TAR-PAMLICO RIVER BASIN REGIONAL COUNCIL

Louisburg Police/Fire Training Center
107 Wade Avenue
Louisburg, NC
919-496-4175

JUNE 19, 1998

AGENDA

10:00	Welcome	Lucy Allen, Mayor Town of Louisburg
10:10	The Tar River Water Reclamation Facility: A Small Town's Approach To Environmental Quality	C.L. Gobble Town Administrator
10:30	Acceptance of Minutes from 4-3-98 and 5-8-98 meetings	Earl Bell, Chairman
10:35	Facilitated Workshop: A Review	Joan & Guy (NC Division of Water Quality)
10:45	ALONG THE RIVER'S EDGE: UPPER TAR-PAMLICO RIVER BASIN Water Quality Conditions (Suzanne Hoover, NC Division of Water Quality) Natural Heritage Features (John Alderman, NC Wildlife Resources Commission) Local Projects: Conservation Tillage & Buffers (William Lord, NC Cooperative Extension Service)	
12:00	INFORMATION ITEM: EMC to Consider Alternative Strategies for Tar-Pamlico Basin Rich Gannon -- NC Division of Water Quality	
12:30	Old/New Business and Open Discussion	
12:45	Adjourn for LUNCH (provided by the Town of Louisburg)	
1:30	BEGIN TOUR: Tar River Water Reclamation Facility in Louisburg Host: Joe Shearon	

TAR-PAMLICO REGIONAL COUNCIL

Louisburg Police/Fire Training Center
Louisburg, NC
June 19, 1998

Minutes

The meeting was called to order by Chairman Bell at 10:15am. (See Attachment A).

TPRBRC and Louisburg City Council member Joe Shearon, recognized R.G.Leary, Franklin Co. Manager; Lois Wheeless, Louisburg City Council member; and Tony King, Louisburg Assistant Administrator who were in attendance. He then introduced Louisburg Mayor, Lucy Allen. Ms. Allen extended a warm welcome to Louisburg and Franklin Co. and encouraged the Regional Council in its work.

Ms. Allen introduced CL Gobble, Louisburg Town Administrator who gave a presentation on Louisburg's award winning wastewater treatment plant. A tour of this facility and Louisburg's water supply facility was conducted at the conclusion of the TPRBRC regular business meeting.

Chairman Bell asked for a motion of acceptance of previous meetings' minutes (4/3/98 and 5/8/98). Dan Wynne motioned for acceptance with Bruce Perkinson seconding the motion. Motion carried with no dissenting votes.

Joan Giordano made a brief presentation regarding the facilitated workshop (5/8/98) held in Greenville and the subsequent summary report submitted by Bitsy Waters who facilitated the workshop. **NOTE**: This summary report was included in the 6/8/98 mailing to RC members). She noted that the day's agenda was focued on topics pertaining to the river's edge (in the upper Tar-Pamlico basin) and that those choices were a direct outgrowth of the Program of Work developed at the workshop. Subsequent TPRBRC meetings will be devoted to the middle and lower portions of the Tar-Pamlico basin.

Chairman Bell then introduced Suzanne Hoover from the NC Dept. of Environment and Natural Resources, Div. of Water Quality . Ms. Hoover, part of the Planning and Assessment Unit of the Planning Branch gave an in-depth presentation on water quality conditions in those sub-basins defined as being part of the Tar-Pamlico upper basin. (See Attachment B). Ms. Hoover reported that the DWQ samples on a monthly basis at ambient monitoring stations. Sampling includes: the benthos for benthic (bottom dwelling) insects; fish communities for data on the types, numbers and age classifications of fish; fish tissue, which is filleted and ground and measured for contaminants; and lakes assessments which reveal the trophic status (or nutrient enrichment) of water bodies. (See Attachment C for 1997 sampling results in the upper Tar-Pam).

Following Ms. Hoover's presentation Chairman Bell introduced John Alderman from the NC Wildlife Resources Commission. Mr. Alderman reported that the Tar-Pamlico basin is home to many rare species and is a very unique habitat. He reviewed, through slides and commentary, many of the species found only in this basin. Further, he apprised the group of a Memorandum of Understanding betwen the Champion Paper Co. and several others (See Attachment D) for the conservation of riparian buffers within the upper Tar-Pamlico River Basin. He underscored the importance of Fishing Creek and Swift Creek to the restoration of the lower Tar-Pamlico basin.

The next presenter, Bill Lord, NC Cooperative Extension Service, addressed the group on the use of conservation tillage and buffers by some area farmers. He said that sedimentation was the number one impairment to water quality and that the "no-till" method of planting, because it did not disturb the soil, was the remedy. He added that this method of planting offers significant reduction in soil loss, especially when it is considered that the largest growers of cucumbers and sweet potatoes in the US are grown in the Tar basin.

Rich Gannon, with the Division of Water Quality in Raleigh, briefly presented information on the Environmental Management Commission's consideration of alternative strategies for the Tar-Pamlico basin. He defined the nutrient sensitive waters (NSW) designation as a supplemental classification on a water body and that this classification requires the state to adopt a water quality plan to reduce nutrient. He added that the EMC is meeting in July to consider these alternative strategies. That meeting will be held on July 9, 1998 in the Groundfloor Hearing Room of the Archdale Bldg. in Raleigh beginning at 9:00am.

Old/New Business:

Mary Jane Jennings urged TPRBRC members who may not have contacted their legislators about the Tar-Pamlico Cooperative Extension Environmental Education Team, to please do so. This piece of legislation is know as Senate Bill (SB) 1445. Mayor Allen remarked that while she was in Raleigh for "Town Hall Day" she would endorse it.

Mary Jane also made the group aware of a Cooperative Extension Service publication entitled "The River's Edge" as being potentially useful in our efforts to address our Program of Work.

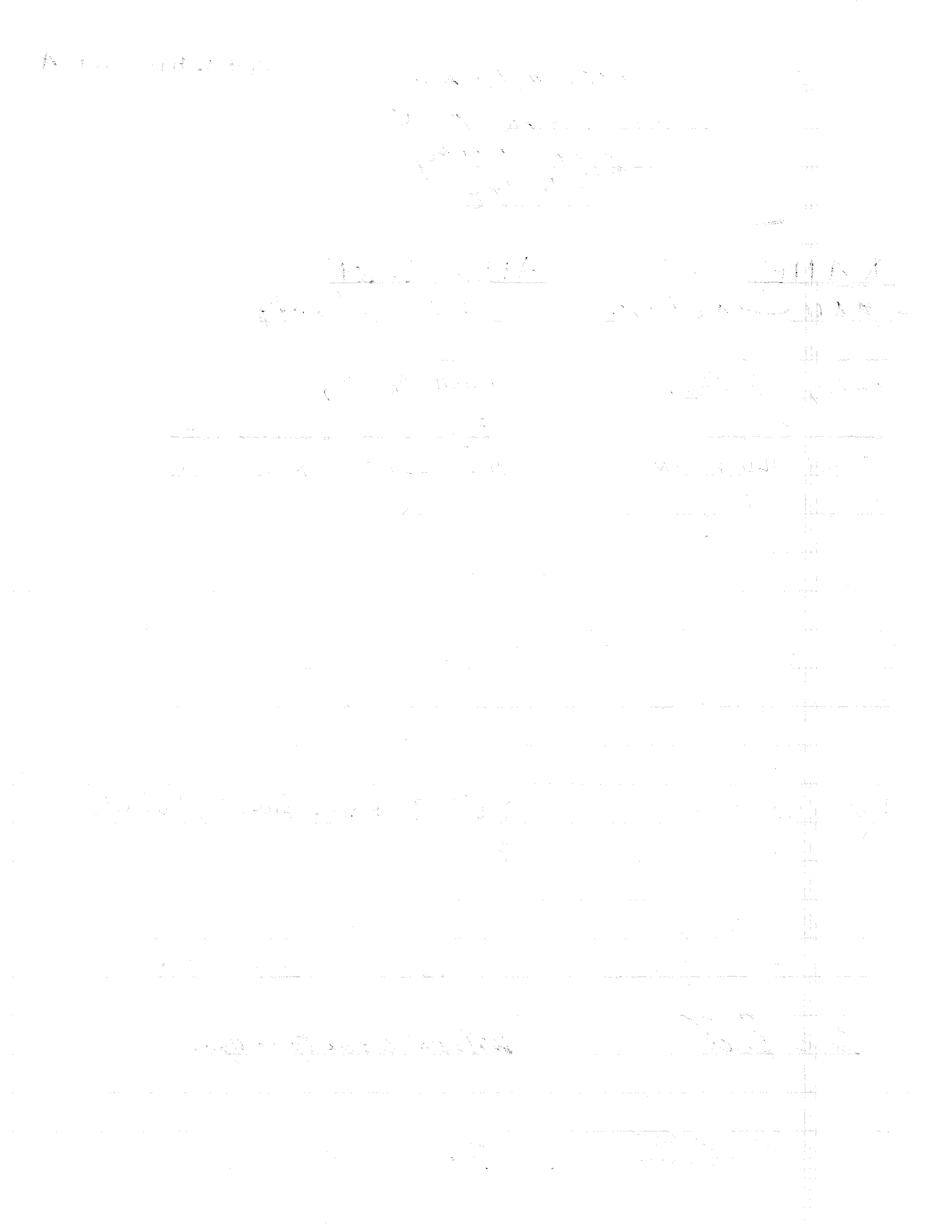
The next meeting will be held in Pamlico Co. on August 14th, the time and place to be arranged.

