluence with Cape Fear River, was built to impound the Harris Reservoir (Reference 2.4-001).

An industrial discharge canal flows into the Cape Fear River immediately upstream of the Buckhorn Dam at the location of the proposed intake structure and pumphouse. The discharge canal carries runoff from PEC's Cape Fear Plant and surrounding areas to the Cape Fear River (Reference 2.4-034). The discharge canal has vegetation typical of the riparian corridor along the Cape Fear River (as described in Subsection 2.4.1.2.1) and has largely remained undisturbed for a number of years (Reference 2.4-003).

No important aquatic habitat is known to occur in this area. (Important habitat as defined by NUREG-1555, includes wildlife sanctuaries, habitats identified as priority for protection, wetlands, floodplains, or critical habitat as defined by the USFWS for threatened or endangered species).

2.4.2.3.1.1 Water Quality

Monitoring of the Middle Cape Fear River Basin by the Middle Cape Fear River Basin Association (MCFRBA) began in 1999. During the time period of 1999 to 2004, monitoring indicates fairly good water quality within the basin, with chlorophyll *a*, dissolved oxygen, and fecal coliform as the primary water quality concerns. The station of particular relevance in this report, directly above Buckhorn Dam, has consistently experienced both elevated dissolved oxygen and chlorophyll *a*. The elevated dissolved oxygen is likely a consequence of algal productivity, which is confirmed by the elevated chlorophyll *a* levels as well as super saturation of dissolved oxygen at times. According to the MCFRBA, this is potentially a result of the dams, which cause reduced velocity conditions and pooling of water on the upstream side, providing appropriate conditions for algal growth. Fecal coliform, metals, and nutrients were not an issue in the segment of the Cape Fear River closest to HNP at Buckhorn Dam (Reference 2.4-035).

2.4.2.3.2 Important Species

The Cape Fear River supports a diverse assemblage of fish species. Near Buckhorn dam, there is no commercial fishing but recreational fishing can occur from the banks or by small boat (usually canoe). The NCWRC performed a creel survey that indicated that most recreational fishing along the Cape Fear River downstream of Buckhorn Dam is directed at catfish. Also, striped bass hybrids, likely from Jordan Lake where they are stocked, have been taken in this section of the Cape Fear River. Upstream of Buckhorn Dam at the Cape Fear Power Plant impingement mortality studies were conducted and 29 fish species representing 10 families were collected. Five species accounted for over 98 percent of the total number of fish collected and 94 percent of the fish biomass collected: threadfin shad, gizzard shad, bluegill, channel catfish, and white perch (see Subsection 5.3.1.2.2.1). This study gives a relative picture of the species that occur in the Cape Fear River upstream of Buckhorn Dam. Downstream of Buckhorn Dam the NCDWQ does not maintain any sampling stations for fish on the Cape Fear River; however, there are two sampling stations located in the tributaries that flow into this stretch of the river. Table 2.4-11 lists the 10 most abundant fish species collected during sampling (1994-2003) for Hector and Avent Creeks. Hector Creek and Avent Creek were both scored for fish community using the NCIBI in 1998 and 2003 with Hector Creek scoring 46 (Good) and 56 (Excellent), and Avent Creek scoring 48 (Good) and 44 (Good-Fair). The Avent Creek site has a waterfall barrier between the sampling station and the Cape Fear River, and therefore, might not contain a representative fish community for the Cape Fear River. The Hector Creek site has no barrier to fish movement, which should allow fish to move between the creek and the Cape Fear River. (Reference 2.4-036)

At this time, two federally listed species (one fish and one mussel) known from the two counties occur in the vicinity of the proposed water intake structure (Table 2.4-2) (Reference 2.4-028). Six fish and six mussel species are also listed by the USFWS as being of special concern in the area.

The Cape Fear shiner, *Notropis mekistocholas*, is a small minnow that prefers gravel, cobble, and boulder substrates in slow pools, riffles, and slow runs. It is endemic to the upper Cape Fear River Basin, known only in the Deep, Haw, and Rocky River subbasins. It has been extirpated to such an extent, that only five populations of the shiner are thought to exist (Reference 2.4-028). This fish likely does not occur in the vicinity of the proposed water intake structure, given the limited distribution of the species and habitat at the intake structure not being conducive for the shiner. The USFWS has identified critical habitat for this species, and the intake structure would not occur in the area of concern (Reference 2.4-037). The Cape Fear shiner is not known to exist in the portion of the Cape Fear River from Buckhorn Dam to Lock and Dam 3, and is thought to be extirpated in this area (Reference 2.4-028).

The dwarf wedgemussel (*Alasmidonta heterodon*) is a federally and State-listed endangered mussel that may occur within Wake County (Reference 2.4-030). However, no extant populations of the dwarf wedgemussel are known within the Cape Fear basin, and it is likely this mussel would not occur in this area (Reference 2.4-028). Therefore, no adverse effects to the dwarf wedgemussel are expected.

An additional four fish and six mussel species are federally listed as being of special concern within Chatham and Wake counties (Reference 2.4-014). Table 2.4-2 identifies State-listed species in Chatham and Wake counties.

Federally listed aquatic species in Chatham and Wake counties include the following:

- The Carolina darter (*Etheostoma collis lepidinion*) is known to occur within the Cape Fear River drainage within Chatham County (Reference 2.4-014).

- The Carolina redhorse (*Moxostoma* sp. 2) is known to occur within the Cape Fear River drainage within Chatham County (Reference 2.4-014).

- The Roanoke bass (*Ambloplites cavifrons*) is listed as obscure (date of last observation is uncertain) within Wake County (Reference 2.4-014).

- The Carolina madtom (*Noturus furiosus*) inhabits the Neuse drainage within Wake County, but is not known to inhabit the Cape Fear River drainage (Reference 2.4-014).

- The Atlantic pigtoe (*Fusconaia masoni*) historically inhabited Chatham County, although it is currently found within Wake County (Reference 2.4-014). It prefers medium to large streams with clean, swift waters and stable gravel or sand gravel substrates (Reference 2.4-030).

- The brook floater (*Alasmidonta varicosa*) historically inhabited Chatham County, but has not been observed in recent years (Reference 2.4-014). It prefers medium streams and rivers with clean, swift waters and stable gravel or sand and gravel substrates (Reference 2.4-030).

- The yellow lance (*Elliptio lanceolata*) is currently distributed in the Neuse River drainage, and is listed as obscure (date of last observation uncertain) within Wake County (Reference 2.4-014). It prefers clean coarse to medium substrate sands and is found in the varying sizes of streams (Reference 2.4-030).

- The yellow lampmussel (*Lampsilis cariosa*) is currently distributed in the Neuse River and Cape Fear River drainages within Chatham County (Reference 2.4-014). It occurs in varying habitats but prefers shifting sands downstream of large boulders in fast flowing medium rivers and medium to large creeks (Reference 2.4-030).

- The green floater (*Lasmigona subviridis*) historically inhabited the Cape Fear River. Its only current occurrence within Chatham and Wake counties is within the Neuse River drainage (Reference 2.4-014). It prefers small to medium streams and is intolerant of strong currents. It is generally found in quiet pools and eddies with gravel and sand substrate with high water quality (Reference 2.4-030).

- The Carolina creekshell (*Villosa vaughaniana*) inhabits parts of the Cape Fear River systems within Chatham County (Reference 2.4-014). It prefers silty sand or clay along the banks of small streams (Reference 2.4-030).

2.4.2.3.3 Stressors

Anthropogenic stressors to the Cape Fear River include, but are not limited to, agricultural runoff, effluent from the upstream Holly Spring Wastewater

Treatment Plant (via Utley Creek), upstream point source NPDES discharges from WWTPs and industry, and roadway runoff (Reference 2.4-001).

2.4.2.4 Harris Lake Makeup Water System Intake Structure and Pumphouse

The Harris Lake makeup water system pipeline corridor primarily follows that of an existing utility ROW for approximately 4 km (2.6 mi.) (Figure 2.4-6). The remaining portion of ROW runs approximately 1.4 km (0.90 mi.) along an existing road and adjacent forest land to the Cape Fear River. The corridor evaluated for the Harris Lake makeup water system pipeline has a width of 61 m (200 ft.), although the affected area is expected to be less.

2.4.2.4.1 Habitat Description

The Harris Lake makeup water system pipeline corridor will exist as an area within the Harris Reservoir perimeter habitat that was addressed in Subsection 2.4.1.2.1. Biologists further evaluated the area in August 2006 to determine greater habitat specificity.

The ROW crosses seven stream channels and contains two wetlands (Table 2.4-12). One perennial stream crosses the ROW. The remaining channels are small ephemeral and intermittent drainage ways (Table 2.4-12). Two wetlands were identified. An emergent wetland dominated by sweetflag (*Acorus calamus*) is located adjacent to the Cape Fear River at the terminus of the ROW. A second wetland is located around a pond within the existing cleared utility ROW. This wetland is open water with a narrow fringe of sedges (Reference 2.4-003).

2.4.2.4.2 Areas of Significance

As previously noted, two wetlands are crossed by the Harris Lake makeup water system pipeline corridor (Reference 2.4-003).

2.4.2.4.3 Important Species

Important species identified in Subsection 2.4.2.3.2 are applicable to this area.

2.4.2.4.4 Stressors

Stressors discussed in Subsections 2.4.1.4.2 and 2.4.2.1.6 are applicable to this area.

2.4.2.5 Transmission Line Corridor

Seven 230-kV transmission lines (with corridor widths of 30.5 m [100 ft.], with few exceptions) presently connect the HNP to the PEC electrical grid through the existing switchyard (Figure 2.4-7). These seven transmission lines, along with an eighth line planned for 2011, will also connect HAR 2 through the HNP common expanded switchyard to the PEC electrical grid. The proposed routing of the transmission lines for HAR 2 is to use the existing HNP ROWs.

Three new 230-kV transmission lines will connect the HAR 3 switchyard to the PEC electrical grid. The proposed routing of the three new transmission lines for HAR 3 are being evaluated to be adjacent to or within the existing maintained transmission corridors from the HNP. Section 3.7 provides specific details on the transmission lines while Chapter 4 provides a discussion on the effects of the transmission lines on the terrestrial ecosystem.

Most corridors pass through land that is primarily agricultural and forest land. The areas are mostly remote, with low population densities. The longer lines cross numerous state and United States highways. Effect of these corridors on land usage is minimal; farmlands that have corridors passing through them generally continue to be used as farmland (Reference 2.4-001).

2.4.2.5.1 Habitat Description

The existing transmission corridors pass through the Harris Reservoir perimeter, which has been discussed in previous sections. The habitat description from those sections applies to this discussion.

2.4.2.5.2 Areas of Significance – Sensitive Areas

A variety of sensitive areas, including wetlands occur in the counties containing the existing transmission lines. Refer to Appendix 2.4-1 for wetlands.

2.4.2.5.3 Important Species

The Sandhills chub (*Semotilus lumbee*), a State special concern species, is known to occur in a stream crossing the Harris-Fayetteville corridor. Habitat for this species consists of slow-flowing headwaters, creeks, and small rivers with sand and gravel bottoms and sparse vegetation (Reference 2.4-001). Other important species with the potential to occur within the transmission line corridor are identified in Table 2.4-2. Important species identified in Subsection 2.4.2.1.5 are applicable to this area.

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Table 2.4-1 (Sheet 1 of 5)
Birds Sited Near Jordan Lake and Raleigh, NC

Common Name	Species	Protected by the Migratory Bird Treaty Act	Jordan Lake, NC	Raleigh, NC
American Black Duck	*Anas rubripes*	X	X	
American Coot	*Fulica americana*	X	X	X
American Crow	*Corvus brachyrhynchos*	X	X	X
American Goldfinch	*Caruelis tristis*	X	X	X
American Kestrel	*Falco sparverius*	X	X	X
American Pipit	*Anthus rubescens*	X	X	X
American Robin	*Turdus migratorius*	X	X	X
American Wigeon	*Anas Americana*	X		X
American Woodcock	*Scolopax minor*	X	X	X
Bald Eagle	*Haliaeetus leucocephalus*	X	X	X
Baltimore Oriole	*Icterus galbula*	X		X
Barred Owl	*Strix varia*	X	X	X
Belted Kingfisher	*Ceryle alcyon*	X	X	X
Black Vulture	*Coragyps atratus*	X	X	
Black-and-white Warbler	*Dendroica varia*	X	X	
Blue Jay	*Cyanocitta cristata*	X	X	X
Blue-headed Vireo	*Vireo soliatrius*	X	X	X
Bonaparte’s Gull	*Larus philadelphia*	X	X	
Brown Creeper	*Certhia americana*	X	X	X
Brown Thrasher	*Toxostoma rufum*	X	X	X
Brown-headed Cowbird	*Molothrus ater*	X	X	X
Brown-headed Nuthatch	*Sitta pusilla*	X	X	X
Bufflehead	*Bucephala albeola*	X	X	X
Canada Goose	*Branta canadensis*	X	X	X

Table 2.4-1 (Sheet 2 of 5)
Birds Sited Near Jordan Lake and Raleigh, North Carolina

Common Name	Species	Protected by the Migratory Bird Treaty Act	Jordan Lake, NC	Raleigh, NC
Carolina Chickadee	*Parus carolinesis*	X	X	X
Carolina Wren	*Thyrothorus ludovicianus*	X	X	X
Cedar Waxwing	*Bombycilla cedrorum*	X	X	X
Chipping Sparrow	*Spizella passerina*	X	X	X
Common Grackle	*Quiscalus quiscula*	X	X	X
Common Loon	*Gavia immer*	X	X	
Common Raven	*Corvus corax*	X		X
Common Yellowthroat	*Geothlypis trichas*	X		X
Cooper's Hawk	*Accipiter cooperii*	X	X	X
Dark-eyed Junco	*Junco hyemalis*	X	X	X
Double-crested Cormorant [(a)]	*Phalacrocorax auritus*	X	X	X
Downy Woodpecker	*Picoides pubescens*	X	X	X
Eastern Bluebird	*Sialia sialis*	X	X	X
Eastern Meadowlark	*Sturnella magna*	X	X	X
Eastern Phoebe	*Sayornis phoebe*	X	X	X
Eastern Screech-owl	*Otus asio*	X		X
Eastern Towhee	*Pipilo crissalis*	X	X	X
European Starling	*Sturnus vulgaris*		X	X
Field Sparrow	*Sipzella pusilla*	X	X	X
Fish Crow	*Corvus ossifragus*	X	X	
Fox Sparrow	*Passerella iliaca*	X	X	X
Gadwall	*Anas strepera*	X		X
Golden-crowned Kinglet	*Regulus satrapa*	X	X	X
Gray Catbird	*Dumetella carolinesis*	X	X	X
Great Blue Heron	*Ardea herodias*	X	X	X
Great Egret	*Ardea alba*	X	X	X
Great Horned Owl	*Bubo virginianus*	X	X	X

Table 2.4-1 (Sheet 3 of 5)
Birds Sited Near Jordan Lake and Raleigh, North Carolina

Common Name	Species	Protected by the Migratory Bird Treaty Act	Jordan Lake, NC	Raleigh, NC
Hairy Woodpecker	*Picoides villosus*	X	X	X
Hermit Thrush	*Catharus guttatus*	X	X	X
Herring Gull	*Larus argentatus*	X	X	X
Hooded Merganser	*Lophodytes cucullatus*	X	X	X
Horned Grebe	*Podiceps nigricollis*	X	X	X
House Finch	*Carpodacus mexicanus*	X	X	X
House Sparrow	*Passer domesticus*		X	X
House Wren	*Troglodytes aedon*	X	X	X
Killdeer	*Charadrius vociferus*	X	X	X
Lesser Scaup	*Aythya affinis*	X		X
Loggerhead Shrike [a]	*Lanius ludovicianus*	X		X
Mallard	*Anas platyrhynchos*	X	X	X
Merlin	*Falco columbarius*	X	X	
Mourning Dove	*Zenaida macroura*	X	X	X
Mute Swan	*Cygnus olor*	X		X
Northern Flicker	*Colaptes auratus*	X	X	X
Northern Bobwhite	*Colinus virginianus*		X	
Northern Cardinal	*Cardinalis cardinalis*	X	X	X
Northern Harrier	*Circus cyaneus*	X	X	
Northern Mockingbird	*Mimus polyglottos*	X	X	X
Northern Pintail	*Anas acuta*	X	X	X
Northern Shoveler	*Anas clypeata*	X		X
Orange-crowned Warbler	*Vermivora celata*	X	X	X
Palm Warbler	*Dendroica palmarum*	X		X
Pied-billed Grebe	*Poilymbus podiceps*	X	X	X
Pileated Woodpecker	*Dryocopus pileatus*	X	X	X
Pine Siskin	*Carduelis pinus*	X		X

Table 2.4-1 (Sheet 4 of 5)
Birds Sited Near Jordan Lake and Raleigh, North Carolina

Common Name	Species	Protected by the Migratory Bird Treaty Act	Jordan Lake, NC	Raleigh, NC
Pine Warbler	*Dendroica pinus*	X	X	X
Purple Finch	*Car[pdacus purpureus*	X		X
Red-bellied Woodpecker	*Melanerpes carolinus*	X	X	X
Red-breasted Nuthatch	*Sitta canadensis*	X	X	
Red-headed Woodpecker	*Melanerpes erythrocephalus*	X	X	X
Red-shouldered Hawk	*Buteo solitarius*	X	X	X
Red-tailed hawk	*Buteo jamaicensis*	X	X	X
Red-winged Blackbird	*Agelaius phoeniceus*	X	X	X
Ring-billed Gull	*Larus delawarensis*	X	X	X
Ring-necked Duck	*Authya collaris*	X	X	X
Rock Pigeon	*Columba livia*		X	X
Ruby-crowned Kinglet	*Regulus caledula*	X	X	X
Ruddy Duck	*Oxyura jamaicensis*	X	X	X
Rufous Hummingbird	*Selasphorus rufus*	X		X
Rusty Blackbird	*Euphagus carolinus*	X	X	X
Savannah Sparrow	*Passerculus sandwichensis*	X	X	X
Sharp-shinned Hawk	*Accipiter striatus*	X	X	X
Snow Goose	*Chen caerulescens*	X		X
Song Sparrow	*Melospiza melodia*	X	X	X
Swamp Sparrow	*Melospiza georgiana*	X	X	X
Tufted Titmouse	*Parus bicolor*	X	X	X
Turkey Vulture	*Cathartes aura*	X	X	X
White-breasted Nuthatch	*Sitta carolinensis*	X	X	X
White-crowned Sparrow	*Zonotrichia leucophrys*	X		X

Table 2.4-1 (Sheet 5 of 5)
Birds Sited Near Jordan Lake and Raleigh, North Carolina

Common Name	Species	Protected by the Migratory Bird Treaty Act	Jordan Lake, NC	Raleigh, NC
White-throated Sparrow	*Zonotrichia albicollis*	X	X	X
Wild Turkey	*Meleagris gallopavo*		X	
Wilson's Snipe	*Gallinago delicata*	X	X	X
Winter Wren	*Troglodytes trodlodytes*	X	X	X
Wood Duck	*Aix sponsa*	X		X
Yellow-bellied Sapsucker	*Sphyrapicus varius*	X	X	X
Yellow-rumped Warbler	*Dendroica coronata*	X	X	X

Notes:
There were observations of birds that could not be identified to species (Accipiter sp., Buteo sp., Sparrow sp., and Vulture sp.).

a) Indicates a state-listed species of special concern or significantly rare

Sources: Reference 2.4-009 and Reference 2.4-010

Table 2.4-2 (Sheet 1 of 7)
Species with Potential to Utilize Habitats Occurring in the Four-County Area Surrounding Shearon Harris Nuclear Plant

Common Name	Scientific Name	State Status	Federal Status	County – Occurrence[1]
Plants				
Scale-leaf Gerardia	*Agalinis aphylla*	SR-P	None	Ha
Striped Garlic	*Allium cuthbertii*	SR-T	None	Ch (H)
Georgia Indigo-bush	*Amorpha georgiana var. georgiana*	E	FSC	Ha, Lee
Sandhills Milk-vetch	*Astragalus michauxii*	T	FSC	Ha
Thin-pod White Wild Indigo	*Baptisia albescens*	SR-P	None	Ch (H)
A Pygmy Moss	*Bruchia brevifolia*	SR-T	None	Ha (H)
A Pygmy Moss	*Bruchia carolinae*	SR-L	None	Lee (H)
A Pygmy Moss	*Bruchia fusca*	SR-T	None	Ha (H)
American Bluehearts	*Buchnera americana*	SR-P	None	Ha (H), Wa (H)
Oersted's Campylopus	*Campylopus oerstedianus*	SR-D	None	Wa (H)
Douglass's Bittercress	*Cardamine douglassii*	SR-P	None	Ha, Wa
Barratt's Sedge	*Carex barrattii*	E	None	Ha (H)
Coastal Sedge	*Carex exilis*	T	None	Ha
Ravine Sedge	*Carex impressinervia*	SR-T	FSC	Ha
James's Sedge	*Carex jamesii*	SR-P	None	Ha, Lee (H)
Necklace Sedge	*Carex projecta*	SR-P	None	Lee
Kidney Sedge	*Carex reniformis*	SR-P	None	Wa (H)
A Sedge	*Carex sp. 4*	SR-L	None	Ha
Rigid Sedge	*Carex tetanica*	SR-P	None	Wa (H)
Carolina Thistle	*Cirsium carolinianum*	SR-P	None	Wa (H)
Twig-rush	*Cladium mariscoides*	SR-O	None	Ha
A Moss	*Cleistocarpidium palustre*	SR-T	None	Wa
Piedmont Horsebalm	*Collinsonia tuberosa*	SR-P	None	Ch
Granite Flatsedge	*Cyperus granitophilus*	SR-T	None	Wa
Bog Oatgrass	*Danthonia epilis*	SR-T	FSC	Ha

Table 2.4-2 (Sheet 2 of 7)
Species with Potential to Utilize Habitats Occurring in the Four-County Area Surrounding Shearon Harris Nuclear Plant

Common Name	Scientific Name	State Status	Federal Status	County - Occurrence
A Witch Grass	*Dichanthelium annulum*	SR-P	None	Ch (H), Lee (H), Wa (H)
A Witch Grass	*Dichanthelium sp. 9*	SR-L	None	Ha, Wa (H)
Water Purslane	*Didiplis diandra*	SR-P	None	Ha (Obs), Wa
Robbins' Spikerush	*Eleocharis robbinsii*	SR-P	None	Ha
Eastern Isopyrum	*Enemion biternatum*	SR-P	None	Ch (H), Ha, Lee
Godfrey's Thoroughwort	*Eupatorium godfreyanum*	SR-P	None	Wa (H)
Pine Barren Boneset	*Eupatorium resinosum*	T-SC	None	Ha
Large Witch-alder	*Fothergilla major*	SR-T	None	Ch, Ha, Wa
Indian Physic	*Gillenia stipulata*	SR-P	None	Ch (H), Lee (H), Wa
Littleleaf Sneezeweed	*Helenium brevifolium*	E	None	Wa (H)
Crested Coralroot	*Hexalectris spicata*	SR-P	None	Ha
Sarvis Holly	*Ilex amelanchier*	SR-P	None	Ha (H)
Slender Blue Iris	*Iris prismatica*	SR-T	None	Ha
Piedmont Quillwort	*Isoetes piedmontana*	T	None	Wa
Virginia Quillwort	*Isoetes virginica*	SR-L	FSC	Ch (H)
Raven Rock Liverwort	*Lejeunea glaucescens var. acrogyna*	SR-L	None	Ha (H)
Earle's Blazing-star	*Liatris squarrulosa*	SR-P	None	Ha (Obs), Wa
Sandhills Lily	*Lilium pyrophilum*	E-SC	FSC	Ha, Lee
Bog Spicebush	*Lindera subcoriacea*	T	FSC	Lee, Wa
Carolina Birdfoot-trefoil	*Lotus helleri*	SR-T	FSC	Wa
Long Beach Seedbox	*Ludwigia brevipes*	SR-T	None	Ha (H)
Rough-leaf Loosestrife	*Lysimachia asperulifolia*	E	E	Ha
Carolina Bogmint	*Macbridea caroliniana*	T	FSC	Ha
Bigleaf Magnolia	*Magnolia macrophylla*	SR-P	None	Wa
Glade Milkvine	*Matelea decipiens*	SR-P	None	Wa
Sweet Pinesap	*Monotropsis odorata*	SR-T	FSC	Ch, Wa (H)

Table 2.4-2 (Sheet 3 of 7)
Species with Potential to Utilize Habitats Occurring in the Four-County Area Surrounding Shearon Harris Nuclear Plant

Common Name	Scientific Name	State Status	Federal Status	County - Occurrence
Carolina Grass-of-parnassus	*Parnassia caroliniana*	E	FSC	Ha, Lee (H)
Horsetail Crown Grass	*Paspalum fluitans*	SR-D	None	Ch (H), Ha
Buttercup Phacelia	*Phacelia covillei*	SR-T	FSC	Ch, Ha, Lee
A Moss	*Pleuridium sullivantii*	SR-O	None	Ha (H)
Seneca Snakeroot	*Polygala senega*	SR-D	None	Wa
Small's Portulaca	*Portulaca smallii*	T	None	Wa
Conferva Pondweed	*Potamogeton confervoides*	SR-D	None	Ha
Heller's Rabbit-Tobacco	*Pseudognaphalium helleri*	SR-P	None	Wa
Harperella	*Ptilimnium nodosum*	E	E	Ch, Lee (H)
Virginia Mountain-mint	*Pycnanthemum virginianum*	SR-P	None	Wa
Sandhills Pyxie-moss	*Pyxidanthera barbulata var. brevifolia*	E	FSC	Ha, Lee (H)
Michaux's Sumac	*Rhus michauxii*	E-SC	E	Wa
Southern White Beaksedge	*Rhynchospora macra*	E	None	Ha
Long-beak Baldsedge	*Rhynchospora scirpoides*	SR-O	None	Ha
Sun-facing Coneflower	*Rudbeckia heliopsidis*	E	FSC	Ha (H)
Low Wild-petunia	*Ruellia humilis*	T	None	Wa (H)
Pursh's Wild-petunia	*Ruellia purshiana*	SR-O	None	Wa
Grassleaf Arrowhead	*Sagittaria weatherbiana*	SR-T	FSC	Wa (H)
Swamp Saxifrage	*Saxifraga pensylvanica*	SR-P	None	Wa
Canby's Bulrush	*Schoenoplectus etuberculatus*	SR-P	None	Ha
Swaying Bulrush	*Schoenoplectus subterminalis*	SR-P	None	Ha
Southern Skullcap	*Scutellaria australis*	SR-P	None	Lee (H), Wa (H)
Veined Skullcap	*Scutellaria nervosa*	SR-P	None	Ch (H), Wa (H)
Prairie Dock	*Silphium terebinthinaceum*	SR-P	None	Wa (H)

Table 2.4-2 (Sheet 4 of 7)
Species with Potential to Utilize Habitats Occurring in the Four-County Area Surrounding Shearon Harris Nuclear Plant

Common Name	Scientific Name	State Status	Federal Status	County - Occurrence
Western Rough Goldenrod	*Solidago radula*	SR-P	None	Wa (H)
Spring-flowering Goldenrod	*Solidago verna*	T	FSC	Ha
Orange Peatmoss	*Sphagnum subsecundum*	SR-P	None	Wa (H)
Giant Peatmoss	*Sphagnum torreyanum*	SR-P	None	Ha (H)
Pickering's Dawnflower	*Stylisma pickeringii var. pickeringii*	E	FSC	Ha
Narrow-leaf Aster	*Symphyotrichum laeve var. concinnum*	SR-P	None	Wa (H)
Appalachian Golden-banner	*Thermopsis mollis*	SR-P	None	Ch (H), Wa
Pale Mannagrass	*Torreyochloa pallida*	SR-P	None	Ha
A Chain-teeth Moss	*Tortula plinthobia*	SR-O	None	Wa (H)
Virginia Spiderwort	*Tradescantia virginiana*	SR-P	None	Ha, Wa
Carolina Triodia	*Tridens carolinianus*	SR-T	None	Ha
Buffalo Clover	*Trifolium reflexum*	SR-T	None	Ch (H), Ha, Wa
Virginia Least Trillium	*Trillium pusillum var. virginianum*	E	FSC	Wa
Carolina Pineland-cress	*Warea cuneifolia*	E	None	Ha (H)
Chapman's Yellow-eyed-grass	*Xyris chapmanii*	SR-T	None	Ha
Harper's Yellow-eyed-grass	*Xyris scabrifolia*	SR-T	FSC	Ha
Animals				
Bachman's Sparrow	*Aimophila aestivalis*	SC	FSC	Ch, Ha, Wa (H)
Dwarf Wedgemussel	*Alasmidonta heterodon*	E	E	Wa
Triangle Floater	*Alasmidonta undulata*	T	None	Ch, Ha, Lee, Wa
Brook Floater	*Alasmidonta varicosa*	E	FSC	Ch
Roanoke Bass	*Ambloplites cavifrons*	SR	FSC	Wa
Eastern Tiger Salamander	*Ambystoma tigrinum*	T	None	Wa
American eel	*Anguilla rostrata*	None	FSC	Ch, Ha, Lee, Wa

Table 2.4-2 (Sheet 5 of 7)
Species with Potential to Utilize Habitats Occurring in the Four-County Area Surrounding Shearon Harris Nuclear Plant

Common Name	Scientific Name	State Status	Federal Status	County - Occurrence
Frosted Elfin	*Callophrys irus*	SR	None	Ha
Carolina Ladle Crayfish	*Cambarus davidi*	SR	None	Ch, Ha, Wa
Dismal Swamp Green Stink Bug	*Chlorochroa dismalia*	SR	None	Ha (H)
A Mayfly	*Choroterpes basalis*	SR	None	Ch
Star-nosed Mole - Coastal Plain Population	*Condylura cristata pop. 1*	SC	None	Wa
A Caddisfly	*Dibusa angata*	SR	None	Wa
Pod Lance	*Elliptio folliculata*	SC	None	Ha
Yellow Lance	*Elliptio lanceolata*	E	FSC	Wa
Roanoke Slabshell	*Elliptio roanokensis*	T	None	Cha, Ha, Lee, Wa
Mottled Duskywing	*Erynnis martialis*	SR	None	Wa
Carolina Darter - Eastern Piedmont Population	*Etheostoma collis pop. 2*	SC	FSC	Ch
Carolina darter	*Etheostoma collis lepidinion*	None	FSC	Ch, Wa
Two-spotted Skipper	*Euphyes bimacula*	SR	None	Ha
Atlantic Pigtoe	*Fusconaia masoni*	E	FSC	Ch, Ha, Wa
Spine-crowned Clubtail	*Gomphus abbreviatus*	SR	None	Ch (Obs), Lee (Obs)
Rapids Clubtail	*Gomphus quadricolor*	SR	None	Ch (Obs)
Septima's Clubtail	*Gomphus septima*	SR	FSC	Ch, Ha, Lee
Bald Eagle	*Haliaeetus leucocephalus*	T	None	Ch, Ha, Lee, Wa
Four-toed Salamander	*Hemidactylium scutatum*	SC	None	Ch, Wa
Southern Hognose Snake	*Heterodon simus*	SC	FSC	Wa (Obs)
Pine Barrens Treefrog	*Hyla andersonii*	SR	None	Ha, Lee (H)
Least Brook Lamprey	*Lampetra aepyptera*	T	None	Wa
Yellow Lampmussel	*Lampsilis cariosa*	E	FSC	Ch, Ha, Lee

Table 2.4-2 (Sheet 6 of 7)
Species with Potential to Utilize Habitats Occurring in the Four-County Area Surrounding Shearon Harris Nuclear Plant

Common Name	Scientific Name	State Status	Federal Status	County - Occurrence
Eastern Lampmussel	*Lampsilis radiata radiata*	T	None	Wa
Loggerhead Shrike	*Lanius ludovicianus*	SC	None	Ch, Ha, Lee, Wa
Green Floater	*Lasmigona subviridis*	E	FSC	Wa
Lemmer's Pinion	*Lithophane lemmeri*	SR	None	Wa (Obs)
Pinewoods shiner	*Lythrurus matutinus*	None	FSC	Wa
A Short-winged Melanoplus	*Melanoplus nubilus*	SR	None	Ha
Eastern Coral Snake	*Micrurus fulvius*	E	None	Ha (Obs)
Carolina Redhorse	*Moxostoma sp. 2*	SR [PE]	FSC	Ch, Ha, Lee
Southeastern Myotis	*Myotis austroriparius*	SC	FSC	Wa (H)
Northern Long-eared Myotis	*Myotis septentrionalis*	SC	None	Wa (H)
Neuse River Waterdog	*Necturus lewisi*	SC	None	Wa
Smoky Shadow Dragon	*Neurocordulia molesta*	SR	None	Ha (Obs)
Cinnamon Shadowdragon	*Neurocordulia virginiensis*	SR	None	Ch (Obs), Ha (Obs)
Cape Fear Shiner	*Notropis mekistocholas*	E	E	Ch, Ha (H), Lee
Carolina Madtom	*Noturus furiosus*	SC [PT]	FSC	Wa
North Carolina Spiny Crayfish	*Orconectes carolinensis*	SC	None	Wa (H)
Giant Swallowtail	*Papilio cresphontes*	SR	None	Wa (Obs)
Double-crested Cormorant	*Phalacrocorax auritus*	SR	None	Ch
Red-cockaded Woodpecker	*Picoides borealis*	E	E	Ch (H), Ha, Lee (H), Wa (H)
Northern Pine Snake	*Pituophis melanoleucus melanoleucus*	SC	FSC	Ha (H)
Diana fritillary (butterfly)	*Speyeria diana*	None	FSC	Wa
A New Prominent Moth	*Schizura sp. 1*	SR	None	Wa (Obs)
Eastern Fox Squirrel	*Sciurus niger*	SR	None	Ha, Wa
Sandhills Chub	*Semotilus lumbee*	SC	FSC	Ha
Pigmy Rattlesnake	*Sistrurus miliarius*	SC	None	Ha (Obs)

Table 2.4-2 (Sheet 7 of 7)
Species with Potential to Utilize Habitats Occurring in the Four-County Area Surrounding Shearon Harris Nuclear Plant

Common Name	Scientific Name	State Status	Federal Status	County - Occurrence
Creeper	*Strophitus undulatus*	T	None	Ch, Ha, Lee, Wa
Savannah Lilliput	*Toxolasma pullus*	E	FSC	Ch ,Lee
Notched Rainbow	*Villosa constricta*	SC	None	Ch, Ha, Lee (H), Wa
Eastern Creekshell	*Villosa delumbis*	SR	None	Ch
Carolina Creekshell	*Villosa vaughaniana*	E	FSC	Ch

Sources: References 2.4-038 and 2.4-039

Notes:
[1] All species listed have been observed in the County listed unless otherwise noted.
- Historic indicates the species was observed in the County in the last 50 years.
- Obscure indicates that the species observation date or location is uncertain.
- Probable/Potential indicates the species is considered to likely occur in this County based on the proximity of known observations, the potential for suitable habitat, or both.

Ch	Chatham
Ha	Harnett
Lee	Lee
Wa	Wake
H	Historic
Obs	Obscure
Pr	Probable/Potential
E	Endangered
T	Threatened
SC	Species of Concern
C	Candidate
SR	Significantly Rare
EX	Extirpated
-L	Limited
-T	Throughout
-D	Disjunct
-P	Peripheral
-O	Other
-SC	Species of Concern
P_	Proposed
BGPA	Bald and Golden Eagle Protection Act.
EXN	Endangered, nonessential experimental population.
EXP	Exponential Population
T (S/A)	Threatened due to Similarity of Appearance.
FSC	Federal "Species of Concern"
PE	Proposed Endangered
PD	Proposed De-listed
PT	Proposed Threatened

Table 2.4-3
Summary of In Situ Results
Progress Energy Biological Assessment

Station	Stream	Temperature (°C)	DO (mg/L)	pH (SU)	Specific Conductivity (µmhos/cm)	Turbidity (NTU)
BH-1	*Buckhorn Creek*	23.97	8.14	7.40	89	16.2
NB-2	*Norris Branch*	22.80	5.29	7.18	89	10.7
LW-3	*Little White Oak Creek*	21.39	1.12	7.06	152	18.0
WO-4	*White Oak Creek*	22.72	2.23	6.94	110	91.8
BB-5	*Big Branch*	21.98	1.47	7.32	96	12.0
JB-6	*Jim Branch*	24.09	4.02	6.99	155	35.0
UC-7	*Utley Creek*	24.04	4.10	7.30	448	3.4
North Carolina State Standards		Not to exceed 32.0 °C	Daily average 5.0 mgL and 4.0 mgL at any one time	6.00 to 9.00 SU**	N/A	50 NTU in receiving waters

Notes:
* Lower values are permissible if caused by natural conditions

** Swamp waters may have a pH as low as 4.3 if caused by natural conditions.

°C = degrees Celsius
mg/L = milligram(s) per liter
N/A = Data not available
NTU = nephelometric turbidity unit

Sources: Reference 2.4-003 and Reference 2.4-024

Table 2.4-4
Summary of Species Distribution in Lake

Species	Scientific Name	Stations [(a)]
Bowfin	*Amia calva*	H, P, S
Gizzard shad	*Dorosoma cepedianum*	E, H, P, S, V
Threadfin shad	*Dorosoma petenense*	E, P
Common carp	*Cyprinus carpio carpio*	S
Golden shiner	*Notemigonus crysoleucas*	E, H, P, S, V
Coastal shiner	*Notropis petersoni*	E, P, V
Unidentified shiner		E, H, P, S, V
White catfish	*Ameiurus catus*	E, H, P, V
Yellow bullhead	*Ameiurus natalis*	P
Brown bullhead	*Ameiurus nebulosus*	E, H, P, S, V
Flat bullhead	*Ameiurus platycephalus*	E, H, V
Channel catfish	*Ictalurus punctatus*	E, H, P, V
Chain pickerel	*Esox niger*	H, S, V
Eastern mosquitofish	*Gambusia holbrooki*	V
White perch	*Morone americana*	E, H, P
Bluespotted sunfish	*Enneacanthus gloriosus*	E, P
Redbreast sunfish	*Lepomis auritus*	E
Warmouth	*Lepomis gulosus*	E, H, P, S, V
Bluegill	*Lepomis macrochirus*	E, H, P, S, V
Redear sunfish	*Lepomis microlophus*	E, H, P, S, V
Largemouth bass	*Micropterus salmoides*	E, H, P, S, V
Black crappie	*Pomoxis nigromaculatus*	E, H, P, S, V
Swamp darter	*Etheostoma fusiforme*	E

Notes:
a) Locations as shown on Figure 2.4-9

Source: Reference 2.4-002

Table 2.4-5
Summary of Benthic Macroinvertebrate Bioassessment Scores
Progress Energy Biological Assessment

Station	NCIBI Value	EPT Value	NCIBI Score	EPT Score	Final Score (Average)	Ecological Condition
BH-1	5.72	11	4	2	3	Good-Fair
NB-2	6.95	5	2	1	1.5 [a]	Poor
LW-3	8.02	1	1	1	1	Poor
WO-4	8.00	0	1	1	1	Poor
BB-5	7.96	1	1	1	1	Poor
JB-6	6.70	6	2	1.4	1.7	Fair
UC-7	6.22	5	3	1	2	Fair

Notes:
a) Rounded down in accordance with the NCIBI specifications for EPT abundance.

Source: Reference 2.4-003

Table 2.4-6
Fish Community NCIBI Metric Values, Ratings, and Total Scores for Progress Energy Stations, August 2006
Progress Energy Biological Assessment

Metric	Absolute Metric Value (Metric Rating)													
	BH-1		NB-2		LW-3		WO-4		BB-5		JB-6		UC-7	
1. Number of Species	12	(3)	18	(5)	5	(1)	10	(3)	2	(1)	8	(1)	10	(3)
2. Number of Fish	210	(3)	85	(3)	28	(1)	46	(1)	4	(1)	54	(1)	68	(1)
3. Number of Species of Darters	1	(3)	1	(3)	0	(1)	0	(1)	0	(1)	0	(1)	1	(3)
4. Number of Species of Sunfish	4	(5)	7	(5)	2	(1)	6	(5)	0	(1)	5	(5)	5	(5)
5. Number of Species of Sucker	1	(3)	1	(3)	0	(1)	1	(3)	0	(1)	0	(1)	0	(1)
6. Number of Intolerant Species	0	(1)	0	(1)	0	(1)	0	(1)	0	(1)	0	(1)	0	(1)
7. Percentage of Tolerant Individuals	16.7%	(5)	40.0%	(3)	0.0%	(5)	23.9%	(5)	0.0%	(5)	48.1%	(3)	11.8%	(5)
8. Percentage of Omnivorous and Herbivorous Individuals	29.5%	(5)	16.5%	(5)	14.3%	(5)	17.4%	(5)	0.0%	(1)	37.0%	(3)	7.4%	(1)
9. Percentage of Insectivores	55.0%	(3)	75.3%	(5)	75.0%	(5)	63.0%	(3)	75.0%	(5)	61.1%	(3)	85.3%	(5)
10. Percentage of Piscivores	2.9%	(5)	5.9%	(5)	10.7%	(5)	19.6%	(1)	25.0%	(1)	1.9%	(5)	5.9%	(5)
11. Percentage of Diseased Fish	0	(5)	1.2%	(5)	0	(5)	0	(5)	0	(5)	0	(5)	0	(5)
12. Percentage of Species with Multiple Age Groups	45.5%	(3)	22.2%	(1)	40.0%	(3)	30.0%	(1)	0.0%	(1)	12.5%	(1)	40.0%	(3)
NCIBI Score (sum of 12 metric ratings)	44		44		34		34		24		30		38	
Integrity Class	Good-Fair		Good-Fair		Fair		Fair		Poor		Poor		Fair	

Source: Reference 2.4-003

Table 2.4-7 (Sheet 1 of 4)
Terrestrial Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
BB-001	Forested	3.24	1.31	Flood
WA-001	Herbaceous	0.39	0.16	Fill
WA-002	Forested	1.54	0.62	Flood
WA-003	Forested	0.20	0.08	Flood
WB-001	Forested	0.03	0.01	Fill
WB-002	Forested	0.21	0.08	Fill
WB-004	Forested	0.71	0.29	Flood
WB-006	Forested	0.28	0.11	Flood
WB-007	Forested	0.13	0.05	Flood
WB-008	Forested	0.12	0.05	Flood
WB-009	Forested	1.74	0.70	Flood
WB-010-1	Forested	4.15	1.68	Flood
WB-010-2	Forested	0.21	0.08	Flood
WB-011	Forested	92.41	37.4	Flood
WB-012	Forested	0.13	0.05	Flood
WB-013-1	Forested	0.12	0.05	Flood
WB-013-2	Forested	0.24	0.10	Flood
WB-014	Forested	0.25	0.10	Makeup Water Line
WB-014-1	Forested	0.56	0.23	Makeup Water Line
WB-015	Forested	0.10	0.04	Flood
WC-001-1	Forested	3.07	1.24	Fill
WC-001-2	Forested	0.07	0.03	Fill
WC-002	Forested	0.13	0.05	Fill
WC-003	Forested	0.12	0.05	Fill
WC-004	Forested	7.50	3.04	Flood
WC-005-1	Forested	0.32	0.13	Flood
WC-005-2	Forested	0.23	0.09	Flood
WC-005-3	Forested	3.12	1.26	Flood
WC-005-4	Forested	0.12	0.05	Flood
WC-005-5	Forested	0.52	0.21	Flood
WC-006-1	Forested	0.25	0.10	Flood
WC-006-2	Forested	0.16	0.06	Flood
WC-007	Forested	0.09	0.04	Flood
WC-008	Forested	0.10	0.04	Flood
WC-009	Forested	0.10	0.04	Flood
WC-010	Forested	0.48	0.19	Flood
WC-011	Herbaceous	0.33	0.13	Flood
WC-012-1	Forested	18.35	7.43	Flood
WC-012-2	Forested	27.04	10.94	Flood
WC-013	Forested	0.76	0.31	Flood
WC-014	Forested	9.16	3.71	Flood
WC-015	Forested	1.89	0.76	Flood
WC-016	Forested	0.22	0.09	Flood
WC-017	Forested	0.43	0.17	Flood

Table 2.4-7 (Sheet 2 of 4) Terrestrial Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
WC-018	Forested	1.37	0.55	Flood
WC-019	Herbaceous	0.84	0.34	Flood
WD-001-1	Herbaceous	0.39	0.16	Fill
WD-001-2	Herbaceous	0.08	0.03	Fill
WD-002	Forested	0.24	0.10	Flood
WD-003	Forested	0.29	0.12	Flood
WD-004	Forested	0.16	0.06	Flood
WD-005-1	Forested	0.51	0.21	Flood
WD-005-2	Forested	0.07	0.03	Flood
WD-006	Forested	0.35	0.14	Flood
WD-007	Forested	0.17	0.07	Flood
WD-008	Forested	0.20	0.08	Flood
WD-009	Forested	0.08	0.03	Flood
WD-010	Forested	0.08	0.03	Flood
WD-011	Forested	0.16	0.06	Flood
WD-012	Forested	0.05	0.02	Flood
WD-013	Forested	0.29	0.12	Flood
WD-014	Forested	0.03	0.01	Flood
WD-015	Forested	0.11	0.04	Flood
WD-017	Floodplain pool	1.51	0.61	Flood
WD-018	Forested	0.15	0.06	Flood
WD-019	Forested	0.04	0.02	Flood
WD-020	Forested	0.02	0.01	Flood
WD-022	Forested	0.17	0.07	Flood
WD-023	Forested	0.21	0.08	Flood
WD-024-1	Forested	0.23	0.09	Flood
WD-024-2	Forested	0.37	0.15	Flood
WD-025	Forested	0.38	0.15	Flood
WD-025-2	Forested	0.20	0.08	Flood
WD-026	Forested	0.10	0.04	Flood
WD-027	Forested	0.32	0.13	Flood
WD-028	Floodplain pool	0.77	0.31	Flood
WD-029	Floodplain pool	0.13	0.05	Flood
WD-030	Forested	0.05	0.02	Flood
WE-001	Herbaceous	0.00	0.00	Fill
WE-002	Forested	0.17	0.07	Fill
WE-003	Herbaceous	0.07	0.03	Fill
WE-004	Forested	0.94	0.38	Flood
WE-005	Forested	0.06	0.02	Flood
WE-006	Floodplain pool	0.14	0.06	Flood
WE-007-1	Floodplain pool	0.01	0.00	Flood
WE-007-2	Floodplain pool	0.01	0.00	Flood
WE-007-3	Floodplain pool	0.00	0.00	Flood
WE-007-4	Floodplain pool	0.01	0.00	Flood

Table 2.4-7 (Sheet 3 of 4)
Terrestrial Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
WE-007-5	Floodplain pool	0.01	0.00	Flood
WE-008	Forested	0.08	0.03	Flood
WE-009	Forested	0.12	0.05	Flood
WE-010	Forested	0.08	0.03	Flood
WE-011	Forested	0.01	0.00	Flood
WE-012	Forested	0.10	0.04	Flood
WE-013	Forested	0.25	0.10	Flood
WE-014	Forested	0.01	0.00	Flood
WE-015	Forested	0.04	0.02	Flood
WE-017	Forested	0.14	0.06	Flood
WE-018	Forested	0.02	0.01	Flood
WE-019	Herbaceous	0.01	0.00	Flood
WE-020	Forested	0.01	0.00	Flood
WE-021	Herbaceous	0.09	0.04	Flood
WE-022	Forested	0.37	0.15	Flood
WE-023	Forested	0.40	0.16	Flood
WE-024-1	Floodplain pool	0.57	0.23	Flood
WE-024-2	Floodplain pool	0.17	0.07	Flood
WE-024-3	Forested	1.38	0.56	Flood
WE-025	Forested	0.40	0.16	Flood
WE-030	Herbaceous	0.13	0.05	Makeup Water Line
WE-033	Forested	0.06	0.02	Flood
WE-034-1	Herbaceous	0.32	0.13	Flood
WE-035	Forested	0.10	0.04	Flood
WE-036	Forested	0.23	0.09	Flood
WE-037	Forested	0.25	0.10	Flood
WE-038	Forested	0.04	0.02	Flood
WE-039	Herbaceous	0.18	0.07	Flood
WE-040	Forested	0.16	0.06	Flood
WE-041	Forested	0.06	0.02	Flood
WE-042	Herbaceous	0.04	0.02	Flood
WE-101	Herbaceous	0.06	0.02	Flood
WE-102	Herbaceous	0.00	0.00	Flood
WE-103	Herbaceous	0.01	0.00	Flood
WE-104	Herbaceous	0.01	0.00	Flood
WE-105	Herbaceous	0.01	0.00	Flood
WE-106	Herbaceous	0.03	0.01	Flood
WE-107	Herbaceous	0.00	0.00	Flood
WE-108	Herbaceous	0.02	0.01	Flood
WE-109	Herbaceous	0.02	0.01	Flood
WE-111	Herbaceous	0.01	0.00	Flood
WE-112	Herbaceous	0.02	0.01	Flood
WE-113	Herbaceous	0.02	0.01	Flood
WPB-006	Floodplain pool	0.32	0.13	Flood

Table 2.4-7 (Sheet 4 of 4)
Terrestrial Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
WPC-005	Floodplain pool	0.37	0.15	Flood
WPC-006	Floodplain pool	0.17	0.07	Flood
Total	Herbaceous	3.1	1.3	
Total	Floodplain pool	4.2	1.7	
Total	Forested	192.4	77.8	

Notes:
a) Determined by wetland delineations

b) Field measurements were conducted in acres; hectares are approximated.

