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NCD 072 028 251 RUTHERFORD
TORPEDO WIRE AND STRIP, INC.
SITE INSPECTION PRIORITIZATION
AUGUST 1994

BLACK & VEATCH Waste Science, Inc.

The Curtis Center, Suite 705, 601 Walnut Street, Philadelphia, Pennsylvania 19106-3307, (215) 928-0700, Fax: (215) 928-1780

U.S. Environmental Protection Agency
Torpedo Wire and Strip, Inc.

BVWS Project 52012.255
August 25, 1994

Mr. Narindar Kumar, Chief
Site Assessment Section
U.S. Environmental Protection Agency
345 Courtland Street, NE
Atlanta, Georgia 30365

REC'D
SEP 27 1994

RECEIVED
OCT - 7 1994
SUPERFUND SECTION

DATE REPORT ACCEPTED 9-19-94
DISPOSITION NFRAP
TEAM SIGNATURE Cynthia Gurley

Subject: Site Inspection Prioritization
Torpedo Wire and Strip, Inc.
Rocky Mount, Nash County, NC
EPA ID NCD072028251

Dear Mr. Kumar:

BLACK & VEATCH Waste Science, Inc. has been tasked by the U.S. Environmental Protection Agency (EPA), to conduct a Site Inspection Prioritization at the Torpedo Wire and Strip, Inc. (the site) located near Rocky Mount in Nash County, North Carolina. In accordance with the scope of work for Torpedo Wire and Strip, Inc., a preliminary Hazard Ranking System (HRS) score was prepared to determine the need for future activities at the site.

The Torpedo Wire and Strip site, approximately 2 acres in size, is an electroplating facility that specializes in the manufacturing of composite wire (Refs. 1; 2). Approximately 70 people are employed in operations consisting of the solder plating and drawing of steel, copper, and copperclad steel wire (Ref. 2). The facility is located 4 miles north of the town of Rocky Mount in an industrial park (Ref. 1). There are two buildings located onsite: one is the wire operations facility and the other is the plating operations facility (Ref. 3). The site is partially fenced with limited access through driveway entrances (Ref. 3). During an offsite reconnaissance, drums were observed on the west side of the site, and smaller plastic drums and containers were seen on the east side of the site (Ref. 3). The area immediately surrounding the site consists of other small industries and businesses. The site vicinity is predominately rural. A trailer park is located 1000 feet west of the site and North Carolina Wesleyan College is located 1 mile northeast of the site (Refs. 1; 3). The facility began operating in 1974 and used a polypropylene-lined sand filter bed system onsite to treat waste sludge from the electroplating operations until 1983 (Ref. 4). In December 1983, the sand bed removal was completed and the facility began using two sand bag filtration units that contained 36 and 24 filter bags, respectively (Ref. 5). Analysis of soil samples collected from the base of the two sand beds indicated the presence of nickel and lead (Ref. 6). The former sand bed area was filled, graded, and seeded with grass in December 1983 (Refs. 5; 7).

On December 1, 1988 a Screening Site Inspection (SSI) was conducted by the EPA Environmental Services Division; a total of eleven environmental samples were collected (Refs. 2; 4). Four surface soil samples were collected: three in the vicinity of the former filter bed and one upgradient of the former filter bed area (Ref. 4). Three subsurface soil samples were collected in the vicinity of the former filter bed (Ref. 4). Two groundwater samples were collected from the southwest and southeast corners of the former filter bed area and one groundwater sample was collected from the center of the property, upgradient of the former filter bed area (Ref. 4). One sediment sample was collected from the southwest corner of the property near a surface water wash area (Ref. 4). Analytical results of surface and subsurface soil samples collected during the December 1988 sampling indicated the presence of chromium, copper, lead, nickel, and zinc (Ref. 4).

The total annual precipitation for the Nash County area of North Carolina is 46 inches (Refs. 12; 13). The mean annual lake evaporation in the Rocky Mount area is 47.5 inches resulting in a net precipitation of 7.5 inches per year (Refs. 12; 13).

Most residents within the 4-mile radius of the site are serviced by the Rocky Mount Water Company which obtains water from two surface water intakes located on the Tar River Reservoir near the town of Easonburg (Refs. 14; 15). These intakes are not located along the 15-mile surface water pathway. The Dortches Water Company also services residents within the 4-mile radius of the site with water supplied by the Rocky Mount Water Company (Refs. 14; 15; 16).

There are approximately 1,521 people using private wells for drinking water supply within 4 miles of the site, distributed as follows: 0 - 0.25 mile, 26; 0.25 - 0.5 mile, 26; 0.5 - 1 mile, 86; 1 - 2 miles, 286; 2 - 3 miles, 629; 3 - 4 miles, 468 (Refs. 1; 17; 18). The nearest private well is located 1,000 feet northwest of the site (Ref. 3). The depth to water at the site is 20 feet (Refs. 9, p.16; 10). Wellhead protection areas have not yet been delineated within the state of North Carolina (Ref. 19).

Surface water flows off the site to the south toward Compass Creek, the Probable Point of Entry (PPE) for the surface water pathway. Compass Creek flows 3.3 miles to its confluence with the Tar River (Ref. 1). The surface water pathway continues along the Tar River for an additional 11.7 miles, where it is completed (Ref. 1). No surface water samples were collected during the 1988 SSI. Compass Creek is a recreational fishery, with redfin pickerel and sunfish being the dominant species (Ref. 16). The Tar River is a recreational fishery that may have some commercial fishing, and may include the following species: striped bass, american shad, and hickory shad which migrate up the river to the Tar River Reservoir dam (Ref. 16). The Tar River

is used heavily for irrigation in the area (Ref. 16). There are no known wetlands along the surface water pathway (Refs. 1). The annual mean flow rate of the Compass Creek is approximately 25 cubic feet per second (cfs) (Refs. 1; 20). The annual mean flow rate of the Tar River, measured 700 feet downstream from the Tar River dam, was 583 cfs (Ref. 20). The Tar River spiney mussel *(Elliptio Steinstansana)* is a federally-designated endangered species that is found within the surface water pathway (Refs. 16; 21) The Torpedo Wire and Strip site is located outside of any 500-year floodplain (Ref. 22). The 2-year, 24-hour rainfall is 3.5 inches (Ref. 13).

Analytical results of surface and subsurface soil samples collected during the 1988 SSI indicated the presence of chromium, copper, lead, nickel, and zinc (Ref. 4). The site is partially fenced. No soil staining was observed in previous investigations (Ref. 3). There are 70 workers onsite (Ref. 2). The nearest residences are located approximately 400 feet north of the site (Ref. 1). The closest school is the North Carolina Wesleyan College, located 1 mile northeast of the site and has a population of approximately 1,500 students (Refs. 1; 4). There are no known day care facilities, terrestrial sensitive environments, commercial agriculture operations, or commercial silviculture operations within 200 feet of the site (Ref. 1; 3).

No documentation exists to indicate a release of contaminants to air. The nearest residences are located 400 feet north of the site. (Ref. 1). There are approximately 6,511 people living within 4 miles of the site, distributed as follows: 0 - 0.25 mile, 26; 0.25 - 0.5 mile, 26; 0.5 - 1 mile, 190; 1 - 2 miles, 2,198; 2 - 3 miles, 774; 3 - 4 miles, 3,346 (Refs. 10; 17; 18). The closest school is the North Carolina Wesleyan College, located 1 mile northeast of the site (Ref. 1). There are no known sensitive environments within 4 miles of the site (Refs. 1; 4). Wetlands within the 4-mile radius are distributed as follows: 0 - 0.25 mile, 0 acres; 0.25 - 0.5 mile, 0.75 acre; 0.5 - 1 mile, 1.5 acres; 1 - 2 miles, 0 acres; 2 - 3 miles, 50 acres; 3 - 4 miles, 280 acres (Refs. 1; 4). There are known commercial agriculture, commercial silviculture or recreation area within 0.5 mile of the site (Refs. 1; 2).

A preliminary HRS score for the Torpedo Wire and Strip site was calculated using the Site Inspection Worksheets and the HRS Rule of December 1990. The migration pathways evaluated included air migration, soil exposure, surface water migration, and groundwater migration. The Hazardous Waste Quantity (HWQ) score of 100 was based on a 200 feet by 225 feet surface impoundment that was located onsite.

The groundwater exposure pathway was the most significant pathway scored, with a pathway score of 1.80. The other pathways had scores of less than 1.07 due to low waste characteristics and low target values. The overall score was 1.09 which is well below the HRS scoring threshold. Due to the low pathway scores, no further action is recommended for the Torpedo Wire and Strip site.

Pathway	Site Score
Groundwater	1.80
Surface Water	0.50
Soil Exposure	1.07
Air	0.40
Overall Score	1.09

Attached are all references used in this evaluation. If you have any questions or comments, please call me at (215) 928-0700 or Victor Blix at (404) 643-2320.

Very truly yours,

BLACK & VEATCH Waste Science, Inc.

Bruce N. Harrison

Bruce N. Harrison
Site Manager

BNH/jlh

Enclosure

REFERENCES

1. U.S. Geological Survey, 7.5 minute series, Topographic Quadrangle Maps of North Carolina: Drake 1963, Hartsease 1981, Rocky Mount 1977, Whitakers 1961, Scale 1:24,000.

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3. Eric Corbin, NUS FIT 4, Field Logbook for Torpedo Wire and Strip Screening Site Inspection, Project Nº 89-162, December 1, 1988.

4. EPA, "Field Investigation Team Activities at Uncontrolled Hazardous Substances Facilities- Zone 1", Torpedo Wire and Strip Inc. Screening Site Inspection, December 1, 1988.

5. Fred Kibler, Torpedo Wire and Strip Inc., in letter to Billy Morris, North Carolina Solid and Hazardous Waste Management Branch. Subject: Sand Filter Beds on site.

6. Fred Kibler, Torpedo Wire and Strip Inc., in letter to Billy Morris, North Carolina Solid and Hazardous Waste Management Branch. Subject: Analysis of soil under old filter bed area.

7. Sherry Durren, NUS FIT 4, in memorandum to file, April 23, 1990. Subject: Features of Torpedo Wire and Strip site.

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9. M. J. Mundorff, U.S. Geologic Survey, Ground Water in the Halifax Area, North Carolina. Bulletin Number 51, Raleigh, NC. 1946

10. U.S. Environmental Protection Agency, Graphical Exposure Modeling System (GEMS) Database, based on U.S. Bureau of the Census data, 1990.

11. R. Allen Freeze and John A. Cherry, Groundwater, Prentice-Hall, Englewood Cliffs, NJ, 1979.

12. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Climatic Atlas of the United States, Washington, DC: GPO, June 1968, Reprinted 1983,

13. U.S. Department of Agriculture, Soil Conservation Service, Urban Hydrology for Small Watersheds, Technical Release 55, June 1985.

14. Sherry Durren, NUS FIT 4, in telephone memorandum with Marsha Bissett, of Rocky Mount Water Company, April 25, 1990. Subject: Water service area.

15. Sherry Durren, NUS FIT 4, in telephone memorandum with Paul Blount, Director of Water Resources for the City of Rocky Mount, May 1, 1990. Subject: Water service area.

16. Sherry Durren, NUS FIT 4, in telephone memorandum with Bill Collart, of North Carolina Wildlife Resources, May 3, 1990. Subject: Compass Creek and Tar River habitats.

17. U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census, 1990 Census of Population and Housing, Summary Population and Housing Characteristics, North Carolina, Document Nº. 1991 CPH-1-35

18. Bruce Harrison, BLACK & VEATCH Waste Science, Inc. (Black & Veatch) in memorandum to Torpedo Wire and Strip Inc. file, August 4, 1994. Subject: House Count and Private Well House Count.

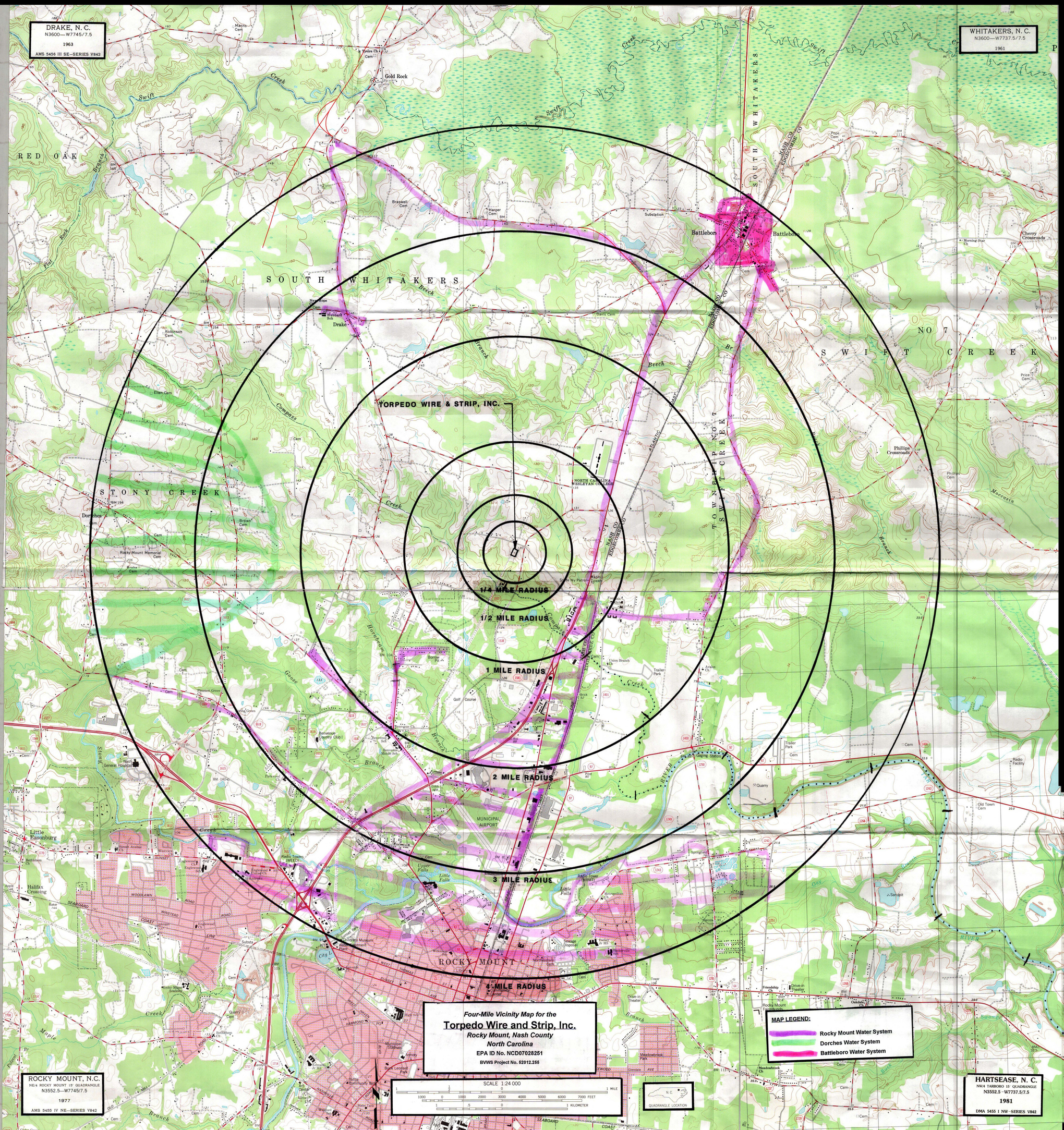
19. Corry T. Platt, Black & Veatch, in telephone memorandum with Randy Prillaman, North Carolina Department of Environmental Management (NCDEM), Groundwater Section, March 23, 1994. Subject: Wellhead Protection Areas.

20. U.S. Department of the Interior, Geological Survey, Water Resources Data, North Carolina, Water Year 1992, Water-Data Report NC-92-2.

21. North Carolina Natural Heritage Program, Element List for Nash County, June 21, 1989.

22. National Flood Insurance Program, Federal Emergency Management Agency, Flood Insurance Rate Map (FIRM) Rocky Mount, NC. Panel Nº 370092 0003 C.

REFERENCE NO. 1


DRAKE, N. C.
N3600—W7745/7.5
1963
AMS 5456 III SE—SERIES V842
WHITAKERS, N. C.
N3600—W7737.5/7.5
1961
TORPEDO WIRE & STRIP, INC.
1/4 MILE RADIUS
1/2 MILE RADIUS
1 MILE RADIUS
2 MILE RADIUS
3 MILE RADIUS
4 MILE RADIUS
RED OAK
SOUTH WHITAKERS
STONY CREEK
SWIFT CREEK
TOWNSHIP NO 7
Battleboro
Drake
Gold Rock
Dorches
Cherry Crossroads
Phillips Crossroads
NORTH CAROLINA WESLEYAN COLLEGE
MUNICIPAL AIRPORT
ROCKY MOUNT
Little Easonburg
Halifax Crossing
Dunbar
Four-Mile Vicinity Map for the
Torpedo Wire and Strip, Inc.
Rocky Mount, Nash County
North Carolina
EPA ID No. NCD07028251
BVWS Project No. 52012.255
MAP LEGEND:
Rocky Mount Water System
Dorches Water System
Battleboro Water System
SCALE 1:24 000
1 MILE
7000 FEET
1 KILOMETER
QUADRANGLE LOCATION
ROCKY MOUNT, N.C.
NE/4 ROCKY MOUNT 15' QUADRANGLE
N3552.5—W7745/7.5
1977
AMS 5455 IV NE—SERIES V842
HARTSEASE, N. C.
NW/4 TARBORO 15' QUADRANGLE
N3552.5 - W7737.5/7.5
1981
DMA 5455 I NW—SERIES V842

REFERENCE NO. 2

NUS CORPORATION AND SUBSIDI/ *CON NOTE*

CONTROL NO. NCX31S	DATE: 4/17/90	TIME: 1100

DISTRIBUTION: F4-9002-62

BETWEEN: Joan Howard, Sales person	OF: Torpedo Wire & Strip, Pittsfield, PA	PHONE: (814) 563-7505

AND: Sherry Durren, NUS FIT 4

Sherry Durren 4/19/90

DISCUSSION:

Ms. Howard informed me that the North Carolina branch of Torpedo employs 70 people. Only wire, no strips are produced there. The two main activities are solder plating & drawing of wire. Plating of tin: solder is done as 60:40 and 30:70 ratios. Starting wire is copperclad steel, steel and copper.

REFERENCE NO. 3

"Rite in the Rain"®

ALL-WEATHER

LEVEL

Notebook No. 311

FY-2071

Torpedo Wire and Strip Inc.
FY-9002-62
Rocky Mount, Nash Co, North Carolina
Eric Corbin - Project Manager
EPA ID No. NCD072028251

LOGBOOK REQUIREMENTS
REVISED - NOVEMBER 28, 1988

NOTE: ALL LANGUAGE SHOULD BE FACTUAL AND OBJECTIVE

1. Record on front cover of the Logbook: TDD No., Site Name, Site Location, Project Manager.
2. All entries are made using ink. Draw a single line through errors. Initial and date corrections.
3. Statement of Work Plan, Study Plan, and Safety Plan discussion and distribution to field team with team members' signatures.
4. Record weather conditions and general site information.
5. Sign and date each page. Project Manager is to review and sign off on each logbook daily.
6. Document all calibration and pre-operational checks of equipment. Provide serial numbers of equipment used onsite.
7. Provide reference to Sampling Field Sheets for detailed sampling information.
8. Describe sampling locations in detail and document all changes from project planning documents.
9. Provide a site sketch with sample locations and photo locations.
10. Maintain photo log by completing the stamped information at the end of the logbook.
11. If no site representative is on hand to accept the receipt for samples, an entry to that effect must be placed in the logbook.
12. Record I.D. numbers of COC and receipt for sample forms used. Also record numbers of destroyed documents.
13. Complete SHO information in the space provided.

All entries in this logbook will be made by myself Eric Corbin - Project Manager for Roger Engelbing; Each page will be signed and dated. Any and all corrections will be properly initialed (EAC).

Signature: Eric A. Corbin

All notes & observations made during this phase by SST Inspection will be documented in this logbook.

This logbook is an extension of work plan TDD# FG-9002-62

03/06/90 E. A. Corbin

The following NUS personnel herein listed have read and understand the following NUS/E&A document listed.

Work Plan - TDD#F4-9002-62

As our confirmation of having read and having understood the above listed document we the undersigned place our signatures.

Eric Corbi - Eric A. Corbi
Mark Adams - Mark L. Adams

03/06/90 E. A. Corbi

0800 - Awake for breakfast. Weather forecast calls for clear skies with highs in the upper 50's to low 60's.

0900 - Left for Torpedo Wire and Strip Inc. in Rocky Mount, Nash Co., N.C.

1020 - Arrive at Torpedo Wire and Strip Inc. on Industrial Drive. The facility is currently active and is situated in an industrial park. Facilities that lie adjacent to Torpedo Wire and Strip include Brown Ferris Industries, a trucking center and several other business and industries. Downwind of the facility is the Cross Creek Mobile Home Park.

03/06/90 E. A. Corbi

Phone # 919-1675. The facility is only partially fenced with access available via the facility entrance. Two entrances to the facility and two separate parking areas exist - one located east of the facility and one on the west side of the facility. The facility is comprised of one large main building. Drainage from the area surrounding the facility would be directed south into Cypress Creek. The nearest homes to the facility are trailers located in a trailer park situated due west of the facility. No day-care centers were identified within a 1-mile radius of the facility, however North Carolina Wesleyan College is

03/06/90 E.A. Cole

located approximately 0.9 tenths of a mile northeast of the facility. No waste disposal areas were identified visually onsite, however drums were seen outside on the west side of the facility and smaller plastic drums and small plastic containers were seen on the eastern side of the facility. Pictures were taken of facility.

1115 - Have found who is believed to be the nearest well. It is located @ 1000 feet NW of facility at the home of John Crusenberry, 212 Cranberry Rd. Ottawa Village, Rocky Mt.

1130 - Arrive at the Battleboro Water Department and talk with Water Dept. Manager Earl Conway. We [redacted] to Mr. Conway [redacted] were conducting a ground

03/06/90 E.A. Cole

water studies in the area and that we needed info. on their water system. Mr. Conway stated that their system obtains all their water through a purchase agreement with Rocky Mount Water Dept. They have a main 12" line located on Hwy. 301 that goes as far north as Whitakers, N.C. He also stated that their system only serves the area within the corporate limits of Battleboro and a few homes located immediately outside the town boundary. He stated that their system provided service to @ 400 customers

1200- Break for lunch

1330- Arrive at the Rocky Mt. Engineering office and met w/ Francis Bellamy - draftsman. Mrs. Bellamy was informed by us that we were trying to obtain general info. pertaining to the Rocky Mt. Water System. She told us that she needed to contact Mark Bassett of the Engineering Section but she was not in today. Mrs. Bellamy however, provided us with a copy of the Rocky Mount Water System Map. She stated that she believed that the system obtained their water from a site located due west of Battleboro, Enfield, N.C. located west of Rocky Mt. She stated that we would have to go to the billing office to obtain the [illegible] bills issued. Most [illegible] arrived

03/06/90 E.A. Carter

03/06/90 E.A. Carter

?

8

of the West Rocky Mt.
Billing Dept. and spoke
w/a billing clerk. She stated
that the system issues
@ 8,000 water bills/mo.

03/06/90 E.L. Cole

Site Layout Map

N

John Crossingburg Residence - nearest identified well to the facility
1212 Crossingburg Rd.
Brown Ferris Industries

Instrument Drive (Crossingburg Rd.)

water line noticed on the side of the street - allowed to give Portland Cement in the industrial Park.

Dirt zone free

Truck Center

Gravel Entrance

Parking Area

Plastic Dumpsters Plastic Containers

Torpedo Wire & Strip, Inc.

Gravel Entrance

Parking Area

Gravel

Park Mobile Home located downwest of facility

Thru 1538

03/06/90 E.L. Cole

9

40

Case No. ____

Low Concentration yes/no

Organics

No.	Airbill No.	Lab	Media Soil Water

Inorganics

No.	Airbill No.	Lab	Media Soil Water

IDD # F4-9002-62
Date 03/06/90 By Whom: E. Corbi
Time @ 1020 # keved to map: 1
Location On Instrumental Drive Cuyahoga Road looking south
Picture of: Rear side drive for Torpedo Wire & Strip

IDD # F4-9002-62
Date 03/06/90 By Whom: E. Corbi
Time @ 1020 # keved to map: 2
Location On gravel entrance road on eastside of facility
Picture of: Front of Torpedo Wire & Strip

IDD # F4-9002-62
Date 03/06/90 By Whom: E. Corbi
Time @ 1020 # keved to map: 3
Location On gravel entrance road on east side of facility
Picture of: Front of Torpedo Wire & Strip

41

42

IDD # F4-9002-62

Date: 03/06/90 By Whom: E Cole

Time @ 1030 # keyed to map: (4)

Location: On gravel entrance road on east side of facility

Picture of: Front of Torpedo Wire & Strip

IDD #

Date By Whom:

Time # keyed to map:

Location:

Picture of:

IDD #

Date By Whom:

Time # keyed to map:

Location:

Picture of:

IDD #

Date By Whom:

Time # keyed to map:

Location:

Picture of:

IDD #

Date By Whom:

Time # keyed to map:

Location:

Picture of:

IDD #

Date By Whom:

Time # keyed to map:

Location:

Picture of:

43

REFERENCE NO. 4

NUS CORPORATION
A Halliburton Company

FIELD INVESTIGATION TEAM ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCES FACILITIES — ZONE I

NUS CORPORATION
SUPERFUND DIVISION

A 1984 RCRA inspection of the facility found Torpedo to be in full compliance with generator standards (Ref. 10). Currently the facility is listed as a generator (Ref. 11). The Part A Application was withdrawn and interim status was terminated in March 1982 (Ref. 12). File material contains two requests for extensions of holding time for accumulated wastes (Refs. 13, 14). In 1989, Torpedo was found to be in non-compliance for not providing treatment standards documentation to hazardous waste shippers (Ref. 15). A 1985 Preliminary Assessment noted that groundwater testing had not been performed The facility was recommended for low-priority follow-up work (Ref. 4). ESD performed a Screening Site Inspection in 1988 (Ref. 16).

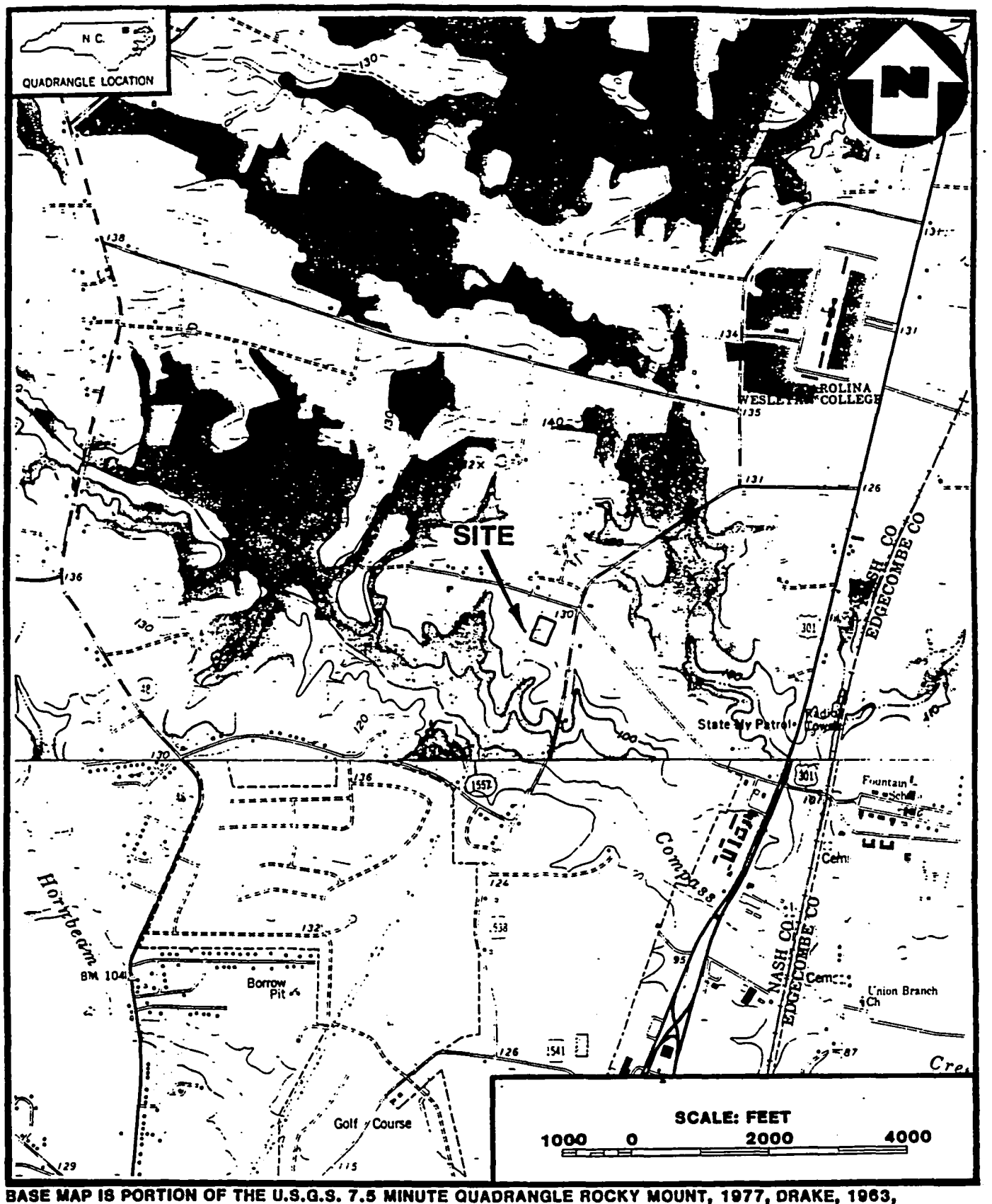
2.2 SITE DESCRIPTION

2.2.1 Site Features

Torpedo Wire and Strip is located on Instrument Drive off Highway 301, 4 miles north of Rocky Mount, North Carolina (Figure 1). There are two interconnected buildings at the facility, a wire shop and a plating shop (Figure 2). The facility is only partially fenced. Access is available from two driveways, one on the east side and one on the west side of the building. There are also two parking lots. During an offsite reconnaissance, no waste disposal areas were identified. Drums were observed on the west side of the facility. Smaller plastic drums and containers were observed on the east side (Ref. 17). The former filter bed area can no longer be seen as indicated in Figure 2. The entire area is grass covered (Ref. 18). The treatment area was filled and graded in 1983 (Ref. 19).

