

NEUSE RIVER BASIN REGIONAL COUNCIL

Wayne Center
208 W. Chestnut Street, Goldsboro, NC
(919) 731-1520

JANUARY 30, 1998

9:00 am Executive Session Executive Committee

AGENDA

9:30	Call to Order & Welcome	Chairman Bill Ritchie
9:35	Self-Introductions	All
9:40	Acceptance of Minutes from 10-31-97 meeting	Chairman Ritchie
9:50	Report on Executive Committee meeting on 11-21-97	Chairman Ritchie
10:00	Discussion on Revised By-laws (amended to reflect changes in Executive Order)	Joan Giordano Division of Water Quality
10:10	Neuse River NSW Management Strategy -- Update	Beth McGee Division of Water Quality
10:20	Selection of NRBRC Representatives to the Coordinating Council	Chairman Ritchie
10:30	BREAK	
10:40	"The Economics of Wastewater Treatment"	Dr. Mitch Renkow N.C. State University
11:10	"Advances in Wastewater Treatment Technology"	Dr. Robert Rubin N.C. State University
11:40	Discussion/Vote on Draft Resolution titled: <u>Review to Provide Modernization of Existing Obsolete and Inadequate Sewerage Treatment Facilities</u>	Chairman Ritchie
11:50	Discussion/Vote on Draft Resolution titled: <u>Improved Communication and Coordination on Water Quality Issues in North Carolina</u>	Chairman Ritchie
12:00	Membership/Participation Concerns	Chairman Ritchie
12:15	New Business/Open Discussion	Chairman Ritchie
12:30	Adjourn	

NEUSE RIVER BASIN REGIONAL COUNCIL

Wayne Center
Goldsboro, NC
January 30, 1998

Minutes

The Neuse River Basin Regional Council met in Goldsboro on January 30, 1998. In attendance were the following:

E.T. Iseley	Bruce Whitfield	Norman Ricks
Tom Jones*	Craig Bromby*	Sondra Riggs
Joan Giordano*	Guy Stefanski*	Jim Cummings*
Joe Hughes	Marguerite Whitfield	Jeri Gray*
Martin Lebo*	Tom McGee	Margaret Holton
Caroline Parker	Bill Ritchie	John Costlow
Sam Holton*	Mitch Renkow*	Don Cox - excused absence
Chester Lowder*	Beth McGee*	

* Denotes staff or visitor

Chairman Ritchie called the meeting to order. The minutes were approved as received. Mr Ritchie discussed the need for a designated repository for all "paper work" generated by the NRBRC and he reported on issues discussed at the Executive Committee meeting held 11/21/97.

Joan Giordano reviewed changes to our by-laws which reflect changes in the Executive Order: Article 1, section 4, paragraph -A restates NRBRC function; Article 2, section 3, paragraphs 1 and 2-clarify the filling of vacancies; and Article VI section 1, adds the phrase "and with the Council Secretary" at the end of the paragraph.

Beth McGee (DWQ) gave an update of the Neuse River NSW Management Strategy rule making procedure. She also explained about the three non-point source teams which are located in her section. DWQ will establish a sample of model storm water runoff handling procedures. She also addressed some questions raised by members concerning rules for NSW. Dr. Costlow suggested that the Executive Committee review the NSW Management Strategy and report to the full Council for approval. Mrs. Riggs expressed her concern about the proposed rules. Ms. McGee agreed that some changes are being made. Tom Jones said agricultural agencies are involved in suggesting changes. Mr. Ritchie feels that the Dept. of Transportation should do something about abatement of nutrients coming into the river from roadsides and highways.

Mr. Ritchie explained that we need NRBRC representation on the Coordinating Council by region. The Executive Committee nominated the following three representatives and their alternates: Bill Ritchie, alternate John Costlow for the lower Neuse; Caroline Parker, alternate Sondra Riggs for the middle Neuse; and Terry Roland and alternate John Cooke for the upper



Neuse. There being no further nominations from the floor, Mrs. Holton moved the acceptance of this slate. The motion was seconded by Joe Hughes and the motion carried.

Dr. Mitch Renkow of NC State University (NCSU) spoke to the Council on the "Economics of Wastewater Treatment." He explained assessment criteria and management options. He emphasized that all evolving treatment technologies are very expensive.

Dr. Bob Rubin, also from NCSU, spoke on "Advances in Wastewater Treatment Technology." His slide presentation was informative, particularly in the area of reuse of treated water, and the treatment and use of bio solids.

The next discussion centered on the draft of a resolution entitled "Review to Provide Modernization of Existing Obsolete and Inadequate Sewage Treatment Facilities." Dr. Costlow moved the adoption of this resolution and the motion was seconded by Joe Hughes. The resolution was modified to add the word "traditional" before the words "new and innovative" in the paragraph beginning "Now Therefore, It Is Resolved." The idea of adding the words "septic systems" to the same paragraph was seen as unnecessary because this was thought to be included by inference. The motion carried. **See attached revised resolution.**

Mr. Ritchie explained his review of attendance at our meetings. He will contact sponsoring agencies giving them our annual report and the attendance of their representatives. He will request that vacancies be filled by appointing bodies. Chairman Ritchie distributed copies of the "Findings and Recommendations of the Craven County Intensive Livestock Operations Moratorium Study Committee." He requested that it be sent to the membership for possible endorsement by the group at the March meeting.

Mr. Ritchie then read his draft of the NRBRC Annual Report for 1996 and 1997. He requested assistance with obtaining information missing from the early meetings. In response to a question Mr. Ritchie requested the widest possible distribution of our resolution and endorsements, including DWQ. He urged our membership to distribute to their appointing bodies as well. This procedure needs to be part of our Work Plan and will be refined by the Executive Committee.

Dr. Costlow made the following motion: "When a resolution is passed by a majority of those present at a regular meeting of the NRBRC, it shall be circulated to all members with the minutes of the meeting. Unless a majority of those members not present at the regular meeting vote against the resolution in writing, it shall be considered passed. At the next regular meeting the resolution will be re-read, and unless substantive changes are made, it shall be distributed to the appropriate officials." Mr. E.T. Iseley seconded the motion. Discussion followed concerning changes that may be suggested. The motion carried.

The Executive Committee meeting was scheduled for February 23 at 10:00 am at the River Bend Town Hall. **This meeting has subsequently been rescheduled to March 5th at the same time and place.** There being no further business, the meeting was adjourned.



**RESOLUTION: REVIEW TO PROVIDE MODERNIZATION OF EXISTING
OBSOLETE AND INADEQUATE SEWAGE TREATMENT FACILITIES**

WHEREAS, development throughout North Carolina over the past two decades has resulted in significant increases in population, industry, agriculture and tourism; and

WHEREAS, many of these increases have resulted in significant increases in the generation of sewage, both human and that derived from large animal factories; and

WHEREAS, inadequate and obsolete treatment facilities, combined with technical problems and such natural disasters as floods and hurricanes, have resulted in the accidental discharge of untreated human and other animal sewage into wetlands, tributaries and major rivers throughout North Carolina; and

WHEREAS, direct discharges of untreated human and other animal wastes into the public trust waters of North Carolina have been demonstrated to contribute to excessive nutrients, as well as potentially hazardous materials which constitute a threat to human health as well as natural, renewable resources including fisheries; and

WHEREAS, scientific evidence indicates that the presence of excessive nutrients resulting from the direct discharge of untreated sewage from all animal sources contributes to both noxious algal blooms and the proliferation of the uni-cellular organism identified as *Pfiesteria*; and

WHEREAS, *Pfiesteria* has been demonstrated to constitute a threat to human health as well as both estuarine and marine fisheries; and

WHEREAS, consideration needs to be given immediately to the replacement of existing inadequate and obsolete sewage treatment facilities with systems which will utilize the most modern concepts and technology available in the interest of reducing the discharge of excessive nutrients and materials hazardous to human health,

NOW, THEREFORE, It Is:

RESOLVED, that the Neuse River Basin Regional Council requests the Office of the Governor charge the NC Board of Science and Technology, or any other qualified body within North Carolina, to conduct a review of traditional, new and innovative sewage treatment facilities and provide recommendations as to specific facilities which are deemed appropriate for both treatment of human sewage and the treatment of the wastes generated from large, animal factories.

_____	Chairman,	_____
William Ritchie	Neuse River Basin Regional Council	Date
_____	Secretary,	_____
Caroline Parker	Neuse River Basin Regional Council	Date



NORTH CAROLINA DEPARTMENT OF
ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER QUALITY

ANNOUNCEMENT OF PUBLIC MEETING

STAKEHOLDER PARTICIPATION IN DEVELOPMENT OF NEUSE RIVER ESTUARY NUTRIENT RESPONSE MODEL

You are invited to participate in a public meeting of the North Carolina Division of Water Quality (DWQ). This forum is to inform you of forthcoming opportunities for you to get involved in the water quality modeling analysis of the Neuse River estuary

WHEN:

Thursday March 19, 1998 at 7:00 PM

WHERE:

Lecture Hall of Learning Center at Wayne Community College in Goldsboro

From Highway 70 East, take the Wayne Memorial Drive exit, pass a hospital and the college is on your right. Follow the signs for the Learning Center

WHY:

House Bill 515 resulted in an amendment of the North Carolina General Statutes (NCGS) in 1997. NCGS 143-215.1 now requires that nutrient response models developed by DWQ include participation of affected parties. You and/or your organization have been identified by DWQ as possible affected parties.

Currently DWQ is developing a nutrient response model for the Neuse River estuary. Therefore, you are hereby invited to participate in the model development process.

The upcoming meeting on March 19, 1998 is designed to set up the foundation for technical workshops tentatively scheduled for April 1998. Due to the highly technical nature of water quality modeling, it is expected that these workshops will be of a technical nature.

The March 19th meeting will be a non-technical general meeting intended to 1) Introduce you to the matters more likely to be discussed in the April 1998 workshops; and 2) To solicit your input in this process.

For additional information, please contact:

Jon C. Mangles, QEP at (919) 733-5083, ext. 515

NEUSE RIVER BASIN REGIONAL COUNCIL

STATUS REPORT

RE:

FINANCE COMMITTEE

This is to acknowledge the necessity of presenting a committee and a commitment for the proper reception and disbursement of funds which may become available to the Council. It is being presented for NRBRC consideration.

As Chairman of the Finance Committee, I am asking your concurrence for the appointment of Mrs. Marguerite Whitfield (At-large, Lenior Co.) And Mr. Tom McGee (Town Admin. for Butner-Granville Co.) to this three member Finance Committee. Guidance and staff support will be provided by one or more members of the Division of Water Quality.

Our purpose is to receive, record and properly disperse any funds received by the Council. A preliminary disbursement review follows that will be subject to improvement and expansion by the members of the Committee:

- Disbursements will be made as approved by the unanimous agreement of the Finance Committee
- Disbursement of funds that fail unanimous agreement of the Finance Committee will be held in abeyance until they are submitted to the full NRBRC for direction and payment
- Should the full NRBRC elect to delegate their authority to the Council's Executive Committee, then the judgment of that delegated body will prevail and the Finance Committee may disburse the funds properly and expeditiously

With the approval of Mrs. Whitfield and Mr. McGee, I propose an initial overview and/or a critical path to render all possible assistance to the NRBRC and staff to the realization of our purpose to clean the waters of the Neuse River basin.

At this point we should discuss, but not limit the discussion, to some mechanism incorporating the following:

A. Funding

- potential sources of funds
- probable or estimated amounts of funds
- pursuit of further avenues of funding

B. Disbursements

- criteria for expense approval
- methods for considering fund requests for Council
(Consensus vs. Unanimous, etc.)
- methods for tracking results or performance of "contracts"
- methods of partial payments or underwriting

Update on the Neuse River Nutrient Sensitive Waters Management Strategy

Status of Rule-Making Proceedings

July 22, 1997	Temporary rule effective for riparian areas with forest vegetation
December 1997	Environmental Management Commission (EMC) approved permanent rules
January 1998	Rules Review Commission considered rules and had several minor objections
January 22, 1998	Revised rule effective for riparian areas with forest vegetation
February 1998	EMC to consider revisions to rules (to satisfy RRC objections)
March 1998	RRC to consider rule revisions
August 1, 1998	Proposed effective date if RRC and General Assembly approve rules

Major Rule Components

Point Sources

- Point sources, such as wastewater treatment and industrial plants, discharging more than 0.5 million gallons of wastewater per day will have to optimize their facilities for nitrogen removal and then meet a "mass-based" nitrogen limit in terms of pounds per year. The mass-based load will be determined using each plant's permitted flow in 1995.
- Dischargers will have the option of meeting the mass-based load collectively through a coalition of dischargers or paying offset fees to fund wetland restoration to achieve equivalent nitrogen reduction.