Source: Reference 2.4-040

Table 2.4-8 (Sheet 1 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
ED-001	Emergent	0.73	0.30	Flood
ED-002	Emergent	0.48	0.19	Flood
ED-003	Emergent	0.33	0.13	Flood
ED-004	Emergent	0.32	0.13	Flood
ED-005	Emergent	0.09	0.04	Flood
ED-006	Emergent	0.08	0.03	Flood
ED-007	Emergent	0.21	0.08	Flood
ED-008	Emergent	0.06	0.02	Flood
ED-009	Emergent	2.76	1.12	Flood
ED-010	Emergent	0.17	0.07	Flood
ED-011	Emergent	0.19	0.08	Flood
ED-012	Emergent	0.20	0.08	Flood
ED-013	Emergent	0.07	0.03	Flood
ED-014	Emergent	0.12	0.05	Flood
ED-015	Emergent	0.06	0.02	Flood
ED-016	Emergent	0.30	0.12	Flood
ED-017	Emergent	0.03	0.01	Flood
ED-018	Emergent	0.25	0.10	Flood
ED-019	Emergent	0.10	0.04	Flood
ED-020	Emergent	0.27	0.11	Flood
ED-021	Emergent	0.04	0.02	Flood
ED-022	Emergent	0.04	0.02	Flood
ED-023	Emergent	0.10	0.04	Flood
ED-024	Emergent	0.03	0.01	Flood
ED-025	Emergent	0.03	0.01	Flood
ED-026	Emergent	0.20	0.08	Flood
ED-027	Emergent	0.11	0.04	Flood
ED-028	Emergent	0.19	0.08	Flood
ED-029	Emergent	1.98	0.80	Flood
ED-030	Emergent	0.37	0.15	Flood
ED-031	Emergent	1.25	0.51	Flood
ED-032	Emergent	0.19	0.08	Flood
ED-033	Emergent	2.94	1.19	Flood
ED-034	Emergent	1.63	0.66	Flood
ED-035	Emergent	1.56	0.63	Flood
ED-036	Emergent	0.02	0.01	Flood
ED-037	Emergent	0.02	0.01	Flood
ED-038	Emergent	0.27	0.11	Flood
ED-039	Emergent	0.82	0.33	Flood
ED-040	Emergent	0.38	0.15	Flood
ED-041	Emergent	0.04	0.02	Flood
ED-042	Emergent	1.08	0.44	Flood
ED-043	Emergent	0.02	0.01	Flood
ED-044	Emergent	0.05	0.02	Flood

Table 2.4-8 (Sheet 2 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
ED-045	Emergent	0.40	0.16	Flood
ED-046	Emergent	0.11	0.04	Flood
ED-047	Emergent	0.24	0.10	Flood
ED-048	Emergent	0.98	0.40	Flood
ED-049	Emergent	1.04	0.42	Flood
ED-050	Emergent	1.35	0.55	Flood
ED-051	Emergent	0.08	0.03	Flood
ED-052	Emergent	2.31	0.93	Flood
ED-053	Emergent	4.96	2.01	Flood
ED-054	Emergent	0.78	0.32	Flood
ED-055	Emergent	0.66	0.27	Flood
ED-056	Emergent	0.16	0.06	Flood
ED-057	Emergent	0.37	0.15	Flood
ED-058	Emergent	3.13	1.27	Flood
ED-059	Emergent	0.22	0.09	Flood
ED-060	Emergent	0.88	0.36	Flood
ED-061	Emergent	0.06	0.02	Flood
ED-062	Emergent	1.63	0.66	Flood
ED-063	Emergent	0.28	0.11	Flood
ED-064	Emergent	0.04	0.02	Flood
ED-065	Emergent	0.59	0.24	Flood
ED-066	Emergent	3.13	1.27	Flood
ED-067	Emergent	0.40	0.16	Flood
ED-068	Emergent	0.99	0.40	Flood
ED-069	Emergent	0.54	0.22	Flood
ED-070	Emergent	0.41	0.17	Flood
ED-071	Emergent	0.36	0.15	Flood
ED-072	Emergent	0.22	0.09	Flood
ED-073	Emergent	0.01	0.00	Flood
ED-074	Emergent	0.52	0.21	Flood
ED-075	Emergent	37.50	15.18	Flood
ED-076	Emergent	111.94	45.30	Flood
ED-077	Emergent	4.35	1.76	Flood
ED-078	Emergent	0.12	0.05	Flood
ED-079	Emergent	1.74	0.70	Flood
ED-080	Emergent	1.17	0.47	Flood
ED-081	Emergent	0.24	0.10	Flood
ED-082	Emergent	0.08	0.03	Flood
ED-083	Emergent	0.01	0.00	Flood
ED-084	Emergent	0.26	0.11	Flood
ED-085	Emergent	0.09	0.04	Flood
ED-086	Emergent	0.09	0.04	Flood
ED-087	Emergent	0.03	0.01	Flood
ED-088	Emergent	0.06	0.02	Flood

Table 2.4-8 (Sheet 3 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
ED-089	Emergent	0.96	0.39	Flood
ED-090	Emergent	0.04	0.02	Flood
ED-091	Emergent	0.44	0.18	Flood
ED-092	Emergent	0.79	0.32	Flood
ED-093	Emergent	0.34	0.14	Flood
ED-094	Emergent	0.29	0.12	Flood
ED-095	Emergent	0.05	0.02	Flood
ED-096	Emergent	0.88	0.36	Flood
ED-097	Emergent	0.34	0.14	Flood
ED-098	Emergent	0.67	0.27	Flood
ED-099	Emergent	1.45	0.59	Flood
ED-100	Emergent	0.06	0.02	Flood
ED-101	Emergent	0.66	0.27	Flood
ED-102	Emergent	0.42	0.17	Flood
ED-103	Emergent	0.27	0.11	Flood
ED-104	Emergent	0.45	0.18	Flood
ED-105	Emergent	1.18	0.48	Flood
ED-106	Emergent	0.89	0.36	Flood
ED-107	Emergent	0.08	0.03	Flood
ED-108	Emergent	0.93	0.38	Flood
ED-109	Emergent	0.04	0.02	Flood
ED-110	Emergent	0.16	0.06	Flood
ED-111	Emergent	0.21	0.08	Flood
ED-112	Emergent	0.05	0.02	Flood
ED-113	Emergent	0.12	0.05	Flood
ED-114	Emergent	0.46	0.19	Flood
ED-115	Emergent	0.18	0.07	Flood
ED-116	Emergent	0.08	0.03	Flood
ED-117	Emergent	0.23	0.09	Flood
ED-118	Emergent	0.60	0.24	Flood
ED-119	Emergent	0.34	0.14	Flood
ED-120	Emergent	0.05	0.02	Flood
ED-121	Emergent	0.76	0.31	Flood
ED-122	Emergent	3.10	1.25	Flood
ED-123	Emergent	0.04	0.02	Flood
ED-124	Emergent	3.30	1.34	Flood
ED-125	Emergent	2.13	0.86	Flood
ED-126	Emergent	0.13	0.05	Flood
ED-127	Emergent	0.21	0.08	Flood
ED-128	Emergent	0.35	0.14	Flood
ED-129	Emergent	1.61	0.65	Flood
ED-130	Emergent	0.62	0.25	Flood
ED-131	Emergent	0.24	0.10	Flood
ED-132	Emergent	0.72	0.29	Flood

Table 2.4-8 (Sheet 4 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
ED-133	Emergent	0.20	0.08	Flood
ED-134	Emergent	0.09	0.04	Flood
ED-135	Emergent	0.05	0.02	Flood
ED-136	Emergent	0.10	0.04	Flood
ED-137	Emergent	0.10	0.04	Flood
ED-129	Emergent	1.61	0.65	Flood
ED-130	Emergent	0.62	0.25	Flood
ED-131	Emergent	0.24	0.10	Flood
ED-132	Emergent	0.72	0.29	Flood
ED-133	Emergent	0.20	0.08	Flood
ED-134	Emergent	0.09	0.04	Flood
ED-135	Emergent	0.05	0.02	Flood
ED-136	Emergent	0.10	0.04	Flood
ED-137	Emergent	0.10	0.04	Flood
ED-138	Emergent	0.16	0.06	Flood
ED-139	Emergent	0.03	0.01	Flood
ED-140	Emergent	0.76	0.31	Flood
ED-141	Emergent	0.06	0.02	Flood
ED-142	Emergent	0.01	0.00	Flood
ED-143	Emergent	0.13	0.05	Flood
ED-144	Emergent	0.02	0.01	Flood
ED-145	Emergent	0.11	0.04	Flood
ED-146	Emergent	0.02	0.01	Flood
ED-147	Emergent	0.01	0.00	Flood
ED-148	Emergent	0.04	0.02	Flood
ED-149	Emergent	0.07	0.03	Flood
ED-150	Emergent	0.08	0.03	Flood
ED-151	Emergent	0.06	0.02	Flood
ED-152	Emergent	0.07	0.03	Flood
ED-153	Emergent	0.04	0.02	Flood
ED-154-A	Emergent	0.10	0.04	Flood
ED-154-B	Emergent	0.01	0.00	Flood
ED-155	Emergent	0.27	0.11	Flood
ED-156	Emergent	0.24	0.10	Flood
ED-157	Emergent	0.06	0.02	Flood
ED-158	Emergent	0.31	0.13	Flood
ED-159	Emergent	0.20	0.08	Flood
ED-160	Emergent	0.23	0.09	Flood
ED-161	Emergent	0.34	0.14	Flood
ED-162	Emergent	0.23	0.09	Flood
ED-163	Emergent	0.27	0.11	Flood
ED-164	Emergent	0.02	0.01	Flood
ED-165	Emergent	0.14	0.06	Flood
ED-166	Emergent	0.01	0.00	Flood

Table 2.4-8 (Sheet 5 of 13) Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
ED-167	Emergent	0.39	0.16	Flood
ED-168	Emergent	0.05	0.02	Flood
ED-169	Emergent	0.14	0.06	Flood
ED-170	Emergent	0.23	0.09	Flood
ED-171	Emergent	0.23	0.09	Flood
ED-172	Emergent	0.04	0.02	Flood
ED-173	Emergent	0.06	0.02	Flood
ED-174	Emergent	0.12	0.05	Flood
ED-175	Emergent	0.13	0.05	Flood
ED-176	Emergent	0.02	0.01	Flood
ED-177	Emergent	0.31	0.13	Flood
ED-178	Emergent	0.04	0.02	Flood
ED-179	Emergent	0.22	0.09	Flood
ED-180	Emergent	0.14	0.06	Flood
ED-181	Emergent	0.15	0.06	Flood
ED-182	Emergent	0.05	0.02	Flood
ED-183	Emergent	0.10	0.04	Flood
ED-184	Emergent	0.07	0.03	Flood
ED-185	Emergent	0.16	0.06	Flood
ED-186	Emergent	0.06	0.02	Flood
ED-187	Emergent	0.06	0.02	Flood
ED-188	Emergent	0.31	0.13	Flood
ED-189	Emergent	0.06	0.02	Flood
ED-190	Emergent	0.15	0.06	Flood
ED-191	Emergent	0.03	0.01	Flood
ED-192	Emergent	0.02	0.01	Flood
ED-193	Emergent	1.38	0.56	Flood
ED-194	Emergent	0.21	0.08	Flood
ED-195	Emergent	0.06	0.02	Flood
ED-196	Emergent	0.00	0.00	Flood
ED-197	Emergent	0.29	0.12	Flood
ED-198	Emergent	0.29	0.12	Flood
ED-199	Emergent	4.73	1.91	Flood
ED-200	Emergent	0.11	0.04	Flood
ED-201	Emergent	15.31	6.20	Flood
ED-202	Emergent	23.24	9.40	Flood
ED-203	Emergent	0.01	0.00	Flood
ED-204	Emergent	0.04	0.02	Flood
ED-205	Emergent	0.45	0.18	Flood
ED-206	Emergent	0.18	0.07	Flood
ED-207	Emergent	0.02	0.01	Flood
ED-208	Emergent	0.18	0.07	Flood
ED-209	Emergent	0.27	0.11	Flood
ED-210	Emergent	0.23	0.09	Flood

Table 2.4-8 (Sheet 6 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
ED-211	Emergent	0.17	0.07	Flood
ED-212	Emergent	0.02	0.01	Flood
ED-213	Emergent	0.27	0.11	Flood
ED-214	Emergent	0.01	0.00	Flood
ED-215	Emergent	0.07	0.03	Flood
ED-216	Emergent	0.05	0.02	Flood
ED-217	Emergent	0.44	0.18	Flood
ED-218	Emergent	0.21	0.08	Flood
ED-219	Emergent	0.18	0.07	Flood
ED-220	Emergent	0.12	0.05	Flood
ED-221	Emergent	0.17	0.07	Flood
ED-222	Emergent	0.10	0.04	Flood
ED-223	Emergent	0.03	0.01	Flood
ED-224	Emergent	0.03	0.01	Flood
ED-225	Emergent	0.03	0.01	Flood
ED-226	Emergent	0.10	0.04	Flood
ED-227	Emergent	0.64	0.26	Flood
ED-228	Emergent	0.16	0.06	Flood
ED-229	Emergent	0.24	0.10	Flood
ED-230	Emergent	0.03	0.01	Flood
ED-231	Emergent	0.05	0.02	Flood
ED-232	Emergent	0.18	0.07	Flood
ED-233	Emergent	0.20	0.08	Flood
ED-234	Emergent	0.48	0.19	Flood
ED-235	Emergent	0.22	0.09	Flood
ED-236	Emergent	0.23	0.09	Flood
ED-237	Emergent	0.58	0.23	Flood
ED-238	Emergent	0.29	0.12	Flood
ED-239	Emergent	0.96	0.39	Flood
ED-240	Emergent	0.64	0.26	Flood
ED-241	Emergent	0.09	0.04	Flood
ED-242	Emergent	0.34	0.14	Flood
ED-243	Emergent	1.91	0.77	Flood
ED-244	Emergent	0.22	0.09	Flood
ED-245	Emergent	0.94	0.38	Flood
ED-246	Emergent	0.43	0.17	Flood
ED-247	Emergent	4.48	1.81	Flood
ED-248	Emergent	0.20	0.08	Flood
ED-249	Emergent	1.55	0.63	Flood
ED-250	Emergent	0.62	0.25	Flood
ED-251	Emergent	0.58	0.23	Flood
ED-252	Emergent	0.10	0.04	Flood
ED-253	Emergent	0.66	0.27	Flood
ED-254	Emergent	0.44	0.18	Flood

Table 2.4-8 (Sheet 7 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
ED-255	Emergent	0.04	0.02	Flood
ED-256	Emergent	0.50	0.20	Flood
ED-257	Emergent	0.05	0.02	Flood
ED-258	Emergent	0.03	0.01	Flood
ED-259	Emergent	0.06	0.02	Flood
ED-260	Emergent	0.14	0.06	Flood
ED-261	Emergent	2.40	0.97	Flood
ED-262	Emergent	0.87	0.35	Flood
ED-263	Emergent	0.15	0.06	Flood
ED-264	Emergent	0.12	0.05	Flood
ED-265	Emergent	0.77	0.31	Flood
ED-266	Emergent	0.09	0.04	Flood
ED-267	Emergent	0.37	0.15	Flood
ED-268	Emergent	4.37	1.77	Flood
ED-269	Emergent	0.17	0.07	Flood
ED-270	Emergent	0.44	0.18	Flood
ED-271	Emergent	3.04	1.23	Flood
ED-272	Emergent	4.49	1.82	Flood
ED-273	Emergent	2.51	1.02	Flood
ED-274	Emergent	4.36	1.76	Flood
ED-275	Emergent	3.16	1.28	Flood
ED-276	Emergent	2.24	0.91	Flood
ED-277	Emergent	1.52	0.62	Flood
ED-278	Emergent	1.38	0.56	Flood
ED-279	Emergent	1.14	0.46	Flood
FD-001	Vegetated Fringe	0.20	0.08	Flood
FD-002	Vegetated Fringe	0.11	0.04	Flood
FD-003	Vegetated Fringe	0.11	0.04	Flood
FD-004	Vegetated Fringe	0.12	0.05	Flood
FD-005	Vegetated Fringe	0.02	0.01	Flood
FD-006	Vegetated Fringe	0.02	0.01	Flood
FD-007	Vegetated Fringe	0.05	0.02	Flood
FD-008	Vegetated Fringe	0.01	0.00	Flood
FD-009	Vegetated Fringe	0.63	0.25	Flood
FD-010	Vegetated Fringe	0.02	0.01	Flood
FD-011	Vegetated Fringe	0.02	0.01	Flood
FD-012	Vegetated Fringe	0.04	0.02	Flood
FD-013	Vegetated Fringe	0.01	0.00	Flood
FD-014	Vegetated Fringe	0.01	0.00	Flood
FD-015	Vegetated Fringe	0.01	0.00	Flood
FD-016	Vegetated Fringe	0.10	0.04	Flood
FD-018	Vegetated Fringe	0.08	0.03	Flood
FD-019	Vegetated Fringe	0.03	0.01	Flood
FD-020	Vegetated Fringe	0.10	0.04	Flood

Table 2.4-8 (Sheet 8 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
FD-021	Vegetated Fringe	0.06	0.02	Flood
FD-023	Vegetated Fringe	0.08	0.03	Flood
FD-024	Vegetated Fringe	0.02	0.01	Flood
FD-025	Vegetated Fringe	0.01	0.00	Flood
FD-026	Vegetated Fringe	0.05	0.02	Flood
FD-027	Vegetated Fringe	0.03	0.01	Flood
FD-028	Vegetated Fringe	0.04	0.02	Flood
FD-029	Vegetated Fringe	0.49	0.20	Flood
FD-030	Vegetated Fringe	0.11	0.04	Flood
FD-031	Vegetated Fringe	0.61	0.25	Flood
FD-032	Vegetated Fringe	0.05	0.02	Flood
FD-033	Vegetated Fringe	0.75	0.30	Flood
FD-034	Vegetated Fringe	0.56	0.23	Flood
FD-035	Vegetated Fringe	0.67	0.27	Flood
FD-036	Vegetated Fringe	0.01	0.00	Flood
FD-037	Vegetated Fringe	0.01	0.00	Flood
FD-038	Vegetated Fringe	0.11	0.04	Flood
FD-039	Vegetated Fringe	0.47	0.19	Flood
FD-040	Vegetated Fringe	0.17	0.07	Flood
FD-041	Vegetated Fringe	0.01	0.00	Flood
FD-042	Vegetated Fringe	0.44	0.18	Flood
FD-043	Vegetated Fringe	0.02	0.01	Flood
FD-044	Vegetated Fringe	0.03	0.01	Flood
FD-045	Vegetated Fringe	0.23	0.09	Flood
FD-046	Vegetated Fringe	0.06	0.02	Flood
FD-047	Vegetated Fringe	0.14	0.06	Flood
FD-048	Vegetated Fringe	0.23	0.09	Flood
FD-049-1	Vegetated Fringe	0.36	0.15	Flood
FD-049-2	Vegetated Fringe	0.10	0.04	Flood
FD-050	Vegetated Fringe	0.32	0.13	Flood
FD-051	Vegetated Fringe	0.04	0.02	Flood
FD-052	Vegetated Fringe	0.65	0.26	Flood
FD-053	Vegetated Fringe	2.16	0.87	Flood
FD-054	Vegetated Fringe	0.26	0.11	Flood
FD-055	Vegetated Fringe	0.36	0.15	Flood
FD-056	Vegetated Fringe	0.10	0.04	Flood
FD-057	Vegetated Fringe	0.27	0.11	Flood
FD-058	Vegetated Fringe	0.06	0.02	Flood
FD-059	Vegetated Fringe	0.07	0.03	Flood
FD-060	Vegetated Fringe	0.43	0.17	Flood
FD-062	Vegetated Fringe	0.61	0.25	Flood
FD-063	Vegetated Fringe	0.14	0.06	Flood
FD-064	Vegetated Fringe	0.03	0.01	Flood
FD-065	Vegetated Fringe	0.13	0.05	Flood

Table 2.4-8 (Sheet 9 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
FD-066	Vegetated Fringe	0.94	0.38	Flood
FD-067	Vegetated Fringe	0.13	0.05	Flood
FD-068	Vegetated Fringe	0.18	0.07	Flood
FD-069	Vegetated Fringe	0.11	0.04	Flood
FD-070	Vegetated Fringe	0.09	0.04	Flood
FD-071	Vegetated Fringe	0.16	0.06	Flood
FD-072	Vegetated Fringe	0.09	0.04	Flood
FD-074	Vegetated Fringe	0.12	0.05	Flood
FD-075-1	Vegetated Fringe	1.04	0.42	Flood
FD-075-2	Vegetated Fringe	0.05	0.02	Flood
FD-075-3	Vegetated Fringe	0.12	0.05	Flood
FD-075-4	Vegetated Fringe	0.39	0.16	Flood
FD-076-1	Vegetated Fringe	4.04	1.63	Flood
FD-076-2	Vegetated Fringe	5.15	2.08	Flood
FD-077	Vegetated Fringe	0.62	0.25	Flood
FD-079-1	Vegetated Fringe	0.03	0.01	Flood
FD-079-2	Vegetated Fringe	0.01	0.00	Flood
FD-079-3	Vegetated Fringe	0.24	0.10	Flood
FD-080	Vegetated Fringe	0.23	0.09	Flood
FD-081	Vegetated Fringe	0.13	0.05	Flood
FD-084	Vegetated Fringe	0.15	0.06	Flood
FD-089	Vegetated Fringe	0.46	0.19	Flood
FD-091	Vegetated Fringe	0.10	0.04	Flood
FD-092	Vegetated Fringe	0.44	0.18	Flood
FD-093	Vegetated Fringe	0.07	0.03	Flood
FD-094	Vegetated Fringe	0.16	0.06	Flood
FD-095	Vegetated Fringe	0.02	0.01	Flood
FD-096	Vegetated Fringe	0.16	0.06	Flood
FD-097	Vegetated Fringe	0.08	0.03	Flood
FD-099	Vegetated Fringe	0.67	0.27	Flood
FD-100	Vegetated Fringe	0.03	0.01	Flood
FD-101	Vegetated Fringe	0.20	0.08	Flood
FD-102	Vegetated Fringe	0.15	0.06	Flood
FD-103	Vegetated Fringe	0.14	0.06	Flood
FD-104	Vegetated Fringe	0.06	0.02	Flood
FD-105	Vegetated Fringe	0.32	0.13	Flood
FD-106	Vegetated Fringe	0.19	0.08	Flood
FD-107	Vegetated Fringe	0.07	0.03	Flood
FD-108	Vegetated Fringe	0.16	0.06	Flood
FD-110	Vegetated Fringe	0.04	0.02	Flood
FD-113	Vegetated Fringe	0.02	0.01	Flood
FD-114	Vegetated Fringe	0.13	0.05	Flood
FD-115	Vegetated Fringe	0.04	0.02	Flood
FD-116	Vegetated Fringe	0.03	0.01	Flood

Table 2.4-8 (Sheet 10 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
FD-117	Vegetated Fringe	0.09	0.04	Flood
FD-118-1	Vegetated Fringe	0.04	0.02	Flood
FD-118-2	Vegetated Fringe	0.03	0.01	Flood
FD-119	Vegetated Fringe	0.13	0.05	Flood
FD-120	Vegetated Fringe	0.02	0.01	Flood
FD-121	Vegetated Fringe	0.19	0.08	Flood
FD-122-1	Vegetated Fringe	0.68	0.28	Flood
FD-122-2	Vegetated Fringe	0.19	0.08	Flood
FD-123	Vegetated Fringe	0.05	0.02	Flood
FD-124-1	Vegetated Fringe	0.36	0.15	Flood
FD-124-2	Vegetated Fringe	0.18	0.07	Flood
FD-124-3	Vegetated Fringe	0.02	0.01	Flood
FD-125	Vegetated Fringe	0.43	0.17	Flood
FD-128	Vegetated Fringe	0.05	0.02	Flood
FD-129	Vegetated Fringe	0.39	0.16	Flood
FD-130	Vegetated Fringe	0.19	0.08	Flood
FD-131	Vegetated Fringe	0.05	0.02	Flood
FD-132	Vegetated Fringe	0.15	0.06	Flood
FD-133	Vegetated Fringe	0.05	0.02	Flood
FD-134	Vegetated Fringe	0.06	0.02	Flood
FD-136	Vegetated Fringe	0.05	0.02	Flood
FD-137	Vegetated Fringe	0.03	0.01	Flood
FD-138	Vegetated Fringe	0.07	0.03	Flood
FD-139	Vegetated Fringe	0.03	0.01	Flood
FD-140	Vegetated Fringe	0.11	0.04	Flood
FD-143	Vegetated Fringe	0.10	0.04	Flood
FD-144	Vegetated Fringe	0.00	0.00	Flood
FD-145	Vegetated Fringe	0.03	0.01	Flood
FD-148	Vegetated Fringe	0.05	0.02	Flood
FD-155	Vegetated Fringe	0.12	0.05	Flood
FD-156	Vegetated Fringe	0.14	0.06	Flood
FD-158	Vegetated Fringe	0.10	0.04	Flood
FD-159	Vegetated Fringe	0.06	0.02	Flood
FD-160	Vegetated Fringe	0.14	0.06	Flood
FD-161	Vegetated Fringe	0.09	0.04	Flood
FD-162	Vegetated Fringe	0.12	0.05	Flood
FD-163	Vegetated Fringe	0.10	0.04	Flood
FD-165	Vegetated Fringe	0.05	0.02	Flood
FD-167	Vegetated Fringe	0.14	0.06	Flood
FD-168	Vegetated Fringe	0.02	0.01	Flood
FD-169	Vegetated Fringe	0.03	0.01	Flood
FD-170	Vegetated Fringe	0.08	0.03	Flood
FD-174	Vegetated Fringe	0.06	0.02	Flood
FD-175	Vegetated Fringe	0.11	0.04	Flood

Table 2.4-8 (Sheet 11 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
FD-176	Vegetated Fringe	0.02	0.01	Flood
FD-177	Vegetated Fringe	0.22	0.09	Flood
FD-178	Vegetated Fringe	0.03	0.01	Flood
FD-179	Vegetated Fringe	0.11	0.04	Flood
FD-180	Vegetated Fringe	0.03	0.01	Flood
FD-181	Vegetated Fringe	0.07	0.03	Flood
FD-182	Vegetated Fringe	0.07	0.03	Flood
FD-183	Vegetated Fringe	0.06	0.02	Flood
FD-184	Vegetated Fringe	0.01	0.00	Flood
FD-185	Vegetated Fringe	0.06	0.02	Flood
FD-186	Vegetated Fringe	0.02	0.01	Flood
FD-187	Vegetated Fringe	0.03	0.01	Flood
FD-187-A	Vegetated Fringe	0.00	0.00	Flood
FD-188	Vegetated Fringe	0.05	0.02	Flood
FD-189	Vegetated Fringe	0.08	0.03	Flood
FD-193	Vegetated Fringe	0.46	0.19	Flood
FD-199	Vegetated Fringe	0.72	0.29	Flood
FD-200	Vegetated Fringe	0.07	0.03	Flood
FD-201-1	Vegetated Fringe	1.38	0.56	Flood
FD-201-2	Vegetated Fringe	0.38	0.15	Flood
FD-202-1	Vegetated Fringe	2.97	1.20	Flood
FD-202-2	Vegetated Fringe	1.42	0.57	Flood
FD-203	Vegetated Fringe	0.00	0.00	Flood
FD-204	Vegetated Fringe	0.02	0.01	Flood
FD-205-1	Vegetated Fringe	0.11	0.04	Flood
FD-205-2	Vegetated Fringe	0.04	0.02	Flood
FD-206	Vegetated Fringe	0.08	0.03	Flood
FD-207	Vegetated Fringe	0.01	0.00	Flood
FD-208	Vegetated Fringe	0.07	0.03	Flood
FD-210	Vegetated Fringe	0.05	0.02	Flood
FD-211	Vegetated Fringe	0.07	0.03	Flood
FD-217	Vegetated Fringe	0.29	0.12	Flood
FD-220	Vegetated Fringe	0.12	0.05	Flood
FD-221	Vegetated Fringe	0.20	0.08	Flood
FD-222	Vegetated Fringe	0.04	0.02	Flood
FD-225	Vegetated Fringe	0.02	0.01	Flood
FD-226-1	Vegetated Fringe	0.01	0.00	Flood
FD-226-2	Vegetated Fringe	0.03	0.01	Flood
FD-227	Vegetated Fringe	0.18	0.07	Flood
FD-228	Vegetated Fringe	0.12	0.05	Flood
FD-229	Vegetated Fringe	0.19	0.08	Flood
FD-231	Vegetated Fringe	0.01	0.00	Flood
FD-233	Vegetated Fringe	0.06	0.02	Flood
FD-234	Vegetated Fringe	0.13	0.05	Flood

Table 2.4-8 (Sheet 12 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
FD-235	Vegetated Fringe	0.14	0.06	Flood
FD-236	Vegetated Fringe	0.09	0.04	Flood
FD-237	Vegetated Fringe	0.38	0.15	Flood
FD-239	Vegetated Fringe	0.21	0.08	Flood
FD-240	Vegetated Fringe	0.34	0.14	Flood
FD-241	Vegetated Fringe	0.03	0.01	Flood
FD-242	Vegetated Fringe	0.13	0.05	Flood
FD-243	Vegetated Fringe	0.55	0.22	Flood
FD-245	Vegetated Fringe	0.35	0.14	Flood
FD-247	Vegetated Fringe	1.65	0.67	Flood
FD-249	Vegetated Fringe	0.68	0.28	Flood
FD-250	Vegetated Fringe	0.29	0.12	Flood
FD-251	Vegetated Fringe	0.23	0.09	Flood
FD-252	Vegetated Fringe	0.08	0.03	Flood
FD-253	Vegetated Fringe	0.27	0.11	Flood
FD-254	Vegetated Fringe	0.20	0.08	Flood
FD-256	Vegetated Fringe	0.32	0.13	Flood
FD-260	Vegetated Fringe	0.07	0.03	Flood
FD-261	Vegetated Fringe	0.77	0.31	Flood
FD-262	Vegetated Fringe	0.29	0.12	Flood
FD-265	Vegetated Fringe	0.38	0.15	Flood
FD-268	Vegetated Fringe	1.87	0.76	Flood
FD-269	Vegetated Fringe	0.06	0.02	Flood
FD-270	Vegetated Fringe	0.19	0.08	Flood
FD-271	Vegetated Fringe	0.80	0.32	Flood
FD-272	Vegetated Fringe	1.25	0.51	Flood
FD-273	Vegetated Fringe	0.26	0.11	Flood
FD-274	Vegetated Fringe	0.90	0.36	Flood
FD-275	Vegetated Fringe	1.00	0.40	Flood
FD-276	Vegetated Fringe	0.58	0.23	Flood
FD-277	Vegetated Fringe	0.34	0.14	Flood
FD-278	Vegetated Fringe	0.49	0.20	Flood
FD-279	Vegetated Fringe	0.45	0.18	Flood
FD-280	Vegetated Fringe	0.05	0.02	Flood
FD-281	Vegetated Fringe	0.03	0.01	Flood
FD-282	Vegetated Fringe	0.05	0.02	Flood
FD-283	Vegetated Fringe	1.21	0.49	Flood
FD-284	Vegetated Fringe	0.29	0.12	Flood
FD-285	Vegetated Fringe	0.31	0.13	Flood
PA-001	Open Water	2.82	1.14	Fill
PA-002	Open Water	2.17	0.88	Fill
PB-003	Open Water	0.27	0.11	Flood
PB-004	Open Water	1.01	0.41	Flood
PB-005	Open Water	1.72	0.70	Flood

Table 2.4-8 (Sheet 13 of 13)
Aquatic Jurisdictional Wetlands Affected by Proposed HAR

Wetland Name	Wetland Type[a]	Acreage	Hectares[b]	Impact Type
PB-007	Open Water	0.62	0.25	Flood
PC-001	Open Water	1.57	0.64	Flood
PC-002	Open Water	1.33	0.54	Flood
PC-003	Open Water	1.53	0.62	Flood
PC-004	Open Water	1.11	0.45	Flood
PC-007	Open Water	0.19	0.08	Flood
PE-001	Open Water	0.28	0.11	Flood
PE-002	Open Water	0.12	0.05	Flood
Total	Emergent	340.5	137.8	
Total	Vegetated Fringe	63.9	25.7	
Total	Open Water	14.7	6.0	

Notes:
a) Determined by wetland delineations

b) Field measurements were conducted in acres; hectares are approximated.

Source: Reference 2.4-040

Table 2.4-9 (Sheet 1 of 2) Intermittent Streams between the 67- and 73.2-meter (220- and 240-foot) Mean Sea Level Contours

Stream Number	Length (Feet)	Length (Meters)	Impact Type	Stream Number	Length (Feet)	Length (Meters)	Impact Type
SA-001	1085.6	330.9	Flood/Fill	SD-017	666.2	203.1	Flood
SA-002-1	330.9	100.9	Flood/Fill	SD-018	804.7	245.3	Flood
SA-002-2	333.7	101.7	Flood/Fill	SD-019	429.6	130.9	Flood
SB-005	193.2	58.9	Flood	SD-020	693.0	211.2	Flood
SB-006	633.2	193.0	Flood	SD-021	537.4	163.8	Flood
SB-007	586.5	178.8	Flood	SD-022	323.1	98.5	Flood
SB-009	1016.7	309.9	Flood	SD-026-1	755.5	230.3	Flood
SB-010-1	1801.3	549.0	Flood	SD-027	145.6	44.4	Flood
SB-010-2	886.5	270.2	Flood	SD-029	33.2	10.1	Flood
SB-013-1	374.9	114.3	Flood	SD-030	612.0	186.5	Flood
SB-013-2	867.3	264.4	Flood	SD-031	1117.5	340.6	Flood
SB-014	467.5	142.5	Flood	SD-032	611.8	186.5	Flood
SB-015	397.9	121.3	Flood	SD-033	974.2	296.9	Flood
SB-016	415.2	126.6	Flood	SD-034-1	240.2	73.2	Flood
SB-017	589.6	179.7	Flood	SD-034-2	61.4	18.7	Flood
SB-018	610.7	186.1	Flood	SD-035-1	88.6	27.0	Flood
SB-022-2	1061.8	323.6	Flood	SD-035-2	213.0	64.9	Flood
SB-022-3	54.7	16.7	Flood	SD-036-2	107.3	32.7	Flood
SB-024	1080.8	329.4	Flood	SD-037-1	450.6	137.3	Flood
SB-030	778.0	237.1	Flood	SD-037-2	469.7	143.2	Flood
SB-031	381.6	116.3	Flood	SD-038	424.0	129.2	Flood
SB-033	322.8	98.4	Flood	SD-040	614.0	187.1	Flood
SB-037	544.0	165.8	Flood	SD-042	678.7	206.9	Flood
SB-038-2	182.2	55.5	Flood	SD-043	479.1	146.0	Flood
SB-038-3	140.6	42.9	Flood	SD-044	229.6	70.0	Flood
SB-039-2	113.8	34.7	Flood	SD-045	830.7	253.2	Flood
SB-040-1	322.6	98.3	Flood	SD-046-1	304.8	92.9	Flood
SB-040-2	101.7	31.0	Flood	SD-046-2	169.7	51.7	Flood
SB-041	518.2	157.9	Flood	SD-047	283.5	86.4	Flood
SB-046	428.9	130.7	Flood	SD-049-1	473.9	144.4	Flood
SB-049	333.7	101.7	Flood	SD-049-2	41.5	12.6	Flood
SB-050	441.5	134.6	Flood	SD-049-3	55.6	16.9	Flood
SC-001	485.8	148.1	Fill	SD-050	1834.5	559.2	Flood
SC-004	524.8	160.0	Fill	SD-051	175.8	53.6	Flood
SC-006	319.5	97.4	Flood	SD-052-1	382.8	116.7	Flood
SC-008	1772.9	540.4	Flood	SD-052-2	40.3	12.3	Flood

Table 2.4-9 (Sheet 2 of 2) Intermittent Streams between the 67- and 73.2-meter (220- and 240-foot) Mean Sea Level Contours

Stream Number	Length (Feet)	Length (Meters)	Impact Type	Stream Number	Length (Feet)	Length (Meters)	Impact Type
SC-009	1053.7	321.2	Flood	SD-054-1	91.9	28.0	Flood
SC-010	1254.8	382.5	Flood	SD-054-2	344.5	105.0	Flood
SC-012	577.8	176.1	Flood	SD-056	633.4	193.1	Flood
SC-013	865.2	263.7	Flood	SD-057	636.2	193.9	Flood
SC-017	183.3	55.9	Flood	SD-058	746.6	227.6	Flood
SC-018	260.2	79.3	Flood	SE-001	458.3	139.7	Fill
SC-019-2	198.3	60.4	Flood	SE-002	211.4	64.4	Flood
SC-019-3	897.4	273.5	Flood	SE-007-1	130.8	39.9	Flood
SC-022	70.9	21.6	Flood	SE-007-2	65.1	19.8	Flood
SC-024	474.9	144.7	Flood	SE-007-3	29.7	9.1	Flood
SC-027	1182.3	360.4	Flood	SE-010	149.3	45.5	Flood
SC-029	436.4	133.0	Flood	SE-011	597.5	182.1	Flood
SC-030	491.7	149.9	Flood	SE-012	522.2	159.2	Flood
SC-032	369.1	112.5	Flood	SE-013	242.5	73.9	Flood
SC-034	112.3	34.2	Flood	SE-014	315.3	96.1	Flood
SC-036	597.9	182.2	Flood	SE-015	117.4	35.8	Flood
SC-038	539.2	164.3	Flood	SE-034	217.1	66.2	Flood
SC-039	869.9	265.1	Flood	SE-035-2	130.0	39.6	Flood
SC-040	622.1	189.6	Flood	SE-036	317.8	96.9	Flood
SC-041-2	274.7	83.7	Flood	SE-037	166.5	50.7	Flood
SC-043	193.8	59.1	Flood	SE-038-2	714.4	217.7	Flood
SD-001	131.7	40.1	Fill	SE-038-3	34.4	10.5	Flood
SD-002	149.2	45.5	Fill	SE-039	177.5	54.1	Flood
SD-006	259.1	79.0	Flood	SE-040	348.9	106.3	Flood
SD-007-1	165.1	50.3	Flood	SE-041	460.8	140.5	Flood
SD-007-2	395.3	120.5	Flood	SE-042	661.7	201.7	Flood
SD-009	125.7	38.3	Flood	SE-043	353.9	107.9	Flood
SD-010	141.7	43.2	Flood	SE-044	488.0	148.7	Flood
SD-011	27.9	8.5	Flood	SE-045	382.2	116.5	Flood
SD-012	450.0	137.2	Flood	SE-047-1	160.9	49.0	Flood
SD-015	724.0	220.7	Flood	SE-047-2	136.5	41.6	Flood
SD-016	350.6	106.9	Flood	**Total**	**61342.6**	**18697.0**	

Source: Reference 2.4-040

Table 2.4-10
Perennial Streams between the 67- and 73.2-meter (220- and 240-foot) Mean Sea Level Contours

Stream Number	Length (Feet)	Length (Meters)	Impact Type	Stream Number	Length (Feet)	Length (Meters)	Impact Type
SB-004	511.0	155.8	Flood/Fill	SC-015	1242.8	378.8	Flood
SB-008	2981.8	908.9	Flood	SC-016-1	2860.5	871.9	Flood
SB-011-1	49.8	15.2	Flood	SC-016-2	127.0	38.7	Flood
SB-011-2	126.6	38.6	Flood	SC-019-1	348.7	106.3	Flood
SB-011-3	3000.7	914.6	Flood	SC-020	11182.4	3408.4	Flood
SB-011-4	2865.9	873.5	Flood	SC-021	3148.4	959.6	Flood
SB-012	627.9	191.4	Flood	SC-023	21.5	6.6	Flood
SB-020	4075.8	1242.3	Flood	SC-025	1703.4	519.2	Flood
SB-021	2831.6	863.1	Flood	SC-025-2	3930.1	1197.9	Flood
SB-022-1	939.7	286.4	Flood	SC-026	1027.8	313.3	Flood
SB-023	2910.4	887.1	Flood	SC-028	717.3	218.6	Flood
SB-025	2765.1	842.8	Flood	SC-031	1264.2	385.3	Flood
SB-026	4796.3	1461.9	Flood	SC-033	700.2	213.4	Flood
SB-027	611.2	186.3	Flood	SC-035-1	159.3	48.6	Flood
SB-028	531.2	161.9	Flood	SC-035-2	49.7	15.1	Flood
SB-029	306.2	93.3	Flood	SC-037-1	229.9	70.1	Flood
SB-032	3667.3	1117.8	Flood	SC-037-2	59.5	18.1	Flood
SB-038-1	336.4	102.5	Flood	SC-041-1	135.1	41.2	Flood
SB-039-1	1464.8	446.5	Flood	SC-042	919.3	280.2	Flood
SB-042	225.2	68.6	Flood	SD-003-1	374.6	114.2	Fill
SB-043	807.9	246.2	Flood	SD-003-2	35.8	10.9	Fill
SB-044	244.2	74.4	Flood	SD-003-3	76.1	23.2	Fill
SB-045	292.6	89.2	Flood	SD-004	84.2	25.7	Fill
SB-047	493.2	150.3	Flood	SD-028	1027.7	313.2	Flood
SB-048	399.5	121.8	Flood	SD-036-1	1251.5	381.5	Flood
SC-002	2340.1	713.3	Flood/Fill	SE-032	215.7	65.7	Flood
SC-003	594.7	181.3	Fill	SE-005	144.3	44.0	Flood
SC-005	2242.7	683.6	Flood	SE-035-1	205.7	62.7	Flood
SC-007-1	2297.5	700.3	Flood	SE-038-1	582.9	177.7	Flood
SC-007-2	1083.2	330.2	Flood	SE-046	264.9	80.7	Flood
SC-011	6535.8	1992.1	Flood	Total	**87690.3**	**26728.1**	
SC-014	643.5	196.1	Flood				

Source: Reference 2.4-040

Table 2.4-11
Fish Species Found in Greatest Abundance on Cape Fear River Tributaries

Species	Common Name	Total
Nocomis leptocephalus	Bluehead Chub (carps)	776
Lepomis macrochirus	Bluegill (sunfish)	722
Lepomis auritus	Redbreast Sunfish	567
Luxilus albeolus	White Shiner	533
Etheostoma olmstedi	Tessellated Darter	305
Notropis altipinnis	Highfin Shiner	301
Aphredoderus sayanus	Prate Perch	130
Smolitilus atromaculatus	Cheek chub	120
Noturus insignis	Margined madtom	119
Anguilla rostrata	American Eel	109

Source: Reference 2.4-036

Table 2.4-12
Streams Crossed by Makeup Water Line from Cape Fear River

Stream Number	**Stream Type**	**Length (Feet)**	**Length (Meters)**	**Impact Type**
SB-034-1	Perennial	1612.5	491.5	Makeup Water Line
SB-034-2	Perennial	375.1	114.3	Makeup Water Line
SB-034-3	Perennial	160.0	48.8	Makeup Water Line
SB-035-1	Perennial	116.4	35.5	Makeup Water Line
SB-035-2	Intermittent	104.3	31.8	Makeup Water Line
SB-036	Perennial	217.6	66.3	Makeup Water Line
SE-030	Perennial	372.3	113.5	Makeup Water Line
SE-031	Intermittent	174.3	53.1	Makeup Water Line
Total	Intermittent	**278.6**	**84.9**	
Total	Perennial	**2853.9**	**869.9**	

Source: Reference 2.4-040

2.5 SOCIOECONOMICS

This section follows the content and organization of the Standard Review Plans for Environmental Reviews for Nuclear Power Plants, also known as NUREG-1555, "U.S. Nuclear Regulatory Commission (NRC) Environmental Standard Review Standard." NUREG-1555 is designed to meet the requirements of 10 Code of Federal Regulations (CFR) 51. This section was prepared in accordance with NUREG-1555 and is organized into the following subsections:

- Demographics (Subsection 2.5.1)
- Community Characteristics (Subsection 2.5.2)
- Historic Properties (Subsection 2.5.3)
- Environmental Justice (Subsection 2.5.4)

2.5.1 DEMOGRAPHICS

This subsection discusses population within the vicinity and region, projected populations for the vicinity and region, transient and migratory population, and demographic characteristics, which include sex, race, age, and income. Data on population were gathered using U.S. Census Bureau 2000 data (Reference 2.5-001). Projected population was determined based upon projection data provided by the North Carolina State Data Center (SDC), Data Services Unit, Office of the State Budget and Management website entitled North Carolina State Demographics, Website (Reference 2.5-002).

2.5.1.1 Population within 16 km (10 mi.)

Based on the 2000 U.S. Census, the total residential population within 16 kilometers (km) (10 miles [mi.]) of the existing Shearon Harris Nuclear Power Plant Unit 1 (HNP) site is 55,219 persons, as shown in Table 2.5-1. The significant population groupings (for example, cities and towns) within 16 km (10 mi.) of the HNP site are shown in Figure 2.5-1, which also shows a sector chart divided into radii for 0 to 16 km (0 to 10 mi.). The sector chart was used in determining population distribution as described in the following subsections. The current proposed plan includes the installation of two AP1000 units. The center of the distance between the two reactor buildings was assumed to be the centerpoint for the radii and sector grid. The radii were expanded by half of the distance between the two reactor buildings for the proposed Shearon Harris Nuclear Power Plant Units 2 and 3 (HAR). The two proposed reactor buildings are centered at the following coordinates:

Proposed Shearon Harris Nuclear Power Plant Unit 2 (HAR 2)
Latitude: 35° 38' 15.39" Longitude: -78° 57' 29.84"

Proposed Shearon Harris Nuclear Power Plant Unit 3 (HAR 3)
Latitude: 35° 38’ 23.90” Longitude: -78° 57’ 34.71”

The HAR exclusion area boundary (EAB) is defined as two overlapping areas centered on the reactor building of each unit. The areas are defined by a circular distance of 1600 meters (m) (5249 feet [ft.]) in the southerly sectors (east-southeast through west-southwest) and 1245 m (4085 ft.) in the east, west, and northerly sectors (west through east). The overall shape of the HAR EAB is defined by the outermost boundary of each unit’s area. The HAR site is located within a much larger tract of land that includes the HNP EAB, the Harris Reservoir, and some surrounding lands. The minimum distance in any direction from the centerpoint of the HAR site to the outermost boundary of the HAR EAB ranges from approximately 1247 to 1749 m (4090 to 5738 ft.).

The distance between the centerpoint of the reactor buildings for HAR 2 and HAR 3 is 289 m (950 ft.). Half of this distance, or 144 m (475 ft.), was used to extend the radii in the grid sectors. To account for the difference in distance between each proposed unit and the HAR centerpoint, 0.16 km (0.1 mi.) was added to each radial distance to conservatively adjust the population data.

Residential population distribution within the sectors, shown on Figure 2.5-1, has been summarized and provided in Table 2.5-1. The table indicates that a majority of the population lives in the east-southeast to north-northeast sectors, 8 to 16 km (5 to 10 mi.) from the HAR site. The eastern sectors include the City of Apex (population 20,212) located 13 km (8 mi.) northeast, and the towns of Holly Springs (population 9192) located 13 km (8 mi.) east, and Fuquay-Varina (population 7898) located 13 km (8 mi.) east of the HAR (Reference 2.5-003). The U.S. Census Bureau data from the 2000 U.S. Census, in addition to a Geographic Information System (GIS), were used to determine the sector population distribution. Populations were calculated using census blocks, the smallest unit of data collected by the U.S. Census Bureau. Approximately 33 census blocks were within the 16-km (10-mi.) radius of the HAR site. For population calculations, the census population data were assumed to be evenly distributed throughout a census block. Using this assumption, the GIS was used to determine the percent area of a census block contained in a particular sector. The percent area of the census block was then used to calculate the portion of the census block population within that sector. For example, if a sector contained 50 percent of a census block, the sector was assumed to also contain 50 percent of the census block population.

Population projections for 10-year increments up to 80 years from the latest U.S. Census are included in Table 2.5-2. Projection information was collected from the North Carolina State Demographics unit website for county projections. The population projections are based on the expected population percent change rates (percent change) between 2000 and 2010, 2010 and 2020, and 2020 and 2030 (Reference 2.5-004). The percent change was estimated for each county, and the expected population change rate for the 10-year increments between 2020 and 2080 were assumed to be similar to the estimated percent change between 2010 and 2020. The county percent change rates were then used to project populations using the U.S. Census Bureau data for each census block within the county. Population projections for each sector were calculated using the same method described above, assuming even distribution throughout the census block.

2.5.1.2 Population between 16 and 80 km (10 and 50 mi.)

Based on the 2000 U.S. Census, the total residential population between 16 km (10 mi.) and 80 km (50 mi.) of the HAR site is 1,973,427 persons, as shown in Table 2.5-3. The significant population groupings (for example, cities and towns) within the region (80 km [50 mi.]) are shown in Figure 2.5-2, which also shows a sector chart divided into radii for 16 to 80 km (10 to 50 mi.). The sector chart was used in determining population distribution as described below.

Residential population distributions within the sectors for the 16- to 80-km (10- to 50-mi.) radii are shown on Figure 2.5-2, and have been summarized and provided in Table 2.5-3. Table 2.5-3 indicates that a majority of the residential population is concentrated in the north, northeast, and east-northeast sectors; however, a significant portion of the resident population is in the south sector. The U.S. Census Bureau data from the 2000 U.S. Census and a GIS were used to determine the sector population distribution, as described in Subsection 2.5.1.1.

Population projections for 10-year increments up to 80 years from the latest U.S. Census are included in Table 2.5-4. The population projections are based on the expected population percent change between 2000 and 2010, 2010 and 2020, and between 2020 and 2030. Population projections were obtained from the North Carolina State Demographics unit Web site (Reference 2.5-004). The methodology described in Subsection 2.5.1.1 was used to forecast populations within the 16 to 80 km (10 to 50 mi.) region.

2.5.1.3 Demographic Characteristics of the Enclosed Population within 80 km (50 mi.)

Demographic characteristics were prepared for the low population zone (LPZ) (the area within a 5-km [3-mi.] radius centered on the HAR facility footprint), the emergency planning zone (EPZ) (the area within approximately a 16-km [10-mi.] radius of the HAR site), and the region (the area within an 80-km [50-mi.] radius of the HAR site).

2.5.1.3.1 Age and Gender Distribution of Population

Age and gender distribution of the population within the LPZ, EPZ, and region are summarized in Table 2.5-5.

2.5.1.3.2 Transient Population

Transient populations were calculated and included in the population estimates. Transient populations were defined as follows:

- **Seasonal Population**. A GIS was used to collect information on seasonal and vacation home usage within the 16-km (10-mi.) radius.

- **Transient Business Population**. For businesses located within the 16-km (10-mi.) radius, the employees for major employers were assumed to be included in the transient population estimates. A list of the major employers and total number of employees was obtained from the Economic Development offices for Wake, Chatham, Lee, and Harnett counties (Reference 2.5-005, Reference 2.5-006, Reference 2.5-007, and Reference 2.5-008). Major employers were defined as those employers with more than 100 employees.

- **Hotel/Motel Population**. Hotels and motels located within the 16-km (10-mi.) radius were identified using a GIS. The GIS data were sorted based on distance from the centerpoint of the two proposed reactor units. Total room numbers were obtained by phone survey or by hotel websites, and one person was assumed to occupy each room on a given night (Reference 2.5-009, Reference 2.5-010, Reference 2.5-011, Reference 2.5-012, and Reference 2.5-013).

- **Recreation Areas**. Three major recreational areas were identified within the 16-km (10-mi.) radius of the HAR site: the Jordan Lake State Park, Wake County – Harris Lake County Park, and the North Carolina Wildlife Resources Commission (NCWRC) Game Lands. The NCWRC Game Lands include the Harris Game Land (approximately 5 km [3 mi.] south-southeast) and the Chatham Game Land (approximately 5 to 6 km [3 to 4 mi.] south-southwest) (Reference 2.5-014, Reference 2.5-015, Reference 2.5-016, and Reference 2.5-017). The NCWRC Game Lands do not employ measures for determining daily usage. This information was verified by telephone communication with a representative of Butner Depot, management office for the Game Lands (Reference 2.5-018). Therefore, the NCWRC Game Lands were not included in the determination of transient population estimates. Recreation is further discussed in Subsection 2.5.2.6.

- **Special Populations (Schools, Hospitals, Nursing Homes, and Correctional Facilities**) (Reference 2.5-019, Reference 2.5-020, Reference 2.5-021, Reference 2.5-022, Reference 2.5-023, Reference 2.5-024, Reference 2.5-025, Reference 2.5-026, Reference 2.5-027, Reference 2.5-028, Reference 2.5-029, Reference 2.5-030, Reference 2.5-031, Reference 2.5-032, Reference 2.5-033, Reference 2.5-034, and Reference 2.5-035). A GIS was used to determine schools, hospitals, and nursing homes located within the 16-km (10-mi.) radius. Additional information was provided in the "Harris Nuclear Plant Development of Evacuation Time Estimates," as shown in Tables 2.5-6 and 2.5-7 (Reference 2.5-036). Telephone interviews were conducted to identify correctional facilities located within the 16-km (10-mi.) radius, as shown in Table 2.5-8 (Reference 2.5-037, Reference 2.5-038, Reference 2.5-039, Reference 2.5-040, Reference 2.5-041, and Reference 2.5-042).

- **Festivals**. There are no major festivals within the 16-km (10-mi.) radius that would affect the transient population estimates. The annual Progress Energy Lineman's Rodeo is held on Progress Energy's property and is attended by approximately 1300 people; however, this 1-day event is not included in transient population estimates because of its short duration.

- **Migrant Workers**. Migrant worker populations were calculated using average statewide statistical information supplied by the United States Department of Agriculture (USDA) 2002 Agricultural Census (Reference 2.5-043).

The following categories were used in estimating the transient population for each sector in the 16- to 80-km (10- to 50-mi.) radius:

- **Seasonal Population**. The methodology described for the 16-km (10-mi.) radius was used to determine seasonal population for the 80-km (50-mi.) radius.

- **Transient Business Population**. For businesses located within the 80-km (50-mi.) radius, no net change was assumed to occur in population. This assumption was based on the large radial area and reasonable judgment that the number of workers commuting into the 80-km (50-mi.) area is the same as the number of workers commuting out of the 80-km (50-mi.) area on a daily basis.

- **Hotel/Motel Population**. A GIS was used to collect information on the location and number of hotels and motels within the 80-km (50-mi.) radius. Based on of the large area and reasonable judgment, the average hotels and motels were assumed to contain 75 rooms and 25 rooms, respectively. For the purposes of determining transient population estimates, one person was assumed to occupy each room on a given night.