2.2.2 Waste Characteristics

Torpedo used a sand bed filter system for eight years to treat wastewater and sludge generated from electroplating. Waste quantity was estimated at 90 tons per year (Ref. 1). During this time, cleaning of the filter bed required periodic shipment of sand and sludge to SCA/GSX in Pinewood, South Carolina. Since 1982, the waste has been treated by filtration through sludge bags. Two filter bag units containing 24 and 36 filter bags, respectively, are suspended on steel racks over a drain tank (Ref. 19). All waste treatment occurs indoors. According to Torpedo, the company produces about twenty 55-gallon drums per week of wastewater sludge. Much of their waste is directed to SCA in Pinewood, South Carolina for disposal (Refs. 4, 10). Total waste was 40,272 pounds for 1988 and 71,092 pounds for 1989 (Refs. 20, 21). Two soil samples from the filter bed were analyzed in 1983. Sample No. 1 contained 0.6 mg/l of leachable nickel and <0.5 mg/l of leachable lead. Sample No. 2 contained <0.2 mg/l of leachable nickel and <0.5 mg/l of leachable lead (Ref. 22).

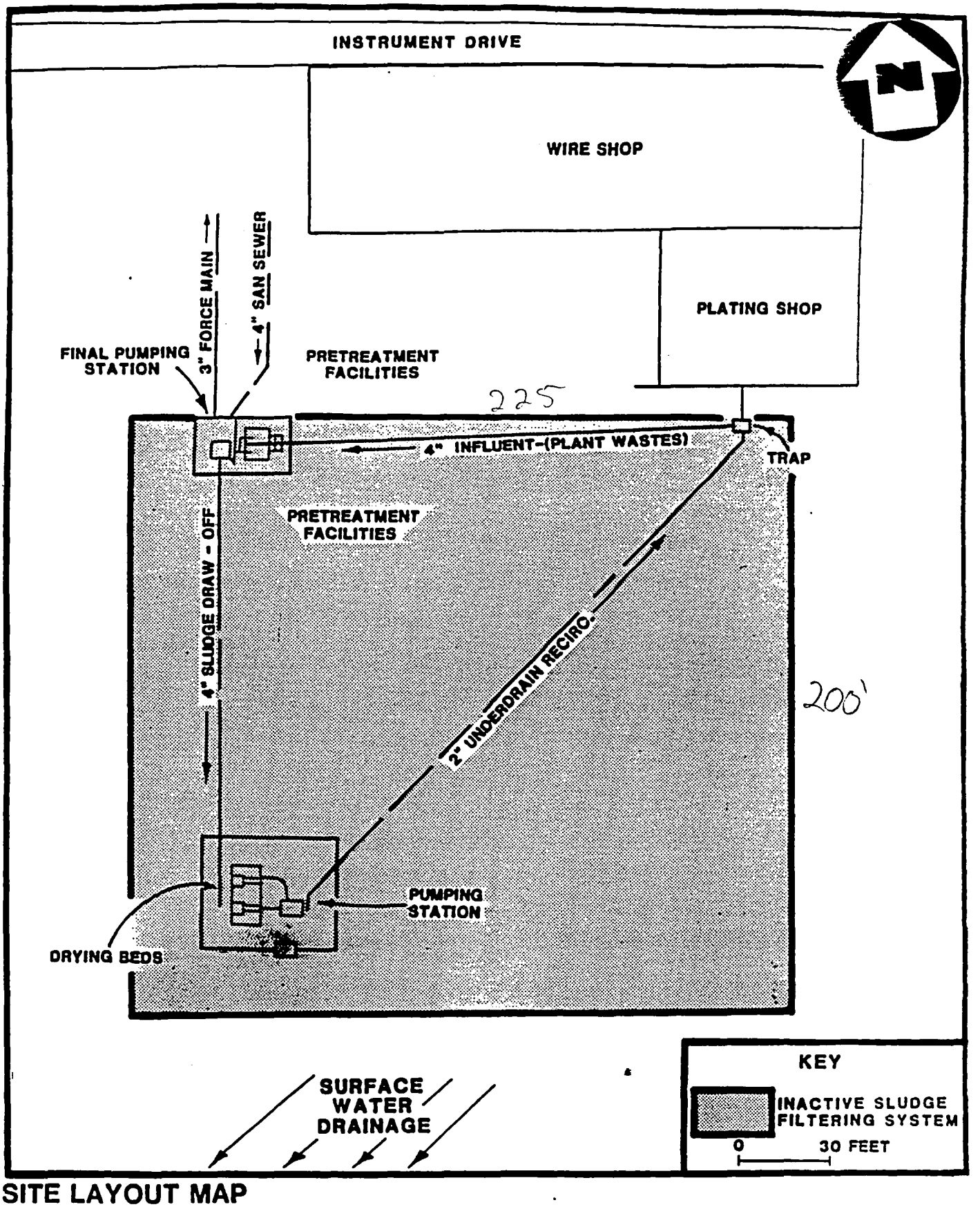


BASE MAP IS PORTION OF THE U.S.G.S. 7.5 MINUTE QUADRANGLE ROCKY MOUNT, 1977, DRAKE, 1963, NORTH CAROLINA

SITE LOCATION MAP
TORPEDO WIRE AND STRIP, INC.
ROCKY MOUNT, NASH COUNTY, NORTH CAROLINA

FIGURE 1

NUS CORPORATION



SITE LAYOUT MAP
TORPEDO WIRE AND STRIP, INC.
ROCKY MOUNT, NASH COUNTY, NORTH CAROLINA

FIGURE 2

NUS CORPORATION

3.0 REGIONAL POPULATIONS AND ENVIRONMENTS

3.1 POPULATION AND LAND USE

3.1.1 Demography

Torpedo Wire and Strip is located in an industrial park in a rural setting in Nash County, North Carolina. The 4-mile radius surrounding the facility includes portions of both Rocky Mount (population: 41,283) and Battleboro (population: 632), with a total population of 20,911 people (Refs. 23, 24). The population distribution is 491 people between 0 and 1 mile; 3,700 people between 1 and 2 miles; 1,734 people between 2 and 3 miles; and 14,986 people between 3 and 4 miles. Population figures for the four radii were obtained from the U.S. Census Bureau data base. North Carolina Wesleyan College with a student population of 1,500 lies 0.9 mile to the northeast (Refs. 24, 25).

3.1.2 Land Use

Torpedo, which is located in an industrial park, is surrounded by several businesses including a trucking center. Cross Creek Mobile Home Park, which houses 154 people, lies adjacent to the west side of the facility. No day-care centers were identified within 1 mile of Torpedo. Additionally, there are a trailer park and one school in the 1- to 2-mile radius, four schools in the 2- to 3-mile radius, and one school and one trailer park in the 3- to 4-mile radius. There are no identified parks or boat ramps within 4 miles (Refs. 17, 25). One federally endangered species, the red-cockaded woodpecker (*Picoides borealis*), makes its home in the woods of Nash County. The pinebarrens sandreed (*Calamovilfa brevipilis*), a state-designated threatened species, occurs in Nash County (Ref. 26).

3.2 SURFACE WATER

3.2.1 Climatology

Nash County is located in northeastern North Carolina. The climate is temperate with a net annual precipitation of 7.5 inches (Ref. 27). One-year, 24-hour rainfall is approximately 3.5 inches (Ref. 28). Total annual precipitation is 47.5 inches (Ref. 27).

3.2.2 Overland Drainage

Surface water drains across the Torpedo property toward Compass Creek, which lies approximately 2000 feet to the southwest at a slope of 2.0 to 2.5 percent. There is evidence of surface washes and intermittent streams at the southwest corner of the property (Ref. 18). Compass Creek flows southeast for 4.2 miles before entering the Tar River, where the extended surface water pathway is completed (Ref. 25). The facility does not lie in a floodplain (Ref. 29).

3.2.3 Potentially Affected Water Bodies

There is recreational fishing off the banks of Compass Creek. The creek is also a minor source of irrigation water (Ref. 30). Intakes for the Rocky Mount Water Department are located on the Tar River at Sunset Avenue in Rocky Mount and at the Tar River Reservoir, 3 and 5 miles, respectively, upgradient from the Compass Creek point of entry into the Tar River (Refs. 25, 31). Rocky Mount Water Company serves all of Rocky Mount, as well as portions of Nash County. Battleboro and Dortches both purchase water from Rocky Mount. Rocky Mount has recently added water lines extending north and east of Torpedo Wire and Strip. Use of these lines is optional at the present time (Refs. 31, 32, Appendix B). There are no surface water intakes along the extended surface water pathway. Land along the pathway is rural. The main crops are tobacco, sweet potatoes, cucumbers and peanuts. The Tar River is used extensively for irrigation and recreational fishing. This section of the Tar River is an important habitat for the Tar River spiny mussel (*Elliptio steinstansana*), an endangered species. The Atlantic pigtoe (*Fusconaia masoni*), a state-designated threatened species, occurs in Nash County (Refs. 26, 30).

3.3 GROUNDWATER

3.3.1 Hydrogeology

Torpedo Wire and Strip is located in the Coastal Plain Physiographic Province of central North Carolina. This province is characterized by thick, sloping layers of sedimentary rock over crystalline bedrock (Ref. 33, p. 270). The eastern portion of Nash County is characterized by flat to gently rolling topography with steeper slopes along the drainage ways (Ref. 34, p. 3). Topographical relief near the site ranges from 100 feet to 140 feet above mean sea level (Ref. 25).

The aquifers in the area are the Sunderland Formation and the Yorktown Formation. Water is also found in the upper, weathered portion of the underlying granite. All of these aquifers are

unconfined (Ref. 34, pp. 4, 5). The Sunderland Formation is a part of the Pleistocene terrace deposits that form a series of parallel, northeast-trending belts across the Coastal Plain. It consists of cross-bedded sand with clay and gravel and ranges in thickness from 0 to 40 feet (Ref. 34, pp. 5, 7). The depth to water at the site is about 20 feet (Refs. 25; 34, p. 52). The hydraulic conductivity of this unit is 1×10^{-3} cm/sec (Ref. 35, p. 29). The Yorktown Formation consists of blue, fossiliferous marl, with clay and a small amount of sand. It ranges in thickness from 40 to 70 feet. Underlying the Yorktown Formation is granite. The granite ranges from pink, orthoclase granite to quartz monzonite and diorite (Ref. 34, pp. 5, 6).

Water is found in the pore spaces of the unconsolidated sediments of the Sunderland and Yorktown Formations and in the joints and fractures of the granite (Ref. 34, p. 48). The direction of groundwater flow is to the southeast (Ref. 34, p. 3). Wells drilled in the Sunderland Formation yield small to medium supplies. More water is obtained from wells that penetrate areas of gravel (Ref. 34, p. 5). Wells drilled in the Yorktown Formation yield small supplies ranging from 0.5 to 12 gallons per minute (gpm) (Ref. 34, pp. 5, 52). This aquifer is rarely used because of the poor quality of the water (Ref. 34, p. 48). Most of the wells in the area are drilled in the granite. Yields range from 0 to 21 gpm, depending on the degree of weathering and the amount of joints and fractures (Ref. 34, pp. 48, 52). There are several springs in the area. They are formed by the intersection of a confining layer, such as clay or massive granite, with the land surface. Yields of these springs are variable (Ref. 34, p. 48).

3.3.2 Aquifer Use

Private wells supply potable water to the residents within a 4-mile radius who are not served by the Rocky Mount Water Company. These wells have an average depth of 150 feet, but range from shallower than 150 feet down to 300 feet (Ref. 36). Households using private wells number approximately 25 in the 0-1 mile radius; 75 in the 1-2 mile radius; 215 in the 2-3 mile radius; and 130 in the 3-4 mile radius. Numbers of private well users are based on house counts obtained from topographic maps dated 1961, 1963, 1977, and 1981 (Appendix B). The nearest private well is located 1,000 feet northwest of the facility (Ref. 17).

3.4 SUMMARY OF POTENTIALLY AFFECTED POPULATIONS AND ENVIRONMENTS

There are two pathways of concern at this facility: groundwater and surface water pathways. The air pathway is not of concern at this time except as a possible source of metal-contaminated particulates. The red-cockaded woodpecker (*Picoides borealis*), a federally endangered species, inhabits Nash

County. Because of the insufficient file material on the nature of the soil, it is not clear whether fugitive dusts carrying metallic contaminants could be a concern.

Surface water washes from the property and drains into Compass Creek. Compass Creek flows into the Tar River. Both the creek and the river are used for fishing and irrigation. One endangered species, the Tar River spiny mussel (Elliptio steinstansana), inhabits the surface water pathway. Groundwater supplies drinking water for up to 445 residences in a 4-mile radius. Because the three aquifers beneath the Torpedo facility are unconfined, groundwater users face a potential threat of drinking contaminated water.

4.0 FIELD INVESTIGATION

4.1 SAMPLE COLLECTION

4.1.1 Sample Collection Methodology

All sample collection, sample preservation, and chain-of-custody procedures used during this investigation were in accordance with standard operating procedures as specified in Sections 3 and 4 of the Engineering Support Branch Standard Operating Procedures and Quality Assurance Manual; United States Environmental Protection Agency, Region IV, Environmental Services Division (ESD), April 1, 1986.

4.1.2 Duplicate Samples

Duplicates of groundwater samples were accepted by Loren Ota of Torpedo Wire and Strip, Inc. Receipt for sample forms are on file at FIT 4.

4.1.3 Description of Samples and Sample Locations

A total of 11 environmental samples were collected for this investigation. A subsurface soil, surface soil, and groundwater sample were collected from the center of the property. Two surface soil, three subsurface soil, and two groundwater samples were collected from the southwest and southeast corners of the former filter bed area. One sediment sample was collected from the southwest corner in a surface wash area. All sample locations are shown in Figure 3. Sample codes, descriptions, and field measurements are presented in Table 1.

4.1.4 Field Measurements

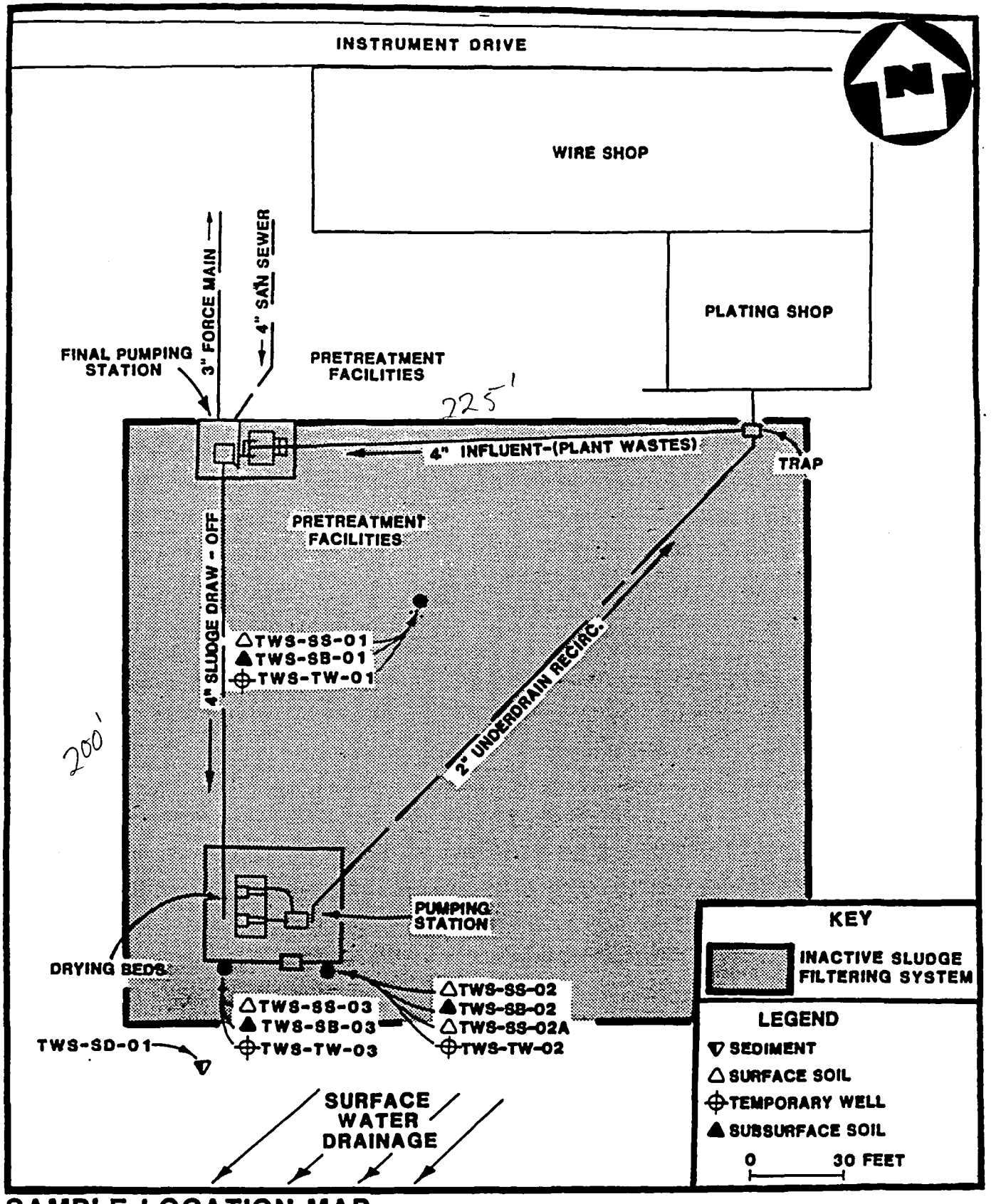
Field measurements were recorded for the groundwater samples (Table 1). Parameters measured included temperature, pH, and conductivity of the sample at time of collection. No field measurements were performed on the soil samples during this investigation.

TABLE 1

SAMPLE CODES, DESCRIPTIONS AND FIELD MEASUREMENTS
TORPEDO WIRE AND STRIP, INC.
ROCKY MOUNT, NASH COUNTY, NORTH CAROLINA

Sample Code	Location/Description	Date (1988)	Time	Depth (ft bls)	pH	Temp (°C)	Conductivity (umhos/cm²)
TWS-SS-01	A designated control surface soil sample collected from the center of the property, upgradient of the filter bed.	12/1	0940	NA	NA	NA	NA
TWS-SS-02	Surface soil sample collected from the southeast corner of the former filter bed.	12/1	1350	NA	NA	NA	NA
TWS-SS-03	Surface soil sample collected from the southwest corner of the former filter bed.	12/1	1215	NA	NA	NA	NA
TWS-SB-01	A designated control subsurface sample collected from the center of the property, upgradient of the filter bed.	12/1	1040	12.5	NA	NA	NA
TWS-SB-02	Subsurface soil sample collected from the southeast corner of the former filter bed.	12/1	1420	10	NA	NA	NA
TWS-SS-02A	Subsurface soil sample collected from the southeast corner of the former filter bed. This sample was designated as a surface soil sample by ESD.	12/1	1355	2	NA	NA	NA
TWS-SB-03	Subsurface soil sample collected from the southwest corner of the former filter bed.	12/1	1420	10	NA	NA	NA
TWS-TW-01	A designated control groundwater sample collected from the center of the property, upgradient of the filter bed.	12/1	1130	13.75	4.3	18.5	75
TWS-TW-02	Groundwater sample collected from the southeast corner of the former filter bed.	12/1	1455	11.85	4.7	16	100
TWS-TW-03	Groundwater sample collected from the southwest corner of the former filter bed.	12/1	1500	12.35	4.6	16	140
TWS-SD-01	Sediment sample collected from the southwest corner in a surface wash area.	12/1	1130	NA	NA	NA	NA

NA - Not Applicable
TWS - Torpedo Wire and Strip
SB - Subsurface Soil
SS - Surface Soil
SD - Sediment
TW - Temporary Well



SAMPLE LOCATION MAP
TORPEDO WIRE AND STRIP, INC.
ROCKY MOUNT, NASH COUNTY, NORTH CAROLINA

FIGURE 3

NUS CORPORATION

4.2 SAMPLE ANALYSIS

4.2.1 Analytical Support and Methodology

All samples collected were analyzed under the Contract Laboratory Program (CLP) and analyzed for all inorganic parameters listed in the Target Compound List (TCL). Analysis of soil and water was performed by the Analytical Support Branch, Environmental Protection Agency, Environmental Services Division, Athens, Georgia. No organic analysis of samples was performed.

All laboratory analyses and laboratory quality assurance procedures used during this investigation were in accordance with standard procedures and protocols as specified in the Analytical Support Branch Operations and Quality Assurance Manual, United States Environmental Protection Agency, Region IV, Environmental Services Division, revised June 1, 1985; or as specified by the existing United States Environmental Protection Agency standard procedures and protocols for the contract analytical laboratory program.

4.2.2 Analytical Data Quality

All analytical data were subjected to a quality assurance review as described in the EPA Environmental Services Division laboratory data evaluation guidelines. Some of the data were found to be invalid according to QA/QC procedures. Invalid data were not used in this report, since resampling and analysis would be necessary to confirm the results of all invalid data. Flanders Filters, Inc., in Washington, North Carolina was sampled on November 30, 1988. At the end of the work day, sampling equipment was decontaminated in preparation for sampling at Torpedo Wire and Strip. A rinsate blank sample was obtained. This blank contained chromium (18 ug/l), nickel (24 ug/l), zinc (150 ug/l), aluminum (260 ug/l), calcium (1.5 ug/l), magnesium (0.19 ug/l), and iron (0.19 ug/l). Field cleaning consisted of a soapy water wash, tap water rinse, and deionized water rinse. The equipment was not completely dry when wrapped with aluminum foil. Sand points and screens were cleaned on site at Torpedo Wire and Strip with the same procedure and used as needed (Ref. 21). The complete analytical data sheets are provided in Appendix C.

4.2.3 Presentation of Analytical Results

This section presents a discussion of the analytical results from the environmental samples collected during the investigation at Torpedo Wire and Strip. Results of groundwater, sediment, surface soil, and subsurface soil samples are presented in Tables 2 and 3. Interpretation of data follows.

Table 2 presents inorganic analytical results for surface soil, subsurface soil, and sediment samples. Surface sample TWS-SS-01, and subsurface sample TWS-SB-01 were designated by ESD as control samples. Without a clean, offsite background sample for comparison, it is difficult to determine the value of these samples as adequate control samples. All comparisons are tentative based on available information. The two subsurface soil samples (TWS-SB-02 and TWS-SB-03) and one sediment sample (TWS-SD-01) contained no significant metals (i.e., at least three times) above quantities detected in the control samples. Surface soil sample TWS-SS-02, collected from the southeast corner of the filter bed, contained copper (4.9 times control), lead (50 times control), nickel (56 times control), and tin (144 times control). Solder used at Torpedo Wire and Strip is an alloy of tin and lead. The lead to tin ratios most commonly used are 60:40 and 70:30. Elevated levels of lead and tin as contaminants are representative of the plating process at this facility (Refs. 2, 38). A sample collected 2 feet below TWS-SS-02, and designated as TWS-SS-02A, contained no metals above background. Sample TWS-SS-03 collected from the southwest corner of the filter bed contained a significant amount of nickel.

Table 3 presents inorganic analytical results for groundwater samples. Due to unavailability of an adequate control sample, there appear to be no significant contaminants in TWS-TW-02 and TWS-TW-03 compared to TWS-TW-01. Sample TWS-TW-02 contains smaller quantities of most metals than TWS-TW-01. Without a "clean" background sample, it is not possible to attribute contaminants to processes at the Torpedo facility. Only one element, chromium, exceeds the groundwater standard as determined by the State of North Carolina by 2 ug/l (Ref. 37).

TABLE 2

SUMMARY OF INORGANIC ANALYTICAL RESULTS
SURFACE SOIL, SEDIMENT, AND SUBSURFACE SOIL SAMPLES
TORPEDO WIRE AND STRIP, INC.
ROCKY MOUNT, NASH COUNTY, NORTH CAROLINA

	Control	Filter Bed			Control	Filter Bed		Drainage
PARAMETERS (mg/kg)	TWS-SS-01	SE Corner TWS-SS-02	SE Corner TWS-SS-02A	SW Corner TWS-SS-03	TWS-SB-01	SE Corner TWS-SB-02	SW Corner TWS-SB-03	TWS-SD-01
ALUMINUM	14,000	13,000	9200	14,000	31 000	29,000	28,000	3100
ARSENIC	-	-	-	-	15	-	-	-
BARIUM	14	16	17	16	48	36	39	7 9
CALCIUM	300	340	95	160		-	-	110
CHROMIUM	14	15	9 0	12	41	50	44	27
COPPER	15	73	2 8	8 7	8 4	-	-	3 4
IRON	9500	8600	5900	8300	24,000	60,000	36,000	2000
LEAD	8 7	440	11	13	20	-	16	8 5
MAGNESIUM	320	350	260	340	1300	740	850	110
MANGANESE	27	38	28	32	23	21	17	23
MERCURY	-	-			-	0 08	-	-
NICKEL	8 7	490	8 7	54	-	-	-	22
POTASSIUM	-	-	-	-	2800	1700	2000	-
TIN	4 8	690	10	4.2	-	-	-	2 9
VANADIUM	24	21	15	22	72	72	82	5 2
ZINC	14	17	5 3	25	23	10	15	10
STRONTIUM	2 5	2.2	1 7	2 2	24	15	16	1 0
TITANIUM	180	160	200	260	180	140	120	160
YTTRIUM		2 7	3 4	3 2	23	9 0	13	1 4

- Material analyzed for but not detected above minimum quantitation limit

TABLE 3

SUMMARY OF INORGANIC ANALYTICAL RESULTS
TEMPORARY WELL SAMPLES
TORPEDO WIRE AND STRIP, INC.
ROCKY MOUNT, NASH COUNTY, NORTH CAROLINA

PARAMETERS (ug/l)	Control	Filter Bed	
	TWS-TW-01	SE Corner TWS-TW-02	SW Corner TWS-TW-03
ALUMINUM	30,000	13,000	32,000
ARSENIC	20	-	-
BARIUM	100	63	100
CALCIUM	1.0	1.3	1.5
CHROMIUM	41	23	52
COPPER	26	-	24
IRON	41	18	32
MAGNESIUM	1.8	1.2	1.9
MANGANESE	37	14	35
NICKEL	23	28	61
POTASSIUM	3.1	-	3.6
SODIUM	7.3	10	18
VANADIUM	58	22	62
ZINC	84	34	86
STRONTIUM	34	19	27
TITANIUM	300	140	330
YTTRIUM	12	-	11

- Material analyzed for but not detected above minimum quantitation limit

5.0 SUMMARY

Torpedo Wire and Strip has been in the business of fabricating electroplated wires since 1974. For approximately 9 years, an outdoor sand filter bed was used for disposal of metallic sludges. When this practice stopped in 1983, all processing including waste treatment was moved indoors. The site of the old filter bed was considered to be a possible environmental threat and a site inspection was initiated.

The surface water pathway and groundwater pathway are potentially at risk due to wastes deposited at Torpedo. The surface water pathway comprised of Compass Creek and the Tar River are used for fishing and irrigation. The aquifer of concern provides drinking water for as many as 445 homes. Metallic contaminants found in surface soil samples are characteristic of the electroplating wastes found near the old filter bed area. Due to the lack of an adequate background or control sample, limited sampling and evidence of a contaminated rinsate sample, the results of this inspection are inconclusive. Based on this information, FIT 4 recommends that Torpedo Wire and Strip be considered for reevaluation at a later date. Sampling of a nearby private well is highly recommended.

REFERENCES

1. EPA Hazardous Waste Permit Application (EPA Form 3510-1) for Torpedo Wire and Strip, Inc., Rocky Mount, North Carolina. Filed by James Lybarger, Plant Manager, November 18, 1980.

2. Joan Howard, Torpedo Wire and Strip, Pittsfield, Pennsylvania, telephone conversation with Sherry Durren, NUS Corporation, April 17, 1990. Subject: Rocky Mount facility.

3. Environmental Services Division, USEPA, Field Logbook for Torpedo Wire and Strip, Inc., ESD Project #89-162. Documentation of Screening Site Inspection, December 1, 1988.

4. Potential Hazardous Waste Site Preliminary Assessment (EPA Form 2070-12) and attachments for Torpedo Wire and Strip, Inc. Filed by D. Mark Durway, Environmental Health Section, North Carolina Department of Human Resources, December 6, 1985.

5. EPA Notification of Hazardous Waste Activity (EPA Form 8700-12) for Torpedo Wire and Strip, Inc., Rocky Mount, North Carolina. Filed by Loren Ota, Vice President, July 21, 1980.

6. Loren D. Ota, Vice President of Manufacturing, Torpedo Wire and Strip, Pittsfield, Pennsylvania, letter to Gary Babb, Geologist, North Carolina Division of Health Services, November 10, 1981. Subject: Use of sand filter at Torpedo Wire and Strip.

7. O.W. Strickland, Head, Solid and Hazardous Waste Management Branch, Environmental Health Section, North Carolina Division of Health Services, Raleigh, North Carolina, letter to Jim Lybarger, Torpedo Wire and Strip, March 3, 1982. Subject: Change in RCRA status.

8. Loren Ota, Vice President of Manufacturing, Torpedo Wire and Strip, Rocky Mount, North Carolina, letter to Gary Babb, North Carolina Division of Health Services, April 8, 1983. Subject: Removal of sand filter bed from Torpedo Wire and Strip.

9. Gary Babb, Geologist, North Carolina Division of Health Services, Raleigh, North Carolina, letter to Loren Ota, Vice President of Manufacturing, Torpedo Wire and Strip, Pittsfield, Pennsylvania, April 20, 1983. Subject: Approval of closure plan for sand filter bed.

10. Billy W. Morris, Eastern Regional Office, Solid and Hazardous Waste Management Branch, memorandum to O.W. Strickland, Head, Solid and Hazardous Waste Management Branch, March 30, 1984. Subject: RCRA annual inspection.

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12. Jim Edwards, Hazardous Waste Section, Division of Solid Waste Management, Raleigh, North Carolina, telephone conversation with Sherry Durren, NUS Corporation, June 13, 1990. Subject: RCRA status of Torpedo Wire and Strip.