Agriculture

- Owners and operators of agricultural lands will have two options -- either become part of a collective local strategy for implementing best management practices on their land, or implement standard best management practices as specified by the rule. Local farming strategies implemented under the collective option will be coordinated by a multi-agency Basin Oversight Committee.

Urban Stormwater

- The basin's most populated and rapidly growing cities, towns and counties will be required to develop and implement local stormwater management programs.

Nutrient Management

- People covered by this rule will have an option of successfully completing nutrient management training within five years or developing a nutrient management plan for the lands where fertilizer is applied.

Protection of Riparian Areas With Forest Vegetation

- Immediate protection of 50-foot riparian areas with existing forest vegetation. These areas include 30 feet of essentially undisturbed forest vegetation plus 20 feet of either grass, trees or other vegetation. (These requirements were adopted as temporary rules effective 7/22/97 but were clarified and amended in rules which became effective 1/22/98.)



Neuse River Nutrient Sensitive Waters Management Strategy Rules

On December 11, 1997, the North Carolina Environmental Management Commission adopted the following rules to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy. These rules will become effective as permanent rules on August 1, 1998, pending approval by the Rules Review Commission and the North Carolina General Assembly. Two of the rules, .0233 and a portion of .0234, became effective as temporary rules on January 22, 1998 (see pages 9 and 15 of this packet). Rules were adopted for the following areas:

- (a) Rule .0232 to establish the nutrient reduction goal,
- (b) Rule .0233 for protection and maintenance of riparian areas with existing forest vegetation,
- (c) Rule .0234 for wastewater discharges,
- (d) Rule .0235 for urban stormwater management,
- (e) Rules .0236 and .0238 for agricultural nitrogen reduction,
- (f) Rule .0239 for nutrient management, and
- (g) Rule .0240 for nitrogen offset fees.

In addition, Rule .0202 was amended with new definitions.



On December 11, 1997, the North Carolina Environmental Management Commission adopted changes to the following rule to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy. This rule will become effective August 1, 1998, pending approval by the Rules Review Commission and the North Carolina General Assembly.

15A NCAC 2B.0202 has been amended with changes as published in 12:6 NCR 462-479 as follows:

.0202 DEFINITIONS

The definition of any word or phrase used in this Section shall be the same as given in Article 21, Chapter 143 of the General Statutes of North Carolina. The following words and phrases, which are not defined in this article, shall be interpreted as follows:

- (1) Acute toxicity to aquatic life means lethality or other harmful effects sustained by either resident aquatic populations or indicator species used as test organisms in a controlled toxicity test due to a short-term exposure (relative to the life cycle of the organism) to a specific chemical or mixture of chemicals (as in an effluent). Short-term exposure for acute tests is generally 96 hours or less. Acute toxicity shall be determined using the following procedures:
 - (a) for specific chemical constituents or compounds, acceptable levels shall be equivalent to a concentration of one-half or less of the Final Acute Value (FAV) as determined according to "Guidelines for Deriving Numerical Water Quality Criteria for the Protection of Aquatic Life and its Uses" published by the Environmental Protection Agency and referenced in the Federal Register (50 FR 30784, July 29, 1985) which is hereby incorporated by reference including any subsequent amendments.
 - (b) for specific chemical constituents or compounds for which values described under Subparagraph (1)(a) of this Rule can not be determined, acceptable levels shall be equivalent to a concentration of one-third or less of the lowest available LC50 value.
 - (c) for effluents, acceptable levels are defined as no statistically measurable lethality (99 percent confidence level using Student's t test) during a specified exposure period. Concentrations of exposure shall be determined on a case-by-case basis.
 - (d) in instances where detailed dose response data indicate that levels of acute toxicity are significantly different from those defined in this Rule, the Director may determine on a case-by-case basis an alternate acceptable level through statistical analyses of the dose response curve.
- (2) Acute to Chronic Ratio (ACR) means the ratio of acute toxicity expressed as an LC50 for a specific toxicant or an effluent to the chronic value for the same toxicant or effluent.
- (3) Agricultural uses include the use of waters for stock watering, irrigation, and other farm purposes.
- (4) Applicator means any person, firm, corporation, wholesaler, retailer, distributor, any local, state, or federal governmental agency, or any other person who applies fertilizer to the land of a consumer or client or to land they own or to land which they lease or otherwise hold rights.
- (5) Approved treatment, as applied to water supplies, means treatment accepted as satisfactory by the Division of Environmental Health or Division of Water Quality.
- (6) Average (except bacterial) means arithmetical average and includes the analytical results of all samples taken during the specified period; all sampling shall be done as to obtain the most representative sample under prevailing conditions:
 - (a) Daily Average for dissolved oxygen, shall be of at least four samples;
 - (b) Weekly Average means the average of all daily composite samples obtained during the calendar week. If only one grab sample is taken each day, the weekly average is the average of all daily grab samples. A minimum of three daily grab samples is needed to calculate a weekly average.
 - (c) Monthly Average means the average of all daily composites (or grab samples if only one per day) obtained during the calendar month.

The definitions in this Paragraph do not affect the monitoring requirements for NPDES permits but rather shall be used by the Division along with other methodologies in determining violations of water quality standards. Arithmetical averages as defined by this Section, and not confidence limits nor other statistical



descriptions, shall be used in all calculations of limitations which require the use of averages pursuant to this Section and 40 CFR 122.41(i)(4)(iii).

- (7) Best Management Practice (BMP) means a structural or nonstructural management-based practice used singularly or in combination to reduce nonpoint source inputs to receiving waters in order to achieve water quality protection goals.
- (8) Best usage of waters as specified for each class means those uses as determined by the Environmental Management Commission in accordance with the provisions of G.S. 143-214.1.
- (9) Bioaccumulation factor (BAF) is a unitless value that describes the degree to which substances are taken up or accumulated into tissues of aquatic organisms from water directly and from food or other ingested materials containing the accumulated substances, and is usually measured as a ratio of a substance's concentration in tissue versus its concentration in water in situations where exposure to the substance is occurring from both water and the food chain.
- (10) Bioconcentration factor (BCF) is a unitless value that describes the degree to which substances are absorbed or concentrated into tissues of aquatic organisms from water directly and is usually measured as a ratio of substance's concentration in tissue versus its concentration in water in situations where exposure to the substance is occurring from water only.
- (11) Biological integrity means the ability of an aquatic ecosystem to support and maintain a balanced and indigenous community of organisms having species composition, diversity, population densities and functional organization similar to that of reference conditions.
- (12) Buffer means a natural or vegetated area through which stormwater runoff flows in a diffuse manner so that the runoff does not become channelized and which provides for infiltration of the runoff and filtering of pollutants. The buffer shall be measured landward from the normal pool elevation of impounded structures and from the bank of each side of streams or rivers.
- (13) Built-upon area means that portion of a development project that is covered by impervious or partially impervious cover including buildings, pavement, gravel areas (e.g. roads, parking lots, paths), recreation facilities (e.g. tennis courts), etc. (Note: Wooden slatted decks and the water area of a swimming pool are considered pervious.)
- (14) Chronic toxicity to aquatic life means any harmful effect sustained by either resident aquatic populations or indicator species used as test organisms in a controlled toxicity test due to long-term exposure (relative to the life cycle of the organism) or exposure during a substantial portion of the duration of a sensitive period of the life cycle to a specific chemical substance or mixture of chemicals (as in an effluent). In absence of extended periods of exposure, early life stage or reproductive toxicity tests may be used to define chronic impacts.
- (15) Chronic value for aquatic life means the geometric mean of two concentrations identified in a controlled toxicity test as the No Observable Effect Concentration (NOEC) and the Lowest Observable Effect Concentration (LOEC).
- (16) Cluster development means the grouping of buildings in order to conserve land resources and provide for innovation in the design of the project including minimizing stormwater runoff impacts. This term includes nonresidential development as well as single-family residential and multi-family developments. For the purpose of Sections .0100, .0200 and .0300 of this Subchapter, planned unit developments and mixed use development shall be considered as cluster development.
- (17) Commercial applicator means any person, firm, corporation, wholesaler, retailer, distributor or any other person who for hire or compensation applies fertilizer to the land of a consumer or client.
- (18) Concentrations are the mass of a substance per volume of water and for the purposes of this Section shall be expressed as milligrams per liter (mg/l), micrograms per liter (ug/l), or nanograms per liter (ng/l).
- (19) Contiguous refers to those wetlands landward of the mean high water line or normal water level and within 575 feet of classified surface waters which appear as solid blue lines on the most recently published versions of U.S.G.S. 1:24,000 (7.5 minute) scale topographic maps.
- (20) Critical area means the area adjacent to a water supply intake or reservoir where risk associated with pollution is greater than from the remaining portions of the watershed. The critical area is defined as extending either ½ mile from the normal pool elevation of the reservoir in which the intake is located or



to the ridge line of the watershed (whichever comes first); or ½ mile upstream from and draining to the intake (or other appropriate downstream location associated with the water supply) located directly in the stream or river (run-of-the-river), or to the ridge line of the watershed (whichever comes first). Since WS-I watersheds are essentially undeveloped, establishment of a critical area is not required. Local governments may extend the critical area as needed. Major landmarks such as highways or property lines may be used to delineate the outer boundary of the critical area if these landmarks are immediately adjacent to the appropriate outer boundary of ½ mile. The Commission may adopt a different critical area size during the reclassification process.

- (21) Cropland means agricultural land that is not covered by a certified animal waste management plan and is used for growing corn, grains, oilseed crops, cotton, forages, tobacco, beans, or other vegetables or fruits.
- (22) Designated Nonpoint Source Agency means those agencies specified by the Governor in the North Carolina Nonpoint Source Management Program, as approved by the Environmental Protection Agency.
- (23) Development means any land disturbing activity which adds to or changes the amount of impervious or partially impervious cover on a land area or which otherwise decreases the infiltration of precipitation into the soil.
- (24) Director means the Director of the Division of Water Quality.
- (25) Discharge is the addition of any man-induced waste effluent either directly or indirectly to state surface waters.
- (26) Division means the Division of Water Quality or its successors.
- (27) Domestic wastewater discharge means the discharge of sewage, non-process industrial wastewater, other domestic wastewater or any combination of these items. Domestic wastewater includes, but is not limited to, liquid waste generated by domestic water using fixtures and appliances, from any residence, place of business, or place of public assembly even if it contains no sewage. Examples of domestic wastewater include once-through non-contact cooling water, seafood packing facility discharges and wastewater from restaurants.
- (28) Effluent channel means a discernable confined and discrete conveyance which is used for transporting treated wastewater to a receiving stream or other body of water as provided in Rule .0215 of this Section.
- (29) Existing development, for projects that do not require a state permit, shall be defined as those projects that are built or those projects that at a minimum have established a vested right under North Carolina zoning law as of the effective date of the local government water supply ordinance, or such earlier time that an affected local government's ordinances shall specify, based on at least one of the following criteria:
 - (a) substantial expenditures of resources (time, labor, money) based on a good faith reliance upon having received a valid local government approval to proceed with the project, or
 - (b) having an outstanding valid building permit in compliance with G.S. 153A-344.1 or G.S. 160A-385.1, or
 - (c) having an approved site specific or phased development plan in compliance with G.S. 153A-344.1 or G.S. 160A-385.1.

For projects that require a state permit, such as landfills, NPDES wastewater discharges, land application of residuals and road construction activities, existing development shall be defined as those projects that are built or those projects for which a state permit was issued prior to August 3, 1992.

(30) Existing uses mean uses actually attained in the water body, in a significant and not incidental manner, on or after November 28, 1975, whether or not they are included in the water quality standards, which either have been actually available to the public or are uses deemed attainable by the Environmental Management Commission. At a minimum, uses shall be deemed attainable if they can be achieved by the imposition of effluent limits and cost-effective and reasonable best management practices (BMPs) for nonpoint source control.