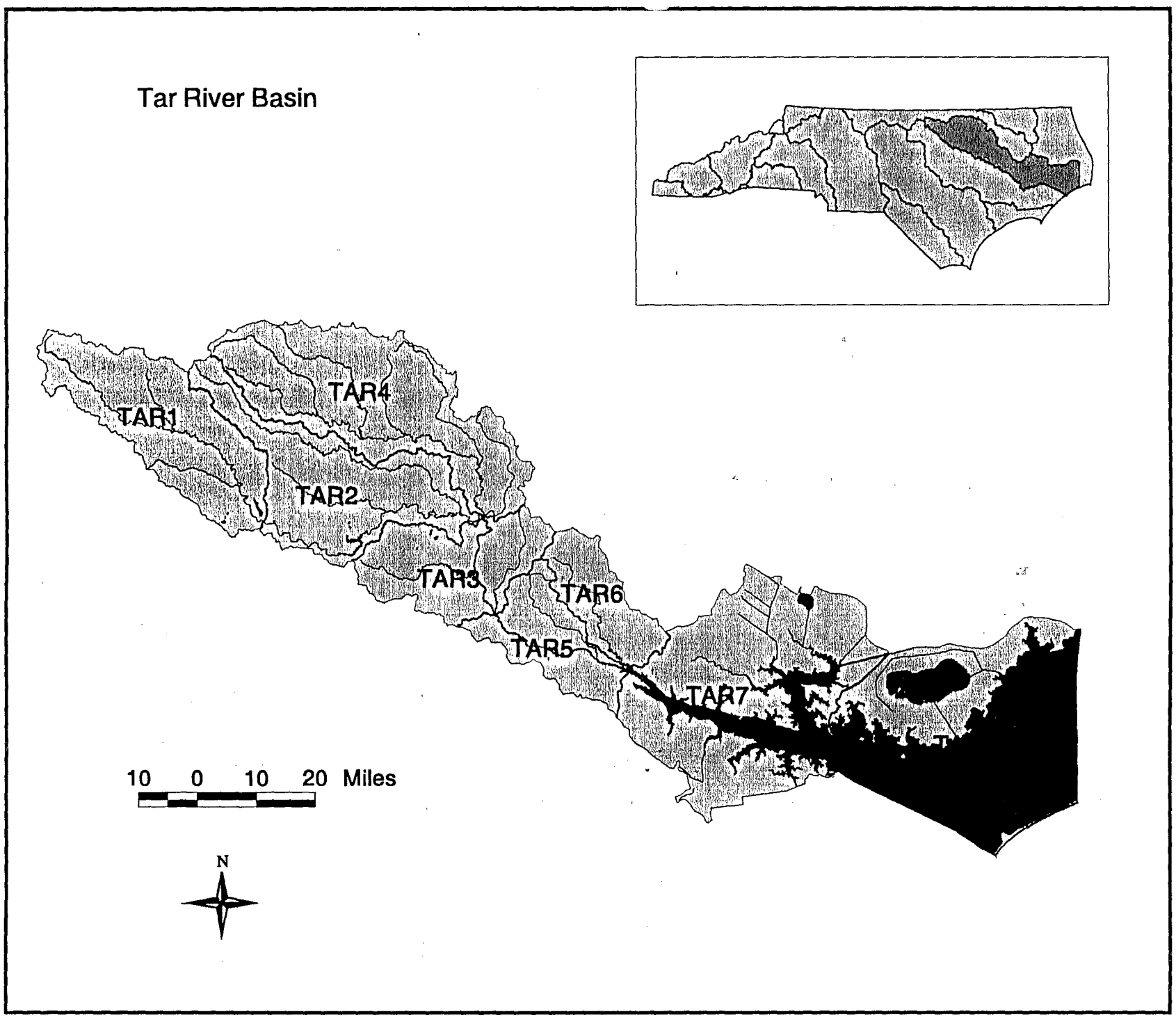
There being no further business, the meeting was adjourned for luncheon. Following lunch (which was provided by the Town of Louisburg) the group departed for the field tours described earlier in these minutes.

Attachment A

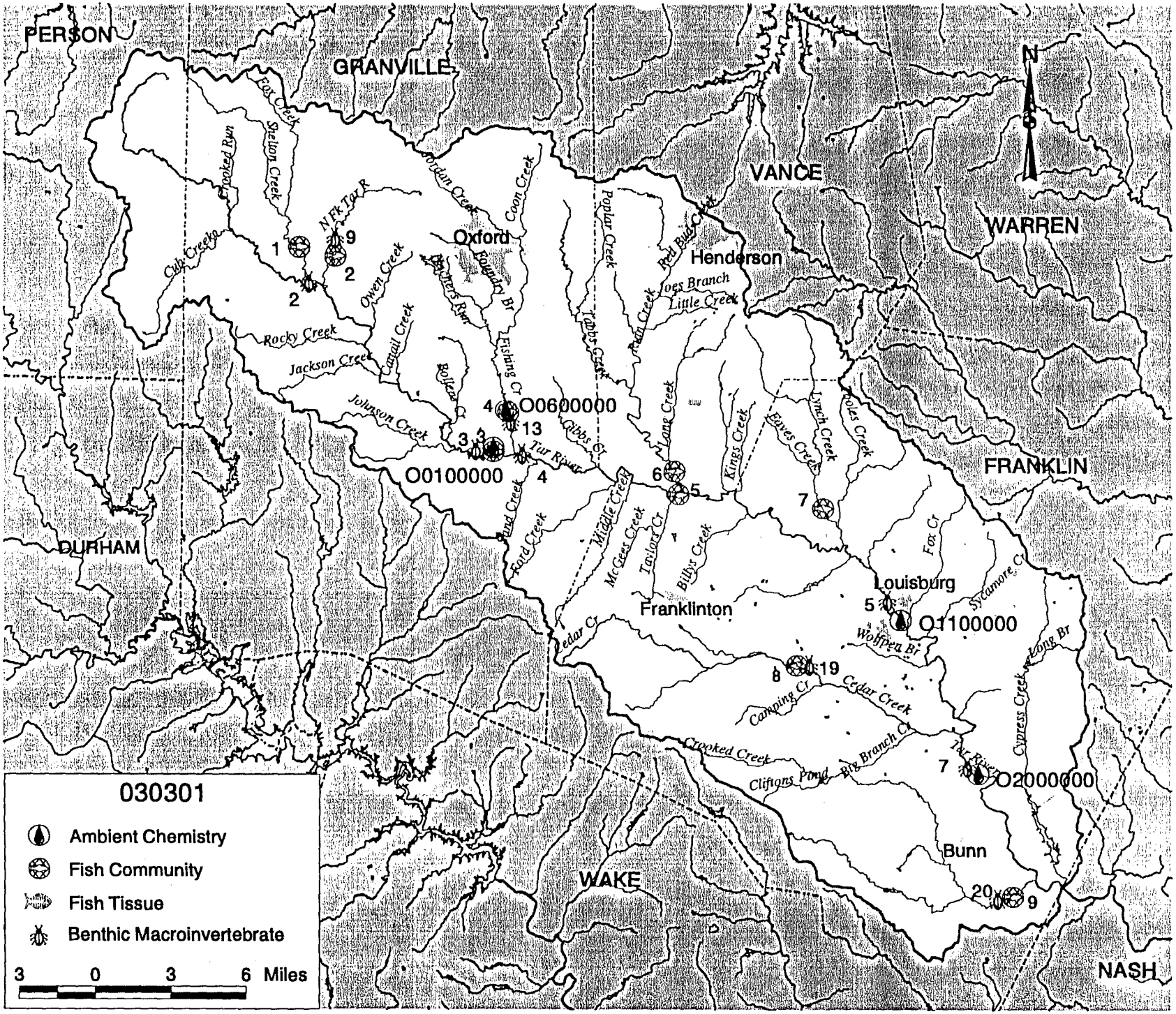
attendance
Tar-Pam RC
Louisburg
6/19/98

NAME	AFFILIATION
Jerry Giordano	DWQ Staff
Guy Stofonsk	DWQ Staff
LARRY S. ODOM	NASH County
Adele Bagnall	Franklin Cty concerned citizen
JOHN ALDERMAN	NC WILDLIFE RES. COMM.
Suzanne Hoover	DWQ
DAN WYNNE	PITT COUNTY PLANNING BOARD
Erline Wynne	Pitt Co. Visitor
JESSE A. SULLINS, JR	GRANVILLE CO - CITY OF OXFORD
JULIE KELLY	CITY OF HENDERSON, PLANNING: COMMUNITY DEV. DIR.
Allen KIMBALL	WARREN COUNTY EDC
BRUCE PERKINSON	WARREN COUNTY
Bill Lord	N.C. Cooperative Extension, Louisburg NC
Rich Gannon	DWQ Planning Branch, Raleigh
Vince Bellis	Pitt Co / Greenville
Ann Bellis	Greenville - visitor
RICK LEARY	FRANKLIN COUNTY MANAGER
LOIS B. WHELESS	LOUISBURG TOWN COUNCIL
Joe Shearon	Louisburg Town Council
Earl Bell	Wilson County - Agri
Lucy T. Allen	Town of Louisburg, Mayor
Mary Jane Lennon	Conservation at Large (Franklin)
[illegible]	TOWN OF LOUISBURG