13. Fred Kibler, Manufacturing Engineer, Torpedo Wire and Strip, Rocky Mount, North Carolina, letter to Jerry Rhodes, North Carolina Division of Health Services, December 7, 1987. Subject: Compliance with shipment of sludge.

14. Jerry Rhodes, Head, Hazardous Waste Management Branch, North Carolina Department of Human Resources, Raleigh, North Carolina, letter to Fred Kibler, Manufacturing Engineer, Torpedo Wire and Strip, May 6, 1988. Subject: Extension of accumulation time.

15. Jerome Rhodes, Head, Hazardous Waste Management Branch, North Carolina Department of Human Resources, Raleigh, North Carolina, letter to Fred Kibler, Manufacturing Engineer, Torpedo Wire and Strip, July 6, 1989. Subject: Notice of violation.

16. Environmental Services Division, USEPA, "Screening Site Inspection Report, Torpedo Wire and Strip, Inc., Rocky Mount, North Carolina." Prepared under ESD Project No. 89-162 for the Waste Management Division of the EPA (July 7, 1989).

17. NUS Corporation Field Logbook No. F4-2071 for Torpedo Wire and Strip, Inc., TDD No. F4-9002-62. Documentation of facility reconnaissance, March 6, 1990.

18. Sherry Durren, NUS Corporation, memo to file for Torpedo Wire and Strip, Inc., April 20, 1990. Subject: Meeting with Roger Carlton, Environmental Services Division, USEPA, Athens, Georgia, concerning sampling at Torpedo.

19. Fred Kibler, Manufacturing Engineer, Torpedo Wire and Strip, Inc., Rocky Mount, North Carolina, letter to Billy Morris, North Carolina Division of Health Services, December 16, 1983. Subject: Closure history for Torpedo Wire and Strip.

20. North Carolina 1987 Hazardous Waste Generator Only (Part A) Report for Torpedo Wire and Strip. Filed by Fred Kibler, Hazardous Waste Management Branch, North Carolina Department of Human Resources, February 2, 1988.

21. North Carolina 1988 Hazardous Waste Generator That Does On-site Treatment, Storage, or Disposal - TSD Facility Report for Torpedo Wire and Strip. Filed by Fred Kibler, February 15, 1989.

22. James Thacker, Technical Director, Grainger Laboratories, Raleigh, North Carolina, memorandum to Fred Kibler, Torpedo Wire and Strip, October 12, 1983. Subject: Analyses of samples received October 10, 1983.

23. North Carolina Department of Transportation, Map of Enlarged Municipal and Suburban Areas, Nash County, North Carolina (Raleigh, North Carolina: North Carolina Department of Transportation, January 1988).

24. U.S. Environmental Protection Agency, Graphical Exposure Modeling System (GEMS) Data Base, compiled from U.S. Bureau of the Census data (1980).

25. U.S. Geological Survey, 7.5 minute series Topographic Quadrangle Maps of North Carolina: Hartsease 1981, Rocky Mount 1977, Whitakers 1961, Drake 1963, scale 1:24,000.

26. North Carolina Natural Heritage Program Element List, June 21 and June 30, 1989.

27. U.S. Department of Commerce, Climatic Atlas of the United States (Washington, D.C.: GPO, June 1968) Reprint: 1983, National Oceanic and Atmospheric Administration.

28. U.S. Department of Commerce, Rainfall Frequency Atlas of the United States: Technical Paper Number 40 (Washington, D.C.: GPO, 1961).

29. Federal Emergency Management Agency, Flood Insurance Rate Map: City of Rocky Mount, North Carolina, Edgecombe and Nash Counties, Community-Panel Number 370092 0003C, January 20, 1982.

30. Bill Collart, Fisheries Biologist, North Carolina Wildlife Resources, Rocky Mount, North Carolina, telephone conversation with Sherry Durren, NUS Corporation, May 3, 1990. Subject: Use of Compass Creek and Tar River.

31. Marsha Bissett, Engineer, Rocky Mount Water Company, Rocky Mount, North Carolina, telephone conversation with Sherry Durren, NUS Corporation, April 25, 1990. Subject: Water distribution lines of Rocky Mount Water Company.

32. Paul Blount, Director of Water Resources, City of Rocky Mount, North Carolina, telephone conversation with Sherry Durren, NUS Corporation, May 1, 1990. Subject: Dortches Water Company.

33. Linda Aller, et al., DRASTIC: A Standardized System for Evaluating Ground Water Pollution Potential Using Hydrogeologic Settings, EPA-600/2-87-035 (Ada, Oklahoma: EPA, April 1987).

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35. R. Allan Freeze and John A. Cherry, Groundwater (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1979).

36. NUS Corporation Field Logbook No. F4-1375 for Abbott Labs, TDD No. F4-8902-50. Documentation of facility reconnaissance, May 3, 1989.

37. North Carolina Administrative Code, Title 15, Department of Environment, Health and Natural Resources, Division of Environmental Management, Subchapter 2L, Classifications and Water Quality Standards Applicable to the groundwaters of North Carolina, Section .0100, .0200 and .0300. Current through December 1, 1989.

38. R. David Prengaman, "Lead Alloys," Kirk-Othmer Encyclopedia of Chemical Technology, 3rd ed., Vol. 14 (New York: John Wiley and Sons, 1983).

APPENDIX A

Site Inspection Report

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE: NC | 02 SITE NUMBER: D072028251

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
TORPEDO WIRE AND STRIP	INSTRUMENT DRIVE				
03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
ROCKY MOUNT	NC	27801	NASH		

09 COORDINATES: LATITUDE 360003.0 | LONGITUDE 774723.0

10 TYPE OF OWNERSHIP (Check one): ☒ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: 12.1.88 (MONTH DAY YEAR)

02 SITE STATUS: ☒ ACTIVE ☐ INACTIVE

03 YEARS OF OPERATION: 1974 (BEGINNING YEAR) ____ (ENDING YEAR) ____ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply): ☒ A. EPA ☒ B. EPA CONTRACTOR NUS, FIT 4 (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ____ (Name of firm) ☐ E. STATE ☐ F. STATE CONTRACTOR ____ (Name of firm) ☐ G. OTHER ____ (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO
Roger Carlton	Project Manager	ESD	404 546-3308

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Doug Mundrick	Support	ESD	404 546-3117
Don Hunter	↓	↓	( )
Fred Sloan	↓	↓	( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Fred Kibler	V.P of manufacturing	P.O. Box 42 Rocky Mount, NC 27801	919 977-3900
Loren Ota	V.P.		( ) "
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT		

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Roger Carlton	ESD, Athens	904 546-3308

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Sherry Durren	NUS	FIT 4	(404) 938-7710	4/30/90 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER FINES
- C SLUDGE
- D OTHER _____ (Specify)
- E SLURRY
- F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS 3-4/MG

CUBIC YARDS _____

NO OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ✓ TOXIC
- B CORROSIVE
- C RADIOACTIVE
- D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	90	tons/yr	Part A estimate.
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	TIN		filter bed, offsite	690	mg/kg
	NICKEL	7440-02-0	disposal	490	
	LEAD			440	
	COPPER			73	
	ELECTROPLATING	WASTE			

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

ESD Sample analysis

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☑ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~~1400~~ 1200 — 04 NARRATIVE DESCRIPTION
3.8 x ~~363~~ 315 houses in 3-mile radius

01 ☑ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION
aquatic species, compass Creek + Tar River are used for irrigation

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: NA — 04 NARRATIVE DESCRIPTION
small possibility of dusts contaminated with metals escaping from the site

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: NA — 04 NARRATIVE DESCRIPTION

01 ☑ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: 60-70 — 04 NARRATIVE DESCRIPTION
onsite employees, exposure to toxic metals

01 ☑ F. CONTAMINATION OF SOIL — 02 ☑ OBSERVED (DATE: ~~12/1/88~~) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: Unknown (Acres) — 04 NARRATIVE DESCRIPTION
Onsite soil may be contaminated with metals.

01 ☑ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ~~1400~~ 1200 — 04 NARRATIVE DESCRIPTION
3.8 people x 315 houses/3-mile radius

01 ☑ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☑ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: 60-70 — 04 NARRATIVE DESCRIPTION
exposure to toxic metals

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: NA — 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include names of species)

None observed

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Potential through irrigation using surface waters, also species inhabiting surface waters

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

NA

none observed

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

NA

none observed

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

None observed

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: 1400 groundwater users

IV. COMMENTS

There is no evidence of current processing causing contamination.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

File material, onsite observation by ESD & FIT 4

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC				
☐ C. AIR				
☐ D. RCRA				
☑ E. RCRA INTERIM STATUS	terminated	March, 1982		Generator
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE, DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☑ E. TANK, BELOW GROUND *	40,000+	lbs.
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)
- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☑ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER
- ☑ A. BUILDINGS ON SITE

06 AREA OF SITE
Unknown Acres.

07 COMMENTS
* when the filter bed was closed the first of two loads of sludge ~~in~~ removed weighed 40,000 lbs.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☑ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.
polypropylene liner in filter bed. File information does not state that this liner was designed to contain electroplating wastes so adequacy is unknown.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☑ NO
02 COMMENTS

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

File material

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☑	B. ☐
NON-COMMUNITY	C. ☐	D. ☑

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

upgradient

A. 7 (mi)

B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☑ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☐ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER ~~363~~ 315 households

03 DISTANCE TO NEAREST DRINKING WATER WELL 1000 ft. ~~(mi)~~

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
20 (ft)	NE	35-50' (ft)	0-21 gpm ~~(gpd)~~	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

70% of wells in area are 35-50' deep
(Tom Arrington, Raleigh Regional Office, Groundwater Division) (919) 733-2314

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☐ NO	COMMENTS: Unknown	☐ YES ☐ NO	COMMENTS: Unknown

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☑ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☑ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☐ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
Compass Creek	☐	2000 ft. (mi)
Tar River	☐	4.2 (mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 491 NO. OF PERSONS	B. 3700 NO. OF PERSONS	C. 1,734 NO. OF PERSONS

02 DISTANCE TO NEAREST POPULATION: 1000' ~~(mi)~~

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE: ~200

04 DISTANCE TO NEAREST OFF-SITE BUILDING: < 1000' ~~(mi)~~

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site e.g. rural, village, densely populated urban area)

Mostly rural. NC Wesleyan College (student population: 1500) is 0.9 miles NE of facility

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☒ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
Unknown (ft)	Unknown (ft)	Unknown

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
5 (in)	3.2 (in)	0 %	—	2 %

09 FLOOD POTENTIAL

SITE IS IN NA YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum) none within 3 miles

ESTUARINE A. _____ (mi)

OTHER B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

0 (mi)

ENDANGERED SPECIES: red-cockaded woodpecker (Picoides borealis)

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. <500' ~~(mi)~~	B. 1000' ~~(mi)~~	C. _____ (mi)	D. 0.25 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

site is relatively flat, slopes slightly to the southwest corner.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

State file material, Topographic maps, Climatic Atlas

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER	3	ESD/ ATHENS	NOW
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL	7	"	"
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS
conductivity	GW samples
pH	
temp.	

IV. PHOTOGRAPHS AND MAPS

01 TYPE X GROUND ☐ AERIAL

02 IN CUSTODY OF NUS, FIT 4 (Name of organization or individual)

03 MAPS ☑ YES ☐ NO

04 LOCATION OF MAPS NUS, FIT 4

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

Water Distribution Lines, Rocky Mount Water Dept.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

State files; ESD SSI, Phase II

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. CURRENT OWNER(S)			PARENT COMPANY (If applicable)		
01 NAME: Same as parent		02 D+B NUMBER	08 NAME: Torpedo Wire and Strip		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.): RD 2		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY: Pittsfield,	13 STATE: PA	14 ZIP CODE: 16340
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (If applicable; list most recent first)		
01 NAME: NA		02 D+B NUMBER	01 NAME: NA		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. CURRENT OPERATOR (Provide if different from owner)			OPERATOR'S PARENT COMPANY (If applicable)		
01 NAME: Torpedo Wire and Strip	02 D+B NUMBER		10 NAME: Torpedo Wire and Strip	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.): Instrument Drive, Box 42	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.): RD 2	13 SIC CODE	
05 CITY: Bakey Mount	06 STATE: NC	07 ZIP CODE: 27801	14 CITY: Pittsfield PA	15 STATE: PA	16 ZIP CODE: 16340
08 YEARS OF OPERATION: 16	09 NAME OF OWNER: ?				

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)			PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)		
01 NAME: NA	02 D+B NUMBER		10 NAME: NA	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				
01 NAME	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				
01 NAME	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Part A Application

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
TORPEDO WIRE AND STRIP	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
NA			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
NA			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

FILE MATERIAL

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☑ S. CAPPING/COVERING — 02 DATE 1982 — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

State File material

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION (YES) NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY ENFORCEMENT ACTION

North Carolina Environment Health Section, Hazardous Waste Management, recommended closing of filter bed in 1993 in favor of a cleaner operation for securing wastes generated onsite. Change from Filter bed to sludge bags changed the status of Torpedo Wire & Strip from T/S/D to Generator.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis reports)

State File Material

EPA FORM 2070-13 (7-81)

APPENDIX B

APPENDIX C

Ref. 24

APPENDIX C

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 02/03/89

```
***************************************************************************************
**  PROJECT NO. 89-162    SAMPLE NO. 32027  SAMPLE TYPE: BLKWA     PROG ELEM: NSF   COLLECTED BY: D HUNTER   **
**  SOURCE: TORPEDO WIRE & STRIP                                  CITY: ROCKYMOUNT          ST: NC          **
**  STATION ID: TW-RB BLANK FOR RINSE                             COLLECTION START: 11/30/88  1700  STOP: 00/00/00  **
**                                                                                                          **
***************************************************************************************
```

UG/L	ANALYTICAL RESULTS	MG/L	ANALYTICAL RESULTS
10U	SILVER	1.5	CALCIUM
80U	ARSENIC	0.19	MAGNESIUM
N/A	BORON	0.19	IRON
10U	BARIUM	1.0U	SODIUM
5.0U	BERYLLIUM	2.0U	POTASSIUM
5.0U	CADMIUM		
10U	COBALT		
18	CHROMIUM		
10U	COPPER		
10U	MOLYBDENUM		
24	NICKEL		
40U	LEAD		
30U	ANTIMONY		
40U	SELENIUM		
25U	TIN		
10U	STRONTIUM		
50U	TELLURIUM		
10U	TITANIUM		
100U	THALLIUM		
10U	VANADIUM		
10U	YTTRIUM		
150	ZINC		
N/A	ZIRCONIUM		
0.2U	MERCURY		
260	ALUMINUM		
10U	MANGANESE		

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
*U-MATERIAL WAS ANALYZED FOR BUT NOT DETECTED. THE NUMBER IS THE MINIMUM QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 02/03/89

PROJECT NO. 89-162 SAMPLE NO. 32027 SAMPLE TYPE: BLKWA
SOURCE: TORPEDO WIRE & STRIP
STATION ID: TW-RB BLANK FOR RINSE

PROG ELEM: NSF COLLECTED BY: D HUNTER
CITY: ROCKYMOUNT ST: NC
COLLECTION START: 11/30/88 1700 STOP: 00/00/00

UG/L	ANALYTICAL RESULTS
10U	SILVER
30U	ARSENIC
N/A	BORON
10U	BARIUM
5.0U	BERYLLIUM
5.0U	CADMIUM
10U	COBALT
18	CHROMIUM
10U	COPPER
10U	MOLYBDENUM
24	NICKEL
40U	LEAD
30U	ANTIMONY
40U	SELENIUM
25U	TIN
10U	STRONTIUM
50U	TELLURIUM
10U	TITANIUM
100U	THALLIUM
10U	VANADIUM
10U	YTTRIUM
150	ZINC
N/A	ZIRCONIUM
0.2U	MERCURY
260	ALUMINUM
10U	MANGANESE

MG/L	ANALYTICAL RESULTS
1.5	CALCIUM
0.19	MAGNESIUM
0.19	IRON
1.0U	SODIUM
2.0U	POTASSIUM

REMARKS

REMARKS

FOOTNOTES
*A-AVERAGE VALUE *NA-NOT ANALYZED *NAI-INTERFERENCES *J-ESTIMATED VALUE *N-PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
*K-ACTUAL VALUE IS KNOWN TO BE LESS THAN VALUE GIVEN *L-ACTUAL VALUE IS KNOWN TO BE GREATER THAN VALUE GIVEN
*U-MATERIAL WAS ANALYZED FOR BUT NOT DETECTED. THE NUMBER IS THE MINIMUM QUANTITATION LIMIT.

SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 02/03/89

PROJECT NO. 89-162 SAMPLE NO. 32028 SAMPLE TYPE: SOIL
SOURCE: TORPEDO WIRE & STRIP
STATION ID: TWS-SS-01 UPGRAD BACKGROUND ON SITE

PROG ELEM: NSF COLLECTED BY: D HUNTER
CITY: ROCKYMOUNT ST: NC
COLLECTION START: 12/01/88 0940 STOP: 00/00/00

MG/KG	ANALYTICAL RESULTS
2.0U	SILVER
6.0U	ARSENIC
N/A	BORON
14	BARIUM
1.0U	BERYLLIUM
1.0U	CADMIUM
2.0U	COBALT
14	CHROMIUM
15	COPPER
2.0U	MOLYBDENUM
8.7	NICKEL
8.7	LEAD
6.0U	ANTIMONY
8.0U	SELENIUM
4.8	TIN
2.5	STRONTIUM
10U	TELLURIUM
180	TITANIUM
20U	THALLIUM
24	VANADIUM
2.0U	YTTRIUM
14	ZINC
N/A	ZIRCONIUM
0.05U	MERCURY
14000	ALUMINUM
27	MANGANESE

MG/KG	ANALYTICAL RESULTS
300	CALCIUM
320	MAGNESIUM
9500	IRON
200U	SODIUM
400U	POTASSIUM
13	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 02/03/89

PROJECT NO. 89-162 SAMPLE NO. 32030 SAMPLE TYPE: SOIL
SOURCE: TORPEDO WIRE & STRIP
STATION ID: TWS-SD-01 DOWNGRAD SEDIM ON SITE

PROG ELEM: NSF COLLECTED BY: D HUNTER
CITY: ROCKYMOUNT ST: NC
COLLECTION START: 12/01/88 1130 STOP: 00/00/00

MG/KG	ANALYTICAL RESULTS
1.0U	SILVER
3.0U	ARSENIC
N/A	BORON
7.9	BARIUM
0.50U	BERYLLIUM
0.50U	CADMIUM
1.0U	COBALT
27	CHROMIUM
3.4	COPPER
1.0U	MOLYBDENUM
22	NICKEL
8.5	LEAD
3.0U	ANTIMONY
4.0U	SELENIUM
2.9	TIN
1.0	STRONTIUM
5.0U	TELLURIUM
160	TITANIUM
10U	THALLIUM
5.2	VANADIUM
1.4	YTTRIUM
10	ZINC
N/A	ZIRCONIUM
0.05U	MERCURY
3100	ALUMINUM
23	MANGANESE

MG/KG	ANALYTICAL RESULTS
110	CALCIUM
110	MAGNESIUM
2000	IRON
100U	SODIUM
200U	POTASSIUM
9	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 02/03/89

PROJECT NO. 89-162 SAMPLE NO. 32029 SAMPLE TYPE: SOIL
SOURCE: TORPEDO WIRE & STRIP
STATION ID: TWS-SB-01 UPGRAD SUBSURFACE ON SITE

PROG ELEM: NSF COLLECTED BY: D HUNTER
CITY: ROCKYMOUNT ST: NC
COLLECTION START: 12/01/88 1040 STOP: 00/00/00

MG/KG	ANALYTICAL RESULTS
3.0U	SILVER
15	ARSENIC
N/A	BORON
48	BARIUM
1.5U	BERYLLIUM
1.5U	CADMIUM
3.0U	COBALT
41	CHROMIUM
8.4	COPPER
3.0U	MOLYBDENUM
6.0U	NICKEL
20	LEAD
9.0U	ANTIMONY
12U	SELENIUM
7.5U	TIN
24	STRONTIUM
15U	TELLURIUM
180	TITANIUM
30U	THALLIUM
72	VANADIUM
23	YTTRIUM
23	ZINC
N/A	ZIRCONIUM
0.05U	MERCURY
31000	ALUMINUM
23	MANGANESE

MG/KG	ANALYTICAL RESULTS
150U	CALCIUM
1300	MAGNESIUM
24000	IRON
300U	SODIUM
2800	POTASSIUM
27	PERCENT MOISTURE

REMARKS

REMARKS

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 02/03/89

** PROJECT NO. 89-162 SAMPLE NO. 32035 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: D HUNTER **
** SOURCE: TORPEDO WIRE & STRIP CITY: ROCKYMOUNT ST: NC **
** STATION ID: TWS-SB-02 SUBSURFACE SE CORNER SFB COLLECTION START: 12/01/88 1420 STOP: 00/00/00 **

MG/KG	ANALYTICAL RESULTS
7.0U	SILVER
21U	ARSENIC
N/A	BORON
36	BARIUM
3.5U	BERYLLIUM
3.5U	CADMIUM
7.0U	COBALT
50	CHROMIUM
7.0U	COPPER
7.0U	MOLYBDENUM
14U	NICKEL
28U	LEAD
21U	ANTIMONY
28U	SELENIUM
18U	TIN
15	STRONTIUM
35U	TELLURIUM
140	TITANIUM
70U	THALLIUM
72	VANADIUM
9.0	YTTRIUM
10	ZINC
N/A	ZIRCONIUM
0.06	MERCURY
29000	ALUMINUM
21	MANGANESE

MG/KG	ANALYTICAL RESULTS
350U	CALCIUM
740	MAGNESIUM
60000	IRON
700U	SODIUM
1700	POTASSIUM
30	PERCENT MOISTURE

REMARKS

REMARKS

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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 02/03/89

** PROJECT NO. 89-162 SAMPLE NO. 32034 SAMPLE TYPE: SOIL PROG ELEM: NSF COLLECTED BY: D HUNTER **
** SOURCE: TORPEDO WIRE & STRIP CITY: ROCKYMOUNT ST: NC **
** STATION ID: TWS-SS-02A 2' SUBSURFACE SAND/CLAY COLLECTION START: 12/01/88 1355 STOP: 00/00/00 **

MG/KG	ANALYTICAL RESULTS	MG/KG	ANALYTICAL RESULTS
1.0U	SILVER	95	CALCIUM
1.0U	ARSENIC	260	MAGNESIUM
N/A	BORON	5900	IRON
17	BARIUM	100U	SODIUM
0.50U	BERYLLIUM	200U	POTASSIUM
0.50U	CADMIUM	11	PERCENT MOISTURE
1.0U	COBALT		
9.0	CHROMIUM		
2.8	COPPER		
1.0U	MOLYBDENUM		
8.7	NICKEL		
11	LEAD		
3.0U	ANTIMONY		
4.0U	SELENIUM		
10	TIN		
1.7	STRONTIUM		
5.0U	TELLURIUM		
200	TITANIUM		
10U	THALLIUM		
15	VANADIUM		
3.4	YTTRIUM		
5.3	ZINC		
N/A	ZIRCONIUM		
0.05U	MERCURY		
9200	ALUMINUM		
28	MANGANESE		

REMARKS ***REMARKS***

FOOTNOTES
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SAMPLE AND ANALYSIS MANAGEMENT SYSTEM
EPA-REGION IV ESD, ATHENS, GA.

METALS DATA REPORT 02/03/89

PROJECT NO. 89-162 SAMPLE NO. 32039 SAMPLE TYPE: BLKWA
SOURCE: TORPEDO WIRE & STRIP
STATION ID: TWS-TB-01 PRES BLK

PROG ELEM: NSF COLLECTED BY: D HUNTER
CITY: ROCKYMOUNT ST: NC
COLLECTION START: 12/01/88 1515 STOP: 00/00/00

UG/L	ANALYTICAL RESULTS
10U	SILVER
30U	ARSENIC
N/A	BORON
10U	BARIUM
5.0U	BERYLLIUM
5.0U	CADMIUM
10U	COBALT
10U	CHROMIUM
10U	COPPER
10U	MOLYBDENUM
20U	NICKEL
40U	LEAD
30U	ANTIMONY
40U	SELENIUM
25U	TIN
10U	STRONTIUM
50U	TELLURIUM
10U	TITANIUM
100U	THALLIUM
10U	VANADIUM
10U	YTTRIUM
10U	ZINC
N/A	ZIRCONIUM
0.2U	MERCURY
100U	ALUMINUM
10U	MANGANESE

MG/L	ANALYTICAL RESULTS
0.50U	CALCIUM
0.10U	MAGNESIUM
0.050U	IRON
1.0U	SODIUM
2.0U	POTASSIUM

REMARKS

REMARKS

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REFERENCE NO. 5

TORPEDO WIRE & STRIP, INC.

COMPOSITE WIRE & STRIP SPECIALISTS

RD #6 BOX 42
ROCKY MOUNT, N.C. 27801

December 16, 1983

Solid & Hazardous Waste Management Branch
Environmental Health Section
404 St. Andrews Street
Greenville, N.C. 27834

Attention: Mr. Billy Morris

Dear Mr. Morris:

This is to inform you that all the required work has been completed on disposal of our sand beds as of December 5, 1983.

I have enclosed a copy of the steps and dates of completion of various phases of work needed to eliminate our sand beds.

If there are any further questions please feel free to call me at 919-977-3900.

Sincerely yours,

Fred Kibler

Fred Kibler
Manufacturing Engineer

FK/sj

cc: Loren Ota
File

Enclosure

TORPEDO WIRE & STRIP, INC. - ROCKY MOUNT, N.C. PLANT

STATUS OF WASTE TREATMENT MODIFICATION PLAN

5/24/83

(1) Material on order for Sand Bag Filtration Unit:

As of May 16, 1983;

(a) Bags are on order and for delivery on June 16, 1983.

(b) All hardware for the bags are on order and for delivery as of June 1, 1983.

(c) Drain tank for the unit is in 5/23/83.

(2) Maintenance [illegible]

As of June 6, 1983 maintenance is to start construction of the frame for the sand bag unit.

(3) Unit ready for completion by June 27, 1983.

/20/83

(a) Drawing layout of the sand filter unit has been completed.

(b) The steel for the rack is in.

(c) Fabrication of the rack is scheduled for 6/21/83.

(d) The unit should be ready to operate 6/27/83.

/27/83

Filter bag units have been completed and are in operation. Two units were built - the large unit contains 36 filter bags and the small unit contains 24 filter bags.

/15/83

Mailed a letter requesting a permit to haul away the material in the sand beds to Mr. Thomas Davis of SCA Services, Pinewood, S.C.

19/83

A call from Mr. Thomas Davis of SCA was received. He says we need no special permit. We ship the sand bed material to him under F-006 classification and our license #7251101 along with the usual manifest. SCA will furnish the equipment and operator along with the truck to remove the sand bed material or he will furnish the truck and we make arrangements to get our own equipment and operator.

8/22/83

Received a letter from Charlie Rountree III of S.C.A. saying the South Carolina Department of Health & Environmental Control has approved disposal of our sand bed material.

9/16/83

The first load of sand bed material was hauled to SCA in Pinewood, South Carolina for disposal on Manifest #17237 under F-006 Classification and our license #725-1101. This weighed approximately 42,920#.

9/21/83

The second and last load of sand bed material was hauled to SCA on Manifest #17236.

9/30/83

Sent a soil sample from each sand bed to Grainger Laboratories for a screening test.

10/7/83

Sent a soil sample from Sand Bed "A" and Sand Bed "B" for analysis of extractable nickel and extractable lead.

10/12/83

Received analysis back from sample of 10/7/83 showing Sand Bed "A" to have 0.6 mg/l Ni and <0.5 mg/l Pb. Sand Bed "B" shows <0.2 mg/l Ni and <0.5 mg/l of Pb. These are leachable test results, sampled according to state requirements.

10/13/83

Letter sent to Mr. Billy Morris with analysis requesting approval to fill in, grade and seed over the beds.

10/24/83

Received a letter from Gary Babb, geologist with the Solid & Hazardous Waste Management branch that the analytical results submitted for closing the sand beds are acceptable and that the evaluation can now be filled, graded and [illegible]. Mr. Billy Morris must be notified when this has been completed.

12/5/83

Inco Construction Company of Rocky Mount, N.C. filled in, graded and completed the required work on the sand beds.

REFERENCE NO. 6

GRAINGER LABORATORIES
INCORPORATED
ANALYTICAL AND CONSULTING CHEMISTS

709 West Johnson Street • Raleigh, North Carolina 27603

(919) 828-3360

CAL LABORATORY

CONSULTATI

Metallurgical Ser
Pollution Abate
Process Develop
Quality Co
Methods Develop
Special Investig
Pesti
R

October 12, 1983
83-8690

Torpedo Wire & Strip Company
Route 6, Box 42
Rocky Mount, N.C. 27801

Attn: Fred Kibler

Subject: Analyses of Samples Received 10-10-83

Sample Identification:

1. Sand Bed A
2. Sand Bed B

RESULTS

	1	2
Nickel, leachable as Ni, mg/l	0.6	<0.2
Lead, leachable as Pb, mg/l	<0.5	<0.5

James D. Thacker
Technical Director

JDT/at
Customer #88000

TORPEDO WIRE & STRIP, INC.

COMPOSITE WIRE & STRIP SPECIALISTS

RD #6 BOX 42
ROCKY MOUNT, N.C. 27801

(6)

October 13, 1983

North Carolina Dept. of Human Resources
Division of Health Services
404 St. Andrews Street
Greenville, North Carolina 27834

Attention: Mr. Billy Morris

Dear Mr. Morris:

I am enclosing a copy of the soil analysis taken at the base of our disposed of sand beds. These samples were taken as you recommended.

The results should be well within the limits you gave me which require <5.0 ppm of extractable lead and <10.0 ppm of extractable nickel.

We will be waiting your written approval to fill in, grade and seed over the beds. We will then proceed.

Sincerely yours,

Fred Kibler

Fred Kibler
Manufacturing Engineer

FK/sj

Enclosure

REFERENCE NO. 7

NUS CORPORATION
SUPERFUND DIVISION

PROJECT NOTES

TO: File

DATE: April 23, 1990

FROM: Sherry Durren Sherry Durren 4/25/90

COPIES:

SUBJECT: Torpedo Wire and Strip Inc., Rocky Mount, N.C.

Roger Carlton of ESD, Athens, provided the following information on Torpedo Wire and Strip where he had done a screening site inspection.