- (31) Family subdivision means a division of a tract of land:
 - (a) to convey the resulting parcels, with the exception of parcels retained by the grantor, to a relative or relatives as a gift or for nominal consideration, but only if no more than one parcel is conveyed by the grantor from the tract to any one relative; or
 - (b) to divide land from a common ancestor among tenants in common, all of whom

inherited by intestacy or by will.

- (32) Fertilizer means any substance containing nitrogen or phosphorus which is used primarily for its plant food content.
- (33) Fishing means the taking of fish by sport or commercial methods as well as the consumption of fish or shellfish or the propagation of fish and such other aquatic life as is necessary to provide a suitable environment for fish.
- (34) Forest vegetation means the plants of an area which grow together in disturbed or undisturbed conditions in various wooded plant communities in any combination of trees, saplings, shrubs, vines and herbaceous plants. This includes mature and successional forests as well as cutover stands.
- (35) Freshwater means all waters that under natural conditions would have a chloride ion content of 500 mg/l or less.
- (36) Industrial discharge means the discharge of industrial process treated wastewater or wastewater other than sewage. Stormwater shall not be considered to be an industrial wastewater unless it is contaminated with industrial wastewater. Industrial discharge includes:
- (a) wastewater resulting from any process of industry or manufacture, or from the development of any natural resource;
 - (b) wastewater resulting from processes of trade or business, including wastewater from laundromats and car washes, but not wastewater from restaurants; or
 - (c) wastewater discharged from a municipal wastewater treatment plant requiring a pretreatment program.
- (37) Land-disturbing activity means any use of the land that results in a change in the natural cover or topography that may cause or contribute to sedimentation.
- (38) LC50 means that concentration of a toxic substance which is lethal (or immobilizing, if appropriate) to 50 percent of the organisms tested during a specified exposure period. The LC50 concentration for toxic materials shall be determined for sensitive species as defined by Subparagraph (43) of this Rule under aquatic conditions characteristic of the receiving waters.
- (39) Local government means a city or county in singular or plural as defined in G.S. 160A-1(2) and G.S. 158A-10.
- (40) Lower piedmont and coastal plain waters mean those waters of the Catawba River Basin below Lookout Shoals Dam; the Yadkin River Basin below the junction of the Forsyth, Yadkin, and Davie County lines; and all of the waters of Cape Fear, Lumber, Roanoke, Neuse, Tar-Pamlico, Chowan, Pasquotank, and White Oak River Basins; except tidal salt waters which are assigned S classifications.
- (41) MF is an abbreviation for the membrane filter procedure for bacteriological analysis.
- (42) Major variance means a variance from the minimum statewide watershed protection rules that results in the relaxation, by a factor greater than five percent of any buffer, density or built-upon area requirement under the high density option; any variation in the design, maintenance or operation requirements of a wet detention pond or other approved stormwater management system; or relaxation by a factor greater than 10 percent, of any management requirement under the low density option.
- (43) Minor variance means a variance from the minimum statewide watershed protection rules that results in a relaxation, by a factor of up to five percent of any buffer, density or built-upon area requirement under the high density option; or that results in a relaxation by a factor up to 10 percent, of any management requirement under the low density option.
- (44) Mixing zone means a region of the receiving water in the vicinity of a discharge within which dispersion and dilution of constituents in the discharge occurs and such zones shall be subject to conditions established in accordance with 15A NCAC 2B .0204(b).
- (45) Mountain and upper piedmont waters mean all of the waters of the Hiwassee; Little Tennessee, including the Savannah River drainage area; French Broad; Broad; New; and Watauga River Basins; and those portions of the Catawba River Basin above Lookout Shoals Dam and the Yadkin River Basin above the junction of the Forsyth, Yadkin, and Davie County lines.
- (46) Nonconforming lot of record means a lot described by a plat or a deed that was recorded prior to the effective date of local watershed regulations (or their amendments) that does not meet the minimum

lot-size or other development requirements of Rule .0211 of this Subchapter.

- (47) Nonpoint source pollution means pollution which enters waters mainly as a result of precipitation and subsequent runoff from lands which have been disturbed by man's activities and includes all sources of water pollution which are not required to have a permit in accordance with G.S. 143-215.1(c).
- (48) Non-process discharge means industrial effluent not directly resulting from the manufacturing process. An example would be non-contact cooling water from a compressor.
- (49) Nutrient sensitive waters mean those waters which are so designated in the classification schedule in order to limit the discharge of nutrients (usually nitrogen and phosphorus). They are designated by "NSW" following the water classification.
- (50) Offensive condition means any condition or conditions resulting from the presence of sewage, industrial wastes or other wastes within the waters of the state or along the shorelines thereof which shall either directly or indirectly cause foul or noxious odors, unsightly conditions, or breeding of abnormally large quantities of mosquitoes or other insect pests, or shall damage private or public water supplies or other structures, result in the development of gases which destroy or damage surrounding property, herbage or grasses, or which may cause the impairment of taste, such as from fish flesh tainting, or affect the health of any person residing or working in the area.
- (51) Primary Nursery Areas (PNAs) are tidal saltwaters which provide essential habitat for the early development of commercially important fish and shellfish and are so designated by the Marine Fisheries Commission.
- (52) Primary recreation includes swimming, skin diving, skiing, and similar uses involving human body contact with water where such activities take place in an organized or on a frequent basis.
- (53) Protected area means the area adjoining and upstream of the critical area in a WS-IV water supply in which protection measures are required. The boundaries of the protected areas are defined as within five miles of the normal pool elevation of the reservoir and draining to water supply reservoirs (measured from the normal pool elevation) or to the ridge line of the watershed (whichever comes first); or 10 miles upstream and draining to the intake located directly in the stream or river (run-of-the-river), or to the ridge line of the watershed (whichever comes first). Local governments may extend the protected area. Major landmarks such as highways or property lines may be used to delineate the outer boundary of the protected area if these landmarks are immediately adjacent to the appropriate outer boundary of five or 10 miles. In some cases the protected area shall encompass the entire watershed. The Commission may adopt a different protected area size during the reclassification process.
- (54) Residential development means buildings for residence such as attached and detached single family dwellings, apartment complexes, condominiums, townhouses, cottages, and their associated outbuildings such as garages, storage buildings, and gazebos.
- (55) Residuals means any solid or demisolid waste generated from a wastewater treatment plant, water treatment plant or air pollution control facility permitted under the authority of the Environmental Management Commission.
- (56) Riparian area means an area that is adjacent to a body of water.
- (57) Secondary recreation includes wading, boating, other uses not involving human body contact with water, and activities involving human body contact with water where such activities take place on an infrequent, unorganized, or incidental basis.
- (58) Sensitive species for aquatic toxicity testing is any species utilized in procedures accepted by the Commission or its designee in accordance with Rule .0103 of this Subchapter, or the following genera:
- (a) Daphnia;
 - (b) Ceriodaphnia;
 - (c) Salmo;
 - (d) Pimephales;
 - (e) Mysisopsis;
 - (f) Champia;
 - (g) Cyprinodon;
 - (h) Arbacia;

- (i) Penaeus;
- (j) Menidia;
- (k) Notropis;
- (l) Salvelinus;
- (m) Oncorhynchus;
- (n) Selenastrum;
- (o) Chironomus;
- (p) Hyalella;
- (q) Lumbriculus.

- (59) Shellfish culture includes the use of waters for the propagation, storage and gathering of oysters, clams, and other shellfish for market purposes.
- (60) Stormwater collection system means any conduit, pipe, channel, curb or gutter for the primary purpose of transporting (not treating) runoff. A stormwater collection system does not include vegetated swales, swales stabilized with armoring or alternative methods where natural topography prevents the use of vegetated swales (subject to case-by-case review), curb outlet systems or pipes used to carry drainage underneath built-upon surfaces that are associated with development controlled by the provisions of 15A NCAC 2H .1003(c)(1).
- (61) Source of water supply for drinking, culinary or food-processing purposes means any source, either public or private, the waters from which are used for human consumption, or used in connection with the processing of milk, beverages, food, or other purpose which requires water suitable for human consumption.
- (62) Swamp waters mean those waters which are classified by the Environmental Management Commission and which are topographically located so as to generally have very low velocities and other characteristics which are different from adjacent streams draining steeper topography. They are designated by "Sw" following the water classification.
- (63) Tidal salt waters mean all tidal waters which are classified by the Environmental Management Commission which generally have a natural chloride ion content in excess of 500 parts per million and include all waters assigned S classifications.
- (64) Toxic substance or toxicant means any substance or combination of substances (including disease-causing agents), which after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, has the potential to cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions or suppression in reproduction or growth) or physical deformities in such organisms or their offspring.
- (65) Trout waters are those waters which have conditions which shall sustain and allow for trout propagation and survival of stocked trout on a year-round basis. These waters shall be classified by the Commission after considering the requirements of Rule .0101(b) and (c) of this Subchapter and include all waters designated by "Tr" in the water classification.
- (66) Waste disposal includes the use of waters for disposal of sewage, industrial waste or other waste after approved treatment.
- (67) Water dependent structures are those structures for which the use requires access or proximity to or siting within surface waters to fulfill its basic purpose, such as boat ramps, boat houses, docks and bulkheads. Ancillary facilities such as restaurants, outlets for boat supplies, parking lots and commercial boat storage areas are not water dependent structures.
- (68) Water quality based effluent limits and best management practices are limitations or best management practices developed by the Division for the purpose of protecting water quality standards and best usage of surface waters consistent with the requirements of G.S. 143-214.1 and the Federal Water Pollution Control Act as amended.
- (69) Waters with quality higher than the standards means all waters for which the determination of waste load allocations (pursuant to Rule .0206 of this Section) indicates that water quality is sufficiently greater than that defined by the standards such that significant pollutant loading capacity still exists in

those waters.

(70) Watershed means the entire land area contributing surface drainage to a specific point. For the purpose of the water supply protection rules in 15A NCAC 2B .0104 and .0211 local governments may use major landmarks such as highways or property lines to delineate the outer boundary of the drainage area if these landmarks are immediately adjacent to the ridgeline.

(71) Wetlands are "waters" as defined by G.S. 143-212(6) and are areas that are inundated or saturated by an accumulation of surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands classified as waters of the state are restricted to waters of the United States as defined by 33 CFR 328.3 and 40 CFR 230.3.

History Note: Authority G. S. 143-214.1; 143-215.3(a)(1);

Eff. February 1, 1996;

Amended Eff. August 1, 1995; February 1, 1993; August 3, 1992; August 1,

1990;

RRC objection Eff. July 18, 1996 due to lack of statutory authority and

ambiguity;

Amended Eff. August 1, 1998; October 1, 1996.

On December 11, 1997, the North Carolina Environmental Management Commission adopted the following rule to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy. This rule will become effective August 1, 1998, pending approval by the Rules Review Commission and the North Carolina General Assembly.

15A NCAC 2B .0232 has been adopted with changes as published 12:6 NCR 462-479 as follows:

**.0232 NEUSE RIVER BASIN- NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
BASIN NUTRIENT REDUCTION GOAL**

Pursuant to 1995 (Reg. Sess., 1996) N.C. Session Laws, c. 572, the Environmental Management Commission hereby establishes the goal of reducing the average annual load of nitrogen delivered to the Neuse River Estuary from point and nonpoint sources by a minimum of 30 percent of the average annual load for the period 1991 through 1995 by the year 2001. All waters of the Neuse River Basin have been supplementally classified as Nutrient Sensitive Waters (NSW) pursuant to 15A NCAC 2B .0223. The following procedures are to be implemented in accordance with 15A NCAC 2B .0223 in all waters of the Neuse River Basin; ^{r-l-s}

(1) NSW management requirements for the Neuse River Basin are specified in the following Rules of this Section:

- (a) Rule .0233 for protection and maintenance of riparian areas,
- (b) Rule .0234 for wastewater discharges,
- (c) Rule .0235 for urban stormwater management,
- (d) Rules .0236 and .0238 for agricultural nitrogen reduction,
- (e) Rule .0239 for nutrient management, and
- (f) Rule .0240 for nitrogen offset fees.

(2) Failure to meet requirements of Rules .0233, .0234, .0235, .0236, .0238, .0239, and .0240 of this Section may result in imposition of enforcement measures as authorized by N.C.G.S. 143-215.6A (civil penalties), N.C.G.S. 143-215.6B (criminal penalties), and N.C.G.S. 143-215.6C (injunctive relief).