Attachment B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Cub Creek
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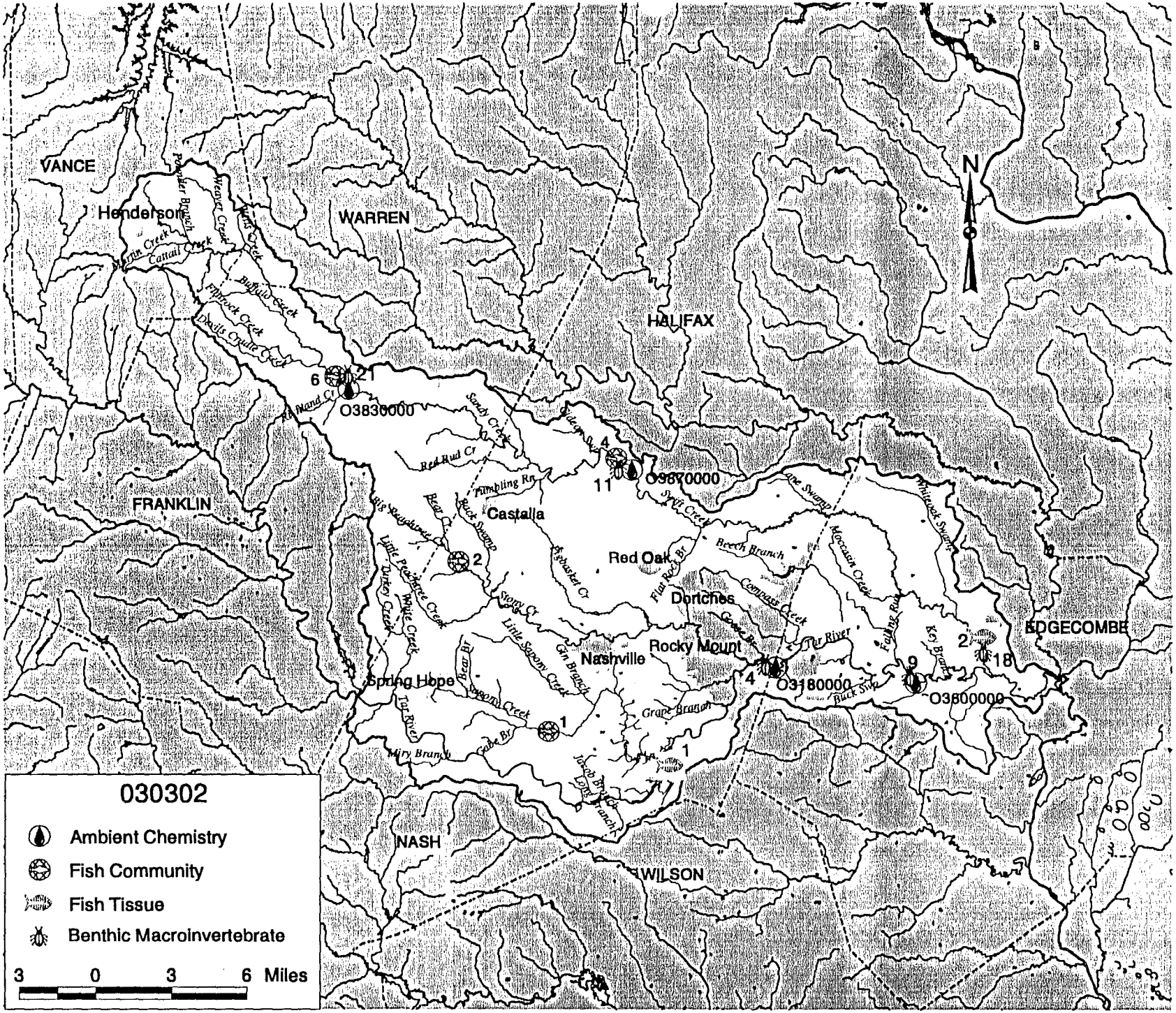
Jordan Creek
Coon Creek
Poplar Creek
Red Bud Creek
Owen Creek
Beavers Run
Fishing Cr
Tabbs Creek
Main Creek
Goes Branch
Little Creek
Rocky Creek
Jackson Creek
Canail Creek
Bolkers Cr
Johnson Creek
Gibbs St
Tar River
Lanes Creek
Kings Creek
Eaves Creek
Lynch Creek
Coles Creek
Ford Creek
Middle Creek
McGees Creek
Taylors Cr
Billys Creek
Fox Cr
Sycamore Cr
Cedar Cr
Wolfpen Br
Long Br
Camping Cr
Cedar Creek
Cypress Creek
Crooked Creek
Cliftons Pond
Big Branch Cr
030301
Ambient Chemistry
Fish Community
Fish Tissue
Benthic Macroinvertebrate
3 0 3 6 Miles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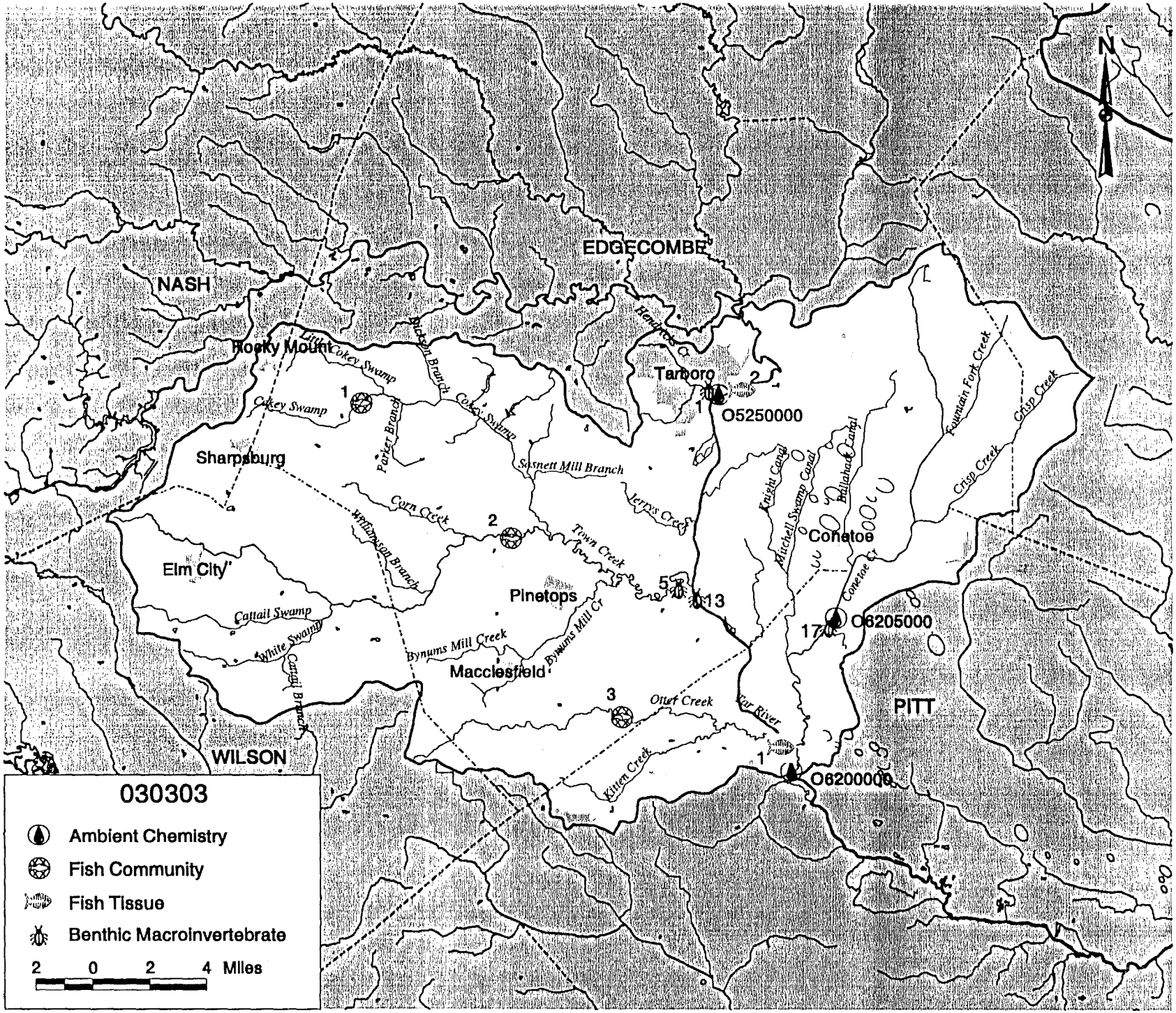
Ambient Chemistry
Fish Community
Fish Tissue
Benthic Macroinvertebrate
3 0 3 6 Miles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Little Cokey Swamp
Cokey Swamp
Parker Branch
Jackson Branch
Cokey Swamp
Swanett Mill Branch
Jerrys Creek
Corn Creek
Williamson Branch
Town Creek
Cattail Swamp
White Swamp
Bynums Mill Creek
Bynums Mill Cr
Canal Branch
Otter Creek
Knight Canal
Mitchell Swamp Canal
Ballahack Canal
Fountain Fork Creek
Crisp Creek
Conetoe
Tar River
Town Creek
030303
Ambient Chemistry
Fish Community
Fish Tissue
Benthic Macroinvertebrate
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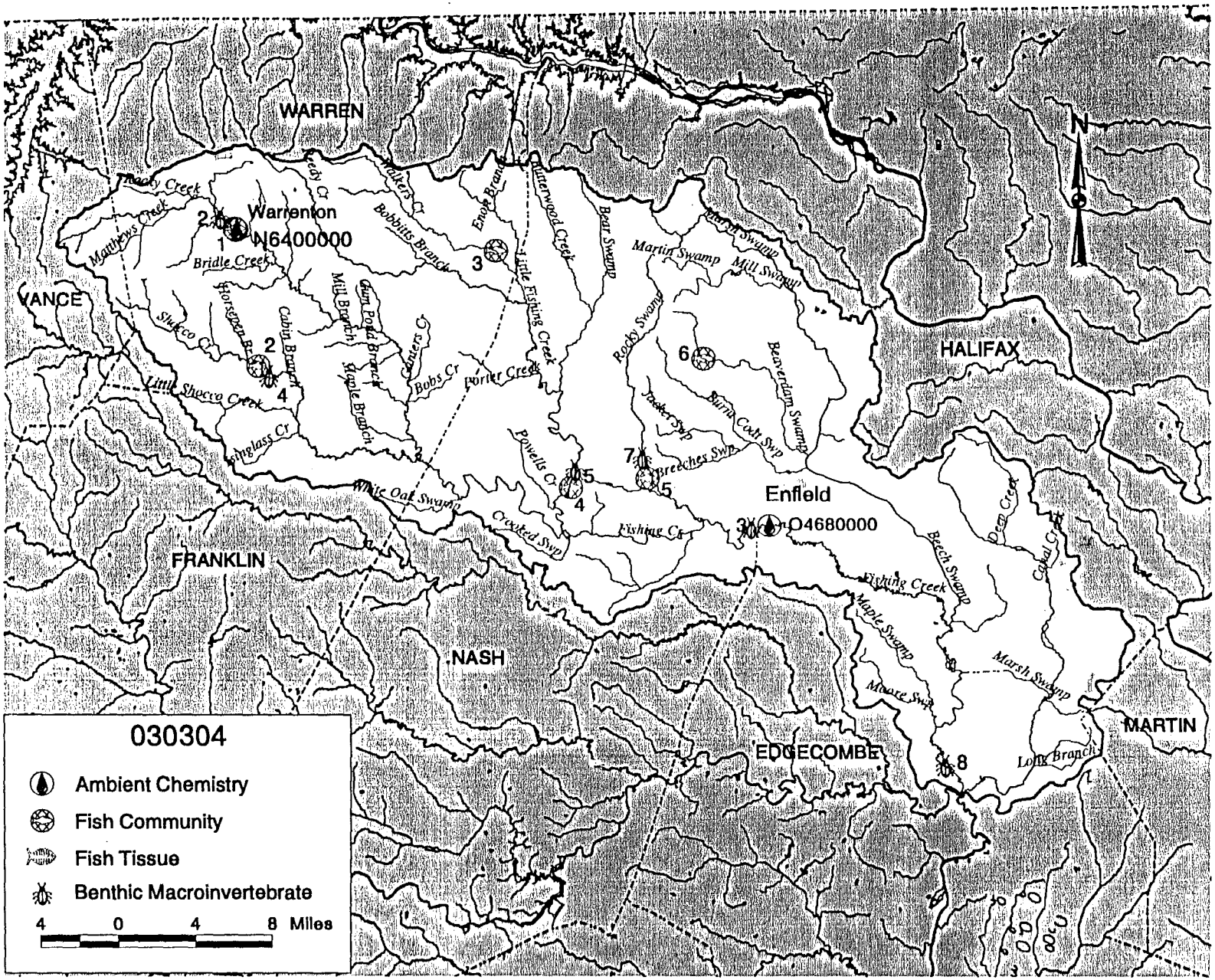
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Bridle Creek
Shocco Cr
Horsepen Br
Cabin Branch
Mill Branch
Gum Pond Branch
Maple Branch
Bobbitts Branch
Walkers Cr
Eaton Brand
Little Fishing Creek
Bear Swamp
Martin Swamp
Mill Swamp
Rocky Swamp
Beaverdam Swamp
Jacker Swp
Burnt Coat Swp
Breeches Swp
Bubbs Cr
Porter Creek
Powells Cr
Fishing Cr
Crooked Swp
White Oak Swamp
Little Shocco Creek
Spinglass Cr
Fishing Creek
Beech Swamp
Maple Swamp
Moore Swp
Marsh Swamp
Deep Creek
Cabal Cr
Long Branch
030304
Ambient Chemistry
Fish Community
Fish Tissue
Benthic Macroinvertebrate
4 0 4 8 Miles
N