The entire site is grass-covered. The site layout map in ESD's report is from an old blueprint. There is no above ground evidence of the drying beds. All processing takes place indoors so there is also no evidence of the sludge bag system currently in use. Loren Ota, the onsite manager, is very cooperative and will answer questions.

Rinseate blank was obtained after field deconning of equipment. Previous site was near Pimlico sound.

Drainage across the site is southwest. Sample SD-01 was taken from a surface wash area that flows towards an intermittent stream.

Water was obtained when putting in wells at 150-160" (inches). Land surrounding the facility is agricultural.

REFERENCE NO. 8

EPA-600/2-87-035
April 1987

DRASTIC: A Standardized System for Evaluating Ground Water Pollution Potential Using Hydrogeologic Settings

by

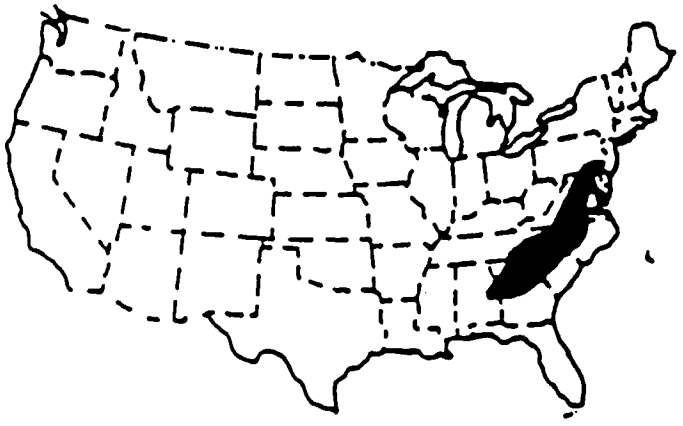
Linda Aller
Truman Bennett
Jay H. Lehr
Rebecca J. Petty
and
Glen Hackett
National Water Well Association
Dublin, Ohio 43017

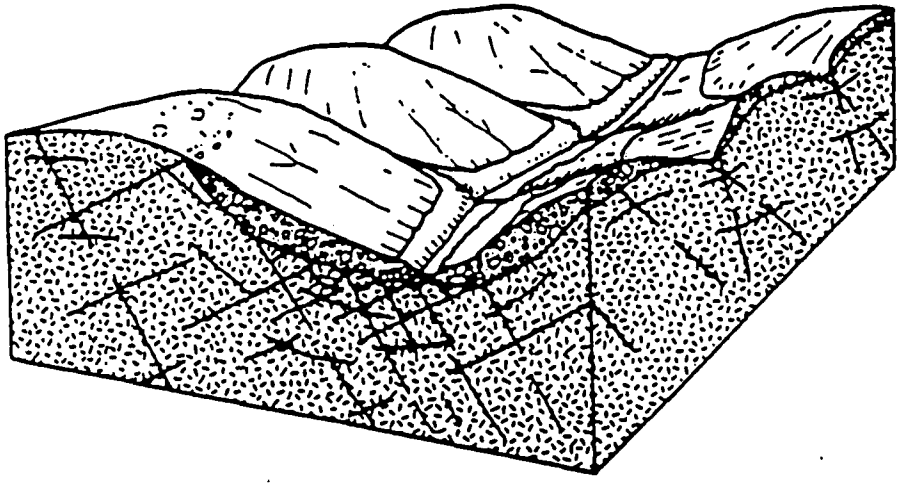
Cooperative Agreement CX-810715-01

Project Officer
Jerry Thornhill
Applications and Assistance Branch
Robert S. Kerr Environmental Research Laboratory
Ada, Oklahoma 74820

ROBERT S. KERR ENVIRONMENTAL RESEARCH LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
ADA, OKLAHOMA 74820

8. PIEDMONT BLUE RIDGE GROUND-WATER REGION





8A	Mountain Slopes
8B	Alluvial Mountain Valleys
8C	Mountain Flanks
8D	Regolith
8E	River Alluvium
8F	Mountain Crests
8G	Swamp/Marsh

8. PIEDMONT BLUE RIDGE REGION

(Thick regolith over fractured crystalline and metamorphosed sedimentary rocks)

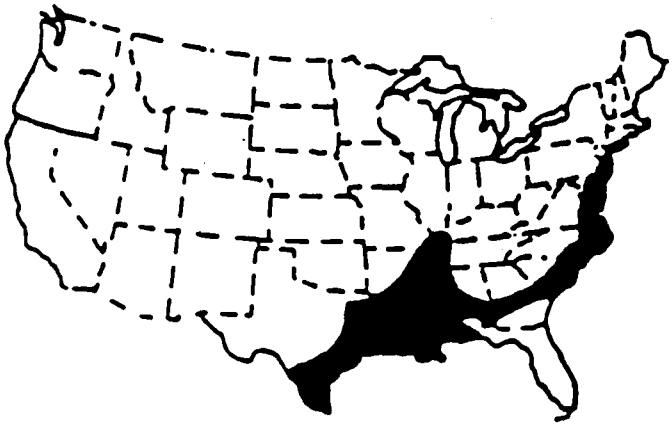
The Piedmont and Blue Ridge region is an area of about 247,000 km2 extending from Alabama on the south to Pennsylvania on the north. The Piedmont part of the region consists of low, rounded hills and long, rolling, northeast-southwest trending ridges whose summits range from about a hundred meters above sea level along its eastern boundary with the Coastal Plain to 500 to 600 m along its boundary with the Blue Ridge area to the west. The Blue Ridge is mountainous and includes the highest peaks east of the Mississippi. The mountains, some of which reach altitudes of more than 2,000 m, have smooth-rounded outlines and are bordered by well-graded streams flowing in relatively narrow valleys.

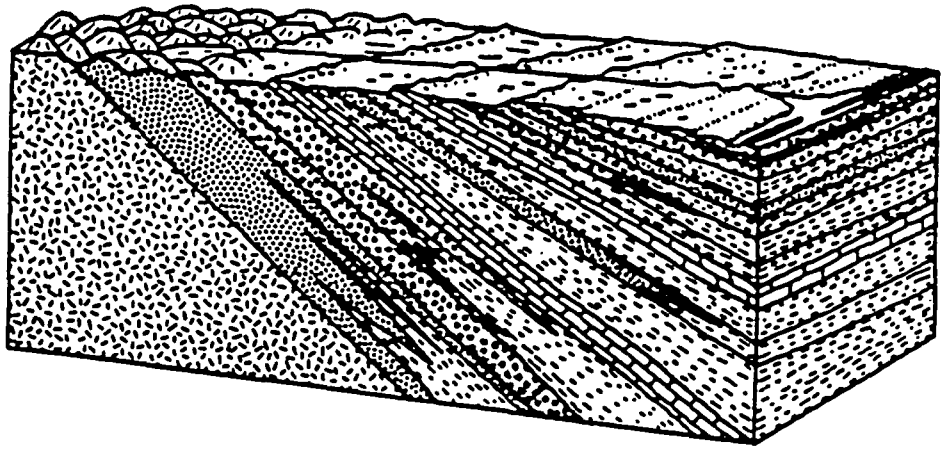
The Piedmont and Blue Ridge region is underlain by bedrock of Precambrian and Paleozoic age consisting of igneous and metamorphosed igneous and sedimentary rocks. These include granite, gneiss, schist, quartzite, slate, marble, and phyllite. The land surface in the Piedmont and Blue Ridge is underlain by clay-rich, unconsolidated material derived from in situ weathering of the underlying bedrock. This material, which averages about 10 to 20 m in thickness and may be as much as 100 m thick on some ridges, is referred to as saprolite. In many valleys, especially those of larger streams, flood plains are underlain by thin, moderately well-sorted alluvium deposited by the streams. When the distinction between saprolite and alluvium is not important, the term regolith is used to refer to the layer of unconsolidated deposits.

The regolith contains water in pore spaces between rock particles. The bedrock, on the other hand, does not have any significant intergranular porosity. It contains water, instead, in sheetlike openings formed along fractures (that is, breaks in the otherwise "solid" rock). The hydraulic conductivities of the regolith and the bedrock are similar and range from about 0.001 to 1 m day^{-1}. The major difference in their water-bearing characteristics is their porosities, that of regolith being about 20 to 30 percent and that of the bedrock about 0.01 to 2 percent. Small supplies of water adequate for domestic needs can be obtained from the regolith through large-diameter bored or dug wells. However, most wells, especially those where moderate supplies of water are needed, are relatively small in diameter and are cased through the regolith and finished with open holes in the bedrock. Although, as noted, the hydraulic conductivity of the bedrock is similar to that of the regolith, bedrock wells generally have much larger yields than regolith wells because, being deeper, they have a much larger availble drawdown.

3.

10. ATLANTIC AND GULF COASTAL PLAIN GROUND-WATER REGION





10Aa	Regional Aquifers
10Ab	Unconsolidated & Semi-Consolidated Shallow Surficial Aquifer
10Ba	River Alluvium With Overbank Deposits
10Bb	River Alluvium Without Overbank Deposits
10C	Swamp

REFERENCE NO. 9

NORTH CAROLINA
DEPARTMENT OF CONSERVATION AND DEVELOPMENT
R. BRUCE ETHERIDGE, *Director*

NASH

DIVISION OF MINERAL RESOURCES
JASPER L. STUCKEY, *State Geologist*

BULLETIN NUMBER 51

Ground Water IN THE Halifax Area, North Carolina

By
M. J. MUNDORFF

PREPARED IN COOPERATION WITH THE UNITED STATES GEOLOGICAL SURVEY

RALEIGH
1946

The average annual snowfall is about 8 inches.

Temperature.—Records of temperature are kept by the U. S. Weather Bureau at Nashville, Scotland Neck, Tarboro, and Weldon. In addition, records of temperature are available for Eagleton, in Northampton County, from 1904 to 1922 and for Littleton from 1891 to 1905. The average mean annual temperature for these six stations is 59.6°F. January with an average mean temperature of 41.4°F. is the coldest month, and July with an average mean of 79.5°F. is the warmest month. Littleton, with an annual mean of 57.6° has the coldest temperature, which is to be expected since it is the farthest north and has the highest elevation of all the stations.

The average date of the last killing frost in the spring is about April 10, and the average date of the first killing frost in the autumn is about October 28, leaving an average growing season of about 201 days.

DRAINAGE

The area is drained by a number of nearly parallel, southeastward flowing streams, the largest of which, listed in order of occurrence from north to south, are the Meherrin River, Roanoke River, Fishing Creek, Swift Creek, Tar River, and Contentnea Creek. All these streams rise in the Piedmont, west of the area described in this report. In the western half of the area they occupy valleys, generally 150 to 200 feet deep, with narrow flood plains; but east of the Fall Zone, the valleys are wider and less deep and have extensive flood plains. In general, the stream gradient ranges from 1.4 to 2.0 feet per mile above the Fall Zone, 2.5 to 5.0 feet per mile in the Fall Zone, and 0.5 to 1.25 feet per mile below the Fall Zone.

PHYSIOGRAPHY

The area described in this report lies in two major physiographic provinces, about the western two-fifths being in the Piedmont province and the eastern three-fifths in the Coastal Plain province. The general slope of the upland surface in both provinces is southeastward, the direction in which the stream valleys trend. In the Piedmont province the older crystalline rocks are at or near the surface, but in the Coastal Plain province the erosion surface formed on them dips beneath the sedimentary formations of the Coastal Plain. The southeastward flowing streams have cut down into these sediments much more easily than into the crystalline rocks, and thus falls and rapids have been developed in all the streams along the southeastern margin of the Piedmont province.

According to Fenneman[1] the boundary between the two provinces should be drawn at the western limit of the Cretaceous formations, and where they are absent, at the western margin of the Tertiary. The boundary between the two also has sometimes been drawn at the western limit of the Pleistocene terrace deposits which overlap the Cretaceous and Tertiary formations. However, the topography developed on the higher terraces is much more typical of the Piedmont province than of the Coastal Plain, and furthermore, erosion has removed much of these terrace deposits so that the crystalline rocks form a large part of the surface. For these reasons, the boundary line as defined by Fenneman is used in this report. From north to south the boundary line passes approximately through Pleasant Hill and Weldon, thence through points near or west of Halifax, Enfield, Whitakers, Battleboro, Rocky Mount, and Wilson, thence veering westward south of Wilson, towards Selma in Johnston County.

In the western part of Northampton, Halifax, Nash, and Wilson Counties the topography is typical of the Piedmont province. Crystalline rocks are at the surface or are covered only by discontinuous patches of unclassified high-level sand and gravel and remnants of the Brandywine and Coharie terrace deposits. The relief is 150 to 200 feet near the larger streams where the surface has been eroded to approximate maturity. The interstream areas have much less relief and in places are poorly drained. The comparatively flat areas west of, and higher than, the westernmost Pleistocene terrace, were formed by erosion and are what is left of the extensive pre-Pleistocene peneplain. Along the western margin of the area, the upland is 300 to 400 feet above sea level. In the Piedmont province the eastward slope of the surface is 13 to 15 feet per mile; in the Coastal Plain province the slope flattens out to about two or three feet per mile. The eastern edge of the area is only about 60 to 90 feet above sea level.

[1] Fenneman, N. M.: Physiographic Divisions of the United States: Assoc. Am. Geographers Annals, vol. 18, no. 4, p. 290, 1928.

2.

The Coastal Plain province is underlain by a wedge of Tertiary and Cretaceous sediments, which are 1,500 to 2,000 feet thick along the coast but become thinner westward until they disappear along the Fall Zone. However, these formations are rarely exposed at the surface as they are covered nearly everywhere by the Pleistocene terrace deposits. These terraces are the outstanding physiographic features of the Coastal Plain province, forming irregular belts extending northeast-southwest across the eastern part of the State. The highest terrace is believed to be the oldest, and the lower terraces are successively younger. The terraces were formed at the margin of the sea when it stood at different levels in Pleistocene time. They slope gently eastward and were formed during comparatively long halts in the fluctuation of the sea level. Each terrace is generally separated from the next higher one by a more or less pronounced scarp, which marks the shore line of the sea that formed it.

The Brandywine and Coharie terraces and part of the Sunderland terrace lie within the Piedmont province in the five counties described in this report. The Brandywine terrace is the oldest and highest of the Pleistocene terraces and is shown as a narrow belt on the geologic map, plate 2. However it has undergone considerable erosion and no longer forms a continuous surface. This terrace is about 270 feet above sea level at its western margin, the former shore line, and slopes eastward to about 230 feet above sea level. The Coharie terrace is next lower and younger and forms a similar belt east of the Brandywine terrace. It slopes eastward from

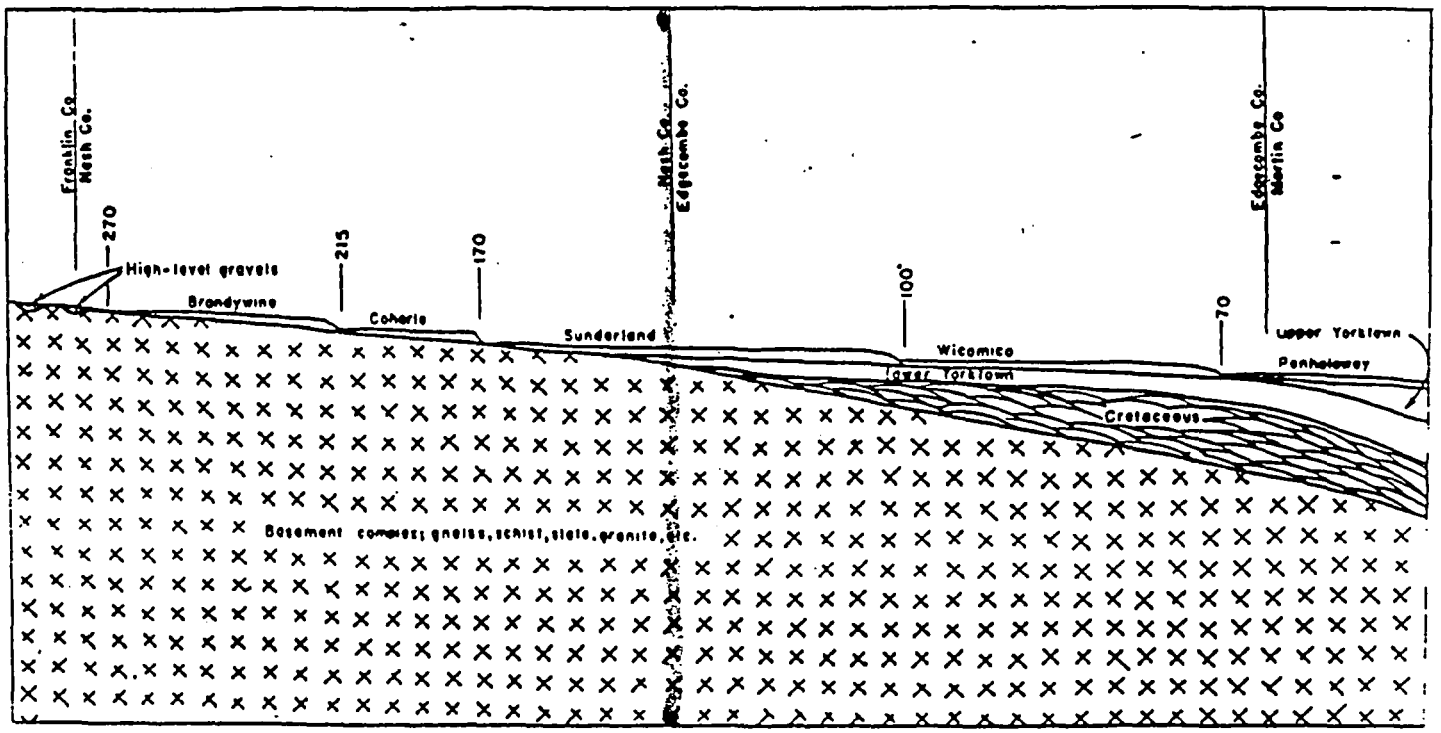


FIG. 3. Generalized physiographic and geologic section of the Halifax area.

about 210 feet to 170 feet. The third terrace, the Sunderland, lies chiefly within the Coastal Plain province and is the most extensive terrace within the area, covering a belt 18 to 25 miles wide and occupying considerable areas in each of the five counties. Long tongues of this terrace border the major streams and extend for a number of miles west of the main belt. This and the lower terraces are much flatter and have undergone much less erosion than the two higher terraces. The Sunderland terrace slopes from about 170 feet at its inner boundary to about 110 feet. The Wicomico terrace is also quite extensive, its main development being in eastern and northern Edgecombe, and in eastern Halifax and southeastern Northampton Counties. It is quite flat, and considerable areas are poorly drained. At the inner margin it is about 100 feet, and along the seaward margin is about 65 to 70 feet above sea level. It usually is separated from the Penholoway terrace by a well-defined scarp. The Penholoway terrace, with an elevation of from 45 to 60 feet above sea level, has its most extensive development east of the area described, but tongues from the main belt extend up the principal streams. Its

3

most extensive development within the area is north and west of Tarboro, in Edgecombe County. The two lowest terraces, the Talbot, at 30 to 40 feet, and the Pamlico, below 25 feet, are found only bordering the larger streams in the eastern part of the area.

GEOLOGY

STRATIGRAPHY

The formations of eastern North Carolina are listed in the following table. The oldest rocks are listed at the bottom of the table, and the formations toward the top are successively younger. The distribution of the formations is shown on the maps, plates 1 and 2.

GEOLOGIC FORMATIONS IN EASTERN NORTH CAROLINA

		Age	Formation	Description	Water-bearing properties
Cenozoic	Quaternary	Pleistocene	Pamlico formation† Talbot formation† Penholoway formation† Wicomico formation† Sunderland formation‡ Coharie formation† Brandywine formation†	[redacted]	Yields small to moderate supplies to shallow [redacted] plies are obtained from gravel-walled wells or group [redacted] and gravel.
	Cenozoic	(?)*	Unclassified high-level gravels, muds, and clays†	Yellow and red clays, sandy clays and gravels in clay matrix; often cross-bedded. 0-60′ thick	Yields small supplies to shallow domestic wells and a few larger supplies to screened or gravel-walled wells.
		Pliocene	Croatan sand‡ Waccamaw formation‡		
		Miocene	Upper part of Yorktown formation‡ Duplin Marl‡ Lower part of Yorktown formation‡ Trent marl‡	[redacted] 40-70′ thick (in this area)	Usually yields small supplies. The water is us- [redacted] gravel-walled wells which penetrate clean sand.
		Eocene	Castle Hayne marl‡ Black Mingo formation‡		
Mesozoic	Cretaceous	Upper Cretaceous Lower Cretaceous†	Peedee formation‡ Black Creek formation‡ Tuscaloosa formation‡ (undifferentiated)†	Clay, mud and sandy clay; some gravel; characteristically lenticular, often cross-bedded, drab, brown and reddish colors common. 0-400′±thick	Important water-bearing formation. Yields moderate to large supplies from sand and gravel lenses a few miles east of Fall Zone. Smaller supplies are obtained father west as the formation becomes thinner. Water is usually soft and sometimes contains considerable iron.
Paleozoic	Carboniferous		Gabbros	Medium grained granodiorite to coarse, porphyritic orthoclase granite.	[redacted] and fractured sand in upper, weathered zone [redacted] free from iron, usually moderately soft
Proterozoic	Pre-Cambrian (?)		Slates and schists†	Slate, schist, and phyllites, metamorphosed lavas, tuffs, and volcanic breccias. In places cut by many quartz veins; also by some diabase dikes.	Yields small supplies from metamorphosed lavas and tuffs. Larger supplies are obtained from schists and phyllite, especially where quartz veins are plentiful. Water is usually soft; often contains objectionable amounts of iron.
	Pre-Cambrian		Gneisses and schists†	Granite-gneiss, mica schist	Small supplies in areas of massive rock; moderate supplies where schistosity or jointing are well developed. Water is only moderately soft, sometimes contains objectionable iron.

† Formation present in Halifax area.
‡ Formation not found in Halifax area but present in other parts of the Coastal Plain of North Carolina.
* The age of these deposits is indefinite. They may include representatives of several ages, some possibly as old as the the Cretaceous.

Pre-Cambrian gneisses and schists:—These rocks consist of gneisses and schists that were formed from granites and other igneous rocks and probably some sedimentary formations. They have undergone considerable metamorphism by heat and pressure and have been greatly deformed. The rocks include granite-gneiss and schists and quartz-mica schists. Although the stratigraphic relationship of these rocks to rocks of known age has not been determined in this area, they are considered to be pre-Cambrian because of the intense deformation they have undergone and their lithologic similarity to pre-Cambrian rocks in other areas.

Pre-Cambrian (?) slates and schists:—This is a thick sequence of slates, phyllites, and sericite schists which were metamorphosed from sedimentary and igneous rocks, including lavas, tuffs, and breccias. Sedimentary formations apparently predominated. The degree of metamorphism, except near the contact of the intrusive granite, is much less than in the gneisses and schists described above. The age of these rocks is probably pre-Cambrian.

Carboniferous (?) granites:—The granites range from a pink, orthoclase granite to quartz monzonite and quartz diorite. The orthoclase granite has both equigranular and porphyritic phases, but only equiangular phases of the quartz diorite were observed. The granites are intrusive into the slates and schists of pre-Cambrian (?) age and along the contact occasionally have developed a gneissic structure. Similar granites in other areas have been determined to be late Paleozoic in age and have been correlated with a period of intrusion in Carboniferous time. Intruded into the granites are diabase dikes which, in other areas, have been shown to be of Triassic age.

Cretaceous deposits (undifferentiated):—The undifferentiated Cretaceous deposits are the oldest sedimentary deposits recognized in the Coastal Plain of North Carolina. They consist of sands and clays and mixtures of the two varying proportions. The sands are fine to very coarse in texture, are commonly arkosic and often contain considerable mica. These strata rest directly upon igneous and metamorphic rocks of pre-Cretaceous age, and were deposited as stream and near-shore deposits at the margin of the sea lying to the east. Having been formed as stream deposits or as beach, bar, or lagoon deposits, none of the layers are of very great extent laterally but occur as lenses and stringers.

The strata range in thickness from a feather edge along their western margin to more than 400 feet at their maximum development 30 or 40 miles to the east. The oldest formation overlying these strata, in the Halifax area, is the lower part of the Yorktown formation of Miocene age; but a short distance south and east of Edgecombe and Wilson Counties they are overlain by the Black Creek formation of Upper Cretaceous age.

The basal Cretaceous deposits of North Carolina originally were called the "Cape Fear" by L. W. Stephenson[1] and were assigned to the Lower Cretaceous. A few years later he correlated the "Cape Fear" with the Patuxent formation in Maryland and Virginia, and abandoned the name "Cape Fear" in favor of Patuxent[2]. The Patuxent formation in Maryland and Virginia is of Lower Cretaceous age. However, in 1925 C. W. Cooke[3] showed that, in the southern part of the State, the formation under consideration is mostly, if not entirely, of Upper Cretaceous age and that it is chiefly the northward extension of the Tuscaloosa formation as recognized in Alabama and Georgia.

The Cretaceous deposits in the Halifax area are very similar in lithology, structure, and thickness to the Tuscaloosa formation in the southern part of the State and appear to form a continuous unit with the Tuscaloosa. However, similar beds in southeastern Virginia have been correlated with the Patuxent formation of Lower Cretaceous age. It is possible that both formations are represented in the Halifax area. In this report these deposits are called Cretaceous (undifferentiated).

Miocene (Yorktown formation):—The Yorktown formation consists predominantly of arenaceous marls and clays with subordinate sand strata. The color is characteristically blue and fossil shells are often present. The lower part of this formation forms a blanket over almost the entire part of the area that lies within the Coastal Plain, and few wells drilled to 60 feet or more have failed to encounter "blue clay" or "blue marl." In previous years the marl was dug extensively for applying to the soil because of the beneficial action of the lime.

[1] Stephenson, L. W., Some facts relating to the Mesozoic deposits of the Coastal Plain of North Carolina: Johns Hopkins University Cir. new. ser. no. 7 (Whole no. 199), pp. 93-99, 1907.
[2] Clark, Wm. B.; Miller, B. L.; Stephenson, L. W., The Coastal Plain of North Carolina: North Carolina Geol. and Econ. Survey Vol. III part I, 1912.
[3] Cooke, C. Wythe, Correlation of the coastal Cretaceous beds of the southeastern states: U. S. Geol. Survey Prof. Paper 140-F, pp. 137-38, 1925 (1926)

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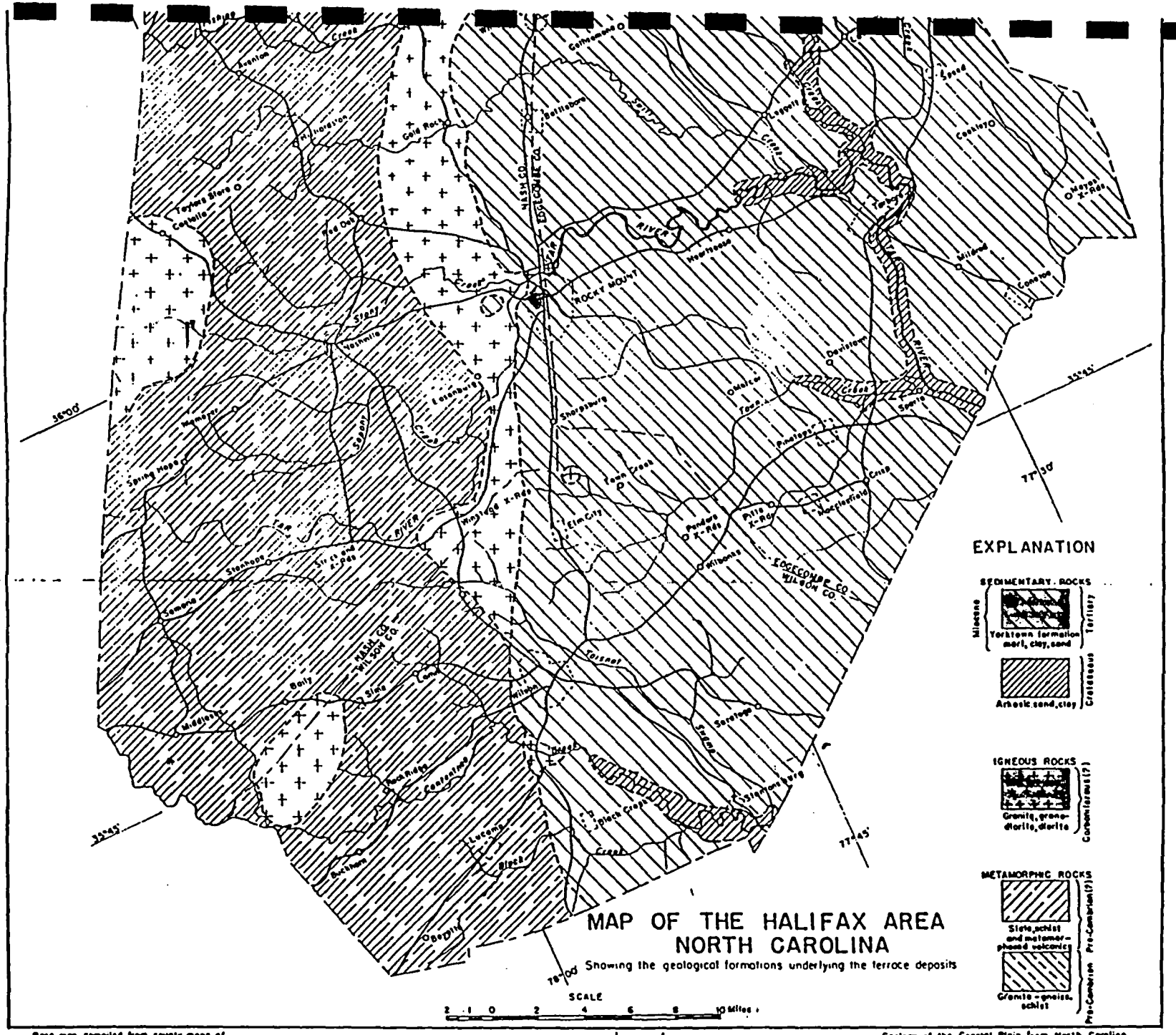
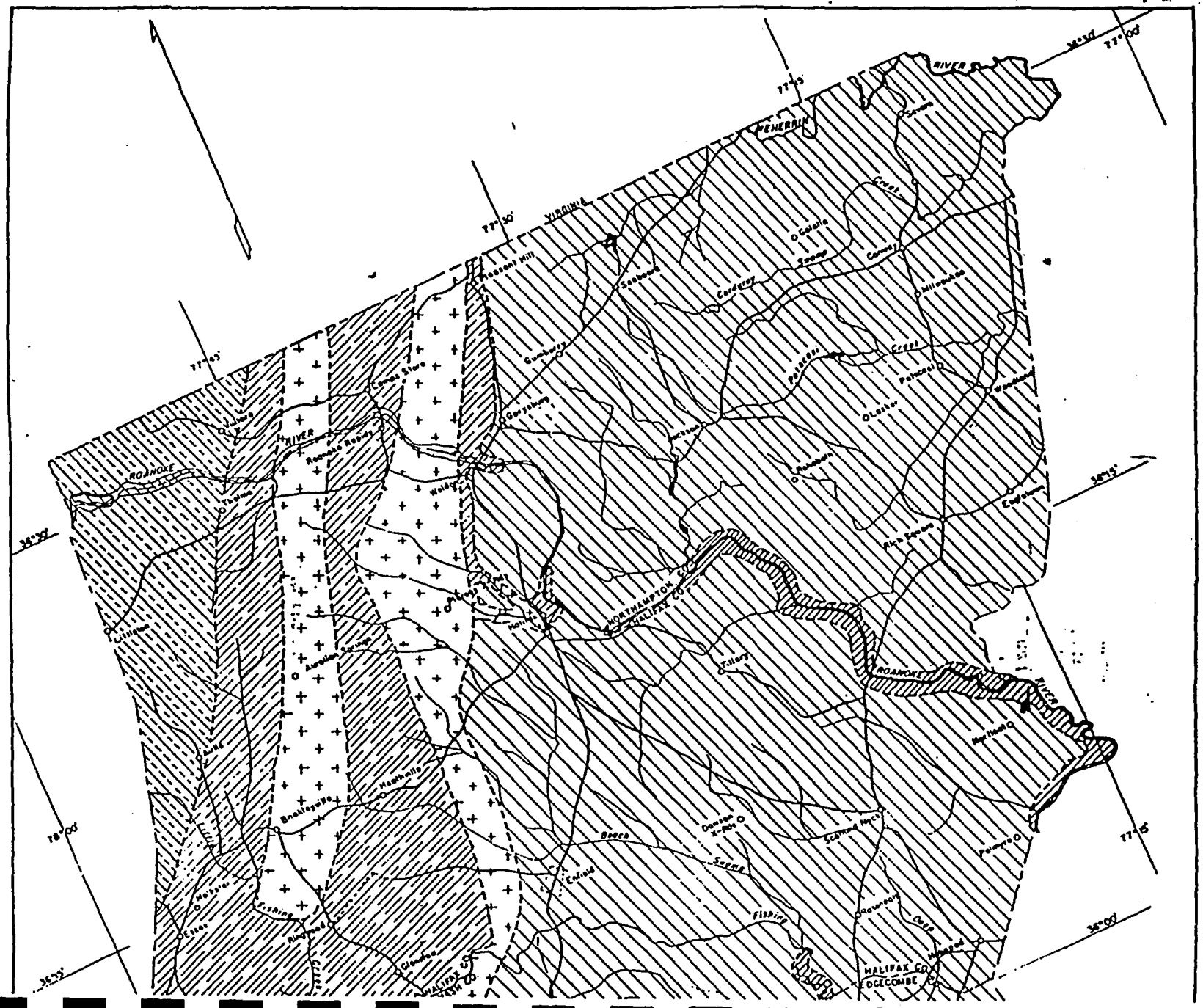