*History Note: Authority G. S. 143-214.1; 143-214.7; 143-215.1; 143-215.3(a)(1); 143-215.6A; 143-215.6B; 143-215.6C.
Eff. August 1, 1998.*



On December 11, 1997, the North Carolina Environmental Management Commission adopted the following rule to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy. This rule became effective as a temporary rule on January 22, 1998, and will become a permanent rule on August 1, 1998, pending approval by the Rules Review Commission and the North Carolina General Assembly. Text in *italics* or struckthrough format represents corrections to typographical errors which will be made in the permanent rule.

15A NCAC 2B .0233 has been adopted with changes as published 12:6 NCR 462-479 as follows:

**SUBCHAPTER 2B - SURFACE WATER AND WETLANDS STANDARDS, MONITORING
SECTION .0200 - CLASSIFICATIONS AND WATER QUALITY STANDARDS APPLICABLE TO
SURFACE WATERS AND WETLANDS OR NORTH CAROLINA**

**.0233 NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
PROTECTION AND MAINTENANCE OF RIPARIAN AREAS *WITH EXISTING FOREST
VEGETATION***

The following is the management strategy for maintaining and protecting riparian areas in the Neuse River Basin:

(1) Riparian areas shall be protected and maintained in accordance with this Rule on all sides of surface waters in the Neuse River Basin (intermittent streams, perennial streams, lakes, ponds, and estuaries) as indicated on the most recent versions of United States Geological Survey 1:24,000 scale (7.5 minute quadrangle) topographic maps or other site-specific evidence. This Rule only applies to riparian areas where forest vegetation is established in Zone 1 (as described in Sub-Item 3(a)) as of July 22, 1997. Forest vegetation, as defined in 15A NCAC 2B .0202, of any width in Zone 1 must be protected and maintained in accordance with this Rule. This Rule does not establish new buffers in riparian areas. Exceptions to the requirements of this Rule for riparian areas are described in Sub-Items (2) (a-h). Maintenance of the riparian areas should be such that, to the maximum extent possible, sheet flow of surface water is achieved. This Rule specifies requirements that shall be implemented in riparian areas to ensure that the pollutant removal functions of the riparian area are protected and maintained.

(2) The following waterbodies and land uses are exempt from the riparian area protection requirements:

- (a) Ditches and manmade conveyances other than modified natural streams;
- (b) Areas mapped as intermittent streams, perennial streams, lakes, ponds, or estuaries on the most recent versions of United States Geological Survey 1:24,000 scale (7.5 minute quadrangle) topographic maps where no perennial waterbody, intermittent waterbody, or lake, pond or estuary actually exists on the ground;
- (c) Ponds and lakes created for animal watering, irrigation, or other agricultural uses that are not part of a natural drainage way that is classified in accordance with 15A NCAC 2B .0100;
- (d) Water dependent structures as defined in 15A NCAC 2B .0202, provided that they are located, designed, constructed and maintained to provide maximum nutrient removal, to have the least adverse effects on aquatic life and habitat and to protect water quality;
- (e) The following uses may be allowed where no practical alternative exists. A lack of practical alternatives may be shown by demonstrating that, considering the potential for a reduction in size, configuration or density of the proposed activity and all alternative designs, the basic project purpose cannot be practically accomplished in a manner which would avoid or result in less adverse impact to surface waters. Also, these structures shall be located, designed, constructed, and maintained to have minimal disturbance, to provide maximum nutrient removal and erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of best management practices.
 - (i) Road crossings, railroad crossings, bridges, airport facilities, and utility crossings may be allowed if conditions specified in 2(e) of this Rule are met.
 - (ii) Stormwater management facilities and ponds, and utility construction and maintenance corridors

for utilities such as water, sewer or gas, may be allowed in Zone 2 of the riparian area as long as the conditions specified in 2(e) of this Rule are met and they are located at least 30 feet from the top of bank or mean high water line. Additional requirements for utility construction and maintenance corridors are listed in 2(f) of this Rule.

- (f) A corridor for the construction and maintenance of utility lines, such as water, sewer or gas, (including access roads and stockpiling of materials) may run parallel to the stream and may be located within Zone 2 of the riparian area, as long as no practical alternative exists and they are located at least 30 feet from the top of bank or mean high water line and best management practices are installed to minimize runoff and maximize water quality protection to the maximum extent practicable. Permanent, maintained access corridors shall be restricted to the minimum width practicable and shall not exceed 10 feet in width except at manhole locations. A 10 feet by 10 feet perpendicular vehicle turnaround is allowed provided they are spaced at least 500 feet apart along the riparian area.
 - (g) Stream restoration projects, scientific studies, stream gauging, water wells, passive recreation facilities such as boardwalks, trails, pathways, historic preservation and archaeological activities are allowed and provided that they are located in Zone 2 and are at least 30 feet from the top of bank or mean high water line and are designed, constructed and maintained to provide the maximum nutrient removal and erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of best management practices. Activities that must cross the stream or be located within Zone 1 are allowed as long as all other requirements of this Item are met.
 - (h) Stream crossings associated with timber harvesting are allowed if performed in accordance with the Forest Practices Guidelines Related to Water Quality (15A NCAC 1J .0201-.0209).
- (3) The protected riparian area shall have two zones as follows:
- (a) Zone 1 is intended to be an undisturbed area of forest vegetation. Any forest vegetation, as defined in Rule .0202 of the Section, in Zone 1 as of July 22, 1997 shall be maintained and protected in accordance with this Rule.
 - (i) Location of Zone 1: Zone 1 begins at the top of bank for intermittent streams and perennial streams and extends landward a distance of 30 feet on all sides of the waterbody, measured horizontally on a line perpendicular to the waterbody. For all other waterbodies, Zone 1 begins at the top of bank or mean high water line and extends landward a distance of 30 feet, measured horizontally on a line perpendicular to the waterbody.
 - (ii) The following practices and activities are allowed in Zone 1:
 - (A) Natural regeneration of forest vegetation and planting vegetation to enhance the riparian area if disturbance is minimized, provided that any plantings should primarily consist of locally native trees and shrubs;
 - (B) Selective removal of individual high value cutting of individual trees of high value in the outer 20 feet of Zone 1, provided that the basal area (measured as 12-inch diameter at breast height) remains at or above 0.52 square feet per 15 running feet of the outer 20 feet of Zone 1, as measured along the bank of the stream or waterbody. (Limited mechanized equipment is allowed in this area.) -- need to fix
 - (C) Horticulture or silvicultural practices to maintain the health of individual trees;
 - (D) Removal of individual trees which are in danger of causing damage to dwellings, other structures or the stream channel; and
 - (E) Removal of dead trees and other timber cutting techniques necessary to prevent extensive pest or disease infestation if recommended by the Director, Division of Forest Resources and approved by the Director, Division of Water Quality.
 - (F) Ongoing agricultural operations provided that existing forest vegetation is protected and requirements in Rules .0236 and .0238 of this Section are followed.
 - (iii) The following practices are not allowed in Zone 1:
 - (A) Land-disturbing activities and placement of fill and other materials, other than those allowed in Items 2 and 3(a)(ii) of this Rule, that would disturb forest vegetation, as defined in Rule .0200 of this Section;



- (B) New development, except as provided in Sub-Items 2(d), 2(e) and 2(f) of this Rule;
 - (C) New on-site sanitary sewage systems which use ground adsorption;
 - (D) The application of fertilizer; and
 - (E) Any activity that threatens the health and function of the vegetation including, but not limited to, application of chemicals in amounts exceeding the manufacturer's recommended rate, uncontrolled sediment sources on adjacent lands, and the creation of any areas with bare soil.
- (b) Vegetation in Zone 2 shall consist of a dense ground cover composed of herbaceous or woody species which provides for diffusion and infiltration of runoff and filtering of pollutants.
- (i) Location of Zone 2: Zone 2 begins at the outer edge of Zone 1 and extends landward a minimum of 20 feet as measured horizontally on a line perpendicular to the waterbody. The combined minimum width of Zones 1 and 2 shall be 50 feet on all sides of the waterbody.
 - (ii) The following practices and activities are allowed in Zone 2 in addition to those allowed in Zone 1:
 - (A) Periodic mowing and removal of plant products such as timber, nuts, and fruit is allowed on a periodic basis provided the intended purpose of the riparian area is not compromised by harvesting, disturbance, or loss of forest or herbaceous ground cover.
 - (B) Forest vegetation in Zone 2 may be managed to minimize shading on adjacent land outside the riparian area if the water quality function of the riparian area is not compromised.
 - (C) On-going agricultural operations provided that requirements of Rules .0236 and .0238 of this Section are followed.
 - (iii) The following practices and activities are not allowed in Zone 2:
 - (A) Land disturbing activities and placement of fill and other materials, other than those allowed in Items 2 and 3(b)(ii) of this Rule;
 - (B) New development, except as provided in Sub-Items 2(e) and 2(f) of this Rule;
 - (C) New on-site sanitary sewage systems which use ground adsorption;
 - (D) The application of fertilizer; and
 - (E) Any activity that threatens the health and function of the vegetation including, but not limited to, application of chemicals in amounts exceeding the manufacturer's recommended rate, uncontrolled sediment sources on adjacent lands, and the creation of any areas with bare soil.
- (c) Timber removal and skidding of trees shall be directed away from the water course or water body. Skidding shall be done in a manner to prevent the creation of ephemeral channels perpendicular to the water body. Any tree removal must be performed in a manner that does not compromise the intended purpose of the riparian area and is in accordance with the Forest Practices Guidelines Related to Water Quality (15A NCAC 1J .0201-.0209).
- (d) Maintenance of sheet flow in Zones 1 and 2 is required in accordance with this Item.
- (i) Sheet flow must be maintained to the maximum extent practical through dispersing concentrated flow and/or re-establishment of vegetation to maintain the effectiveness of the riparian area.
 - (ii) Concentrated runoff from new ditches or manmade conveyances must be dispersed into sheet flow before the runoff enters Zone 2 of the riparian area. Existing ditches and manmade conveyances, as specified in Sub-Item 2(a) of this Rule, are exempt from this requirement; however, care should be taken to minimize pollutant loading through these existing ditches and manmade conveyances from fertilizer application or erosion.
 - (iii) Periodic corrective action to restore sheet flow should be taken by the landowner if necessary to impede the formation of erosion gullies which allow concentrated flow to bypass treatment in the riparian area.
- (e) Periodic maintenance of modified natural streams such as canals is allowed provided that disturbance is minimized and the structure and function of the riparian area is not compromised. A grassed travelway is allowed on one side of the waterbody when alternative forms of maintenance access are not practical. The width and specifications of the travelway shall be only that needed for equipment access and operation. The travelway shall be located to maximize stream shading.
- (4) If a local government has been issued a Municipal Separate Stormwater Sewer System permit or has been delegated to implement a local stormwater program, then the local government shall ensure that the riparian areas to

be protected are, as a standard practice, recorded on new or modified plats.

(5) Where the standards and management requirements for riparian areas are in conflict with other laws, regulations, and permits regarding streams, steep slopes, erodible soils, wetlands, floodplains, forest harvesting, surface mining, land disturbance activities, development in Coastal Area Management Act Areas of Environmental Concern, or other environmental protection areas, the more protective shall apply.

(6) Where application of this Rule would prevent all reasonable uses of a lot platted and recorded prior to the effective date of this Rule, a variance may be granted by the Environmental Management Commission if it finds that:

- (a) practical difficulties or unnecessary hardships would result in strict application of the Rule;
- (b) such difficulties or hardships result from conditions which are peculiar to the property involved; and
- (c) the general purpose and intent of the Rule would be preserved, water quality would be protected and substantial justice would be done if the variance were granted.

*History Note: Authority G. S. 143-214.1; 143-214.7; 143-215.3(a)(1); Chapter 572, 1995 Session Laws.
Temporary Adoption Eff. January 9, 1998.
Eff. August 1, 1998.*



On December 11, 1997, the North Carolina Environmental Management Commission adopted the following rule to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy. A portion of the rule became effective as a temporary rule on January 22, 1998 (see italics text following end of this rule, page 15). The entire rule will become effective August 1, 1998 as a permanent rule, pending approval by the Rules Review Commission and the North Carolina General Assembly.