Types of Water Quality Sampling Conducted by DWQ

- Ambient
- Benthic Macroinvertebrate
- Fish Community
- Fish Tissue
- Lakes

Attachment C

Ambient Monitoring

- Monthly sampling
- Physical and chemical parameters

  - D.O., pH, temp., nutrients, TSS, turbidity, fecal coliforms, metals, chlorophyll *a*

Benthic Macroinvertebrates

- Bottom-dwelling organisms (mostly insect larvae)
- Sensitive to changes in water quality
- Bioclassifications assigned based on # of intolerant taxa present
  - Excellent
  - Good
  - Fair
  - Poor

Fish Community and Fish Tissue

Fish Community

- Based on structure and health of fish community
  - species richness and composition
  - trophic composition
  - fish abundance and condition

Fish Tissue

- Assesses accumulation of contaminants in fish (heavy metals, pesticides)
- Human health concerns

Lakes Assessment

- Monitor general water quality characteristics including trophic status
- Trophic status = measurement of nutrient enrichment and productivity
- Based on nutrients, secchi depth and chlorophyll *a*

Sampling Results for Upper Tar-Pamlico River Basin

- Sampling conducted in 1997 as part of basinwide assessment
- Results will be summarized in upcoming basin plan

Subbasin 01
Upper Tar River and Tributaries

- Contains Louisburg, Franklinton and Oxford
- Carolina Slate Belt and Piedmont Ecoregions
- Landcover is approximately 30% agriculture and 45% forest

Subbasin 01
Benthic and Fish Data

Benthic Macroinvertebrates

- 9 sites
- Mostly Good -> Good-Fair

Fish Community

- 9 sites
- Mostly Good
- Some sites improved since 1992

Notable: Tar River @ NC 96 had Excellent fish and Good bugs

Subbasin 01
Lakes

Lake Devin - Granville County

Surface Area: 125 acres
Mean Depth: 16.4 feet
Classification: WS-II
Trophic Status: eutrophic

* Has had problems with hydrilla

Subbasin 01 - Special Studies

Daniel's and Daniel's Dairy

- DWQ sampling between 3/95 and 10/97
- Report currently being finalized
- Water quality improvement seen in tribs that run through dairy
- No significant changes seen in Tar River

Subbasin 01
Ambient Data

- 4 sites: 3 on Tar River; 1 on Fishing Creek
- Water quality generally good
- Fecal coliform concentrations increase downstream to Bunn
- Lower nutrient levels found in Fishing Creek since Oxford WWTP upgraded

Subbasin 02 -Tar River: Nash Co. to Edgecombe Co.

- Contains Henderson, Nashville and Rocky Mount
- Piedmont ecoregion
- Landcover is approximately 60% agriculture and 25% forest

Subbasin 02
Ambient Data

- 4 sites: 2 on Tar River; 1 on Sandy Cr.; 1 on Swift Cr.
- Water quality generally good
- Fecal coliform levels much lower than those in subbasin 01

Subbasin 02
Benthic and Fish Data

Benthic Macroinvertebrates

- 7 sites; water quality mostly in Good range
- Improvements seen since last sampling event
- Excellent sites on Swift Creek

Fish Community

- 4 sites
- Results range from Fair to Excellent
- Some results negatively influenced by Hurricane Fran

Subbasin 02
Swift Creek Watershed

- Excellent water quality assigned at most locations
- Supports populations of the federally endangered Tar River Spiney Mussel
- Portion of watershed qualifies for ORW designation
- Proposed reclassification on track to go to the legislature in the year 2000

Subbasin 02
Lakes

Tar River Reservoir - Nash County

- Surface area: 1,161 acres
- Mean depth: 17 feet
- Classification: WS-IV
- Trophic status: eutrophic

* USGS to do an in depth study of lake to provide information needed to protect it

Subbasin 03 - Tar River from Swift Cr. to Conetoe Cr.