- **Recreation Areas**. Recreation areas were defined to be public recreation areas where usage patterns are tracked based on parking permits or other entrance fees (Reference 2.5-044 and Reference 2.5-045). Recreation is discussed in further detail in Subsection 2.5.2.6.

- **Special Populations (Schools, Hospitals, Nursing Homes, and Correctional Facilities**). Overall, 55 hospitals and 35 nursing homes are located in the region (shown on Figure 2.5-3). Based on the large area and reasonable judgment, no net change in special population was assumed to occur within the 80-km (50-mi.) radius. The U.S. Census was assumed to include university students living in dormitories and apartments, residents of correctional facilities, and long-term residents of nursing homes, hospitals, and other institutions, as part of the census survey for residential totals. Staff and residents temporarily placed in hospitals, nursing homes, and other institutions are likely to live within the 80-km (50-mi.) radial area; therefore, special populations would not contribute to transient population estimates.

- **Festivals**. Several large festivals and sporting events occur in the larger Raleigh area. However, these festivals occur throughout the year causing the transient population to vary on a daily basis. Any additional transient population would be small in comparison and short in duration.

- **Migrant Workers**. The methodology described for the 16-km (10-mi.) radius was used to determine migrant worker population for the 80-km (50-mi.) radius.

2.5.1.3.3 Racial and Ethnic Distribution of Population

The minority population within the LPZ is 24 percent. The minority population within the EPZ is 23.8 percent and within the region is 36 percent. The national average for minority population is 37 percent. The minority population in the LPZ, EPZ, and region are below the national average. The racial and ethnic distribution of the population in the LPZ, EPZ, and region are provided in Table 2.5-9. (Reference 2.5-001)

2.5.1.3.4 Income Distribution of Population

Within the LPZ, 4 percent of the population had a 1999 income below the poverty level, 5.2 percent of the population within the EPZ had a 1999 income below the poverty level, and 11.1 percent of the population within the region had a 1999 income below the poverty level. The national average of the population below the poverty level is 12.4 percent. Other income distributions for the LPZ, EPZ, and region are provided in Table 2.5-10.

2.5.2 COMMUNITY CHARACTERISTICS

This section discusses a series of community characteristics that describe the community surrounding the HAR site. The HAR site is located in two counties: Wake and Chatham. For purposes of community characteristics, the area of discussion will include Wake, Chatham, Lee, and Harnett counties. An initial screening of the site location and its proximity to Raleigh was conducted to identify general settlement patterns, labor force, transportation, housing availability, public services and economic issues. Construction and operational workforces are assumed to come from or to relocate to areas in Wake, Chatham, Lee, and Harnett counties, or the adjacent counties that are within commuting distance to the HAR site.

2.5.2.1 Economic Characteristics

Industrial growth patterns in the area were identified through a series of Internet searches and personal communication with representatives of local entities as described in the following subsections. Additionally, a comprehensive review of existing plant documents, including the previous HNP FSAR, was conducted.

Industrial development within a 16-km (10-mi.) radius of the HAR site primarily is concentrated in the immediate vicinity of the City of Apex and towns of Holly Springs and Fuquay-Varina (shown in Figure 2.5-1). The Southwest Wake Area Land Use Classification Map shows the westernmost portion of Wake County as primarily residential, with some office/research park, forestry/light industry, and industrial uses along U.S. Highway 1 (Reference 2.5-046). The area west of the HAR site is located in Chatham County. The Chatham County zoning categories for this area include heavy industrial use and office and institutional use along U.S. Highway 1 and Old U.S. Highway 1, surrounded by low-density residential or agricultural use (Reference 2.5-047). The area to the southwest of the HAR in Lee County is primarily residential agricultural with a few small industrial areas (Reference 2.5-048). A review of the Harnett County Land Use Map reveals that the area immediately south of the HAR site in Harnett County is primarily rural, agricultural, and residential (Reference 2.5-049).

No new industrial development is anticipated within the immediate vicinity of the HAR site. Contacts have been made with the Wake, Chatham, and Harnett counties' industrial development authorities, and no plans exist for any significant future industrial development within an 8-km (5-mi.) radius of the HAR site (Reference 2.5-050, Reference 2.5-051, and Reference 2.5-052).

Four active quarrying and mining facilities are located within the vicinity of the HAR site: a crushed stone facility, Holly Springs Quarry (Hanson Aggregates Carolina) in Wake County, and three clay brick facilities: Brickhaven Mine No. 2 (Cherokee Sanford Group), Merry Oaks Site #1 and Merry Oaks Site #2 (Triangle Brick Company) in Chatham County (Reference 2.5-053).

The North Carolina Department of Commerce (NCDOC) tracks economic data for the State of North Carolina. NCDOC has divided the State into seven regional partnerships for economic development (Reference 2.5-054). The HAR site is located within the Research Triangle Region, which is defined as Chatham, Durham, Franklin, Granville, Harnett, Johnston, Lee, Moore, Orange, Person, Vance, Wake, and Warren counties (Reference 2.5-055). Labor force information is shown in Table 2.5-11 to include the largest non-government employers in Chatham, Harnett, and Wake counties (Reference 2.5-056). The regional employment by industry breakdown for the years 1990 and 2000 is shown in Table 2.5-12 (Reference 2.5-057).

The 2000 Census recorded 121,528 construction jobs in the region, accounting for 6.41 percent of the total jobs in the region. This was a 37 percent increase over the 1990 Census, which recorded 88,596 construction jobs, accounting for 5.96 percent of the total jobs in the region (shown in Table 2.5-12). (Reference 2.5-057) These statistics reflect the growth and development in nearby towns that serve as bedroom communities to the larger City of Raleigh. These statistics also indicate that a significant pool of construction workers already live in the area.

Typical construction workers anticipated to be needed include welders, fabricators, carpenters, millwrights, electricians, ironworkers, laborers, and pipefitters. Migration of additional workers into the region would most likely be temporary or incidental. Specialists would move into the area when needed for construction tasks, then move away once the job was complete.

Between the years 1999 and 2003, the Research Triangle Region has experienced robust industrial investment, as shown in Table 2.5-13. In 2003, new and expanded industry investment in the region reached $856 million and resulted in an estimated 5038 jobs (Reference 2.5-058). Unemployment trends for the region also are shown in Table 2.5-13. Wake, Chatham, Lee, and Harnett counties have shown an increase in unemployment rates from 1995 to 2005. Unemployment rates have increased from 2.4 percent to 4.0 percent for Wake County, 2.8 percent to 3.8 percent for Chatham County, 4.8 percent to 5.5 percent for Lee County, and 3.8 percent to 5.2 percent for Harnett County. (Reference 2.5-059)

During refueling outages (typically every 18 months per unit) there will be increases above the permanent workforce by as many as 800 temporary workers brought on-site to perform maintenance work. The total temporary workforce was approximated using historical tracked staffing levels during refueling outages plus approximated non-tracked staff. These refueling outages are considered periodic maintenance activities and are currently conducted at the existing facility. These additional outage workers are easily accommodated in the surrounding community because of the variety and availability of both short- and long-term housing.

2.5.2.2 Political Structure

The political jurisdictions in the region, including cities and counties, are shown in Figure 2.5-4. The HAR is located in Buckhorn Township in Wake County. Other nearby townships include: Holly Springs and White Oak in Wake County; New Hope, Cape Fear, and Haw River in Chatham County; and Buckhorn in Harnett County. The primary taxing district that will be directly affected by the facility construction and operation includes the Wake County Government and the Wake County Public School System (WCPSS).

The Wake County Government tax rate was 0.634 as of 2006 (Reference 2.5-060). The county calculated a gradual increase of 2.0 cents to pay for the operation of newly constructed buildings. In 2008, the operating impact would be 0.9 cents, with the total impact by 2011 being 2.0 cents. (Reference 2.5-061)

Because HNP is located in Wake County, PEC pays the majority of its annual property tax to Wake County. Chatham County receives the remaining portion of the annual property tax. The average amount of taxes paid to Chatham County between 2001 and 2004 ranged between $114,106 and $134,596 annually. This averages out to be less than 0.3 percent of Chatham County's total tax annual revenues. From 2001 to 2004, PEC paid between $7,003,821 and $8,261,467 annually in total real and personal property taxes to Wake County. A portion of these funds is retained for county operations and the remainder is disbursed to the 12 cities and municipalities in the county to fund their respective operating budgets. Approximately 1.6 percent of Wake County's total tax revenue from real and personal property is generated by HNP and contributes to the County General Fund. Dispersal of General Fund revenues is as follows:

- Education: 32.2 percent.
- Human services: 26.6 percent.
- Capital and debt: 20.2 percent.
- General administration: 6.6 percent.
- Sheriff: 5.7 percent.
- Public safety: 2.7 percent.
- Community services: 2.7 percent.
- Environmental services: 1.0 percent.
- Other: 1.3 percent.

Other revenue generated by the HNP includes state income tax and sales tax. Employees of the facility and other facility-related jobs pay state income tax to the State of North Carolina as a result of the wages they earn working at the HNP or in related businesses. Additionally, sales tax is levied on materials purchased during operation of the facility, as well as on goods and services purchased by new workers.

Wake County government is the local planning authority for the HAR site. The proposed project will not conflict with the zoning for the HAR site because the site will be constructed next to the HNP. The current HNP site is zoned H1, Industrial 2 (Reference 2.5-062). The land use for the HAR site is not designated by Wake County Government; however, the area immediately adjacent to the HAR site is a combination of forestry, light industry, residential and office/research park (Reference 2.5-046). Some recreational boating occurs on

Harris Lake as a result of nearby boat ramps associated with the Wake County - Harris Lake County Park and the nearby Shearon Harris Game Lands, which are State Wildlife Management Areas (Reference 2.5-015, Reference 2.5-016, and Reference 2.5-017).

2.5.2.3 Social Structure

The project is located within the Research Triangle area of North Carolina. This area is known nationwide as a hub for research and technology. As described in Subsection 2.5.2.5, the Research Triangle area has a number of major universities and research institutions that support the research and technology culture of the area. This results in a highly educated workforce. Additionally, nearby towns of Cary, Apex, and Holly Springs have been ranked among the most desirable places to live in the eastern United States because of their quality of life. (Reference 2.5-063 and Reference 2.5-064)

Cary (population 94,536), Durham (population 187,035), Raleigh (population 276,093), and Fayetteville (population 121,015) are the largest cities in the region (Reference 2.5-065). These cities are regional centers for employment, services, entertainment, education, research, and cultural activities. Major cities and smaller communities are experiencing growth, with several of the smaller communities experiencing rapid growth.

The Research Triangle and Raleigh/Wake County areas including Apex, Fuquay-Varina, and Holly Springs support light industry such as electronic component manufacturing, electronic research, fiber chemistry research, pharmaceutical research, health statistics studies, and air pollution research. Industries in the surrounding area include manufacturers of wood products and building materials such as bricks. The region is experiencing growth associated with existing and new industries in the area. Because the area is rapidly growing, it is becoming more urbanized, and rural areas are being suburbanized. Some agricultural activities still occur in the less-developed areas of the region. No special groups have been identified. Several Native American tribes may have historically used the area around the HAR, but there are currently no known land holdings by federally or state-recognized Native American tribes within the project area.

2.5.2.4 Housing Information

The 2000 Census indicated that the region has a robust housing market, as shown in the following housing status data (Reference 2.5-066):

- Wake County had 258,953 total housing units. Of this number, 242,040 (93.5 percent) were occupied and 16,913 (6.5 percent) were vacant. Of the occupied housing units, 159,456 (65.9 percent) were occupied by owners, and 82,584 (34.1 percent) were occupied by renters.

- Chatham County had 21,358 total housing units. Of this number, approximately 19,741 (92.4 percent) were occupied and 1617 (7.6 percent) were vacant. Of the occupied housing units, 15,239 (77.2 percent) were occupied by owners, and 4502 (22.8 percent) were occupied by renters.

- Lee County had 19,909 total housing units. Of this number, approximately 18,466 (92.8 percent) were occupied and 1,443 (7.2 percent) were vacant. Of the occupied housing units, 13,236 (66.5 percent) were occupied by owners, and 5,230 (26.3 percent) were occupied by renters.

- Harnett County had 38,605 total housing units. Of this number, approximately 33,800 (87.6 percent) were occupied and 4,805 (12.4 percent) were vacant. Of the occupied housing units, 23,753 (70.3 percent) were occupied by owners, and 10,047 (29.7 percent) were occupied by renters.

Housing characteristics for the region are shown in Table 2.5-14 (Reference 2.5-066).

Residential building permits for Wake, Chatham, Lee, and Harnett counties between 2003 and 2007 are shown in Table 2.5-15. The majority of the counties experienced an increase in the number of building permits for new residential buildings between 2003 and 2007. Chatham County experienced a slight decrease (4.6 percent) in residential building permits between 2003 and 2006. (Reference 2.5-067, Reference 2.5-068, Reference 2.5-069, and Reference 2.5-070)

More recent data from May 2007 indicate similar patterns of availability. The total number of homes available in the area are shown in Table 2.5-16, the total number of apartments available in the area are shown in Table 2.5-17, and the median home value and median income for Wake, Chatham, Lee, and Harnett counties are shown in Table 2.5-18 (Reference 2.5-071, Reference 2.5-072, and Reference 2.5-073).

Based on the vacancy rates described previously, as well as the increase in building permits for residential construction in Wake County, rental units and houses are readily available in this area (Reference 2.5-071, Reference 2.5-072, and Reference 2.5-073).

2.5.2.5 Educational System

Approximately 22 primary and secondary schools are located in the 16-km (10-mi.) radius of the HAR site. These schools and their current enrollments are presented in Table 2.5-19. (Reference 2.5-036)

WCPSS is expected to gain 7000 new students in the 2006 - 2007 school year (Reference 2.5-061). For the 2006 - 2007 school year, Wake County School

District had 128,072 students enrolled (Reference 2.5-074). To service the increased enrollments, WCPSS is planning to open two middle schools and three elementary schools for the 2007 - 2008 school year. Of these schools, East Cary Middle School, will be located in Cary, North Carolina, and will be closest to the HAR site (Reference 2.5-075). By the school year 2010 - 2011, WCPSS is expected to grow by 42,000 students (Reference 2.5-074). This growth represents an increase of 33 percent over 2006-2007 total student enrollment.

As of January 2007, Harnett County School System (HCSS) had a total enrollment of 17,906 students for grades kindergarten through twelfth grade. HCSS built a new high school in 2004. However, for kindergarten through eighth grades (K-8), the school district is over capacity and needs 690 seats. Currently, the HCSS has 153 mobile classrooms. Temporary facilities are expected to increase by an additional 25 to 30 portables in 2008. HCSS is also in the process of building a new elementary school with a capacity of 750 students, which will reduce the need for temporary facilities. Additionally, HCSS plans to build another school for grades 3 through 5. For the past 2 years, the number of students in the HCSS has increased at an average of approximately 600 students per year. The county anticipates a similar growth rate for the next 5 years. (Reference 2.5-076)

Chatham County School System (CCSS) is composed of 16 schools and had 7251 students enrolled during the 2005 - 2006 school year (Reference 2.5-077). Sixty-seven mobile units are associated with the 16 schools. Thirteen of the 16 schools in the county are over capacity. The county commission has approved the construction of a new middle school and high school, but no projected date has been set for completion of these schools. Proposed school construction projects are as follows (Reference 2.5-078):

- A new middle school to accommodate an enrollment of 650 to 700 students ($21 million), location to be determined.
- A new high school to accommodate 1200 students ($44 million), location to be determined.
- A new elementary school to accommodate 700 students ($17 million) is scheduled to be built in Siler City in the fall of 2007.
- Expansion of Jordon-Mathews High School to accommodate an additional 100 students in fall 2007.

The CCSS has averaged 110 to 120 new students each year from 2001 to 2007 (Reference 2.5-079). Based on the current student enrollments and projected growth rates for each of the three counties, insufficient capacity exists for large increases in population for this area.

Lee County Schools had a total enrollment of 9395 students during the 2006-2007 school year. Fourteen schools are in the county school system.

Southern Lee High School opened during the 2006 - 2007 school year. Two new construction projects have been approved to support the growing student population. A new middle school adjacent to Southern Lee High School and a gymnasium/therapeutic center at Floyd L. Knight /The Children's Center will be open by the 2008 -2009 school year. (Reference 2.5-080 and Reference 2.5-081)

Seven community colleges and 20 four-year colleges and universities are located in the region, as shown in Figure 2.5-5. The 4-year colleges and universities are as follows:

- Campbell University
- Duke University
- Elon University
- Fayetteville State University
- Liberty University
- Louisburg College
- Meredith College
- Methodist College
- North Carolina State University
- North Carolina Central University
- North Carolina Wesleyan College
- Peace College
- Pfeiffer College
- Saint Augustine's College
- Shaw University
- Strayer University
- Troy State University
- University of North Carolina – Chapel Hill
- University of North Carolina – Greensboro

- Webster University

2.5.2.6 Recreation

Several parks, forest preserves, golf courses, and other recreation areas are located in the region. These recreation areas generally serve the local community only. The general daily attendance at these recreation areas is shown in Table 2.5-20 (Reference 2.5-044).

The State parks and larger recreation areas that serve the region include:

- Jordan Lake State Recreation Area
- Eno River State Park
- Falls Lake State Recreation Area
- Raven Rock State Park
- William B. Umstead Park
- Harris Lake County Park
- Shearon Harris Game Lands
- Chatham Game Lands

Jordan Lake State Recreation Area is located approximately 12 to 19 km (5 to 12 mi.) northwest of the HAR site. The recreation area is composed of approximately 5666 hectares (ha) (14,000 acres [ac.]) of water. Jordan Lake State Recreation Area is operated by the North Carolina Department of Environment and Natural Resources (NCDENR). Jordan Lake has eight recreation areas on the lake including Crosswinds Campground, Ebenezer Church, Parkers Creek, Poplar Point, Seaforth, Vista Point, Robeson Creek, and New Hope Overlook. (Reference 2.5-014)

Eno River State Park is located 48 km (30 mi.) north of the HAR site. The park is operated by NCDENR and is composed of 1052 ha (2600 ac.) of land. Eno River State Park lies alongside the Eno River and has five access areas including Cabe Lands, Cole Mill, Few’s Ford, Pleasant Green, and Pump Station. (Reference 2.5-082)

Fall Lake State Recreation Area is located 48 km (30 mi.) north-northeast of the HAR site. The recreation area consists of a 4856-ha (12,000-ac.) lake and 10,522 ha (26,000 ac.) of land and is operated by NCDENR. Falls Lake is used for boating, fishing, and camping and has seven recreation areas including

Beaverdam, B.W. Wells, Highway 50, Holly Point, Rolling View, Sandling Beach, and Shinleaf. (Reference 2.5-083)

Raven Rock State Park is located 19 km (12 mi.) south-southeast of the HAR site. The park is operated by NCDENR and is composed of 1889 ha (4667 ac.) of land. Raven Rock is a short drive from the Research Triangle area of North Carolina and is located high above the Cape Fear River. (Reference 2.5-084)

William B. Umstead State Park is located 30 km (19 mi.) northeast of the HAR site. The park is composed of 2257 ha (5577 ac.) of land and is divided into two sections, Crabtree Creek and Reedy Creek. William B. Umstead State Park offers fishing, hiking, horseback riding, and biking. (Reference 2.5-085)

Harris Lake County Park is located 3 km (2 mi.) east of the HAR site. The park is approximately 275 ha (680 ac.) of land and provides locations for group camping, fishing, playgrounds, picnicking, and biking and hiking trails (Reference 2.5-015).

NCWRC Game Lands are adjacent to Harris Lake and consist of the Harris Game Land and the Chatham Game Land. The Harris Game Lands occupy approximately 5702 ha (14,090 ac.), and the Chatham Game Land is approximately 1131 ha (2794 ac.) (Reference 2.5-086).

The Chatham and Harris Game Lands provide recreational space for hunting and fishing. Although the NCWRC does not track daily attendance at the Game Lands, the number of active licenses and hunting statistics provide indication of their use. Currently, there are 57,520 active hunting and fishing licenses in Wake County, 6630 in Chatham County, 5741 in Lee County, and 12,134 in Harnett County, as shown in Table 2.5-21. In 2006, an average of 12.8 percent of deer and 15.9 percent of turkeys were killed on Game Lands in this area. This information is presented in further detail in Table 2.5-21. (Reference 2.5-018 and Reference 2.5-087)

Nearby recreation areas also include numerous campgrounds. Six year-round campgrounds are within 40 km (25 mi.) of New Hill, as shown in Table 2.5-22 (Reference 2.5-088). Ten additional year-round campgrounds are within 80 km (50 mi.) of New Hill, as listed in Table 2.5-23 (Reference 2.5-089).

Several local- and community-operated parks and recreation areas are located in southwestern Wake County. The cities of Cary and Apex and the towns of Holly Springs and Fuquay-Varina have community-based parks and recreation areas that serve the local communities. These areas were not incorporated into the transient population because most travel to these areas is assumed to be from within the local community.

2.5.2.7 Public Services and Facilities

Public services and facilities consist of schools, public utilities, police and fire departments, hospitals, and churches, which are typically located within municipal boundaries and are near population centers. Schools are described in Subsection 2.5.2.5. The remaining services are described below.

Public utilities include facilities for distributing energy, such as electricity and natural gas, as well as water supplies and wastewater treatment plants (WWTP). The HAR site is located within the Cape Fear River Basin. Five water treatment plants (WTPs) and intakes use this river basin as described below and presented in Table 2.5-25. Each WTP is permitted on a maximum day demand (MDD) basis.

- Cary/Apex, Wake County WTP has a permitted capacity of 151 million liters per day (mld) (40 million gallons per day [mgd]) and serves Cary, Apex, Morrisville, Research Triangle Park (RTP) south. The plant is six miles from Jordan Lake, in western Wake County, near US Highway 64. (Reference 2.5-090)

- Chatham County WTP (11 mld [3 mgd]) serves northern Chatham County. The plant is located on the eastern shore of Jordan Lake off US Highway 64. (Reference 2.5-091)

- City of Sanford, Lee County WTP, located above the Buckhorn Dam (45 mld [12 mgd]), serves the City of Sanford, Chatham County East, Lee County District 1, Town of Broadway, and Utilities, Inc. (Carolina Trace) (Reference 2.5-092 and Reference 2.5-093).

- Harnett County Regional WTP (68 mld [18 mgd]) serves unincorporated Harnett County as well as the Harnett County towns of Angier, Coats, Lillington, Linden, and contracts water sales to the Wake County communities of Holly Springs and Fuquay-Varina (Reference 2.5-092 and Reference 2.5-094). The plant is located along the Cape Fear River in the Town of Lillington.

- HNP WTP is located within the exclusion area boundary (EAB).

The North Carolina Department of Environment and Natural Resources (NCDENR), Division of Water Resources, has established water supply allocations from the Cape Fear River basin, specifically the Cape Fear River upstream of Buckhorn Dam and Jordan Lake. In 2001, the Division of Water Resources reviewed the water demands of the communities utilizing Jordan Lake and downstream to Buckhorn Dam, and concluded the capacity of the watershed was sufficient for projected population demands through at least 2030. (Reference 2.5-092) Water demands for the area and water allocation based on average day demand (ADD) basis are described below:

- Cary, Wake County WTP anticipates an increase in ADD from 59.8 mld (15.8 mgd) in 2005 (for a population of approximately 130,500) to 70.0 mld (18.5 mgd) in 2010 (for a projected population of nearly 152,000) and

94.6 mld (25.0 mgd) in 2020 (for a projected population of nearly 197,000) (Reference 2.5-092).

- Apex, Wake County WTP anticipates an increase in ADD from 11.7 mld (3.1 mgd) in 2005 (for a population of approximately 36,000) to 15.9 mld (4.2 mgd) in 2010 (for a projected population of nearly 49,000) and 23.8 mld (6.3 mgd) in 2020 (for a projected population of nearly 75,000) (Reference 2.5-092).

  This growth will require expansion of the Cary/Apex WTP. An expansion of the plant's treatment capacity to 212.9 mld (56 mgd) is planned to be completed by 2015 (Reference 2.5-095).

- Chatham County WTP: Chatham County anticipates consolidation of its water system to serve customers countywide in unincorporated areas. Additionally, the county plans future sales to the towns of Siler City and Pittsboro, after 2030. In addition to an allocation from Jordan Lake, used by the Chatham County WTP, the county receives water for its customers from Pittsboro, Siler City, Sanford, and the Goldston-Gulf Sanitary District. As adjusted by the Division of Water Resources, the anticipated ADD for the countywide system is expected to increase from 11.0 mld (2.9 mgd) in 2005 (for a population of approximately 16,000) to 23.5 mld (6.2 mgd) in 2010 (for a projected population of just over 20,500), and 30.7 mld (8.1 mgd) in 2020 (for a projected population of nearly 27,000). (Reference 2.5-092)

  This growth will require expansion of the Chatham County WTP. The water treatment plant is anticipated to be expanded to 22.7 mld (6 mgd) in 2008. The expanded WTP will have the ability to expand to 30.3 mld (8 mgd), should it be needed to meet system demand, which should be sufficient for demands through 2020. (Reference 2.5-096)

- City of Sanford, Lee County WTP: Sanford's water system anticipates an increase in ADD from 30.3 mld (8.0 mgd) in 2005 (for a population of approximately 35,000 and substantial commercial demand) to 35.6 mld (9.4 mgd) in 2010 (for a projected population of nearly 41,000 and substantial commercial demand), and 52.0 mld (13.7 mgd) in 2020 (for a projected population of nearly 57,000 and substantial commercial demand) (Reference 2.5-092).

  This growth is expected to require expansion of the City of Sanford WTP by 2010 to 2020 based on a comparison of the MDD to the permitted capacity. The MDD is calculated by multiplying the ADD by the peaking ration. The peaking ration is calculated by dividing the maximum day withdrawal of 36.7 mld (9.7 mgd) by the average day withdrawal of 26.5 mld (7.0 mgd). Using the 2010 ADD (35.6 mld [9.4 mgd]) and the calculated peaking ration (5.3 mld [1.4 mgd]) the 2010 MDD is 51.7 mld (13.7 mgd). As stated previously, the City of Sanford WTP's permitted capacity is 45.4 mld (12 mgd), based on the projected 2010 MDD of 51.7 mld (13.7 mgd), the City of Sanford WTP would need to expand to meet the projected demand in 2010. (Reference 2.5-092 and Reference 2.5-093)

The 2020 ADD for the City of Sanford WTP is 51.5 mld (13.6 mgd) and the MDD is 72.0 mld (19.0 mgd) (Reference 2.5-092). Based on the projected 2020 MDD of 72.0 mld (19.0 mgd), the capacity would have to be expanded to meet the projected demand in 2020.

- Harnett County Regional WTP: Harnett County's water system anticipates an increase in ADD from 25.0 mld (6.6 mgd) in 2005 (for a population of approximately 75,000) to 29.1 mld (7.7 mgd) in 2010 (for a projected population of nearly 85,000) and 37.5 mld (9.9 mgd) in 2020 (for a projected population of nearly 110,000) (Reference 2.5-092).

  This growth is expected to require expansion of the Harnett County WTP by 2012. The WTP site can be expanded from its current 71.9 mld (18 mgd) capacity to a maximum day capacity of approximately 90.8 mld (24 mgd). (Reference 2.5-094)

Wastewater treatment facilities (shown in Table 2.5-25) in the area include:

- Utley Creek WWTP (23 mld [6 mgd]), the municipal wastewater plant for the Town of Holly Springs, Wake County (Reference 2.5-097).

- Proposed Western Wake Regional Water Reclamation Facility (WRF), which will serve the towns of Cary, Apex, Morrisville, and Holly Springs, will have a treatment capacity of 68 mld (18 mgd) on a maximum month average day basis when it begins operation, which is estimated to occur in 2012. The plant will eventually have a treatment capacity of 114 mld (30 mgd) when it is expanded after 2020 (Reference 2.5-098). The plant is anticipated to be constructed west of the Town of Apex, near the intersection of US Highway 1 and Shearon Harris Road (Reference 2.5-099).

- Chatham County Bynum WWTP (0.1 mld [0.03 mgd]) serves a total of 26 customers and does not have any plans to expand their wastewater treatment facility. The county has 3130 water service connections with septic systems. (Reference 2.5-096)

- City of Sanford, Lee County WWTP (26.1 mld [6.8 mgd]) is the municipal WWTP for the City of Sanford, which serves 7714 customers and does not have any plans to expand their wastewater treatment facility. Additionally, the City of Sanford has 5610 water service connections with septic systems. (Reference 2.5-093)

- Harnett County's North Harnett Regional WWTP (21.2 mld [5.6 mgd]), the municipal wastewater plant for Lillington, Angier, and unincorporated areas of Harnett County, serves 3475 customers and has 26,000 septic systems. This wastewater treatment facility does have plans to expand by 2012. (Reference 2.5-092, Reference 2.5-094, and Reference 2.5-100)

Five public water supply wells are located in the area as shown on Figure 2.5-6 and Table 2.5-26.

The Apex Fire Department is composed of three fire stations that are within a 16-km (10-mi.) radius of the HAR site, as presented in Figure 2.5-7 (Reference 2.5-101). Apex Fire Station 2 is the closest fire station to the HAR site at approximately 5 km (3 mi.) from the site in New Hill, North Carolina. The Apex Fire Department is staffed by 27 full-time and 4 part-time operations staff, and 40 volunteer fire fighters (Reference 2.5-102). The closest police station is the Holly Springs Police Station at 11.1 km (6.9 mi.) from the HAR (Reference 2.5-103). Cape Fear Volunteer Fire Department is the closest fire department to the site in Lee County (Reference 2.5-104). N.W. Harnett Fire Department is the closest fire department to the site in Harnett County (Reference 2.5-105). Overall, 238 fire stations and 50 police stations are located in the region as shown on Figure 2.5-7.

Wake County Emergency Management (EM) is the primary responder for emergencies in Wake County. Wake County EM coordinates disaster response during emergencies from its Emergency Operations Center (EOC). From this centralized area, staff members coordinate fire, law enforcement and emergency medical service personnel to provide assistance to areas within the community that need assistance. During an emergency, the EOC is usually staffed around the clock to provide this coordination and handle various requests for assistance. (Reference 2.5-106)

Wake County Emergency Medical Services (EMS) operates 15 Type III advanced life support ambulances. Ambulances operate 24 hours per day, 7 days per week. A minimum of one paramedic and one intermediate are required per ambulance, and each shift is supervised by a district chief. However, two paramedics attend the ambulances 95 percent of the time. All district chiefs and command staff officers are paramedics. The ambulances operate from 10 discrete stations and 4 stations shared with local fire departments. Wake County EMS has 123 full-time and 41 part-time employees. (Reference 2.5-107)

Wake County EM Disaster response near the Harris site uses the three Apex fire stations within the Apex Fire Department. Police enforcement is provided through the Wake County Sheriff Office.(Reference 2.5-108) The closest hospital to the Harris site is WakeMed Cary Hospital, which is approximately 19 km (12 mi.) from the site (Reference 2.5-103). WakeMed Women's Pavilion and Birthplace and Western Wake Medical Center are part of the WakeMed Hospital system at the WakeMed Cary Hospital (Reference 2.5-109). Wake County Emergency Management uses WakeMed Cary Hospital to conduct medical services one

(MS-1) drills (Reference 2.5-108). WakeMed Cary Hospital has 500 medical support staff and 114 acute beds. As of May 2007, 92 beds were occupied. (Reference 2.5-110)

In 2009, WakeMed Cary Hospital will expand to include an additional 42 acute beds (Reference 2.5-110). Wake County Emergency Management also uses WakeMed Raleigh, WakeMed North HealthPlex, Duke Raleigh Hospital, and Rex Hospital for their emergency operations (Reference 2.5-108). These hospitals are between 35 and 44 km (22 and 27.5 mi.) from the site (Reference 2.5-103).

Other nearby EM services are provided in the adjacent counties of Chatham, Harnett, and Lee.

Chatham County Emergency Management Agency (CEMA) provides EM services in response to major emergencies in Chatham County (Reference 2.5-111). CEMA uses fire departments from North Chatham, Pittsboro, Moncure, Fowler City, and Bonlee. The Chatham County Police Department is the emergency contact for Chatham County Emergency Operations. (Reference 2.5-112) Chatham County Hospital is located approximately 48 km (30 mi.) from the site and is the closest in the county to the HAR (Reference 2.5-103); however, the facility is not a FEMA-graded hospital. Therefore, CEMA uses WakeMed Cary (Western Wake) and Betsy Johnson Hospital. CEMA also uses WakeMed Cary Hospital to conduct its MS-1 drills. CEMA has identified Moncure Elementary School and the campgrounds at Jordon Lake State Park as special populations near the Harris site. (Reference 2.5-112)

Harnett County Emergency Management (HCEM) provides EM services in response to emergencies in Harnett County (Reference 2.5-113). For emergency response assistance, HCEM uses fire departments from N.W. Harnett, Angier, Summerville, Buies Creek, and Coats Grove. Police enforcement is provided by the Harnett County Sheriff Department. HCEM uses Betsy Johnson Hospital, which is 47 km (29 mi.) from the site. HCEM has identified Raven Rock State Park as a special population near the Harris site. (Reference 2.5-103 and Reference 2.5-105)

Lee County Office of Emergency Management (OEM) is responsible for providing EM services in response to natural and man-made emergencies in Lee County (Reference 2.5-114). Lee County OEM utilizes 10 fire departments located within the county. Police enforcement is provided by Sanford Police Department, Lee County Sheriff Department, and Broadway Police Department. Lee County OEM uses the Central Carolina Hospital, which is approximately 27 km (17 mi.) from the site. The hospital has an emergency room but does not have a Level 1 trauma center. Lee County OEM has identified Deep River Elementary school as a special population near the Harris site. (Reference 2.5-103 and Reference 2.5-104)

The project capacity of the public services is adequate and is expected to expand to meet the demands of a slight population growth in the region.

2.5.2.8 Transportation Facilities

The Raleigh-Durham area is a major transportation hub for central North Carolina. Both cities are served by rail line and major interstate highways that assist both local and interstate traffic.

Transportation corridors near the Harris site include U.S. Highway 1, Old U.S. Highway 1, and State Road 42 in Wake County. Average daily traffic counts for the two major transportation corridors near the plant site were obtained from the North Carolina Department of Transportation (NCDOT) website. U.S. Highway 1 and Old U.S. Highway 1 are the most direct routes to the plant site from nearby population centers and are described as follows:

- U.S. Highway 1: At its nearest point, U.S. Highway 1 is approximately 2.1 km (1.3 mi.) from the center of the plant site. The average annual daily traffic (AADT) near the plant site is 18,000 vehicles (Reference 2.5-115).

- Old U.S. Highway 1: At its nearest point, Old U.S. Highway 1 is approximately 3.2 km (2 mi.) from the center of the plant site. The AADT for Old U.S. Highway 1 near the plant site is 1800 vehicles (Reference 2.5-116).

The nearest local roads are New Hill Holleman Road, which is approximately 3170 m (10,400 ft.) (2 km [1.97 mi.]) from the HAR site at its nearest point, and Bartley Holleman Road, which is approximately 3566 m (11,700 ft.) (3.6 km [2.22 mi.]) from the HAR site at its nearest point. The nearest interstate (I-40) is approximately 24 km (15 mi.) from the HAR site.

Progress Energy has initiated discussion with the DOT regarding County and State roadway impacts due to increased lake levels in the Harris Reservoir required for HAR operation. A Transportation Impact Analysis will be completed by Progress Energy to evaluate construction and operational road impacts. As part of this process, a temporary access road at the intersection of U.S. Highway 1 and Shearon Harris Road will be evaluated. This access road would be used during construction of the HAR.

The proposed Western Wake Parkway will provide additional transportation mobility and capacity when complete. This project (No. R-2635) will provide a new six-lane, controlled-access parkway in western Wake County. The roadway will be approximately 20 km (12.6 mi.) in length and will extend the Raleigh Outer Loop from NC-55 near Research Triangle Park south to the NC-55 Holly Springs Bypass. The estimated cost of the project is between $435 million to $780 million. (Reference 2.5-117 and Reference 2.5-118)

The project is divided into three segments: R-2635A, R-2635B, and R-2635C. Segment R-2635A extends from North of SR-1172 (Old Smithfield Road) between Apex and Holly Springs at NC-55 to south of U.S. Highway 1; Segment R-2635B begins south of U.S. Highway 1 and extends to south of U.S. 64; and Segment R-2635C travels from south of U.S. 64 to NC-55, which is north of Cary, NC (Reference 2.5-119). Segments R-2635A and R-2635B are scheduled for construction in 2010 and are projected to be open to traffic in 2012. Segment R-2635C is scheduled for construction at the beginning of 2008 and is projected to be open in 2011. (Reference 2.5-120)

The two primary railways in the area are the Norfolk Southern Railroad and the CSX Railroad. Three railroad segments are located within 8 km (5 mi.) of the project location, including a spur line that connects to the plant site:

- The Bonsal – Durham segment, which is 4 km (2.5 mi.) northwest of the project site
- The Fuquay-Varina – Brickhaven segment, which is 6.9 km (4.3 mi.) south of the project site
- The Raleigh – Moncure segment, which is 3 km (1.9 mi.) northwest of the project site.

The New Hope Valley Railway (NHVRy) operates as a living-history tourist attraction near the project site. The NHVRy operates along the former Southern Railway System between Bonsal and New Hill. This line includes a spur to the existing HNP. The NHVRy tourist attraction has been in operation since April 1984 (Reference 2.5-121). The railway currently operates 1 or 2 days a month for approximately 6 months a year. Each trip lasts approximately 1 hour and occurs up to five times a day when the railway is open. Current hours of operation span between May and December and included 10 scheduled days (50 one-hour trips) between August and December of 2006. (Reference 2.5-122 and Reference 2.5-123)

Major airports in the 80-km (50-mi.) region include Raleigh-Durham International Airport (RDU), Pope Air Force Base at Fort Bragg in Fayetteville, Fayetteville Regional Airport, and Moore County General Aviation Airport. These airports are located more than 32 km (20 mi.) from the project site and do not use airspace near the Harris site. Nearby airports, as well as those around the project location, are shown in Figure 2.5-8.

Pope Air Force Base is the closest aviation-related military base. It is located 56 km (35 mi.) south of the plant site at Fort Bragg (Figure 2.5-9). In addition, a National Guard facility is located at RDU.

Twelve airports are located within 32 km (20 mi.) of the site. These airports include one major public airport, RDU (30.5 km [19 mi.]); two general public aviation airports, Sanford-Lee County Regional Airport (14.5 km [9 mi.]) and

Triple W Airport (23.3 km [14.5 mi.]) (Table 2.5-27), and nine privately owned airports. The nine privately owned airports are shown below (Reference 2.5-127):

- Bagwell
- Barclaysville Field
- CAG Farms
- Cox
- Deck Airpark
- Eagles Landing
- Fuquay/Angier Field
- Moretz Riverside Landing
- Womble Field.

No airports are located within 8 km (5 mi.) of the site. One airport within 16 km (10 mi.), Sanford Lee County Regional Airport, has greater than 193 d^2 (500 d^2) movements per year, and no airport greater than 16 km (10 mi.) away has greater than 386 d^2 (1000 d^2) movements per year, as shown in Table 2.5-27 (Reference 2.5-124, Reference 2.5-125, Reference 2.5-126, Reference 2.5-127, Reference 2.5-128, and Reference 2.5-129). As defined in Regulatory Guide 1.206, d equals the distance in miles from the site.

RDU is the largest airport located more than 16 km (10 mi.) from the site. As shown in Table 2.5-28, annual operations for 2006 were 245,099 (Reference 2.5-130 and Reference 2.5-131). These operations are less than 1000 d^2 movements per year, where d is 30.5 km (19 mi.). Based on that assumption, 1000 (30.5 km [19 mi.])^2 equals 361,000. Among the airports within 16 km (10 mi.) of the HAR site, only the RDU airport is expected to grow substantially in the foreseeable future.

Sanford Lee County Regional Airport will be constructing new hangar storage and anticipates a 1 percent growth for 2007 (Reference 2.5-132). The Sanford Lee County Regional Airport is located approximately 14.5 km (9 mi.) southwest of the HAR. This General Aviation Airport is accessed via Runway 3/21, which is 2 km (6500 ft.) by 30 m (100 ft.) and is in good condition. Approximately 89 aircraft are based at the field (86 single-engine and 3 multi-engine), with approximately 129 aircraft operations a day (85 percent local general aviation with 110 flights, 13 percent transient general aviation with 17 flights, and 2 percent military with 2 flights). (Reference 2.5-124)

The majority of the aircraft operations at RDU in 2005 were commercial air carrier flights (31 percent), general aviation-itinerant (22 percent), and air taxi/commuter (45.2 percent). Only 1.7 percent of aircraft operations in 2005 were military operations. (Reference 2.5-125) Twelve major airways branch out from this airport. Three pass within 16 km (10 mi.) of the site. No flight-holding or landing patterns, however, affect the project location (Reference 2.5-133). The Federal Aviation Administration (FAA) Temporary Flight Restrictions Map for the area is shown in Figure 2.5-9. This figure shows nearby airports, as well as those around the HAR site.

In 2006, a total of 9.4 million passengers traveled through RDU, averaging approximately 25,000 passengers per day. From 2005 to 2006 the usage of RDU increased by 1 percent. (Reference 2.5-134) The RDU Authority began major construction on the redevelopment and expansion of Terminal C in 2006 (Reference 2.5-135). Terminal C will increase to a total of 32 gates. The Terminal C redevelopment and expansion will be conducted in two phases. Phase One is scheduled for completion in summer 2008, while Phase Two completion is projected for late 2010. The expansion will accommodate up to 12 million passengers per year. (Reference 2.5-136)

Currently, RDU has 49 gates: 23 gates at Terminal A and 26 gates at Terminal C. There is no Terminal B (Reference 2.5-137). As shown in Table 2.5-28, total operations in 2006 were 245,099 (Reference 2.5-130 and Reference 2.5-131). Following completion of the Terminal C expansion, RDU will have a total of 55 gates. Assuming 245,099 total operations at 49 gates, operations per gate per year were calculated to be 5002. Using this assumption, the redevelopment and expansion of Terminal C has the potential to increase operations by approximately 30,012 operations (based on six gates multiplied by 5002 operations) or 12 percent in 2010.

The Cape Fear River runs southwest of the Harris site, but this portion of the river is not used for commercial traffic.

2.5.2.9 Distinctive Communities

The population in the region is fairly homogeneous, mostly Caucasian, and not dominated by a particular ethnic group. Subsections 2.5.1 and 2.5.4 discuss the population in the region in more detail. As stated in Subsection 2.5.2.3, there are no Native American tribes directly linked to the project area. Additionally, there are no major tourist attractions, cultural resources, or visual resources in the vicinity that would be considered distinctive communities. Table 2.5-31 describes historic properties within 16 km (10 mi.) of the HAR site. The majority of these are associated with family farms or downtown historic districts in New Hill, Fuquay-Varina, Apex, and Holly Springs. (Reference 2.5-138) While the area has historically been used for tobacco farming and other agricultural purposes, there are no distinctive ethnic or special groups that would be considered a distinctive community.

2.5.2.10 Agriculture

Section 2.2 of the Environmental Report explains in detail agricultural lands within the HAR site, vicinity, and region. According to the North Carolina Department of Agriculture & Consumer Services (NCDA&CS), Agricultural Statistics Division, North Carolina is a large producer of tobacco, sweet potatoes, hogs, pigs, Christmas trees, and farm-raised turkeys. In 2004, North Carolina ranked first among all states in the production of tobacco and sweet potatoes. North Carolina also ranked second among states in the production of hogs and pigs, Christmas trees, and farm-raised turkeys. Other agricultural resources in North Carolina include cucumbers, trout, poultry, and eggs. (Reference 2.5-139)

According to the 2002 U.S. Census of Agriculture, Wake County had 846 farms totaling 37,556 ha (92,803 ac.) of land. The average farm size was approximately 45 ha (110 ac.). Chatham and Harnett counties had 1,128 and 730 total farms, respectively. Chatham County farms totaled 48,057 ha (118,752 ac.) in size and Harnett County farms totaled 46,280 ha (114,361 ac.) of land. Wake County ranked fifth within the State in 2004 in production of tobacco, twelfth in sweet potatoes, and thirty-eighth in soybeans. Chatham County ranked forty-ninth in tobacco production and sixty-eighth in soybeans, while Harnett County ranked ninth in tobacco production and twenty-fourth in both cotton and soybeans. A summary is shown in Table 2.5-30 of the agricultural lands, as provided in the 2002 U.S. Census of Agriculture for the counties surrounding the 80-km (50-mi.) region of the HAR site (Reference 2.5-140).

The total market value of Wake County agricultural products sold in 2003 was $54,393,000. Crop sales accounted for 86 percent of Wake County agricultural cash receipts in 2003. Major crop sales for Wake County were from tobacco, producing a total of $21,968,000. (Reference 2.5-140) Table 2.5-30 provides a summary of the breakdown of agricultural cash receipts for the counties within the 80-km (50-mi.) region (Reference 2.5-141).

Some low income populations augment existing incomes with subsistence fishing or farming. Subsistence fishing and farming takes place primarily in rural areas. While the majority of the immediate area surrounding the proposed site is undeveloped game lands or recreational areas, subsistence fishing is not expected to occur in the area due to the steep slopes of the bank, forested shoreline, and limited accessibility unless traveling by boat. Subsistence agriculture might include growing small vegetable gardens or growing and collecting agricultural products for resale. Collecting pine straw for resale as landscaping material could be considered subsistence farming in this area. However, because of the heavily wooded steep slopes of the shoreline, collection of pine straw as a method of subsistence farming is not expected to occur in this area.

2.5.3 HISTORIC PROPERTIES

Prior to the construction of the HNP, an archaeological investigation of the site was conducted by the University of North Carolina. An archaeological survey was published in January 1978 focusing on the area to be affected by plant construction and on the area targeted for the planned reservoir. The area surveyed included approximately 1619 ha (4000 ac.) that would be inundated by the cooling-water reservoir. Prior to the initiation of the survey, no known archaeological sites were within the impoundment area. During the course of the survey, 36 prehistoric sites and 1 historic site were discovered. Most of the sites found were on relatively flat terraces rimming more pronounced bluffs. The archaeological sites ranged from those containing only a few flakes to some containing a moderate concentration of artifacts, including diagnostic tools. All of the sites fell in the Woodland and Archaic periods ranging from 600 AD to 1000 AD and were occupied for a relatively brief period of time. The results of the investigation concluded that archaeological sites in the area have been significantly altered and influenced by erosional forces and historic land use practices. Sites in the project area were occupied mostly by the Middle and Late Archaic people, consisting of migratory bands of hunters that left artifacts similar in nature across North Carolina and the Southeast. (Reference 2.5-142)

PEC has a policy to conduct a Cultural Resource Assessment on any project that might have the potential to affect cultural resources (e.g., archaeological, historical, or architectural). The policy ensures appropriate identification of historic properties and consultation with the State Historic Preservation Office (SHPO). This policy is consistent with the General Statutes of North Carolina designed to protect historic properties (North Carolina General Statute Chapter 70, Article 1), and Section 106 of the National Historic Preservation Act (NHPA) 16 United States Code (USC) 470 to ensure the protection of known historic properties on PEC property (Reference 2.5-143 and Reference 2.5-144). Historic properties in a 16-km (10-mi.) area of the site are listed on Table 2.5-31 (Reference 2.5-138).

2.5.3.1 Historic Properties Adjacent to HAR and Transmission Corridors

Although historic property surveys were conducted in the project area prior to the construction of the original plant and reservoir, additional areas will be impacted by the proposed plants. Follow-up investigations, pursuant to Section 106 of the NHPA (36 CFR 800), were conducted to identify the full extent of historic properties immediately adjacent to and within the project area (Reference 2.5-145). Section 106 provides regulatory guidance on the identification, evaluation, and protection of historic properties.

According to Environmental Standard Review Plan, Section 2.5.3, with the construction of a new or expanded nuclear power plant, planned data and information on historic properties within 16 km (10 mi.) of the proposed plant are required. A cursory review of existing resources indicated that, for this project, 26 historic structures and 35 historic districts are located within 16 km (10 mi.) of the

HAR site, as shown in Table 2.5-31 (Reference 2.5-138). The New South Associates publication, “An Archaeological Survey of the Proposed Water Makeup Line, Shearon Harris Nuclear Plant,” discusses relevant information gathered during an archaeological survey. Section 4.1 discusses this report in more detail.

According to Environmental Standard Review Plan, Section 2.5.3, when new transmission lines and corridors are planned, data and information on historic properties within 2 km (1.2 mi.) of the proposed plant are required. An electronic database of the National Historic Register and survey properties in the state is not available. According to SHPO administrators, no electronic or database records exist for properties in potential corridors. Planning efforts associated with any new transmission lines and/or corridors will take into consideration existing historic properties, and consultation with the SHPO will occur regarding any new transmission lines and corridors.

2.5.3.2 Consultation with SHPO

PEC began consulting with the SHPO on August 14, 2006 regarding the HAR. The letter to the SHPO outlined the proposed undertaking at the HAR and requested guidance regarding potential impacts on historic properties. Potential impacts identified included the construction of the new facilities, increased lake level from 67 m (220 ft.) msl to approximately 73 m (240 ft.) msl, the installation of an intake structure on the Cape Fear River, and the installation of an intake water pipeline from the Cape Fear River to Harris Reservoir. The SHPO responded to PEC on September 20, 2006, indicating that areas affected by the new plant, intake structure, and intake pipeline would require a Phase I archaeological investigation. Phase I has been completed on the Harris Lake makeup water system pipeline corridor. Areas requiring Phase I investigation have been identified in the New South Associates publication, “Archaeological Survey Plan, Proposed Expansion of Harris Lake,” and PEC is committed to performing the work identified in the report. Sites needing further investigation will be identified during the Phase I investigations, which will be completed prior to the initiation of site preparation or construction activities.

2.5.4 ENVIRONMENTAL JUSTICE

Environmental justice refers to a federal executive order in which federal actions should not result in disproportionately high and adverse impacts to low income or minority populations. Executive Order 12898 directs federal agencies to consider environmental justice by identifying and mitigating disproportionately high and adverse human health and environmental effects. This includes the interrelated social and economic benefits of their programs, policies, and activities on low income and minority populations. (Reference 2.5-146) This review considers “minority” or “low income” communities within 80 km (50 mi.). In addition, the review demonstrates that the construction and operation of the proposed facility do not adversely affect the distinctive character of these communities or disproportionately affect low income or minority populations.

This section, along with ER Subsection 4.4.2 and ER Subsection 5.8.3, details the studies that are used to define these populations of interest. Furthermore, the environmental justice review has two goals:

1. Define racial, ethnic, and special characteristics of the group that could be affected by any adverse environmental impacts from the facility.

2. Define the income characteristics of the populations that could be affected by any adverse environmental impacts from the facility.

The scope of the review includes an analysis of impacts on low income and minority populations, the location and significance of any environmental impact during operations on populations that are particularly sensitive, and any additional information pertaining to mitigation.

U.S. Census Bureau data from 2000 were used to identify low income or minority populations in the region and information on racial, ethnic, and income population characteristics. Based on environmental justice guidelines, each census block within the region (community of comparison) was examined for racial composition and median household income in comparison to the potential impact area as a whole.

GIS was used to determine the minority characteristics by census block group. Census block groups were included if any part of their area lay within the 80-km (50-mi.) radius. The 80-km (50-mi.) radius is centered on the centerpoint of HAR 2 and HAR 3. This centerpoint is located to the northwest of the HNP centerpoint. The total number of census block groups located within in the 80-km (50-mi.) radius based on the centerpoint of HAR 2 and HAR 3 includes 1144 block groups. The percent of minority population and low income population within the census block were then tallied based on the total block groups that exceed the criteria described in Section 2.5.4.1 for census block groups within the 80-km (50-mi.) radius.