15A NCAC 2B .0234 has been adopted with changes as published 12:6 NCR 462-479 as follows:

**.0234 NEUSE RIVER BASIN - NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
WASTEWATER DISCHARGE REQUIREMENTS**

The following is the National Pollutant Discharge Elimination System (NPDES) wastewater discharge management strategy for the Neuse River Basin:

(1) All new and expanding dischargers will be required to document that all practical alternatives to surface water discharge were evaluated pursuant to 15A NCAC 2H .0105(c)(2), prior to a submittal of an application for a discharge. For purposes of this rule, permitted discharges means those individually permitted and not those covered under general permits.

(2) All wastewater dischargers greater than or equal to 0.5 million gallons per day (MGD) permitted flow regardless of current loading levels are required to evaluate and optimize the operation of their facilities in order to reduce nutrient loadings. One year after the effective date of this rule, a report shall be submitted to the division by each wastewater discharger or collectively by an Association, documenting the efforts/level of reductions achieved.

(3) The collective total nitrogen load for all individually permitted wastewater discharges shall, on an annual mass basis, be no more than 2.8 million pounds per year, unless individual wastewater discharges separately or collectively purchase a portion of the nonpoint source allocation in accordance with the formula for offset payments set forth in 15A NCAC 2B .0240. Paragraphs (5), (6) and (7) of this Rule indicate how this load is allocated in the basin. Compliance with the 2.8 million pounds annual average mass load of total nitrogen shall be required within five years of the effective date of this rule. If dischargers individually choose to make nutrient offset payments per rule .0240 of this Section, those offset payments shall be required prior to permit issuance and reissuance. Nutrient offset payments made to purchase nitrogen load reductions from nonpoint sources shall not be credited to the existing nonpoint source's load allocation.

(4) Any existing individual discharger or collective group of wastewater dischargers that accepts wastewater from another wastewater treatment facility in the Neuse River Basin and that results in the elimination of the discharge from that wastewater treatment facility shall be allowed to increase the annual mass load of total nitrogen discharged by the annual mass load of total nitrogen allocated to the wastewater treatment facility that is eliminated. If the wastewater treatment system that is to be eliminated has a permitted flow of less than 0.5 MGD, the annual mass load of total nitrogen shall be calculated from the most recent available data on that facility. (5) The individually permitted wastewater discharges to the Neuse River basin with permitted flows of less than 0.5 MGD in 1995 shall be allocated an annual average mass load of 280,000 pounds of total nitrogen. All existing facilities above Falls Lake Dam with permitted flows greater than or equal to 0.05 MGD will be required to meet a quarterly average total phosphorus limit of 2 mg/l. More stringent limits may apply to protect water quality standards in localized areas.

(6) The following Item specifies the nutrient allocations for discharges above Falls Lake with permitted flows greater than or equal to 0.5 MGD in 1995.

- (a) The individually permitted discharges above Falls Lake Dam with permitted flows of greater than or equal to 0.5 MGD in 1995 shall be allocated an annual average mass load of 444,000 pounds of total nitrogen. The estimate of the total nitrogen load discharged through the Falls Lake Dam to the lower Neuse River shall be fifteen (15) percent, or 66,600 pounds annual average total nitrogen discharged to the lower Neuse River. The load shall be allocated to the individual facilities based upon the ratio of their 1995 permitted flow to the total permitted flow of those dischargers greater than or equal to 0.5 MGD above the Falls Lake Dam.
- (b) All existing facilities above Falls Lake Dam with permitted flows greater than or equal to 0.05 MGD will



be required to meet a quarterly average total phosphorus limit of 2 mg/l. More stringent limits may apply to protect water quality standards in localized areas.

(7) The following Item specifies the nutrient allocations for discharges below Falls Lake with permitted flows greater than or equal to 0.5 MGD in 1995.

- (a) Wastewater treatment plants below Falls Lake Dam that have a permitted flow greater than or equal to 0.5 MGD shall be assigned an annual mass loading limit for total nitrogen based upon the ratio of their flow to the sum of the individual flows as set forth in Paragraph (7)(b) of this rule multiplied by 2.45 million pounds within five years of the effective date of this rule.
- (b) For purposes of the above calculation the flows shall be:
Central Johnston County 4.99 MGD, Raleigh 60 MGD, Clayton 1.9 MGD, Burlington Industries 5 MGD, Cary-Northside 12 MGD, Wake Forest 6 MGD, Cary-Southside 16 MGD, Apex 3.6 MGD, Fuquay-Varina 6 MGD, Benson 3 MGD, Goldsboro 16.8 MGD, Kinston-Peachtree 6.75 MGD, LaGrange 0.75 MGD, Kinston-Northside 4.5 MGD, Dupont-Kinston 3.6 MGD, Kenly 0.63 MGD, Wilson 14 MGD, Contentnea Sewerage District 2.85, Farmville 3.5 MGD, Zebulon 1.85 MGD, Weyerhaeuser 32 MGD, New Bern 4.7 MGD, Havelock 1.9 MGD, US Marine Corps Cherry Point 3.5 MGD, CWS Inc. NE Craven Utilities 1 MGD, and Snow Hill 0.5 MGD.
- (c) All existing facilities below Falls Lake Dam with permitted flows greater than or equal to 0.5 MGD will be required to meet a quarterly average total phosphorus limit of 2 mg/l. Upon expansion, these facilities must meet a monthly average total phosphorous limit of 1 mg/l. More stringent limits may apply to protect water quality standards in localized areas.

(8) All new wastewater discharge flows, flows not permitted prior to December 31, 1995, shall document efforts to obtain allocation from the load established in paragraph (3) of this section from existing wastewater discharges. If allocation can not be obtained from the existing dischargers, new dischargers may purchase a portion of the nonpoint source load allocation at a rate of 200 percent of the cost as set in 15A NCAC 2B .0240 of this Section to implement practices designed to reduce that same loading created by the new discharge. Payment for the portion of the nonpoint source load allocation purchased shall be made prior to permit issuance and reissuance. The new discharge shall at a minimum comply with an annual mass load of total nitrogen based on a concentration of 3.5 mg/l and their permitted flow. These facilities must meet a monthly average total phosphorous limit of 1 mg/l. More stringent limits may be given to protect water quality standards in localized areas.

(9) The following Item describes the option for dischargers to join an Association to collectively meet nutrient load allocations.

- (a) All dischargers within the basin will have the option of forming an Association to meet their allocated total nitrogen load collectively. For dischargers that join the Association, an agreement will be drafted between the Division and the Association that includes annual loading targets. The total nitrogen load allocated to the Association shall be calculated by the sum of the individual allocated loads developed in Paragraphs (5), (6) and (7) of this rule. The membership of the Association shall be established no later than March 1, 1998. All facilities who apply for membership in the Association prior to March 1, 1998 shall be accepted. Thereafter, additions of facilities existing as of the effective date of this rule to the membership in the Association may be considered every five years.
- (b) This annual total nitrogen loading target shall be met within five years of the effective date of this rule. The agreement may also require stepwise decreases in total nitrogen loads for the 5 years following the effective date of this rule. When developing a final agreement, the Commission shall acknowledge the differences in transport percentages between dischargers above and below Falls Lake Dam. The Association shall also be required to document reduction in total nitrogen loadings for any member facilities located in Craven, Jones, Pamlico and Carteret Counties as a result of their immediate proximity to the estuary. If the Association does not meet its annual total nitrogen loading target in any given year, the Association shall make payments for nonpoint source controls at a rate as set in 15A NCAC 2B .0240 of this section. No Association exists, for the purposes of this Rule, until the Agreement is formally approved by the Commission.
- (c) All existing Association dischargers below Falls Lake Dam that have a permitted flow greater than or

equal to 0.5 MGD will receive a quarterly average total phosphorus limit of 2 mg/l in their NPDES permits. All existing Association dischargers above Falls Lake Dam that have a permitted flow greater than or equal to 0.05 MGD will receive a quarterly average total phosphorus limit of 2 mg/l in their NPDES permits. New and expanding Association dischargers will receive a quarterly average total phosphorus limit of 2 mg/l in their NPDES permits. More stringent phosphorous limits may apply to protect water quality standards in localized areas.

History Note: Authority G. S. 143-214.1; 143-215; 143-215.1; 143-215.3(a)(1); Chapter 572, 1995 Session Laws.

Eff. August 1, 1998.

Temporary rule effective January 22, 1998.

**.0234 NEUSE RIVER BASIN - NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
APPLICATION DEADLINE FOR MEMBERSHIP IN THE ASSOCIATION OPTION
FOR WASTEWATER DISCHARGERS**

The membership of the Association shall be established no later than March 1, 1998. All facilities who apply to the Division of Water Quality for membership in the Association prior to March 1, 1998 shall be accepted. Thereafter, additions of facilities existing as of the effective date of this Rule, to the membership in the Association may be considered every five years.

History Note: Authority G. S. 143-214.1; 143-215; 143-215.1; 143-215.3(a)(1); Chapter 572, 1995 Session Laws.

Temporary Adoption Eff. January 22, 1998.

On December 11, 1997, the North Carolina Environmental Management Commission adopted the following rule to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy. This rule will become effective August 1, 1998, pending approval by the Rules Review Commission and the North Carolina General Assembly.

15A NCAC 2B .0235 is proposed for adoption with changes as published in 12:6 NCR 462-479 as follows:

**.0235 NEUSE RIVER BASIN- NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
BASINWIDE STORMWATER REQUIREMENTS**

The following is the urban stormwater management strategy for the Neuse River Basin:

(1) The following local governments shall be designated, based on population and other factors, for stormwater management requirements as part of the Neuse River Nutrient Sensitive Waters stormwater management strategy:

- (a) Cary,
- (b) Durham,
- (c) Garner,
- (d) Goldsboro,
- (e) Havelock,
- (f) Kinston,
- (g) New Bern,
- (h) Raleigh,
- (I) Smithfield,
- (j) Wilson
- (k) Durham County,
- (l) Johnston County,
- (m) Orange County,
- (n) Wake County, and
- (o) Wayne County.

(2) Other incorporated areas and other counties, not listed under Item (1), may seek to implement their own local stormwater management plan by complying with the requirements specified in Items (5), (6) and (7) of this rule.

(3) The Environmental Management Commission may designate additional local governments based on their potential to contribute significant nutrient loads to the Neuse River. The Commission shall review the need to designate additional local governments, based on population growth or pollution potential. At a minimum, the Commission shall review the need for additional designations to the stormwater management program as part of the basinwide planning process for the Neuse River Basin. Any local governments that are designated at a later date under the Neuse Nutrient Sensitive Waters Stormwater Program shall meet the requirements under Items (5), (6) and (7) of this rule.

(4) Within 12 months of the effective date of this rule, the Division of Water Quality shall submit a model local stormwater management program plan to control nutrients to the Commission for approval. The Division will work in cooperation with subject local governments in developing this model plan. The model plan shall address nitrogen reductions for both existing and new development and include, but not be limited to, the following elements:

- (a) Review and approval of stormwater management plans for new developments to ensure that:
 - (i) the nitrogen load contributed by new development activities is held at 70% of the average nitrogen load contributed by the 1995 land uses of the non-urban areas of the Neuse River Basin. The local governments shall use a nitrogen export standard of 3.6 pounds/acre/year, determined by the Environmental Management Commission as 70% of the average collective nitrogen load for the 1995 non-urban land uses in the basin above New Bern. The EMC may periodically update the design standard based on the availability of new scientific information. Developers shall have the option of partially offsetting their nitrogen loads by funding wetland or riparian area

restoration through the North Carolina Wetland Restoration Fund at the rate specified in Rule .0240 of this Section. However, before using offset payments, the development must attain, at a minimum, a nitrogen export that does not exceed 6 pounds/acre/year for residential development and 10 pounds/acre/year for commercial or industrial development.

- (ii) there is no net increase in peak flow leaving the site from the predevelopment conditions for the 1-year, 24-hour storm.
- (b) Review of new development plans for compliance with requirements for protecting and maintaining existing riparian areas as specified in Rule 15A NCAC 2B .0233;
- (c) Implementation of public education programs;
- (d) Identification and removal of illegal discharges;
- (e) Identification of suitable locations for potential stormwater retrofits (such as riparian areas) that could be funded by various sources; and
- (f) Submittal of an annual report on October 30 to the Division documenting progress and net changes to nitrogen load from the local government's planning jurisdiction.