- Tarboro largest urban area
- Coastal plain ecoregion
- Many streams channelized before 1970
- Predominant land cover is agriculture

Subbasin 03
Ambient Data

- 2 sites on Tar River
- Low pH and dissolved oxygen reflect swampy nature of streams
- Water quality generally normal

Subbasin 03
Benthic and Fish Data

Benthic Macroinvertebrates

- 4 sites sampled; results generally Good
- Low flow year; higher #s of intolerant taxa - suggests NPS impacts
- Tar River at Hwy 42 received an Excellent rating

Fish Community

- 3 sites
- results ranged from Fair to Good

Subbasin 04 - Fishing Creek and Tributaries

- Includes Warrenton and Enfield
- Piedmont and coastal plain ecoregions
- Land cover predominantly agriculture

Subbasin 04
Ambient, Benthic and Fish

Ambient

- 2 sites; water quality normal

Benthic Macroinvertebrates

- 6 sites; results generally Good
- Some improvements because of low flows suggesting affects of NPS

Fish Community

- 6 sites; Good-Fair -> Good
- No changes since '92 sampling

Attachment D

NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF PARKS AND RECREATION

NCDENR

JAMES B. HUNT JR.
GOVERNOR

WAYNE MCDEVITT
SECRETARY

DR. PHILIP K. MCKNELLY
DIRECTOR

February 24, 1998

MEMORANDUM

TO: Champion MOU Signatory Parties (see attached list)

FROM: Ann Prince, Protection Specialist
Natural Heritage Program

SUBJECT: Champion MOU

Attached is a signed copy of the Champion Memorandum-of-Understanding for conservation of riparian buffers within the Upper Tar River Basin. Each party to the MOU is also provided with a map of the Champion tracts that are covered within this agreement. The description of the significance of the Fishing Creek and Swift Creek Subbasins of the Upper Tar is provided for informational purposes and is not an attachment to the MOU. I personally wish to thank each of you for contributing your expertise to this cooperative effort and for your prompt response as needed in order to complete signature of the MOU. Danny Morgan is especially to be commended for his efforts to secure conservation of riparian buffers on Champion lands and for the work he and his staff did to provide maps. I also want to thank John Alderman and USFWS in particular for initiating this conservation project and for providing valuable biological information for the description.

John Fridell of USFWS has agreed to take the lead on providing public recognition to Champion for their conservation of riparian buffer within their ownership on the Upper Tar. He will coordinate with Ida Lynch of The Nature Conservancy and with Danny Morgan of Champion. When they have selected potential dates for a presentation, John will notify other parties to the MOU so that all can participate. The Department of Environment and Natural Resources plans to send a representative to present a registry certificate; I ideally need about two months advance notice for scheduling purposes.

Thanks again to all of you for helping to conserve the Upper Tar! Following a presentation ceremony, we should determine whether there is a need for a meeting to discuss aspects of implementation.

/AP

P.O. BOX 27687, RALEIGH NC 27611-7687 PHONE 919-733-4181 FAX 919-715-3085

List of Fed-Ex Addresses and Phone Numbers for
Champion MOU Signatory Parties

1) Attn: Randall Wilson
North Carolina Wildlife Resources Commission
Division of Wildlife Management
322 Chapanoke Road
Raleigh, North Carolina 27603
919/661-4872

2) Mark Johns
1804 Audubon Parc Drive
Cary, North Carolina 27511
919/852-5124

3) Merrill Lynch
The Nature Conservancy
Suite 201, 4011 University Drive
Durham, North Carolina 27707
919/403-8558

4) John Fridell
U.S. Fish and Wildlife Service
Ecological Services Office
160 Zillicoa Street
Asheville, North Carolina 28801
704/258-3939 (ext 225)

5) Attn: Danny Morgan
Champion International
Highway 125 and Smith Church Road
Roanoke Rapids, North Carolina 27870
919/533-5048

6) Ann Prince
Natural Heritage Program
Division of Parks and Recreation, DENR
512 N. Salisbury Street
Raleigh, North Carolina 27604
919/715-8695 (H: 919/929-4207)

MEMORANDUM OF UNDERSTANDING

among

CHAMPION INTERNATIONAL CORPORATION,

U.S. FISH AND WILDLIFE SERVICE,

THE NATURE CONSERVANCY,

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION,

NORTH CAROLINA PARTNERS IN FLIGHT,

and the

NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

for the

CONSERVATION OF RIPARIAN BUFFERS

within the

UPPER TAR RIVER BASIN

This agreement is made and entered into this 17th day of Feb. 1998; by and between the Champion International Corporation, the U.S. Fish and Wildlife Service, The Nature Conservancy, the North Carolina Wildlife Resources Commission, North Carolina Partners in Flight, and the North Carolina Department of Environment and Natural Resources (hereinafter referred to as the Department).

Objectives:

WHEREAS Champion International Corporation ("Champion") is strongly committed to the conservation of riparian buffers contributing to overall aquatic diversity, water quality and wildlife habitat; and

WHEREAS Champion:

- recognizes the value of no-harvest zones directly adjacent to the stream to protect aquatic habitat from insolation and sedimentation, to maintain the integrity of stream banks

through the development of extensive, near-shore root networks, and to provide a diversity of plant materials necessary for energy flow, nutrient cycling, and structure within aquatic habitats;

- recognizes that larger buffers extending beyond the no-cut zone, when managed through careful selective harvest, help control the rafting of excessive woody debris into the associated streams and help maintain the integrity of the no-harvest zone;

- owns 32 miles of riparian buffer in the Upper Tar River Basin, a watershed whose designated component streams are nationally significant, containing sixteen rare animal species, ten of which are rare mussels which include two Federally Endangered and six State Threatened species; and

- as one of the major landowners in the Upper Tar River Basin, is committed to demonstrating leadership in the conservation of riparian buffers.

WHEREAS, the U.S. Fish and Wildlife Service is the principal Federal agency with responsibility for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. Whereas protection strategies used by the Fish and Wildlife Service are as follows:

- acquiring, protecting and managing unique ecosystems necessary to sustain fish and wildlife, such as migratory birds and endangered species. The Service presently manages 511 national wildlife refuges covering 92 million acres (58 refuges have been acquired specifically for threatened and endangered species);

- entering into agreements with other natural resources agencies, organizations, and private entities that promote conservation of Federal Trust resources such as migratory birds, endangered species, wetlands and riparian areas;

- implementing recovery plans for Federally listed endangered and threatened species under the authority of the Endangered Species Act of 1973, as amended;

- assisting private landowners in restoring, enhancing, and maintaining valuable fish and wildlife habitat while keeping the land in private ownership;

- encouraging land management practices that balance human needs and uses with wise stewardship of fish and wildlife; and

- developing environmental awareness and outreach programs to promote a more informed and involved citizenry to understand the need for conservation of the world's biological diversity; and

WHEREAS, under existing provisions of law, the U.S. Fish and Wildlife Service is authorized to enter into agreements with private corporations and organizations, and other public agencies.

WHEREAS, the North Carolina Wildlife Resources Commission's mission is to manage, restore, develop, cultivate, conserve, protect, and regulate wildlife resources and their habitats for the citizens of the state, and

WHEREAS, the conservation strategies used by the Wildlife Resources Commission include:

- acquiring and managing lands to better conserve wildlife resources;
- cooperating with numerous other governmental agencies, conservation groups, and landowners to facilitate enhanced conservation of wildlife resources;
- surveying large areas of the state to help identify state, regional, and nationally significant wildlife resources; and
- entering into conservation agreements with owners of significant habitats to provide for appropriate management of wildlife resources.

WHEREAS, The Nature Conservancy is a private non-profit conservation organization established to protect and preserve the nation's significant natural areas; and

WHEREAS, the protection strategies used by The Nature Conservancy are as follows:

- acquiring and managing significant natural areas as private nature preserves, and using those preserves to educate the public about the value of natural areas;
- entering into conservation agreements with owners of significant natural areas in order to provide for ecologically sound management of the rare species and communities therein;
- facilitating acquisition of significant natural areas by public agencies through negotiation with landowners and, at times, temporary ownership of real property until agency funds become available;
- entering into memoranda-of-understanding with landowners of significant natural areas in order to provide for inventory, management, and protection of natural areas;
- promoting the awareness and involvement of the general public, private corporations, and agencies in natural area protection; and

- providing information to assist landowners in land use planning that optimally has beneficial impacts on the special elements of natural diversity and natural areas which best exemplify the state's natural heritage; and

WHEREAS, through policies established by its Board of Governors, The Nature Conservancy is authorized to enter into Agreements with public agencies and private corporations.

WHEREAS North Carolina Partners in Flight is a program that works to save species and habitats before they become endangered by promoting joint efforts between agencies, organizations, and individuals to further migratory bird conservation; and

WHEREAS North Carolina Partners in Flight:

- promotes understanding of the problems facing migratory birds through a variety of educational efforts targeted toward the public and other interested groups;

- provides training opportunities for natural resource professionals and educators;

- participates in bird monitoring programs currently in place such as the Breeding Bird Survey (BBS), Monitoring Avian Productivity and Survivorship (MAPS), the Christmas and Spring Bird Counts, Point Counts, and Migration Monitoring;

- works with individuals, and also local, state, regional, national, and international groups, organizations and agencies that will benefit migratory birds and their habitats; and

- assists in the development and implementation of local, statewide, regional, and national management plans to help further migratory bird conservation; and

WHEREAS, under the direction of the North Carolina Partners in Flight Steering Committee, Partners in Flight is authorized to enter into Agreements with public agencies and private corporations.