Base map compiled from county maps of North Carolina State Highway Department

Geology of the Coastal Plain from North Carolina Geologic and Economic Survey, Vol III


VIRGINIA
PEMBRIN
RIVER
ROANOKE
RIVER
Roanoke Rapids
Weldon
Gaston
Garysburg
Seaboard
Roanoke Rapids
Jackson
Rich Square
Aulander
Colerain
Powellsville
Woodland
Ahoskie
Cofield
Menola
Tillery
Scotland Neck
Hobgood
Palmyra
Hamilton
Oak City
Williamston
Bethel
Hobgood
Enfield
Conetoe
Pinetops
Lewiston
Woodville
Bethel
Hamilton
Jamesville
Plymouth
Roanoke Rapids
Weldon
Gaston
Garysburg
Seaboard
Rich Square
Aulander
Colerain
Powellsville
Woodland
Ahoskie
Cofield
Menola
Tillery
Scotland Neck
Hobgood
Palmyra
Hamilton
Oak City
Williamston
Bethel
Hobgood
Enfield
Conetoe
Pinetops
Lewiston
Woodville
Bethel
Hamilton
Jamesville
Plymouth
Roanoke Rapids
Weldon
Gaston
Garysburg
Seaboard
Rich Square
Aulander
Colerain
Powellsville
Woodland
Ahoskie
Cofield
Menola
Tillery
Scotland Neck
Hobgood
Palmyra
Hamilton
Oak City
Williamston
Bethel
Hobgood
Enfield
Conetoe
Pinetops
Lewiston
Woodville
Bethel
Hamilton
Jamesville
Plymouth
NORTHAMPTON CO
HALIFAX CO
HALIFAX CO
DUPLIN CO
HALIFAX CO
DUPLIN CO
77°45'
77°30'
77°15'
77°00'
36°30'
36°15'
36°00'
35°45'
35°30'

This formation was mapped in about 1910 by Benjamin L. Miller and was correlated with the St. Marys formation of Maryland[1]. A. Olsson[2], in 1917, proposed the name "Murfreesboro" for the lower part of the upper Miocene deposits extending from central Virginia to central North Carolina. He stated that this formation was much more closely related to the Yorktown than the St. Marys. W. C. Mansfield[3], in 1929, assigned the "Murfreesboro" stage of Olsson to the lower part of the Yorktown. Since the name "Murfreesboro" is pre-occupied by the Murfreesboro limestone, of Ordovician age, in Tennessee and Virginia, the formation should properly be known as Yorktown. Only the lower part of the Yorktown occurs within the Halifax area.

Unclassified high-level gravels, sands, and clays of tertiary and Cretaceous (?) age:—These deposits formerly were called the "Lafayette formation" which, as originally defined by L. W. Stephenson[4], included gravel, sand, and clay, in many places cross-bedded, of fluviatile and marginal marine origin between 230 and 400 feet above sea level. The age was given as Pliocene, and it was considered to have been deposited as a more or less continuous terrace deposit on an irregular erosion surface. It has since been shown by C. Wythe Cooke[5] that the formation, as originally defined and mapped, included the Brandywine terrace of Pleistocene age, which lies at 220 to 270 feet above sea level. Furthermore, the name "Lafayette" has been abandoned[6] because the deposits at the type locality were shown, by E. W. Berry, to be of Eocene age and did not represent the concept of the high-level gravels. Accordingly, in this report these deposits will be called "unclassified high-level gravel, sand, and clay" or, more briefly "high-level gravel". The deposits apparently are entirely continental and were formed as stream channel and flood plain deposits and basin fill over the eastern and central Piedmont. After their deposition, a long period of erosion formed a planation surface beveling alike the fill and the crystalline rocks in which the channels and basins were cut. When the area was later uplifted, the streams cut new channels without regard to the courses of the previous streams; and, as a result, many of these channel fillings are found on the present interstream divides. Plate 6, B and C, show two such channels in schist at the western edge of Nash County. These deposits may include representatives of several different ages, some possibly as old as the Cretaceous.

Pleistocene terraces and terrace deposits:—The Pleistocene terraces of the Coastal Plain in North Carolina were first recognized by B. L. Johnson[7] who listed seven terraces between sea level and 320 feet above sea level. However, L. W. Stephenson[8], a few years later mapped the highest two terraces as a single terrace, the "Lafayette." More recent work, especially by C. Wythe Cooke[9], has resulted in the recognition of seven Pleistocene terraces and formations along the Atlantic Coastal Plain.

Seven Pleistocene formations, underlying the terraces of the same names, have been recognized in the present investigation. The terraces, from youngest to oldest with the elevation of the strand line, are: Pamlico, 25 feet; Talbot, 42 feet; Penholoway, 70 feet; Wicomico, 100 feet; Sunderland, 170 feet; Coharie, 215 feet; Brandywine, 270 feet. These terraces form roughly parallel belts trending northeast-southwest across the Coastal Plain, with the lowest terrace adjacent to the coast and the higher ones successively westward. The lowest two, however, are of limited extent within the area, occurring only as tongues extending up the major streams from the main body of the terrace to east.

The Pleistocene formations, which are cross-bedded in many places, consist of sands, clays, and mixtures of the two. They contain quartz pebbles, in some exposures, especially at the base of the formation. The colors of the deposits include gray, yellow, brown, and red, with the formations of higher elevation, which are also the oldest, having the most color. The formations of higher elevation also have more coarse material and more cross-bedding than those of lower elevation. The thickness ranges from a few feet to 60 feet or more, averaging about 25 or 30 feet.

The four highest terraces do not contain marine fossils and, therefore, are not definitely proven to be of marine origin. However, the continuity, uniform altitude and thickness, flat surface, well-developed scarps, and universal development are strong arguments in favor of a marine origin.

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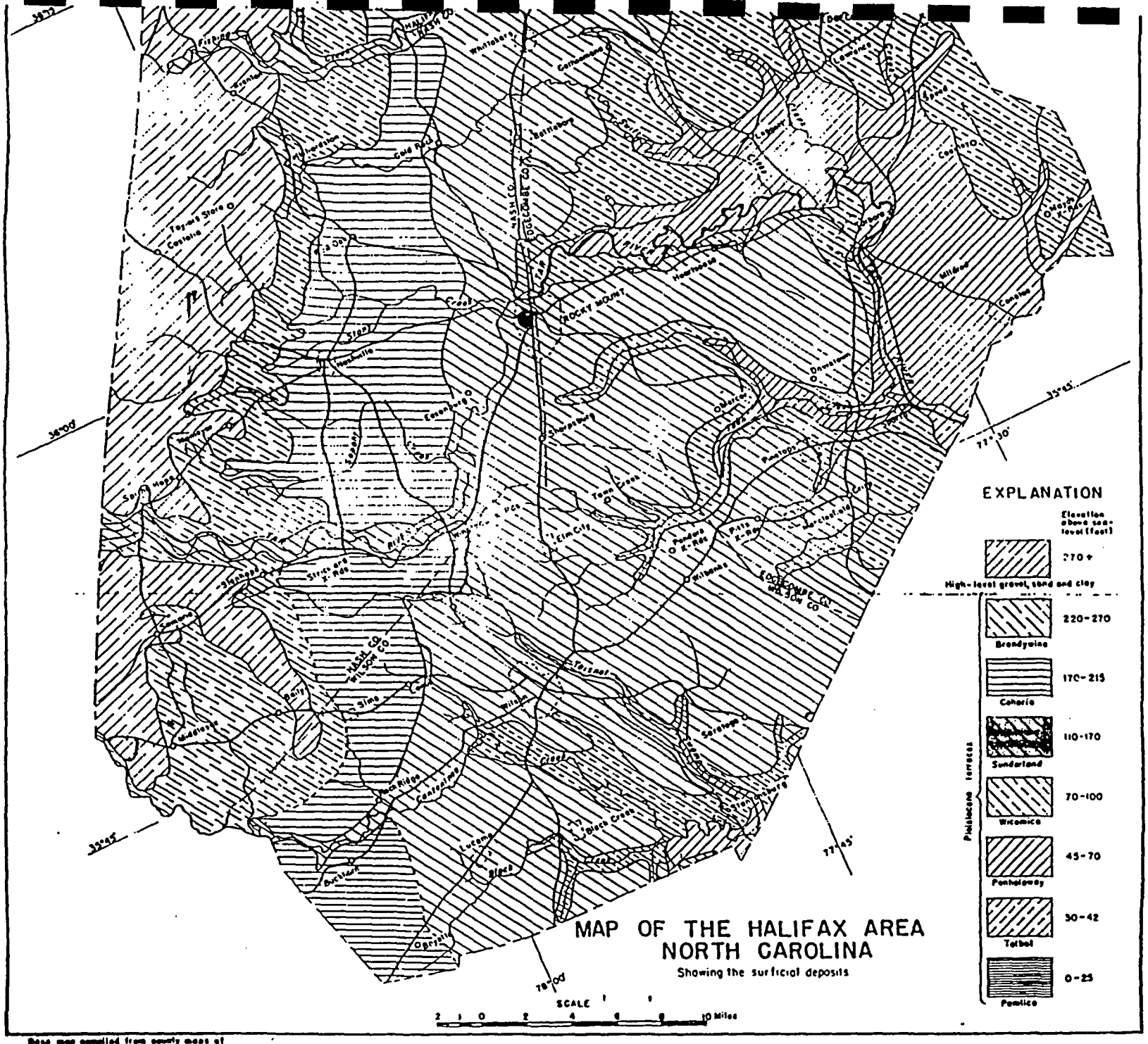
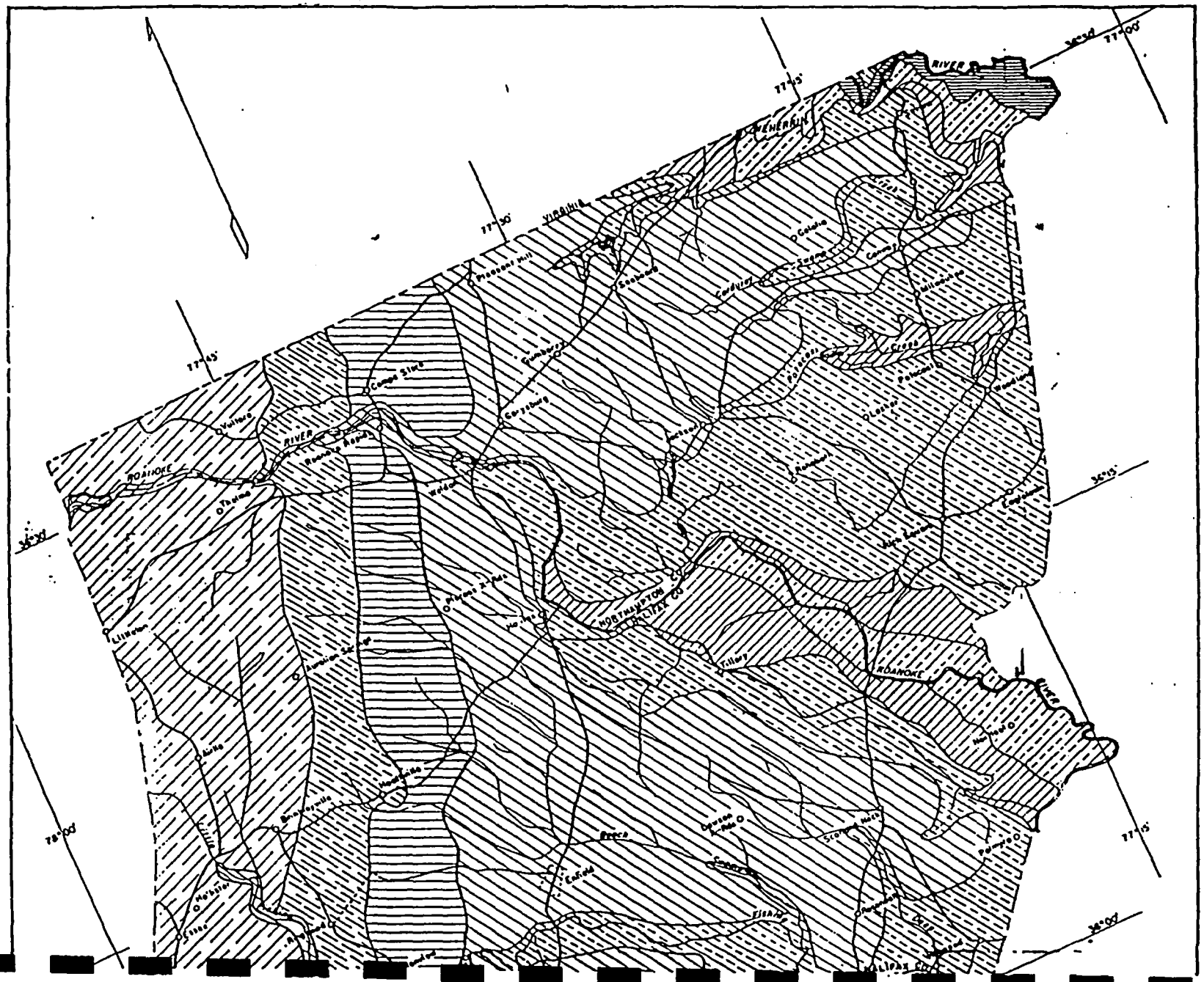
[1] Op. Cit. (The Coastal Plain of North Carolina) p. 197.
[2] Olsson, Alex A., The Murfreesboro stage of our East Coast Miocene: Bull. Am. Paleontology: vol. 5, no. 28.
[3] Mansfield, W. C., The Chesapeake Miocene basin of sedimentation as expressed in the new geologic map of Virginia: Washington Acad. Sci. Jour., vol. 19 p. 166, 1929.
[4] Op. Cit. (The Coastal Plain of North Carolina)
[5] Cooke, C. Wythe, Correlation of coastal terraces. Jour. Geology, vol. 38, pp. 337-389, 1930.
[6] Matson, G. C., The Pliocene Citronelle formation of the Gulf Coastal Plain, U. S. Geol. Survey Prof. Paper 98I, pp. 167-192, 1917.
[7] Johnson, B. L., Pleistocene terracing in the North Carolina Coastal Plain, Science, new. ser. vol. 26, pp. 640-642, 1907.
[8] Op. Cit. (The Coastal Plain of North Carolina).
[9] Cooke, C. W., Seven coastal terraces in the southeastern States: Washington Acad. Sci. Jour. vol. 21, no. 21, pp. 503-513, 1931
Geology of the Coastal Plain of South Carolina: U. S. Geol. Survey Bull. 867, p. 140, 1936.
Geology of the Coastal Plain of Georgia: U. S. Geol. Survey Bull. 911, pp. 104-113, 1939.



Base map compiled from county maps of North Carolina State Highway Department.


RIVER
VIRGINIA
ROANOKE
RIVER
NORTHAMPTON
CO.
ROANOKE
RIVER
Vultare
Pleasant Hill
Seaboard
Conway
Cofield
Tillery
Roanoke Rapids
Weldon
Gaston
Littleton
Lake Gaston
Boykins
Emporia
Franklin
Hobgood
Scotland Neck
Pendleton
Rich Square
Jackson
Aulander
Colerain
Merry Hill
Windsor
Ahoskie
Murfreesboro
Cofield
Tunbridge
Fishing Creek
Halifax
Roanoke Rapids
Lake Gaston
77°00'
77°15'
77°30'
77°45'
78°00'
36°30'
36°15'
36°00'

LOG OF WELL 134, AT SCOTLAND NECK, HALIFAX COUNTY

	Thickness (feet)	Depth (feet)
Pleistocene, Sunderland formation:		
Top soil	2	2
Clay, red, sandy	24	26
Sand, coarse, brown	25	41
Miocene, Yorktown formation:		
Marl, blue, with sand and shells	12	53
Clay, soft	5	58
Sand, gray, with oyster shells	21	79
Cretaceous (undifferentiated):		
Clay, tough	41	120
Clay, soft red	16	136
Pocket	2	138
Hard pan	2	140
Pocket	2	142
Clay, tough, red	21	163
Sand and clay, gray	16	179
Pocket	3	182
Clay, soft, red	28	210
Clay, tough, red		

NASH COUNTY

(Area 552 square miles, Population 55,608)

TOPOGRAPHY AND PHYSIOGRAPHY

Nash County lies mostly within the Piedmont (Physiographic) province, according to the definition used in this report. However, because the Pleistocene terraces cover considerable areas, the topography is not as mature as the topography which is typical of the piedmont farther west. The topography of the southern half of the county has been mapped and is included in the Rocky Mount, Spring Hope, and Kenly quadrangle maps of the U. S. Geological Survey.

The Sunderland terrace forms comparatively flat areas of considerable extent in a belt crossing the county from south to north and extending 3 to 5 miles west of the eastern boundary of the county. The Coharie terrace lies west of and roughly parallel to the Sunderland terrace. It has been dissected considerably more than the Sunderland, and, except for a few areas, it is quite rolling. However, it has not been dissected so much that it cannot be readily traced across the county. The highest terrace, the Brandywine, forms a very irregular belt extending north and south across the western half of the county. It has been thoroughly dissected and is difficult to trace, especially across that part of the county not mapped topographically. The surface of the western half of the county is quite rolling and should probably be classified as mature or sub-mature topography. The maximum relief is 150 to 200 feet.

The largest stream in Nash County is Tar River, which flows from west to east, in a very irregular course, across the county. This river leaves the county at Rocky Mount at the lowest elevation of any point in the county, about 72 feet. Tar River and its tributaries, of which the important ones in the county are Stony Creek and Sapony Creek, drains the central half of the county, while Fishing Creek, along the northern boundary, and Swift Creek, which enters Fishing Creek in Edgecombe County, drain the northern quarter of the county. The extreme southern part of the county is drained by Toisnot Swamp, Turkey Creek, and Moccasin Creek, all of which eventually flow into Contentnea Creek.

GEOLOGY

The entire county is underlain by crystalline rocks which crop out at the surface or are encountered at comparatively shallow depths below the surface. These crystallines consist of two types, the metamorphic slates, schists, and volcanic rocks of pre-Cambrian age, and the younger granites (Carboniferous?) which have been intruded in them. The areas occupied by these rocks are shown on the accompanying geologic map, plate 1. In the western part of the county, outcrops are numerous, and it is comparatively easy to trace the approximate contact between the granite and the metamorphic rocks. In the eastern part of the county, erosion has not cut through the overlying terrace deposits except along the larger streams making it difficult to map the contact accurately. However, the bedrock is exposed along these streams, and on a few road cuts, and additional information was obtained from owners of wells and from well drillers, and it is believed that the map is fairly accurate.

The Cretaceous deposits, which overlie the crystalline bedrock as it dips eastward under the Coastal Plain, are not definitely known to be present in Nash County, but their presence is inferred from logs of wells at Whitakers and Battleboro.

The Yorktown formation, of Miocene age, which lies on the irregular erosion surface of the Cretaceous strata east of Nash County, extends westward into Nash County in several places, upon the irregular surface of the granite. This formation consists of clay and shell marl with a few layers of sand and sandy clay. There

11,

are a number of abandoned marl pits along tributaries of the Tar River west and northwest of Rocky Mount. The westernmost occurrence reported is about 3 miles west of Rocky Mount, and marl is also reported along Beaverdam Swamp 3 or 4 miles west of Whitakers. Shell marl is reported in drilled and bored wells in South Rocky Mount, Rocky Mount, Battleboro, and Whitakers. The thickness of the Yorktown at Whitakers is apparently about 38 to 40 feet, and at Battleboro about 25 feet. The log of well 60, in South Rocky Mount, is not available; but as the well was in shell rock at 57 feet, the thickness probably is between 30 and 40 feet.

Unconformably overlying the Yorktown formation and the crystalline rocks are the Pleistocene formations. These crop out in roughly north-south belts across the county, their surfaces forming terraces of the same name. The formations consist of clay, sand, and sandy clays and average 20 to 30 feet in thickness but in some places may be as much as 50 or 60 feet thick.

GROUND WATER

There are a considerable number of drilled wells in the county, although most of the domestic wells are dug, bored, or driven. Most of the shallow domestic wells yield water from the terrace formation or from decayed and disintegrated rock in the upper part of the crystalline bedrock. Most drilled wells obtain their supplies from the crystalline rocks, with a few wells obtaining supplies from the Yorktown formation. Most of the western two-thirds of Nash County is underlain by the metamorphic slates and schists, and moderate supplies are obtained in this rock. A well at a cotton gin at Taylor's Store was reported to have yielded 60 gallons a minute. Pumped at the maximum capacity of a pitcher pump, about 15 gallons a minute, the water level lowered only to 3.5 feet below the surface, a drawdown of 2.5 feet. Several wells in the schist at Red Oak yield from 20 to 45 gallons a minute, each. The main city well at Nashville yields 300 gallons a minute, while several others yield 25 to 100 gallons a minute. The two town wells at Spring Hope yield 75 and 155 gallons a minute each and a number of others yield from 20 to 40 gallons a minute each. Around Bailey and Middlesex are a number of wells which yield from 20 to 50 or more gallons a minute. Besides the examples given, which are 6 or 8-inch wells, a large number of 1¼-inch jetted or "washed down" wells are used for domestic purposes. The discussion of this type of well on page 16 applies particularly to Nash and Wilson Counties. These wells usually yield satisfactory supplies for domestic purposes. Wells drilled in the granite area around and south of Castalia, have usually not been so successful as a well in the metamorphic rock, and several wells in this granite area have been complete failures. Wells drilled in the granite belt in the eastern third of the county show considerable variation in yield. Yields from 0 to 45 gallons a minute are reported. It appears that wells drilled in the granite along the western margin of the belt, near the contact with schist, are considerably better than wells drilled farther from the contact. The average yield of five wells in the granite near the contact is about 16 gallons a minute while the average yield of 18 wells, two or more miles from the contact, is about 9 gallons a minute.

A few wells near Rocky Mount and at Whitakers are drilled or bored into more sandy strata of the Yorktown formation. Usually the supply is small and a number of wells in this formation have been abandoned because of the bad taste and odor of the water.

There are a number of springs in Nash County, a few of which furnish domestic water supplies. Most of these are either depression or contact springs. Most of them furnish only a few gallons a minute. One of the strongest, on the farm of J. W. Moore, about one mile south of Red Oak, flows about 40 gallons a minute. This is a contact spring, the water issuing at the base of a permeable arkosic sand stratum lying upon an impermeable clay stratum, both of which belong to the Coharie formation. There is a thin band of gravelly sand just above the clay. The water issues from this layer several feet above the bottom, in the side of a gulley. A hydraulic ram is used to deliver water to an elevated tank. A spring at Rocky Cross, about 3 miles west of Samaria, yields about 16 gallons a minute. It issues from the ground near the base of a hill and also appears to be a contact spring. A masive quartz vein, cutting across the slope, apparently acts as a barrier to downward percolation and forces the water to the surface at this point. The water is used for domestic purposes and for cattle. Harris Spring in Taylor Park at Rocky Mount is another contact spring, brought to the surface by the intersection of underlying massive granite with the surface. The main spring, emptying into a round concrete basin, yields about 1 gallon per minute, and there are a number of other small seeps in addition.

Analyses of water from eight wells and one spring are given in the table of analyses. The water from wells 11 and 157, from a sand stratum in the Pleistocene formations, is very soft and potable, but that from well 11

contains an excessive amount of iron. Analyses 48, 85, 128, 153, and 215 are from wells drilled in schist. All of the samples were moderately soft, averaging about 50 parts per million, and very potable. The iron content was very low in all these samples, although a number of wells drilled in the schist have excessive iron.

The anaysis of well 53, at Battleboro, drilled in granite, shows a very much harder water, with a large percentage of sodium bicarbonate, than the other samples from this county.

The analyses of the water from the spring, Rocky Cross, show a soft water, very low in mineral content and is characteristic of shallow ground water.

MUNICIPAL SUPPLIES

There are seven public water supplies in Nash County, and six of them are from wells. All of these supplies are municipally owned.

Bailey completed its water supply in 1942. The source of the supply is well 191, drilled 247 feet deep with a yield of 40 gallons a minute. The water comes from the metamorphic rock of pre-Cambrian (?) age; the water is pumped with a deep-well turbine pump which discharges directly into the mains. A 100,000-gallon elevated tank, interconnected to the system, serves as storage and to maintain a uniform pressure. Average consumption is 40,000 gallons a day, about 30 percent of this being used by the railroad. The water is treated.

The public supply at Battleboro, which was installed in 1942, is obtained from a drilled well 250 feet deep, 54 in the table; the log of this well is given on page 57. It yields 25 gallons a minute and is pumped with a deep-well turbine pump that discharges directly into the distribution system. A 75,000-gallon elevated tank is interconnected in the system and serves as storage and to equalize the pressure, which varies between 40-and 55 pounds. Well 53, at the Battleboro Cotton Oil Mill is connected with the distribution system and can be used in emergencies. Average consumption is about 6,000 gallons a day. The water is not treated. Analysis of the water from well 53 is given in the table.

Middlesex has had a municipal supply since 1934, and obtains its water from two drilled wells, 215 and 216 in the table, which were drilled about 1908 for the Montgomery Lumber Company who had a complete water system for the mill village. The mills have long been abandoned, and in 1934 the wells were cleaned out for use by the town. Well 215 is the main supply, and it is equipped with a deep-well turbine pump with a capacity of 50 gallons a minute. Well 216, equipped with a 25-gallon-a-minute deep-well piston pump, is used as an auxiliary well and is reported to have a capacity of more than 50 gallons a minute. The water is pumped directly from the wells into the distribution system. A 30,000-gallon elevated tank furnishes storage capacity and maintains a pressure of 30 to 40 pounds. Average consumption is about 13,000 gallons a day. The water is not treated. Analysis of water from well 215 is given in the table of analyses.

Nashville has had a city supply since 1915. The source is two drilled wells, 85 and 86 in the table, which yield 300 and 55 gallons a minute, respectively. They are both equipped with deep-water turbine pumps. The pump at well 85 discharges directly into the mains at the rate of 250 gallons a minute. A 60,000-gallon elevated tank is connected with the distribution system for storage and to maintain a uniform presure. The other well, used as an auxiliary supply, discharges into a 110,000-gallon, round concrete tank at ground level. Three pumps are available to force the water from the concrete reservoir into the distributing system. The water pressure in the system ranges from 40 to 50 pounds. Consumption averages about 50,000 gallons a day. The only treatment consists of the addition of sodium hydroxide directly into the distribution system at well 85. Analysis of the untreated water from this well is given in the table of analyses.

Rocky Mount has had a municipal supply since 1888. From 1888 to 1909 the water was taken from Stony Creek but since 1909 has been obtained from Tar River. The pumping and treatment plant is on the bank of the river at the western edge of the city. After treatment with alum, lime, and charcoal, the water is filtered and settled and then ammonia and chlorine are added. Clear water storage consists of one 1,500,000 and one 500,000-gallons reservoirs. Two electrically-driven and one gasoline-driven pumps force the water into the main. A 1,000,000-gallon elevated tank in the eastern part of the city serves as additional storage and to maintain pressure on the mains which ranges from 50 to 55 pounds. The capacity of the plant is 6,750,000 gallons a day; maximum consumption is about 2,500,000 and averages about 2,000,000 gallons a day. About 50 percent of the water is used by industries.