(5) Within 12 months of the EMC's approval of the model local government stormwater program or later designation (as described in Item (3)), subject local governments shall submit their local stormwater management program plans to the Commission for review and approval. These local plans shall equal or exceed the model local stormwater management program plan established in Item (4). Local governments may submit a more stringent local stormwater management program plan. Local stormwater management programs and modifications to these programs shall be kept on file by the Division of Water Quality.

(6) Within 18 months of the EMC's approval of the model local government stormwater program or designation, subject local governments are required to adopt and implement a local stormwater management program according to their approved plan. Local governments administering a stormwater management program are required to submit annual reports to the Division documenting their progress and net changes to nitrogen load by October 30 of each year.

(7) If a local government fails to submit an acceptable local stormwater management program plan within the time frames established in this Rule or fails to properly implement an approved plan, then stormwater management requirements for existing and new urban areas within its jurisdiction will be administered through the NPDES municipal stormwater permitting program per 15A NCAC 2H .0126.

- (a) Subject local governments will be required to develop and implement comprehensive stormwater management programs, tailored toward nitrogen reduction, for both existing and new development.
- (b) These stormwater management programs shall provide all components that are required of local government stormwater programs in Item (4)(a)-(f) above.
- (c) Local governments that are subject to an NPDES permit shall be covered by the permit for at least one permitting cycle (five years) before they are eligible to submit a local stormwater management program for consideration and approval by the EMC.

*History Note: Authority G. S. 143-214.1; 143-214.7; 143-215.1; 143-215.3(a)(1); Chapter 572, 1995 Session Laws; 143-282(d).
Eff. August 1, 1998.*

On December 11, 1997, the North Carolina Environmental Management Commission adopted the following rule to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy. This rule will become effective August 1, 1998, pending approval by the Rules Review Commission and the North Carolina General Assembly.

15A NCAC 2B .0236 has been adopted with changes as published 12:6 NCR 462-479 as follows:

**.0236 NEUSE RIVER BASIN- NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
AGRICULTURAL NITROGEN LOADING REDUCTION**

All persons engaging in agricultural operations in the Neuse River Basin, including those related to crops, livestock, and poultry, shall collectively achieve and maintain a 30% net total nitrogen loading reduction from the cumulative average 1991-1995 nitrogen loadings. In addition to requirements set forth in general permits for animal operations issued pursuant to N.C.G.S. 143-215.10C, these rules apply to all livestock and poultry operations, regardless of size, in the Neuse River Basin. A management strategy to achieve this reduction is specified in Rule .0238 of this Section.

*History Note: Authority G. S. 143.214.1; 143.214.7; 143.215.3(a)(1).
Eff. August 1, 1998.*

On December 11, 1997, the North Carolina Environmental Management Commission adopted the following rule to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy. This rule will become effective August 1, 1998, pending approval by the Rules Review Commission and the North Carolina General Assembly.

15A NCAC 2B .0238 is proposed for adoption as follows:

**.0238 NEUSE RIVER BASIN- NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
AGRICULTURAL NITROGEN REDUCTION STRATEGY**

The following requirements apply to all persons in the Neuse River Basin who engage in agricultural operations. Agricultural operations are activities which relate to the production of crops, livestock, and poultry.

(1) All persons engaging in agricultural operations in the Neuse River Basin shall collectively achieve and maintain a 30% net total nitrogen loading reduction from the cumulative average 1991-1995 nitrogen loadings within five years from the effective date of this Rule. Persons subject to this Rule are provided with two options for meeting the requirements of this Rule. The first option is to sign-up for and participate in implementing a collective local strategy for agricultural nitrogen reduction as described in Item (7) of this Rule. This option allows site-specific plans to be developed for those operations where further nitrogen reduction practices are necessary to achieve the collective reduction goal. The second option requires the implementation of standard Best Management Practices as specified in Item (8) of this Rule. Failure to meet requirements of this Rule may result in imposition of enforcement measures as authorized by N.C.G.S. 143-215.6A (civil penalties), N.C.G.S. 143-215.6B (criminal penalties), and N.C.G.S. 143-215.6C (injunctive relief).

(2) Formation and membership of the Basin Oversight Committee. The Environmental Management Commission shall delegate to the Secretary of the Department of Environment and Natural Resources the responsibility of forming a Basin Oversight Committee.

- (a) The Secretary shall solicit one nomination for membership on this Committee from each of the following agencies:
- (i) Division of Soil and Water Conservation,
 - (ii) United States Department of Agriculture- Natural Resources Conservation Service,
 - (iii) North Carolina Department of Agriculture,
 - (iv) North Carolina Cooperative Extension Service, and
 - (v) Division of Water Quality.

(b) The Secretary shall also solicit one nomination that represents environmental interests, one nomination that represents agricultural interests, and one from the scientific community with experience related to water quality problems in the Neuse River Basin.

(c) Nominations for Basin Oversight Committee shall be approved by the Secretary, Department of Environment and Natural Resources. Members shall be appointed for a term not to exceed five years and shall serve at the pleasure of the Secretary. The United States Department of Agriculture-Natural Resources Conservation Service member will serve in an "ex-officio" non-voting capacity and will function as a technical program advisor to the committee.

(3) Role of the Basin Oversight Committee. The Environmental Management Commission shall delegate the following responsibilities to the Basin Oversight Committee .

- (a) Develop a tracking and accounting methodology, as described below, for evaluating total nitrogen loading from agricultural operations and progress toward reaching the total nitrogen net loading reduction from the implementation BMPs within the Neuse River Basin . The accountability methodology must demonstrate how the nitrogen loading reduction can be met collectively by implementing best management practices approved by the Soil and Water Conservation Commission that include, but are not limited to, water control structures, riparian area establishment, and nutrient management.

- (b) Submit a draft accountability process to the Environmental Management Commission for review within six months after the effective date of the Rule and the final accountability process to the Environmental Management Commission for approval within one year after the effective date of the Rule. If the Basin Oversight Committee fails to submit an approvable accountability process to the Environmental Management Commission, the Environmental Management Commission may require all agricultural operations to follow the standard Best Management Practices option as specified in Item (8) of this Rule.
 - (c) Include in the accountability process a method to accurately track implementation of BMPs, including location and type of BMPs; to estimate nitrogen reductions from BMP implementation; to quantify increases or decreases in nitrogen loading due to changes in land use, modified agricultural activity, or atmospheric nitrogen loading, based on the best available scientific information; to ensure operation and maintenance of BMPs, including year round management for water control structures; to address life expectancy of BMPs; and a method to ensure maintenance of the nitrogen net loading reduction after the initial five years of this Rule, including substitute BMPs to replace expired practices and additional BMPs to offset new sources of nitrogen.
 - (d) Calculate a separate total nitrogen loading for agricultural lands in the Neuse River Basin above and below New Bern based on the average of 1991-1995 conditions. Based on this loading, calculate a separate 30% net reduction. Loading calculations must include atmospheric emissions and deposition of nitrogen from agricultural lands based on the best available scientific information. Allocate to counties or watersheds, as allowed in 4(a), within the Neuse River Basin their portion of the calculated nitrogen loading reduction from agricultural operations, including any division of the reduction between specific categories of agricultural operations. Each county or watershed may not have to reduce individually its nitrogen loading by 30%; however, the nitrogen loading reduction from all counties or watershed above New Bern should collectively meet their total nitrogen reduction and all counties or watersheds below New Bern should collectively meet their total nitrogen reduction. If the Basin Oversight Committee fails to allocate the nitrogen loading reductions from agricultural operations to counties or watersheds within the Neuse River Basin, the Environmental Management Commission may assign the agricultural nitrogen reductions based on the approved accountability methodology.
 - (e) Review, approve and summarize county nitrogen reduction strategies and present these strategies to the Environmental Management Commission for approval within two years from the effective date of this Rule.
 - (f) Review, approve and summarize local nitrogen reduction annual reports and present these reports to the Environmental Management Commission each October. Information to be included in the Annual Report is described in Item (5)(d) of this Rule.
- (4) Formation and membership of the Local Advisory Committees. The Environmental Management Commission shall delegate to the Directors of the Division of Water Quality and Division of Soil and Water Conservation the responsibility of forming Local Advisory Committees.
- (a) The Directors shall form Local Advisory Committees in each county (or watershed specified by the Basin Oversight Committee) within the Neuse River Basin. The Directors shall solicit nominations for membership on the Local Advisory Committee from each of the following local agencies:
 - (i) Soil and Water Conservation District,
 - (ii) United States Department of Agriculture- Natural Resources Conservation Service,
 - (iii) North Carolina Department of Agriculture,
 - (iv) North Carolina Cooperative Extension Service, and
 - (v) North Carolina Division of Soil and Water Conservation.
 - (vi) The Directors shall also solicit at least two nominations that represents a local farmer in the county watershed.
The Soil and Water Conservation District may be designated by the Basin Oversight Committee as the lead agency on the Local Advisory Committee.
 - (b) Nominations for the Local Advisory Committees shall be approved by the Environmental Management Commission and Soil and Water Conservation Commission and shall be appointed for a term not to exceed five years and shall serve at the pleasure of the Commissions.



(5) Role of the Local Advisory Committees. The Environmental Management Commission shall delegate the following responsibilities to qualified employees of the Department who are members of the Local Advisory Committees and employees of the Division of Soil and Water Conservation or its designee. These qualified employees shall act with advice from the Local Advisory Committees.

- (a) Conduct a sign-up process for persons wishing to voluntarily implement the local nitrogen reduction strategy as specified in Item (7) of this Rule. This sign-up process shall be completed within one year following the effective date of this Rule.
- (b) Develop local nitrogen reduction strategies that meet the nitrogen loading reduction goal for agricultural operations assigned by the the Basin Oversight Committee. The local strategies shall be designed to achieve the required nitrogen loading reduction within five years from the effective date of this Rule. A matrix of best management practice options, which account for stream order, floodplain width, and regional variations in soil types and topography, may be used in developing the local nitrogen reduction strategies. Local nitrogen reduction strategies must specify the name and location of participant agricultural farming operations, BMPs which will be required as part of the plan, estimated nitrogen reduction, schedule for BMP implementation, and operation and maintenance requirements. If the Local Advisory Committee fails to develop the local nitrogen reduction strategy, the Environmental Management Commission may develop the strategy based on the tracking and accounting method approved by the Environmental Management Commission.
- (c) Submit an annual report to the Basin Oversight Committee each May on net total nitrogen loading reductions from agricultural operations, the implementation of BMPs for nitrogen control, and progress towards the total nitrogen loading reduction requirements in the Neuse River Basin above and below New Bern.
- (d) Include in the annual report, at a minimum, documentation on the BMPs implemented (including type and location), their costs, documentation of any expired contracts for BMPs, estimated nitrogen net loading reductions achieved as a result of those BMPs, any increases or decreases in nitrogen loading resulting from changes in land use or modified agricultural-related activity, discussion of operation and maintenance of BMPs, and a summary of the estimated load from agricultural operations for the previous year, and any modifications to the accounting methodology. Information shall be provided in the annual report on the status of BMP implementation and estimated total nitrogen reduction by all agricultural operations within the Neuse River Basin in each county or watershed. The annual report shall also be summarized separately for cropland, livestock and poultry activities.

(6) Options for meeting the collective total nitrogen net loading reduction requirement. Each agricultural operation in the Neuse River Basin shall have two options for meeting the requirements of this Rule. The options are to either implement a local nitrogen reduction strategy, specified by Item (7) of this Rule, or implement standard Best Management Practices specified by Item (8) of this Rule.

(7) Local nitrogen reduction strategy option. All persons subject to this Rule that choose to implement the county nitrogen reduction plan must complete the sign-up process that will be conducted per the requirements of Item (5)(a) of this Rule. This sign-up process will be completed within one year from the effective date of this Rule. If a person subject to this Rule does not complete the sign-up process, he shall be subject to implementation of Best Management Practices as specified in Item (8) of this Rule. Persons who choose to participate in the local nitrogen reduction strategy must commit and implement their portion of the plan within 5 years of the effective date of this Rule. A person may withdraw from the local nutrient reduction strategy up until the time that the local strategy is finalized by the Local Advisory Committee and the person signs the specific plan for his property, which represents his commitment to implement the plan within 5 years of the effective date of the Rules. After a person has made the commitment to implement the local strategy by signing the plan for his property, then such persons may not withdraw from the local nitrogen reduction strategy during the initial five-year period. The local nitrogen reduction strategy is not required to be more stringent than the standard best management practice option provided that the net nitrogen reduction goals are met collectively; however, the Local Advisory Committes may develop strategies that achieve reductions of greater than 30%.