WHEREAS the Department's Division of Parks and Recreation was created by the General Assembly of North Carolina to inventory and facilitate the protection of the special elements of natural diversity and natural areas which best exemplify the state's natural heritage; and

WHEREAS the protection strategies used by the Division of Parks and Recreation include:

- acquiring and managing significant natural areas;

- promoting appreciation through educational and interpretive activities;
- establishing a statewide system of registered natural areas and dedicated nature preserves;
- entering into Memoranda of Understanding with landowners of significant natural areas that may provide for inventory, management, and protection of natural areas;
- promoting the awareness and involvement of the general public, private corporations, and agencies in natural area protection; and
- providing information to assist landowners in land use planning that optimally has beneficial impacts on the special elements of natural diversity and natural areas which best exemplify the state's natural heritage; and

WHEREAS, under existing provisions of law, the Department is authorized to enter into agreements with private corporations.

NOW THEREFORE, in consideration of the above premises and in the interest of the mutual advantage in attainment of common objectives, the parties hereto desire to cooperate and mutually agree as follows:

Statements of Work:

A. Champion agrees to:

1) work cooperatively with the Division of Parks and Recreation's Natural Heritage Program to identify and map riparian buffers adjoining designated perennial streams (see Exhibit A) in the Upper Tar River Basin on tracts owned by Champion. The total minimum width of the riparian buffers will be 200 feet on each side of the stream. This 200-foot buffer width could be expanded at Champion's discretion on tracts where it makes sense to do so. For example, where the existing natural hardwood stand bordering a stream is wider than 200 feet, Champion, at its sole discretion, could decide to include the entire width of the hardwood stand as part of the riparian buffer. Within that buffer, there will be a no-harvest zone that will extend from the stream edge to a distance of 50 feet or to the top of the first levee, whichever is greater. The remaining buffer (Selectively Harvested Zone) will be selectively harvested according to the provisions described in section 2 of this paragraph.

2) manage the Selectively Harvested Zone within the 200-foot buffer as follows in order to enhance wildlife habitat suitability:

a) avoid conversion of hardwood or mixed forests to pine;

b) use single tree or small group selection for harvest, with a goal of retaining an average of 70% canopy closure throughout the buffer, with no less than 50% closure in any specific location;
c) favor for retention den trees, mast-producing trees, or other tree species utilized by wildlife;
d) attempt to conduct tree harvest during the non-breeding season (October 1st to March 1st);
e) avoid construction of new roads or right-of-way corridors within the buffer;
f) attempt to keep existing road widths to a minimum (ideally, 25 feet wide or less) to reduce fragmentation;
g) retain snags, especially those which do not protrude above the canopy and those which occur in clusters, where safe to do so, and otherwise not in violation of the Occupational Safety Hazard Act;
h) avoid soil disturbance to the extent practicable; and
I) avoid use of herbicides, pesticides, or fertilizers.

3) consult all parties to this Memorandum if any significant management activities not covered under this Memorandum are considered within the riparian buffer.

4) add the riparian buffers as shown in Exhibit A to the North Carolina Registry of Natural Heritage Areas.

5) notify all parties to this Memorandum if sale, trade, or transfer of registered areas is anticipated.

6) notify all parties to this Memorandum if threats to the registered areas are observed, or if an emergency or operational situation occurs that potentially impacts a registered area.

7) facilitate access to designated riparian buffers in this agreement for representatives of other parties of the Memorandum as needed for inventory, research, and other protection activities. Access will be closed to the general public and the properties will continue to be leased by Champion to existing recreational lessees. Lessee information will be given to the other parties of this Memorandum so that direct contact with Champion and its lessees can be made when access is needed.

B. The U.S. Fish and Wildlife Service and the North Carolina Wildlife Resources Commission agree to:

1) contingent upon funding, jointly survey and monitor rare and common aquatic species populations.

2) provide information gathered to Champion, The Nature Conservancy, and the Division of Parks and Recreation's Natural Heritage Program.

3) notify Champion and its lessees when survey and/or other activities are planned on its property.

C. The Department agrees to:

1) provide Champion with location and management information for the rare species and high quality natural communities known to occur in the riparian buffers, and for any rare species or natural communities subsequently identified.

2) notify Champion and its lessees when survey and/or other activities are planned on its property.

D. The Nature Conservancy agrees to:

1) provide stewardship assistance to support Champion's management of riparian buffers.

2) provide additional information to Champion pertaining to conservation easements and other protection tools available for protecting riparian buffers.

3) notify Champion and its lessees when survey and/or other activities are planned on its property.

E. North Carolina Partners in Flight agrees to:

1) encourage and support organized migratory bird research efforts in the buffer.

2) provide bird monitoring training for Champion foresters, with Wildlife Resources Commission assistance, contingent upon funding.

3) survey bird populations in the buffer and adjacent lands, with Wildlife Resources Commission assistance, contingent upon funding.

F. The U.S. Fish and Wildlife Service, The Nature Conservancy, the North Carolina Wildlife Resources Commission, North Carolina Partners in Flight, and the Department additionally agree to publicly recognize Champion's leadership among forest product corporations in the basinwide protection of riparian buffers.

Conditions of Agreement:

This Memorandum of Understanding shall become effective when signed by all the parties and shall continue in force until terminated by any party.

This Memorandum of Understanding may be terminated thirty (30) days after written notification by any party.

This Memorandum of Understanding may be modified through the mutual consent of the signatory parties.

This Memorandum of Understanding is not intended to restrict, shall not restrict, and shall not be construed as restricting any rights Champion may have as an owner of private property.

This Memorandum of Understanding does not promote or provide for public access. Champion and its lessees may control public access to the designated riparian buffers. Registration of the riparian buffers does not constitute assurance as to the safety conditions on the land or for the safety of the persons thereon. Any parties to this Memorandum, except the U.S. Fish and Wildlife Service, will indemnify and hold Champion and its lessees harmless for any damage or injury incurred while on Champion property. (The U.S. Fish and Wildlife Service shall be liable to Champion for property damage, personal injury or death caused by the wrongful or negligent act or omission of an employee of the U.S. Fish and Wildlife Service acting within the scope of his/her office or employment on lands of Champion in accordance with and to the extent provided in the Federal Tort Claims Act, 28 U.S.C. Section 1346 (b), 2671-80.)

Key Contacts:

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N.C. Partners in Flight:

Mark Johns
N.C. Partners in Flight
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Signature:

CHAMPION INTERNATIONAL CORPORATION

APPROVED:

Larry Davis 2/3/98

Larry Davis, General Manager, Eastern Carolina Region Date

Signature:

U.S. FISH AND WILDLIFE SERVICE

APPROVED:

Brian P. Cole 1/30/98

Brian P. Cole, State Supervisor Date

Signature:

NORTH CAROLINA WILDLIFE RESOURCES COMMISSION

APPROVED:

Charles R. Fullwood 1-26-98

Charles R. Fullwood, Director Date

Signature:

THE NATURE CONSERVANCY

APPROVED:

Katherine D. Skinner 1-28-98

Katherine Skinner, Director Date

Signature:

NORTH CAROLINA PARTNERS IN FLIGHT

APPROVED:

Mark Johns

Mark Johns, North Carolina Coordinator

1-27-98

Date

Signature:

DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
Division of Parks and Recreation

APPROVED:

Dr. Philip K. McKnelly, Director

2/17/98

Date

Winter 1997
Volume 2, Number 2

Krüger

A Quarterly Report On Advanced Water And Wastewater Treatment Technologies From Krüger, Inc. FLUENT lines

Louisburg, N.C.:

BioDenipho® Plant Wins National EPA Award

When the Tar River Wastewater Reclamation Facility serving Louisburg, N.C., was due for renovation in 1990, Peirson & Whitman Architects and Engineering searched for a biological nutrient removal system requiring no chemical treatment. Anticipating strict removal limits in the future, planners wanted reliable phosphorus and nitrogen removal, but also a safe and energy efficient facility.

"We looked at quite a few processes, but most appeared to not meet nitrogen removal requirements and many use methanol, which can be expensive and dangerous," explains Senior Project Engineer Steve Scruggs.

They selected Krüger's BioDenipho® process, making the 1.37 MGD Tar River facility the first plant in the United States to use this process. The new facility went on-line in 1993.

See Louisburg Plant, pg. 4

The totally biological BioDenipho® nutrient removal process used at the Tar River Wastewater Reclamation Facility reduces plant energy costs by 40 percent, requires minimal maintenance after four years of operation.

New Ulm, Minn.:

ATAD Proves Best Choice For 503 Rule, Extreme Cold

When the EPA's Biosolids Rule 503 went into effect in 1993, the New Ulm, Minn., Wastewater Treatment Plant (WWTP) made plans to replace its conventional aerobic digestion system in order to comply with the new regulations. The plant's storage capacity was inadequate and the time/temperature ratio required by Rule 503 would have called for a digestion capacity of 60 - 70 days.