2.5.4.1 Racial, Ethnic, and Special Groups

The 2004 NRC's "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues" defines a "minority" population as: American Indian or Alaskan Native; Asian; Native Hawaiian or other Pacific Islander; Black or African American; other single races; multi-racial; and Hispanic ethnicity (NRR Office Instruction No. LIC-203 Rev 1, Appendix D). The guidance indicates that a minority population exists if either of the following two conditions exists:

1. The minority population in the census block group or environmental impact site exceeds 50 percent.

2. The minority population percentage of the environmental impact area is significantly greater (typically at least 20 percentage points) than the minority population percentage in the geographic area chosen for comparative analysis.

Data from the 2000 census were used to determine the percentage of the total population in North Carolina of each minority category and to identify minority populations within 50 mi. of HAR. In order to obtain the percent of the block group's population represented by each minority category, population numbers for each minority population within each block group were divided by the total population of that block group. For each of the 1144 block groups within 50 mi. of HAR, the percent of the population in each minority category was calculated and compared with the result of the corresponding geographic area's minority threshold percentages to determine whether minority populations exist. The geographic area for comparative analysis for the HAR is defined as the State of North Carolina.

North Carolina is characterized by 1.2 percent of the population as American Indian or Alaskan Native; 1.4 percent Asian; 0.04 percent Native Hawaiian or other Pacific Islander; 21.6 percent Black or African American; 2.3 percent other single races; 1.3 percent multi-racial; 27.8 percent aggregate of minority races; and 4.7 percent Hispanic ethnicity (Reference 2.5-147). Using the second criteria as stated in the NRC's guidance document, census block groups were considered significant if the block group's minority population exceeded; 21.2 percent of the population as American Indian or Alaskan Native; 21.4 percent Asian; 20.04 percent Native Hawaiian or other Pacific Islander; 41.6 percent Black or African American; 22.3 percent all other single minorities; 21.3 percent multi-racial; 47.8 percent aggregate of minority races; and 24.7 percent Hispanic ethnicity.

Figure 2.5-10 presents the census block groups for each county from within the 80-km (50-mi.) radius that exceed the threshold for minority populations.

Four census blocks groups within the 80-km (50-mi.) radius have American Indian or Alaskan Native populations that are 20 percent greater than the state average (or greater than 21.2 percent). Of those four block groups, one has American Indian or Alaskan Native populations of 50 percent or more.

No census block groups with minority populations of Asian, Hawaiian or other Pacific Islander, or multi-racial exceeded 20 percent greater than the state averages or the 50 percent criteria.

Two hundred and nineteen census block groups within the 80-km (50-mi.) radius have Black or African American populations that are 20 percent greater than the state average (or greater than 41.6 percent). Of those 219 block groups, 156 have Black or African American populations of 50 percent or more.

Twelve census block groups within the 50-mile radius have other single minority populations that are 20 percent greater than the state average (or greater than 22.3 percent). No block groups with single minority populations exceed the 50 percent criteria.

Two hundred and fifty-three census block groups within the 50-mile radius have aggregate minority populations that are 20 percent greater than the state average (or greater than 47.8 percent). Of those 253 block groups, 234 have aggregate minority populations of 50 percent or more.

Thirty-seven census block groups within the 50-mile radius have Hispanic ethnicity populations that are 20 percent greater than the state average (or greater than 24.7 percent). No block groups with Hispanic populations exceed the 50 percent criteria.

As stated in Subsection 2.5.2.3, no special groups are located within the region.

2.5.4.2 Income Characteristics

An evaluation of census block group data for household income was performed to identify low income populations, as defined by the Department of Health and Human Services.[1] The 2004 NRC guidance defines low income based on statistical poverty thresholds (NRR Office Instruction No. LIC-203 Rev 1, Appendix D). The low income households in each census block group were divided by the total households for that block group to obtain the percentage of low income households per block group. A low income population is considered to be present if:

1. The low income population in the census block group or environmental impact site exceeds 50 percent.

2. The percentage of households below the poverty level in an environmental impact area is significantly greater (typically at least 20 percentage points) than the low income population percentage in the geographic area chosen for comparative analysis. The geographic area for comparative analysis for the HAR is defined as the State of North Carolina. The state average for low income population is 12.3 percent (Reference 2.5-148).

Fifty-eight census block groups within the 80-km (50-mi.) radius have low income households that are 20 percent greater than the state average (or greater than 32.3 percent). Of these 58 block groups, 8 have 50 percent or more low income households. The populations below the poverty level within each census block are shown in Figure 2.5-11.

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[1] The Department of Health and Human Services defines “low income” and those residents living below the defined poverty guideline; the U.S. Census Bureau defines families whose income falls below the poverty threshold as “poor” (for more information, refer to www.census.gov). For a family of four, the poverty threshold for the year 2000 is $17,463.

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Table 2.5-1 (Sheet 1 of 2)
2000 Resident and Transient Population within 16 km (10 mi.)

mi. km	0-1 0-1.61	1-2 1.61-3.22	2-3 3.22-4.83	3-4 4.83-6.44	4-5 6.44-8.05	5-10 8.05-16.1	Total for Sector
North-Residential	0	22	82	89	119	999	**1,311**
North-Transient	0	0	0	0	0	3	**3**
North-Northeast-Residential	0	20	121	166	168	7,755	**8,230**
North-Northeast-Transient	0	0	0	0	0	898	**898**
Northeast-Residential	0	23	81	90	138	12,619	**12,951**
Northeast-Transient	0	0	0	0	0	8,845	**8,845**
East-Northeast-Residential	0	5	20	24	23	6,999	**7,071**
East-Northeast-Transient	0	0	0	0	0	219	**219**
East-Residential	0	3	11	14	106	9,006	**9,140**
East-Transient	0	0	0	0	0	3,224	**3,224**
East-Southeast-Residential	1	3	4	29	52	8,183	**8,272**
East-Southeast-Transient	0	78	63	0	0	4,053	**4,194**
Southeast-Residential	0	3	3	14	52	2,238	**2,310**
Southeast-Transient	0	77	9	0	0	529	**615**
South-Southeast-Residential	0	0	3	2	22	898	**925**
South-Southeast-Transient	0	12	0	0	1	4	**17**
South-Residential	0	0	0	1	2	283	**286**
South-Transient	0	0	0	1	1	6	**8**
South-Southwest-Residential	0	0	1	14	30	611	**656**
South-Southwest-Transient	0	0	0	1	1	5	**7**
Southwest-Residential	0	0	5	19	22	303	**349**
Southwest-Transient	0	0	0	1	1	476	**478**
West-Southwest-Residential	0	0	6	20	62	961	**1,049**
West-Southwest-Transient	0	0	0	1	1	1,467	**1,469**

Table 2.5-1 (Sheet 2 of 2)
2000 Resident and Transient Population within 16 km (10 mi.)

mi. km	0-1 0-1.61	1-2 1.61-3.22	2-3 3.22-4.83	3-4 4.83-6.44	4-5 6.44-8.05	5-10 8.05-16.1	Total for Sector
West-Residential	0	0	29	66	73	1,049	**1,217**
West-Transient	0	0	165	1	1	225	**392**
West-Northwest-Residential	0	7	35	58	78	257	**435**
West-Northwest-Transient	0	0	0	1	1	3	**5**
Northwest-Residential	2	19	37	51	51	439	**599**
Northwest-Transient	0	0	0	1	1	4	**6**
North-Northwest-Residential	2	35	49	24	34	274	**418**
North-Northwest-Transient	0	0	0	0	0	3,985	**3,985**
Residential Total	**5**	**140**	**487**	**681**	**1,032**	**52,874**	**55,219**
Cumulative Total Residential plus Transient)	**5**	**307**	**724**	**688**	**1,040**	**76,820**	**79,584**

Notes:
To account for the difference in distance between each proposed unit and the HAR centerpoint, 0.16 km (0.1 mi.) was added to each radial distance to conservatively adjust the population data. The totals are subject to rounding differences.

Source: Reference 2.5-001

Table 2.5-2 (Sheet 1 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi.	0-1	1-2	2-3	3-4	4-5	5-10	Total for
km	0-1.61	1.61-3.22	3.22-4.83	4.83-6.44	6.44-8.05	8.05-16.1	Sector
North-Residential							
2010 Population	1	31	115	123	163	1,300	**1,733**
2020 Population	1	40	149	158	209	1,601	**2,157**
2030 Population	1	50	184	195	257	1,914	**2,600**
2040 Population	1	65	241	254	333	2,386	**3,281**
2050 Population	1	85	316	331	432	2,981	**4,146**
2060 Population	2	112	413	432	560	3,730	**5,249**
2070 Population	2	146	541	563	728	4,675	**6,656**
2080 Population	3	192	709	735	946	5,871	**8,455**
North-Transient							
2010 Population	0	0	0	0	0	4	**4**
2020 Population	0	0	0	0	0	5	**5**
2030 Population	0	0	0	0	0	6	**6**
2040 Population	0	0	0	0	0	8	**8**
2050 Population	0	0	0	0	0	10	**10**
2060 Population	0	0	0	0	0	12	**12**
2070 Population	0	0	0	0	0	16	**16**
2080 Population	0	0	0	0	0	20	**20**
North-Northwest-Residential							
2010 Population	0	28	168	231	235	10,828	**11,490**
2020 Population	0	36	218	299	304	13,996	**14,852**
2030 Population	0	44	270	370	376	17,351	**18,412**
2040 Population	0	58	353	485	493	22,721	**24,110**

Table 2.5-2 (Sheet 2 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. / km	0-1 / 0-1.61	1-2 / 1.61-3.22	2-3 / 3.22-4.83	3-4 / 4.83-6.44	4-5 / 6.44-8.05	5-10 / 8.05-16.1	Total for Sector
2050 Population	0	76	463	635	646	29,753	**31,573**
2060 Population	0	99	606	832	845	38,962	**41,345**
2070 Population	0	130	794	1,089	1,107	51,021	**54,141**
2080 Population	0	170	1,039	1,427	1,450	66,812	**70,898**
North-Northeast-Transient							
2010 Population	0	0	0	0	0	1,254	**1,254**
2020 Population	0	0	0	0	0	1,621	**1,621**
2030 Population	0	0	0	0	0	2,009	**2,009**
2040 Population	0	0	0	0	0	2,631	**2,631**
2050 Population	0	0	0	0	0	3,445	**3,445**
2060 Population	0	0	0	0	0	4,512	**4,512**
2070 Population	0	0	0	0	0	5,908	**5,908**
2080 Population	0	0	0	0	0	7,736	**7,736**
Northeast-Residential							
2010 Population	0	33	113	125	193	17,618	**18,083**
2020 Population	0	42	147	162	250	22,773	**23,374**
2030 Population	0	52	182	201	310	28,232	**28,977**
2040 Population	0	69	238	263	406	36,970	**37,946**
2050 Population	0	90	312	345	531	48,413	**49,690**
2060 Population	0	118	408	451	696	63,396	**65,069**
2070 Population	0	154	534	591	911	83,018	**85,209**
2080 Population	1	202	700	774	1,193	108,712	**111,581**

Table 2.5-2 (Sheet 3 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. / km	0-1 / 0-1.61	1-2 / 1.61-3.22	2-3 / 3.22-4.83	3-4 / 4.83-6.44	4-5 / 6.44-8.05	5-10 / 8.05-16.1	Total for Sector
Northeast-Transient							
2010 Population	0	0	0	0	0	12,350	**12,350**
2020 Population	0	0	0	0	0	15,963	**15,963**
2030 Population	0	0	0	0	0	19,789	**19,789**
2040 Population	0	0	0	0	0	25,914	**25,914**
2050 Population	0	0	0	0	0	33,935	**33,935**
2060 Population	0	0	0	0	0	44,438	**44,438**
2070 Population	0	0	0	0	0	58,191	**58,191**
2080 Population	0	0	0	0	0	76,201	**76,201**
East-Northeast-Residential							
2010 Population	1	7	28	33	33	9,772	**9,874**
2020 Population	1	9	36	43	42	12,631	**12,763**
2030 Population	1	12	45	53	52	15,659	**15,822**
2040 Population	2	15	58	70	68	20,506	**20,719**
2050 Population	2	20	76	92	89	26,852	**27,132**
2060 Population	3	26	100	120	117	35,163	**35,529**
2070 Population	3	34	131	157	153	46,046	**46,526**
2080 Population	4	45	172	206	201	60,298	**60,926**
East-Northeast-Transient							
2010 Population	0	0	0	0	0	306	**306**
2020 Population	0	0	0	0	0	395	**395**
2030 Population	0	0	0	0	0	490	**490**
2040 Population	0	0	0	0	0	642	**642**

Table 2.5-2 (Sheet 4 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi.	0-1	1-2	2-3	3-4	4-5	5-10	Total for
km	0-1.61	1.61-3.22	3.22-4.83	4.83-6.44	6.44-8.05	8.05-16.1	Sector
2050 Population	0	0	0	0	0	840	**840**
2060 Population	0	0	0	0	0	1,100	**1,100**
2070 Population	0	0	0	0	0	1,441	**1,441**
2080 Population	0	0	0	0	0	1,887	**1,887**
East-Residential							
2010 Population	0	4	16	20	148	12,574	**12,761**
2020 Population	0	5	21	25	191	16,252	**16,494**
2030 Population	0	6	26	31	237	20,148	**20,448**
2040 Population	0	7	34	41	310	26,385	**26,777**
2050 Population	0	10	44	54	406	34,551	**35,064**
2060 Population	0	13	58	70	532	45,244	**45,917**
2070 Population	0	17	75	92	696	59,247	**60,128**
2080 Population	1	22	99	121	912	77,585	**78,738**
East-Transient							
2010 Population	0	0	0	0	0	4,501	**4,501**
2020 Population	0	0	0	0	0	5,818	**5,818**
2030 Population	0	0	0	0	0	7,213	**7,213**
2040 Population	0	0	0	0	0	9,446	**9,446**
2050 Population	0	0	0	0	0	12,369	**12,369**
2060 Population	0	0	0	0	0	16,198	**16,198**
2070 Population	0	0	0	0	0	21,211	**21,211**
2080 Population	0	0	0	0	0	27,776	**27,776**

Table 2.5-2 (Sheet 5 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi.	0-1	1-2	2-3	3-4	4-5	5-10	Total for
km	0-1.61	1.61-3.22	3.22-4.83	4.83-6.44	6.44-8.05	8.05-16.1	Sector
East-Southeast-Residential							
2010 Population	0	5	5	40	72	11,425	**11,547**
2020 Population	0	6	7	52	93	14,767	**14,925**
2030 Population	0	8	8	64	115	18,308	**18,503**
2040 Population	0	10	11	84	151	23,974	**24,230**
2050 Population	0	13	14	110	198	31,394	**31,729**
2060 Population	0	17	18	144	259	41,111	**41,549**
2070 Population	0	23	24	188	339	53,835	**54,409**
2080 Population	0	30	32	247	444	70,497	**71,249**
East-Southeast-Transient							
2010 Population	0	109	88	0	0	5,659	**5,856**
2020 Population	0	140	114	0	0	7,314	**7,568**
2030 Population	0	176	141	0	0	9,068	**9,385**
2040 Population	0	230	185	0	0	11,874	**12,288**
2050 Population	0	301	242	0	0	15,549	**16,092**
2060 Population	0	394	317	0	0	20,362	**21,073**
2070 Population	0	515	415	0	0	26,664	**27,593**
2080 Population	0	675	543	0	0	34,916	**36,134**

Table 2.5-2 (Sheet 6 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. / km	0-1 / 0-1.61	1-2 / 1.61-3.22	2-3 / 3.22-4.83	3-4 / 4.83-6.44	4-5 / 6.44-8.05	5-10 / 8.05-16.1	Total for Sector
Southeast-Residential							
2010 Population	0	4	4	19	72	2,879	**2,979**
2020 Population	0	6	5	25	93	3,570	**3,699**
2030 Population	0	7	7	31	114	4,291	**4,450**
2040 Population	0	9	9	41	149	5,349	**5,556**
2050 Population	0	12	11	53	194	6,677	**6,947**
2060 Population	0	15	15	70	253	8,346	**8,699**
2070 Population	0	20	20	91	330	10,449	**10,910**
2080 Population	0	26	26	120	430	13,102	**13,703**
Southeast-Transient							
2010 Population	0	108	13	0	0	701	**822**
2020 Population	0	140	16	0	0	883	**1,039**
2030 Population	0	173	20	0	0	1,074	**1,267**
2040 Population	0	227	26	0	0	1,365	**1,618**
2050 Population	0	297	35	0	0	1,738	**2,069**
2060 Population	0	388	45	0	0	2,215	**2,649**
2070 Population	0	509	59	0	0	2,828	**3,396**
2080 Population	0	666	78	0	0	3,614	**4,358**
South-Southeast-Residential							
2010 Population	0	1	4	2	27	1,111	**1,145**
2020 Population	0	1	5	3	33	1,348	**1,390**
2030 Population	0	1	6	3	39	1,592	**1,643**
2040 Population	0	1	8	5	48	1,928	**1,989**
2050 Population	0	2	11	6	58	2,333	**2,409**

Table 2.5-2 (Sheet 7 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. km	0-1 0-1.61	1-2 1.61-3.22	2-3 3.22-4.83	3-4 4.83-6.44	4-5 6.44-8.05	5-10 8.05-16.1	Total for Sector
2060 Population	0	3	14	8	70	2,824	**2,918**
2070 Population	0	3	18	10	84	3,419	**3,535**
2080 Population	0	4	24	13	102	4,138	**4,282**
South-Southeast-Transient							
2010 Population	0	17	0	0	1	5	**23**
2020 Population	0	22	0	0	2	6	**29**
2030 Population	0	27	0	0	2	7	**36**
2040 Population	0	35	0	0	2	9	**46**
2050 Population	0	46	0	0	3	10	**59**
2060 Population	0	61	0	0	3	13	**76**
2070 Population	0	79	0	0	4	15	**99**
2080 Population	0	104	0	0	5	18	**127**
South-Residential							
2010 Population	0	0	0	1	2	349	**353**
2020 Population	0	0	0	1	3	420	**424**
2030 Population	0	0	0	2	3	492	**497**
2040 Population	0	0	1	2	4	593	**599**
2050 Population	0	0	1	2	4	713	**721**
2060 Population	0	0	1	3	5	859	**868**
2070 Population	0	0	1	3	7	1,034	**1,046**
2080 Population	0	0	2	4	8	1,246	**1,259**

Table 2.5-2 (Sheet 8 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. / km	0-1 / 0-1.61	1-2 / 1.61-3.22	2-3 / 3.22-4.83	3-4 / 4.83-6.44	4-5 / 6.44-8.05	5-10 / 8.05-16.1	Total for Sector
South-Transient							
2010 Population	0	0	0	1	1	7	**10**
2020 Population	0	0	0	2	1	9	**12**
2030 Population	0	0	0	2	2	10	**14**
2040 Population	0	0	0	2	2	13	**17**
2050 Population	0	0	0	3	3	15	**20**
2060 Population	0	0	0	3	3	18	**24**
2070 Population	0	0	0	4	4	22	**29**
2080 Population	0	0	0	4	4	27	**36**
South-Southwest-Residential							
2010 Population	0	0	2	17	38	729	**786**
2020 Population	0	0	2	20	45	846	**914**
2030 Population	0	0	3	24	53	968	**1,048**
2040 Population	0	0	3	29	64	1,130	**1,226**
2050 Population	0	0	4	35	77	1,319	**1,434**
2060 Population	0	0	4	42	92	1,540	**1,678**
2070 Population	0	0	5	50	111	1,798	**1,965**
2080 Population	0	0	6	60	134	2,100	**2,300**
South-Southwest-Transient							
2010 Population	0	0	0	1	1	6	**8**
2020 Population	0	0	0	2	1	7	**10**
2030 Population	0	0	0	2	2	8	**11**
2040 Population	0	0	0	2	2	9	**13**
2050 Population	0	0	0	3	3	11	**16**

Table 2.5-2 (Sheet 9 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. / km	0-1 / 0-1.61	1-2 / 1.61-3.22	2-3 / 3.22-4.83	3-4 / 4.83-6.44	4-5 / 6.44-8.05	5-10 / 8.05-16.1	Total for Sector
2060 Population	0	0	0	3	3	13	**19**
2070 Population	0	0	0	4	4	15	**22**
2080 Population	0	0	0	4	4	17	**26**
Southwest-Residential							
2010 Population	0	0	6	24	27	364	**421**
2020 Population	0	0	7	28	33	425	**493**
2030 Population	0	0	9	33	38	488	**568**
2040 Population	0	0	10	40	46	573	**669**
2050 Population	0	0	12	48	55	673	**788**
2060 Population	0	0	15	58	67	790	**929**
2070 Population	0	0	18	69	80	928	**1,095**
2080 Population	0	0	22	83	97	1,090	**1,292**
Southwest-Transient							
2010 Population	0	0	0	1	1	567	**569**
2020 Population	0	0	0	2	1	657	**660**
2030 Population	0	0	0	2	2	751	**754**
2040 Population	0	0	0	2	2	874	**879**
2050 Population	0	0	0	3	3	1,018	**1,023**
2060 Population	0	0	0	3	3	1,186	**1,192**
2070 Population	0	0	0	4	4	1,382	**1,389**
2080 Population	0	0	0	4	4	1,610	**1,618**

Table 2.5-2 (Sheet 10 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. km	0-1 0-1.61	1-2 1.61-3.22	2-3 3.22-4.83	3-4 4.83-6.44	4-5 6.44-8.05	5-10 8.05-16.1	Total for Sector
West-Southwest-Residential							
2010 Population	0	0	8	25	78	1,152	**1,263**
2020 Population	0	0	10	30	93	1,341	**1,473**
2030 Population	0	0	11	35	108	1,537	**1,691**
2040 Population	0	0	13	42	130	1,798	**1,984**
2050 Population	0	1	16	51	157	2,104	**2,328**
2060 Population	0	1	19	61	188	2,464	**2,733**
2070 Population	0	1	23	73	227	2,885	**3,209**
2080 Population	0	1	28	88	273	3,379	**3,770**
West-Southwest-Transient							
2010 Population	0	0	0	1	1	1,751	**1,753**
2020 Population	0	0	0	2	1	2,032	**2,035**
2030 Population	0	0	0	2	2	2,325	**2,329**
2040 Population	0	0	0	2	2	2,713	**2,717**
2050 Population	0	0	0	3	3	3,165	**3,170**
2060 Population	0	0	0	3	3	3,694	**3,700**
2070 Population	0	0	0	4	4	4,311	**4,319**
2080 Population	0	0	0	4	4	5,034	**5,043**

Table 2.5-2 (Sheet 11 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. km	0-1 0-1.61	1-2 1.61-3.22	2-3 3.22-4.83	3-4 4.83-6.44	4-5 6.44-8.05	5-10 8.05-16.1	Total for Sector
West-Residential							
2010 Population	0	1	36	83	91	1,305	**1,515**
2020 Population	0	1	43	99	108	1,554	**1,805**
2030 Population	0	1	50	115	126	1,809	**2,102**
2040 Population	0	1	61	139	152	2,170	**2,523**
2050 Population	0	1	73	167	183	2,603	**3,028**
2060 Population	0	2	88	201	220	3,124	**3,635**
2070 Population	0	2	106	242	265	3,749	**4,364**
2080 Population	0	2	127	291	319	4,500	**5,240**
West-Transient							
2010 Population	0	0	203	1	1	278	**483**
2020 Population	0	0	248	2	1	330	**580**
2030 Population	0	0	285	2	2	383	**672**
2040 Population	0	0	345	2	2	458	**807**
2050 Population	0	0	413	3	3	547	**965**
2060 Population	0	0	495	3	3	655	**1,156**
2070 Population	0	0	600	4	4	783	**1,390**
2080 Population	0	0	720	4	4	936	**1,665**
West-Northwest-Residential							
2010 Population	0	9	44	73	98	321	**544**
2020 Population	0	11	52	87	117	383	**650**
2030 Population	0	14	61	101	136	447	**759**
2040 Population	0	17	74	122	164	538	**914**
2050 Population	0	22	89	147	197	647	**1,102**

Table 2.5-2 (Sheet 12 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. / km	0-1 / 0-1.61	1-2 / 1.61-3.22	2-3 / 3.22-4.83	3-4 / 4.83-6.44	4-5 / 6.44-8.05	5-10 / 8.05-16.1	Total for Sector
2060 Population	0	28	107	177	237	779	**1,327**
2070 Population	1	35	128	213	285	937	**1,599**
2080 Population	1	45	155	256	343	1,128	**1,927**
West-Northwest-Transient							
2010 Population	0	0	0	1	1	4	**6**
2020 Population	0	0	0	2	1	4	**7**
2030 Population	0	0	0	2	2	5	**9**
2040 Population	0	0	0	2	2	6	**10**
2050 Population	0	0	0	3	3	8	**13**
2060 Population	0	0	0	3	3	9	**15**
2070 Population	0	0	0	4	4	11	**18**
2080 Population	0	0	0	4	4	13	**22**
Northwest-Residential							
2010 Population	2	25	46	64	63	548	**749**
2020 Population	3	31	55	76	76	655	**896**
2030 Population	4	37	64	89	88	764	**1,046**
2040 Population	5	47	77	107	106	919	**1,262**
2050 Population	7	60	92	129	128	1,106	**1,522**
2060 Population	9	76	111	155	154	1,332	**1,837**
2070 Population	11	97	134	187	185	1,603	**2,216**
2080 Population	15	123	161	225	222	1,929	**2,675**

Table 2.5-2 (Sheet 13 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. / km	0-1 / 0-1.61	1-2 / 1.61-3.22	2-3 / 3.22-4.83	3-4 / 4.83-6.44	4-5 / 6.44-8.05	5-10 / 8.05-16.1	Total for Sector
Northwest-Transient							
2010 Population	0	0	0	1	1	5	**7**
2020 Population	0	0	0	2	1	6	**9**
2030 Population	0	0	0	2	2	7	**10**
2040 Population	0	0	0	2	2	8	**13**
2050 Population	0	0	0	3	2	10	**15**
2060 Population	0	0	0	3	3	12	**18**
2070 Population	0	0	0	4	4	15	**22**
2080 Population	0	0	0	4	4	18	**26**
North-Northwest-Residential							
2010 Population	2	48	64	30	42	342	**528**
2020 Population	3	61	79	36	50	409	**638**
2030 Population	4	76	94	42	59	477	**751**
2040 Population	5	98	118	50	71	574	**915**
2050 Population	7	128	147	60	85	690	**1,117**
2060 Population	9	167	184	73	102	831	**1,365**
2070 Population	11	217	231	87	123	1,000	**1,670**
2080 Population	15	283	290	105	148	1,203	**2,045**
North-Northwest-Transient							
2010 Population	0	0	0	0	0	4,979	**4,979**
2020 Population	0	0	0	0	0	5,947	**5,947**
2030 Population	0	0	0	0	0	6,937	**6,937**
2040 Population	0	0	0	0	0	8,348	**8,348**

Table 2.5-2 (Sheet 14 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. km	0-1 0-1.61	1-2 1.61-3.22	2-3 3.22-4.83	3-4 4.83-6.44	4-5 6.44-8.05	5-10 8.05-16.1	Total for Sector
2050 Population	0	0	0	0	0	10,047	**10,047**
2060 Population	0	0	0	0	0	12,091	**12,091**
2070 Population	0	0	0	0	0	14,552	**14,552**
2080 Population	0	0	0	0	0	17,512	**17,512**
2010 Population							
Residential Total	6	194	660	911	1,382	72,617	**75,771**
Cumulative Total (Residential plus Transient)	6	428	963	920	1,392	104,993	**108,703**
2020 Population							
Residential Total	8	249	835	1,145	1,739	92,970	**96,946**
Cumulative Total (Residential plus Transient)	8	551	1,213	1,156	1,751	133,967	**138,645**
2030 Population							
Residential Total	10	307	1,019	1,391	2,113	114,477	**119,318**
Cumulative Total (Residential plus Transient)	10	683	1,465	1,403	2,127	164,561	**170,250**
2040 Population							
Residential Total	13	400	1,308	1,774	2,694	148,512	**154,700**
Cumulative Total (Residential plus Transient)	13	891	1,864	1,788	2,711	212,830	**220,097**
2050 Population							
Residential Total	17	520	1,680	2,265	3,440	192,809	**200,731**
Cumulative Total (Residential plus Transient)	17	1,163	2,369	2,282	3,460	275,528	**284,820**

Table 2.5-2 (Sheet 15 of 15)
Resident and Transient Population Projections within 16 km (10 mi.)

mi. km	0-1 0-1.61	1-2 1.61-3.22	2-3 3.22-4.83	3-4 4.83-6.44	4-5 6.44-8.05	5-10 8.05-16.1	Total for Sector
2060 Population							
Residential Total	23	676	2,162	2,896	4,398	250,493	**260,648**
Cumulative Total (Residential plus Transient)	23	1,520	3,019	2,917	4,423	357,020	**368,921**
2070 Population							
Residential Total	30	880	2,784	3,708	5,632	325,643	**338,678**
Cumulative Total (Residential plus Transient)	30	1,983	3,858	3,734	5,662	463,006	**478,273**
2080 Population							
Residential Total	39	1,146	3,589	4,755	7,222	423,588	**440,340**
Cumulative Total (Residential plus Transient)	39	2,591	4,930	4,786	7,258	600,925	**620,529**

Notes:
To account for the difference in distance between each proposed unit and the HAR centerpoint, 0.16 km (0.1 mi.) was added to each radial distance to conservatively adjust the population data. The totals are subject to rounding differences.

Source: Reference 2.5-001

Table 2.5-3
2000 Resident and Transient Population between 16 km and 80 km (10 mi. and 50 mi.)

Mi. Km	10-20 16-32	20-30 32-48	30-40 48-64	40-50 64-80	Total for Sector
North-Residential	26,833	150,895	25,818	13,975	**217,521**
North-Transient	1,941	3,286	938	134	**6,299**
North-Northeast-Residential	22,862	45,342	20,709	12,057	**100,970**
North-Northeast-Transient	2,724	2,646	410	177	**5,957**
Northeast-Residential	107,335	150,622	34,588	19,172	**311,717**
Northeast-Transient	3,514	2,582	385	357	**6,838**
East-Northeast-Residential	75,967	108,363	32,014	19,983	**236,327**
East-Northeast-Transient	1,242	2,334	110	327	**4,013**
East-Residential	27,829	32,145	23,381	18,594	**101,949**
East-Transient	21	588	82	152	**843**
East-Southeast-Residential	16,905	15,620	22,132	13,936	**68,593**
East-South east-Transient	174	62	1,015	72	**1,323**
Southeast-Residential	12,282	26,062	15,429	9,791	**63,564**
Southeast-Transient	13	305	719	111	**1,148**
South-Southeast-Residential	6,903	8,949	10,377	17,340	**43,569**
South-Southeast-Transient	395	37	240	117	**789**
South-Residential	4,777	18,020	138,693	134,349	**295,839**
South-Transient	37	102	1,803	2,727	**4,669**
South-Southwest-Residential	7,886	11,707	10,206	18,915	**48,714**
South-Southwest-Transient	96	40	103	227	**466**
Southwest-Residential	25,432	10,090	20,419	32,649	**88,590**
Southwest-Transient	706	122	551	2,570	**3,949**
West-Southwest-Residential	5,718	4,275	7,311	9,829	**27,133**
West-Southwest-Transient	15	670	99	156	**940**
West-Residential	2,490	6,695	8,460	44,116	**61,761**
West-Transient	22	30	25	458	**535**
West-Northwest-Residential	4,246	8,651	13,768	30,994	**57,659**
West-Northwest-Transient	42	151	3	24	**220**
Northwest-Residential	6,672	7,698	42,007	74,026	**130,403**
Northwest-Transient	42	98	1,103	816	**2,059**
North-Northwest-Residential	40,738	38,246	29,766	10,368	**119,118**
North-Northwest-Transient	351	476	395	56	**4,508**
Residential Total	**394,875**	**643,380**	**455,078**	**480,094**	**1,973,427**
Cumulative Total (Residential plus Transient)	**409,440**	**656,909**	**463,059**	**488,575**	**2,017,983**

Notes:
To account for the difference in distance between each proposed unit and the HAR centerpoint, 0.16 km (0.1 mi.) was added to each radial distance to conservatively adjust the population data. The totals are subject to rounding differences.

Source: Reference 2.5-001

Table 2.5-4 (Sheet 1 of 9)
Resident and Transient Population Projections between 16 km and 80 km (10 mi. and 50 mi.)

mi. / km	10-20 / 16-32	20-30 / 32-48	30-40 / 48-64	40-50 / 64-80	Total for Sector
North-Residential					
2010 Population	31,174	174,193	29,690	15,383	**250,440**
2020 Population	35,615	198,108	33,697	17,015	**284,434**
2030 Population	40,156	222,577	37,729	18,548	**319,010**
2040 Population	45,981	253,399	42,824	20,391	**362,594**
2050 Population	52,681	288,500	48,610	22,419	**412,210**
2060 Population	60,394	328,474	55,183	24,653	**468,705**
2070 Population	69,285	373,999	62,649	27,114	**533,047**
2080 Population	79,543	425,848	71,130	29,826	**606,347**
North-Transient					
2010 Population	2,255	3,793	1,079	148	**7,275**
2020 Population	2,576	4,314	1,224	163	**8,277**
2030 Population	2,905	4,847	1,371	178	**9,301**
2040 Population	3,326	5,518	1,556	196	**10,596**
2050 Population	3,811	6,283	1,766	215	**12,075**
2060 Population	4,369	7,153	2,005	236	**13,763**
2070 Population	5,012	8,144	2,276	260	**15,692**
2080 Population	5,754	9,274	2,584	286	**17,898**
North-Northeast-Residential					
2010 Population	31,480	55,126	24,834	14,220	**125,661**
2020 Population	40,362	65,163	29,155	16,509	**151,189**
2030 Population	49,762	75,652	33,437	18,743	**177,594**
2040 Population	64,703	90,492	39,330	21,733	**216,257**
2050 Population	84,203	108,719	46,327	25,209	**264,458**
2060 Population	109,664	131,214	54,652	29,251	**324,781**
2070 Population	142,921	159,103	64,582	33,951	**400,556**
2080 Population	186,375	193,835	76,455	39,417	**496,082**
North-Northeast-Transient					
2010 Population	3,751	3,217	492	209	**7,669**
2020 Population	4,809	3,803	577	242	**9,431**
2030 Population	5,929	4,415	662	275	**11,281**
2040 Population	7,709	5,281	779	319	**14,088**
2050 Population	10,033	6,344	917	370	**17,664**
2060 Population	13,066	7,657	1,082	429	**22,234**
2070 Population	17,029	9,285	1,279	498	**28,091**
2080 Population	22,207	11,312	1,514	579	**35,612**

Table 2.5-4 (Sheet 2 of 9)
Resident and Transient Population Projections between 16 km and 80 km (10 mi. and 50 mi.)

mi. km	10-20 16-32	20-30 32-48	30-40 48-64	40-50 64-80	Total for Sector
Northeast-Residential					
2010 Population	149,864	210,302	47,070	24,008	**431,244**
2020 Population	193,707	271,827	59,926	28,969	**554,430**
2030 Population	240,145	336,993	73,452	34,048	**684,638**
2040 Population	314,471	441,293	94,721	41,335	**891,820**
2050 Population	411,801	577,876	122,273	50,224	**1,162,173**
2060 Population	539,255	756,730	157,991	61,069	**1,515,045**
2070 Population	706,156	990,942	204,326	74,303	**1,975,727**
2080 Population	924,715	1,297,642	264,472	90,458	**2,577,288**
Northeast-Transient					
2010 Population	4,906	3,605	524	447	**9,482**
2020 Population	6,342	4,660	667	539	**12,208**
2030 Population	7,862	5,777	818	634	**15,091**
2040 Population	10,295	7,565	1,054	770	**19,684**
2050 Population	13,482	9,906	1,361	935	**25,684**
2060 Population	17,654	12,972	1,759	1,137	**33,522**
2070 Population	23,119	16,987	2,274	1,384	**43,764**
2080 Population	30,274	22,245	2,944	1,684	**57,147**
East-Northeast-Residential					
2010 Population	106,067	151,299	44,588	24,373	**326,327**
2020 Population	137,098	195,562	57,566	28,861	**419,087**
2030 Population	169,964	242,444	71,325	33,437	**517,170**
2040 Population	222,569	317,482	93,282	40,038	**673,371**
2050 Population	291,455	415,743	122,010	48,130	**877,338**
2060 Population	381,662	544,418	159,597	58,077	**1,143,754**
2070 Population	499,788	712,917	208,778	70,337	**1,491,820**
2080 Population	654,474	933,568	273,132	85,485	**1,946,659**
East-Northeast-Transient					
2010 Population	1,734	3,259	153	399	**5,545**
2020 Population	2,241	4,212	198	472	**7,123**
2030 Population	2,779	5,222	245	547	**8,793**
2040 Population	3,639	6,838	321	655	**11,453**
2050 Population	4,765	8,955	419	788	**14,927**
2060 Population	6,240	11,726	548	950	**19,464**
2070 Population	8,171	15,355	717	1,151	**25,394**
2080 Population	10,700	20,108	938	1,399	**33,145**

Table 2.5-4 (Sheet 3 of 9)
Resident and Transient Population Projections between 16 km and 80 km (10 mi. and 50 mi.)

mi. / km	10-20 / 16-32	20-30 / 32-48	30-40 / 48-64	40-50 / 64-80	Total for Sector
East-Residential					
2010 Population	38,854	44,674	32,442	24,192	**140,162**
2020 Population	50,221	57,791	41,980	30,058	**180,050**
2030 Population	62,263	71,922	52,313	36,354	**222,852**
2040 Population	81,533	94,167	68,490	46,050	**290,241**
2050 Population	106,768	123,293	89,669	58,625	**378,356**
2060 Population	139,813	161,428	117,398	74,956	**493,596**
2070 Population	183,086	211,358	153,701	96,197	**644,342**
2080 Population	239,751	276,731	201,231	123,854	**841,567**
East-Transient					
2010 Population	29	817	114	198	**1,158**
2020 Population	38	1,057	147	246	**1,488**
2030 Population	47	1,316	183	297	**1,843**
2040 Population	62	1,723	240	376	**2,401**
2050 Population	81	2,255	314	479	**3,129**
2060 Population	106	2,953	412	613	**4,084**
2070 Population	138	3,866	539	786	**5,329**
2080 Population	181	5,062	706	1,012	**6,961**
East-Southeast-Residential					
2010 Population	23,284	21,661	30,709	17,774	**93,428**
2020 Population	29,922	28,021	39,737	21,826	**119,506**
2030 Population	36,972	34,910	49,519	26,167	**147,568**
2040 Population	48,092	45,691	64,831	32,862	**191,476**
2050 Population	62,584	59,803	84,879	41,556	**248,823**
2060 Population	81,480	78,275	111,126	52,864	**323,745**
2070 Population	106,125	102,455	145,490	67,588	**421,658**
2080 Population	138,275	134,106	190,480	86,783	**549,644**
East-Southeast-Transient					
2010 Population	240	86	1,408	92	**1,826**
2020 Population	308	111	1,822	113	**2,354**
2030 Population	381	139	2,271	135	**2,926**
2040 Population	495	181	2,973	170	**3,819**
2050 Population	644	237	3,893	215	**4,989**
2060 Population	839	311	5,096	273	**6,519**
2070 Population	1,092	407	6,672	349	**8,520**
2080 Population	1,423	532	8,736	448	**11,139**

Table 2.5-4 (Sheet 4 of 9)
Resident and Transient Population Projections between 16 km and 80 km (10 mi. and 50 mi.)

mi. / km	10-20 / 16-32	20-30 / 32-48	30-40 / 48-64	40-50 / 64-80	Total for Sector
Southeast-Residential					
2010 Population	15,216	32,699	19,286	11,296	**78,497**
2020 Population	18,477	40,012	23,560	13,116	**95,165**
2030 Population	21,846	47,631	28,099	15,056	**112,633**
2040 Population	26,480	58,337	34,534	17,420	**136,772**
2050 Population	32,100	71,507	42,570	20,184	**166,362**
2060 Population	38,918	87,726	52,631	23,423	**202,698**
2070 Population	47,190	107,718	65,263	27,228	**247,399**
2080 Population	57,227	132,392	81,161	31,711	**302,491**
Southeast-Transient					
2010 Population	16	383	899	128	**1,426**
2020 Population	20	468	1,098	149	**1,735**
2030 Population	23	557	1,309	171	**2,060**
2040 Population	28	683	1,609	197	**2,517**
2050 Population	34	837	1,984	229	**3,084**
2060 Population	41	1,027	2,453	266	**3,787**
2070 Population	50	1,261	3,041	309	**4,661**
2080 Population	61	1,549	3,782	360	**5,752**
South-Southeast-Residential					
2010 Population	8,538	10,718	10,882	18,531	**48,668**
2020 Population	10,357	12,736	11,728	20,295	**55,115**
2030 Population	12,236	14,803	12,518	22,036	**61,593**
2040 Population	14,810	17,600	13,369	23,963	**69,742**
2050 Population	17,927	20,971	14,303	26,110	**79,311**
2060 Population	21,700	25,035	15,332	28,508	**90,574**
2070 Population	26,266	29,938	16,468	31,189	**103,861**
2080 Population	31,793	35,855	17,727	34,193	**119,569**
South-Southeast-Transient					
2010 Population	489	44	252	125	**910**
2020 Population	593	53	271	137	**1,054**
2030 Population	700	61	290	149	**1,200**
2040 Population	847	73	309	162	**1,391**
2050 Population	1,026	87	331	176	**1,620**
2060 Population	1,242	104	355	192	**1,893**
2070 Population	1,503	124	381	210	**2,218**
2080 Population	1,818	148	408	230	**2,604**

Table 2.5-4 (Sheet 5 of 9)
Resident and Transient Population Projections between 16 km and 80 km (10 mi. and 50 mi.)

mi. / km	10-20 / 16-32	20-30 / 32-48	30-40 / 48-64	40-50 / 64-80	Total for Sector
South-Residential					
2010 Population	5,908	21,609	142,896	141,150	**311,564**
2020 Population	7,167	25,700	151,670	152,172	**336,709**
2030 Population	8,467	29,894	159,341	162,470	**360,172**
2040 Population	10,249	35,570	166,905	174,610	**387,335**
2050 Population	12,406	42,412	174,833	188,746	**418,397**
2060 Population	15,017	50,663	183,144	205,427	**454,251**
2070 Population	18,177	60,619	191,856	225,379	**496,030**
2080 Population	22,002	72,636	200,991	249,554	**545,183**
South-Transient					
2010 Population	46	122	1,858	2,865	**4,891**
2020 Population	56	145	1,972	3,089	**5,262**
2030 Population	66	169	2,071	3,298	**5,604**
2040 Population	79	201	2,170	3,544	**5,994**
2050 Population	96	240	2,273	3,831	**6,440**
2060 Population	116	287	2,381	4,170	**6,954**
2070 Population	141	343	2,494	4,575	**7,553**
2080 Population	170	411	2,613	5,065	**8,259**
South-Southwest-Residential					
2010 Population	9,432	14,347	11,628	26,688	**62,094**
2020 Population	11,029	17,238	13,217	34,608	**76,093**
2030 Population	12,693	20,223	14,803	43,299	**91,018**
2040 Population	14,889	24,284	16,953	57,166	**113,293**
2050 Population	17,472	29,171	19,536	75,489	**141,667**
2060 Population	20,510	35,051	22,656	99,701	**177,917**
2070 Population	24,086	42,128	26,448	131,698	**224,360**
2080 Population	28,297	50,648	31,084	173,986	**284,015**
South-Southwest-Transient					
2010 Population	115	49	117	320	**601**
2020 Population	134	59	133	415	**741**
2030 Population	155	69	149	520	**893**
2040 Population	181	83	171	686	**1,121**
2050 Population	213	100	197	906	**1,416**
2060 Population	250	120	229	1,197	**1,796**
2070 Population	293	144	267	1,581	**2,285**
2080 Population	344	173	314	2,088	**2,919**

Table 2.5-4 (Sheet 6 of 9)
Resident and Transient Population Projections between 16 km and 80 km (10 mi. and 50 mi.)

mi. / km	10-20 / 16-32	20-30 / 32-48	30-40 / 48-64	40-50 / 64-80	Total for Sector
Southwest-Residential					
2010 Population	30,078	11,892	23,880	38,222	**104,073**
2020 Population	34,721	13,693	27,338	43,793	**119,545**
2030 Population	39,576	15,540	30,725	49,263	**135,104**
2040 Population	45,866	17,950	35,212	56,541	**155,569**
2050 Population	53,157	20,733	40,355	64,913	**179,158**
2060 Population	61,606	23,948	46,249	74,551	**206,354**
2070 Population	71,398	27,663	53,004	85,653	**237,718**
2080 Population	82,746	31,956	60,746	98,452	**273,900**
Southwest-Transient					
2010 Population	835	144	644	3,009	**4,632**
2020 Population	964	166	738	3,447	**5,315**
2030 Population	1,099	188	829	3,878	**5,994**
2040 Population	1,273	217	950	4,451	**6,891**
2050 Population	1,476	251	1,089	5,110	**7,926**
2060 Population	1,710	290	1,248	5,868	**9,116**
2070 Population	1,982	334	1,430	6,742	**10,488**
2080 Population	2,297	386	1,639	7,750	**12,072**
West-Southwest-Residential					
2010 Population	6,810	5,133	8,568	11,033	**31,543**
2020 Population	7,896	5,981	9,826	12,318	**36,021**
2030 Population	9,028	6,846	11,065	13,600	**40,539**
2040 Population	10,517	8,018	12,710	15,190	**46,435**
2050 Population	12,254	9,396	14,601	16,984	**53,234**
2060 Population	14,280	11,014	16,777	19,010	**61,080**
2070 Population	16,644	12,917	19,280	21,299	**70,140**
2080 Population	19,403	15,155	22,160	23,889	**80,607**
West-Southwest-Transient					
2010 Population	18	804	116	175	**1,113**
2020 Population	21	937	133	196	**1,287**
2030 Population	24	1,073	150	216	**1,463**
2040 Population	28	1,257	172	241	**1,698**
2050 Population	32	1,473	198	270	**1,973**
2060 Population	37	1,726	227	302	**2,292**
2070 Population	44	2,024	261	338	**2,667**
2080 Population	51	2,375	300	379	**3,105**

Table 2.5-4 (Sheet 7 of 9)
Resident and Transient Population Projections between 16 km and 80 km (10 mi. and 50 mi.)

mi. / km	10-20 / 16-32	20-30 / 32-48	30-40 / 48-64	40-50 / 64-80	Total for Sector
West-Residential					
2010 Population	3,105	8,365	9,810	49,551	**70,832**
2020 Population	3,705	9,992	11,273	55,933	**80,903**
2030 Population	4,318	11,656	12,769	62,458	**91,202**
2040 Population	5,191	14,027	14,680	70,134	**104,032**
2050 Population	6,239	16,881	16,895	78,753	**118,769**
2060 Population	7,500	20,316	19,465	88,432	**135,714**
2070 Population	9,016	24,450	22,452	99,302	**155,220**
2080 Population	10,840	29,425	25,926	111,507	**177,698**
West-Transient					
2010 Population	27	37	29	514	**607**
2020 Population	33	45	33	581	**692**
2030 Population	38	52	38	648	**776**
2040 Population	46	63	43	728	**880**
2050 Population	55	76	50	818	**999**
2060 Population	66	91	58	918	**1,133**
2070 Population	80	110	66	1,031	**1,287**
2080 Population	96	132	77	1,158	**1,463**
West-Northwest-Residential					
2010 Population	5,306	10,764	15,868	34,781	**66,719**
2020 Population	6,337	12,833	18,196	39,211	**76,577**
2030 Population	7,392	14,953	20,597	43,742	**86,685**
West-Northwest-Transient					
2040 Population	8,896	17,957	23,599	49,066	**99,518**
2050 Population	10,707	21,566	27,062	55,038	**114,373**
2060 Population	12,885	25,904	31,062	61,736	**131,588**
2070 Population	15,507	31,119	35,686	69,251	**151,562**
2080 Population	18,662	37,386	41,038	77,680	**174,766**
2010 Population	52	188	3	27	**270**
2020 Population	63	224	4	30	**321**
2030 Population	73	261	4	34	**372**
2040 Population	88	313	5	38	**444**
2050 Population	106	376	6	43	**531**
2060 Population	127	452	7	48	**634**
2070 Population	153	543	8	54	**758**
2080 Population	185	653	9	60	**907**

Table 2.5-4 (Sheet 8 of 9)
Resident and Transient Population Projections between 16 km and 80 km (10 mi. and 50 mi.)

mi. km	10-20 16-32	20-30 32-48	30-40 48-64	40-50 64-80	Total for Sector
Northwest-Residential					
2010 Population	8,322	8,785	47,529	83,629	**148,265**
2020 Population	9,931	10,026	54,224	95,203	**169,385**
2030 Population	11,576	11,300	61,387	107,507	**191,769**
2040 Population	13,917	12,853	69,662	121,753	**218,185**
2050 Population	16,733	14,627	79,053	137,889	**248,302**
2060 Population	20,121	16,653	89,710	156,168	**282,651**
2070 Population	24,196	18,968	101,803	176,873	**321,840**
2080 Population	29,098	21,617	115,527	200,328	**366,569**
Northwest-Transient					
2010 Population	52	112	1,248	922	**2,334**
2020 Population	63	128	1,424	1,049	**2,664**
2030 Population	73	144	1,612	1,185	**3,014**
2040 Population	88	164	1,829	1,342	**3,423**
2050 Population	105	186	2,076	1,520	**3,887**
2060 Population	127	212	2,356	1,721	**4,416**
2070 Population	152	241	2,673	1,950	**5,016**
2080 Population	183	275	3,033	2,208	**5,699**
North-Northwest-Residential					
2010 Population	46,707	43,157	33,628	11,459	**134,951**
2020 Population	53,009	48,481	38,027	12,787	**152,304**
2030 Population	58,918	53,334	42,356	14,124	**168,732**
2040 Population	66,741	59,590	47,648	15,688	**189,668**
2050 Population	75,668	66,580	53,605	17,443	**213,295**
2060 Population	85,866	74,389	60,310	19,411	**239,975**
2070 Population	97,528	83,114	67,857	21,620	**270,120**
2080 Population	110,882	92,863	76,354	24,101	**304,200**
North-Northwest-Transient					
2010 Population	4,106	537	446	62	**5,151**
2020 Population	4,660	603	505	69	**5,837**
2030 Population	5,179	664	562	76	**6,481**
2040 Population	5,867	742	632	85	**7,326**
2050 Population	6,651	829	711	94	**8,285**
2060 Population	7,548	926	800	105	**9,379**
2070 Population	8,573	1,034	900	117	**10,624**
2080 Population	9,747	1,156	1,013	130	**12,046**

Table 2.5-4 (Sheet 9 of 9)
Resident and Transient Population Projections between 16 km and 80 km (10 mi. and 50 mi.)

mi. km	10-20 16-32	20-30 32-48	30-40 48-64	40-50 64-80	Total for Sector
2010 Population					
Residential Total	520,145	824,723	533,307	546,291	**2,424,467**
Cumulative Total (Residential plus Transient)	538,816	841,920	542,689	555,931	**2,479,357**
2020 Population					
Residential Total	649,554	1,013,164	621,120	622,675	**2,906,512**
Cumulative Total (Residential plus Transient)	672,475	1,034,149	632,066	633,612	**2,972,301**
2030 Population					
Residential Total	785,312	1,210,678	711,435	700,852	**3,408,277**
Cumulative Total (Residential plus Transient)	812,645	1,235,632	724,000	723,999	**3,485,369**
2040 Population					
Residential Total	994,906	1,508,712	838,751	803,940	**4,146,308**
Cumulative Total (Residential plus Transient)	1,028,957	1,539,614	853,564	817,900	**4,240,034**
2050 Population					
Residential Total	1,264,155	1,887,779	996,581	927,711	**5,076,225**
Cumulative Total (Residential plus Transient)	1,306,765	1,926,214	1,014,166	943,710	**5,190,854**
2060 Population					
Residential Total	1,610,670	2,371,239	1,193,281	1,077,237	**6,252,427**
Cumulative Total (Residential plus Transient)	1,664,208	2,419,246	1,214,297	1,095,662	**6,393,413**
2070 Population					
Residential Total	2,057,367	2,989,408	1,439,642	1,258,983	**7,745,401**
Cumulative Total (Residential plus Transient)	2,124,899	3,049,610	1,464,920	1,280,318	**7,919,748**
2080 Population					
Residential Total	2,634,084	3,781,664	1,749,614	1,481,222	**9,646,584**
Cumulative Total (Residential plus Transient)	2,719,575	3,857,455	1,780,224	1,506,058	**9,863,312**

Notes:
To account for the difference in distance between each proposed unit and the HAR centerpoint, 0.16 km (0.1 mi.) was added to each radial distance to conservatively adjust the population data. The totals are subject to rounding differences.