13.

Spring Hope has had a municipal water supply since 1920. The water is obtained from two drilled wells, 128 and 129 in the table, which have a capacity of 155 and 80 gallons a minute, respectively. Both are equipped with deep-well turbine pumps which discharge directly into the distribution system. A 100,000-gallon elevated tank is the only storage. Pressure varies between 40 and 45 pounds, and consumption averages about 75,000 gallons a day. The water is not treated. Analysis of the water from well 128, which is the main supply, is given in the table of chemical analyses.

The water supply of the town of Whitakers was installed in 1937. A number of test wells were drilled, one to 405 feet, with poor results. Logs of these wells are given. Well 12 was completed satisfactorily and tested at 40 gallons a minute for 36 hours. However, after using this well for several years, the yield decreased, and it was found necessary to provide more water. The present supply consists of 30 wells in three lines 50 feet apart. The wells are about 20 feet apart in each line. They are 1½ inches in diameter and average about 27½ feet in depth. They were jetted down using a jetting point with a screen. The yield of the individual wells is reported to have been 18 to 40 gallons a minute each, but the total combined yield for the field was 90 gallons a minute on a 36-hour test. These wells were put in service in 1941. The well field is pumped with a piston-vacuum pump at the pumping and treatment plant. Treatment consists of pre-chlorination, areation, addition of lime and alum, settling and filtering. A centrifugal pump with a capacity of 75 gallons a minute forces the water into the distribution system. A 75,000-gallon elevated tank, near the center of town, serves as storage and to maintain the pressure, which averages about 50 pounds. Maximum consumption is about 50,000 gallons and the average is about 20,000 gallons a day. Analyses of the untreated water is given under 11 in the table of analyses.

RECORDS OF WELLS IN NASH COUNTY

Well Number	Location	Owner	Driller	Type of Well	Depth of Well (feet)	Diameter of Well (inches)	Geologic Formation and Chief Aquifer	Depth to Water level (feet)	Yield Gallons Per Minute	Remarks
1	Taylor's Store	J. T. Taylor, Ben Bailey	Hester Well Co.	drilled	57.3	6	Schist		10	Cased 65 feet.
2	Aventon	F. D. Avent, Cotton Gin	R. L. Jones	drilled	165	6	Schist		10±	Abandoned.
3	Aventon	Walter P. Avent	R. L. Jones	drilled	185	6	Schist			
4	Aventon	J. H. Jurnigan	R. L. Jones (?)	drilled	76	4	Schist	30±		Cased 45 feet. Not in use.
5	Aventon	T. M. Ward, Tenant house	John Brandie	jetted	33	1¼	Schist	25–30	4–5	Cased 35 feet.
6	Whitakers	Mrs. O. S. Woody	C. W. Norton	drilled	105	4	Granite	15±	4–5	Cased 105 feet. Not in use since town system was installed.
7	Whitakers	Mrs. T. N. Partin	C. W. Norton	drilled	73	4	Granite		5–6	Not in use since town system was installed.
8	Whitakers	Mrs. J. C. Braswell	C. W. Norton	drilled	187	6	Granite			Not in use since town system was installed.
9	Whitakers	L. L. Draughon	C. W. Norton	drilled	153	6	Granite	9	4–5	Not in use since town system was installed.
10a	Whitakers	Mrs. G. W. Taylor	R. L. Jones (?)	drilled	100±	4	Granite	5		Pitcher pump used: good supply reported.
10b	Whitakers	Town	Hester Well Co.	drilled	126	4	Sandstone ?			Test well no 1, "sandstone" at 125 feet.
10c	Whitakers	Town	Hester Well Co.	drilled	82	4	Granite ?			Test well no. 2, see log.
10d	Whitakers	Town	Hester Well Co.	drilled	200	4	?		0	Test well no 3, marine clay with sand and shells to bottom reported.
10e	Whitakers	Town	Virginia Machinery & Well Company	drilled	405	8	Granite		0	Test well, see log. Cased 157 feet.
10f	Whitakers	J. M. Ethridge	Hester Well Co.	drilled	50	4	Cretaceous, sandstone?		12	Cased 48 feet.
10g	Whitakers	Z. E. Mann		drilled	60	[illegible]	Cretaceous, sandstone?		7	Cased 50 feet.
11	Whitakers	Town	Hester Well Co.	jetted	27½	1½	Sunderland, sand		18–40	Battery of 30 wells in field. Combined yield 90 gallons per minute on 36-hour test. See analysis.
12	Whitakers	Town	Hester Well Co.	drilled	52	4	Yorktown, sand		40–20	Yielded 40 gallons per minute at first; decreased to 20 gallons per minute. See log.
13	Whitakers	Whitakers School	C. W. Norton	drilled	100	6	Yorktown, marl		8	Bottom is gravel packed. Water reported to contain iron.

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RECORDS OF WELLS IN NASH COUNTY—*Continued*

Well Number	Location	Owner	Driller	Type of Well	Depth of Well (feet)	Diameter of Well (inches)	Geologic Formation and Chief Aquifer	Depth to Water Level (feet)	Yield Gallons Per Minute	Remarks
14a	Hillardston	L. F. Williams	R. L. Jones	drilled	165	4½	Schist	30±	¾	Abandoned; water never cleared up. Cased 160 feet.
14b	Hillardston	W. F. Woodruff	Hester Well Co.	drilled	118	6	Slate			Cased 86 feet.
15	Taylor's Store	Cedar Grove School	John Broadie	jetted	55	1¼	High-level gravels.		3-4	Cased to bottom.
16	Taylor's Store	Griffin school	C. W. Norton	drilled	[illegible]	6	Schist	8-10	40	Yields water from quartz veins. Cased 66 feet.
17	Taylor's Store	J. T. Taylor, Cotton Gin	R. L. Jones	drilled	60	6	Schist		60	Cased to bottom. Used for cooling oil engine at cotton gin. Pumping 15 gallons a minute, with pitcher pump only lowered water level 3.5 feet.
18	Taylor's Store	W. B. Taylor	(?)	jetted	160	1¼	Schist		2-3	Cased 110 feet.
19	Taylor's Store	J. T. Taylor	Suggs	jetted	138	1¼	Schist		4-5	Cased 120 feet.
20	Castalia	C. W. Lassiter Cotton Gin	(?)	drilled	30	6	Granite	15	10±	Not used; formerly supplied boiler for cotton gin.
21	Castalia	L. W. Bobbitt	John Broadie	jetted	104.8	1¼	Granite		107	Cased 100 feet.
22	Castalia	W. J. Lancaster	C. W. Norton	drilled	400	4½	Granite		0	
23	Castalia	Castalia School	C. W. Norton	drilled	110	6	Granite	20±	8-10	Cased 75 feet. Maximum yield is 10 gallons a minute
24	Castalia	Roy C. Pullen	John Broadie	jetted	47	1¼	Weathered Granite	20±	6	
25	Castalia	Roy C. Pullen	Sydnor Pump & Well Company	drilled	20+	6	Granite		0	Granite very close to surface.
26	Spring Hope	E. D. May	C. W. Norton	drilled	132	5	Granite	23	207	Rock at 66 feet. Cased 98 feet.
27	Spring Hope	B. E. Morgan, Hugh Worter	Hester Well Co.	drilled	101	5	Granite		5	Cased 97 feet.
28	Nashville	O. M. Strickland Boddie Mill Farm	Sydnor Pump & Well Company	drilled	75	6	Schist ?		0.5	Cased 10 feet.
29	Nashville	O. M. Strickland M. W. Nelms	Hester Well Co.	drilled	187	6	Schist		10	Cased 132 feet.
30	Nashville	Snow Hill School	Powell	jetted	108	1¼	Schist		4-5	Cased 86 feet.
31	Nashville	H. E. Chappell	John Broadie	jetted	148	1¼	Schist			Cased 125 feet.
32a	Nashville	Wm. G. Collins	John Broadie	jetted	48	1¼	Schist	25±	5	Cased 45 feet. Abandoned during drought of 1941-42. Water level too low for vacuum pump.
32b	Nashville	Wm. G. Collins	Hester Well Co.	drilled	76	6	Schist		20	Drilled in 1942. Cased 29 feet.
33	Taylor's Store	W. T. Williams		drilled	190	6	Schist	?	8-10	Reported 190 feet deep, measured 63 feet deep January 7, 1943. Not in use.
34	Taylor's Store	W. T. Williams, H. G. Williams	Charlie Griffins	jetted	90	1¼	Schist	10-12		
35	Red Oak	Fred McIntyre	R. L. Jones	drilled	119	6	Schist		20	Cased about 40 feet.
36	Red Oak	Rev. R. L. Mays	Tom Taylor	jetted	65	1¼	Schist		6-7	Cased to bottom.
37	Red Oak	N. E. Bass, Smith	J. W. Moore	jetted	98	1¼	Schist	12±	10	Cased 66 feet. Not in use.
38	Red Oak	Mrs. H. D. Griffin	R. L. Jones	drilled	122	6¼	Schist		20	
39	Red Oak	Red Oak School	R. L. Jones	drilled	130	6	Schist		15-20	Cased 100 feet. Abandoned; well caved in.
40	Red Oak	Red Oak School	Hester Well Co.	drilled	125	8	Schist		45	Cased 98 feet.
41	Red Oak	Mrs. G. E. May		bored	20	6	Coharie sand		7½	Clay tile casing to bottom; 1¼-inch draw pipe
42	Red Oak	J. W. Moore	J. W. Moore	jetted	97	6-2	Schist	30±	5-6	Cased 18 feet. Not used.
43	Red Oak	J. W. Moore		dug	25±	27	Coharie clay	22½		
44	Red Oak	R. T. Whitfield	Arch Bobbitt	drilled	90	4	Schist	12±	10	Cased 86 feet.
45	Red Oak	J. A. Tharrington	A. R. Bobbitt	drilled	92	6	Schist	20±	10	Cased 90 feet.
46	Red Oak	H. O. Coley	C. W. Norton	drilled	125	6	Granite	20±	207	Cased 80 feet.
47	Red Oak	J. R. Ellen	Truby	drilled	78	6	Granite	20±	5-6	Cased 66 feet. Water contains iron.
48	Red Oak	John Griffin	Hester Well Co.	drilled	144	6	Schist ?	20±	20	Cased 107 feet. "Soft rock"; analysis in table. Temperature 61.5°F.
[illegible]	Rocky Mount	[illegible]	R. T. Jones	drilled	[illegible]	[illegible]	[illegible]		6	Cased about 40 feet.
[illegible]	[illegible]	[illegible]	Jones & Bobbitt	drilled	150	[illegible]	[illegible]			[illegible]

15.

RECORDS OF WELLS IN NASH COUNTY—*Continued*

Well number	Location	Owner	Driller	Type of Well	Depth of Well (feet)	Diameter of Well (inches)	Geologic Formation and Chief Aquifer	Depth to Water Level (feet)	Yield Gallons Per Minute	Remarks
51	Battleboro	J. C. Braswell L. T. Warren		drilled	140	5	Granite	15±	4-6	Cased 40 feet.
52	Battleboro	J. T. Fisher	J. K. Bridges	drilled	152	3	Granite	12-14	8-10	Cased 100 feet. Water reported to be slightly hard.
53	Battleboro	Battleboro Cotton Oil Co.	J. K. Bridges	drilled	140	6	Granite	20±	25	Cased 125 feet. Connected with town water system. Analysis in table.
54	Battleboro	Town	White Well Co.	drilled	250	8	Granite	56?	40	Cased 175 feet. Log given. First well drilled encountered granite at 165 feet and failed to yield sufficient water.
55	Rocky Mount	R. T. Griffin, Jr.	Hester Well Co.	drilled	200	4	Granite	19	5	Cased 100 feet.
56	Rocky Mount	R. T. Griffin, Jr.	R. T. Griffin	bored	60	4	Sunderland, sand and clay	20±	½	Cased 25 feet, with tile.
57	Rocky Mount	T. E. Jolliet M. B. Vendrick		drilled	180	4	Granite		6-8	
58	Rocky Mount	Nash Brick Co.	(?)	drilled	140	4	Granite ?		7	Abandoned: supply insufficient.
59a	Rocky Mount	C. S. Blount	Hester Well Co.	drilled	55	4	Yorktown (?), shell rock			Cased 45 feet. Abundant supply.
59b	Rocky Mount	L. I. McCall	(?)	bored	55	4	Yorktown (?), shell marl		½	Cased to bottom.
60a	Rocky Mount	W. B. Riley	Hester Well Co.	drilled	57	4	Yorktown (?), shell rock	11±	12	Cased 53 feet. Water reported to be hard.
60b	Rocky Mount	W. A. Crandall	Hester Well Co.	drilled	40	6	Granite	15-20	8	Cased 25 feet. Use vacuum pump.
60c	Rocky Mount	L. A. Simmons	Hester Well Co.	drilled	60	4	Granite		21	Contains no iron.
61a	Rocky Mount	Williford School	C. W. Norton	drilled	150	6	Granite	8±	10	Cased 35 feet.
61b	Rocky Mount	C. T. Colbert	Hester Well Co.	drilled	36	6	Granite		3½	Cased 11 feet.
62	Rocky Mount	H. A. Easley	C. W. Norton (?)	drilled	80	4	Granite	1±		Cased 12 feet. Flows into pool just below surface.
63	Rocky Mount	Carolina Power & Light Co.	Hester Well Co.	drilled	97	6	Weathered granite	5±	8	Cased 73 feet. Water reported to be hard.
64	Rocky Mount	P. H. Johnson	A. R. Bobbitt	drilled	44	6	Granite		0	Cased 22 feet.
65	Rocky Mount	A. S. Jarlett		dug	16	24		12		
66	Rocky Mount	J. B. Overton	A. R. Bobbitt	drilled	52	4	Granite	16	6.5	Cased 42 feet.
67	Rocky Mount	Beaverdam Country Club	A. R. Bobbitt	drilled	55	4	Granite		0	Cased 48 feet.
68	Rocky Mount	Beaverdam Country Club	A. R. Bobbitt	drilled	55	4	Granite		3±	Cased about 48 feet.
69	Rocky Mount	Jefferies School	Powell	jetted	50	1¼	Weathered granite	25±	3-4	Cased to bottom.
70a	Rocky Mount	C. G. Shearin, Texaco Station		dug	30	36	Sunderland, sandy clay	9		
70b	Rocky Mount	S. E. Ballentine	Hester Well Co.	drilled	36	4	Granite		5	Cased 30 feet.
70c	Rocky Mount	S. E. Ballentine	Hester Well Co.	drilled	35	4	Granite		5	Cased 10 feet.
[illegible]	Rocky Mount	Little Easonburg School (Colored)	John Broadie	jetted	45	1¼	Slate or schist		5	Cased 30 feet.
72	Easonburg	Macklin Colored School	John Broadie	jetted	60	1¼	Slate or schist	Jows	10	Cased to bottom. Flows ½ gallon a minute.
73	Easonburg	F. W. Langley	C. W. Norton	drilled	40	6	Granite ?	4½	10	
74	Easonburg	S. B. Weaver	C. W. Norton	drilled	65	6	Granite ?	15±	10-12	Cased 25 feet.
75	Nashville	Jim Battles	John Broadie	jetted	65	1¼	Slate		5	Cased 60 feet.
76	Nashville	K. E. Bone	John Broadie	jetted	103	2	Schist	23	6	Cased 93 feet.
77	Nashville	K. E. Bone	John Broadie	jetted	104	1¼	Schist		5	Cased 65 feet.
78	Westry	Oak Level School	A. R. Bobbitt	drilled	101	6	Triassic dike (?), diabase ?		6	Cased 75 feet.
79	Westry	DeLeon Carter	C. W. Norton	drilled	140	[illegible]	Schist		4+	
80a	Westry	R. E. Bunn	Jenkins	jetted	83	1¼	Schist		2-3	Cased 80 feet. Water contains some iron.
80b	Westry	R. L. Dozier	Hester Well Co.	drilled	109	6½	Slate		20	Cased 96 feet.
81	Westry	M. Williamson, Robt. Davis		jetted	58	1¼	Slate	34		Not used because water level is below limit of lift of vacuum pump.
82	Nashville	Clarence Beal	Jenkins	jetted	103	1¼	Slate			
83	Nashville	Nashville Lumber Co.	C. W. Norton	drilled	100	6	Slate and schist	20±	5	
84	Nashville	Nashville Supply & Gin Co.	Roberson	drilled	180	6	Schist	5±	26	Not used at present. Formerly used to help supply town in periods of emergency.
85	Nashville	Town	Sydner Pump & Well Co.	drilled	239.3	8	Schist	10±	300	Analysis in table.

16.

REFERENCE NO. 10

Enter [illegible] (in parentheses) ([illegible])
or a command: HELP, HELP option, BACK, CLEAR, EXIT, TUTOR
GEMS>

COVERAGE
========

STATE	COUNTY	STATE NAME	COUNTY NAME
37	65	North Carolina	Edgecombe Co
37	83	North Carolina	Halifax Co
37	127	North Carolina	Nash Co

CENTER POINT AT STATE : 37 North Carolina
COUNTY : 127 Nash Co

Press RETURN key to continue...

REGION OF THE COUNTRY
==========

Zipcode found: 27809 at a distance of 4.8 Km

STATE	CITY NAME	FIPSCODE	LATITUDE	LONGITUDE
NC	BATTLEBORO	37127	36.0383	77.7533

Press RETURN key to continue ...

CENSUS DATA
==========

Torpedo Wire
LATITUDE 36: 0:20 LONGITUDE 77:47:18 1990 HOUSING

RM	0.00-.400	.400-.800	.800-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	0	0	2	0	32	34
S 2	0	0	0	11	2	316	329
S 3	0	0	14	9	0	350	373
S 4	0	3	59	149	0	105	316
S 5	0	0	0	1739	41	1883	3663
S 6	0	0	79	255	397	533	1264
S 7	0	0	0	33	101	127	261
S 8	0	0	38	0	233	0	271
ING TOTALS	0	3	190	2198	774	3346	6511
	26 *	26 *					

Press RETURN key to continue ...

* = house count

REFERENCE NO. 11

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Waterloo, Ontario

GROUNDWATER

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

Table 2.2 Range of Values of Hydraulic Conductivity and Permeability

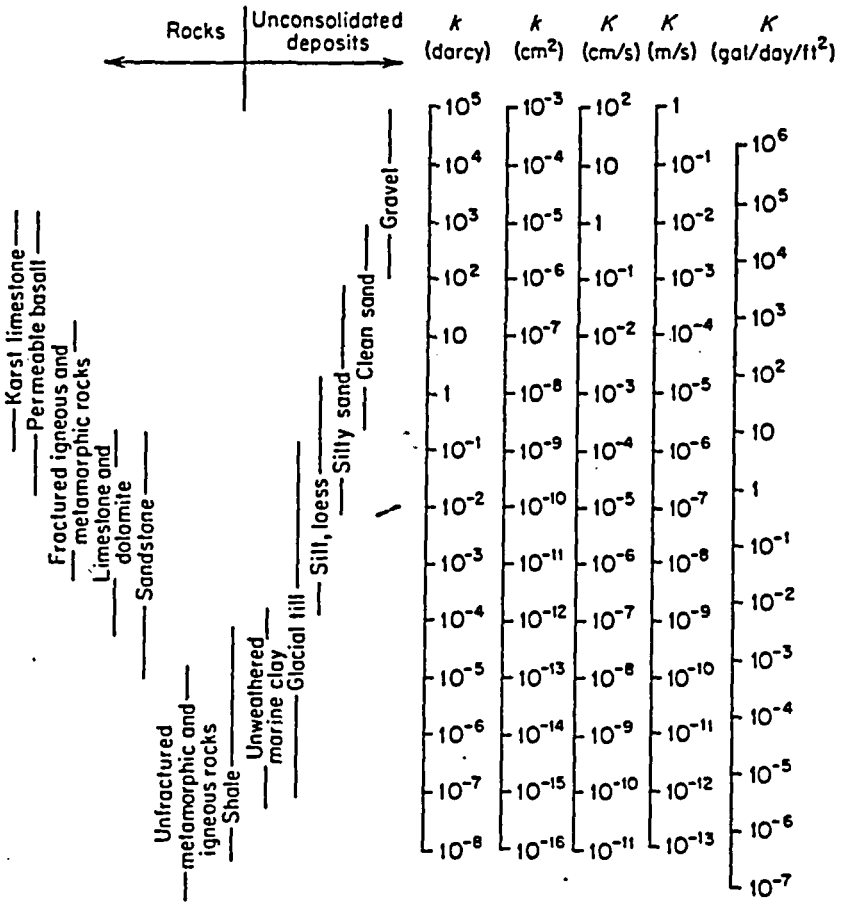
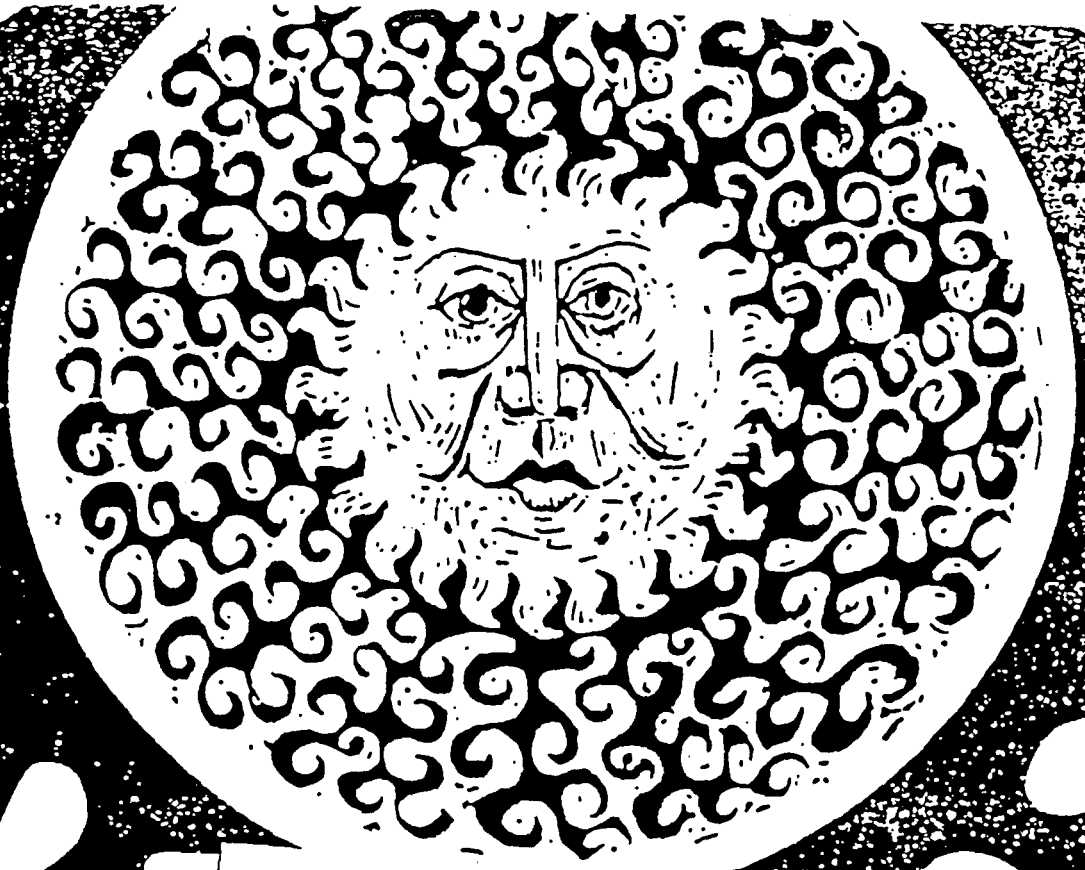


Table 2.3 Conversion Factors for Permeability and Hydraulic Conductivity Units

	Permeability, k*			Hydraulic conductivity, K		
	cm^2	ft^2	darcy	m/s	ft/s	U.S. gal/day/ft^2
cm^2	1	1.08×10^{-3}	1.01×10^{8}	9.80×10^{2}	3.22×10^{3}	1.85×10^{9}
ft^2	9.29×10^{2}	1	9.42×10^{10}	9.11×10^{5}	2.99×10^{6}	1.71×10^{12}
darcy	9.87×10^{-9}	1.06×10^{-11}	1	9.66×10^{-6}	3.17×10^{-5}	1.82×10^{1}
m/s	1.02×10^{-3}	1.10×10^{-6}	1.04×10^{5}	1	3.28	2.12×10^{6}
ft/s	3.11×10^{-4}	3.35×10^{-7}	3.15×10^{4}	3.05×10^{-1}	1	6.46×10^{5}
U.S. gal/day/ft^2	5.42×10^{-10}	5.83×10^{-13}	5.49×10^{-2}	4.72×10^{-7}	1.55×10^{-6}	1

*To obtain k in ft^2, multiply k in cm^2 by 1.08×10^{-3}.

REFERENCE NO. 12



CLIMATIC ATLAS OF THE UNITED STATES

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U.S. DEPARTMENT OF COMMI
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ENVIRONMENTAL SCIENCE SERVICES ADMII
Robert M. White, Administrator

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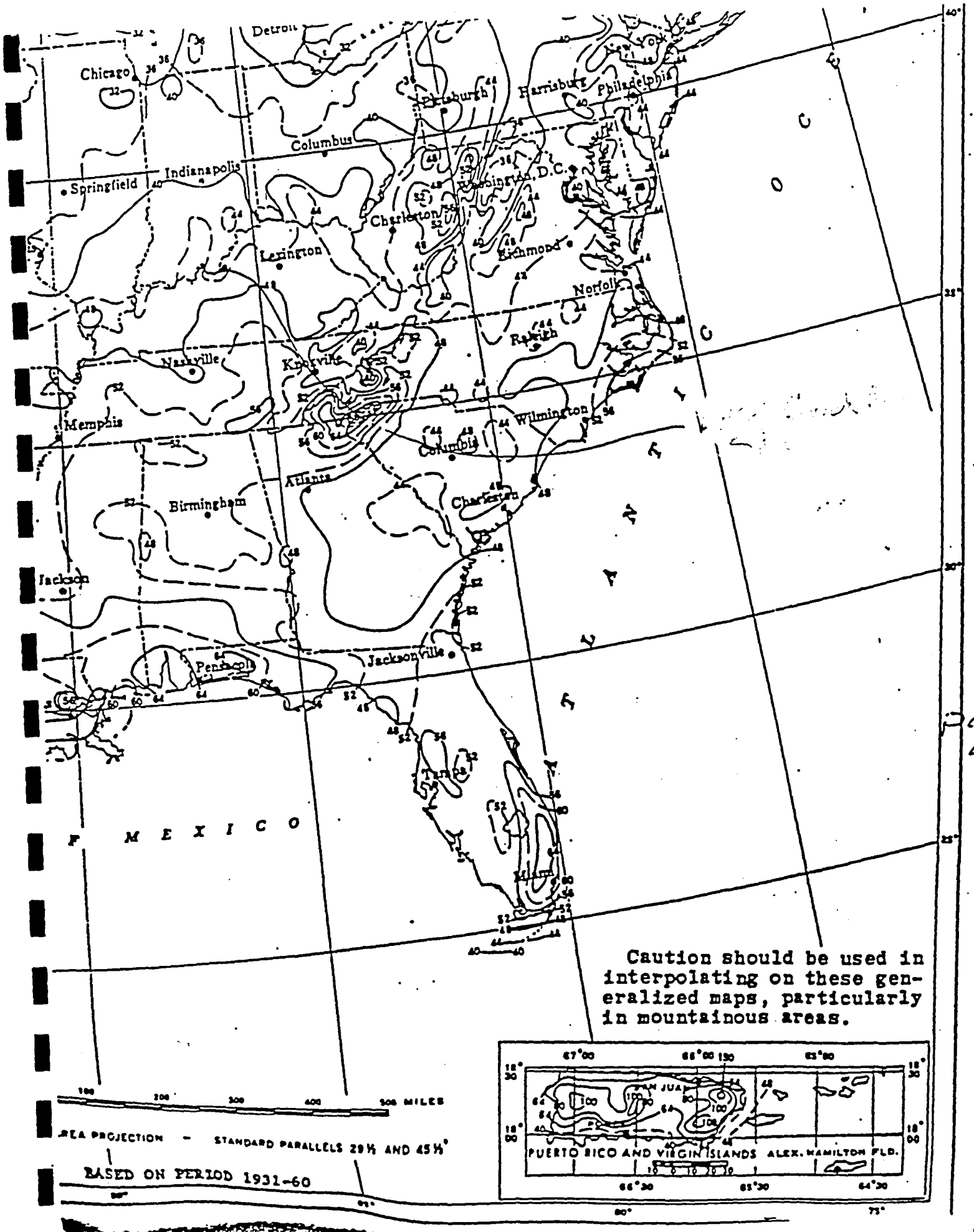
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Atlanta
Birmingham
Charleston
Jackson
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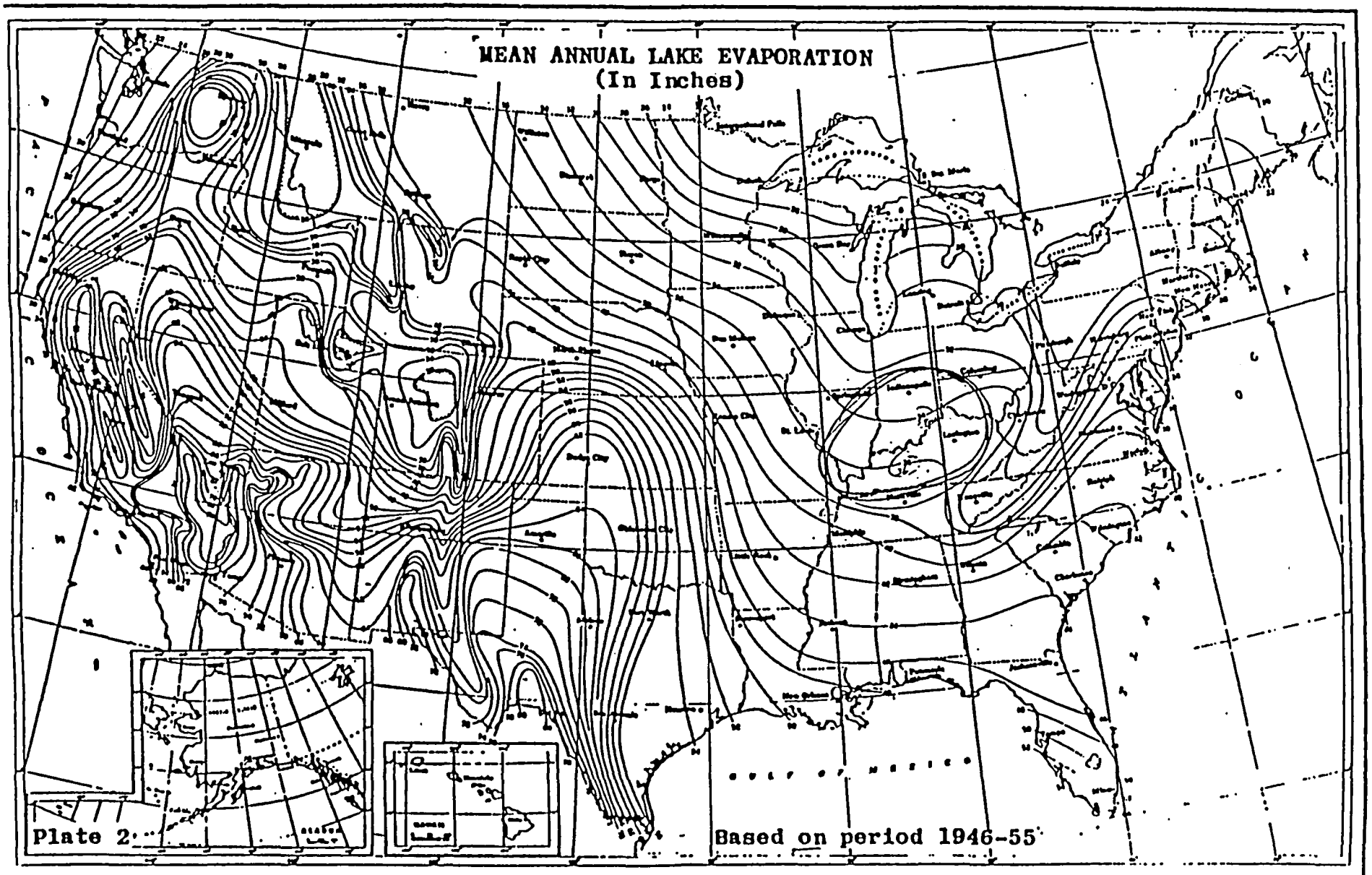
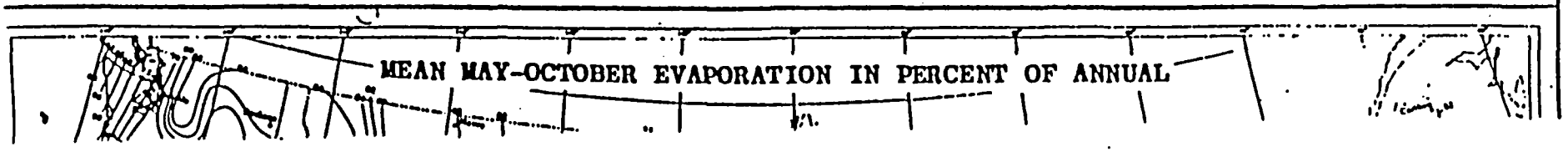
Pensacola
Tampa
Miami
MEXICO
ATLANTIC OCEAN
Caution should be used in interpolating on these generalized maps, particularly in mountainous areas.
100 200 300 400 500 MILES
AREA PROJECTION — STANDARD PARALLELS 29½ AND 45½°
BASED ON PERIOD 1931-60
PUERTO RICO AND VIRGIN ISLANDS
SAN JUAN
ALEX. HAMILTON FLD.