(8) Standard best management practice option. If a person subject to this Rule does not complete the sign-up process for implementation of the local nitrogen reduction strategy, then he shall implement the following best



management practices within four years following the effective date of this Rule.

(a) A forested riparian area, as described in Sub-Item (8)(a)(i)-(ii) of this Rule, is required on all sides of surface waters in the Neuse River Basin (intermittent streams, perennial streams, lakes, ponds and estuaries) as indicated on the most recent versions of U.S.G.S. 1:24,000 scale (7.5 minute quadrangle) topographic maps or other site-specific evidence. Design and installation of the forested riparian area should be such that, to the maximum extent possible, sheet flow of surface water is achieved. Any activities that would result in water quality standard violations or disrupt the structural or functional integrity of the forested riparian area are prohibited. The protected riparian area shall have two zones as follows:

- (i) Zone 1 is intended to be undisturbed forest. Zone 1 begins at the top of bank for intermittent streams and perennial streams without tributaries and extends landward a distance of 30 feet on each side of the waterbody, measured horizontally on a line perpendicular to the waterbody. For all other waterbodies, Zone 1 begins at the top of bank or the mean high water line and extends landward a distance of 30 feet, measured horizontally on a line perpendicular to the waterbody. Forest vegetation of any width that exists in Zone 1 as of July 22, 1997 must be preserved and maintained in accordance with Sub-Items (A)-(F). The application of fertilizer in Zone 1 is prohibited. The following practices and activities are allowed in Zone 1:
 - (A) Natural regeneration of forest vegetation and planting vegetation to enhance the riparian area if disturbance is minimized, provided that any plantings should primarily consist of locally native trees and shrubs;
 - (B) Selective cutting of individual trees of high value in the outer 20 feet of Zone 1, provided that the basal area (measured as 12-inch diameter at breast height) remains at or above 0.52 square feet per 15 running feet of the outer 20 feet of Zone 1, as measured along the bank of the stream or waterbody. Limited mechanized equipment is allowed in this area.
 - (C) Horticulture or silvicultural practices to maintain the health of individual trees;
 - (D) Removal of individual trees which are in danger of causing damage to dwellings, other structures, or the stream channel; and
 - (E) Removal of dead trees and other timber cutting techniques necessary to prevent extensive pest or disease infestation if recommended by the Director, Division of Forest Resources and approved by the Director, Division of Water Quality
- (ii) Zone 2: begins at the outer edge of Zone 1 and extends landward a minimum of 20 feet as measured horizontally on a line perpendicular to the waterbody. The combined minimum width of Zones 1 and 2 shall be 50 feet on all sides of the waterbody. Vegetation in Zone 2 shall consist of a dense ground cover composed of herbaceous or woody species which provides for diffusion and infiltration of runoff and filtering of pollutants. The following practices and activities are allowed in Zone 2 in addition to those allowed in Zone 1: Periodic mowing and removal plant products such as timber, nuts, and fruit is allowed on a periodic basis provided the intended purpose of the riparian area is not compromised by harvesting, disturbance, or loss of forest or herbaceous ground cover. Forest vegetation in Zone 2 may be managed to minimize shading on adjacent land outside the riparian area if the water quality function of the riparian area is not compromised.
- (iii) The following practices and activities are not allowed in Zone 1 and Zone 2:
 - (A) Land disturbing activities and placement of fill and other materials, other than those allowed in Items 8(a)(i) and 8(b) of this Rule;
 - (B) New development ;
 - (C) New on-site sanitary sewage systems which use ground absorptions;
 - (D) Any activity that threatens the health and function of the vegetation including, but not limited to, application of fertilizer or chemicals in amounts exceeding the manufacturer's recommended rate, uncontrolled sediment sources on adjacent lands, and the creation of

any areas with bare soil.

- (iv) Timber removal and skidding of trees in the riparian area shall be directed away from the water course or water body. Skidding shall be done in a manner to prevent creation of ephemeral channels perpendicular to the water body. Any tree removal must be performed in a manner that does not compromise the intended purpose of the riparian area and is in accordance with the Forest Practices Guidelines Related to Water Quality (15A NCAC 1J .0201-.0209).
- (b) The following waterbodies and land uses are exempt from the riparian area requirement:
 - (i) Ditches and manmade conveyances, other than modified natural streams, which under normal conditions do not receive drainage waters from any tributary ditches, canals, or streams, unless the ditch or manmade conveyance delivers runoff directly to waters classified in accordance with 15A NCAC 2B .0100;
 - (ii) Ditches and manmade conveyances other than modified natural streams which are used exclusively for drainage of silvicultural land or naturally forested areas. All forest harvesting operations shall be in compliance with North Carolina's Forest Practices Guidelines Related to Water Quality;
 - (iii) Areas mapped as perennial streams, intermittent streams, lakes, ponds or estuaries on the most recent versions of United States Geological Survey 1:24,000 scale (7.5 minute quadrangle) topographic maps where no perennial, intermittent waterbody, or lakes, ponds or estuaries exists on the ground;
 - (iv) Ponds and lakes created for animal watering, irrigation, or other agricultural uses that are not part of a natural drainage way that is classified in accordance with 15A NCAC 2B .0100.
 - (v) Water dependent structures as defined in 15A NCAC 2B .0202 provided that they are located, designed, constructed and maintained to provide maximum nutrient removal, to have the least adverse effects on aquatic life habitat and to protect water quality.
 - (vi) The following uses may be allowed where no practical alternative exists. A lack of practical alternatives may be shown by demonstrating that, considering the potential for a reduction in size, configuration or density of the proposed activity and all alternative designs, the basic project purpose cannot be practically accomplished in a manner which would avoid or result in less adverse impact to surface waters. Also, these structures shall be located, designed, constructed, and maintained to have minimal disturbance, to provide maximum nutrient removal and erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to the maximum extent practical through the use of best management practices.
 - (A) Road crossings, railroad crossings, bridges, airport facilities, and utility crossings may be allowed if conditions specified in 8(b)(vi) of this Rule are met.
 - (B) Stormwater management facilities and ponds, and utility construction and maintenance corridors for utilities such as water, sewer or gas, may be allowed in Zone 2 of the riparian area as long as the conditions specified in 8(b)(vi) of this Rule are met and they are located at least 30 feet from the top of bank or mean high water line. Additional requirements for utility construction and maintenance corridors are listed in 8(b)(vi) of this Rule.
 - (vii) A corridor for the construction and maintenance of utility lines, such as water, sewer or gas, (including access roads and stockpiling of materials) may run parallel to the stream and may be located within Zone 2 of the riparian area, as long as no practical alternative exists and they are located at least 30 feet from the top of bank or mean high water line and best management practices are installed to minimize runoff and maximize water quality protection to the maximum extent practicable. Permanent, maintained access corridors shall be restricted to the minimum width practicable and shall not exceed 10 feet in width except at manhole locations. A 10 feet by 10 feet perpendicular vehicle turnaround is allowed provided they are spaced at least 500 feet apart along the riparian area.
 - (viii) Stream restoration projects, scientific studies, stream gauging, water wells, passive recreation facilities such as boardwalks, trails, pathways, historic preservation and archaeological activities

are allowed; provided that they are located in Zone 2 and are at least 30 feet from the top of bank or mean high water line and are designed, constructed and maintained to provide the maximum nutrient removal and erosion protection, to have the least adverse effects on aquatic life and habitat, and to protect water quality to maximum extent practical through the use of best management practices. Activities that must cross the stream or be located within Zone 1 are allowed as long as all other requirements of this Item are met.

- (ix) Stream crossings associated with timber harvesting are allowed if performed in accordance with the Forest Practices Guidelines Related to Water Quality (15A NCAC 1J .0201- .0209; and
 - (x) In addition to exceptions included in 8(b)(i)-(ix), canals, ditches, and other drainage conveyances are exempt from the riparian area requirement if both water control structures with a water control structure management plan and a nutrient management plan, are implemented on the adjacent agricultural land according to the standards and specifications of the USDA - Natural Resources Conservation Service or the standards and specifications adopted by the NC Soil and Water Conservation Commission. The water control structures and nutrient management practices must provide equivalent protection and directly affect the land and waterbodies draining into the waterbody exempted from the riparian area requirement. To the maximum extent practical, water control structures should be managed to maximize nitrogen removal throughout the year. A technical specialist designated pursuant to rules adopted by the Soil and Water Conservation Commission must provide written approval that the nutrient management and water management plans meet the standards and specifications of the USDA - Natural Resources Conservation Service or the standards and specifications adopted by the NC Soil and Water Conservation Commission. If the nutrient management plans and water management plans are not implemented, then a riparian area pursuant to this Section is required.
- (c) The following are modifications to the riparian area requirements.
- (i) On agricultural land where either water control structures with a water control structure management plan, or a nutrient management plan is implemented according to the standards and specifications of the USDA - Natural Resources Conservation Service or the standards and specifications adopted by the NC Soil and Water Conservation Commission, then a 20-ft forested or a 30-ft vegetated buffer is required. The water control structures or nutrient management practices must provide equivalent protection and directly affect the land and waterbodies draining into the waterbody with a modified buffer requirement. To the maximum extent practical, water control structures should be managed to maximize nitrogen removal throughout the year. A technical specialist designated pursuant to rules adopted by the Soil and Water Conservation Commission must provide written approval that the nutrient management plan meets the standards and specifications of the USDA - Natural Resources Conservation Service or the standards and specifications adopted by the NC Soil and Water Conservation Commission.
 - (ii) A vegetated riparian area may be substituted for an equivalent width of forested riparian area within 100 feet of tile drainage.
 - (iii) Where the riparian area requirements would result in an unavoidable loss of tobacco allotments [(7 CFR 723.220(c)] and the BMPs of controlled drainage or nutrient management are not in place, forest cover is required only in the first 20 feet of the riparian area.
- (d) Maintenance of Zones 1 and 2 is required in accordance with this Rule.
- (i) Sheet flow must be maintained to the maximum extent practical through dispersing concentrated flow and/or re-establishment of vegetation to maintain the effectiveness of the riparian area.
 - (ii) Concentrated runoff from new ditches or manmade conveyances must be dispersed into sheetflow before the runoff enters Zone 2 of the riparian area. Existing ditches and manmade conveyances, as specified in Sub-Item 8(b)(ii) of this Rule, are exempt from this requirement; however, care should be taken to minimize pollutant loading through these existing ditches and manmade conveyances from fertilizer application or erosion.
 - (iii) Periodic corrective action to restore sheet flow should be taken by the landowner if necessary to impede the formation of erosion gullies which allow concentrated flow to bypass treatment in the

riparian area.

- (e) Periodic maintenance of modified natural streams such as canals is allowed provided that disturbance is minimized and the structure and function of the riparian area is not compromised. A grassed travelway is allowed on one side of the waterbody when alternative forms of maintenance access are not practical. The width and specifications of the travelway shall be only that needed for equipment access and operation. The travelway should be located to maximize stream shading.
- (f) Where the standards and management requirements for riparian areas are in conflict with other laws, regulations, and permits regarding streams, steep slopes, erodible soils, wetlands, floodplains, forest harvesting, surface mining, land disturbance activities, development in Coastal Area Management Act Areas of Environmental Concern, or other environmental protection areas, the more protective shall apply .
- (g) The Environmental Management Commission acknowledges that best management practices under the standard management practice option of this Rule do not fully address nitrogen loading, including atmospheric emissions and deposition, from animal operations. As information becomes available on nitrogen loadings from animal operations and best management practices to control these loadings, other best management practices from animal operations may be required by the Commission as necessary to achieve equivalent reduction in nitrogen loadings therefrom. These additional best management practices shall be required if deemed necessary to achieve a net total nitrogen loading reduction from the animal operations based on average 1991-1995 conditions.

*History Note: Authority G. S. 143-214.1; 143-214.7; 143-215.3(a)(1).
Eff. August 1, 1998.*

On December 11, 1997, the North Carolina Environmental Management Commission adopted the following rule to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy. This rule will become effective August 1, 1998, pending approval by the Rules Review Commission and the North Carolina General Assembly.