Source: Reference 2.5-001

Table 2.5-5
Age and Gender Distribution within the Region

	Low Population Zone (5 km [3-mi.] radius)	Emergency Planning Zone (16 km [10-mi.] radius)	Region (80 km [50-mi.] radius)
Male	1,089	27,859	977,636
Female	1,093	28,643	1,001,892
Under 5 yrs	192	5,151	139,460
5 yrs to 17 yrs	402	11,119	351,920
18 yrs to 21 yrs	69	1,698	131,421
22 yrs to 29 yrs	254	6,414	261,241
30 yrs to 39 yrs	475	12,227	333,905
40 yrs to 49 yrs	352	9,121	294,792
50 yrs to 64 yrs	289	6,757	271,986
65 yrs and Older	149	4,016	194,803

Source: Reference 2.5-001

Table 2.5-6
Schools Located within 10 Miles of EPZ

School Name	Street Address	Municipality
Moncure Elementary School	Moncure School Rd	Moncure
Apex High School	1501 Laura Duncan Rd	Apex
Apex Middle School	400 E Moore St	Apex
Baucom Elementary School	400 Hunter St	Apex
Hope Montessori	6175 Old Jenks Rd	Apex
Lufkin Rd Middle School	1002 Lufkin Rd	Apex
Olive Chapel Elementary School	1751 Olive Chapel Rd	Apex
Salem Elementary School	6116 Old Jenks Rd	Apex
Salem Middle School	6150 Old Jenks Rd	Apex
St. Mary Magdalene Catholic School	625 Magdala Place	Apex
Apex Elementary School	700 Tingen Rd	Apex
Community Partners Charter High School	116 Quantam St	Holly Springs
Holly Grove Elementary School	1451 Avent Ferry Rd	Holly Springs
Holly Ridge Elementary School	900 Holly Springs Rd	Holly Springs
Holly Ridge Middle School	950 Holly Springs Rd	Holly Springs
Holly Springs Elementary School	401 Holly Springs Rd	Holly Springs
Holly Springs High School	5329 Cass Holt Rd	Holly Springs
Southern Wake Montessori School	925 Avent Ferry Rd	Holly Springs
The New School Montessori Center	5617 Sunset Lake Rd	Holly Springs
Fuquay-Varina High School	201 Bengal Blvd	Fuquay-Varina
Fuquay-Varina Middle School	109 N Ennis St	Fuquay-Varina
Lincoln Heights Elementary School	307 Bridge St	Fuquay-Varina

Source: Reference 2.5-036

Table 2.5-7 (Sheet 1 of 3)
Medical Facilities and Assisted Living Facilities near HAR Site

Name	Street Address	Municipality	Capacity	Employees (Max Shift)	Employees (Total)
Sanford Health and Rehabilitation	2702 Farrell Rd	Sanford	97	25	72
Brown's Family Care Home	8416 James Rest Home Rd	New Hill	6	2	5
James Rest Home	8420 James Rest Home Rd	New Hill	40	6	24
Buck Jones Road Home	2420 Reliance Ave	Apex	6	2	N/A
Mason Street Home	306 N Mason St	Apex	6	2	9
Rex Rehab. & Nursing Care	911 South Hughes St	Apex	107	50	N/A
Seagroves Family Home	1052 Irongate Dr	Apex	6	2	3
Spring Arbor of Apex	901 Spring Arbor Ct	Apex	76	6	46
Atwater Rest Home	312 Lynch St	Apex	55	13	N/A
Adams Care Home	4825 Optimist Farm Rd	Apex	5	2	N/A
Harrison Home	8421 Pierce Olive Rd	Apex	2	1	3
Autumn Green Adult Care Home	312 Earp St	Holly Springs	6	2	N/A

Table 2.5-7 (Sheet 2 of 3)
Medical Facilities and Assisted Living Facilities near HAR Site

Name	Street Address	Municipality	Capacity	Employees (Max Shift)	Employees (Total)
Avent Ferry Home	904 Avent Ferry Rd	Holly Springs	6	2	9
Country Lane Group Home	534 Country Ln	Holly Springs	6	2	3
Herbert Reid Home	3733 Heritage Meadow Ln	Holly Springs	3	2	N/A
Hickory Street Group Home	112 Hickory Ave	Holly Springs	6	3	12
Murchison Adult Family Living	533 Texanna Way	Holly Springs	2	1	2
St Marks Manor	3735 Heritage Meadow Ln	Holly Springs	9	4	7
Trotters Bluff	912 Avent Ferry Rd	Holly Springs	6	2	9
VOCA Olive Home	707 East Olive St	Apex	6	2	8
Brighton Manor	415 Sunset Dr	Fuquay-Varina	80	20	96
Evans-Walston Home	808 Hawks View Ct	Fuquay-Varina	3	1	1
Fuquay-Varina Home for the Elderly	1012 S Main St	Fuquay-Varina	60	2	2
Kinton Sunset Ret. Cmty.	301 Sunset Dr	Fuquay-Varina	28	N/A	N/A
VOCA Creekway	534 Creekway Dr	Fuquay-Varina	6	3	7

Table 2.5-7 (Sheet 3 of 3)
Medical Facilities and Assisted Living Facilities near HAR Site

Name	Street Address	Municipality	Capacity	Employees (Max Shift)	Employees (Total)
WakeMed Fuquay-Varina Outpatient and Skilled Nursing Facility	400 West Ransom St	Fuquay-Varina	36	10	39
Windsor Point	1221 Broad St	Fuquay-Varina	100	16	150
Mims Family Care Home	6337 Mims Rd	Holly Springs	6	1	2

Source: Reference 2.5-036

Table 2.5-8
Correctional Facilities - Four Counties Surrounding HAR Site

Facility Name	Total Capacity	Current Inmates/Usage
Wake County		
Central Prison	1000	920
NC Correctional Institute for Women	1300	1180-1200
Raleigh Correction Center for Women	186	181
Wake Correctional Center	414	406
Harnett County		
Harnett Correction Institution	988 - 34 sick beds	899
Lee County		
Sanford Correctional Center	302	288

Sources: Reference 2.5-037, Reference 2.5-038, Reference 2.5-039, Reference 2.5-040, Reference 2.5-041, Reference 2.5-042

Table 2.5-9
Racial and Ethnic Distribution within the Region

	African-American	Asian	Native Hawaiian or other Pacific Islander	Hispanic	Native American	Caucasian	Other	Two or More Races
Low Population Zone (5 km [3-mi.] radius)	332	27	2	89	13	1,728	44	35
Emergency Planning Zone (16 km [10-mi.] radius)	8,663	1,199	20	2,070	252	44,655	933	781
Region (80 km [50-mi.] radius)	466,940	42,136	1,512	129,912	12,818	1,356,817	65,536	33,770

Source: Reference 2.5-001

Table 2.5-10
Income Distribution within the Region - Percent of Households

	Low Population Zone (5 km [3-mi.] radius)	Percentage of LPZ	Emergency Planning Zone (16 km [10-mi.] radius)	Percentage of EPZ	Region (80 km [50-mi.] radius)	Percentage of Region
Less Than $10,000	37	4.5%	945	4.5%	68,323	9.0%
$10,000 to $14,999	17	2.1%	632	3.0%	40,714	5.4%
$15,000 to $19,999	35	4.3%	800	3.8%	44,195	5.8%
$20,000 to $24,999	51	6.3%	984	4.7%	48,223	6.4%
$25,000 to $29,999	33	4.1%	876	4.2%	49,596	6.6%
$30,000 to $34,999	43	5.3%	1,037	5.0%	49,812	6.6%
$35,000 to $39,999	38	4.7%	1,067	5.1%	47,171	6.2%
$40,000 to $44,999	44	5.4%	1,047	5.0%	44,820	5.9%
$45,000 to $49,999	44	5.4%	1,066	5.1%	39,375	5.2%
$50,000 to $59,999	77	9.5%	1,954	9.4%	73,313	9.7%
$60,000 to $74,999	122	15.0%	2,803	13.4%	81,498	10.8%
$75,000 to $99,999	127	15.6%	3,445	16.5%	78,498	10.4%
$100,000 to $124,999	79	9.7%	1,980	9.5%	39,636	5.2%
$125,000 to $149,999	32	3.9%	988	4.6%	19,915	2.6%
$150,000 to $199,999	27	3.3%	736	3.5%	16,541	2.2%
$200,000 or More	8	1.0%	499	2.4%	15,211	2.0%
Subtotal	814	100%	20,859	100%	756,841	100%

Source: Reference 2.5-001

**Table 2.5-11 (Sheet 1 of 2)
Largest Companies in Chatham, Harnett, and Wake Counties
(Government/Public Not Included)**

Company	Specialization	Employment
	Chatham County	
1. Townsends	Poultry Processing	1,375
2. Gold Kist	Poultry Processing	800
3. Joann Fabrics	Upholstery Fabrics for Auto & Home	700
4. Performance Fibers	Fiber Manufacturer	525
5. Acme-McCrary Corporation	Women's Hosiery	365
6. Carolina Meadows	Health Services	250
7. Wal-Mart	Retail & Distribution	250
8. ATC Panels	Panel Manufacturer	220
9. Weyerhaeuser	Woodworking	175
10. Performance Bicycle Shop	Bicycle Manufacturer	100
	Harnett County	
1. Food Lion Distribution Center	Grocery Warehouse & Shipping	760
2. Campbell University	University/Education	600
3. Betsy Johnson Hospital	Medical Center	550
4. Energy Conversion Systems	Carbon Brushes	485
5. Wal-Mart	Mass Retail	420
6. Edwards Brothers	Hard & Soft Bound Books	269
7. Good Hope Hospital	Medical Center	250
8. Machine & Welding Supply	Industrial Gases & Supplies	200
9. Champion Homes	Mfg. Mobile Homes	175
10. Godwin Mfg. Company	Truck Bodies, Hydraulics	170

Table 2.5-11 (Sheet 2 of 2)
Largest Companies in Chatham, Harnett, and Wake Counties
(Government/Public Not Included)

Company	Specialization	Employment
Wake County		
1. Wake Med	Medical Center	6,739
2. SAS Institute	Computer Software Developer	4,143
3 Rex Healthcare	Medical Center	3,870
4. Progress Energy	Utility Company	3,400
5. Cisco Systems	Digital Switching Equipment	2,850
6. Eaton Corporation	Integrated Power Systems	2,600
7. Waste Industries	Waste Management	2,000
8. Verizon Wireless	Telecommunication	1,600
9. First Citizens Bank & Trust	Banking (Financial)	1,574
10. Food Lion Stores	Grocery Distribution	1,500
11. Longistics	Warehouse & Distribution	1,500
12. Misys Healthcare Systems	Software Development & Marketing	1,500

Source: Reference 2.5-056

Table 2.5-12
Regional Employment by Industry

Industry	1990		2000	
	Number of Jobs	Percent of Total	Number of Jobs	Percent of Total
Farming	30,490	2.05%	26,317	1.39%
Agricultural Services, Forestry, Fishing	12,026	0.81%	18,267	0.96%
Mining	1,524	0.10%	1,467	0.08%
Construction	88,596	5.96%	121,528	6.41%
Manufacturing	292,902	19.71%	287,100	15.14%
Transportation and Public Utilities	54,512	3.67%	73,427	3.87%
Wholesale Trade	68,073	4.58%	84,151	4.44%
Retail Trade	240,393	16.18%	303,792	16.02%
Finance, Insurance, and Real Estate	91,004	6.12%	109,784	5.79%
Services	342,274	23.03%	553,652	29.20%
Government and Government Enterprises	264,234	17.78%	316,895	16.71%
Total	**1,486,028**		**1,896,380**	

Source: Reference 2.5-057

Table 2.5-13
Regional Employment Trends

County	Workers Employed 1995	Workers Employed 2005	Percent Change in Workers Employed 1995-2005	Unemployment Rate 1995	Unemployment Rate 2005
Alamance	61,848	65,419	5.5%	3.8%	5.9%
Caswell	11,298	9,787	-15.4%	3.7%	7.9%
Chatham	23,342	29,537	21.0%	2.8%	3.8%
Cumberland	106,479	122,345	13.0%	5.5%	5.7%
Durham	104,888	125,019	16.1%	3.1%	4.3%
Franklin	20,221	25,440	20.5%	4.3%	4.6%
Granville	20,642	22,269	7.3%	4.4%	6.0%
Guilford	205,578	229,199	10.3%	3.4%	5.1%
Harnett	33,098	43,113	23.2%	3.8%	5.2%
Hoke	10,082	16,665	39.5%	6.8%	5.9%
Johnston	49,123	68,466	28.3%	2.9%	4.3%
Lee	24,647	24,397	-1.0%	4.8%	5.5%
Montgomery	11,038	11,439	3.5%	6.9%	7.0%
Moore	27,313	35,528	23.1%	3.9%	4.9%
Nash	41,932	41,159	-1.9%	5.4%	6.2%
Orange	58,674	63,264	7.3%	2.0%	3.8%
Person	16,206	17,716	8.5%	5.5%	6.4%
Randolph	64,916	71,036	8.6%	2.9%	4.8%
Richmond	19,085	18,427	-3.6%	9.8%	7.9%
Sampson	22,375	29,431	24.0%	5.9%	5.0%
Vance	17,817	17,098	-4.2%	8.5%	8.9%
Wake	294,329	389,050	24.3%	2.4%	4.0%
Wayne	46,067	48,717	5.4%	5.2%	5.5%
Wilson	32,856	35,551	7.6%	9.0%	8.1%

Source: Reference 2.5-059

Table 2.5-14
Regional Housing Characteristics

County	Total Housing Units	Number Vacant	Number Owner-Occupied	Number Renter-Occupied
Alamance	55,463	3,879	36,176	15,408
Caswell	9,601	931	6,883	1,787
Chatham	21,358	1,617	15,239	4,502
Cumberland	118,425	11,067	63,748	43,610
Durham	95,452	6,437	48,278	40,737
Franklin	20,364	2,521	13,880	3,963
Granville	17,896	1,242	12,504	4,150
Guilford	180,391	11,724	105,700	62,967
Harnett	38,605	4,805	23,753	10,047
Hoke	12,518	1,145	8,531	2,842
Johnston	50,196	3,601	34,222	12,373
Lee	19,909	1,443	13,236	5,230
Montgomery	14,145	4,297	7,536	2,312
Moore	35,151	4,438	24,143	6,570
Nash	37,051	3,407	22,777	10,867
Orange	49,289	3,426	26,395	19,468
Person	15,504	1,419	10,509	3,576
Randolph	54,422	3,763	38,793	11,866
Richmond	19,886	2,013	12,870	5,003
Sampson	25,142	2,869	16,363	5,910
Vance	18,196	1,997	10,726	5,473
Wake	258,953	16,913	159,456	82,584
Wayne	47,313	4,701	27,826	14,786
Wilson	30,729	2,116	17,512	11,101

Source: Reference 2.5-066

Table 2.5-15
Residential Building Permits for
Wake, Chatham, Lee, and Harnett Counties

County	2003	2004	2005	2006	2007
Wake	8748	0	11,879	11,222	6607 [a]
Chatham	677	746	706	646	N/A
Lee	339	367	372	391	N/A
Harnett	N/A	1242 [b]	1498 [c]	1514 [d]	1507 [e]

Notes:
a) Data reported for January to July 2007

b) Data reported for FY 03/04

c) Date reported for FY 04/05

d) Data reported for FY 05/06

e) Data reported for FY 06/07

N/A = Data not available

Sources: Reference 2.5-067, Reference 2.5-068, Reference 2.5-069, and Reference 2.5-070

Table 2.5-16
Homes for Rent and for Sale near HNP

City	# of Available Homes (includes rental properties)
Angier	246
Apex	488
Carrboro	84
Cary	832
Fuquay-Varina	489
Holly Springs	367
Morrisville	139
Pittsboro	216
Raleigh	3876
Sanford	1208

Source: Reference 2.5-071

Table 2.5-17
Apartments for Rent near HNP

City	# of Available Apartments (includes rental properties)
Angier	96
Apex	235
Carrboro	183
Cary	235
Fuquay-Varina	165
Holly Springs	217
Morrisville	232
Pittsboro	145
Raleigh	236
Sanford	12

Source: Reference 2.5-072

Table 2.5-18
Median Home Value and Median Income by County

County	Median Home Value	Median Income
Chatham	$110,091	$38,304
Harnett	$103,012	$34,692
Lee	$112,755	$38,689
Wake	$189,288	$55,333

Source: Reference 2.5-073

Table 2.5-19
Primary and Secondary Schools

School Name	Municipality	Enrollment	Staff
CHATHAM COUNTY			
Moncure Elementary School	Moncure	203	42
WAKE COUNTY			
Apex High School	Apex	2,215	115
Apex Middle School	Apex	1,166	63
Baucom Elementary School	Apex	904	52
Hope Montessori	Apex	44	4
Lufkin Rd Middle School	Apex	1,066	65
Olive Chapel Elementary School	Apex	925	62
Salem Elementary School	Apex	757	45
Salem Middle School	Apex	656	87
St. Mary Magdalene Catholic School	Apex	510	45
Apex Elementary School	Apex	639	42
Community Partners Charter High School	Holly Springs	115	12
Holly Grove Elementary School	Holly Springs	462	82
Holly Ridge Elementary School	Holly Springs	714	38
Holly Ridge Middle School	Holly Springs	1,285	110
Holly Springs Elementary School	Holly Springs	818	85
Holly Springs High School	Holly Springs	805	82
Southern Wake Montessori School	Holly Springs	100	N/A
The New School Montessori Center	Holly Springs	117	13
Fuquay-Varina High School	Fuquay-Varina	1,730	97
Fuquay-Varina Middle School	Fuquay-Varina	989	51
Lincoln Heights Elementary School	Fuquay-Varina	630	50
		16,850	**1,242**

Source: Reference 2.5-036

Table 2.5-20
Recreational Areas within 80 km (50 mi.) of the HAR Site

Area	Average Daily Attendance	Approximate Distance and Direction
Jordan Lake State Recreation Area	3982	8 to 19 km (5 to 12 mi.) NW
Eno River State Park	858	48 to 64 km (30 to 40 mi.) N
Falls Lake State Recreation Area	2404	32 to 48 km (20 to 30 mi.) NNE
Raven Rock State Park	290	16 to 32 km (10 to 20 mi.) SSE
William B. Umstead Park	1535	16 to 32 km (10 to 20 mi.) NE
Harris Lake County Park	293	3 km (2 mi.) ESE
NCWRC Game Lands [(a)]	NA	5 km (3 mi.) SE
TOTAL	4221	

Notes:

a) NCWRC Game Lands do not have controls in place to keep track of daily attendance.

NCWRC = North Carolina Wildlife Resources Commission

Sources: Reference 2.5-044 and Reference 2.5-045

Table 2.5-21
2006 Hunting Statistics

County	Active Hunting and Fishing Licenses [a]	Deer			Turkeys		
		Total Killed	Killed on Game Lands	% on Game Lands	Total Killed	Killed on Game Lands	% on Game Lands
Wake	57,520	2,284	376	16.5%	49	11	22.4%
Chatham	6630	2,507	384	15.3%	89	18	20.2%
Lee	5741	482	61	12.7%	49	10	10.0%
Harnett	12,134	1,310	20	1.5%	65	1	1.5%
Total	**82,025**	**6,583**	**841**	**12.8%**	**252**	**40**	**15.9%**

Notes:
a) Number of current active hunting and fishing licenses

Sources: Reference 2.5-018 and Reference 2.5-087

Table 2.5-22
Campgrounds within 25 Miles of New Hill

Campground	City	Total # of Sites	Open	Close
Jordan Lake State Rec. Area (Crosswinds Campground)	Apex	129	all year	
Jordan Lake State Rec. Area (Vista Point)	Apex	50	15-Mar	30-Nov
Jordan Lake State Rec. Area (Parkers Creek)	Apex	250	all year	
Jordan Lake State Rec. Area (Poplar Point)	Apex	580	15-Mar	30-Nov
William B Umstead State Park	Raleigh	28	15-Mar	15-Dec
Falls Lake State Rec. Area (Holly Point Campground)	Raleigh	153	all year	
Falls Lake State Rec. Area (Rollingview Campground)	Raleigh	115	all year	
70 East Mobile Acres	Garner	27	all year	
Spring Hill Park	Chapel Hill	31	all year	

Source: Reference 2.5-088

Table 2.5-23
Campgrounds within 50 Miles of New Hill

Campground	City	Total # of Sites	Open	Close
Birchwood RV Park	Durham	70	all year	
Cooper's Mobile Home Park & RV's	Clayton	40	all year	
Fayetteville KOA	Wade	85	all year	
Smithfield KOA	Smithfield	60	all year	
RVacation Campground	Selma	50	all year	
Military Park (Fort Bragg Travel Camp)	Fayetteville	24	all year	
Village of Pinehurst RV Park	Pinehurst	55	all year	
Lazy Acres Campground	Fayetteville	50	all year	
Lake Waldo's Beach Campground	Hope Mills	23	all year	
Rock Ridge Campground	Rock Ridge	117	all year	

Source: Reference 2.5-089

Table 2.5-24
Water Treatment Plants/Intakes

	Water Treatment Plants/Intakes	Service Area	Capacity
1	Chatham County WTP	Northern Chatham County	11 mld (3 mgd)
2	Cary/Apex WTF	Cary/Apex/Morrisville/RTP South	151 mld (40 mgd)
3	City of Sanford WTP (above Buckhorn Dam)	City of Sanford/Town of Broadway/Utilities Inc.	45 mld (12 mgd)
		Lee County District 1/Chatham County East	
4	Harnett County	Unincorporated Harnett County, Angier, Coats, Lillington, Linden, Holly Springs, Fuquay-Varina	68 mld (18 mgd)
5	HNP WTP (within Evacuation Area Boundary)	Private/Industry	

Sources: Reference 2.5-090, Reference 2.5-091, and Reference 2.5-092

Table 2.5-25
Wastewater Treatment Facilities

	Wastewater Treatment Facilities	Service Area	Capacity
1	Utley Creek WWTP	Holly Springs	23 mld (6 mgd)
2	Proposed Western Wake Regional WRF	Cary/Apex/Morrisville/Holly Springs	114 mpd (30 mgd) (in 2020)
3	Chatham County Bynum WWTP	Chatham County	0.1 mld (0.03 mgd)
4	City of Sanford, Lee County WWTP	Sanford	25.7 mld (6.8 mgd)
5	North Harnett WWTP	Harnett County, Lillington, Angier	21 mld (5.6 mgd)

Sources: Reference 2.5-093, Reference 2.5-094, Reference 2.5-096, Reference 2.5-097, and Reference 2.5-098

Table 2.5-26
Public Water Supply Wells

	PWS-ID#	System Name	PWS-Type	Population Served	Responsible Party	Address	City	State	Zip
1	0392271	James Rest Home	Community	51	Randy McMillan or Manager Now	PO Box 70	New Hill	NC	27562
2	0392092	Country Creek S/D	Community	172	Wade Temple or Manager Now	6109 Vicky Drive	Raleigh	NC	27603
3	0392078	Lake Springs S/D	Community	42	Reid Campbell or Manager Now	PO Box 4889	Cary	NC	27519
4	0319414	Honeywell International Inc	Non-Community	700	Michael M Borchers or Manager Now	PO Box 166	Moncure	NC	27559
5	0319125	Cape Fear Park	Community	70	John Poteat or Manager Now	PO Box 16474	Chapel Hill	NC	27514

Table 2.5-27
Public Airports within 32 km (20 mi.) of the HAR Site

Airport	Distance to Site	Operations	Length and Orientation of Runway	Types of Aircraft Using the Facility	Flying Patterns associated with the Airport
Raleigh-Durham International Airport	31 km (19 mi.)	245, 099 per year	1) 3048 m (10,000 ft.) Oriented N 2) 2286 m (7500 ft.) Oriented N 3) 1088 m (3570 ft.) Oriented E	Commercial, commuter, and general aviations	Straight in, left turn patterns, and right turn patterns
Sanford Lee County Regional Airport	14.5 km (9 mi.)	47,085 per year	1981 m (6500 ft.)	Mainly small single-engine and some larger multi-engine	Standard left traffic
Triple W Airpark	23.3 km (14.5 mi.)	21,535 per year	916 m (3004 ft.)	Strictly light aircraft	Standard left and right traffic

Sources: Reference 2.5-124, Reference 2.5-125, Reference 2.5-126, and Reference 2.5-129

Table 2.5-28
Aircraft Operations – Raleigh-Durham International Airport

	Landings Per Year				
	Air Carrier	**General Aviation**	**Air Taxi**	**Military**	**Total**
Actual					
1976	30,826	147,861	9,365	9,568	197,620
1977	33,608	152,229	11,462	9,059	206,358
1978	34,145	154,476	13,153	7,470	209,244
1979	39,929	146,203	14,889	6,720	207,741
1980	40,225	130,079	24,382	7,487	202,173
1985	55,648	111,138	31,299	10,609	208,694
1990	124,113	83,041	67,113	8,683	282,950
1995	90,976	69,007	38,865	6,041	204,889
2000	152,817	67,325	71,434	5,103	296,679
2005	77,059	54,964	112,353	4,135	248,511
2006	76,917	59,112	104,501	4,569	245,099

Notes:
Aircraft operations declined between 1990 and 1995 because American Airlines shut down their hub at RDU. Air Taxi is an aircraft that can be leased from a company and used on an as needed appointment basis.

Sources: Reference 2.5-130 and Reference 2.5-131

Table 2.5-29
Agricultural Lands

County	Total Land Area of County (ac.)	Total Land in Farms (ac.	Percent of Total Land Area	Number of Farms	Average Farm Size (ac.)
Alamance	275,642	97,793	35%	831	118
Caswell	272,467	116,753	43%	517	226
Chatham	437,171	118,752	27%	1128	105
Cumberland	418,003	90,311	22%	478	189
Durham	186,003	26,074	14%	238	110
Franklin	314,618	128,412	41%	574	224
Granville	339,949	146,544	43%	674	217
Guilford	416,083	111,382	27%	1095	102
Harnett	380,826	114,361	30%	730	157
Hoke	250,400	63,356	25%	201	315
Johnston	506,867	194,211	38%	1144	170
Lee	164,659	46,084	28%	304	152
Montgomery	314,278	41,769	13%	292	143
Moore	447,200	101,222	23%	820	123
Nash	345,805	160,187	46%	478	335
Orange	255,866	71,010	28%	627	113
Person	251,098	95,153	38%	374	254
Randolph	503,981	156,704	31%	1583	99
Richmond	303,386	49,293	16%	257	192
Sampson	605,133	298,483	49%	1178	253
Vance	162,272	74,996	46%	228	329
Wake	533,709	92,803	17%	846	110
Wayne	353,664	171,449	48%	722	237
Wilson	237,498	114,564	48%	315	364

Source: Reference 2.5-101

Table 2.5-30
2003 Agricultural Cash Receipts (Thousands of Dollars)

County	Corn	Peanuts	Wheat	Tobacco	Cotton and Cottonseed	Soybeans	Vegetables Fruits, Nuts	All Other Field Crops	Total Crops [a]	Cattle and Calves	Hogs and Pigs	Total Livestock, Dairy and Poultry	Total Receipts [b]
Alamance	408	*	201	5,147	*	331	850	390	10,777	4,600	5,500	23,011	34,683
Caswell	121	*	107	9,911	*	162	540	330	11,820	2,530	*	6,670	19,070
Chatham	251	*	91	2,163	*	232	530	670	6,899	8,500	79,000	102,544	110,301
Cumberland	1,674	195	506	5,466	2,840	2,465	5,240	280	20,766	1,120	7,300	33,863	57,937
Durham	*	*	29	3,444	*	73	330	70	6,263	600	*	1,554	8,270
Franklin	280	*	522	17,522	*	2,760	1,540	315	30,217	2,500	3,400	16,013	47,959
Granville	184	*	113	16,580	*	385	2,450	204	20,466	2,630	*	5,340	27,215
Guilford	590	*	360	12,124	*	1,105	1,490	530	49,399	3,870	1,100	17,484	68,063
Harnett	816	*	409	21,304	4,827	4,392	3,930	460	45,638	2,250	55,500	72,013	122,759
Hoke	293	*	837	2,537	6,020	1,728	215	170	14,250	*	5,100	19,607	37,549
Johnston	1,548	*	1,035	32,533	5,537	9,577	17,500	670	134,722	3,350	27,800	71,403	215,090
Lee	167	*	81	5,122	355	850	1,100	90	12,365	930	13,900	15,774	29,412
Montgomery	*	*	23	826	426	204	2,370	260	7,236	1,550	41,700	48,314	55,972
Moore	146	*	113	5,060	71	737	2,180	280	18,187	2,250	74,700	87,019	106,192
Nash	377	2,186	409	24,142	7,383	4,817	22,550	250	64,984	2,330	19,200	54,088	128,727
Orange	272	*	195	4,155	*	379	450	400	16,801	3,050	*	12,151	30,418
Person	251	*	347	11,747	*	1,048	180	205	14,328	1,950	*	4,224	19,929
Randolph	858	*	253	3,384	*	1,734	1,610	760	27,249	10,000	101,400	148,275	177,138
Richmond	245	*	91	1,943	823	425	2,210	200	7,287	760	57,200	75,178	66,892
Sampson	7,197	588	2,877	17,643	13,119	7,905	42,150	890	98,069	5,380	36,300	468,172	583,257
Vance	*	*	169	10,630	*	827	230	115	14,748	500	*	643	16,208
Wake	207	*	250	21,968	*	2,131	3,020	320	46,641	1,620	*	4,874	54,393
Wayne	5,775	*	3,062	19,378	9,939	10,512	4,450	430	60,776	2,370	38,400	187,414	257,921
Wilson	1,276	*	542	23,733	10,790	6,829	12,450	80	96,325	520	*	9,810	113,093

Notes:
a) Total crops column is not a summation of the individual crops identified in this table, other non-itemized crops were in the total crop summary.

b) Total cash receipt column is not a summation of the data presented in this table.

* = Data not available

Source: Reference 2.5-141

Table 2.5-31 (Sheet 1 of 2)
Historic Properties Within 16 km (10 mi.) of the HAR Site

Historic Districts		
Site Name	**Status**	**Acres**
Lockville Dam, Canal, Powerhouse	NR	18
Goodwin Farm Complex	NR	57
James A Thomas Farm	NR	43
Memphis Methodist Church and Cemetery	SL	1
Joe Kelly Mill & Millpond	SL	14
Obediah Farrar House	NR	38
William B. Thomas Farm	SL	8
Thomas Farm	SL	9
Stevens Milling Co.	SL	2
Buckhorne Ave. Historic District	SL	6
Buckhorne Falls Navigation Works	SL	12
Douglas-Lett Rural Historic District	SL	59
Samuel Bartley Holleman House	SL	6
Collins Grove Baptist Church	SL	3
H. T. Lawrence Farm	SL	4
Allie Lawrence Farm	SL	4
New Hill Historic District	SL	19
New Hill 1st Missionary Baptist Church	SL	2
Varina Commercial Historic District	NR	4
Apex Historic District	NR	48
Fuquay Springs Historic District	SL	9
Apex Historic District Boundary	NR	15+
Fuquay Varina Middle School	SL	9
James A. Jones House	SL	7
J Beale Johnson House	NR	14
K. B. Johnson House	SL	23
Fuquay Springs Consolidated School	SL	4
Richard L. Adams Farm	SL	2
Jeff Stephens House	SL	4
Holly Springs Historic District	SL	15
John H. Seagraves House	SL	4
Oak Grove Primitive Baptist Church	SL	2
Jones-Johnson-Ballentine Historic District	NR	338
Apex Colored School (former)	SL	8
New Hope Rural Historical Archaeological District	NR	_
Newkirk State (Site 31CH366)	NR	_
J.M. Williams Farm	SL	4

Table 2.5-31 (Sheet 2 of 2)
Historic Properties Within 16 km (10 mi.) of the HAR Site

Historic Structures	
Site Name	**Status**
Ebenezer Log Church (Destroyed)	NR
Ebenezer Methodist Church	NR
J.B. Mills House	DOE
Beckwith-Goodwin Farm	DOE
Smith House & Store	SL
Burns Farm	SL
Lebanon Christian Church	SL
Carloss Cemetery	SL
Farrish-Lambeth House	DOE
Mc Leod House	SL
Absalom Kelly Store	SL
Nash-Weathers House	SL
Pearson House	DOE
Callie Lawrence House	SL
Apex Town Hall	NR
Fuquay Mineral Spring	NR
Ben-Wiley Hotel	SL
Wilbon-Adcock Houseand Store	SL
Atkinson-Whitted House	SL
Holly Springs Masonic Lodge	SL
Apex Union Depot (former)	NR
Farish – Lambeth House	NR
Nancy Jones House	NR
Leslie—Alford—Mims House	NR
Julius Lewis and Co. House	NR
Utley Council House	NR
Page—Walker Hotel	NR
Alsey J. Stephens House	Determined eligible for NR
Adams House	Determined eligible for NR
St. Mary AME Zion Church	SL

Notes:
NR = National Historic Register
SL = State Study List
DOE = Study List/Determined Eligible

Source: Reference 2.5-138

2.6 GEOLOGY

The HAR will be co-located with the existing Shearon Harris Nuclear Power Plant Unit 1 (HNP). The two units will be referred to as HAR 2 and HAR 3. This section presents a brief description of the geologic conditions that are present at and in the vicinity of the HAR site. Section 2.5 of the HAR FSAR, which is Part 2 of this COLA, presents a detailed evaluation of site geologic conditions.

2.6.1 GEOLOGIC SETTING

2.6.1.1 Physiographic Province

The HAR site lies within the Piedmont Physiographic Province of the Appalachian Highlands Division of North America, and more specifically, within the Deep River Triassic basin (Figure 2.6-1). The Deep River basin is filled with a complex, wedge shaped deposit of Triassic rocks consisting mainly of claystone, shale, siltstone, sandstone, and conglomerate. These rocks are intruded in places by diabase dikes and sills of Triassic-Jurassic age (Reference 2.6-001 and Reference 2.6-002).

The landscape at the HAR site consists of gently rolling hills and valleys lying about 6 to 15 meters (m) (20 to 50 feet [ft.]) above the adjacent Harris and Auxiliary Reservoirs. The Triassic lowlands generally lie between 53.3 and 144.8 m (175 and 475 ft.) above mean sea level (msl) (Reference 2.6-003). The streams adjacent to the HAR site have been impounded to provide water for cooling and general use by the plant, and the site is surrounded on three sides by Harris Lake.

2.6.1.2 Geologic History

The geologic history of the HAR site can be broken into four general episodes (Reference 2.6-004):

1. Convergence of the North American and African Plates in the late Proterozoic through Paleozoic results in development of an igneous and metamorphic rock basement complex that underlies the site to depths of many thousands of meters.

2. Extension of the Plates results in rifting and faulting during the Triassic forming the half graben features in the basement rocks, which immediately began to fill with fluvial and alluvial sediments.

3. Additional extension between the Plates in late Triassic to Jurassic results in intrusion of igneous rock in the form of diabase dikes into the basement rocks and basin-fill deposits.

4. Subsequent uplift and geologically-recent erosion forms the landforms present in the area today.

2.6.1.3 Geologic Units

Stratigraphic units present in the vicinity of the HAR site area (Figure 2.6-2) include the basement rock complex of Proterozoic and Paleozoic age comprised of igneous and metamorphic rock, sedimentary rocks of Triassic age, and intrusive diabase dikes of Triassic-Jurassic age. Unconsolidated surface deposits may have been located adjacent to some streams in the area but those are covered by impounded water, if present.

The Proterozoic and Paleozoic igneous and metamorphic rocks consist of biotite gneiss and schist, and metamorphosed leucogranite of the Buckhorn Dam Complex, metamorphosed mafic and mafic metavolcanic rocks, and Big Lake-Raven Rock Schist (Reference 2.6-002). All of these rocks are present at the HAR site, underlying the Triassic sedimentary rocks, but they do not crop out on the property.

The biotite gneiss and schist are light colored, inequigranular and megacrystic, are locally garnetifferous, and are often interlayered and gradational with mica schist and amphibolite. Small granite masses may be present. Metamorphosed leucogranite is composed mainly of plagioclase, quartz and microcline with some minor amounts of chlorite, sericite, epidote, biotite and opaque minerals. Metamorphosed mafic rocks are present in the form of metagabbro and metadiorite. These are dark green coarse- to fine-grained variably foliated rocks composed mainly of epidote, chlorite, hornblende, plagioclase and opaque minerals with rare quartz. Metamorphosed volcanic basalt flows and tuffs are occasionally present interbedded with felsic and intermediate metavolcanic rock and mudstone. The Big Lake-Raven Rock Schist is light colored schist that is fine-to medium-grained and grades into gneiss. It contains muscovite (Reference 2.6-002).

The Triassic sedimentary rocks include conglomerate, interbedded sandstone and pebbly sandstone, sandstone interbedded with siltstone, and sandstone interbedded with conglomerate. The sediments were compressed into rock by the weight of large thicknesses of overlying sediments that have since eroded away. The conglomerates may include boulders in the lower parts of the Triassic sequence of rocks and the larger clasts may be composed of underlying igneous or metamorphic bedrock fragments. Generally the larger size clasts are encountered closer to the Jonesboro fault to the southeast of the HAR site. The interbedded sandstone and pebbly sandstone consists of reddish brown, massive, poorly to moderately sorted, medium-to coarse-grained, muddy lithic arkoses, with matrix-supported granules and pebbles as thin basal layers. The interbedded sandstone and siltstone sequences are light colored, coarse- to very coarse-grained, trough cross-bedded lithic arkoses that fine upward through reddish brown, burrowed, rooted siltstones. The sandstone with interbedded conglomerate lithofacies is reddish brown, irregularly bedded, poorly sorted, coarse-grained to pebbly, muddy lithic sandstone interbedded with pebble to cobble conglomerate.

The diabase dikes that occur on-site are composed of dark colored diabase at depth but are commonly weathered to clay at the surface. The depth of weathering commonly ranges from 1.5 to 3 m (5 to 10 ft.) below surface. The dikes are near vertical, trend generally north-south (strike ranges from north 15 to 20 degrees west) and, on-site, vary from less than 1 to 4.5 m (3 to 15 ft.) thick. The Triassic bedrock adjacent to the dikes is often baked to a dark gray or black (Reference 2.6-003).

2.6.1.4 Geologic Structures

As shown on Figure 2.6-2, the primary geologic structure of relevance to the HAR site is the Triassic basin in which the site lies. This half graben formed on the down thrown block, or hanging wall, of the Jonesboro fault. The Jonesboro fault crops out about 6.4 km (4 mi.) southeast of the HAR site and strikes generally northeast to southwest. It is a normal fault with some amount of right-lateral strike-slip movement. As the hanging wall of the fault dropped, erosional forces began moving sediments into the resulting depression (Reference 2.6-004). The Jonesboro fault is probably a reactivated older fault associated with basement rock structure (Reference 2.6-003).

Other faults are known to exist in the area, including the Harris fault, the South Borrow Pit fault, and some nearby small unnamed faults. These faults generally all are associated with the Jurassic extension, have very small displacements, and appear to be confined to the Triassic sedimentary rock sequences. They are not deep-seated or basement-related faults. These faults were extensively investigated during HNP licensing activities. In all cases, they were discovered during construction excavations for borrow production. None were determined to be capable faults; they were last active before the Cretaceous period and do not affect the stability of the HAR site (Reference 2.6-003).

2.6.1.5 Soils and Weathering

At the HAR site, about half of the footprint area for the new reactors (i.e., HAR 2) has been leveled through a process of cut-and-fill during construction of the HNP. The predominant overburden material is broken and crushed sandstone, silt, and other rock that was used to level the HNP site.

The natural topography of the northern reactor site, HAR 3, is underlain with a thin soil layer of silty to sandy clay, with the upper several centimeters of root-rich organic humus. The soils vary in thickness up to 7 m (23 ft.). These soils resulted from in-place weathering of the underlying bedrock. In many places, there is no sharp contact between the soil and bedrock, and the transition occurs across a gradual gradational zone.

The soils are identified as belonging to the Creedmore-White Store association, composed of clayey subsoil and have upper soil layers derived from sandstone, shale and mudstone. These soils are well-drained and occur on gently sloping to hilly terrain. Typical soil types are sandy to silty loams (Reference 2.6-005).

2.6.2 ENVIRONMENTAL IMPACT TO GEOLOGIC SETTING

The potential for the environmental impact of the HAR site on geologic conditions in the vicinity is considered very small. It has been evaluated as part of the application process, as described in Section 2.5 of the HAR FSAR.

2.6.3 REFERENCES

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2.6-002 Ebasco Services, Inc., "Final Geologic Report on Foundation Conditions: Power Plant, Dams, and Related Structures," Vol. 1, 1981.

2.6-003 Carolina Power & Light, Company, "Shearon Harris Nuclear Power Plant Final Safety Analysis Report," Amendments 53 and 54, 1983.

2.6-004 Clark, T.W., P.J.W. Gore, and M.E. Watson, "Depositional and Structural framework of the Deep River Triassic Basin, North Carolina," In Hoffman, C.W., ed., "Field Trip Guidebook, 50th Annual Meeting, Southeastern Section, Geological Society of America, Raleigh, North Carolina," pp. 27-50, April 2001.

2.6-005 U.S. Department of Agriculture Soil Conservation Service, "Soil Survey: Wake County, North Carolina," 55 plates, 1970.

2.7 METEOROLOGY AND AIR QUALITY

2.7.1 GENERAL CLIMATE

The proposed Shearon Harris Nuclear Power Plant Units 2 and 3 (HAR) will be co-located with the existing Shearon Harris Nuclear Power Plant Unit 1 (HNP). The two units will be referred to as the proposed Shearon Harris Nuclear Power Plant Unit 2 (HAR 2) and Unit 3 (HAR 3).This subsection describes the general climate surrounding the HAR. A climatological summary of normal and extreme values of relevant meteorological parameters is presented for the first-order National Weather Service (NWS) stations or Automated Surface Observing System (ASOS) stations located in Charlotte, Greensboro, Raleigh-Durham, and Wilmington, North Carolina. Figure 2.7-1 shows the locations of these meteorological observation stations with respect to the HAR site. Additional information regarding regional climatology was derived from various documents, which are referenced in the text below.

2.7.1.1 General Description

The HAR site is located near the geographical north central portion of North Carolina in the transition zone of the Coastal Plain and Piedmont regions. Four first-order meteorological observation stations are located within the general area surrounding the HAR site. The locations of these stations, which are all in North Carolina, and their distances from the HAR site are presented in Table 2.7-1. The Raleigh-Durham station is approximately 30 kilometers (km) (19 miles [mi.]) to the north-northeast of the HAR site; the Charlotte station is 188 km (117 mi.) to the west-southwest; the Greensboro station is 111 km (69 mi.) to the west-northwest; and the Wilmington station is 179 km (111 mi.) to the south-southeast of the HAR site (Figure 2.7-1). These fully instrumented meteorological stations are "first-order" meteorological observing stations, continuously recording a complete range of meteorological parameters. The observations are recorded continuously, either by automated instruments or by human observer, for the 24-hour period from midnight to midnight. The HAR site is located in the Central Piedmont state climate division of the NCDC (Reference 2.7-028).

Climatological data for the general area surrounding the HAR site were obtained from several sources containing statistical summaries of historical meteorological data for these meteorological observation stations. The references used to characterize the climatology include the following:

- "Climates of the States," Third Edition (Reference 2.7-001).
- "Weather of U.S. Cities," Fourth Edition (Reference 2.7-002).
- "Local Climatological Data (LCD) Annual Summaries with Comparative Data" for Charlotte, Greensboro, Raleigh-Durham, and Wilmington, North Carolina, as published by the National Oceanic and Atmospheric

Administration (NOAA) National Climatic Data Center (NCDC) (Reference 2.7-003, Reference 2.7-004, Reference 2.7-005, and Reference 2.7-006).

The topography of North Carolina is comprised of three physiographic divisions: the Coastal Plain, Piedmont, and Mountains. As illustrated on Figure 2.7-2, the Coastal Plain division is the largest of the State, comprising approximately half of the area of the State. The Coastal Plain division is subdivided into the tidewater area and the interior portion. The slope ranges from 61 meters (m) (200 feet [ft.]) at the fall line to approximately 15 m (50 ft.) in the tidewater area. The fall line represents the dividing line between the Coastal Plain and the Piedmont divisions. The Wilmington observation station is located in the tidewater section of the Coastal Plain region (Reference 2.7-006). The Piedmont represents about one-third of the area of North Carolina, and ranges in slope from 61 m (200 ft.) at the fall line to 457 m (1500 ft.) at the Mountains. The Piedmont is characterized primarily by gently rolling hills with some areas of steep hills. The HAR site is located in the transition zone between the Coastal Plain and Piedmont regions, as is the Raleigh-Durham observation station (Reference 2.7-005). The Charlotte and Greensboro stations are located in the Piedmont region (Reference 2.7-003 and Reference 2.7-004).

The climatology of North Carolina is largely dependent on the elevation above sea level and the distance from the Atlantic Ocean. The climate of the Piedmont and Coastal Plain regions is typically humid, subtropical. With a humid, continental climate, the Appalachian Mountain Range in western North Carolina is typically much cooler than other areas in the State because of its higher elevation. Proximity to the Atlantic Ocean influences the winter weather in the eastern portion of the State by having a moderating effect on summer and winter temperatures. The Appalachian Mountains act as a barrier to cold polar air masses originating from the northwest, which tend to be stopped or deterred by the mountains. Deeper air masses are lifted by the mountains, resulting in a slight warming of the air and a loss of moisture during descent (Reference 2.7-003, Reference 2.7-004, Reference 2.7-005, and Reference 2.7-006). During winter, cold air can wedge southward from the northeastern United States, east of the Appalachians, resulting in a relatively high frequency of freezing rain and sleet in the Piedmont. Summer weather is affected by tropical airstreams originating in the Gulf of Mexico. The higher temperatures and humidity of this tropical air affects the central and eastern portions of the State.

Table 2.7-2 presents a summary of historical climatological observations from the Charlotte, Greensboro, Raleigh-Durham, and Wilmington meteorological observation stations.

2.7.1.2 Winds

The prevailing wind direction is southwesterly for the Greensboro, Raleigh-Durham, and Wilmington meteorological observation stations and southerly for the Charlotte meteorological observation station. The annual average wind speeds for the Charlotte, Greensboro, Raleigh-Durham and Wilmington stations are 11.9 kilometers per hour (km/h) (7.4 miles per hour [mph]), 12.1 km/h (7.5 mph), 11.9 km/h (7.4 mph) and 13.4 km/h (8.3 mph), respectively (Reference 2.7-003, Reference 2.7-004, Reference 2.7-005, and Reference 2.7-006). The highest recorded fastest mile/peak gust of wind was 140 km/h (87 mph [September of 1989]), 97 km/h (60 mph [October of 1985]), 100 km/h (62 mph [February of 1984]), and 126 km/h (78 mph [July of 1986]) for the Charlotte, Greensboro, Raleigh-Durham and Wilmington meteorological observation stations, respectively (Reference 2.7-002).

2.7.1.3 Temperature

The annual average temperature for the Charlotte, Greensboro, Raleigh-Durham and Wilmington meteorological observation stations are 15.8°C (60.5°F), 14.5°C (58.1°F), 15.3°C (59.5°F) and 17.6°C (63.6°F), respectively. Extreme temperatures that were recorded in the region range from a maximum of 40°C (104°F [September of 1954]), 39.4°C (103°F [August of 1988]), 40.6°C (105°F [August of 1988]) and 40°C (104°F [June of 1952]) to a minimum of -20.6°C (-5°F [January of 1985]), -22.2°C (-8°F [January of 1985]), -22.8°C (-9°F [January of 1985]) and -17.8°C (0°F [December of 1952]) for Charlotte, Greensboro, Raleigh-Durham and Wilmington, respectively. Maximum temperatures were equal to or exceeding 32.2°C (90°F) an average of 40.3 (Charlotte), 29.3 (Greensboro), 39.3 (Raleigh-Durham) and 46.3 (Wilmington) days per year. Minimum temperatures were less than or equal to 0°C (32°F) an average of 57.9 (Charlotte), 79.1 (Greensboro), 72.7 (Raleigh-Durham) and 39.3 (Wilmington) days per year (Reference 2.7-003, Reference 2.7-004, Reference 2.7-005, and Reference 2.7-006).

2.7.1.4 Atmospheric Moisture

Maximum relative humidity usually occurs during the early morning hours, and minimum relative humidity is typically observed in the mid-afternoon. For the annual cycle, the lowest relative humidity occurs in mid-spring, with the summer months typically exhibiting the highest relative humidity. The annual average relative humidity for the Charlotte, Greensboro, Raleigh-Durham and Wilmington meteorological observation stations ranges from 82 percent, 83 percent 85 percent and 85 percent in the early morning to 53 percent, 55 percent, 54 percent and 57 percent in the early afternoon, respectively (Reference 2.7-003, Reference 2.7-004, Reference 2.7-005, and Reference 2.7-006).

2.7.1.5 Precipitation

Annual average precipitation for the Charlotte, Greensboro, Raleigh-Durham, and Wilmington stations are 110.52 centimeters (cm) (43.51 inches [in.]), 109.58 cm (43.14 in.), 109.35 cm (43.05 in.), 144.96 cm (57.07 in.), respectively. Maximum annual precipitation recorded for the Charlotte, Greensboro, Raleigh Durham, and Wilmington stations are 144.88 cm (57.04 in. [1979]), 158.29 cm (62.32 in. [2003]), 137.54 cm (54.15 in. [1989]), 183.03 cm (72.06 in. [1999]), respectively. The maximum 24-hour precipitation recorded at the stations were 13.87 cm (5.46 in. [October 1990]), 19.02 (7.49 in. [September 1947]), 14.68 cm (5.78 in. [October 2002]), and 37.69 cm (14.84 in. [September 1999]) for Charlotte, Greensboro, Raleigh-Durham, and Wilmington, respectively. Snowfall occurs in North Carolina during the months of November through March. Annual average snowfall for Charlotte, Greensboro, Raleigh-Durham and Wilmington are 13.21 cm (5.2 in), 22.61 cm (8.9 in.), 18.03 cm (7.1 in.), and 5.33 cm (2.1 in.), respectively. Monthly maximum snowfall recorded for Charlotte, Greensboro, Raleigh-Durham and Wilmington are 49.02 cm (19.3 in. [March 1960]), 58.17 cm (22.9 in. [January 1966]), 65.53 cm (25.8 in. [January 2000]), and 38.86 cm (15.3 in. [December 1989]), respectively. The maximum 24-hour snowfall recorded at the stations were 30.73 cm (12.1 in. [January 1988]), 36.32 cm (14.3 in. [December 1930]), 45.47 cm (17.9 in. [January 2000]), and 29.72 cm (11.7 in. [February 1973]) for Charlotte, Greensboro, Raleigh-Durham, and Wilmington, respectively.

2.7.2 REGIONAL AIR QUALITY

There are 30 counties in the state of North Carolina that are currently designated by the U.S. Environmental Protection Agency as being in nonattainment of the national ambient air quality standards (NAAQS) for 8-hour Ozone. Three of these counties are also designated as being in nonattainment for particulate matter less than 2.5 micrometers (μm) in diameter ($PM_{2.5}$). In addition, the state of North Carolina also has four counties that are designated as carbon monoxide (CO) maintenance areas (Reference 2.7-007). The 30 nonattainment counties and criteria pollutants of concern within each county are shown in Table 2.7-3.