P9
43

AKE EVAPORATION





REFERENCE NO. 13

PB87-101580

United States
Department of
Agriculture

Soil
Conservation
Service

Engineering
Division

Technical
Release 55

June 1986

Urban Hydrology for Small Watersheds

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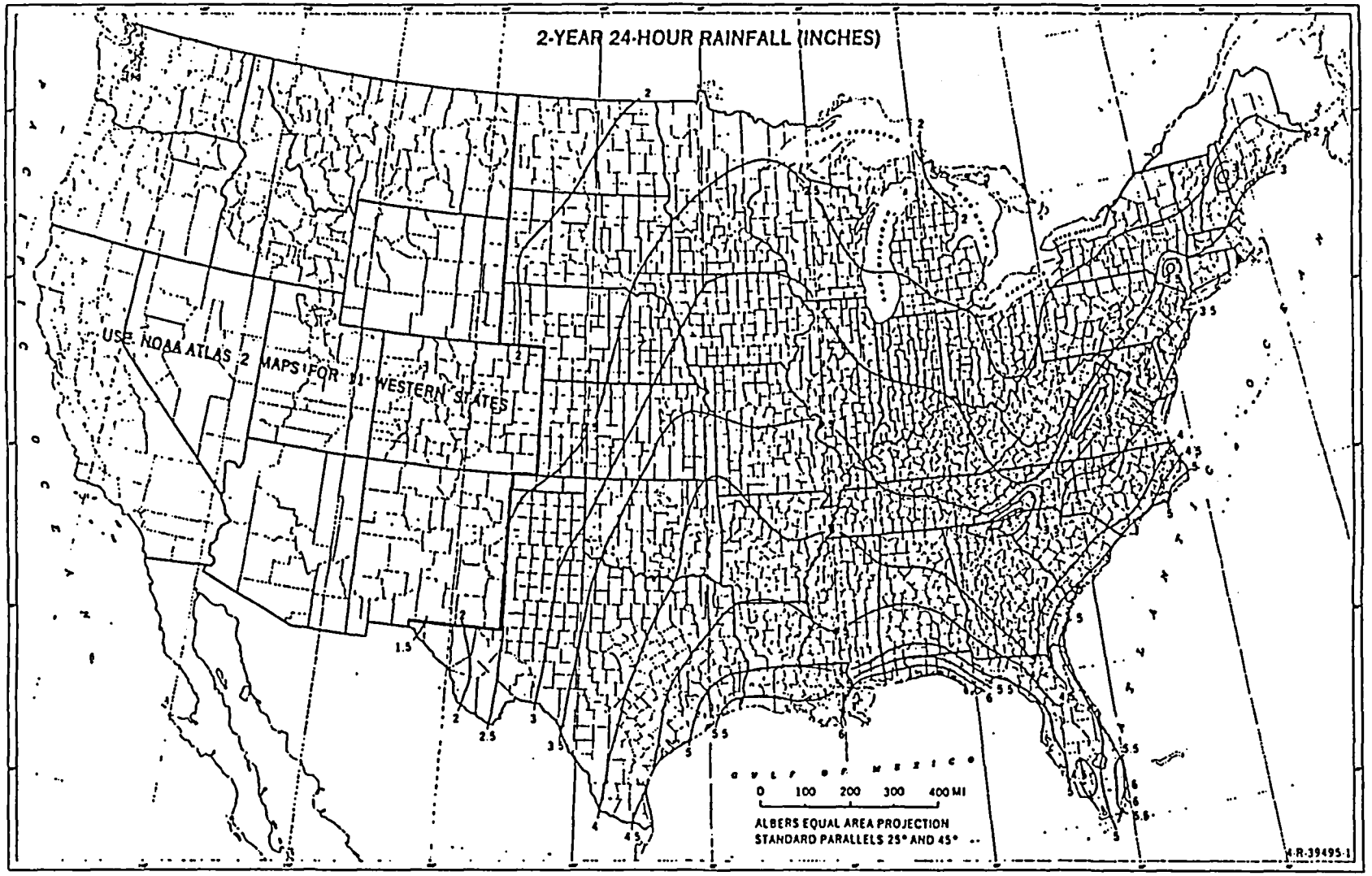


Figure B-3.—Two-year, 24-hour rainfall.

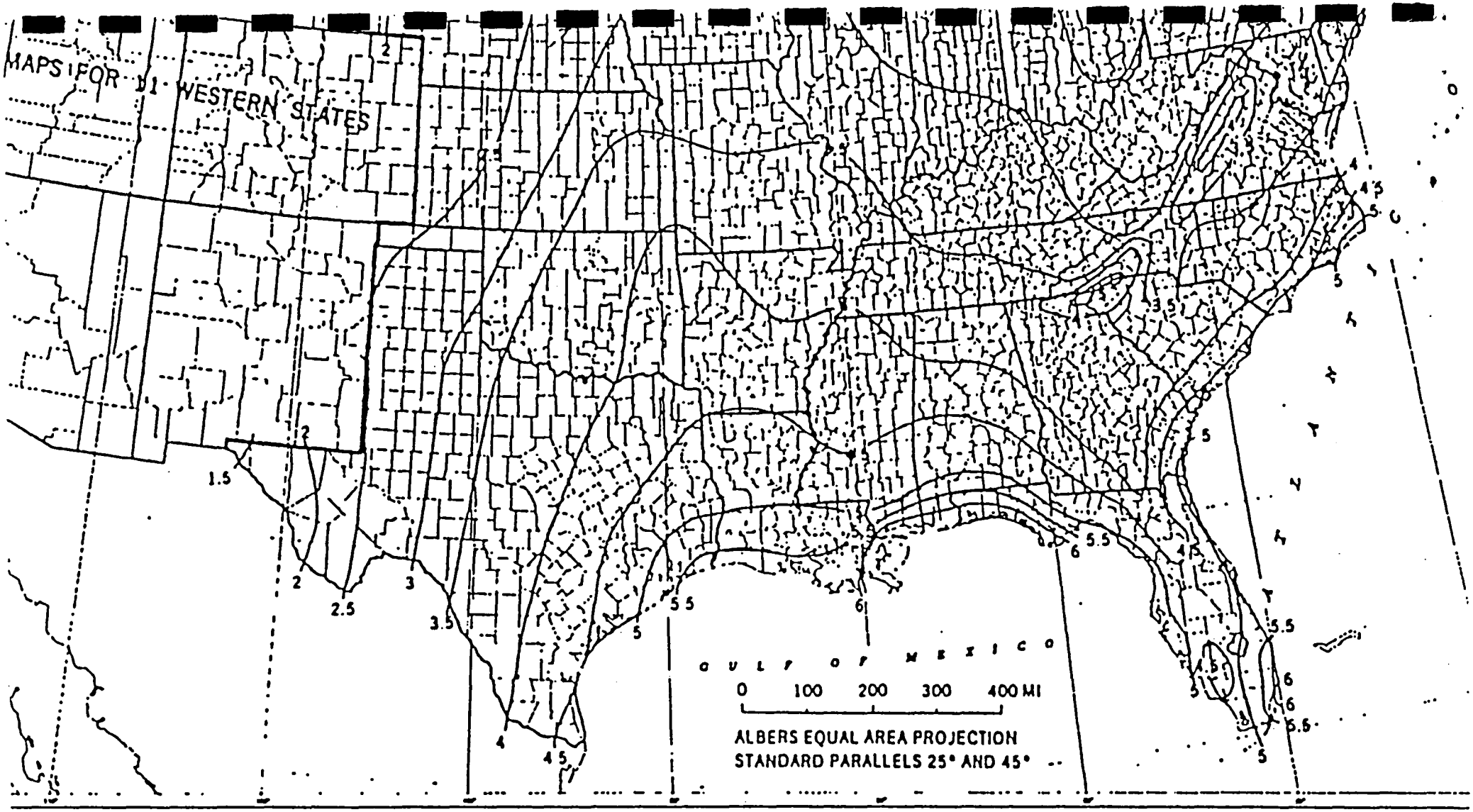


Figure B-3.—Two-year, 24-hour rainfall.

REFERENCE NO. 14

NUS CORPORATION AND SUBSIDIARIES **TELECON NOTE**

CONTROL NO. F4-9002-62	DATE: April 25, 1990	TIME: 1630

DISTRIBUTION:

BETWEEN: Marsha Bissett, Engineer	OF: Rocky Mount Water Company	PHONE: 919-972-1126

AND: Sherry Durren, NUS Corporation SD 4/30/90 Sherry Durren

DISCUSSION:

Rocky Mount Water Company has two surface water intakes, Sunset Avenue and Tar River Reservoir (near Easonburg). Ms. Bissett suggested I call Paul Blount (919-972-1291) for more information on the water system. Water lines have been added in the past two weeks to the following roads: Highway 48 between Drake and Gold Rock, Business 95 from 301 to 48, and 1400 from 1902 to Battleboro. Hook-up is optional.

REFERENCE NO. 15

NUS CORPORATION AND SUBSIDIARIES **TELECON NOTE**

CONTROL NO. NCX3IS	DATE: 5/1/90	TIME: 1000

DISTRIBUTION:

F4-9002-62

BETWEEN: Paul Blount, Dir. of Water Resources	OF: City of Rocky Mount	PHONE: (919) 972-1291

AND: Sherry Durren, NUS FIT 4

Sherry Durren 5/3/90

DISCUSSION:

Dortches Water Company serves the incorporated area of Dortches which is a 1.5 mile (radius) circle around the intersection of Highway 43 and State Route 1527. The mayor of Dortches is John Griffin, and he can best be reached by mail. The zip code is 27804, the same as Rocky Mount. Lines from Rocky Mount north toward Gold Rock were added because of a problem with radon in the groundwater. Lines added along 1400 and 1402 are to serve the new Cogentrix plant which manufactures steam. The Tar River Reservoir south of Rocky Mount is located on State Route 1748, off of State Route 1717. Phone number for Dortches Town Hall is (919) 443-9131.

REFERENCE NO. 16

NUS CORPORATION AND SUBSIDIARIES **TELECON NOTE**

CONTROL NO. NCX3IS	DATE: May 3, 1990	TIME: 0930

DISTRIBUTION:

Torpedo Wire & Strip, Inc.
F4-9002-62

BETWEEN: Bill Collart, Fisheries Biologist	OF: North Carolina Wildlife Resources	PHONE: (919) 942-0858

AND: Sherry Durren, NUS Corporation

S. Durren 5/5/90

DISCUSSION:

Compass Creek drains a swamp. Its average width is 18 feet. There is recreational fishing off the bank, no commercial fishing. The redfin pickerel and sunfish are the dominant species. The northside of the creek is industrial, the southside is agricultural. Water from the creek is used for irrigation but it's not a major source.

Fishing in the Tar River is primarily recreational. There may be limited commercial fishing. The striped bass, American shad and hickory shad make runs upriver to the Tar River Reservoir where the dam is. Mr. Collart had no information on standing crop or quantity. The area of the Tar River near Rocky Mount is very important to the Tar River Spiney Mussel, an endangered species. The Tar River is used heavily for irrigation.

Crops grown in the area are tobacco, sweet potatoes, cucumbers and peanuts.

REFERENCE NO. 17

U.S. Department of Commerce
Economics and Statistics Administration
BUREAU OF THE CENSUS

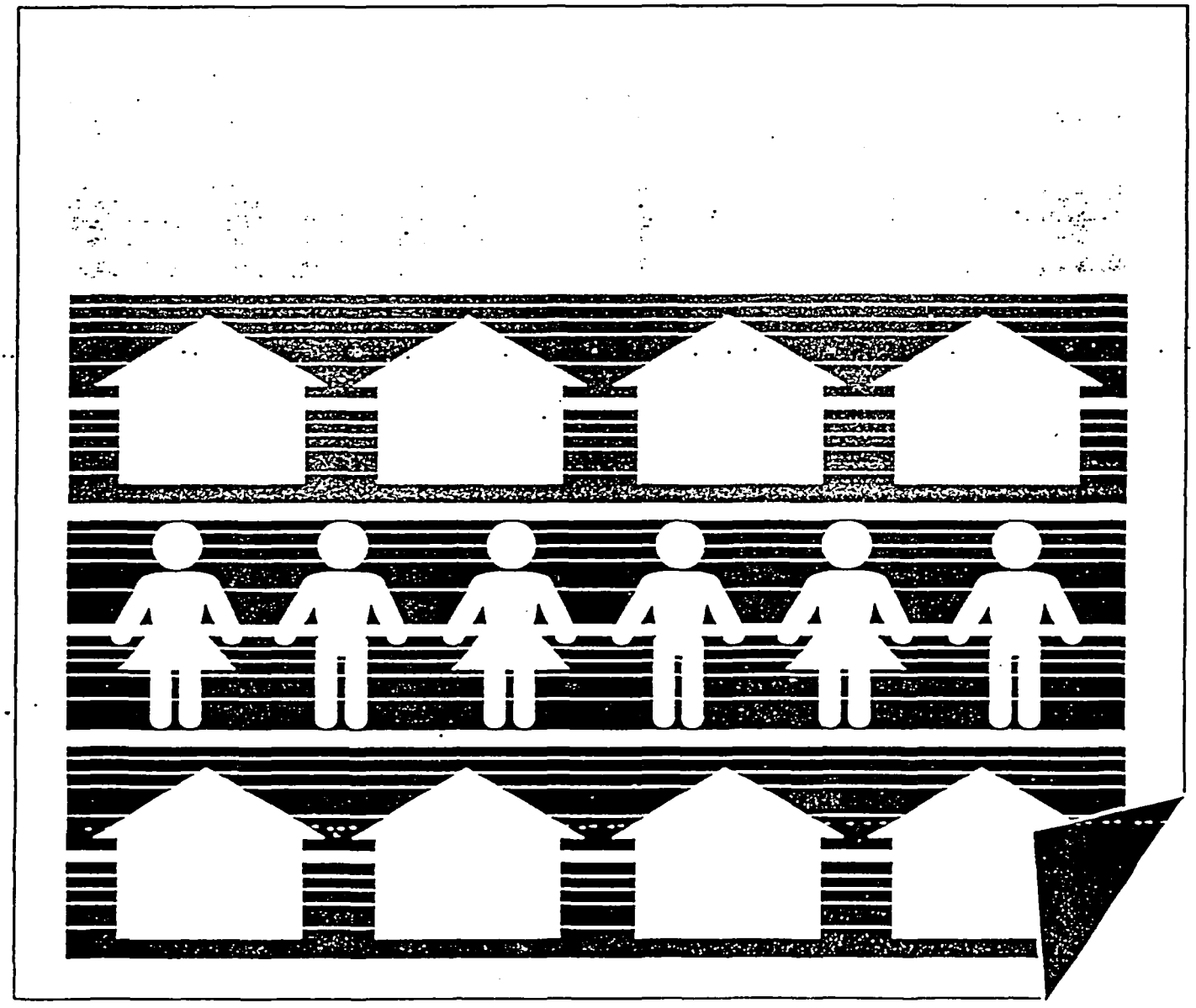
1990 CPH-1-35

CENSUS '90

1990 Census of Population and Housing

Summary Population and Housing Characteristics

North Carolina



ble 6. Household, Family, and Group Quarters Characteristics: 1990

r definitions of terms and meanings of symbols, see text]

State ounty ace and [In Selected States] County Subdivision	Persons in households	All households	Family households: Total	Family households: Married-couple family	Family households: Female householder, no husband present	Nonfamily households: Total	Nonfamily households: Householder living alone: Total	Nonfamily households: Householder living alone: 65 years and over: Total	Nonfamily households: Householder living alone: 65 years and over: Female	Persons per— Household	Persons per— Family	Persons in group quarters: Total	Persons in group quarters: Institutionalized persons	Persons in group quarters: Other persons in group quarters
The State	6 404 167	2 517 026	1 812 053	1 424 206	309 876	704 973	596 959	226 384	182 329	2.54	3.03	224 470	83 400	141 070
COUNTY														
mance County	105 327	42 652	30 745	24 295	5 130	11 907	10 467	4 598	3 748	2.47	2.94	2 886	1 173	1 713
ander County	27 245	10 331	8 049	6 715	952	2 282	2 022	839	651	2.64	3.02	299	299	–
ghany County	9 381	3 894	2 829	2 421	303	1 065	990	539	433	2.41	2.88	209	193	16
on County	23 117	8 531	6 359	4 552	1 475	2 172	2 042	1 075	860	2.71	3.23	357	344	13
Ashe County	21 965	8 848	6 748	5 643	816	2 100	1 935	1 014	809	2.48	2.89	244	220	24
Avery County	13 918	5 520	4 162	3 500	480	1 358	1 229	549	420	2.52	2.95	949	320	629
aufort County	41 704	16 157	11 840	9 140	2 186	4 317	3 915	1 974	1 605	2.58	3.07	579	441	138
e County	20 321	7 412	5 501	3 831	1 419	1 911	1 797	957	755	2.74	3.28	67	67	–
en County	28 150	10 760	8 017	5 854	1 762	2 743	2 579	1 243	1 000	2.62	3.11	513	509	4
swick County	50 497	20 069	15 291	12 636	2 031	4 778	4 227	1 640	1 194	2.52	2.91	488	307	181
Buncombe County	169 713	70 802	49 335	39 637	7 684	21 467	18 868	8 174	6 642	2.40	2.90	5 108	2 966	2 142
Burke County	73 281	29 184	21 711	17 462	3 148	7 473	6 589	2 706	2 228	2.51	2.93	2 463	2 410	53
orrus County	97 255	37 515	28 367	23 279	3 972	9 148	8 038	3 599	2 971	2.59	3.02	1 680	1 223	457
well County	69 917	27 172	20 656	16 653	2 944	6 516	5 660	2 287	1 846	2.57	2.97	792	735	57
den County	5 875	2 180	1 692	1 385	225	488	437	234	169	2.69	3.11	29	–	29
ateret County	51 554	21 238	15 276	12 681	2 021	5 962	5 081	1 901	1 431	2.43	2.88	1 002	750	252
Caswell County	20 053	7 468	5 781	4 454	1 024	1 687	1 593	727	573	2.69	3.13	640	624	16
Catawba County	116 387	45 700	33 773	27 418	4 841	11 927	10 270	3 844	3 115	2.55	2.99	2 025	1 134	891
thorn County	38 315	15 293	11 227	9 115	1 605	4 066	3 445	1 412	1 141	2.51	2.95	444	377	67
okee County	19 899	7 966	6 069	5 065	765	1 897	1 764	975	759	2.50	2.91	271	196	75
wan County	13 233	5 113	3 775	2 842	767	1 338	1 238	641	499	2.59	3.07	273	273	–
Clay County	7 150	2 928	2 177	1 894	203	751	699	418	314	2.44	2.90	5	4	1
Cleveland County	83 012	32 037	24 282	19 011	4 168	7 755	7 011	3 202	2 624	2.59	3.02	1 702	915	787
Columbus County	48 953	18 459	13 754	10 381	2 757	4 705	4 351	2 152	1 695	2.65	3.15	634	624	10
en County	78 014	29 542	22 481	18 189	3 511	7 061	6 121	2 436	1 930	2.64	3.07	3 599	811	2 788
berland County	253 362	91 500	69 966	54 433	12 883	21 534	17 718	4 724	3 752	2.77	3.19	21 204	1 499	19 705
tuck County	13 486	5 038	3 854	3 272	407	1 184	984	419	312	2.68	3.08	250	217	33
Dare County	22 542	9 349	6 425	5 498	682	2 924	2 264	714	522	2.41	2.88	204	140	64
Davidson County	125 358	48 944	37 176	30 410	5 120	11 768	10 262	4 189	3 319	2.56	2.96	1 319	1 277	42
Davie County	27 541	10 785	8 270	6 999	953	2 515	2 246	1 025	817	2.55	2.95	318	288	30
in County	39 368	14 925	11 036	8 376	2 099	3 889	3 553	1 779	1 439	2.64	3.12	627	560	67
ham County	173 310	72 297	45 985	33 614	10 321	26 312	20 860	5 553	4 471	2.40	2.99	8 525	2 175	6 350
ugecombe County	55 856	20 319	15 085	10 000	4 293	5 234	4 703	2 124	1 717	2.75	3.25	702	657	45
Forsyth County	257 466	107 419	72 621	55 715	14 052	34 798	29 870	9 779	7 975	2.40	2.94	8 412	3 493	4 919
Franklin County	35 237	13 503	10 047	7 640	1 865	3 456	3 120	1 384	1 126	2.61	3.07	1 177	568	609
on County	172 791	65 347	49 754	38 905	8 439	15 593	13 580	5 720	4 720	2.64	3.07	2 302	1 458	844
s County	9 202	3 352	2 593	2 040	404	759	705	394	288	2.75	3.19	103	102	1
ham County	7 176	2 772	2 166	1 839	246	606	562	294	225	2.59	2.98	20	18	2
ville County	35 191	13 134	9 883	7 501	1 857	3 251	2 889	1 236	978	2.68	3.13	3 154	3 079	75
Greene County	14 665	5 395	4 066	3 003	875	1 329	1 189	574	481	2.72	3.18	719	704	15
Guilford County	335 348	137 706	92 891	71 195	17 570	44 815	36 578	12 180	9 951	2.44	2.97	12 072	3 084	8 988
ax County	54 122	20 335	14 874	10 092	4 018	5 461	5 005	2 398	1 897	2.66	3.18	1 394	1 356	38
ett County	65 340	25 150	18 529	14 489	3 154	6 621	5 773	2 438	1 962	2.60	3.06	2 482	1 240	1 242
wood County	46 152	19 211	14 120	11 831	1 774	5 091	4 601	2 337	1 886	2.40	2.83	790	751	39
Henderson County	68 206	28 709	21 169	18 113	2 344	7 540	6 838	3 531	2 859	2.38	2.80	1 079	967	112
Hertford County	21 612	8 150	5 921	4 164	1 473	2 229	2 063	977	766	2.65	3.19	911	279	632
Hoke County	21 612	7 405	5 794	3 847	1 605	1 611	1 419	523	420	2.92	3.34	1 244	1 244	–
County	5 383	2 094	1 533	1 151	321	561	516	269	191	2.57	3.07	28	19	9
l County	92 082	35 573	26 869	21 726	4 023	8 704	7 646	3 271	2 682	2.59	3.02	849	814	35
son County	23 834	9 683	6 970	5 749	981	2 713	2 242	966	745	2.46	2.91	3 012	280	2 732
ohnston County	80 341	31 566	23 217	18 566	3 634	8 349	7 441	3 380	2 750	2.55	3.01	965	893	72
ones County	9 412	3 492	2 639	2 034	482	853	774	406	311	2.70	3.17	2	2	–
County	40 651	15 689	11 739	9 087	2 135	3 950	3 482	1 369	1 107	2.59	3.03	723	672	51
r County	55 652	21 938	15 611	11 131	3 798	6 327	5 706	2 580	2 073	2.54	3.06	1 622	1 559	63
in County	49 802	18 764	14 661	12 207	1 827	4 103	3 580	1 467	1 173	2.65	3.03	517	517	–
swell County	35 064	13 680	10 366	8 576	1 363	3 314	2 996	1 399	1 135	2.56	2.99	617	416	201
Macon County	22 992	9 834	7 235	6 236	773	2 599	2 388	1 307	1 021	2.34	2.76	507	233	274
Madison County	16 104	6 488	4 806	4 058	516	1 682	1 510	789	581	2.48	2.92	849	104	745
Martin County	24 813	9 317	6 900	5 087	1 518	2 417	2 213	1 100	906	2.66	3.17	265	257	8
Mecklenburg County	499 886	200 219	134 361	103 211	25 013	65 858	52 037	12 990	10 610	2.50	3.05	11 547	3 578	7 969
ell County	14 288	5 779	4 420	3 777	479	1 359	1 265	669	539	2.47	2.88	145	130	15
Montgomery County	22 279	8 290	6 274	4 823	1 119	2 016	1 838	876	690	2.69	3.14	1 067	997	70
Moore County	58 010	23 827	17 483	14 312	2 473	6 344	5 662	2 744	2 201	2.43	2.87	1 003	970	33
ash County	75 450	29 041	21 224	16 322	3 968	7 817	6 926	2 880	2 316	2.60	3.09	1 227	807	420
Hanover County	116 999	48 139	32 400	24 723	6 383	15 739	12 434	4 372	3 512	2.43	2.95	3 285	1 321	1 964
ampton County	20 055	7 591	5 644	3 958	1 436	1 947	1 816	968	704	2.64	3.13	743	742	1
w County	115 274	40 658	32 971	28 037	3 843	7 687	6 271	1 752	1 384	2.84	3.16	34 564	954	33 610
ge County	84 627	36 104	21 123	16 854	3 380	14 981	10 110	2 257	1 839	2.34	2.93	9 224	770	8 454
amlico County	11 247	4 523	3 382	2 717	547	1 141	1 055	528	410	2.49	2.93	125	112	13
asquotank County	29 884	11 384	8 326	6 356	1 681	3 058	2 725	1 342	1 065	2.63	3.13	1 414	383	1 031
r County	28 497	11 112	8 420	6 707	1 371	2 692	2 388	1 055	796	2.56	2.99	358	348	10
mans County	10 303	3 988	3 038	2 444	468	950	862	443	342	2.58	3.02	144	144	–
n County	29 830	11 423	8 570	6 607	1 547	2 853	2 608	1 209	994	2.61	3.07	350	304	46
tt County	102 400	40 491	26 434	19 369	5 857	14 057	10 412	3 104	2 511	2.53	3.10	5 524	946	4 578
olk County	14 187	6 110	4 346	3 693	511	1 764	1 599	952	768	2.32	2.79	229	227	2
andolph County	105 440	41 096	31 363	26 135	3 957	9 733	8 590	3 435	2 789	2.57	2.97	1 106	1 050	56
ond County	43 534	16 793	12 270	9 126	2 551	4 523	4 174	2 011	1 600	2.59	3.11	984	875	109
son County	103 186	36 154	27 429	18 451	7 353	8 725	7 891	3 355	2 651	2.85	3.34	1 993	1 280	713
ham County	85 242	33 446	24 671	19 351	4 193	8 775	7 959	3 669	2 982	2.55	3.02	822	781	41
wan County	107 079	42 512	31 055	25 100	4 618	11 457	10 236	4 748	3 815	2.52	2.99	3 526	2 408	1 118
utherford County	56 197	22 198	16 480	13 191	2 551	5 718	5 255	2 556	2 050	2.53	2.99	721	721	–
son County	46 754	17 526	13 191	10 058	2 525	4 335	3 975	2 032	1 610	2.67	3.14	543	490	53
nd County	32 679	11 837	8 971	6 225	2 338	2 866	2 618	1 173	935	2.76	3.25	1 075	401	674
County	50 734	19 747	14 967	12 451	1 975	4 780	4 396	2 164	1 785	2.57	3.01	1 031	470	561
s County	36 862	14 123	11 022	9 341	1 273	3 101	2 825	1 246	1 016	2.61	3.00	361	361	–
rry County	60 950	24 252	18 252	15 253	2 341	6 000	5 474	2 732	2 256	2.51	2.94	754	650	104
wan County	10 653	4 173	3 083	2 382	550	1 090	985	467	369	2.55	3.01	615	215	400
nsylvania County	24 283	9 924	7 496	6 442	797	2 428	2 224	1 131	912	2.45	2.86	1 237	178	1 059
County	3 852	1 471	1 078	810	213	393	359	208	148	2.62	3.13	4	4	–
County	82 633	29 307	23 530	19 607	3 063	5 777	5 018	2 148	1 755	2.82	3.18	1 578	455	1 123

Table 6. Household, Family, and Group Quarters Characteristics: 1990—Con.