"We were unable to meet time and temperature regimes particularly in winter," recalls WWTP Supervisor Del Senst.

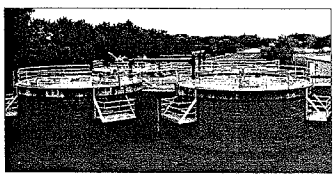
The best solution was installing Krüger's autothermal thermophilic aerobic digestion (ATAD) process, making New Ulm the first city in Minnesota to use this process.

The ATAD process consistently delivers Class A sludge, without external heating. The digestion process generates its own heat, with temperatures in the final stage of the process reaching 55° C (130° F). The high heat destroys pathogens and meets EPA pathogen reduction requirements.

New Ulm's ATAD process was brought on line in December 1996. Robert Brown, Vice President of Bolton & Menk, Inc., the engineering firm supervising the design and construction, toured similar facilities in Europe, where the process has been in use for more than two decades.

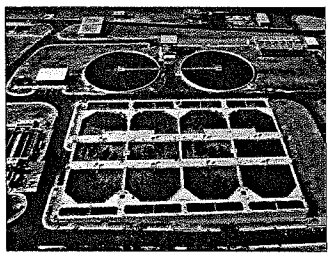
"The ATAD is adaptable to

See New Ulm ATAD, pg. 2



Krüger Process Meets N.C.'s Strict Bill 515 Limits For N & P

House Bill 515, ratified in 1997 by the General Assembly of North Carolina, imposes strict nutrient removal requirements on wastewater treatment facilities throughout the state. Effluent discharged into specified lakes and rivers must contain no more than 5.5 mg/l total nitrogen and no more than 2.0 mg/l total phosphorus.



The regulations are designed to protect nutrient sensitive waters from the "excessive growth of microscopic or macroscopic vegetation" resulting from high levels of nitrogen and phosphorus in plant discharges. While water containing nitrogen and phosphorus is not toxic or polluted, it promotes the proliferation of algae and other aquatic plants. This condition, known as eutrophication, creates an "oxygen sink" when the algae and plants die, settle to bottom and begin to decompose. Decomposition consumes oxygen, leading to fish kills, and the presence of algae is unappealing to boaters and swimmers.

Krüger's BioDenipho® nutrient removal systems at wastewater treatment plants in Cary and Louisburg, N.C., consistently produce effluent measuring well below the newly prescribed nitrogen and phosphorus limits, while reducing operation costs. The Krüger systems are chemical-free, biological processes, aiding the effort to provide effective environmental stewardship of the state's lakes and rivers. ■

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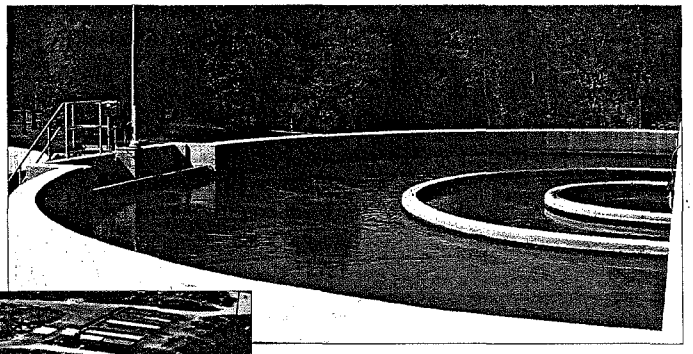
Louisburg, NC:

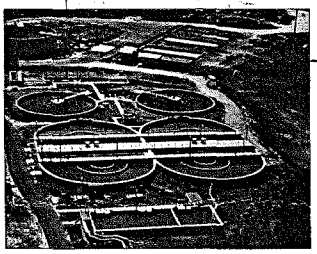
BioDenipho® Process Reduces Plant Energy Costs By 40 Percent

continued from page 1

Plant effluent consistently tests well below state limits – without chemical treatment. "We've never had to add any chemicals of any kind," says Plant Superintendent Tony Arnold. "That's one thing we're really pleased about." The plant has documented energy savings of 40 percent compared to energy costs at conventional activated sludge plants.

In September 1997, the Tar River facility earned the EPA's National Operation and Maintenance Award for plants in the 1.0 - 3.0 mgd category *(see sidebar, below)*.





Anticipating strict nutrient removal limits in the future, planners for the Tar River Wastewater Reclamation Facility wanted reliable phosphorus and nitrate removal, and they wanted a safe and energy efficient facility.

The BioDenipho® Process

The facility consists of two oxidation ditches comprising a single treatment train. Influent flows through a mechanical bar screen then through Kruger's grit and grease removal system. Flows then proceed into a staged anaerobic selector and are mixed with return activated sludge to promote growth of microorganisms that store soluble phosphorus and inhibit the growth of filamentous organisms.

After passing through the three stages of the anaerobic selector, a programmable logic controller (PLC) directs the flow between oxidation ditches during the four phase nutrient removal cycle. Each oxidation ditch contains two 60-HP Maxi-Rotors, which provide oxygen for the oxic phases of the process, and two 9-HP POPL-I submersible mixers, which maintain the suspension of the mixed liquor and the required flow velocity within each reactor.

The PLC operates these units in response to dissolved oxygen (DO) levels, and also controls motorized effluent weirs at the back of each ditch, adjusting water levels for maximum rotor efficiency.

The four separate phases involve changes within the reactors from oxic to anoxic. The number of phases and the duration times can be manipulated to handle a one-quarter load as efficiently as full flow.

The Four Phase Cycle

In phase one of the BioDenipho process, mixed liquor flows from the anaerobic selector into the anoxic reactor. Bacteria feed off organic matter, utilizing nitrates rather than oxygen, releasing harmless nitrogen gas. The nitrate concentration decreases while ammonia rises. Mixers maintain the flow velocity in the basin.

In response to the DO control metering system, the rotors aerate the second reactor basin until a predetermined DO level is achieved. The increased oxygen allows ammonia to be converted into nitrate and BOD to be removed while bacteria store soluble phosphorus. Effluent is discharged when the soluble phosphorus concentration is at the minimum, and phosphorus is ultimately removed in the wasted sludge.

In phase two, both reactors are in an oxic state, minimizing the amount of ammonia and phosphorus in the effluent. The third and fourth phases mirror phases one and two, respectively.

"Using DO control to turn the rotors on and off saves running time, resulting in significant electrical savings," explains Superintendent Arnold. "Most activated sludge or conventional oxidation ditch plants have to run the rotors all the time."

Self-cleaning DO probes monitor the oxygen concentration during oxic phases. The PLC is programmed with upper and lower DO limits, and the rotors operate to maintain the DO within this range despite changes in influent character and loading. When the concentration reaches the upper limit, the rotors shut down and the mixers start. If the concentration approaches the lower limit, aeration is resumed.

After completing the cycle, flows proceed through two clarifiers and a filter before disinfection. After final aeration, the effluent is discharged into the Tar River.

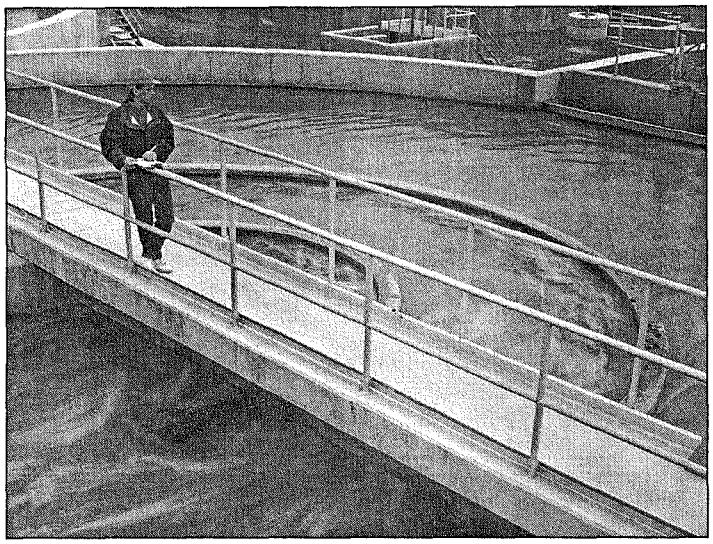
Plant operators particularly like that phase lengths and operating conditions can be varied to provide tremendous system flexibility, allowing the plant to accommodate changes in influent flow and character on a daily and seasonal basis. The plant has the flexibility and accuracy to provide very effective wastewater treatment. ■

EPA Selects Tar River Facility For Top National Award

The Tar River Wastewater Reclamation Facility, which serves the city of Louisburg, N.C., won this year's EPA National Operation and Maintenance Award for plants in the 1.0 - 3.0 MGD category. The selection was based on outstanding performance in three areas:

- The Unique BioDenipho® Process.
- Energy Savings From Processes and Operational Efficiencies.
- The Overall Administration of the new Facility Construction.

"We're very proud of our wastewater treatment plant staff and their achievement," says Louisburg Mayor Lucy Allen. She credits the BioDenipho Process with a major role in the EPA award, describing Krüger as "A Great Partner and Support."