The HAR site is located in Wake County, which is currently designated by the U.S. Environmental Protection Agency (USEPA) as a maintenance area for the 8-hour Ozone standard and in attainment for the remaining NAAQS (Reference 2.7-007). Wake County is also designated as a CO maintenance area. The county was re-designated as being in attainment for CO on September 18, 1995 (Reference 2.7-008).

The North Carolina Department of Environment and Natural Resources (NCDENR) operates a network of ambient air quality monitoring stations throughout the State. The NCDENR separates the State into seven regions. The HAR site is located in the Raleigh region, which includes a network of monitoring locations. Several of the monitoring stations are located within Wake County. These stations monitor for various NAAQS criteria pollutants (i.e., ozone, $PM_{2.5}$, particulate matter of 10 μm and smaller [PM_{10}], sulfur dioxide [SO_2], and CO) (Reference 2.7-008 and Reference 2.7-009). Although Wake County is currently designated by USEPA and NCDENR as a maintenance area for ozone and CO, the operation of the HNP facility (including the proposed units) is not expected to result in a significant change in air quality in the county as a result of the construction or operation of the proposed HAR 2 and HAR 3. Because the construction-related emissions of nitrogen oxides (NOx) (an ozone-forming pollutant) CO are expected to exceed the thresholds in 40 CFR 51, Subpart W (Determining Conformity of General Federal Actions to State or Federal Implementation Plans), a conformity determination will be required prior to construction of the proposed facilities.

The Clean Air Act Amendments of 1977 identified “clean air areas,” designated as Prevention of Significant Deterioration (PSD) Class I areas. PSD Class I areas include all international parks, national wilderness and memorial parks that exceed 2023.4 ha (5000 ac.), and national parks that exceed 2428.1 ha (6000 ac.). There are no PSD Class I areas within 200 km (124.3 mi.) of the HAR site and no adverse air quality impacts on any PSD Class I areas are expected as a result of the construction or operation of the HAR. The closest PSD Class I areas to the HAR site include Linville Gorge National Wilderness Area (250 km [153 mi.] west-northwest), Great Smoky Mountains National Park (375 km [233 mi.] west), Shining Rock National Wilderness Area (360 km [224 mi.] west), Swanquarter National Wilderness Area (250 km [155 mi.] east), Cape Romaine National Wilderness Area (270 km [168 mi.] south), James River Face National Wilderness Area (215 km [134 mi.] west-northwest), and Shenandoah National Park (270 km [168 mi.] north).

2.7.3 SEVERE WEATHER

2.7.3.1 Thunderstorms, Hail, and Lightning

Local Climatological Data (LCD) summaries for the cities in the area surrounding the HAR site indicate that thunderstorms have been observed on an average of 40.6 days per year in Charlotte (67-year period of record), 45.1 days per year in Greensboro (78-year period of record), 44.0 days per year in Raleigh-Durham (61-year period of record), and 47.5 days per year in Wilmington (54-year period of record). The LCD summaries for these cities also indicate that thunderstorms occur most frequently during the months of June, July, and August in all four locations. Charlotte averaged 7 days of thunderstorms in both June and August and 9 days in July. Greensboro averaged 8 days in June and August and 10 days in July. Raleigh-Durham averaged 7 days, 11 days, and 8 days in June, July, and August, respectively. Wilmington averaged 8 days, 12 days, and 9 days in June, July, and August, respectively. Charlotte, Greensboro, and Raleigh-Durham averaged three or more thunderstorm days per month from April through September; Wilmington averaged three or more days per month from March through September. The Charlotte, Greensboro, and Raleigh-Durham stations each averaged two or less thunderstorm days per month from October through March, and the Wilmington station averaged two or less days from October through February. A thunderstorm is normally recorded only if thunder is heard at the weather observation station. It is reported on a regularly scheduled observation if thunder is heard within 15 minutes preceding the observation (Reference 2.7-010). Otherwise, special observations are recorded as a thunderstorm whenever thunder is heard.

A severe thunderstorm is defined in NOAA Technical Memorandum NWS SR-145, entitled "A Comprehensive Glossary of Weather Terms for Storm Spotters," as a thunderstorm that possesses one or more of the following characteristics (Reference 2.7-011):

- Winds of 50 knots (58 miles per hour [mph]) or more.
- Hail 1.91 centimeters (cm) (0.75 inch [in.]) or more in diameter.
- Thunderstorms that produce tornadoes.

Severe thunderstorms producing hail events with hail greater than 1.91 cm (0.75 in.) or more in diameter were recorded during the period from 1950 to 2006. A total of 182 hail events were reported in Wake County, North Carolina, during the period from January 1, 1950 to July 31, 2006. Only one storm resulted in reported property damage (Reference 2.7-012). It is noted that there has been a significant increase in the reported number of hail events over time, primarily as a result of increased reporting efficiency and confirmation skill and that many storms may have been overlooked in the early data collection years. Additionally, the increase in urbanization over the past 50 years has effectively resulted in an increase in the number of reported storms, if for no other reason than there are more targets damaged by hail and thunderstorms in an urban area than in a rural area. As a result, there is a higher frequency of reported storms in urban areas than in rural areas. While 182 hail storms were reported in Wake County over the period 1950 to 2006, more recent storm reports (Reference 2.7-012) indicate that there is a greater frequency of reported storms in more recent years.

The frequency of lightning flashes per thunderstorm day over a specific area can be estimated using Equation 2.7-1, which takes into account the distance of the location from the equator (Reference 2.7-013):

$$N = (0.1 + 0.35\sin\theta)(0.40 \pm 0.20)$$

where

N = Number of flashes to earth per thunderstorm day per square kilometer (km^2)

θ = Geographical latitude

For the HAR site, which is located at 35.64° north latitude, the frequency of lightning flashes (N) is predicted to range from 0.061 to 0.182 flashes per thunderstorm day per km^2. The value 0.182 is used as the most conservative estimate of lightning frequency in the calculations that follow.

The average annual number of thunderstorm days in the area (i.e., as reported at the Charlotte [40.6], Greensboro [45.1], Raleigh-Durham [44.0], and Wilmington

[47.5] observation stations) is 44.3. This results in a predicted mean frequency of 8.1 lightning flashes per km^2 per year, as calculated below:

$$\frac{0.182\,flashes}{(thunderstorm-day)(km^2)} \times \frac{44.3 thunderstorm-days}{year} = \frac{8.1\,flashes}{(km^2)(year)}$$

The total owned area of the HAR site is approximately 4371 hectares (ha) (10,800 acres [ac.]). Hence, the predicted frequency of lightning flashes within the area of the property owned by the existing Shearon Harris Nuclear Power Plant, Unit 1 (HNP) is 354 per year, as calculated below:

$$\frac{8.1\,flashes}{(km^2)(year)} \times 43.7 km^2 = \frac{354\,flashes}{(year)}$$

The exclusion area for HAR 2 and HAR 3 is a radius of 1245 m (4085 ft.) around each unit. This is considered to be the approximate operational area of the HAR site. The predicted frequency of lightning flashes in the HAR site exclusion area of a single reactor can be calculated as follows:

$$\frac{8.1\,flashes}{(km^2)(year)} \times 4.9 km^2 = \frac{40\,flashes}{(year)}$$

Therefore, the predicted number of lightning flashes in the immediate vicinity of HAR 2 and HAR 3 is predicted to be 40 per year.

2.7.3.2 Tornadoes and Severe Wind

North Carolina ranks 20th in the United States in average annual number of tornadoes, based on a 52-year period of record from 1953 to 2004 (Reference 2.7-014). Table 2.7-4 summarizes, by tornado intensity, all tornadoes reported in North Carolina during the period January 1, 1950 to July 31, 2006 (Reference 2.7-015). The storm intensities reported in the table are based on the original Fujita (as opposed to the recently introduced Enhanced-Fujita [E-F]) Tornado Scale. Both scales are used to estimate wind speeds associated with the amount of damage observed after the storm event, as opposed to actual measured wind speeds. During this period, the numbers and types of tornadoes reported in North Carolina were:

- 372 (F0)
- 419 (F1)
- 172 (F2)
- 45 (F3)

- 27 (F4)
- 0 (F5)

These totals equate to an average of seven F0, seven F1, three F2, less than one F3, less than one F4, and zero F5 tornadoes reported in North Carolina per year.

During the same period (1950 to 2006), a total of 28 tornadoes were reported in Wake County. The number of reported tornadoes for Wake County and seven adjacent counties surrounding the HAR site are summarized in Table 2.7-5 using the original Fujita scale. A total of 83 tornadoes were reported during the period of record for the eight counties (Wake, Alamance, Chatham, Durham, Harnett, Johnston, Lee, and Orange) surrounding the HAR site (Reference 2.7-015). The largest reported tornado, an F4, occurred in November 1988 in Wake and Nash counties. This tornado resulted in four fatalities and approximately $250 to $285 million in damage. Table 2.7-6 summarizes the number of tornadoes in North Carolina by year and the (original) Fujita Tornado Scale Category for the period 1950 to 2006.

A statistical analysis of tornado occurrences in the United States over a 70-year period, (Reference 2.7-016) concluded that the indicated increase in tornado occurrences was primarily a result of increased reporting efficiency and confirmation skill and that F0- and F1-class tornadoes were typically overlooked during the early data collection years. Additionally, research conducted by Grazulis (as reported by Gaya et al.) concluded that the increase in urbanization over the past 50 years has effectively resulted in an increase in the number of reported tornadoes, if for no other reason than there are more targets destroyed or damaged by a tornado in an urban area than in a rural area (Reference 2.7-017). As a result, there is a higher frequency of reported incidents in urban areas than in rural areas.

The probability of a tornado strike for the HAR site can be calculated using an empirical relationship such as the following equation (Reference 2.7-018):

where

P_s = Probability that a tornado will strike a particular location during a 1-year interval.

$\overline{n}$ = Average number of tornadoes per year (i.e., equal to 1.46 for the eight-county area containing and surrounding the HAR site, as calculated from Table 2.7-5).

a = Average individual tornado area, equal to 0.813 km^2 (0.314 mi.^{2}) for the HAR site, as calculated from Table 2-14 in NUREG/CR-4461, Rev. 2.

A = Total area of concern (e.g., 1 square with 35˚ 30' mid/latitude) equal to 10,078 km^2 (3891.15 $mi.^2$).

Using this equation, the tornado strike probability (for a tornado of any intensity) for the HAR site, P_s, is estimated to be 0.000118, which corresponds to a return frequency of once in 8475 years. Waterspouts, which are similar to tornadoes, have been observed to occur only over very large bodies of water, such as the ocean, the Great Lakes, the Great Salt Lake and other similar sized large bodies of water, and are not expected to occur in the vicinity of the HAR site.

2.7.3.3 Heavy Snow and Severe Glaze Storms

Winter weather events are defined as the occurrence of measurable precipitation in the form of snow, sleet, freezing rain, or cold rain. Research conducted by Fuhrmann and Konrad of the Department of Geography at the University of North Carolina at Chapel Hill provides information on winter weather events observed at 18 first-order weather stations during the period from 1948 to 2003 (Reference 2.7-019). The North Carolina State Climate Office (SCO) reports that winter weather precipitation typically occurs in the State as a result of cold continental polar air masses from Canada mixing with moist air originating over the Gulf of Mexico. The moist air may be displaced by a cold dome that is formed when air masses from the New England area entrain the polar air masses from Canada, creating a wedge of cold air near the earth's surface. The moist air can migrate upward over the cold dome, resulting in mixed precipitation.

Annual precipitation distributions and mean recurrence intervals were determined for the State of North Carolina. According to the SCO, frozen precipitation totals for the Piedmont region of North Carolina are between 2.54 cm (1.0 in.) and 5.08 cm (2.0 in.) liquid equivalent per year, with liquid equivalent snowfall between 1.27 cm (0.5 in.) and 3.81 cm (1.5 in.) per year, sleet is at least 0.25 cm (0.1 in.) per year, freezing rain averages 1.52 cm (0.6 in.), and 7.62 cm (3.0 in.) to 9.14 cm (3.6 in.) of cold rain per year.

Heavy freezing rain events have occurred in and across portions of the Piedmont of North Carolina, including a December 2002 event where 3.61 cm (1.42 in.) of freezing rain was recorded at Raleigh-Durham (Reference 2.7-019). Mean annual occurrences of measurable winter weather precipitation in Raleigh-Durham are 1.27 cm (0.5 in.), 3.30 cm (1.3 in.), and 1.78 cm (0.7 in.) for freezing rain, sleet, and snowfall, respectively. The probability of occurrence of measurable precipitation in Raleigh-Durham is 100 percent, 77 percent, and 100 percent for freezing rain, sleet, and snowfall, respectively (Reference 2.7-019). Although some events have caused traffic problems (such as the January 2005 snow event), none has caused any significant impact on HNP operations.

Subsection 2.3.1.2 of NRC Regulatory Guide 1.70 and Subsection C.I.2.3.1.2 of NRC Regulatory Guide 1.206 suggest that applicants provide site vicinity estimates of the weight of the 100-year return period snowpack (at ground level) and the weight of the 48-hour probable maximum winter precipitation (PMWP) for use in estimating the weight of snow and ice on the roofs of safety-related structures. The 100-year return snowpack was obtained from the Ground Snow Load 50-year recurrence for Charlotte, Greensboro, and Raleigh-Durham is 54 kilograms per square meter (kg/m^2) (11 pounds per square foot [psf]), 54 kg/m^2 (11 psf), and 68 kg/m^2 (14 psf), respectively (Reference 2.7-020). A correction of the 50-year recurrence values to 100-year recurrence values was performed using Table C7-3, "Factors for Converting from Other Annual Probabilities…," from SEI/ASCE 7-05, "Minimum Design Loads for Buildings and Other Structures" (Reference 2.7-021). Using the conversion factor of 1.22, the 100-year recurrent ground snow load is calculated to be 65 kg/m^2 (13.4 psf), 65 kg/m^2 (13.4 psf), and 83 kg/m^2 (17 psf) for Charlotte, Greensboro, and Raleigh-Durham, respectively. The 48-hour PMWP for the HAR site is estimated to be approximately 620 kg/m^2 (126.9 psf) or approximately 62.23 cm (24.5 in.) of precipitable water (Reference 2.7-022). December averages 1.52 cm (0.6 in.), 2.29 cm (0.9 in.), and 1.27 cm (0.5 in.) of snowfall for Charlotte, Greensboro, and Raleigh-Durham, respectively. Maximum 24-hour snowfall for Charlotte is 30.73 cm (12.1 in.), recorded in January 1988; 36.32 cm (14.3 in.) for Greensboro, recorded in December 1930; and 45.47 cm (17.9 in.) for Raleigh-Durham, recorded in January 2000.

2.7.3.4 Hurricanes

Hurricanes have been observed in coastal and inland areas of North Carolina. While sustained hurricane force winds (greater than 119 km/h [74 mph]) have not been recorded at the Raleigh-Durham weather station, climatological and storm-event records indicate that a number of hurricane tracks have passed within 100 nautical miles of the HAR site.Hurricanes deteriorate rapidly as they move onshore as a result of increased frictional drag and loss of energy. Once onshore, the increased frictional effects have a tendency to turn the winds inward toward the hurricane's center. This results in decreased surface wind speeds but enhanced low-level convergence and greater vertical velocities that are capable of producing intense rainfall and isolated tornadoes. The HAR site is located approximately 225.3 km (140 mi.) inland from the Atlantic coast. The major effect from hurricanes on the area is heavy precipitation.

The State Climate Office of North Carolina reports that there have been 48 reported hurricanes and tropical storms that have made direct landfall in North Carolina during the period 1857 to 2005, which corresponds to an annual average frequency of occurrence of 0.32 storms per year (Reference 2.7-031). The NOAA Coastal Services Center reports that only four hurricanes rated Category 2-5 have passed within 50 nautical miles of Wake County and that only 11 hurricanes rated Category 2-5 have passed within 100 nautical miles of Wake County during the same period (Reference 2.7-032).

2.7.3.5 Inversions and High Air Pollution Potential

Weather records from many United States weather stations have been analyzed by Hosler (Reference 2.7-023) and Holzworth (Reference 2.7-024 and Reference

2.7-025) with the objective of characterizing atmospheric dispersion potential. The expected seasonal frequencies of inversions based below 152 m (500 ft.) for Greensboro, North Carolina, which is 103 km (69 mi.) to the west-northwest of the HAR site, are shown in Table 2.7-7. The extent of vertical mixing is a major factor in the determination of atmospheric diffusion characteristics. Low-level temperature inversions inhibit vertical mixing. As shown in Table 2.7-7, the inversion frequency in Greensboro averaged 33 percent in the summer season and 43 percent in the winter season (Reference 2.7-023).

In general, mixing depths (i.e., the depth of the lowest layer of the atmosphere where turbulent induced dispersion is observed to occur) are characterized by a diurnal cycle of nighttime minimum and daytime maximum depths. The nighttime minimum is the result of surface radiational cooling. This cooling produces stable conditions, frequently coupled with low-level temperature inversions or isothermal layers. Daytime maximums are the result of surface heating, which produces instability and convective overturning through a larger portion of the atmosphere. When daytime (maximum) mixing depths are shallow (low inversion heights), air pollution potential is considered to be greatest. Mean monthly mixing depths for Greensboro are shown in Table 2.7-8. The lowest mean monthly mixing depth occurs in January (390 m [1280 ft.]) and the greatest mean mixing depth occurs in June (1790 m [5873 ft.]) (Reference 2.7-024).

2.7.4 LOCAL METEOROLOGY

Local meteorological conditions are characterized by data obtained from an on-site meteorological monitoring system that was installed and began operation at the HNP facility in March 1973. The on-site tower is located approximately 1.8 km (1.1 mi.) to the northeast of the HNP and consists of a 61.4-m (201.4-ft.) guyed, open-latticed design. The base of the tower is at approximately plant grade elevation of 79.2 m (260 ft.) above mean sea level (msl). The system datalogger and remote access instrumentation used to interrogate the system are housed in an environmentally controlled shelter located approximately 12 m (40 ft.) to the northwest of the tower. Based on the meteorological tower’s proximity to the HAR site, the meteorological parameters that are monitored by the HNP monitoring station are considered to be representative of the HAR site and are therefore appropriate for use in characterizing local meteorological conditions. Local meteorological monitoring results and summaries of the parameters monitored by the on-site system are described and presented in this subsection. A more detailed description of the on-site meteorological monitoring system and operational program is provided in Subsection 2.7.5.

The period of record used to characterize the local meteorological conditions representative of the HAR site is the 5-year period from March 1, 1994, to February 28, 1999. The data from this period were determined to be the most recent contiguous 5-year period of data representative of the HAR site.

During the analysis and evaluation of the data available from the on-site monitoring station (i.e., data are available from January 14, 1976, to present), it was noted that, beginning in March 1999, there was a sharp increase in the observed frequency of calm winds for the lower-level wind measurement system. This increase was determined to be attributable to instrumentation issues and the affected instrumentation was replaced in October 1999. Because of these issues, it was determined that the most appropriate and recent contiguous 5-year period of record for use in the analyses supporting the HAR ER and FSAR was March 1, 1994 through February 28, 1999. These data exceed NRC's requirements (as described in its Regulatory Guide 1.23, Revision 1) for a minimum 24-month period of record. Additionally, more than 1 year of the data will be less than 10 years old at the time of the submittal of this ER and the COLA for the HAR.

2.7.4.1 Normal and Extreme Values of Meteorological Parameters

2.7.4.1.1 Wind Summaries

Detailed wind records are available from the HNP meteorological monitoring system for the period of record from 1976 to 2006. For the purposes of this subsection, wind summaries for the period of record from March 1, 1994, to February 28, 1999, were used, as described in Subsection 2.7.4. Monthly, annual, and 5-year average joint frequency distribution of wind speed and direction by Pasquill Stability Category were constructed from wind speed and direction measurements made at the 12-m (39-ft.) and 61-m (200-ft.) levels of the on-site meteorological tower. It is noted that the measurement levels on the HNP meteorological tower are slightly different than the 10-m (33-ft.) and 60-m (197-ft.) levels recommended in the NRC's Regulatory Guide 1.23, Revision 1. It is also noted that the six wind speed categories presented in the joint frequency distributions differ from the 11 wind speed categories recommended in NRC's Regulatory Guide 1.23, Revision 1.

The lower-level (12-m [39-ft.]) wind direction and wind speed are summarized by individual Pasquill stability category (i.e., A through G) and for the "All Stability" category in Tables 2.7-9, 2.7-10, 2.7-11, 2.7-12, 2.7-13, 2.7-14, 2.7-15 and 2.7-16 for the 1994 to 1999 period. Lower-level (12-m; 39-ft.) wind speed and wind direction data were also summarized for the "All Stability" category for each year from 1994 through 1999, as shown in Tables 2.7-17, 2.7-18, 2.7-19, 2.7-20, and 2.7-21. The percent occurrence of wind speed and wind direction has been summarized for the "All Stability" category for the period 1994 to 1999, as shown in Table 2.7-22. Additionally, the lower-level (12-m [39-ft.]) wind direction and wind speed are summarized monthly for the period March 1994 to February 1999 for the "All Stability" category in Tables 2.7-23, 2.7-24, 2.7-25, 2.7-26, 2.7-27, 2.7-28, 2.7-29, 2.7-30, 2.7-31, 2.7-32, 2.7-33, and 2.7-34. For this same period, graphical illustrations of the wind roses of wind speed and direction for the lower-level tower measurements (12 m [39 ft.]) are shown in Figure 2.7-3 (all stabilities, all 5 years) and in Figures 2.7-4, 2.7-5, 2.7-6, 2.7-7, 2.7-8, 2.7-9, 2.7-10, 2.7-11, 2.7-12, 2.7-13, 2.7-14, and 2.7-15 (all stabilities, all 5 years, by month).

The upper-level (61-m [200-ft.]) wind direction and wind speed data are summarized by individual Pasquill stability category (i.e., A through G) and for the "All Stability" category in Tables 2.7-35, 2.7-36, 2.7-37, 2.7-38, 2.7-39, 2.7-40, 2.7-41, and 2.7-42 for the 1994 to 1999 period. Upper-level (61-m [200-ft.]) wind speed and wind direction data were also summarized for the "All Stability" category for each year from 1994 through 1999, as shown in Tables 2.7-43, 2.7-44, 2.7-45, 2.7-46, and 2.7-47. The percent occurrence of wind speed and wind direction is summarized for the "All Stability" category for the period 1994 to 1999, as shown in Table 2.7-48. Additionally, the upper-level (61-m [200-ft.]) wind direction and wind speed are summarized monthly for the March 1994 to February 1999 period for the "All Stability" category starting in Table 2.7-49 and ending in Table 2.7-60.

The wind summaries prepared from the March 1, 1994, to February 28, 1999, wind data set were compared to the wind summaries provided in the HNP FSAR (Reference 2.7-018). A comparison of the composite wind data for the 1994 to 1999 period indicates that they are generally consistent with the observations of wind speed and direction that were provided in the HNP FSAR report for the period January 14, 1976 to December 31, 1978.

Graphical wind roses of wind speed and direction from the nearby Raleigh-Durham Airport are also provided for comparison with the on-site wind measurements described above. Figure 2.7-16 illustrates the wind rose for the 5-year period from March 1, 1984 through February 28, 1989, and Figure 2.7-17 illustrates the wind rose for the 5-year period from January 1, 2001 through December 31, 2005. The Raleigh-Durham wind roses for the two 5-year periods are somewhat different, with an apparent variation in predominant wind direction on the order of 45 degrees. While there is no definitive explanation for the differences, it is possible that they could be attributable to local development, vegetation growth, or other factors. Differences between the Raleigh-Durham wind roses and the wind roses for the HNP site are more than likely attributable to differences in topography and vegetation between the Raleigh-Durham airport and the HNP site area.

2.7.4.1.2 Ambient Temperatures

Ambient temperature data from the HNP site have been available from the on-site meteorological monitoring station since 1976. Temperature is measured at both the 12-m (39-ft.) and 61-m (200-ft.) levels, and differential temperature (used in determining wind stability classification) is measured between the 12-m (39-ft.) and 61-m (200-ft.) levels of the tower. For the 1994 to 1999 period of record, the absolute maximum temperature recorded by the system was 36.4°C (97.5°F), and the absolute minimum temperature was -16.5°C (2.3°F). Information reported in the HNP FSAR, from the 1976 to 1978 period of record, included composite monthly summaries of on-site ambient temperature measured at the 12-m (39-ft.) level, as well as similar information from the 1994 to 1999 data period (Reference 2.7-018). This information is presented in Table 2.7-61 (mean monthly and annual mean temperature). Table 2.7-62 contains mean monthly and annual maximum and minimum temperatures for the 1976 to 1978 data period. The diurnal temperature range for the HNP site during this period is approximately 20ºC (68ºF) in the winter and summer seasons and approximately 25ºC (77ºF) in the fall or spring seasons (Reference 2.7-018). The 8 years of on-site ambient temperature data reported in Table 2.7-61, are generally representative of the HAR site and consistently within the bounds of the long-term regional observations from Charlotte, Greensboro, and Raleigh-Durham when compared to long-term periods of record at those locations. Mean maximum and minimum daily temperatures for the Charlotte, Greensboro, and Raleigh-Durham stations are summarized in Table 2.7-63 (Reference 2.7-003, Reference 2.7-004, and Reference 2.7-005).

2.7.4.1.3 Atmospheric Moisture

2.7.4.1.3.1 Relative Humidity

Maximum relative humidity usually occurs during the early morning hours, and minimum relative humidity is typically observed in the mid-afternoon. For the annual cycle, the lowest relative humidities occur in mid-spring, with the summer months typically exhibiting the highest relative humidities, on average. Table 2.7-64 summarizes relative humidity observations from the Charlotte, Greensboro, and Raleigh-Durham meteorological observing stations.

2.7.4.1.3.2 Wet-Bulb Temperature

Based on an evaluation of the historical meteorological data presented in Table 2.7-65, the site characteristic maximum 30-day running average wet-bulb temperatures are 22.8ºC (73.0°F), 23.1ºC (73.6°F), and 23.5ºC (74.3°F), respectively, for the Charlotte, Greensboro, and Raleigh-Durham meteorological observing stations. The coincident 30-day average dry-bulb temperatures for the same period are 27.0ºC (80.6°F), 26.7ºC (80.1°F), and 26.3ºC (79.3ºF), respectively (Reference 2.7-026).

Based on an evaluation of the historical meteorological data presented in Table 2.7-65, the site characteristic maximum 5-day running average temperatures for the 30-year period from 1961 to 1990 are 23.9ºC (75.0°F), 24.6ºC (76.3°F), and 24.9ºC (76.8°F), for the Charlotte, Greensboro, and Raleigh-Durham meteorological observing stations, respectively. The coincident 5-day running average temperatures are 28.8ºC (83.8°F), 28.4ºC (83.1°F), and 29.3ºC (84.7°F), respectively. The site characteristic maximum 1-day running average wet-bulb temperatures are 24.9ºC (76.8°F), 25.4ºC (77.7°F), and 26.0ºC (78.8°F), respectively, and the coincident 1-day running average dry-bulb temperatures for the same period are 29.2ºC (84.6°F), 29.6ºC (85.3°F), and 30.7ºC (87.3°F), respectively (Reference 2.7-026).

The site characteristic wet-bulb temperatures that were exceeded less than 1 percent of the time were 24.2ºC (75.6°F), 24.3ºC (75.7°F), and 24.7ºC (76.5°F) for the Charlotte, Greensboro, and Raleigh-Durham stations, respectively. The maximum wet-bulb temperatures recorded for Charlotte, Greensboro, and Raleigh-Durham during this period were 27.4ºC (81.3°F), 27.4ºC (81.3°F), and 28.2ºC (82.8°F), respectively (Reference 2.7-026).

2.7.4.1.3.3 Dew-Point Temperature

Dew-point temperature is used as a measure of the absolute humidity in the air. It is the temperature to which air must be cooled to reach saturation/ condensation, assuming pressure and water vapor content remain constant. The on-site composite monthly and annual dew-point measurements for the 3-year period from 1976 to 1978 were compared with regional observations from the Charlotte, Greensboro, and Raleigh-Durham stations. Table 2.7-66 compares mean dew-point measurements reported for the Charlotte, Greensboro, and Raleigh-Durham observing stations with measurements from the HNP on-site meteorological monitoring station for the 3-year period. Table 2.7-67 provides a summary of monthly and annual mean dew-point measurements from the on-site meteorological data for the period 1976 to 1978.

2.7.4.1.4 Precipitation

The average yearly precipitation observed at the HNP meteorological monitoring station during the period from 1976 to 1978 was 89.92 cm (35.4 in.) (Reference 2.7-018).

Table 2.7-68 compares monthly and annual precipitation measurements at the Charlotte, Greensboro, and Raleigh-Durham meteorological observation stations with the monthly and annual average measurements from the HNP on-site meteorological monitoring station. On-site precipitation totals (monthly and annual) are summarized in Table 2.7-69. As shown in Tables 2.7-68 and 2.7-69, the region displays some variance in total monthly and annual precipitation between stations from year-to-year and month-to-month, but there does not appear to be a well-defined “wet” or “dry” season. The 8 years of on-site precipitation data reported in Table 2.7-69 are consistently within the bounds of the long-term regional observations from Charlotte, Greensboro, Raleigh-Durham and Wilmington when compared with long-term periods of record at those locations.

2.7.4.1.5 Fog

Fog is an aggregate of minute water droplets suspended in the atmosphere near the surface of the earth. According to international definition, fog reduces visibility to less than 1.0 km (0.62 mi.). According to the United States observation practice, ground fog is a fog that hides less than 60 percent of the sky and does not extend to the base of any clouds that may lie above it. Ice fog is fog composed of suspended particles of ice; it usually only occurs in high latitudes in calm, clear weather at temperatures below -28.9˚C (-20°F) and increases in frequency as the temperature decreases (Reference 2.7-027).

Table 2.7-70 summarizes the occurrence of fog at the Charlotte, Greensboro, and Raleigh-Durham meteorological observation stations. Heavy fog (i.e., visibility less than or equal to 0.4 km [0.25 mi.]) has been observed at Charlotte, Greensboro, and Raleigh-Durham an average of 25.2, 32.4, and 32.5 days per year, respectively (Reference 2.7-003, Reference 2.7-004, and Reference 2.7-005). The greatest number of fog days typically occurs in the fall and winter, with approximately 3 days per month in November through February. However, fog can be a very localized phenomenon, and the information provided in Table 2.7-70 is used as a regional estimate for fog occurrence. The most common type of fog occurring near the HAR site is believed to be ground fog resulting from nighttime radiational cooling. Regional fog observations appear to be reasonably representative of the site area and there is no reason to expect that on-site observations of naturally occurring fog would be significantly different.

2.7.4.1.6 Atmospheric Stability

A joint frequency distribution of wind speed, wind direction, and atmospheric stability is used in conjunction with a dispersion model to estimate the average rate of dispersion of routine and potential accidental radioactive releases. For the HAR site, joint frequency distributions have been generated from on-site data using the vertical temperature gradient and the variability of the horizontal wind to estimate atmospheric stability. This is in accordance with NRC's Regulatory Guide 1.23, Revision 1. Joint frequency distributions of wind speed, wind direction, and atmospheric stability measured at the HNP site are provided in Tables 2.7-9, 2.7-10, 2.7-11, 2.7-12, 2.7-13, 2.7-14, 2.7-15, 2.7-16, 2.7-17, 2.7-18, 2.7-19, 2.7-20, 2.7-21, 2.7-22, 2.7-23, 2.7-24, 2.7-25, 2.7-26, 2.7-27, 2.7-28, 2.7-29, 2.7-30, 2.7-31, 2.7-32, 2.7-33, 2.7-34, 2.7-35, 2.7-36, 2.7-37, 2.7-38, 2.7-39, 2.7-40, 2.7-41, 2.7-42, 2.7-43, 2.7-44, 2.7-45, 2.7-46, 2.7-47, 2.7-48, 2.7-49, 2.7-50, 2.7-51, 2.7-52, 2.7-53, 2.7-54, 2.7-55, 2.7-56, 2.7-57, 2.7-58, 2.7-59, and 2.7-60 for the period March 1, 1994, to February 28, 1999.

Table 2.7-71 shows the frequency of occurrence of Pasquill stability categories for the periods 1976 to 1978 and March 1, 1994 to February 28, 1999. Based on the information presented, temporal variations within the individual stability categories are seen to be relatively small. Almost 50 percent of all hours fall into either neutral (D) or slightly stable (E) stability categories. Nearly 20 percent of all hours fall into the extremely stable (G) stability category. Extremely unstable (A), moderately unstable (B), and slightly unstable (C) categories combined occurred during only approximately 16 percent of the total hours. An assessment of the distribution of stability categories for the period from 1994 to 1999 would be expected to yield a distribution similar to that reported for the 1976 to 1978 data period. These distributions of stability categories are generally consistent with what would be expected for this region and the high predominance of A through E stability is considered to be conducive to very good atmospheric dispersion conditions during most hours of the day.

2.7.4.1.7 Topographical Description of the Surrounding Area

The HAR site and surrounding region is relatively flat with no significant terrain features that will otherwise be expected to adversely or unusually impact natural dispersion downwind. The plant lies within a shallow basin, as depicted on Figures 2.7-18, 2.7-19, 2.7-20, and 2.7-21, which show cross-sectional plots of elevation versus distance from the HNP plant center for each of 16 directional sectors. The general elevations within 16 km (10 mi.) of the HAR site gradually increase from the plant grade of 79.2 m (260 ft.) msl to around 121.9 m (400 ft.) msl in all but the north, north-northwest, north-northeast, west-southwest, and southwest directions.

Figure 2.7-22 shows the topographic features within an 8-km (5-mi.) radius of the plant. The figure shows the topography as it will be influenced by the plant. The proposed increase in elevation of Harris Reservoir will result in a significant increase (approximately 72 percent) in the surface area of the reservoir as discussed in Section 2.3 of the Environmental Report.

The increase in surface area of Harris Reservoir, and the corresponding increase in heat rejection to the reservoir attributable to operation of HAR 2 and HAR 3, could result in a slight increase in heat and moisture to the immediate vicinity of the plant. Under some conditions, the surface of the reservoir could be warmer than the surrounding ground and air. This increase in surface temperature could cause the layer of air over Harris Reservoir to achieve a neutral or unstable lapse rate in the vertical, especially when thermally stable conditions prevail over land. Under these conditions, a release from a ground-level source would undergo some additional vertical diffusion compared to what would be computed using a stability category obtained from the meteorological tower. However, because of the relatively small size of Harris Reservoir and its orientation with respect to HAR 2 and HAR 3, no adjustments are proposed to account for any additional surface heating effects. In general, the increase in surface heating effects is expected to be minimal.

There may also be periods when the average temperature of the water in the reservoir is colder than the surrounding land and air. It is expected that such periods could occur during or after synoptic changes in weather patterns or air masses that result in the flow of warm air into the region when the reservoir water is still cool. These occurrences are most likely to occur in the spring when synoptic scale air masses from the Gulf of Mexico or the Atlantic move into the area. Under these circumstances, there could be some short-term effects on local dispersion due to the presence of a stable layer of air over the reservoir. The most likely effects on dispersion would be a decrease in thermally-induced vertical mixing in the near-surface stable layer over the reservoir. However, these effects are not expected to persist for any significant distance from the reservoir for two reasons: 1) the reservoir consists of a number of smaller reaches that extend in different directions, rather than one large mass of water, and 2) the reservoir is surrounded by vegetative and forested areas with surface roughness features that will generate mechanical turbulence and mixing, which in turn will break up the localized layer of stable air.

The proposed increase in the surface elevation of Harris Reservoir from approximately 67.1 m (220.0 ft.) msl to 73.2 m (240.0 ft.) msl represents a discontinuity in the ground surface over which diffusing gases travel. Harris Reservoir presents a smoother surface than does the land over which the air will travel. For wind directions to or from the north-northeast, there is an increased upwind/downwind fetch where the wind will travel over the smoother water surface than would occur in other directions. Under certain conditions, this could reduce the surface or mechanically induced turbulence and, in turn, the resulting diffusion of any effluents released from the facility. At the same time, however, the reduced frictional effects could allow for an increased wind speed, possibly mitigating any reduced diffusion caused by turbulence. Because of the limited potential for the reservoir to influence diffusion, no adjustments to the diffusion calculations are proposed.

Figure 2.7-23 shows topographic features within an 80-km (50-mi.) radius of the HAR site. In general, the terrain slopes upward northwest of the HAR site, averaging about 3 m (10 ft.) per mile, and reaches an elevation of approximately 244 m (800 ft.) at 80 km (50 mi.) from the plant. The terrain through the north and west sectors is gently rolling, ranging from about 30.5 m (100 ft.) msl to 152.4 m (500 ft.) msl (Reference 2.7-018).

2.7.4.2 Local Meteorological Conditions for Design and Operating Bases

Design and operating bases, such as tornado parameters, ice glaze thickness, and winter probable maximum precipitation, are statistics that, by definition and necessity, are based on long-term regional records. Although data collected through the HNP on-site meteorological monitoring system can be considered representative of long-term site meteorology, long-term regional data are considered most appropriate for use as conservative estimates of climatological extremes. Therefore, the design and operating basis conditions were based on regional meteorological data, as previously described in Subsection 2.7.1.

2.7.5 ON-SITE METEOROLOGICAL MEASUREMENTS PROGRAM

The on-site meteorological measurement program at HNP began in March 1973 with the installation of a 61.4-m (201.4-ft.) guyed, open-latticed tower (Reference 2.7-018). The tower has been used to monitor meteorological parameters at two levels above ground level. It has operated continuously since it was first installed. Table 2.7-72 shows the current elevations of the operational sensors for all monitored parameters at both the lower and upper monitoring levels. Figure 2.7-24 shows a topographical map of the area and the location of the meteorological tower with respect to the HNP and the HAR. The monitoring results obtained from the tower will be used to characterize the on-site meteorological conditions for the HAR.

The topography surrounding the on-site meteorological monitoring tower is generally consistent with the terrain where HAR 2 and HAR 3 will be located. The area surrounding the tower is generally considered to be “grassy” within several hundred feet of the tower in all directions. In the immediate vicinity of the tower base and within the security fence, gravel has been used as means of controlling weeds. The presence of this gravel is not extensive and is not expected to have an influence on the parameters measured on the tower. There are also a number of utility poles located within a few hundred feet of the tower that are used for training Progress Energy employees. The presence of these poles is not expected to have an influence on any tower measurements. The tower is located approximately 1069 m (3500 ft.) from the proposed location of the nearest cooling tower for HAR 2 and HAR 3. The base elevation of the meteorological tower is 79.2 m (260 ft.) above mean sea level (msl).

Five years of continuous and consecutive meteorological data from the on-site tower for the period of March 1, 1994 through February 28, 1999, are submitted with this application in electronic format consistent with the requirements of Appendix A of the NRC’s Regulatory Guide 1.23, Revision 1. These data are also used for the determination of short- and long-term diffusion estimates, as described in FSAR Subsections 2.3.4 and 2.3.5. As discussed in Subsection 2.7.4, these data are considered to be the most recent meteorological data representative of the site.

Additional information on tower instrumentation, including wind, temperature, precipitation, and solar system, as well as maintenance, data reduction, and measurement accuracy can be found in Section 6.4.

2.7.6 SHORT-TERM DIFFUSION ESTIMATES

2.7.6.1 Objective

Conservative estimates of the local atmospheric dilution factors (X/Q) for HAR 2 and HAR 3 were made using an atmospheric dispersion model and on-site meteorological data for the 5-year period March 1, 1994, through February 28, 1999. This data was originally prepared in accordance with NRC Regulatory Guide 1.23, Revision 0 that designates six wind speed categories (plus calms), and these data were formatted for use in NRC’s PAVAN dispersion model. The PAVAN modeling results discussed in this section are based on these six wind speed categories (plus calms) as input to the model. This is an exception to NRC Regulatory Guide 1.23, Revision 1, which provides new guidance for the use of eleven wind speed categories (plus calms). The PAVAN analyses were performed prior to the issuance of Regulatory Guide 1.23, Revision 1. The information presented in this section was prepared using Regulatory Guide 1.23, Revision 0.

2.7.6.2 X/Q Estimates Using the PAVAN Computer Code and On-Site Data

According to the NRC's NUREG/CR-2858, the PAVAN computer code was used to calculate short-term accident X/Q values for the HAR 2 and HAR 3 exclusion area boundary (EAB) and minimum calculated low population zone (LPZ). The HAR EAB, which was previously discussed in Section 2.5, is defined as two overlapping areas centered on the reactor building of each unit. The areas are defined by a circular distance of 1600 m (5249 ft.) in the southerly sectors (east-southeast through west-southwest) and 1245 m (4085 ft.) in the east, west, and northerly sectors (west through east). The overall shape of the HAR EAB is defined by the outermost boundary of each unit's area. The HAR site is located within a much larger tract of land that includes the HNP EAB, Harris Reservoir, and some surrounding lands. The measurements to the EAB used in this analysis represent the distances from the center of the reactor building of each unit to the EAB, or 1600 m (5249 ft.) in the southerly sector (east-southeast through west-southwest) and 1245 m (4085 ft.) in the east, west, and northerly sectors (west through east) . The predicted HAR 2 and HAR 3 X/Q values are compared in Table 2.7-73 to the acceptance criteria established in Subsection 2.3.4 of Westinghouse's AP1000 DCD and listed in DCD Table 2-1 (values reproduced in the table).

The maximum predicted 50 percent direction independent X/Q values were determined in accordance with the NRC Regulatory Guide 1.145 for 50-use in the environmental report evaluations.

Input to the PAVAN model consisted of the following information:

Meteorological Data:	Joint frequency distribution of wind speed, wind direction, atmospheric stability for 16 standard azimuthal sectors. Period of record March 1994 – February 1999 (Table 2.7-74).
Wind Sensor Height:	Lower – 12 m (39 ft.).
Delta-T Heights:	Upper – 12 to 61 m (39 – 200 ft.).
Number of Wind Speed Categories:	7.
Minimum Building Cross Section:	2730 square meters (m^2) (29,385 square feet [$ft.^2$]). (DCD Figure 3.8.2-1)
Containment Height:	43.9 m (144 ft.). (DCD Figure 3.8.2-1)

Release Height:	10.0 m (33 ft.) (ground-level default height).

Based on the locations of HAR 2 and HAR 3 with respect the main reservoir and the meteorological tower, the atmospheric diffusion parameters, sigma y and sigma z, are not expected to be unduly influenced by the meteorological or topographical conditions in the vicinity of the site. Therefore, no modifications were made to the atmospheric dispersion parameters, sigma y and sigma z.

The results of the PAVAN analysis for the EAB and LPZ are also summarized for other averaging periods in Table 2.7-75.

2.7.6.3 X/Q Estimates for Short-Term Diffusion Calculations

The 50th percentile EAB and LPZ X/Q values were determined from the PAVAN output and by logarithmic interpolation. The conservatively reported 0- to 2-hour 50th percentile values at the EAB and LPZ without building wake are 5.64E-05 sec/m^3 and 1.14E-05 sec/m^3, respectively. The remaining values for the longer time periods for the LPZ are determined using the 0- to 2-hour 50th percentile LPZ value and the LPZ average annual value of 2.23E-06 sec/m^3 from the PAVAN output by logarithmic interpolation at the intermediate time periods of 8 hours, 16 hours, 72 hours, and 624 hours. The values are shown in Table 2.7-75.

2.7.7 LONG-TERM (ROUTINE) DIFFUSION ESTIMATES

2.7.7.1 Objective

Estimates of long-term atmospheric dilution factors (X/Q) and relative deposition (D/Q) were estimated using a straight-line Gaussian model, consistent with the requirements of the NRC Regulatory Guides 1.109 and 1.111. The objective was to calculate X/Q and D/Q values at the following locations in each of the 16 primary directions, including:

- EAB (as described in Section 2.7.6.2).
- LPZ (variable distance based on site centerpoint).
- Distance to nearest milk cow.
- Distance to nearest milk goat.
- Distance to nearest garden.
- Distance to nearest meat animal.
- Distance to nearest residence.

- Distances of 0.8, 1.2, 1.6, 2.4, 3.2, 4.0, 4.8, 5.6, 6.4, 7.2, 8.0, 12.0, 16.0, 22.5, 32.0, 40.0, 48.0, 56.0, 64.0, 72.0, and 80.0 km (0.5, 0.75, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 7.5, 10.0, 15.0, 20.0, 25.0, 30.0, 35.0, 40.0, 45.0, and 50.0 mi.) from the HAR site.

All distances are measured from a location defined by the mid-point of the two proposed units. Subsection 2.7.7.2 provides additional information on the calculations and results of long-term X/Q estimates for the HAR site.

2.7.7.2 Calculations

The calculations of X/Q and D/Q at the locations and distances listed above were made using NRC's XOQDOQ computer program per NUREG/CR-2919 using 5 years of hourly, on-site meteorological data.

Assumptions used in the analysis are summarized below:

- Meteorological Data Source – HNP on-site meteorological tower.
- Period of Record – March 1, 1994 to February 28, 1999.
- Wind Reference Level – 12 m (39 ft.).
- Stability Calculation – Delta-Temperature (12- and 61 m [39- and 200-ft.] tower levels).
- Release Type – Ground level.
- Release Height – 10 m (33 ft.).
- Building Wake Effects – Included (see Subsection 2.7.6.2).

Based on the location of HAR 2 and HAR 3 with respect to surrounding topography and the main and auxiliary reservoirs, the atmospheric diffusion parameter, sigma z, is not expected to be significantly influenced by the topographical conditions. Therefore, no modifications were made to the atmospheric diffusion parameter.

The results of the long-term atmospheric dilution factors (X/Q) and relative deposition (D/Q) have been summarized in Tables 2.7-76, 2.7-77, 2.7-78, and 2.7-79. Table 2.7-76 contains the X/Q calculations for routine releases, and Table 2.7-77 contains D/Q calculations for routine releases that account for deposition effects. Table 2.7-78 contains X/Q calculations based on radioactive decay with an overall half-life of 2.26 days for short-lived noble gases. Table 2.7-79 contains X/Q calculations based on radioactive decay with an 8-day half-life for all iodines released to the atmosphere

Based on these analyses, the established site characteristic value for the maximum average annual dispersion factor at the EAB is a value of 6.00E-06 sec/m^3 for any given sector (i.e., SSW sector; refer to Table 2.7-76).

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Table 2.7-1
Regional Meteorological Observation Station Locations

Station	Latitude			Longitude			Distance from HAR Site	Direction from HAR Site
	deg	min	sec	deg	min	sec	km. (mi.)	(Compass)
Charlotte, NC	35	12	52	80	56	37	188 (117)	WSW
Greensboro, NC	36	5	51	79	56	37	111 (69)	WNW
Raleigh-Durham, NC	35	52	14	78	47	11	30 (19)	NNE
Wilmington, NC	34	16	6	77	54	22	179 (111)	SSE

Sources: Reference 2.7-003, Reference 2.7-004, Reference 2.7-005, and Reference 2.7-006

Table 2.7-2 (Sheet 1 of 2)
Climatological Data from Charlotte, Greensboro, Raleigh-Durham, and Wilmington, NC

	Station							
Parameter	**Charlotte/ Douglas**	**POR (yrs)**	**Greensboro/ Piedmont**	**POR (yrs)**	**Raleigh-Durham**	**POR (yrs)**	**Wilmington**	**POR (yrs)**
Location								
Distance from HAR Site (mi.)	117		69		19		111	
Direction from HAR Site	West Southwest		West Northwest		North Northeast		South Southeast	
Elevation Above Mean Sea Level (ft.)	721		904		427		30	
Temperature								
Average Annual Observed (°F)	60.5	58	58.1	58	59.5	58	63.6	58
Maximum Observed (°F)	104 (Sept. 1954)	66	103 (Aug. 1988)	77	105 (Aug. 1988)	61	104 (Jun. 1952)	54
Minimum Observed (°F)	-5 (Jan. 1985)	66	-8 (Jan. 1985)	77	-9 (Jan. 1985)	61	0 (Dec. 1989)	54
Normal Degree days/year (heating)	3,162	30	3,848	30	3,465	30	2,429	30
Normal Degree days/year (cooling)	1,681	30	1,332	30	1,521	30	2,017	30
Relative Humidity (%)								
Annual average at 7 A.M.	82	30	83	30	85	30	85	30
Annual average at 1 P.M.	53	30	55	30	54	30	57	30
Wind								
Annual average speed (mph)	7.4	56	7.5	52	7.4	51	8.3	39
Prevailing direction	South	33	Southwest	36	Southwest	36	Southwest	29
Fastest mile/Peak gust[a]								
Speed (mph)[a]	87 (Sept. 1989)	7	97 (July 1996)[b]	6	62 (Feb. 1984)	7	78 (July 1986)	7
Direction[a]	East	7	Northwest	6	Southeast	7	Southwest	7

Table 2.7-2 (Sheet 2 of 2)
Climatological Data from Charlotte, Greensboro, Raleigh-Durham, and Wilmington, NC

Parameter	Station							
	Charlotte/ Douglas	POR (yrs)	Greensboro/ Piedmont	POR (yrs)	Raleigh-Durham	POR (yrs)	Wilmington	POR (yrs)
Precipitation (in.)								
Annual average	43.51	30	43.14	30	43.05	30	57.07	30
Monthly maximum	14.72 (Oct. 1990)	66	13.26 (Sept. 1947)	77	21.79 (Sept. 1999)	61	23.41 (Sept. 1999)	54
Monthly minimum	Trace Amount (Oct. 1953)	66	Trace Amount (Jun. 1990)	77	0.23 (Sept. 1985)	61	0.16 (Apr. 1995)	54
24-hour maximum	5.46 (Oct. 1990)	66	7.49 (Sept. 1947)	77	5.78 (Oct. 2002)	61	14.84 (Sept. 1999)	54
Maximum annual	67.10 (1936)	115	62.32 (2003)	75	64.22 (1936)	116	72.06 (1999)	75
Snowfall (in.)								
Annual average	5.2	30	8.9	30	7.1	30	2.1	30
Monthly maximum	19.3 (Mar. 1960)	66	22.9 (Jan. 1966)	77	25.8 (Jan. 2000)	61	15.3 (Dec. 1989)	54
Maximum 24-hour	12.1 (Jan. 1988)	66	14.3 (Dec. 1930)	77	17.9 (Jan. 2000)	61	11.7 (Feb. 1973)	54
Mean Annual (number of days)								
Precipitation ≥ 0.01 in.	113.2	30	113.7	30	113.1	30	118.1	30
Snow, sleet, hail ≥ 1.0 in.	1.4	30	2.5	30	1.8	30	0.5	30
Heavy fog (visibility 0.25 mi or less)	25.2	67	32.4	78	32.5	56	25.2	54
Maximum temperature ≥ 90°F	40.3	30	29.3	30	39.3	30	46.3	30
Minimum temperature ≤ 32°F	57.9	30	79.1	30	72.7	30	39.3	30

Notes:
POR = period of record

a) Reference 2.7-002

b) Reference 2.7-029

Sources: Reference 2.7-002, Reference 2.7-003, Reference 2.7-004, Reference 2.7-005, Reference 2.7-006, and Reference 2.7-030

Table 2.7-3 (Sheet 1 of 2)
Summary of Designated Nonattainment Areas by County in North Carolina

County	Criteria Pollutants	
Alamance	8-Hour Ozone	
Alexander	8-Hour Ozone	
Burke	8-Hour Ozone	
Cabarrus	8-Hour Ozone	
Caldwell	8-Hour Ozone	
Caswell	8-Hour Ozone	
Catawba	8-Hour Ozone	PM 2.5
Chatham	8-Hour Ozone	
Cumberland	8-Hour Ozone	
Davidson	8-Hour Ozone	PM 2.5
Davie	8-Hour Ozone	
Durham	8-Hour Ozone	
Forsyth	8-Hour Ozone	
Franklin	8-Hour Ozone	
Gaston	8-Hour Ozone	
Granville	8-Hour Ozone	
Guilford	8-Hour Ozone	PM 2.5
Haywood	8-Hour Ozone	
Iredell	8-Hour Ozone	
Johnston	8-Hour Ozone	
Lincoln	8-Hour Ozone	
Mecklenburg	8-Hour Ozone	
Orange	8-Hour Ozone	
Person	8-Hour Ozone	
Randolph	8-Hour Ozone	
Rockingham	8-Hour Ozone	
Rowan	8-Hour Ozone	

Table 2.7-3 (Sheet 2 of 2)
Summary of Designated Nonattainment Areas by County in North Carolina

County	Criteria Pollutants
Swain	8-Hour Ozone
Union	8-Hour Ozone

Source: Reference 2.7-007

Table 2.7-4
Summary of Reported Tornado Occurrences in North Carolina

Tornado Intensity (Fujita Tornado Scale)	Number of Reported Occurrences January 1, 1950 – July 31, 2006
F0	372
F1	419
F2	172
F3	45
F4	27
F5	0

Notes:
F0 = 40 – 72 mph
F1 = 73 – 112 mph
F2 = 113 – 157 mph
F3 = 158 – 206 mph
F4 = 207 – 260 mph
F5 = 261 – 318 mph

Source: Reference 2.7-015

Table 2.7-5
Summary of Reported Tornado Occurrences in Wake and Surrounding Counties

County	F0	F1	F2	F3	F4	F5	No. of Reported Occurrences (1950 – 2006)
Wake	12	9	6	0	1	0	28
Chatham	3	3	2	0	0	0	8
Lee	1	1	1	0	0	0	3
Harnett	7	10	3	1	0	0	21
Johnston	1	5	0	1	0	0	7
Orange	4	1	1	1	0	0	7
Durham	2	1	3	0	0	0	6
Alamance	0	3	0	0	0	0	3

Notes:
These statistics are based on the reporting periods between January 1, 1950, and July 31, 2006.