[For definitions of terms and meanings of symbols, see text]

State County Place and [In Selected States] County Subdivision	Persons in households	All households	Family households: Total	Family households: Married-couple family	Family households: Female householder, no husband present	Nonfamily households: Total	Nonfamily households: Householder living alone: Total	Nonfamily households: Householder living alone: 65 years and over: Total	Nonfamily households: Householder living alone: 65 years and over: Female	Persons per— Household	Persons per— Family	Persons in group quarters: Total	Persons in group quarters: Institutionalized persons	Persons in group quarters: Other persons in group quarters
COUNTY—Con.														
Vance County	38 080	14 166	10 502	7 408	2 584	3 664	3 238	1 440	1 137	2.69	3.16	812	517	295
Wake County	408 267	165 743	109 543	88 567	16 581	56 200	42 662	9 449	7 828	2.46	3.01	15 113	6 571	8 542
Warren County	16 918	6 305	4 762	3 357	1 127	1 543	1 422	742	559	2.68	3.15	347	332	15
Washington County	13 762	5 052	3 839	2 826	833	1 213	1 151	584	454	2.72	3.21	235	234	1
Watauga County	32 476	13 693	8 415	7 121	975	5 278	3 437	1 041	833	2.37	2.88	4 476	279	4 197
Wayne County	97 572	36 889	27 577	21 107	5 320	9 312	8 263	3 258	2 642	2.65	3.11	7 094	2 488	4 606
Wilkes County	58 787	23 021	17 586	14 634	2 274	5 435	4 855	2 182	1 723	2.55	2.96	606	586	20
Wilson County	64 414	25 093	18 031	12 986	4 180	7 062	6 277	2 679	2 184	2.57	3.08	1 647	876	771
Yadkin County	30 053	12 068	9 173	7 720	1 124	2 895	2 669	1 333	1 059	2.49	2.90	435	424	11
Yancey County	15 235	6 124	4 683	4 010	510	1 441	1 354	729	586	2.49	2.90	184	184	–
PLACE AND COUNTY SUBDIVISION														
Aberdeen town, Moore County	2 679	1 154	773	587	150	381	336	188	162	2.32	2.87	21	–	21
Ahoskie town, Hertford County	4 258	1 769	1 164	770	356	605	576	272	229	2.41	3.07	133	130	3
Alamance village, Alamance County	258	112	80	67	11	32	30	17	13	2.30	2.76	–	–	–
Albemarle city, Stanly County	14 403	6 054	4 169	3 205	812	1 885	1 746	913	762	2.38	2.92	536	459	77
Alexander Mills town, Rutherford County	662	279	176	111	55	103	93	59	50	2.37	2.97	–	–	–
Ance town, Pamlico County	583	232	182	150	28	50	49	29	23	2.51	2.91	–	–	–
Alamahaw-Ossipee CDP, Alamance County	1 076	424	307	233	57	117	113	56	44	2.54	3.06	–	–	–
Andrews town, Cherokee County	2 520	1 065	738	566	139	327	302	191	153	2.37	2.88	31	31	–
Angier town, Harnett County	2 230	901	637	449	154	264	236	97	86	2.48	2.98	5	–	5
Ansonville town, Anson County	614	203	165	106	47	38	36	20	16	3.02	3.45	–	–	–
Apex town, Wake County	4 898	1 752	1 378	1 132	196	374	318	115	106	2.80	3.19	70	67	3
Arapahoe town, Pamlico County	430	175	129	108	15	46	44	26	21	2.46	2.93	–	–	–
Archdale city	6 913	2 803	2 085	1 758	248	718	643	183	155	2.47	2.90	–	–	–
Guilford County	234	82	72	66	5	10	8	3	3	2.85	3.07	–	–	–
Randolph County	6 679	2 721	2 013	1 692	243	708	635	180	152	2.45	2.89	–	–	–
Arlington town, Yadkin County	795	333	239	170	57	94	91	52	41	2.39	2.86	–	–	–
Asheboro city, Randolph County	15 682	6 977	4 455	3 357	930	2 522	2 256	979	820	2.25	2.84	680	636	44
Asheville city, Buncombe County	59 322	27 027	16 218	11 717	3 759	10 809	9 511	4 233	3 509	2.19	2.84	2 285	1 269	1 016
Askewville town, Bertie County	201	81	60	56	4	21	21	15	14	2.48	3.00	–	–	–
Atkinson town, Pender County	275	119	85	67	13	34	31	21	20	2.31	2.79	–	–	–
Atlantic Beach town, Carteret County	1 887	935	516	434	63	419	335	56	37	2.02	2.62	51	–	51
Aulander town, Bertie County	1 209	454	320	213	98	134	123	76	58	2.66	3.29	–	–	–
Aurora town, Beaufort County	654	260	181	119	53	79	73	51	40	2.52	3.11	–	–	–
Autryville town, Sampson County	166	73	55	40	9	18	16	8	7	2.27	2.58	–	–	–
Avery Creek CDP, Buncombe County	1 144	408	341	304	27	67	60	15	11	2.80	3.13	–	–	–
Ayden town, Pitt County	4 735	1 795	1 305	854	386	490	445	230	199	2.64	3.13	5	5	–
Bodin CDP, Stanly County	1 481	616	420	315	87	196	183	119	103	2.40	2.97	–	–	–
Bailey town, Nash County	553	245	151	118	26	94	89	55	42	2.26	2.97	–	–	–
Bakersville town, Mitchell County	326	148	99	71	17	49	44	21	15	2.20	2.71	6	6	–
Bald Head Island village, Brunswick County	78	39	32	31	1	7	7	–	–	2.00	2.22	–	–	–
Balsam CDP, Henderson County	1 118	494	344	280	51	150	132	58	47	2.26	2.72	–	–	–
Banner Elk town, Avery County	339	163	89	67	18	74	64	24	19	2.08	2.80	594	–	594
Barker Heights CDP, Henderson County	1 137	468	345	248	84	123	107	47	33	2.43	2.83	–	–	–
Barker Ten Mile CDP, Robeson County	1 087	372	329	292	26	43	34	12	10	2.92	3.12	–	–	–
Bath town, Beaufort County	154	81	41	29	12	40	36	25	20	1.90	2.66	–	–	–
Battleboro town	447	176	127	87	30	49	46	23	19	2.54	3.06	–	–	–
Bayleecombe County	280	100	73	39	26	27	25	9	6	2.80	3.34	–	–	–
Nash County	167	76	54	48	4	22	21	14	13	2.20	2.67	–	–	–
Bayboro town, Pamlico County	720	283	201	130	63	82	75	31	29	2.54	3.10	13	13	–
Beachshore CDP, New Hanover County	1 661	605	517	471	30	88	80	26	22	2.75	3.00	–	–	–
Beargrass town, Martin County	77	35	24	19	4	11	11	6	6	2.20	2.75	–	–	–
Beaufort town, Carteret County	3 795	1 721	1 075	741	292	646	581	255	197	2.21	2.83	13	13	–
Beech Mountain town	239	109	78	75	1	31	25	6	4	2.19	2.55	–	–	–
Avery County	7	3	2	2	–	1	1	–	–	2.33	3.00	–	–	–
Watauga County	232	106	76	73	1	30	24	6	4	2.19	2.54	–	–	–
Belhaven town, Beaufort County	2 241	840	588	359	192	252	233	138	110	2.67	3.29	28	28	–
Belmont city, Gaston County	7 774	3 049	2 149	1 603	407	900	811	354	296	2.55	3.09	660	–	660
Belville town, Brunswick County	66	28	12	7	5	16	11	4	2	2.36	3.75	–	–	–
Belwood town, Cleveland County	631	259	193	164	19	66	59	29	21	2.44	2.87	–	–	–
Benson town, Johnston County	2 728	1 137	718	456	207	419	388	202	176	2.40	3.08	82	67	15
Bent Creek CDP, Buncombe County	1 487	532	452	397	45	80	71	27	18	2.80	3.06	–	–	–
Bessemer City city, Gaston County	4 698	1 762	1 337	975	288	425	386	176	146	2.67	3.10	–	–	–
Bethel town, Pitt County	1 842	709	505	329	159	204	188	101	86	2.60	3.15	–	–	–
Bethlehem CDP, Alexander County	3 186	1 186	966	848	85	220	191	47	35	2.69	2.99	–	–	–
Beulaville town, Duplin County	921	411	274	194	67	137	122	63	52	2.24	2.77	12	12	–
Biltmore Forest town, Buncombe County	1 327	540	420	387	26	120	116	72	58	2.46	2.84	–	–	–
Biscoe town, Montgomery County	1 478	513	389	281	88	124	103	52	38	2.88	3.34	6	6	–
Black Creek town, Wilson County	615	243	192	167	24	51	46	27	24	2.53	2.89	–	–	–
Black Mountain town, Buncombe County	5 032	2 256	1 462	1 168	241	794	722	441	366	2.23	2.81	366	331	55
Blanch town, Bladen County	1 768	758	521	358	143	237	228	120	101	2.33	2.91	53	53	–
Blowing Rock town	1 179	570	333	286	34	237	213	85	68	2.07	2.73	78	76	2
Caldwell County	44	21	14	12	2	7	6	3	2	2.10	2.57	–	–	–
Watauga County	1 135	549	319	274	32	230	207	82	66	2.07	2.74	78	76	2
Boger City CDP, Lincoln County	1 373	569	414	341	60	155	143	56	42	2.41	2.89	–	–	–
Bogue Sound Lakes city, Brunswick County	1 650	666	523	447	53	143	122	54	38	2.48	2.79	–	–	–
Boiling Springs town, Cleveland County	1 675	668	493	380	89	175	148	59	55	2.51	2.94	770	44	726
Bolivia town, Brunswick County	228	87	64	50	12	23	21	15	13	2.62	3.13	–	–	–
Bolton town, Columbus County	531	206	148	96	43	58	56	34	22	2.58	3.16	–	–	–
Bone Doone CDP, Cumberland County	3 888	1 590	1 009	637	315	581	431	41	24	2.45	2.98	5	–	5
Boone town, Watauga County	8 607	4 053	1 470	1 141	248	2 583	1 305	275	238	2.12	2.71	4 395	127	4 181
Boonville town, Yadkin County	998	403	299	247	49	104	97	62	54	2.48	2.95	11	–	11
Bostic town, Rutherford County	371	137	111	92	15	26	22	11	8	2.71	3.04	–	–	–
Brevard city, Transylvania County	4 609	2 072	1 331	1 026	272	741	693	421	365	2.22	2.82	779	168	611
Bridgeton town, Craven County	453	193	130	103	16	63	57	20	17	2.35	2.88	–	–	–
Broadway town	973	362	286	247	32	76	71	37	28	2.69	3.06	–	–	–
Harnett County	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Lee County	973	362	286	247	32	76	71	37	28	2.69	3.08	–	–	–
Brogden CDP, Wayne County	3 246	1 059	851	624	182	208	162	33	25	3.07	3.44	–	–	–
Brookford town, Catawba County	451	189	133	93	27	56	52	31	21	2.39	2.85	–	–	–
Brunswick town, Columbus County	302	106	81	62	15	25	24	8	7	2.85	3.37	–	–	–
Bryson City town, Swain County	1 063	491	303	233	57	188	171	100	84	2.16	2.73	82	82	–

REFERENCE NO. 18

WASTE SCIENCE AND TECHNOLOGY CORP.

Owner: US EPA Region 4
Plant: Torpedo Wire & Strip Unit:
Project No. 52012.255 File No.
Title: Private Well use house Count w/in 4 miles

Computed By: BNH
Date: 8/4/94 19 94
Checked By:
Date: 19
Page 1 of 1

Purpose: Determine the population within 4 miles of the Torpedo Wire & Strip site using existing Refrence data.

Refrences: USGS Topographic Quadrangles: Drake, NC. Hattsease, NC. Rocky Mount, NC. Whitakers NC.

Census data for Nash County N.C. 1990 Census

Distance Radius	# of homes w/ Private Wells	Persons Per house	Total # of Persons
0-1/4 mile	10	2.60	26
1/4-1/2 mile	10	2.60	26
1/2-1 mile	33	2.60	86
1-2 mile	110	2.60	286
2-3 miles	242	2.60	629.
3-4 miles	180	2.60	468

House Count For 0-0.5 miles

Distance Radius	# of homes	Person Per house	Total persons
0-1/4 mile	10	2.60	26
1/4-1/2 mile	10	2.60	26

DO NOT WRITE IN THIS SPACE

P-GN-172A

REVISED, SUPERSEDED, AND VOID CALCULATIONS MUST BE CLEARLY IDENTIFIED, INITIALED, AND DATED BY THE RESPONSIBLE INDIVIDUAL.

REFERENCE NO. 19

BLACK & VEATCH Waste Science, Inc.
Philadelphia Office

TELEPHONE MEMORANDUM

U.S. EPA - Region IV
North Carolina General
Wellhead Protection Areas

B&V Project multiple
B&V File C
March 23, 1994
1330h

To: Randy Prillaman
Company: NC DEM, Groundwater Section
Phone No.: (919) 733-7015

Recorded by: Corry T. Platt

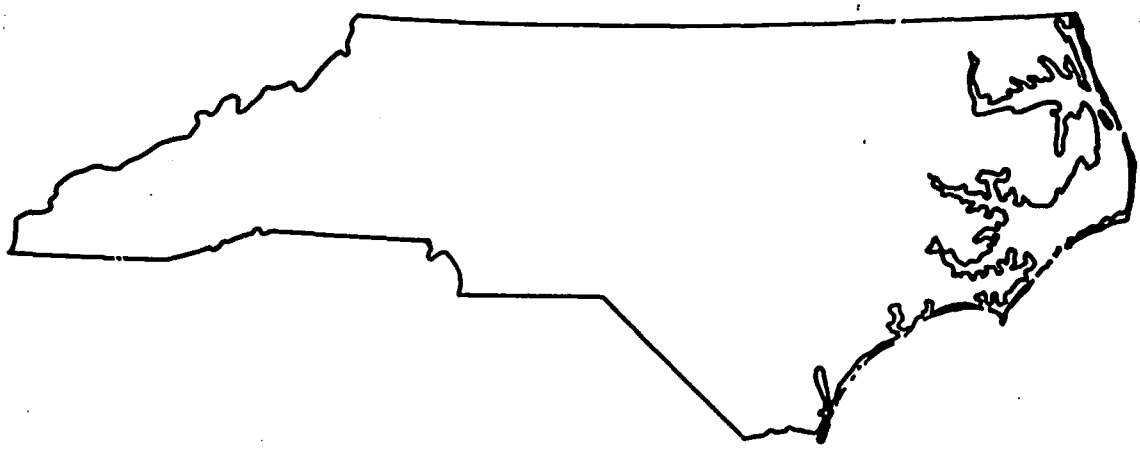
I called Mr. Randy Prillaman to determine if Wellhead Protection Areas have been delineated within the State of North Carolina. Mr. Prillaman said that Wellhead Protection Areas have not yet been delineated within North Carolina.

Mr. Prillaman said there is a pilot study occuring in Gaston County regarding Wellhead Protection Areas (WHPA) and currently the state is awaiting notice from the U.S. EPA if their grant for the delineation of WHPAs will be funded. If funding is granted, then work on the the delineations will begin. He is unsure when the delineations would be complete if funding was to be recieved this year. He recommended following up on this phone call later in the year (October or November) to find out if any guidance has been written.

Corry T. Platt

REFERENCE NO. 20

Water Resources Data North Carolina Water Year 1992



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT NC-92-1
Prepared in cooperation with the North Carolina Department of Environment, Health, and Natural Resources, and with other State, municipal, and Federal agencies

02082585 TAR RIVER AT NC 97 AT ROCKY MOUNT, NC

LOCATION.--Lat 35°57'15", long 77°47'15", Edgecombe County, Hydrologic Unit 03020101, on left bank 20 ft downstream of bridge on State Highway 97, 0.5 mi upstream from Cowlick Branch, and 1.0 mi north-northeast of Rocky Mount.

DRAINAGE AREA.--925 mi^2.

PERIOD OF RECORD.--August 1976 to current year.

REVISED RECORDS.--WDR NC-81-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 53.88 ft above National Geodetic Vertical Datum of 1929. City of Rocky Mount telemeter at station.

REMARKS.--Records good except those for estimated daily discharge, which are poor. Some regulation at low flow caused by mill above station. The city of Rocky Mount diverted an average of 21.4 ft^3/s for municipal water supply, most of which was returned downstream of station as treated effluent. Minimum discharge for period of record and current water year, result of temporary regulation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	97	94	93	772	507	1340	836	353	e1400	492	73	118
2	97	85	93	519	538	868	747	302	e1200	362	132	102
3	104	89	97	833	416	687	671	240	e700	828	158	90
4	116	100	87	4900	396	591	597	313	e450	1050	167	75
5	99	105	85	7910	375	540	580	225	e300	1210	73	71
6	91	109	84	8800	338	536	548	225	e400	1850	53	112
7	94	101	84	8160	337	1680	529	131	e1100	1160	141	197
8	95	100	83	8480	341	3960	474	154	e800	821	82	525
9	98	102	84	8270	265	4940	471	304	e550	565	81	426
10	99	110	85	2730	325	5000	462	277	e800	395	57	310
11	111	97	82	1000	265	3060	440	338	e900	310	54	240
12	93	97	82	799	291	1780	395	321	e760	235	63	228
13	93	104	79	687	265	1710	535	240	480	206	238	241
14	96	104	79	658	342	1200	416	238	361	168	1300	210
15	100	107	78	614	356	923	495	276	307	136	3120	166
16	168	107	77	630	732	777	515	274	298	116	2870	127
17	214	101	76	568	710	688	452	243	299	38	2650	101
18	137	103	76	447	713	604	241	234	168	34	3170	92
19	121	91	75	344	655	667	474	309	155	36	2250	103
20	103	86	76	387	636	795	433	296	266	36	1760	113
21	103	77	78	373	579	1180	331	296	461	44	1120	105
22	103	87	79	356	534	1230	1070	251	900	96	739	146
23	101	84	79	366	530	1020	1800	238	736	261	550	203
24	98	86	96	674	434	987	2230	187	519	652	412	188
25	96	92	106	839	515	957	1240	165	418	567	310	158
26	94	86	281	780	765	1130	754	116	973	372	251	139
27	96	81	176	709	1480	1470	572	74	2860	265	228	135
28	93	90	56	702	3070	2330	505	87	2620	315	179	187
29	95	87	275	708	3050	1920	401	213	1780	442	151	200
30	93	96	251	648	---	1210	367	232	874	404	136	188
31	95	---	743	657	---	951	---	e600	---	121	76	---
TOTAL	3293	2858	3875	64320	19760	46731	19581	7752	23835	13587	22644	5296
MEAN	106	95.3	125	2075	681	1507	653	250	794	438	730	177
MAX	214	110	743	8800	3070	5000	2230	600	2860	1850	3170	525
MIN	91	77	56	344	265	536	241	74	155	34	53	71
CFSM	.11	.10	.14	2.24	.74	1.63	.71	.27	.86	.47	.79	.19
IN.	.13	.11	.16	2.59	.79	1.88	.79	.31	.96	.55	.91	.21

e Estimated

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1992, BY WATER YEAR (WY)

MEAN	266	550	785	1565	1563	2030	1424	974	690	399	429	209
MAX	1079	1905	1720	3230	3280	4301	3447	2725	2238	1316	977	805
(WY)	1990	1980	1984	1978	1983	1989	1987	1989	1982	1984	1989	1979
MIN	70.4	74.5	125	254	546	477	359	250	128	54.1	79.7	84.3
(WY)	1981	1981	1992	1981	1977	1981	1981	1992	1986	1986	1987	1980

SUMMARY STATISTICS	FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1977 - 1992	
ANNUAL TOTAL	193604		233532			
ANNUAL MEAN	530		638		904	
HIGHEST ANNUAL MEAN					1500	1984
LOWEST ANNUAL MEAN					262	1981
HIGHEST DAILY MEAN	5470	Jan 15	8800	Jan 6	12100	May 1 1978
LOWEST DAILY MEAN	56	Dec 28	34	Jul 18	6.6	Oct 3 1983
ANNUAL SEVEN-DAY MINIMUM	76	Jul 21	57	Jul 16	40	Jul 3 1986
INSTANTANEOUS PEAK FLOW			8940	Jan 6	12300	May 1 1978
INSTANTANEOUS PEAK STAGE			20.33	Jan 6	23.66	May 1 1978
INSTANTANEOUS LOW FLOW			8.6*	Jun 18	5.7*	Sep 23 1988
ANNUAL RUNOFF (CFSM)	.57		.69		.98	
ANNUAL RUNOFF (INCHES)	7.79		9.39		13.28	
10 PERCENT EXCEEDS	1140		1230		2240	
50 PERCENT EXCEEDS	168		298		420	
90 PERCENT EXCEEDS	86		84		96	

* See REMARKS.

REFERENCE NO. 21

ORTH CAROLINA NATURAL HERITAGE PROGRAM ELEMENT LIST

cientific and common name	state stat	fed stat	state rank	glob rank
MBLOPLITES CAVIFRONS ROANOKE BASS	SC		S3	G3
ECTURUS LEWISI NEUSE RIVER WATERDOG	SC	3C	S4	G?
NOTURUS FURIOSUS CAROLINA MADTOM	SC	3C	S3	G3?
ICOIDES BOREALIS RED-COCKADED WOODPECKER	E	LE	S2	G2
COASTAL PLAIN SMALL STREAM SWAMP, BROWNWATER			S3	G4
LLIPTIO LANCEOLATA YELLOW LANCE	SC			G4
LLIPTIO STEINSTANSANA TAR RIVER SPINY MUSSEL	E	LE	S1	G1
USCONAIA MASONI ATLANTIC PIGTOE	T			G3
IGUMIA NASUTA EASTERN PONDMUSSEL	SC			G4
SPEYERIA DIANA DIANA	SC		S3	G3
ILLOSA CONSTRICTA NOTCHED RAINBOW	SC			G3
ALAMOVILFA BREVIPILIS PINEBARRENS SANDREED	T	C2	S1	G3
DIDIPLIS DIANDRA WATER PURSLANE	SR		S1	G5
EXASTYLIS LEWISII LEWIS'S HEARTLEAF	PP	C2	S3	G3
SENECIO PAUPERCULUS BALSAM GROUNDSEL	SR		S2?	G5

EXPLANATION OF SPECIES STATUS CODES

The attached output from the N.C. Natural Heritage Program database is a listing of the elements (rare species, geologic features, natural communities, special animal habitats) known to occur in your geographic area of interest. Following is an explanation of the four columns of status codes on the righthand side of the printout.

STATE STATUS

Plants:

From Sutter, R.D., L. Mansberg, and J.H. Moore. 1983. Endangered, threatened, and rare plant species of North Carolina: a revised list. ASB Bulletin 30:153-163, and updated lists of the Natural Heritage and Plant Conservation Programs.

E = Endangered
T = Threatened
SC = Special Concern
PP = Primary Proposed
SR = Significantly Rare

E,T,and SC species are protected by state law (the Plant Protection and Conservation Act, 1979); the other two categories indicate rarity and the need for population monitoring, as determined by the Plant Conservation and Natural Heritage Programs.

Animals:

From Cooper, J.E., S.S. Robinson, and J.B. Funderburg (Eds.). 1977. Endangered and Threatened Plants and Animals of North Carolina. N.C. Museum of Natural History, Raleigh, NC. 444 pages + i-xvi, and updated lists of the Natural Heritage Program.

E = Endangered
T = Threatened
SR = Significantly Rare
SC = Special Concern
UNK= Undetermined
EX = Extirpated

FEDERAL STATUS

From Endangered & Threatened Wildlife and Plants, April 10, 1987. 50 CFR 17.11 & 17.12. Department of Interior. Established by the Endangered Species Act of 1973, as amended.

E = Taxa currently listed as Endangered
T = Taxa currently listed as Threatened
PE = Taxa currently proposed for listing as Endangered
PT = Taxa currently proposed for listing as Threatened

Taxa under review for possible listing ("candidate species"):

C1 = Taxa with sufficient information to support listing
C2 = Taxa without sufficient information to support listing

GLOBAL RANK (STATE RANK)

The Nature Conservancy's system of measuring rarity and threat status. "Global" refers to worldwide, "State" to statewide.

G1 = Critically imperiled globally because of extreme rarity or otherwise very vulnerable to exinction throughout its range.

G2 = Imperiled globally because of rarity or otherwise vulnerable to extinction throughout its range.

G3 = Either very rare and local throughout its range, or found locally in a restricted area.

G4 = Apparently secure globally, though it may be quite rare in parts of its range (especially at the periphery).

G5 = Demonstrably secure globally, though it may be quite rare in parts of its range (especially at the periphery).

GU = Possibly in peril but status uncertain; need more information.

GX = Believed to be extinct throughout range.

Q = a suffix attached to the Global Rank indicating questionable taxonomic status.

T_ = an additional status for the subspecies or variety; the G rank then refers only to the species as a whole.

State rank codes follow the same definitions, except substitute the words, "in the state," for "globally" or "throughout its range."

REFERENCE NO. 22

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE

500 0 500 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
ROCKY MOUNT,
NORTH CAROLINA
EDGECOMBE AND NASH
COUNTIES

PANEL 3 OF 12
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
370092 0003 C

MAP REVISED:
JANUARY 20, 1982

Federal Emergency Management Agency

KEY TO MAP

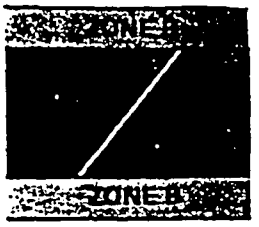
500-Year Flood Boundary

100-Year Flood Boundary

Zone Designations* With Date of Identification e.g., 12/2/74

100-Year Flood Boundary

500-Year Flood Boundary



Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)

Elevation Reference Mark — RM7×

Zone D Boundary

River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

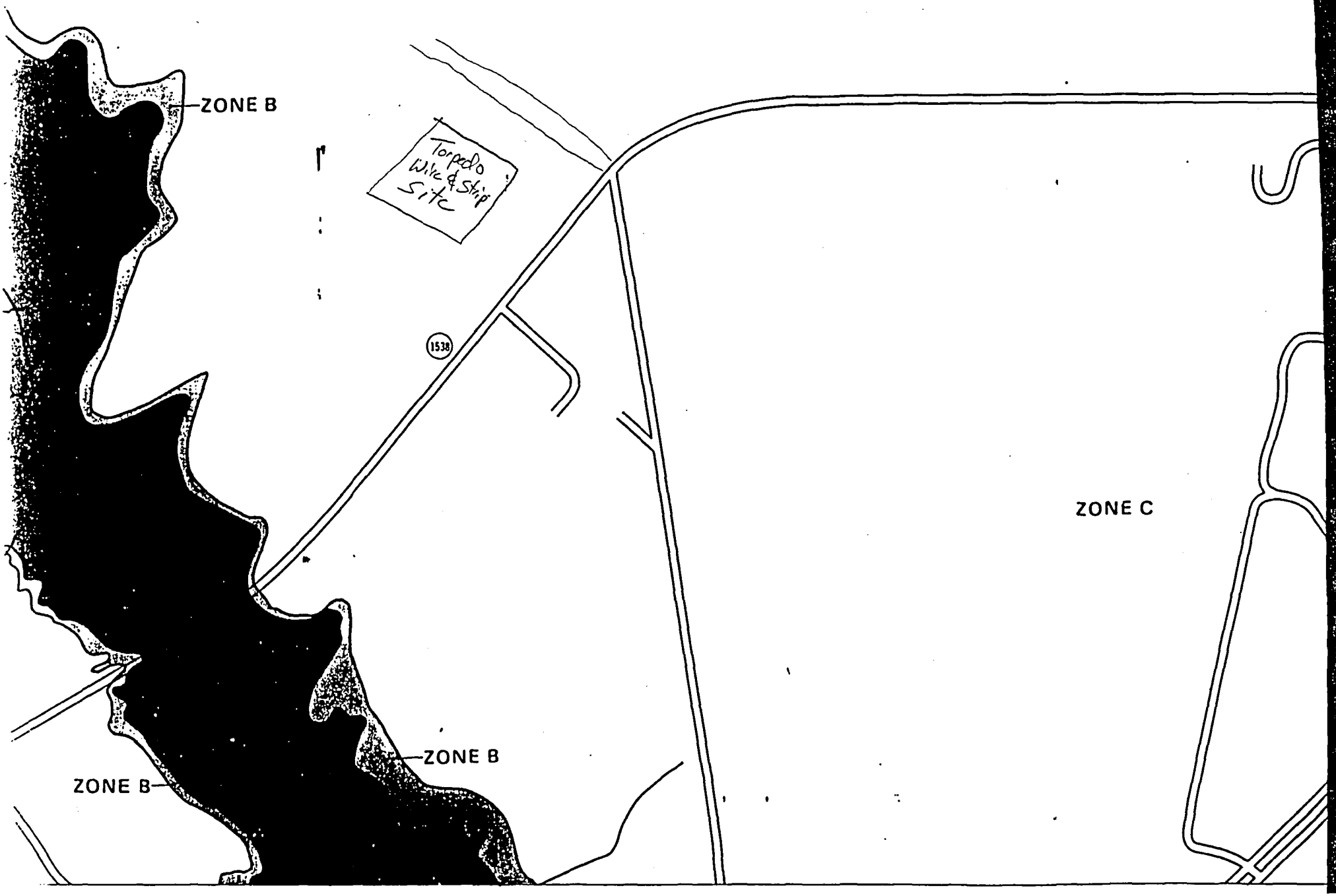
Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
MARCH 1, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:


ZONE B
Torpedo Wire & Ship Site
1538
ZONE C
ZONE B
ZONE B