Plant Superintendent Jimmy Ellington checks an oxidation tank at Louisburg's wastewater treatment plant. Visitors from as far away as Austrailia have come to see the plant that is the nation's first to use a chemical-free process for treating sewage.

Louisburg treatment plant recognized worldwide

You might not expect to go to the little town of Louisburg to examine world-class technology, but right there on the banks of the Tar River the town's sewage treatment plant is attracting plenty of attention.

The Environmental Protection Agency gave its national Wastewater Management Excellence Award to the Tar River Water Reclamation Facility last year after first awarding the plant a regional award for operations and maintenance excellence. The national award recognizes water treatment performance, operational efficiency and overall administration in advanced wastewater treatment plants processing 1 to 3 million gallons a day. The Louisburg plant processes 1.5 million gallons of sewage a day.

In the meantime, representatives from such diverse locations as Florida, Arizona, Australia, Tasmania and Denmark have come to see the plant's operations. "For a while, we had one group after another coming in to take a look at it," said C.L. Gobble, Louisburg town administrator.

The plant has also been the subject of feature articles in such publications as Georgia and Southeast Environmental News and Environment News.

The treatment plant uses a Dutch biological process, known as Bio-Denipho, to remove ammonia, nitrogen and phosphorous from wastewater without using chemicals, Gobble said. And because of the way the process works, the plant also consumes less electricity.

The Town of Louisburg is saving about $90,000 a year previously spent for chemicals and about $60,000 a year in electricity costs, Gobble said.

The lack of chemicals also means the plant's operation is less detrimental to the environment, Gobble said. This is particularly important because the state has increased requirements for removal of nutrients from wastewater, and has specifically labeled the Tar River nutrient-sensitive.

"A lot of plants have to add chemicals for this, chemicals for that, and more chemicals," said Jimmy Ellington, superintendent of the treatment plant. "We don't have to do that. Everything we do is 100 percent biological — well, not 100 percent, but essentially."

The plant replaced one that was built in the 1930s, upgraded in 1979 and failing by the 1990s. The Town Council decided that it was time to resolve continuing problems for the present and the future, and to do so in an environmentally conscious manner, Gobble said.

Town leaders visited several other treatment plants before deciding on the Bio-Denipho process, which is patented by Kruger, Inc., a firm from the Netherlands that has since opened offices in Cary.

The $5.6 million price tag for the project represented starting from scratch to totally replace the existing, outdated plant.

"Now, to do this we had to raise sewer rates significantly," Gobble said, adding that rates tripled. "So we had to have the commitment to the environment from the Council and the city (residents) to, essentially, back it up with their wallets."

Sewer rates are $16.75 for up to 2,000 gallons of total water consumption and $6.23 for each additional 1,000 gallons for customers inside town limits, and are doubled outside of town.

Gobble said the Town developed a "pretty strong PR campaign" to explain the need for the new plant and the benefits of choosing a state-of-the-art design. "Everyone who came out wound up getting a personal tour of the plant," he said. In the end, there was no significant opposition.

Building the plant solved the type of sewage treatment problems that have caused headaches for other North Carolina communities in the past few years, Gobble said.

"I find it interesting that other cities say it just can't be done, because it can be done if that's your priority," he said. "Really, if we can do it, any town can do it. We had our heart in it and believed in what we were doing."

The Town has also built an outdoor learning lab and nature trail at the treatment plant that has proven popular with students from Franklin County Schools and Louisburg College. Because the plant uses ultraviolet light instead of chemicals to disinfect the treated sewage, there's no odor, Gobble pointed out.

Second Annual Status Report to the Environmental Management Commission

Executive Summary

Introduction: In December 1994, the North Carolina Environmental Management Commission adopted Phase II of the Tar-Pamlico Nutrient Sensitive Waters Strategy. A year later under this Strategy, the Commission adopted a plan to manage nonpoint nutrient sources in the river basin. The Commission required annual status reports on implementation of the nonpoint source plan. This report describes efforts made during 1997, the second year of the plan's implementation, to reduce and account for nonpoint source nitrogen loading to the Tar-Pamlico estuary.

The Phase II Agreement set a 30 percent reduction goal in nonpoint nitrogen loading to the estuary, and no increase in phosphorus loading, from 1991 levels. The Nonpoint Plan set a 5-year timeframe, to the end of 2000, for attainment of the 30 percent goal through existing programs. The goal was apportioned among agriculture (95 percent), urban land uses (4 percent), and atmospheric deposition (1 percent) based on their loading contributions. Refinements are planned in these estimates in the future, including an increase in the atmospheric deposition goal.

Agriculture: Much of the Plan's progress hinges on the efforts of cropland and animal agriculture. Cropland agriculture has achieved loading reductions since 1991 through use of nutrient reducing Best Management Practices (BMPs). A workgroup including the Division of Water Quality, Division of Soil and Water Conservation, and others is currently refining methods of estimating progress to date. It is now clear that reduction estimates using the methods applied last year are not comparable with the reduction goal for agriculture. As an interim measure, Soil and Water has estimated the increase in number of acres affected by cost-shared BMPs since 1991 at over 13 percent of basin cropland acres above Washington. This value does not include acres of unassisted BMPs and is known to be an underestimate for other reasons also. For example, conservation tillage has increased significantly in the basin, much of it installed or continued without cost share, with some estimates of coverage ranging up to half of all cropland in the basin. Estimates of progress will be refined for the third annual report.

Using for now the known underestimate figure of 13 percent of all acres currently affected by BMPs, and projecting the average rate of BMP adoption over the last six years into the future, DWQ estimates that as a worst case 20 percent of the basin's cropland would be treated by the end of 2000. For comparison, if an average nitrogen reduction efficiency of 30% is assumed for all BMPs, then it would be necessary to implement BMPs on 100% of cropland in the basin to achieve the 30% reduction goal for cropland agriculture. On the other hand, if the most efficient BMPs are emphasized and are targeted to critical loading areas, as little as 50% of cropland may require treatment to achieve the goal. Noting the qualifications, DWQ believes that an increase in the rate of cropland BMP adoption will be needed to reach the 30% goal by 2000.

Impacts from the growing number of animal operations in the Coastal Plain are not well quantified yet. Soil and Water plans to make preliminary nutrient budget estimates for animals in the basin during the next year, but major gaps exist in determining the fate of nutrients. Atmospheric and groundwater research is underway. Results of initial atmospheric research funded by the 1996 General Assembly are expected by the end of 1998. However, basic questions such as the geographic extent of the ammonia airshed that contributes to the basin, terrestrial buffering, and

estimate load changes to surface waters will take years to answer. Results of initial groundwater research analyzing potential nutrient loading from lagoons are expected in 1998, but further study will likely be needed to allow generalization. Another important question related to animal operations, the potential for nutrient loading from waste application lands, lacks current research.

Lack of resources is a significant barrier to greater progress in all areas. To achieve needed increases in agricultural BMP adoption, Soil and Water has submitted an expansion budget request for additional Agriculture Cost-share Program funding of $1 million per year, along with additional field and office staff to foster, assist, target, and track greater BMP adoption.

Wetlands Restoration: The Wetlands Restoration Program has estimated net load reductions from basin wetland restoration activities since 1991. The program found negligible reductions above Washington but significant decreases below that point. Washington is the accounting point for the 30% goal. Reductions below the city benefit the estuary but do not count toward the goal.

Wetlands restoration has great potential as a tool to reduce nutrient loading. Additional funding would be fundamental to achieving significant load reductions from wetland restoration within the Plan's timeframes. The wetlands program estimates that roughly 1,320 acres of riparian wetland restoration would provide the ability to annually reduce about 45,400 kilograms of nitrogen load, which is equal to the sum of the urban and atmospheric deposition cumulative 5-year reduction goals. The cost for this restoration acreage would be approximately $32 million, or $10.6 million annually for the Plan's remaining three years. This large up-front cost would be very cost-effective over time, since wetland functional life can be indefinite.

Urban: The Division of Water Quality did not quantify loading changes from urban nonpoint sources because of resource constraints. The Division's stormwater staff plans to survey municipalities to estimate historical load changes for the third annual report. Two new on-site wastewater and solid waste staff hired during 1997 with Section 319 funds are attempting to address priorities in these urban categories. The two agencies are investigating use of the Clean Water Management Trust Fund and other funding sources to forward their action plan objectives.

Without additional funding and new initiatives, urban categories will not achieve their reduction goal within the Plan's timeframes. While growth in the basin has continued since 1991, no significant urban initiatives have been implemented to reduce loading. Only 30 percent of the basin is currently subject to stormwater regulation. These regulations attempt to minimize increases in pollutant loading from new development, and do not address loading from existing urban areas. Thus, nitrogen loading from urban areas has increased since 1991 and, lacking new initiatives, will continue to increase.

Urban stormwater activities in need of funding include cost-share for retrofitting, demonstration projects, planning, educational activities and research. Similar resource needs were identified by solid waste, on-site wastewater and construction/mining categories. These categories also identified needs for 23 new staff positions and support funding to perform compliance, source assessment, and technical assistance work.