F0 = 40 – 72 mph
F1 = 73 – 112 mph
F2 = 113 – 157 mph
F3 = 158 – 206 mph
F4 = 207 – 260 mph
F5 = 261 – 318 mph

Source: Reference 2.7-015

**Table 2.7-6 (Sheet 1 of 2)
Reported Tornado Occurrences in North Carolina, 1950 to 2006**

Year	F0	F1	F2	F3	F4	F5	Total
1950	1	6	1	1	0	0	**9**
1951	0	3	1	0	0	0	**4**
1952	0	1	5	1	0	0	**7**
1953	0	1	1	3	0	0	**5**
1954	0	4	5	0	0	0	**9**
1955	0	4	2	0	0	0	**6**
1956	1	7	2	0	0	0	**10**
1957	0	4	0	4	5	0	**13**
1958	2	2	0	0	0	0	**4**
1959	2	9	0	0	0	0	**11**
1960	0	8	2	0	0	0	**10**
1961	1	6	1	0	0	0	**8**
1962	1	1	1	0	0	0	**3**
1963	0	4	7	0	0	0	**11**
1964	2	7	4	2	0	0	**15**
1965	0	3	4	4	0	0	**11**
1966	0	4	4	0	0	0	**8**
1967	1	4	3	0	0	0	**8**
1968	0	3	3	0	0	0	**6**
1969	0	2	5	3	0	0	**10**
1970	0	2	0	0	0	0	**2**
1971	0	1	2	2	0	0	**5**
1972	2	0	1	1	0	0	**4**
1973	13	23	4	1	0	0	**41**
1974	3	13	6	0	1	0	**23**
1975	5	27	6	0	0	0	**38**
1976	1	16	6	0	0	0	**23**
1977	7	22	1	1	0	0	**31**
1978	2	7	5	0	0	0	**14**
1979	4	5	3	0	0	0	**12**
1980	7	6	1	0	0	0	**14**
1981	0	3	9	0	0	0	**12**
1982	2	6	5	0	0	0	**13**
1983	3	6	7	0	0	0	**16**

Table 2.7-6 (Sheet 2 of 2)
Reported Tornado Occurrences in North Carolina, 1950 to 2006

Year	F0	F1	F2	F3	F4	F5	Total
1984	3	8	7	7	10	0	**35**
1985	6	1	0	1	0	0	**8**
1986	8	4	5	0	0	0	**17**
1987	2	1	1	0	0	0	**4**
1988	5	10	4	0	5	0	**24**
1989	1	13	6	1	5	0	**26**
1990	6	7	4	1	0	0	**18**
1991	12	14	3	0	0	0	**29**
1992	15	15	1	10	0	0	**41**
1993	4	7	0	0	0	0	**11**
1994	9	3	1	0	0	0	**13**
1995	13	8	3	0	0	0	**24**
1996	28	19	9	0	0	0	**56**
1997	8	3	0	0	0	0	**11**
1998	30	27	6	2	1	0	**66**
1999	21	8	9	0	0	0	**38**
2000	23	1	0	0	0	0	**24**
2001	11	2	0	0	0	0	**13**
2002	6	4	1	0	0	0	**11**
2003	27	9	0	0	0	0	**36**
2004	50	18	2	0	0	0	**70**
2005	12	8	3	0	0	0	**23**
2006	12	9	0	0	0	0	**21**
Total	372	419	172	45	27	0	**1,035**
Average	7	7	3	1	0	0	**18**

Notes:
F0 = 40 – 72 mph
F1 = 73 – 112 mph
F2 = 113 – 157 mph
F3 = 158 – 206 mph
F4 = 207 – 260 mph
F5 = 261 – 318 mph

Source: Reference 2.7-015

Table 2.7-7
Seasonal Frequencies of Inversions below 152 m (500 ft.) in Greensboro, NC

	Percent Frequency of Inversions Based Below 152 m (500 ft.)				
Season	**0300 GMT**	**1500 GMT**	**0000 GMT**	**1200 GMT**	**All Times**
Winter	73	15	58	72	43
Spring	70	3	13	66	32
Summer	78	1	11	66	33
Fall	74	4	52	74	40

Notes:
GMT = Greenwich Mean Time

Source: Reference 2.7-023

Table 2.7-8
Mean Monthly Mixing Depths at Greensboro, NC

Month	Depth (m)
January	390
February	650
March	1130
April	1180
May	1530
June	1790
July	1490
August	1420
September	1370
October	1020
November	840
December	580

Sources: Reference 2.7-024 and Reference 2.7-025

Table 2.7-9
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence [a])
Period of Record: March 1, 1994 to February 28, 1999
Lower Wind Level, Category A

Wind Level: Lower Level
Stability Category: A
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)[b]																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	0	0	0	0	0	1	0	0	0	2	1	1	0	0	0	1	6
4-7	8	14	9	6	7	6	10	14	37	19	26	56	8	3	19	15	257
8-12	12	23	6	6	8	1	2	3	21	40	37	102	13	12	28	30	344
13-18	0	0	0	0	0	0	0	0	0	0	2	5	0	1	1	0	9
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	20	37	15	12	15	8	12	17	58	61	66	164	21	16	48	46	616

Notes:
Number of Calm Hours: 0

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-10
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Lower Wind Level, Category B

Wind Level: Lower Level
Stability Category: B
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	5	2	2	2	0	3	0	2	1	5	5	2	0	1	5	2	37
4-7	50	46	37	41	23	19	21	26	76	51	42	130	18	17	72	65	734
8-12	19	38	26	6	4	1	0	3	15	32	49	88	23	29	75	46	454
13-18	0	0	0	0	0	0	0	0	0	2	1	4	2	2	2	0	13
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	74	86	65	49	27	23	21	31	92	90	97	224	43	49	154	113	1238

Notes:
Number of Calm Hours: 0

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-11
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Lower Wind Level, Category C

Wind Level: Lower Level
Stability Category: C
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	5	4	11	4	8	4	6	9	11	18	11	9	7	7	4	7	125
4-7	122	101	78	96	51	55	55	70	143	109	96	188	62	69	115	117	1527
8-12	29	44	48	11	7	8	3	6	30	42	54	94	29	61	93	54	613
13-18	0	0	0	0	0	0	0	0	0	1	3	7	4	5	4	0	24
19-24	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	156	149	137	111	66	67	64	85	184	170	164	299	102	142	216	178	2290

Notes:
Number of Calm Hours: 0

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-12
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Lower Wind Level, Category D

Wind Level: Lower Level
Stability Category: D
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	255	260	214	204	153	138	156	157	219	224	206	183	131	147	152	208	3007
4-7	982	876	671	567	321	258	287	376	536	490	578	756	380	374	535	614	8601
8-12	171	168	102	44	7	14	24	44	86	111	159	231	79	195	249	172	1856
13-18	1	1	1	0	0	0	1	5	1	0	12	26	8	16	13	2	87
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1409	1305	988	815	481	410	468	582	842	825	955	1196	598	732	949	996	13551

Notes:
Number of Calm Hours: 56

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-13
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Lower Wind Level, Category E

Wind Level: Lower Level
Stability Category: E
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	564	537	407	330	244	208	239	283	437	591	454	364	253	226	229	344	5710
4-7	572	388	255	192	125	142	229	405	575	638	500	449	196	201	230	381	5478
8-12	59	65	33	16	11	13	26	50	129	68	62	81	25	68	72	72	850
13-18	21	4	0	2	4	0	2	5	5	2	2	9	0	3	1	4	64
19-24	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1218	994	695	540	384	363	496	743	1146	1299	1018	903	474	498	532	801	12104

Notes:
Number of Calm Hours: 61

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-14
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Lower Wind Level, Category F

Wind Level: Lower Level
Stability Category: F
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	513	458	369	266	189	173	131	165	195	255	227	224	215	220	188	270	4058
4-7	78	18	7	11	14	10	19	23	38	27	36	75	23	24	24	58	485
8-12	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1	4
13-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	591	477	376	277	203	183	150	188	233	282	263	299	238	245	213	329	4547

Notes:
Number of Calm Hours: 127

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-15
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Lower Wind Level, Category G

Wind Level: Lower Level
Stability Category: G
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	1442	1777	1139	500	305	180	123	91	100	142	172	232	232	372	406	702	7915
4-7	23	2	2	1	1	5	5	3	0	3	0	6	2	4	1	7	65
8-12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1465	1779	1141	501	306	185	128	94	100	145	172	238	234	376	407	709	7980

Notes:
Number of Calm Hours: 742

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-16
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	2784	3038	2142	1306	899	707	655	707	963	1237	1076	1015	838	973	984	1534	20858
4-7	1835	1445	1059	914	542	495	626	917	1405	1337	1278	1660	689	692	996	1257	17147
8-12	290	339	215	83	37	37	55	106	281	293	361	596	169	366	518	375	4121
13-18	22	5	1	2	4	0	3	10	6	5	20	51	14	27	21	6	197
19-24	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	4933	4827	3417	2305	1482	1239	1339	1740	2655	2872	2735	3323	1710	2058	2519	3172	42326

Notes:
Number of Calm Hours: 986

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-17
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1995
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: 03/01/94 – 02/28/95

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	471	490	343	227	152	148	141	163	246	251	247	218	180	173	197	243	3890
4-7	361	276	189	164	95	96	102	165	374	367	307	323	103	115	158	232	3427
8-12	113	115	71	22	4	11	20	15	62	79	107	177	37	52	97	105	1087
13-18	1	2	0	1	0	0	3	2	0	1	3	3	4	5	4	1	30
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	946	883	603	414	251	255	266	345	682	698	664	721	324	345	456	581	8434

Notes:
Number of Calm Hours: 302

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-18
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1995 to February 29, 1996
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: 03/01/95 – 02/28/96

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	598	734	532	314	200	147	127	132	153	206	165	151	130	149	166	302	4206
4-7	395	307	251	236	135	119	153	189	256	258	202	246	107	150	179	268	3451
8-12	34	43	48	14	9	3	12	26	70	22	51	85	25	63	92	67	664
13-18	0	0	0	0	0	0	0	6	5	1	3	8	4	4	0	0	31
19-24	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1027	1084	831	564	344	269	292	353	484	487	421	491	266	366	437	637	8353

Notes:
Number of Calm Hours: 162

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-19
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1996 to February 28, 1997
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: 03/01/96 – 02/28/97

	Wind Direction (Blowing From)(b)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	585	631	455	291	186	165	174	156	198	245	255	197	201	198	193	337	4467
4-7	313	248	195	159	98	110	148	244	271	258	285	361	106	127	187	238	3348
8-12	27	61	38	12	5	6	10	19	62	73	80	128	25	103	133	32	814
13-18	8	1	0	0	0	0	0	0	0	2	11	23	0	3	0	3	51
19-24	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	935	941	688	462	289	281	332	419	531	578	631	709	332	431	513	610	8682

Notes:
Number of Calm Hours: 65

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-20
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1997 to February 28, 1998
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: 03/01/97 – 02/28/98

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	540	667	438	231	151	125	112	125	141	244	191	197	163	187	208	298	4018
4-7	401	315	213	184	115	97	107	154	239	234	233	364	199	157	227	245	3484
8-12	57	59	28	21	17	14	7	25	40	54	41	100	39	85	116	85	788
13-18	1	2	1	1	4	0	0	0	0	0	1	3	6	10	17	0	46
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	999	1043	680	437	287	236	226	304	420	532	466	664	407	439	568	628	8336

Notes:
Number of Calm Hours: 362

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-21
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1998 to February 28, 1999
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: 03/01/98 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	590	516	374	243	210	122	101	131	225	291	218	252	164	266	220	354	4277
4-7	365	299	211	171	99	73	116	165	265	220	251	366	174	143	245	274	3437
8-12	59	61	30	14	2	3	6	21	47	65	82	106	43	63	80	86	768
13-18	12	0	0	0	0	0	0	2	1	1	2	14	0	5	0	2	39
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	1026	876	615	428	311	198	223	319	538	577	553	738	381	477	545	716	8521

Notes:
Number of Calm Hours: 95

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-22
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Percentage of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: 03/01/94 – 02/28/99

Speed (mph)	Wind Direction (Blowing From)[b]																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	6.43	7.01	4.95	3.02	2.08	1.63	1.51	1.63	2.22	2.86	2.48	2.34	1.93	2.25	6.43	7.01	48.16
4-7	4.24	3.34	2.45	2.11	1.25	1.14	1.45	2.12	3.24	3.09	2.95	3.83	1.59	1.60	4.24	3.34	39.59
8-12	0.67	0.78	0.50	0.19	0.09	0.09	0.13	0.24	0.65	0.68	0.83	1.38	0.39	0.85	0.67	0.78	9.51
13-18	0.05	0.01	0.00	0.00	0.01	0.00	0.01	0.02	0.01	0.01	0.05	0.12	0.03	0.06	0.05	0.01	0.45
19-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
>25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	11.39	11.14	7.89	5.32	3.42	2.86	3.09	4.02	6.13	6.63	6.31	7.67	3.95	4.75	5.82	7.32	97.72

Notes:
Missing Hours: 512

Number of Calm Hours: 986 (2.28%)

Total Observations: 43,312

a) Data represents the percentage of total observations that a condition occurred (excluding calm winds).

b) E = East, N = North, S = South, W = West

Table 2.7-23
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: January (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: January (All Years)(b)

	Wind Direction (Blowing From)(c)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	219	221	144	125	56	45	48	46	60	95	82	85	90	106	116	172	1710
4-7	133	92	84	98	38	46	75	77	94	93	108	145	60	81	127	119	1470
8-12	16	6	15	12	0	3	24	23	27	18	29	75	17	50	33	32	380
13-18	0	0	0	0	0	0	3	8	4	1	5	6	3	4	0	0	34
19-24	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	368	319	243	235	94	94	150	154	185	207	224	312	170	241	276	323	3595

Notes:
Number of Calm Hours: 99

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-24
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: February (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: February (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	198	180	131	76	73	56	37	25	67	89	85	88	59	82	87	129	1462
4-7	145	103	63	63	25	40	39	60	79	114	94	116	55	57	67	118	1238
8-12	44	24	14	14	7	4	3	4	16	23	40	63	20	48	87	52	463
13-18	1	2	1	1	4	0	0	0	0	1	2	1	2	9	9	0	33
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	388	309	209	154	109	100	79	89	162	227	221	268	136	196	250	299	3196

Notes:
Number of Calm Hours: 47

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-25
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: March (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	183	211	174	94	51	48	53	56	68	91	72	34	41	68	53	84	1381
4-7	123	134	113	97	56	54	60	88	112	117	115	130	51	58	101	150	1559
8-12	26	35	27	12	6	11	10	16	60	64	49	68	25	73	114	86	682
13-18	0	0	0	0	0	0	0	0	0	0	3	33	3	5	9	1	54
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	332	380	314	203	113	113	123	160	240	272	239	265	120	204	277	321	3676

Notes:
Number of Calm Hours: 31

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-26
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: April (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: April (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	131	193	109	68	52	39	37	49	84	104	80	66	67	74	71	115	1339
4-7	133	86	78	58	43	37	42	74	224	212	122	163	58	68	93	111	1602
8-12	27	20	21	5	1	2	3	13	70	96	62	89	25	48	63	52	597
13-18	0	0	0	0	0	0	0	0	0	2	1	7	1	5	3	0	19
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	291	299	208	131	96	78	82	136	378	414	265	325	151	195	230	278	3557

Notes:
Number of Calm Hours: 43

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-27
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: May (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: May (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	203	213	186	100	67	54	52	67	76	116	80	74	52	73	73	113	1599
4-7	182	141	67	82	45	40	56	94	128	165	130	171	64	74	83	99	1621
8-12	18	32	14	7	11	2	0	11	10	33	58	62	16	44	53	20	391
13-18	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	403	386	267	189	123	96	108	172	214	314	270	307	132	191	209	232	3613

Notes:
Number of Calm Hours: 54

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-28
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: June (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: June (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	184	202	191	135	80	75	76	73	91	112	86	92	70	62	70	88	1687
4-7	94	113	83	78	71	44	92	116	136	141	122	156	56	66	80	76	1524
8-12	8	4	9	4	6	2	1	3	14	11	29	60	11	16	13	17	208
13-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	286	319	283	217	157	121	169	192	241	264	237	308	137	144	163	181	3419

Notes:
Number of Calm Hours: 81

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-29
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: July (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: July (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	156	206	174	144	125	99	94	98	119	145	118	113	67	76	48	98	1880
4-7	80	65	90	84	49	50	72	129	239	157	145	194	42	63	58	65	1582
8-12	2	11	1	3	1	7	2	7	23	9	18	62	7	6	14	3	176
13-18	3	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3	8
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	241	282	265	231	175	156	168	234	381	311	281	369	117	146	120	169	3646

Notes:
Number of Calm Hours: 67

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-30
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: August (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: August (All Years)[b]

Speed (mph)	Wind Direction (Blowing From)[c]																
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	268	314	231	166	92	71	74	61	105	125	109	83	51	53	65	97	1965
4-7	117	151	119	101	87	76	64	69	118	83	102	100	48	37	60	59	1391
8-12	11	32	17	6	5	5	3	4	13	10	13	21	1	3	7	13	164
13-18	12	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	16
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	408	497	367	273	184	152	141	134	236	218	224	206	100	93	132	171	3536

Notes:
Number of Calm Hours: 184

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-31
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: September (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: September (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	294	293	219	116	61	65	47	69	110	92	104	77	52	57	59	122	1837
4-7	206	165	123	84	44	41	52	78	84	66	92	137	57	24	67	59	1379
8-12	12	40	33	4	0	0	5	6	8	3	12	16	8	7	20	14	188
13-18	2	1	0	0	0	0	0	0	0	0	6	0	1	0	0	0	10
19-24	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	516	499	375	204	105	106	104	153	202	161	214	230	118	88	146	195	3416

Notes:
Number of Calm Hours: 172

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-32
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: October (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: October (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	366	425	256	113	74	43	51	69	63	71	71	84	58	84	78	157	2063
4-7	210	160	117	75	41	21	37	59	80	53	73	119	36	43	65	88	1277
8-12	34	52	34	10	0	0	2	10	9	5	9	11	10	15	22	20	243
13-18	4	2	0	1	0	0	0	2	0	0	0	0	0	0	0	0	9
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	614	639	407	199	115	64	90	140	152	129	153	214	104	142	165	265	3592

Notes: 0
Number of Calm Hours: 103

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-33
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: November (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: November (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	308	322	185	79	91	74	44	53	62	99	100	113	85	109	114	155	1993
4-7	185	114	42	32	18	21	26	33	52	90	103	132	79	42	99	172	1240
8-12	45	34	18	1	0	1	2	5	26	16	28	27	16	29	34	24	306
13-18	0	0	0	0	0	0	0	0	2	1	1	2	1	2	0	0	9
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	538	470	245	112	109	96	72	91	142	206	232	274	181	182	247	351	3548

Notes:
Number of Calm Hours: 43

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-34
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: December (All Years)
Lower Wind Level, All Categories

Wind Level: Lower Level
Stability Category: ALL
Period of Record: December (All Years)(b)

	Wind Direction (Blowing From)(c)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	274	258	142	90	77	38	42	41	58	98	89	106	146	129	150	204	1942
4-7	227	121	80	62	25	25	11	40	59	46	72	97	83	79	96	141	1264
8-12	47	49	12	5	0	0	0	4	5	5	14	42	13	27	58	42	323
13-18	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
≥25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	548	428	234	157	102	63	53	85	122	149	175	245	244	236	304	387	3532

Notes:
Number of Calm Hours: 62

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-35
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Upper Wind Level, Category A

Wind Level: Upper Level
Stability Category: A
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	0	0	0	0	1	0	0	0	0	0	2	1	0	0	1	0	5
4-7	2	7	4	2	1	2	4	7	10	6	5	8	4	2	4	5	73
8-12	9	18	5	9	11	5	5	6	29	31	32	74	5	5	18	21	283
13-18	11	15	6	2	0	0	0	0	5	38	38	63	6	13	16	17	230
19-24	0	0	0	0	0	0	0	0	0	4	2	13	0	1	3	2	25
>25	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
TOTAL	22	40	15	13	13	7	9	13	44	79	80	159	15	21	42	45	617

Notes:
Number of Calm Hours: 0

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-36
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Upper Wind Level, Category B

Wind Level: Upper Level
Stability Category: B
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	2	5	1	1	1	0	1	0	0	3	2	3	3	1	3	2	28
4-7	29	20	24	23	10	10	15	13	28	18	23	44	3	7	30	24	321
8-12	26	55	38	20	15	5	6	7	47	49	37	123	16	33	66	58	601
13-18	11	17	16	0	2	0	0	0	4	22	46	48	13	12	39	23	253
19-24	1	0	0	0	0	0	0	0	0	2	10	8	4	3	3	4	35
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	69	97	79	44	28	15	22	20	79	94	118	226	39	56	141	111	1238

Notes:
Number of Calm Hours: 0

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-37
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Upper Wind Level, Category C

Wind Level: Upper Level
Stability Category: C
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	4	4	7	5	3	3	4	5	5	11	18	9	2	4	7	5	96
4-7	60	42	44	70	32	34	30	38	77	54	61	68	26	34	60	47	777
8-12	74	90	59	55	23	13	14	20	59	85	71	162	38	47	106	84	1000
13-18	15	22	25	6	2	3	1	1	14	45	42	53	19	39	45	29	361
19-24	1	1	0	1	0	0	0	1	0	6	12	14	6	4	5	2	53
>25	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	3
TOTAL	154	159	135	137	60	53	49	65	155	201	205	307	91	129	223	167	2290

Notes:
Number of Calm Hours: 1

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-38
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Upper Wind Level, Category D

Wind Level: Upper Level
Stability Category: D
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	88	100	81	86	81	80	66	75	74	120	130	106	85	82	105	81	1440
4-7	414	510	393	389	255	207	236	212	376	418	355	491	238	230	342	389	5455
8-12	489	697	388	311	140	86	94	146	244	295	337	452	217	216	315	285	4712
13-18	164	156	119	54	7	5	16	25	60	158	174	178	65	138	154	154	1627
19-24	11	19	3	1	0	0	0	8	13	25	45	44	16	26	15	19	245
>25	2	0	1	0	0	0	0	0	0	0	9	15	0	2	2	0	31
TOTAL	1168	1482	985	841	483	378	412	466	767	1016	1050	1286	621	694	933	928	13510

Notes:
Number of Calm Hours: 46

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-39
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Upper Wind Level, Category E

Wind Level: Upper Level
Stability Category: E
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	45	46	27	51	47	43	59	60	51	64	74	59	51	61	57	35	830
4-7	174	233	224	191	127	140	154	178	316	426	362	275	186	138	144	163	3431
8-12	490	589	346	285	164	144	182	272	497	814	759	404	208	203	241	308	5906
13-18	138	88	65	31	19	16	22	67	186	298	251	173	53	77	94	143	1721
19-24	22	33	14	2	5	0	3	8	25	22	16	20	3	13	7	8	201
>25	11	1	0	0	1	0	0	0	2	1	0	2	0	0	0	2	20
TOTAL	880	990	676	560	363	343	420	585	1077	1625	1462	933	501	492	543	659	12109

Notes:
Number of Calm Hours: 27

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-40
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Upper Wind Level, Category F

Wind Level: Upper Level
Stability Category: F
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	11	20	20	17	18	25	23	30	39	30	34	30	22	24	29	24	396
4-7	61	56	94	84	99	86	79	98	167	178	151	120	103	62	102	60	1600
8-12	202	244	190	139	97	66	73	93	147	218	269	200	114	107	102	112	2373
13-18	61	28	13	9	6	2	0	3	14	21	34	31	12	20	10	31	295
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	335	348	317	249	220	179	175	224	367	447	488	381	251	213	243	227	4664

Notes:
Number of Calm Hours: 10

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-41
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Upper Wind Level, Category G

Wind Level: Upper Level
Stability Category: G
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	63	65	46	54	55	61	64	81	88	132	142	94	83	96	106	81	1311
4-7	170	178	177	164	171	194	197	204	268	324	473	410	228	165	203	195	3721
8-12	234	250	221	232	245	187	171	154	164	201	395	363	177	136	122	208	3460
13-18	46	23	15	18	10	4	6	5	3	5	7	21	7	8	6	17	201
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	513	516	459	468	481	446	438	444	523	662	1017	888	495	405	437	501	8693

Notes:
Number of Calm Hours: 33

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-42
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	213	240	182	214	206	212	217	251	257	360	402	302	246	268	308	228	4106
4-7	910	1046	960	923	695	673	715	750	1242	1424	1430	1416	788	638	885	883	15378
8-12	1524	1943	1247	1051	695	506	545	698	1187	1693	1900	1778	775	747	970	1076	18335
13-18	446	349	259	120	46	30	45	101	286	587	592	567	175	307	364	414	4688
19-24	35	53	17	4	5	0	3	17	38	59	85	99	29	47	33	35	559
>25	13	1	1	0	1	0	0	0	2	1	11	18	0	3	2	2	55
TOTAL	3141	3632	2666	2312	1648	1421	1525	1817	3012	4124	4420	4180	2013	2010	2562	2638	43121

Notes:
Number of Calm Hours: 117

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-43
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1995
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: 03/01/94 – 02/28/95

	Wind Direction (Blowing From)(b)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	35	48	30	32	38	38	30	40	52	87	95	60	48	49	61	46	789
4-7	132	153	147	169	136	98	107	133	254	319	318	312	133	117	137	146	2811
8-12	306	386	273	193	109	89	87	113	298	459	473	376	143	119	155	185	3764
13-18	139	113	92	37	14	9	15	21	64	138	125	134	43	53	75	119	1191
19-24	14	34	3	2	0	0	3	8	5	16	16	13	7	13	7	4	145
>25	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
TOTAL	626	734	545	433	297	234	242	315	673	1019	1027	896	374	351	435	500	8701

Notes:
Number of Calm Hours: 36

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-44
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1995 to February 29, 1996
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: 03/01/95 – 02/28/96

	Wind Direction (Blowing From)(b)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	37	42	30	46	47	45	43	43	56	49	65	64	37	45	54	44	747
4-7	196	253	234	204	172	169	161	160	282	319	231	234	136	103	180	162	3196
8-12	305	420	303	233	190	118	132	161	224	284	296	267	144	168	196	190	3631
13-18	68	51	45	20	5	6	8	22	67	74	95	91	32	62	67	76	789
19-24	1	0	0	0	0	0	0	3	23	4	10	18	9	9	1	5	83
>25	0	0	0	0	0	0	0	0	2	1	2	1	0	1	0	0	7
TOTAL	607	766	612	503	414	338	344	389	654	731	699	675	358	388	498	477	8453

Notes:
Number of Calm Hours: 4

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-45
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1996 to February 28, 1997
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: 03/01/96 – 02/28/97

	Wind Direction (Blowing From)(b)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	58	65	49	62	49	54	47	75	50	63	90	74	61	62	56	62	977
4-7	215	221	211	196	141	147	171	165	274	234	269	279	153	120	160	195	3151
8-12	276	306	195	172	110	90	113	167	265	331	371	335	166	156	212	226	3491
13-18	53	62	37	24	9	3	11	27	65	144	129	128	35	88	97	60	972
19-24	1	2	1	0	0	0	0	0	2	14	27	36	0	9	5	6	103
>25	4	0	0	0	0	0	0	0	0	0	9	9	0	0	0	2	24
TOTAL	607	656	493	454	309	294	342	434	656	786	895	861	415	435	530	551	8718

Notes:
Number of Calm Hours: 29

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-46
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1997 to February 28, 1998
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: 03/01/97 – 02/28/98

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	46	47	42	38	33	33	56	45	42	71	89	50	57	52	61	43	805
4-7	206	215	174	152	118	133	152	149	203	254	300	309	191	155	163	175	3049
8-12	353	418	230	218	144	122	108	141	200	293	363	392	163	167	236	239	3787
13-18	105	71	41	26	13	11	6	16	43	99	97	107	34	67	89	80	905
19-24	7	11	8	2	5	0	0	1	3	5	6	12	11	9	20	15	115
>25	1	0	1	0	1	0	0	0	0	0	0	0	0	1	2	0	6
TOTAL	718	762	496	436	314	299	322	352	491	722	855	870	456	451	571	552	8667

Notes:
Number of Calm Hours: 31

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-47
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March 1, 1998 to February 28, 1999
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: 03/01/98 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	37	38	31	36	39	42	41	48	57	90	63	54	43	60	76	33	788
4-7	161	204	194	202	128	126	124	143	229	298	312	282	175	143	245	205	3171
8-12	284	413	246	235	142	87	105	116	200	326	397	408	159	137	171	236	3662
13-18	81	52	44	13	5	1	5	15	47	132	146	107	31	37	36	79	831
19-24	12	6	5	0	0	0	0	5	5	20	26	20	2	7	0	5	113
>25	8	1	0	0	0	0	0	0	0	0	0	7	0	1	0	0	17
TOTAL	583	714	520	486	314	256	275	327	538	866	944	878	410	385	528	558	8582

Notes:
Number of Calm Hours: 17

a) Data represent the number of hours a condition occurred.

b) E = East, N = North, S = South, W = West

Table 2.7-48
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Percentage of Occurrence[a])
Period of Record: March 1, 1994 to February 28, 1999
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: 03/01/94 – 02/28/99

	Wind Direction (Blowing From)(b)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	0.49	0.56	0.42	0.49	0.48	0.49	0.50	0.58	0.59	0.83	0.93	0.70	0.57	0.62	0.71	0.53	9.50
4-7	2.10	2.42	2.22	2.13	1.61	1.56	1.65	1.73	2.87	3.29	3.31	3.27	1.82	1.48	2.05	2.04	35.57
8-12	3.52	4.49	2.88	2.43	1.61	1.17	1.26	1.61	2.75	3.92	4.39	4.11	1.79	1.73	2.24	2.49	42.40
13-18	1.03	0.81	0.60	0.28	0.11	0.07	0.10	0.23	0.66	1.36	1.37	1.31	0.40	0.71	0.84	0.96	10.84
19-24	0.08	0.12	0.04	0.01	0.01	0.00	0.01	0.04	0.09	0.14	0.20	0.23	0.07	0.11	0.08	0.08	1.29
>24	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.00	0.01	0.00	0.00	0.13
Total	7.26	8.40	6.17	5.35	3.81	3.29	3.53	4.20	6.97	9.54	10.22	9.67	4.66	4.65	5.93	6.10	99.73

Notes:
Missing Hours: 586

Number of Calm Hours: 117 (0.27%)

Total Observations: 43,238

a) Data represents the percentage of total observations that a condition occurred (excluding calm winds).

b) E = East, N = North, S = South, W = West

Table 2.7-49
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: January (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: January (All Years) (b)

	Wind Direction (Blowing From)(c)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	17	20	11	17	16	14	12	26	23	31	21	19	12	12	17	16	284
4-7	93	60	54	61	53	41	52	66	57	105	88	80	45	63	106	82	1106
8-12	147	108	86	109	40	53	81	74	77	128	114	167	104	106	126	127	1647
13-18	28	6	21	13	2	2	12	25	41	54	63	81	19	43	37	26	473
19-24	2	0	1	0	0	0	3	15	16	9	12	14	4	6	1	7	90
>25	1	0	0	0	0	0	0	0	1	1	2	1	0	1	0	0	7
TOTAL	288	194	173	200	111	110	160	206	215	328	300	362	184	231	287	258	3607

Notes:
Number of Calm Hours: 43

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-50
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: February (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: February (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	13	12	16	11	9	18	13	23	22	21	26	19	16	12	21	29	281
4-7	76	76	61	60	21	42	47	32	50	83	84	85	44	39	78	76	954
8-12	120	118	79	68	37	43	64	63	71	136	126	131	66	75	95	107	1399
13-18	54	19	11	15	8	4	5	4	13	48	71	73	19	45	66	68	523
19-24	3	11	7	1	5	0	0	1	1	8	9	11	5	15	6	0	83
>25	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	3
TOTAL	266	236	174	155	81	107	129	123	157	296	317	319	150	187	266	280	3243

Notes:
Number of Calm Hours: 36

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-51
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: March (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: March (All Years)(b)

	Wind Direction (Blowing From)(c)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	11	13	7	12	3	15	12	4	8	12	10	8	8	8	17	9	157
4-7	54	101	79	89	48	51	58	39	70	103	82	65	33	38	61	64	1035
8-12	108	152	109	110	69	51	57	60	94	157	198	129	66	93	129	117	1699
13-18	52	40	30	15	2	9	9	17	53	103	54	54	23	71	66	80	678
19-24	0	0	2	0	0	0	0	0	8	18	14	35	8	6	19	7	117
>25	1	0	0	0	0	0	0	0	0	0	3	13	0	1	2	0	20
TOTAL	226	306	227	226	122	126	136	120	233	393	361	304	138	217	294	277	3706

Notes:
Number of Calm Hours: 1

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-52
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: April (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: April (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	13	6	7	6	4	6	10	5	9	14	18	14	11	16	20	12	171
4-7	58	62	52	48	37	40	31	33	64	114	75	85	71	43	70	55	938
8-12	112	130	66	55	44	36	22	66	144	304	227	188	81	79	93	84	1731
13-18	39	22	23	6	4	2	4	12	61	167	92	94	28	38	44	52	688
19-24	2	0	0	0	0	0	0	0	1	7	22	12	4	8	3	8	67
>25	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
TOTAL	224	220	148	115	89	84	67	116	279	606	434	396	195	184	230	211	3598

Notes:
Number of Calm Hours: 2

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-53
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: May (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: May (All Years)(b)

	Wind Direction (Blowing From)(c)																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	11	12	17	16	15	9	12	13	12	18	24	19	12	22	26	11	249
4-7	69	70	71	79	54	48	61	67	101	115	121	125	68	56	76	70	1251
8-12	157	179	85	84	66	29	42	45	123	186	192	213	57	49	73	75	1655
13-18	56	46	12	11	12	3	1	7	22	67	90	48	16	32	47	25	495
19-24	1	0	0	0	0	0	0	0	0	0	5	3	0	1	2	0	12
>25	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	294	307	186	190	147	89	116	132	258	386	432	408	153	160	224	181	3663

Notes:
Number of Calm Hours: 5

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-54
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: June (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: June (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	15	31	19	23	28	18	23	26	24	28	28	32	16	25	25	18	379
4-7	53	74	62	79	70	60	83	70	170	156	123	121	94	59	73	67	1414
8-12	67	114	93	93	77	49	53	110	131	120	158	145	58	38	56	48	1410
13-18	17	11	9	11	5	1	2	5	16	24	46	46	7	6	2	10	218
19-24	0	0	0	0	0	0	0	0	0	1	8	1	0	0	0	0	10
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	152	230	183	206	180	128	161	211	341	329	363	345	175	128	156	143	3431

Notes:
Number of Calm Hours: 3

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-55
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: July (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: July (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	19	24	24	34	27	30	22	29	28	50	41	36	31	29	29	24	477
4-7	70	86	81	86	83	80	86	125	222	191	191	156	76	67	62	72	1734
8-12	62	62	76	64	51	46	40	63	198	187	180	160	44	31	24	28	1316
13-18	3	11	2	3	1	5	1	5	16	26	28	42	6	5	11	4	169
19-24	0	1	1	0	0	0	0	0	0	0	1	0	2	0	2	1	8
>25	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	4
TOTAL	156	184	184	187	162	161	149	222	464	454	441	394	159	132	128	131	3708

Notes:
Number of Calm Hours: 3

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-56
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: August (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: August (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	23	21	25	21	30	30	24	37	35	55	67	45	35	37	24	19	528
4-7	86	117	122	137	88	88	100	99	168	149	174	127	71	45	53	54	1678
8-12	103	166	137	134	108	74	52	56	81	101	121	92	25	14	32	53	1349
13-18	8	15	21	6	2	2	3	5	12	12	17	11	0	2	4	9	129
19-24	4	6	2	0	0	0	0	0	0	0	1	5	0	0	0	3	21
>25	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
TOTAL	231	326	307	298	228	194	179	197	296	317	380	280	131	98	113	138	3713

Notes:
Number of Calm Hours: 7

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-57
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: September (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: September (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	27	27	21	24	22	16	28	28	28	52	46	29	29	21	26	10	434
4-7	105	128	129	69	74	70	60	75	124	129	138	161	78	43	60	60	1503
8-12	121	218	177	124	60	40	55	48	62	80	147	125	40	29	47	57	1430
13-18	19	24	41	5	1	0	4	3	6	11	20	21	5	6	10	21	197
19-24	4	0	3	0	0	0	0	0	0	0	4	2	1	1	0	1	16
>25	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	5
TOTAL	276	397	371	222	157	126	147	154	220	272	360	338	153	100	143	149	3585

Notes:
Number of Calm Hours: 4

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-58
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: October (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: October (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	**N**	**NNE**	**NE**	**ENE**	**E**	**ESE**	**SE**	**SSE**	**S**	**SSW**	**SW**	**WSW**	**W**	**WNW**	**NW**	**NNW**	**TOTAL**
1-3	18	19	10	19	15	19	24	24	24	30	42	23	24	24	35	33	383
4-7	89	100	120	90	87	54	36	61	105	122	168	167	55	51	67	75	1447
8-12	177	265	150	79	61	34	22	59	96	73	115	125	44	47	66	92	1505
13-18	55	44	50	30	4	0	1	6	13	12	15	20	6	10	17	31	314
19-24	3	15	1	3	0	0	0	1	6	0	1	4	0	0	0	5	39
>25	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	344	443	331	221	167	107	83	151	244	237	341	339	129	132	185	236	3690

Notes:
Number of Calm Hours: 5

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-59
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: November (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: November (All Years)[b]

	Wind Direction (Blowing From)[c]																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	16	17	6	17	14	16	20	15	25	26	46	30	26	33	26	14	347
4-7	70	85	48	61	32	54	67	47	64	111	119	123	73	64	86	87	1191
8-12	188	202	100	66	39	19	24	27	61	126	177	155	81	73	114	149	1601
13-18	60	50	26	1	2	2	3	3	22	38	52	36	33	22	13	34	397
19-24	5	8	0	0	0	0	0	0	6	12	7	5	2	7	0	0	52
>25	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2
TOTAL	339	362	180	145	87	91	114	92	179	313	401	350	215	199	239	284	3590

Notes:
Number of Calm Hours: 1

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-60
Joint Frequency Distribution of Wind Speed, Wind Direction, and Atmospheric Stability (Hours of Occurrence[a])
Period of Record: December (All Years)
Upper Wind Level, All Categories

Wind Level: Upper Level
Stability Category: ALL
Period of Record: December (All Years)(b)

	Wind Direction (Blowing From)(c)																
Speed (mph)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL
1-3	30	38	19	14	23	21	17	21	19	23	33	28	26	29	42	33	416
4-7	87	87	81	64	48	45	34	36	47	46	67	121	80	70	93	121	1127
8-12	162	229	89	65	43	32	33	27	49	95	145	148	109	113	115	139	1593
13-18	55	61	13	4	3	0	0	9	11	25	44	41	13	27	47	54	407
19-24	11	12	0	0	0	0	0	0	0	4	1	7	3	3	0	3	44
>25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	345	427	202	147	117	98	84	93	126	193	290	345	231	242	297	350	3587

Notes:
Number of Calm Hours: 7

a) Data represent the number of hours a condition occurred.

b) Represents the Period of Record from March 1, 1994 to December 31, 1999

c) E = East, N = North, S = South, W = West

Table 2.7-61
Mean Monthly and Annual Mean Temperatures (°F)
Shearon Harris Nuclear Power Plant Meteorological Monitoring Station
Period of Record for January 14, 1976 to December 31, 1978 and March 1, 1994 to February 28, 1999

Month	1976[a]	1977[a]	1978[a]	1994[b]	1995[c]	1996[c]	1997[c]	1998[c]	1999[d]	Average
January	40.1	29.3	34.3	NA	42.1	38.8	42.1	45.5	47.1	39.9
February	51.2	41.7	33.8	NA	41.0	44.8	48.0	48.0	46.2	44.3
March	55.7	55.5	48.0	52.3	52.2	46.9	56.1	52.5	NA	52.4
April	59.0	63.0	59.4	63.5	61.3	60.3	56.3	60.4	NA	60.4
May	66.5	68.4	65.2	64.2	68.0	69.1	65.7	69.6	NA	67.1
June	73.1	73.7	73.7	76.5	72.3	76.1	71.1	77.7	NA	74.3
July	77.9	81.3	76.2	78.4	78.8	78.1	78.8	79.3	NA	78.6
August	75.5	77.6	77.3	74.7	79.0	74.5	75.4	77.7	NA	76.5
September	69.9	72.4	72.1	68.0	69.1	70.3	70.9	73.8	NA	70.8
October	55.2	56.6	57.2	57.7	61.9	60.4	59.5	59.9	NA	58.6
November	43.5	52.7	54.0	52.9	46.8	45.9	48.6	51.8	NA	49.5
December	39.6	41.1	43.8	46.4	39.2	46.2	42.3	50.4	NA	43.6
Annual	58.9	59.4	57.9	63.5	59.3	59.3	59.6	62.2	46.7	49.0

Notes:
a) Period of Record: January 14, 1976 to December 31, 1978

b) Period of Record: March 1, 1994 to December 31, 1994.

c) Period of Record: January 1 to December 31 of indicated year.

d) Period of Record: January 1, 1999 to February 28, 1999.

Source: Reference 2.7-018

Table 2.7-62
Mean Monthly and Annual Maximum and Minimum Temperatures (°F)
Shearon Harris Nuclear Power Plant Meteorological Monitoring Station
Period of Record: January 14, 1976 to December 31, 1978

	1976		1977		1978		Average	
Month	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**
January	52.0	27.8	38.6	19.6	44.7	25.3	45.1	24.2
February	65.0	36.7	54.5	28.2	43.8	24.4	54.3	29.8
March	68.5	42.3	67.0	43.6	58.5	37.5	64.7	41.1
April	74.0	43.2	76.0	49.1	71.6	47.0	73.9	46.4
May	78.8	54.5	80.8	56.8	76.0	53.6	78.5	55.0
June	83.6	63.9	84.7	59.7	84.5	63.4	84.3	62.3
July	89.6	67.1	93.0	69.6	86.8	66.3	89.8	67.7
August	86.3	64.4	91.0	68.5	87.8	69.0	88.4	67.3
September	82.2	57.9	83.4	62.9	83.2	62.9	82.9	61.2
October	67.6	43.2	67.7	45.8	71.0	44.2	68.8	44.4
November	56.5	30.8	62.7	42.9	63.6	44.8	60.9	39.5
December	50.4	28.1	50.7	31.1	55.6	31.6	52.2	30.3
Annual	71.2	46.7	70.8	48.2	68.9	47.5	70.3	47.5

Source: Reference 2.7-018

Table 2.7-63
Summary of Mean Daily Temperatures (°F)

	Charlotte		Greensboro		Raleigh-Durham	
Month	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**
January	51.0	31.3	48.1	28.2	50.5	29.9
February	54.9	33.5	51.6	30.5	53.9	31.8
March	62.6	39.9	60.0	37.2	61.7	38.3
April	72.3	48.7	70.3	45.9	72.0	46.7
May	79.5	57.4	77.6	55.1	79.0	55.4
June	85.9	65.5	84.2	63.3	85.7	63.7
July	89.0	69.4	87.5	67.6	88.8	68.1
August	87.8	68.3	85.8	66.5	87.3	67.0
September	81.7	62.0	79.9	59.5	81.4	60.6
October	72.2	50.3	70.1	47.2	71.9	48.4
November	62.3	40.2	60.1	37.8	62.6	39.0
December	53.1	33.2	50.4	30.4	53.0	32.0
Annual	71.0	50.0	68.8	47.4	70.7	48.4
Period of Record (yrs)	58	58	58	58	58	58

Sources: Reference 2.7-003, Reference 2.7-004, and Reference 2.7-005

Table 2.7-64
Summary of Diurnal Relative Humidity (%)

	Charlotte[a]				Greensboro[b]				Raleigh-Durham[c]			
Month	**01:00**	**07:00**	**13:00**	**19:00**	**01:00**	**07:00**	**13:00**	**19:00**	**01:00**	**07:00**	**13:00**	**19:00**
January	72	78	56	61	74	78	56	64	74	80	56	65
February	68	76	51	54	70	77	53	57	72	79	53	60
March	68	77	49	52	70	77	50	54	71	80	50	56
April	68	76	46	49	70	77	47	52	74	81	46	54
May	78	81	52	57	81	82	54	61	84	86	54	66
June	80	83	54	61	84	84	56	65	87	87	56	67
July	82	85	56	64	86	87	58	67	88	89	57	70
August	84	88	57	66	87	90	59	69	89	92	59	73
September	84	88	58	68	88	90	60	72	89	92	59	77
October	80	86	53	66	84	88	54	72	86	90	53	77
November	76	83	53	63	78	83	54	66	80	85	53	69
December	73	79	56	62	75	79	56	65	76	81	56	67
Annual	76	82	53	60	79	83	55	64	81	85	54	67
Period of Record (years)	30	30	30	30	30	30	30	30	30	30	30	30

Sources: Reference 2.7-003, Reference 2.7-004, and Reference 2.7-005

Table 2.7-65
Summary of Wet and Dry Bulb Temperature Observations

	Charlotte/Douglas		Greensboro		Raleigh-Durham	
	Wet Bulb (°F)	Dry Bulb (°F)	Wet Bulb (°F)	Dry Bulb (°F)	Wet Bulb (°F)	Dry Bulb (°F)
Highest Running Average Wet Bulb (with Coincident Dry Bulb)						
30 Day Average	73.0	80.6	73.6	80.1	74.3	79.3
5 Day Average	75.0	83.8	76.3	83.1	76.8	84.7
1 Day Average	76.8	84.6	77.7	85.3	78.8	87.3
Maximum Ambient Dry Bulb (with Coincident Wet Bulb)						
0% Exceedance	77.0	102.9	72.7	102.9	72.3	104.0
1% Exceedance	NA	90.9	NA	89.8	NA	89.8
5% Exceedance	NA	84.7	NA	83.7	NA	83.7
Minimum Ambient Dry Bulb (with Coincident Wet Bulb)						
100% Exceedance	-6.5	-5.1	-9.6	-8.0	-8.7	-7.1
99% Exceedance	NA	22.1	NA	16.2	NA	20.1
95% Exceedance	NA	31.1	NA	24.8	NA	29.1
Maximum Ambient Wet Bulb (with Coincident Dry Bulb)						
0% Exceedance	81.3	89.1	81.3	89.1	82.8	91.9
1% Exceedance	75.6	NA	75.7	NA	76.5	NA
5% Exceedance	73.0	NA	72.9	NA	73.8	NA

Notes:
NA = Coincident Wet Bulb or Dry Bulb data not available

Source: Reference 2.7-026

Table 2.7-66
Comparison of Mean Dew-Point Temperatures (°F)

Month	Charlotte[a]	Greensboro[b]	Raleigh-Durham[c]	HNP (On-Site)[d]
January	28.7	26.1	28.4	22.0
February	31.7	28.9	31.2	26.3
March	36.5	34.4	36.9	38.6
April	44.7	43.2	45.3	44.1
May	55.6	54.2	53.3	55.9
June	63.8	62.8	64.6	64.4
July	67.9	67.5	66.1	67.6
August	67.1	66.5	64.8	68.8
September	60.9	60.3	59.0	63.4
October	50.5	48.7	50.9	47.3
November	40.7	38.5	40.6	39.7
December	31.4	29.2	29.5	30.5
Annual	48.3	46.7	47.6	47.4
Period of Record	21 years	20 years	21 years	3 years[d]

Sources: Reference 2.7-003, Reference 2.7-004, Reference 2.7-005, and Reference 2.7-018

Table 2.7-67
Mean Dew-Point Temperatures (°F)
Shearon Harris Nuclear Power Plant Meteorological Monitoring Station
Period of Record: January 14, 1976 to December 31, 1978

Month	1976	1977	1978	Average
January	25.6	18.8	21.7	22.0
February	32.4	25.6	21.0	26.3
March	40.5	41.2	34.2	38.6
April	39.2	50.0	43.2	44.1
May	53.6	58.5	55.7	55.9
June	65.1	64.5	63.7	64.4
July	67.2	69.0	66.6	67.6
August	65.5	72.2	68.6	68.8
September	60.7	65.5	64.0	63.4
October	46.8	48.8	46.4	47.3
November	32.2	41.3	45.5	39.7
December	30.0	30.9	30.7	30.5
Annual	46.6	48.9	46.8	47.4

Source: Reference 2.7-018

Table 2.7-68
Summary of Average Monthly and Annual Precipitation Measurements (in.)

Month	Charlotte[a]	Greensboro[b]	Raleigh-Durham[c]	HNP (On-Site)[d]
January	4.00	3.54	4.02	3.79
February	3.55	3.10	3.47	1.49
March	4.39	3.85	4.03	4.91
April	2.95	3.43	2.80	2.32
May	3.66	3.95	3.79	2.73
June	3.42	3.53	3.42	2.86
July	3.79	4.44	4.29	2.74
August	3.72	3.71	3.78	3.00
September	3.83	4.30	4.26	3.92
October	3.66	3.27	3.18	2.11
November	3.36	2.96	2.97	2.35
December	3.18	3.06	3.04	3.20
Annual	43.51	43.14	43.05	35.41
Period of Record	30 years	30 years	30 years	3 years

Sources: Reference 2.7-003, Reference 2.7-004, Reference 2.7-005, and Reference 2.7-018

Table 2.7-69
Monthly and Annual Precipitation (in.)
Shearon Harris Nuclear Power Plant Meteorological Monitoring Station
Period of Record: January 14, 1976 to December 31, 1978 and March 1, 1994 to February 28, 1999

Month	1976[a]	1977[a]	1978[a]	1994[b]	1995[c]	1996[c]	1997[c]	1998[c]	1999[d]	Average
January	1.29	2.65	7.42	NA	4.09	2.82	2.06	3.22	2.56	3.26
February	1.15	1.57	1.74	NA	5.38	2.23	2.11	3.24	1.06	2.31
March	4.69	6.18	3.85	3.83	2.30	3.14	2.29	6.33	NA	4.08
April	0.43	2.17	4.36	0.58	0.83	3.48	4.51	3.10	NA	2.43
May	2.72	1.87	3.59	3.86	4.60	2.67	1.91	6.26	NA	3.43
June	2.74	0.77	5.08	3.22	5.80	3.11	2.87	1.35	NA	3.12
July	1.66	1.92	4.63	5.56	2.08	5.80	5.54	2.99	NA	3.77
August	1.76	3.78	3.47	3.75	3.02	2.31	0.47	0.79	NA	2.42
September	2.87	6.16	2.72	2.35	2.14	7.09	2.69	2.19	NA	3.53
October	1.26	4.17	0.91	4.90	10.07	3.70	2.25	1.57	NA	3.60
November	1.14	2.35	3.57	1.37	3.35	2.42	1.96	0.95	NA	2.14
December	3.66	3.08	2.85	1.11	1.09	1.98	1.83	0.60	NA	2.03
Annual	25.37	36.67	44.19	30.54	44.74	40.76	30.50	32.61	3.62	36.12

Notes:
a) Period of Record: January 14, 1976 to December 31, 1978 (HNP FSAR).

b) Period of Record: March 1, 1994 to December 31, 1994

c) Period of Record: January 1 to December 31 of indicated year.

d) Period of Record: January 1, 1999 to February 28, 1999.

Source: Reference 2.7-018

Table 2.7-70
Average Number of Days of Fog Occurrence

Month	Charlotte	Greensboro	Raleigh-Durham
January	3.7	4.7	3.5
February	2.8	3.3	2.7
March	2.4	2.8	2.1
April	1.2	1.6	1.4
May	1.0	1.9	2.3
June	1.0	1.4	1.9
July	1.1	1.8	2.6
August	1.4	2.3	3.1
September	2.0	3.0	3.3
October	1.8	2.6	3.3
November	3.0	3.2	3.1
December	3.8	3.8	3.2
Total	25.2	32.4	32.5
Period of Record	67 years	78 years	56 years

Sources: Reference 2.7-003, Reference 2.7-004, and Reference 2.7-005

Table 2.7-71
Frequency of Occurrence of Stability Class
Shearon Harris Nuclear Power Plant Meteorological Monitoring Station
Period of Record: January 14, 1976 to December 31, 1978

	Pasquill Stability Category (% Occurrence)						
Year	**A**	**B**	**C**	**D**	**E**	**F**	**G**
1976	8.5	4.8	5.2	24.3	23.7	12.6	21.0
1977	6.8	4.9	7.0	27.6	22.5	12.9	18.4
1978	4.5	3.2	4.1	29.0	26.6	12.7	19.9
1976-1978	6.5	4.3	5.4	27.0	24.3	12.7	19.8
3/1/94 – 2/28/1999	1.5	2.9	5.4	32.0	28.6	10.7	18.9

Source: Reference 2.7-018

Table 2.7-72
HNP/HAR Meteorological Monitoring Tower
Meteorological Sensor Elevations

Sensor	Elevation Above Tower Base (meters)
Wind Speed and Direction	12.5 and 61.4
Dew Point [(a)]	11.0
Solar Radiation	1.5
Ambient Temperature (two at each level)	11.0 and 59.9
Delta Temperature (two channels) [(b)]	11.0 and 59.9
Precipitation	1.5
Barometric Pressure	1.5

Notes:
a) Existing system monitors relative humidity. Dew point was measured during the 1994 – 1999 period of record used in this report

b) Used to measure differential temperature channel between these elevations.

Source: Reference 2.7-018

Table 2.7-73
Predicted HAR 2 and HAR 3 X/Q Values

Location and Averaging Period	AP1000 DCD Acceptance X/Q Criteria (sec/m^3)	HAR 2 and HAR 3 Maximum Predicted X/Q [(a)] (sec/m^3)
Exclusion Area Boundary		
0 – 2 hr	$\leq 5.1 \times 10^{-4}$	4.7×10^{-4}
Low Population Zone		
0 – 8 hr	$\leq 2.2 \times 10^{-4}$	9.1×10^{-5}
8 – 24 hr	$\leq 1.6 \times 10^{-4}$	6.0×10^{-5}
24 – 96 hr	$\leq 1.0 \times 10^{-4}$	2.8×10^{-5}
96 – 720 hr	$\leq 8.0 \times 10^{-5}$	9.0×10^{-6}

Notes:
a) Maximum predicted X/Q values occurred in the SSW sector for all averaging periods.

Table 2.7-74 (Sheet 1 of 4)
Meteorological Input Data for PAVAN Model
Joint Frequency Distribution by Hours
Shearon Harris Nuclear Power Plant Meteorological Monitoring Station
Period of Record: March 1994 to February 1999 (Lower Elevation)

Wind Speed (Miles/hr)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class A																
1-3	0	0	0	0	0	1	0	0	0	2	1	1	0	0	0	1
4-7	8	14	9	6	7	6	10	14	37	19	26	56	8	3	19	15
8-12	12	23	6	6	8	1	2	3	21	40	37	102	13	12	28	30
13-18	0	0	0	0	0	0	0	0	0	0	2	5	0	1	1	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Class B																
1-3	5	2	2	2	0	3	0	2	1	5	5	2	0	1	5	2
4-7	50	46	37	41	23	19	21	26	76	51	42	130	18	17	72	65
8-12	19	38	26	6	4	1	0	3	15	32	49	88	23	29	75	46
13-18	0	0	0	0	0	0	0	0	0	2	1	4	2	2	2	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2.7-74 (Sheet 2 of 4)
Meteorological Input Data for PAVAN Model
Joint Frequency Distribution by Hours
Shearon Harris Nuclear Power Plant Meteorological Monitoring Station
Period of Record: March 1994 to February 1999 (Lower Elevation)

Wind Speed (Miles/hr)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class C																
1-3	5	4	11	4	8	4	6	9	11	18	11	9	7	7	4	7
4-7	122	101	78	96	51	55	55	70	143	109	96	188	62	69	115	117
8-12	29	44	48	11	7	8	3	6	30	42	54	94	29	61	93	54
13-18	0	0	0	0	0	0	0	0	0	1	3	7	4	5	4	0
19-24	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
>24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Class D																
1-3	255	260	214	204	153	138	156	157	219	224	206	183	131	147	152	208
4-7	982	876	671	567	321	258	287	376	536	490	578	756	380	374	535	614
8-12	171	168	102	44	7	14	24	44	86	111	159	231	79	195	249	172
13-18	1	1	1	0	0	0	1	5	1	0	12	26	8	16	13	2
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2.7-74 (Sheet 3 of 4)
Meteorological Input Data for PAVAN Model
Joint Frequency Distribution by Hours
Shearon Harris Nuclear Power Plant Meteorological Monitoring Station
Period of Record: March 1994 to February 1999 (Lower Elevation)

Wind Speed (Miles/hr)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class E																
1-3	564	537	407	330	244	208	239	283	437	591	454	364	253	226	229	344
4-7	572	388	255	192	125	142	229	405	575	638	500	449	196	201	230	381
8-12	59	65	33	16	11	13	26	50	129	68	62	81	25	68	72	72
13-18	21	4	0	2	4	0	2	5	5	2	2	9	0	3	1	4
19-24	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Class F																
1-3	513	458	369	266	189	173	131	165	195	255	227	224	215	220	188	270
4-7	78	18	7	11	14	10	19	23	38	27	36	75	23	24	24	58
8-12	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	1
13-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2.7-74 (Sheet 4 of 4)
Meteorological Input Data for PAVAN Model
Joint Frequency Distribution by Hours
Shearon Harris Nuclear Power Plant Meteorological Monitoring Station
Period of Record: March 1994 to February 1999 (Lower Elevation)

Wind Speed (Miles/hr)	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
Class G																
1-3	1442	1777	1139	500	305	180	123	91	100	142	172	232	232	372	406	702
4-7	23	2	2	1	1	5	5	3	0	3	0	6	2	4	1	7
8-12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19-24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
>24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Information based on NRC's Regulatory Guide 1.145, Revision 1.

Table 2.7-75
0 – 2 Hour 50th Percentile EAB X/Q Values for HAR 2 and HAR 3

Time Period	X/Q (sec/m^3)	Source
0 - 2 hr.	5.64E-05	PAVAN Model

0 – 30 day 50th Percentile LPZ X/Q Values for HAR 2 and HAR 3

Time Period	X/Q (sec/m^3)	Source
0 - 2 hr.	1.14E-05	PAVAN Model
0 - 8 hr.	8.80E-06	Interpolation
8 - 24 hr.	7.70E-06	Interpolation
1 - 4 days	5.84E-06	Interpolation
4 - 30 days	3.84E-06	Interpolation
Annual Average	2.23E-06	PAVAN Model

Source: Information based on NRC's Regulatory Guide 1.145, Revision 1

Table 2.7-76 (Sheet 1 of 3)
Long-Term X/Q (in sec/m^3) Calculations for Routine Releases for HAR 2 and HAR 3

	Exclusion Area Boundary		Low Population Zone[(a)]		Nearest Milk Cow		Nearest Milk Goat		Nearest Garden		Nearest Meat Animal	
Downwind Sector	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q
N	1245	2.30E-06	4959	3.10E-07	2973	6.50E-07	7472	1.80E-07	2974	6.50E-07	2974	6.50E-07
NNE	1245	2.80E-06	4925	3.90E-07	4297	4.70E-07	7630	2.10E-07	2668	9.30E-07	2668	9.30E-07
NE	1245	2.60E-06	4876	3.70E-07	7851	1.90E-07	7851	1.90E-07	7851	1.90E-07	7851	1.90E-07
ENE	1245	2.80E-06	4832	4.10E-07	8100	2.00E-07	8100	2.00E-07	8100	2.00E-07	8100	2.00E-07
E	1245	2.10E-06	4887	3.10E-07	8338	1.50E-07	8338	1.50E-07	2994	6.10E-07	2994	6.10E-07
ESE	1600	1.8E-06	4934	4.00E-07	8530	1.90E-07	8530	1.90E-07	7887	2.10E-07	7887	2.10E-07
SE	1600	1.9E-06	4964	4.20E-07	8651	2.00E-07	8651	2.00E-07	7202	2.50E-07	4790	4.40E-07
SSE	1600	2.9E-06	4973	6.60E-07	8686	3.20E-07	8686	3.20E-07	7398	3.90E-07	7398	3.90E-07
S	1600	5.5E-06	4959	1.30E-06	8631	6.20E-07	8631	6.20E-07	8631	6.20E-07	8631	6.20E-07
SSW	1600	6.0E-06	4925	1.40E-06	8492	7.10E-07	8492	7.10E-07	6565	9.80E-07	8492	7.10E-07
SW	1600	4.1E-06	4876	9.60E-07	8287	4.90E-07	8287	4.90E-07	4922	9.50E-07	4922	9.50E-07
WSW	1600	2.3E-06	4832	5.30E-07	8044	2.70E-07	8044	2.70E-07	7242	3.10E-07	7242	3.10E-07
W	1245	2.20E-06	4887	3.40E-07	7798	1.80E-07	7798	1.80E-07	4754	3.50E-07	4754	3.50E-07
WNW	1245	1.70E-06	4934	2.50E-07	7588	1.40E-07	7588	1.40E-07	7588	1.40E-07	7588	1.40E-07
NW	1245	1.50E-06	4964	2.10E-07	7449	1.20E-07	7449	1.20E-07	7449	1.20E-07	7449	1.20E-07
NNW	1245	1.70E-06	4973	2.30E-07	7408	1.30E-07	7408	1.30E-07	2580	5.90E-07	2580	5.90E-07

Table 2.7-76 (Sheet 2 of 3)
Long-Term X/Q (in sec/m^3) Calculations for Routine Releases for HAR 2 and HAR 3

	Nearest Residence		Downwind Distance (mi.)									
Downwind Sector	Distance (m)	X/Q	0.5	0.75	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
N	2974	6.50E-07	4.47E-06	2.41E-06	1.57E-06	8.74E-07	5.79E-07	4.21E-07	3.25E-07	2.62E-07	2.17E-07	1.84E-07
NNE	2668	9.30E-07	5.45E-06	2.94E-06	1.91E-06	1.07E-06	7.11E-07	5.19E-07	4.02E-07	3.24E-07	2.69E-07	2.29E-07
NE	3534	5.80E-07	5.09E-06	2.72E-06	1.76E-06	9.93E-07	6.62E-07	4.85E-07	3.76E-07	3.04E-07	2.53E-07	2.15E-07
ENE	8100	2.00E-07	5.52E-06	2.90E-06	1.88E-06	1.06E-06	7.11E-07	5.21E-07	4.06E-07	3.28E-07	2.74E-07	2.33E-07
E	2680	7.10E-07	4.21E-06	2.20E-06	1.42E-06	8.18E-07	5.53E-07	4.09E-07	3.20E-07	2.60E-07	2.18E-07	1.86E-07
ESE	4676	4.30E-07	5.35E-06	2.74E-06	1.77E-06	1.03E-06	6.99E-07	5.20E-07	4.08E-07	3.33E-07	2.80E-07	2.40E-07
SE	4790	4.40E-07	5.73E-06	2.92E-06	1.88E-06	1.09E-06	7.40E-07	5.50E-07	4.31E-07	3.52E-07	2.95E-07	2.53E-07
SSE	7398	3.90E-07	8.96E-06	4.55E-06	2.92E-06	1.71E-06	1.17E-06	8.69E-07	6.84E-07	5.60E-07	4.70E-07	4.04E-07
S	8631	6.20E-07	1.68E-05	8.44E-06	5.43E-06	3.20E-06	2.20E-06	1.64E-06	1.30E-06	1.06E-06	8.95E-07	7.70E-07
SSW	6565	9.80E-07	1.86E-05	9.28E-06	5.95E-06	3.53E-06	2.43E-06	1.83E-06	1.45E-06	1.19E-06	1.00E-06	8.63E-07
SW	4922	9.50E-07	1.26E-05	6.32E-06	4.06E-06	2.40E-06	1.65E-06	1.24E-06	9.76E-07	8.01E-07	6.75E-07	5.81E-07
WSW	7242	3.10E-07	6.93E-06	3.54E-06	2.28E-06	1.33E-06	9.05E-07	6.73E-07	5.29E-07	4.32E-07	3.63E-07	3.11E-07
W	4594	3.70E-07	4.50E-06	2.32E-06	1.50E-06	8.67E-07	5.90E-07	4.38E-07	3.44E-07	2.81E-07	2.35E-07	2.02E-07
WNW	3577	3.80E-07	3.33E-06	1.74E-06	1.13E-06	6.47E-07	4.37E-07	3.23E-07	2.53E-07	2.06E-07	1.72E-07	1.47E-07
NW	3268	3.80E-07	3.00E-06	1.59E-06	1.03E-06	5.82E-07	3.90E-07	2.86E-07	2.23E-07	1.80E-07	1.50E-07	1.28E-07
NNW	1936	8.80E-07	3.29E-06	1.77E-06	1.15E-06	6.46E-07	4.30E-07	3.14E-07	2.43E-07	1.96E-07	1.63E-07	1.39E-07

Table 2.7-76 (Sheet 3 of 3)
Long-Term X/Q (in sec/m^3) Calculations for Routine Releases for HAR 2 and HAR 3

Downwind Sector	Downwind Distance (mi.)										
	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0
N	1.59E-07	9.11E-08	6.16E-08	3.56E-08	2.43E-08	1.81E-08	1.42E-08	1.16E-08	9.77E-09	8.38E-09	7.31E-09
NNE	1.98E-07	1.14E-07	7.71E-08	4.49E-08	3.07E-08	2.29E-08	1.80E-08	1.48E-08	1.24E-08	1.07E-08	9.31E-09
NE	1.86E-07	1.08E-07	7.31E-08	4.27E-08	2.93E-08	2.19E-08	1.73E-08	1.42E-08	1.20E-08	1.03E-08	8.99E-09
ENE	2.02E-07	1.17E-07	8.01E-08	4.71E-08	3.24E-08	2.43E-08	1.93E-08	1.59E-08	1.34E-08	1.15E-08	1.01E-08
E	1.62E-07	9.50E-08	6.53E-08	3.88E-08	2.69E-08	2.03E-08	1.61E-08	1.33E-08	1.13E-08	9.72E-09	8.53E-09
ESE	2.09E-07	1.24E-07	8.55E-08	5.11E-08	3.56E-08	2.70E-08	2.15E-08	1.78E-08	1.51E-08	1.31E-08	1.15E-08
SE	2.20E-07	1.30E-07	9.01E-08	5.39E-08	3.76E-08	2.85E-08	2.27E-08	1.88E-08	1.59E-08	1.38E-08	1.21E-08
SSE	3.52E-07	2.10E-07	1.45E-07	8.73E-08	6.10E-08	4.63E-08	3.70E-08	3.06E-08	2.60E-08	2.26E-08	1.99E-08
S	6.73E-07	4.02E-07	2.80E-07	1.69E-07	1.18E-07	9.00E-08	7.20E-08	5.97E-08	5.08E-08	4.41E-08	3.88E-08
SSW	7.55E-07	4.53E-07	3.17E-07	1.92E-07	1.35E-07	1.03E-07	8.23E-08	6.84E-08	5.82E-08	5.05E-08	4.45E-08
SW	5.08E-07	3.04E-07	2.12E-07	1.28E-07	8.99E-08	6.84E-08	5.48E-08	4.55E-08	3.87E-08	3.36E-08	2.96E-08
WSW	2.71E-07	1.61E-07	1.11E-07	6.65E-08	4.64E-08	3.51E-08	2.80E-08	2.32E-08	1.97E-08	1.70E-08	1.50E-08
W	1.76E-07	1.04E-07	7.18E-08	4.29E-08	2.99E-08	2.26E-08	1.80E-08	1.49E-08	1.26E-08	1.09E-08	9.60E-09
WNW	1.28E-07	7.50E-08	5.15E-08	3.06E-08	2.12E-08	1.60E-08	1.27E-08	1.05E-08	8.86E-09	7.65E-09	6.71E-09
NW	1.11E-07	6.44E-08	4.40E-08	2.58E-08	1.78E-08	1.33E-08	1.06E-08	8.66E-09	7.31E-09	6.30E-09	5.51E-09
NNW	1.20E-07	6.90E-08	4.68E-08	2.72E-08	1.86E-08	1.39E-08	1.10E-08	8.97E-09	7.55E-09	6.49E-09	5.66E-09

Notes:
a) The reported distance of the Low Population Zone (LPZ) is measured from centerpoint of HAR 2 and HAR 3 to outermost boundary of the LPZ.

Wind Reference Level = 12 m
Stability Type = ΔT (61 – 12 m)
Release Type = Ground Level:12 m
Building Height/Cross Section = 43.9 m/2,730 m^2

Table 2.7-77 (Sheet 1 of 3)
Long-Term Average D/Q (in l/m^2) Calculations for Routine Releases for HAR 2 and HAR 3

	Exclusion Area Boundary		Low Population Zone[a]		Nearest Milk Cow		Nearest Milk Goat		Nearest Garden		Nearest Meat Animal	
Downwind Sector	Distance (m)	D/Q	Distance (m)	D/Q	Distance (m)	D/Q	Distance (m)	D/Q	Distance (m)	D/Q	Distance (m)	D/Q
N	1245	5.90E-09	4959	5.40E-10	2973	1.30E-09	7472	2.60E-10	2974	1.30E-09	2974	1.30E-09
NNE	1245	6.40E-09	4925	5.90E-10	4297	7.50E-10	7630	2.70E-10	2668	1.70E-09	2668	1.70E-09
NE	1245	6.10E-09	4876	5.70E-10	7851	2.40E-10	7851	2.40E-10	7851	2.40E-10	7851	2.40E-10
ENE	1245	7.40E-09	4832	7.10E-10	8100	2.80E-10	8100	2.80E-10	8100	2.80E-10	8100	2.80E-10
E	1245	3.80E-09	4887	3.60E-10	8338	1.40E-10	8338	1.40E-10	2994	8.50E-10	2994	8.50E-10
ESE	1600	3.00E-09	4934	4.30E-10	8530	1.60E-10	8530	1.60E-10	7887	1.80E-10	7887	1.80E-10
SE	1600	3.66E-09	4964	5.20E-10	8651	1.90E-10	8651	1.90E-10	7202	2.70E-10	4790	5.50E-10
SSE	1600	4.63E-09	4973	6.50E-10	8686	2.40E-10	8686	2.40E-10	7398	3.20E-10	7398	3.20E-10
S	1600	7.26E-08	4959	1.00E-09	8631	3.80E-10	8631	3.80E-10	8631	3.80E-10	8631	3.80E-10
SSW	1600	7.15E-08	4925	1.00E-09	8492	3.90E-10	8492	3.90E-10	6565	6.10E-10	8492	3.90E-10
SW	1600	5.05E-09	4876	7.40E-10	8287	2.80E-10	8287	2.80E-10	4922	7.20E-10	4922	7.20E-10
WSW	1600	3.37E-09	4832	5.00E-10	8044	2.00E-10	8044	2.00E-10	7242	2.40E-10	7242	2.40E-10
W	1245	3.40E-09	4887	3.10E-10	7798	1.40E-10	7798	1.40E-10	4754	3.30E-10	4754	3.30E-10
WNW	1245	2.80E-09	4934	2.60E-10	7588	1.20E-10	7588	1.20E-10	7588	1.20E-10	7588	1.20E-10
NW	1245	3.00E-09	4964	2.70E-10	7449	1.30E-10	7449	1.30E-10	7449	1.30E-10	7449	1.30E-10
NNW	1245	3.90E-09	4973	3.50E-10	7408	1.70E-10	7408	1.70E-10	2580	1.10E-09	2580	1.10E-09

Table 2.7-77 (Sheet 2 of 3)
Long-Term Average D/Q (in l/m^2) Calculations for Routine Releases for HAR 2 and HAR 3

	Nearest Residence		Downwind Distance (mi.)									
Downwind Sector	Distance (m)	D/Q	0.5	0.75	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
N	2974	1.30E-09	1.21E-08	6.22E-09	3.82E-09	1.90E-09	1.16E-09	7.81E-10	5.66E-10	4.30E-10	3.39E-10	2.74E-10
NNE	2668	1.70E-09	1.31E-08	6.74E-09	4.14E-09	2.06E-09	1.25E-09	8.46E-10	6.13E-10	4.66E-10	3.67E-10	2.97E-10
NE	3534	1.00E-09	1.25E-08	6.42E-09	3.94E-09	1.97E-09	1.19E-09	8.06E-10	5.84E-10	4.44E-10	3.50E-10	2.83E-10
ENE	8100	2.80E-09	1.52E-08	7.80E-09	4.79E-09	2.39E-09	1.45E-09	9.79E-10	7.09E-10	5.39E-10	4.25E-10	3.44E-10
E	2680	1.00E-09	7.88E-09	4.05E-09	2.49E-09	1.24E-09	7.51E-10	5.08E-10	3.68E-10	2.80E-10	2.21E-10	1.79E-10
ESE	4676	4.70E-10	9.52E-09	4.89E-09	3.00E-09	1.50E-09	9.07E-10	6.13E-10	4.44E-10	3.38E-10	2.66E-10	2.16E-10
SE	4790	5.50E-10	1.16E-08	5.96E-09	3.66E-09	1.83E-09	1.11E-09	7.48E-10	5.42E-10	4.12E-10	3.25E-10	2.63E-10
SSE	7398	3.20E-10	1.47E-08	7.55E-09	4.64E-09	2.31E-09	1.40E-09	9.48E-10	6.87E-10	5.22E-10	4.12E-10	3.33E-10
S	8631	3.80E-10	2.30E-08	1.18E-08	7.26E-09	3.62E-09	2.20E-09	1.49E-09	1.08E-09	8.18E-10	6.44E-10	5.22E-10
SSW	6565	6.10E-10	2.27E-08	1.17E-08	7.15E-09	3.57E-09	2.16E-09	1.46E-09	1.06E-09	8.06E-10	6.35E-10	5.14E-10
SW	4922	7.20E-10	1.60E-08	8.23E-09	5.05E-09	2.52E-09	1.53E-09	1.03E-09	7.48E-10	5.69E-10	4.48E-10	3.63E-10
WSW	7242	2.40E-10	1.07E-08	5.50E-09	3.37E-09	1.68E-09	1.02E-09	6.90E-10	5.00E-10	3.80E-10	2.99E-10	2.42E-10
W	4594	3.50E-10	6.88E-09	3.53E-09	2.17E-09	1.08E-09	6.56E-10	4.43E-10	3.21E-10	2.44E-10	1.93E-10	1.56E-10
WNW	3577	4.50E-10	5.72E-09	2.94E-09	1.80E-09	9.00E-10	5.46E-10	3.69E-10	2.67E-10	2.03E-10	1.60E-10	1.30E-10
NW	3268	5.70E-10	6.15E-09	3.16E-09	1.94E-09	9.66E-10	5.86E-10	3.96E-10	2.87E-10	2.18E-10	1.72E-10	1.39E-10
NNW	1936	1.80E-09	7.96E-09	4.08E-09	2.51E-09	1.25E-09	7.58E-10	5.13E-10	3.72E-10	2.83E-10	2.23E-10	1.80E-10

Table 2.7-77 (Sheet 3 of 3)
Long-Term Average D/Q (in l/m^2) Calculations for Routine Releases for HAR 2 and HAR 3

Downwind Sector	Downward Distance (mi.)										
	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0
N	2.27E-10	1.11E-10	6.98E-11	3.53E-11	2.14E-11	1.43E-11	1.03E-11	7.70E-12	5.99E-12	4.78E-12	3.90E-12
NNE	2.46E-10	1.21E-10	7.56E-11	3.82E-11	2.31E-11	1.55E-11	1.11E-11	8.35E-12	6.49E-12	5.18E-12	4.23E-12
NE	2.34E-10	1.15E-10	7.21E-11	3.64E-11	2.20E-11	1.48E-11	1.06E-11	7.95E-12	6.18E-12	4.94E-12	4.03E-12
ENE	2.85E-10	1.39E-10	8.75E-11	4.42E-11	2.68E-11	1.79E-11	1.29E-11	9.66E-12	7.51E-12	6.00E-12	4.89E-12
E	1.48E-10	7.24E-11	4.54E-11	2.30E-11	1.39E-11	9.31E-12	6.67E-12	5.01E-12	3.90E-12	3.11E-12	2.54E-12
ESE	1.78E-10	8.74E-11	5.48E-11	2.77E-11	1.68E-11	1.12E-11	8.06E-12	6.05E-12	4.70E-12	3.76E-12	3.07E-12
SE	2.18E-10	1.07E-10	6.69E-11	3.38E-11	2.05E-11	1.37E-11	9.83E-12	7.38E-12	5.74E-12	4.59E-12	3.74E-12
SSE	2.76E-10	1.35E-10	8.47E-11	4.28E-11	2.59E-11	1.74E-11	1.25E-11	9.35E-12	7.27E-12	5.81E-12	4.74E-12
S	4.32E-10	2.12E-10	1.33E-10	6.71E-11	4.06E-11	2.72E-11	1.95E-11	1.46E-11	1.14E-11	9.10E-12	7.42E-12
SSW	4.25E-10	2.08E-10	1.31E-10	6.61E-11	4.00E-11	2.68E-11	1.92E-11	1.44E-11	1.12E-11	8.96E-12	7.31E-12
SW	3.00E-10	1.47E-10	9.23E-11	4.67E-11	2.82E-11	1.89E-11	1.36E-11	1.02E-11	7.92E-12	6.33E-12	5.16E-12
WSW	2.01E-10	9.83E-11	6.17E-11	3.12E-11	1.89E-11	1.27E-11	9.06E-12	6.81E-12	5.29E-12	4.23E-12	3.45E-12
W	1.29E-10	6.32E-11	3.96E-11	2.00E-11	1.21E-11	8.13E-12	5.83E-12	4.37E-12	3.40E-12	2.72E-12	2.22E-12
WNW	1.07E-10	5.26E-11	3.30E-11	1.67E-11	1.01E-11	6.76E-12	4.85E-12	3.64E-12	2.83E-12	2.26E-12	1.85E-12
NW	1.15E-10	5.65E-11	3.54E-11	1.79E-11	1.08E-11	7.27E-12	5.21E-12	3.91E-12	3.04E-12	2.43E-12	1.98E-12
NNW	1.49E-10	7.30E-11	4.58E-11	2.32E-11	1.40E-11	9.40E-12	6.74E-12	5.06E-12	3.93E-12	3.14E-12	2.56E-12

Notes:
a) The reported distance of the Low Population Zone (LPZ) is measured from centerpoint of HAR 2 and HAR 3 to outermost boundary of the LPZ.

Wind Reference Level = 12 m
Stability Type = ΔT (61 – 12 m)
Release Type = Ground Level:12 m
Building Height/Cross Section = 43.9 m/2,730 m^2

Table 2.7-78 (Sheet 1 of 3)
Long-Term Average X/Q (in sec/m^3) Calculations (2.26 Day Decay) for Routine Releases for HAR 2 and HAR 3

	Exclusion Area Boundary		Low Population Zone[a]		Nearest Milk Cow		Nearest Milk Goat		Nearest Garden		Nearest Meat Animal	
Downwind Sector	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q
N	1245	2.30E-06	4959	3.10E-07	2973	6.40E-07	7472	1.70E-07	2974	6.40E-07	2974	6.40E-07
NNE	1245	2.80E-06	4925	3.80E-07	4297	4.60E-07	7630	2.00E-07	2668	9.10E-07	2668	9.10E-07
NE	1245	2.60E-06	4876	3.60E-07	7851	1.80E-07	7851	1.80E-07	7851	1.80E-07	7851	1.80E-07
ENE	1245	2.70E-06	4832	3.90E-07	8100	1.90E-07	8100	1.90E-07	8100	1.90E-07	8100	1.90E-07
E	1245	2.10E-06	4887	3.00E-07	8338	1.50E-07	8338	1.50E-07	2994	6.00E-07	2994	6.00E-07
ESE	1600	1.8E-06	4934	3.80E-07	8530	1.80E-07	8530	1.80E-07	7887	2.00E-07	7887	2.00E-07
SE	1600	1.90E-06	4964	4.00E-07	8651	1.90E-07	8651	1.90E-07	7202	2.40E-07	4790	4.20E-07
SSE	1600	2.90E-06	4973	6.30E-07	8686	3.00E-07	8686	3.00E-07	7398	3.70E-07	7398	3.70E-07
S	1600	5.40E-06	4959	1.20E-06	8631	5.70E-07	8631	5.70E-07	8631	5.70E-07	8631	5.70E-07
SSW	1600	5.90E-06	4925	1.40E-06	8492	6.60E-07	8492	6.60E-07	6565	9.20E-07	8492	6.60E-07
SW	1600	4.00E-06	4876	9.30E-07	8287	4.60E-07	8287	4.60E-07	4922	9.10E-07	4922	9.10E-07
WSW	1600	2.30E-06	4832	5.10E-07	8044	2.50E-07	8044	2.50E-07	7242	2.90E-07	7242	2.90E-07
W	1245	2.20E-06	4887	3.30E-07	7798	1.70E-07	7798	1.70E-07	4754	3.40E-07	4754	3.40E-07
WNW	1245	1.60E-06	4934	2.40E-07	7588	1.30E-07	7588	1.30E-07	7588	1.30E-07	7588	1.30E-07
NW	1245	1.50E-06	4964	2.10E-07	7449	1.20E-07	7449	1.20E-07	7449	1.20E-07	7449	1.20E-07
NNW	1245	1.70E-06	4973	2.30E-07	7408	1.30E-07	7408	1.30E-07	2580	5.80E-07	2580	5.80E-07

Table 2.7-78 (Sheet 2 of 3)
Long-Term Average X/Q (in sec/m^3) Calculations (2.26 Day Decay) for Routine Releases for HAR 2 and HAR 3

	Nearest Residence		Downwind Distance (mi.)									
Downwind Sector	Distance (m)	X/Q	0.5	0.75	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
N	2974	6.40E-07	4.45E-06	2.40E-06	1.56E-06	8.63E-07	5.69E-07	4.12E-07	3.17E-07	2.54E-07	2.10E-07	1.77E-07
NNE	2668	9.10E-07	5.42E-06	2.92E-06	1.89E-06	1.06E-06	6.99E-07	5.08E-07	3.91E-07	3.14E-07	2.60E-07	2.20E-07
NE	3534	5.70E-07	5.07E-06	2.70E-06	1.75E-06	9.79E-07	6.50E-07	4.73E-07	3.65E-07	2.94E-07	2.43E-07	2.06E-07
ENE	8100	1.90E-07	5.50E-06	2.88E-06	1.86E-06	1.05E-06	6.97E-07	5.09E-07	3.94E-07	3.17E-07	2.63E-07	2.23E-07
E	2680	7.00E-07	4.18E-06	2.18E-06	1.41E-06	8.04E-07	5.41E-07	3.97E-07	3.09E-07	2.50E-07	2.08E-07	1.77E-07
ESE	4676	4.10E-07	5.32E-06	2.72E-06	1.75E-06	1.01E-06	6.83E-07	5.04E-07	3.94E-07	3.19E-07	2.66E-07	2.27E-07
SE	4790	4.20E-07	5.70E-06	2.90E-06	1.86E-06	1.07E-06	7.23E-07	5.33E-07	4.16E-07	3.37E-07	2.81E-07	2.40E-07
SSE	7398	3.70E-07	8.90E-06	4.50E-06	2.89E-06	1.68E-06	1.14E-06	8.43E-07	6.59E-07	5.36E-07	4.47E-07	3.82E-07
S	8631	5.70E-07	1.66E-05	8.36E-06	5.36E-06	3.13E-06	2.14E-06	1.59E-06	1.25E-06	1.02E-06	8.49E-07	7.26E-07
SSW	6565	9.20E-07	1.85E-05	9.19E-06	5.87E-06	3.46E-06	2.37E-06	1.77E-06	1.39E-06	1.13E-06	9.48E-07	8.11E-07
SW	4922	9.10E-07	1.25E-05	6.26E-06	4.01E-06	2.35E-06	1.61E-06	1.19E-06	9.38E-07	7.64E-07	6.39E-07	5.46E-07
WSW	7242	2.90E-07	6.89E-06	3.51E-06	2.26E-06	1.30E-06	8.83E-07	6.53E-07	5.10E-07	4.14E-07	3.45E-07	2.94E-07
W	4594	3.50E-07	4.48E-06	2.30E-06	1.48E-06	8.52E-07	5.76E-07	4.25E-07	3.32E-07	2.69E-07	2.24E-07	1.91E-07
WNW	3577	3.70E-07	3.31E-06	1.73E-06	1.12E-06	6.37E-07	4.28E-07	3.14E-07	2.44E-07	1.98E-07	1.64E-07	1.40E-07
NW	3268	3.70E-07	2.98E-06	1.57E-06	1.02E-06	5.74E-07	3.82E-07	2.79E-07	2.16E-07	1.74E-07	1.44E-07	1.22E-07
NNW	1936	8.80E-07	3.28E-06	1.76E-06	1.14E-06	6.38E-07	4.22E-07	3.07E-07	2.37E-07	1.90E-07	1.57E-07	1.33E-07

Table 2.7-78 (Sheet 3 of 3)
Long-Term Average X/Q (in sec/m^3) Calculations (2.26 Day Decay) for Routine Releases for HAR 2 and HAR 3

Downwind Sector	Downwind Distance (mi.)										
	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0
N	1.53E-07	8.54E-08	5.64E-08	3.13E-08	2.05E-08	1.47E-08	1.11E-08	8.74E-09	7.08E-09	5.87E-09	4.95E-09
NNE	1.89E-07	1.06E-07	7.04E-08	3.91E-08	2.56E-08	1.83E-08	1.39E-08	1.09E-08	8.85E-09	7.32E-09	6.17E-09
NE	1.77E-07	1.00E-07	6.63E-08	3.70E-08	2.42E-08	1.74E-08	1.31E-08	1.03E-08	8.37E-09	6.93E-09	5.84E-09
ENE	1.92E-07	1.09E-07	7.24E-08	4.05E-08	2.66E-08	1.91E-08	1.45E-08	1.14E-08	9.27E-09	7.68E-09	6.48E-09
E	1.53E-07	8.72E-08	5.83E-08	3.28E-08	2.16E-08	1.55E-08	1.17E-08	9.22E-09	7.47E-09	6.18E-09	5.20E-09
ESE	1.97E-07	1.13E-07	7.57E-08	4.27E-08	2.82E-08	2.02E-08	1.54E-08	1.21E-08	9.79E-09	8.11E-09	6.83E-09
SE	2.07E-07	1.19E-07	7.98E-08	4.51E-08	2.97E-08	2.13E-08	1.62E-08	1.28E-08	1.03E-08	8.56E-09	7.21E-09
SSE	3.31E-07	1.91E-07	1.28E-07	7.26E-08	4.79E-08	3.45E-08	2.62E-08	2.06E-08	1.67E-08	1.38E-08	1.17E-08
S	6.30E-07	3.64E-07	2.46E-07	1.40E-07	9.22E-08	6.64E-08	5.04E-08	3.97E-08	3.22E-08	2.66E-08	2.24E-08
SSW	7.05E-07	4.09E-07	2.77E-07	1.57E-07	1.04E-07	7.48E-08	5.68E-08	4.47E-08	3.62E-08	3.00E-08	2.52E-08
SW	4.75E-07	2.75E-07	1.86E-07	1.05E-07	6.96E-08	5.01E-08	3.80E-08	2.99E-08	2.42E-08	2.01E-08	1.69E-08
WSW	2.55E-07	1.46E-07	9.82E-08	5.54E-08	3.65E-08	2.62E-08	1.99E-08	1.56E-08	1.27E-08	1.05E-08	8.81E-09
W	1.65E-07	9.47E-08	6.35E-08	3.58E-08	2.36E-08	1.69E-08	1.28E-08	1.01E-08	8.17E-09	6.76E-09	5.68E-09
WNW	1.21E-07	6.88E-08	4.60E-08	2.58E-08	1.70E-08	1.22E-08	9.22E-09	7.25E-09	5.87E-09	4.86E-09	4.09E-09
NW	1.06E-07	5.96E-08	3.97E-08	2.21E-08	1.45E-08	1.04E-08	7.87E-09	6.19E-09	5.01E-09	4.15E-09	3.49E-09
NNW	1.15E-07	6.44E-08	4.27E-08	2.37E-08	1.56E-08	1.11E-08	8.43E-09	6.63E-09	5.37E-09	4.45E-09	3.75E-09

Notes:
a) The reported distance of the Low Population Zone (LPZ) is measured from centerpoint of HAR 2 and HAR 3 to outermost boundary of the LPZ.

Wind Reference Level = 12 m
Stability Type = ΔT (61 – 12 m)
Release Type = Ground Level:12 m
Building Height/Cross Section = 43.9 m/2,730 m^2

Table 2.7-79 (Sheet 1 of 3)
Long-Term Average X/Q (in sec/m^3) Calculations (Depleted and 8-Day Decayed) for Routine Releases for HAR 2 and HAR 3

	Exclusion Area Boundary		Low Population Zone[a]		Nearest Milk Cow		Nearest Milk Goat		Nearest Garden		Nearest Meat Animal	
Downwind Sector	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q	Distance (m)	X/Q
N	1245	2.00E-06	4959	2.50E-07	2973	5.40E-07	7472	1.30E-07	2974	5.40E-07	2974	5.40E-07
NNE	1245	2.50E-06	4925	3.10E-07	4297	3.80E-07	7630	1.60E-07	2668	7.80E-07	2668	7.80E-07
NE	1245	2.30E-06	4876	2.90E-07	7851	1.40E-07	7851	1.40E-07	7851	1.40E-07	7851	1.40E-07
ENE	1245	2.50E-06	4832	3.20E-07	8100	1.50E-07	8100	1.50E-07	8100	1.50E-07	8100	1.50E-07
E	1245	1.90E-06	4887	2.50E-07	8338	1.10E-07	8338	1.10E-07	2994	5.10E-07	2994	5.10E-07
ESE	1600	1.60E-06	4934	3.10E-07	8530	1.40E-07	8530	1.40E-07	7887	1.60E-07	7887	1.60E-07
SE	1600	1.70E-06	4964	3.30E-07	8651	1.50E-07	8651	1.50E-07	7202	1.90E-07	4790	3.40E-07
SSE	1600	2.60E-06	4973	5.20E-07	8686	2.30E-07	8686	2.30E-07	7398	2.90E-07	7398	2.90E-07
S	1600	4.80E-06	4959	9.80E-07	8631	4.40E-07	8631	4.40E-07	8631	4.40E-07	8631	4.40E-07
SSW	1600	5.20E-06	4925	1.10E-06	8492	5.10E-07	8492	5.10E-07	6565	7.40E-07	8492	5.10E-07
SW	1600	3.60E-06	4876	7.60E-07	8287	3.60E-07	8287	3.60E-07	4922	7.50E-07	4922	7.50E-07
WSW	1600	2.00E-06	4832	4.20E-07	8044	2.00E-07	8044	2.00E-07	7242	2.30E-07	7242	2.30E-07
W	1245	2.00E-06	4887	2.70E-07	7798	1.30E-07	7798	1.30E-07	4754	2.80E-07	4754	2.80E-07
WNW	1245	1.50E-06	4934	1.90E-07	7588	1.00E-07	7588	1.00E-07	7588	1.00E-07	7588	1.00E-07
NW	1245	1.30E-06	4964	1.70E-07	7449	9.20E-08	7449	9.20E-08	7449	9.20E-08	7449	9.20E-08
NNW	1245	1.50E-06	4973	1.80E-07	7408	1.00E-07	7408	1.00E-07	2580	4.90E-07	2580	4.90E-07

Table 2.7-79 (Sheet 2 of 3)
Long-Term Average X/Q (in sec/m^3) Calculations (Depleted and 8-Day Decayed) for Routine Releases for HAR 2 and HAR 3

	Nearest Residence		Downwind Distance (mi.)									
Downwind Sector	Distance (m)	X/Q	0.5	0.75	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5
N	2974	5.40E-07	4.08E-06	2.15E-06	1.37E-06	7.39E-07	4.77E-07	3.39E-07	2.57E-07	2.03E-07	1.65E-07	1.38E-07
NNE	2668	7.80E-07	4.97E-06	2.61E-06	1.67E-06	9.05E-07	5.86E-07	4.18E-07	3.17E-07	2.51E-07	2.05E-07	1.71E-07
NE	3534	4.70E-07	4.64E-06	2.42E-06	1.54E-06	8.40E-07	5.45E-07	3.90E-07	2.96E-07	2.35E-07	1.92E-07	1.61E-07
ENE	8100	1.50E-07	5.04E-06	2.58E-06	1.64E-06	8.98E-07	5.85E-07	4.19E-07	3.19E-07	2.54E-07	2.08E-07	1.74E-07
E	2680	5.90E-07	3.83E-06	1.95E-06	1.24E-06	6.91E-07	4.55E-07	3.28E-07	2.52E-07	2.01E-07	1.65E-07	1.39E-07
ESE	4676	3.40E-07	4.88E-06	2.44E-06	1.54E-06	8.68E-07	5.75E-07	4.17E-07	3.21E-07	2.57E-07	2.12E-07	1.78E-07
SE	4790	3.40E-07	5.22E-06	2.60E-06	1.64E-06	9.20E-07	6.09E-07	4.41E-07	3.39E-07	2.71E-07	2.23E-07	1.88E-07
SSE	7398	2.90E-07	8.17E-06	4.04E-06	2.55E-06	1.44E-06	9.59E-07	6.98E-07	5.38E-07	4.31E-07	3.56E-07	3.00E-07
S	8631	4.40E-07	1.53E-05	7.50E-06	4.74E-06	2.70E-06	1.80E-06	1.32E-06	1.02E-06	8.18E-07	6.77E-07	5.72E-07
SSW	6565	7.40E-07	1.70E-05	8.25E-06	5.19E-06	2.98E-06	2.00E-06	1.47E-06	1.14E-06	9.14E-07	7.57E-07	6.41E-07
SW	4922	7.50E-07	1.15E-05	5.62E-06	3.54E-06	2.02E-06	1.36E-06	9.91E-07	7.67E-07	6.16E-07	5.10E-07	4.31E-07
WSW	7242	2.30E-07	6.32E-06	3.15E-06	1.99E-06	1.12E-06	7.44E-07	5.40E-07	4.16E-07	3.33E-07	2.74E-07	2.31E-07
W	4594	2.90E-07	4.11E-06	2.06E-06	1.31E-06	7.33E-07	4.85E-07	3.52E-07	2.70E-07	2.16E-07	1.78E-07	1.50E-07
WNW	3577	3.10E-07	3.04E-06	1.55E-06	9.84E-07	5.47E-07	3.60E-07	2.60E-07	1.99E-07	1.59E-07	1.30E-07	1.10E-07
NW	3268	3.10E-07	2.73E-06	1.41E-06	8.97E-07	4.92E-07	3.21E-07	2.30E-07	1.75E-07	1.39E-07	1.14E-07	9.55E-08
NNW	1936	7.60E-07	3.00E-06	1.58E-06	1.01E-06	5.47E-07	3.54E-07	2.53E-07	1.92E-07	1.52E-07	1.24E-07	1.04E-07

Table 2.7-79 (Sheet 3 of 3)
Long-Term Average X/Q (in sec/m^3) Calculations (Depleted and 8-Day Decayed) for Routine Releases for HAR 2 and HAR 3

Downwind Sector	Downwind Distance (mi.)										
	5.0	7.5	10.0	15.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0
N	1.17E-07	6.30E-08	4.03E-08	2.13E-08	1.35E-08	9.38E-09	6.95E-09	5.36E-09	4.27E-09	3.49E-09	2.90E-09
NNE	1.46E-07	7.86E-08	5.05E-08	2.68E-08	1.70E-08	1.18E-08	8.77E-09	6.77E-09	5.40E-09	4.41E-09	3.67E-09
NE	1.37E-07	7.42E-08	4.77E-08	2.54E-08	1.62E-08	1.13E-08	8.37E-09	6.48E-09	5.17E-09	4.22E-09	3.51E-09
ENE	1.48E-07	8.09E-08	5.22E-08	2.80E-08	1.78E-08	1.25E-08	9.29E-09	7.20E-09	5.76E-09	4.71E-09	3.92E-09
E	1.19E-07	6.53E-08	4.24E-08	2.29E-08	1.47E-08	1.03E-08	7.69E-09	5.97E-09	4.77E-09	3.91E-09	3.26E-09
ESE	1.53E-07	8.48E-08	5.54E-08	3.01E-08	1.94E-08	1.37E-08	1.02E-08	7.93E-09	6.35E-09	5.21E-09	4.34E-09
SE	1.61E-07	8.95E-08	5.84E-08	3.18E-08	2.04E-08	1.44E-08	1.08E-08	8.36E-09	6.70E-09	5.49E-09	4.58E-09
SSE	2.58E-07	1.44E-07	9.41E-08	5.14E-08	3.31E-08	2.34E-08	1.75E-08	1.36E-08	1.09E-08	8.95E-09	7.47E-09
S	4.92E-07	2.75E-07	1.81E-07	9.91E-08	6.40E-08	4.53E-08	3.39E-08	2.64E-08	2.12E-08	1.74E-08	1.45E-08
SSW	5.52E-07	3.10E-07	2.04E-07	1.12E-07	7.27E-08	5.15E-08	3.86E-08	3.01E-08	2.42E-08	1.98E-08	1.66E-08
SW	3.71E-07	2.08E-07	1.37E-07	7.51E-08	4.86E-08	3.44E-08	2.57E-08	2.01E-08	1.61E-08	1.32E-08	1.10E-08
WSW	1.98E-07	1.10E-07	7.20E-08	3.92E-08	2.52E-08	1.78E-08	1.33E-08	1.03E-08	8.26E-09	6.77E-09	5.65E-09
W	1.29E-07	7.13E-08	4.65E-08	2.53E-08	1.62E-08	1.14E-08	8.53E-09	6.63E-09	5.31E-09	4.35E-09	3.63E-09
WNW	9.37E-08	5.15E-08	3.35E-08	1.81E-08	1.16E-08	8.12E-09	6.05E-09	4.70E-09	3.76E-09	3.08E-09	2.56E-09
NW	8.16E-08	4.44E-08	2.87E-08	1.53E-08	9.76E-09	6.83E-09	5.07E-09	3.93E-09	3.14E-09	2.56E-09	2.13E-09
NNW	8.82E-08	4.77E-08	3.06E-08	1.63E-08	1.03E-08	7.18E-09	5.32E-09	4.12E-09	3.28E-09	2.68E-09	2.23E-09

Notes:
a) The reported distance of the Low Population Zone (LPZ) is measured from centerpoint of HAR 2 and HAR 3 to outermost boundary of the LPZ.

Wind Reference Level = 12 m
Stability Type = ΔT (61 – 12 m)
Release Type = Ground Level:12 m
Building Height/Cross Section = 43.9 m/2,730 m^2

2.8 RELATED FEDERAL PROJECT ACTIVITIES

This purpose of this section is to identify federal projects directly relating to the proposed expansion of Shearon Harris Nuclear Power Plant. If projects are identified, then this section will assess the interrelationship and cumulative environmental impacts of the proposed project and related federal agency, as well as the potential need for another agency to cooperatively participate in the Environmental Impact Statement (EIS) process. This does not include actions relating to the granting of licenses, permits, or approvals by other federal agencies. A preliminary analysis of possible federal agency actions in the vicinity of the proposed Shearon Harris Nuclear Power Plant Units 2 and 3 (HAR) regarding federal projects related to this COLA is presented in the following sections.

2.8.1 TRANSMISSION LINES

PEC is a vertically integrated investor-owned company regulated by the State of North Carolina and the Federal Energy Regulatory Commission (FERC). Although PEC will bear the ultimate responsibility for defining the nature and extent of system improvements, as well as the design and routing of connecting transmission lines, separate agencies and reports are required to obtain licenses for the new transmission lines (Reference 2.8-001).

Seven 230 kV transmission lines presently connect the HNP to the PEC electrical grid through the existing switchyard (Reference 2.8-002). These seven transmission lines, along with an eighth line planned for 2011, will also connect HAR 2 through the HNP common expanded switchyard to the PEC electrical grid. The proposed routing of the transmission lines for HAR 2 is to use the existing HNP ROWs.

Three new 230 kV transmission lines will connect the HAR 3 switchyard to the PEC electrical grid. The proposed routing of the three new transmission lines for HAR 3 are being evaluated to be adjacent to or within the existing maintained transmission corridors from the HNP.

Most corridors pass through land that is primarily agricultural and forest land. The areas are mostly remote, with low population densities. The longer lines cross numerous state and United States highways. Effect of these corridors on land usage is minimal; farmlands that have corridors passing through them generally continue to be used as farmland.

2.8.2 HIGHWAY IMPROVEMENTS

PEC is considering the addition of two temporary access ramps on and off of U.S. Highway 1 at the intersection of Shearon Harris Road. The access ramps would be used for construction traffic during the construction of the HAR. PEC would work closely with the Federal Highway Administration (FHWA), North Carolina Department of Transportation (NCDOT) and other agencies during the planning of the temporary ramps. Should the decision be made to pursue installation of the temporary ramps, PEC would conduct all appropriate surveys (e.g., cultural resources, wetlands, threatened and endangered species) early in the planning phase of the project. PEC will work with the appropriate agencies to acquire permits and identify any necessary mitigation before construction activities begin. Significant environmental impacts are not expected should the decision be made to construct the temporary access ramps and cumulative impacts will not be further evaluated in the ER.

Funding for the project would likely be the responsibility of PEC and therefore would not be considered a directly related federal project. However, if the NCDOT is involved in funding or constructing these temporary ramps, then FHWA funds would likely be involved. Due to the temporary nature and the limited area of impacts from the two ramps, it is unlikely that the FHWA will need to be an active participant in the EIS process other than that of a commenting agency.

No other federal project activities are associated with the proposed project:

- There are no federal projects planned to provide cooling water. A Harris Lake makeup water system pipeline will bring an adequate water supply from the Cape Fear River to Harris Reservoir.

- There are no federal projects contingent upon the proposed construction and operation of the HAR.

- There are currently no federal projects that will result in significant new power purchases within the HNP service area that justify a need for power.

2.8.3 REFERENCES

2.8-001 North Carolina General Statutes, Title 62 Chapter 110.1 “Certificate for construction of generating facility; analysis of long-range needs for expansion of facilities,” Updated through 2006 North Carolina General Assembly session, Website, www.ncga.state.nc.us/gascripts/statutes/Statutes.asp, accessed March 8, 2007.

2.8-002 Carolina Power & Light, Company, “Shearon Harris Nuclear Power Plant Final Safety Analysis Report,” Amendments 53 and 54, 1983.