15A NCAC 2B .0239 has been adopted with changes as published 12:6 NCR 462-479 as follows:

**.0239 NEUSE RIVER BASIN: NUTRIENT SENSITIVE WATERS
MANAGEMENT STRATEGY: NUTRIENT MANAGEMENT**

The following is the management strategy for nutrient management in the Neuse River Basin:

(1) The following persons are required to obtain a certificate, issued within five years of the effective date of this Rule by the Cooperative Extension Service or the Division of Water Quality, verifying completion of training and continuing education in nutrient management. Within one year from the effective date of this Rule, the Division of Water Quality, in cooperation with the Cooperative Extension Service, shall conduct a sign-up process for persons wishing to take the nutrient management training. If these persons fail to obtain the nutrient management certificate, they are required to develop and properly implement nutrient management plans for the lands where they apply fertilizer within five years of the effective date of this Rule:

- (a) Applicators who in a calendar year apply fertilizer to cropland areas, including row and vegetable crops, floraculture areas, ornamental areas and greenhouse production areas, that together comprise at least 50 acres and persons responsible for managing cropland areas, as described in this Sub-Item, that together comprise at least 50 acres;
- (b) Applicators who in a calendar year apply fertilizer to a golf course, recreational land areas, right-of-way, or other turfgrass areas that together comprise at least 50 acres, and persons responsible for managing the turfgrass aspects of lands, as described in this Sub-Item, that together comprise at least 50 acres; and
- (c) Commercial applicators who apply fertilizer to at least 50 total acres per year of lawn and garden areas in residential, commercial, or industrial developments, and persons responsible for managing the lawn and garden aspects of lands, as described in this Sub-Item, that together comprise at least 50 acres.

(2) If the persons listed in Item 1 (a)-(c) do not attend and complete within 5 years of the effective date of this Rule a nutrient management training program administered by the Cooperative Extension Service, their nutrient management plans shall meet the following requirements:

- (a) Nutrient management plans for cropland shall meet the standards and specifications of the USDA - Natural Resources Conservation Service or the standards and specifications adopted by the NC Soil and Water Conservation Commission. Written approval from a technical specialist designated pursuant to rules adopted by the Soil and Water Conservation Commission must be obtained by the applicator certifying that a nutrient management plan meeting these standards has been developed for the lands where they apply fertilizer.
- (b) Nutrient management plans for turfgrass, floraculture, ornamental and greenhouse production application of nutrients shall meet the standards and specifications of the Division of Water Quality. These standards and specifications shall be developed by the Division of Water Quality in consultation with the Cooperative Extension Service, the Natural Resources Conservation Service, the Division of Soil and Water Conservation, and the North Carolina Department of Agriculture and approved by the Director of the Division of Water Quality within 1 year of the effective date of this Rule. Written approval from a technical specialist designated pursuant to rules adopted by the the Environmental Management Commission must be obtained by the applicator certifying that a nutrient management plan meeting these standards has been developed for the lands where they apply fertilizer.

(c) Nutrient management plans and supporting documents must be kept on-site or be producible within 24 hours of a request by the Division of Water Quality.

(d) Nutrient management plans may be written by the applicator or a consultant to the applicator.

(3) Applicators and commercial applicators subject to Item (2) of this Rule who do not develop a nutrient management plan or do not apply nutrients in accordance with a nutrient management plan meeting the specifications in Item (2) are in violation of this Rule and are subject to enforcement measures authorized in N.C.G.S. 143-215.6A (civil penalties), N.C.G.S. 143-215.6B (criminal penalties), and N.C.G.S. 143-215.6C (injunctive relief).

(4) Dry poultry litter from animal waste management systems involving 30,000 or more birds shall be applied at agronomic rates for nitrogen based on realistic yield expectations derived from waste nutrient content, crop, and soil type or yield records.

(5) Residential landowners and other individuals applying fertilizer to less than 50 acres per year should to the maximum extent practical apply fertilizer to residential, commercial, industrial, turfgrass, and cropland areas at rates recommended by the Cooperative Extension Service.

*History Note: Authority G. S. 143-214.1; 143-214.7; 143-215.3(a)(1).
Eff. August 1, 1998.*

On December 11, 1997, the North Carolina Environmental Management Commission adopted the following rule to support implementation of the Neuse River Nutrient Sensitive Waters Management Strategy. This rule will become effective August 1, 1998, pending approval by the Rules Review Commission and the North Carolina General Assembly.

15A NCAC 2B .0240 has been adopted with changes as published 12:6 NCR 462-479 as follows:

**.0240 NEUSE RIVER BASIN- NUTRIENT SENSITIVE WATERS MANAGEMENT STRATEGY:
NUTRIENT OFFSET PAYMENTS**

(a) Nutrient offset payments made as part of fulfilling requirements of the Neuse River Nutrient Sensitive Waters Management Strategy shall be paid to the North Carolina Wetland Restoration Fund. Monies paid to this fund pursuant to this Rule shall be targeted toward restoration of wetlands and riparian areas within the Neuse River Basin.

(b) A cost effectiveness rate shall be established by the Division that represents the cost to achieve a reduction of one kilogram (1 kg) or one pound (1 lb) of total nitrogen per year through the use of nitrogen reduction measures. The rate shall be periodically updated by the Division based on the availability of new cost or effectiveness data. The rate shall be:

(c) The offset payment shall be an amount sufficient to fund 30 years of nitrogen reduction. For loading offset in the wastewater discharge Rule (15A NCAC 2B .0234), payment shall be made prior to permit issuance. For loading offset in the stormwater Rule (15A NCAC 2B .0235), payment shall be made prior to approval of the development plan twenty-three dollars per kilogram per year (\$23/kg/year) or eleven dollars per pound per year (\$11/lb/year).

(d) The nitrogen reduction credit associated with restored wetlands and riparian areas funded under this Rule will be awarded exclusively to the person, municipality, discharger or group of dischargers who paid the offset fee.

*History Note: Authority G. S. 143-214.1.
Eff. August 1, 1998.*

Findings and Recommendations
of the

Craven County
Intensive Livestock Operations Moratorium
Study Committee

Summary Report

Submitted to the
Craven County Board of Commissioners

December 15, 1997

PREFACE

In February 1997, the Craven County Board of Commissioners passed a resolution declaring a moratorium on new intensive livestock operations and expansions of existing operations. Citing numerous public and environmental health concerns, the Board recognized the need for a public discussion on the issues surrounding the growth of the livestock industry in the county. The resolution also called for the formation of a Study Committee to conduct the necessary research to describe the problems associated with intensive livestock operations and recommended solutions to those problems.

The Study Committee consists of a broad range of stakeholders who represent various interests regarding livestock operations in Craven County. The following are the specific individuals and their respective interest categories who carry the credibility and the authority necessary to make this process successful:

Lee K. Allen	Craven County Board of Commissioners
Earl Wright	Craven County Board of Commissioners
James Nicholas Blackerby	Member at Large
Ray Silverthorne	Craven Co. Environmental Health Dept.
Billy Dunham	NC Cooperative Extension Service
Doug Phelps, Grenda Dennis	Neuse River Foundation
William H. Ritchie	Member at large
James K. Spruill	Craven County Soil and Water Board
Willie Perry	Member at large

The purpose of the Study Committee is to forward a recommendation to the Board of Commissioners on how the Board should proceed with respect to adopting regulations of intensive livestock operations over and above those enacted by the State of North Carolina. The final report of the Study Committee contains the following components:

1. A description of the problems that the Study Committee has researched and have associated with intensive livestock operations in Craven County.
2. A summary of the Committee's findings regarding the scope of the problems identified above and options available to solve those problems.
3. Recommended solutions for the Board of County Commissioners to consider.

I. Intensive Livestock Operations (ILOs) in Craven County

Objective:

The committee sought to understand the cause of growth in the North Carolina swine industry, the current status of the intensive livestock operations in Craven County, and availability of land parcels in Craven County suitable for the expansion of the industry.

Sources:

- Presentation by Dr. Larry Calhoun, Dept. of Biological Science, UNC-Wilmington
- Presentation by Mr. Andy Metts, USDA Natural Resources Conservation Service
- Presentation and GIS Map created by Mr. Lou Valenti, Craven County Mapping Department

Finding:

Economic factors such as cheaper land and less restrictive environmental regulations have brought a large number of intensive livestock operations into North Carolina since 1990. Craven County in particular has experienced a doubling in the number of ILOs located here since 1990. Currently there are 31 swine ILOs in Craven County containing a total of about 150,000 animals. A GIS analysis has identified approximately 23 potential land parcels in Craven County that might be suitable for the expansion of ILOs in accordance with State legislated parameters, as of October 1, 1995. That number may vary under new state criteria.

Dissenting Report (Neuse River Foundation):

The Neuse River Foundation (NRF) disagrees with the inclusion of the GIS map regarding potential ILO sites in Craven County as it stands. The NRF feels that the title of the map is misleading and does not accurately reflect the number of sites that can be identified by this analysis. Sites under 53 acres were not marked on the map. It is conceivable that adjoining parcels under 52 acres could be purchased to make one site. A five hundred-foot setback from residential property was used, while the regulation states any property. For these reasons the NRF believes that there are more than 23 potential sites in the county.

It is the understanding of the NRF that a new GIS map will be redrawn with new and updated criteria prior to review by the Board of Commissioners. The NRF supports this measure.

II. Animal Housing and Waste Management in Intensive Livestock Operations

Objective:

To better understand the problems associated with intensive livestock production, the committee invited faculty from North Carolina State University to provide information on conventional swine production and waste management practices.

Sources:

- Presentation by Dr. Jim Barker, Dept. of Biological and Agricultural Engineering, North Carolina State University (NCSU)
- Presentation by Dr. David Crouse, Dept. of Soil Science, NCSU

Finding:

Three types of swine housing systems were presented by Dr. Jim Barker, North Carolina State University; pasture/drylot, concrete slab floor facilities, and slotted floor enclosed buildings. The latter is the most commonly used system for housing swine in North Carolina.

Two types of waste management systems were discussed by Dr. Barker: liquid systems and slurry systems. Liquid systems use lagoons as a method of storing and decomposing waste, while slurry systems rely on a solids separation process. Slurry systems are not common in the southeastern U.S. because they require large areas of cropland for spreading manure. Anaerobic lagoon systems are used to store liquid manure before applying to land. Although lagoons are economically feasible and offer ease of manure treatment for farmers, improper management of lagoons may intensify odor or cause leakage. Regardless of management practices, lagoons also allow volatilization of ammonia into the atmosphere, a portion of which is deposited as nitrogen into the estuary.

Recent legislation requires that intensive livestock operations have animal waste management plans as part of the general permitting process. Intensive livestock operations must designate a state trained and certified "operator in charge" of the waste management system as well.

III. Dead Animal Disposal

Objective:

The committee sought to learn about dead animal disposal and determine ways of disposing dead animals that are least harmful to the environment.

Sources:

- Presentation and NC Cooperative Extension Fact Sheets provided by Dr. Jim Barker, Dept. of Biological and Agricultural Engineering, NCSU

Finding:

The five options for dead animal disposal presented by Dr. Barker include landfilling, on-site burial and pit disposal, incineration, rendering into by-products, and composting. Incineration contributes to air pollution, while onsite burial and pit disposal may contribute to soil nutrient loading and ground water pollution. Rendering of carcasses into by-products reduces the need for on-site disposal or burial. Rendering is the most common disposal option practiced in Craven County.

IV. Odor Generation and Control

Objective:

The committee gathered information on the sources of odor and methods for controlling odor from swine production facilities.

Sources:

- Presentation and North Carolina Cooperative Extension Fact Sheets provided by Dr. Jim Barker, Dept. of Biological and Agricultural Engineering, NCSU
- Presentation on the role of dust in odor by Dr. Bob Bottcher, Professor, Biological and Agricultural Engineering, NCSU

Finding:

Dr. Barker explained that odor from ILOs is caused by the anaerobic decomposition of manure. For odor to be detected, odorous gases must be generated, released to the atmosphere, and transported to the receptor site. Interference with one of these steps diminishes odor. Ways to diminish odors include solid separation, biofiltration, and the use of best management practices. European biofilters reduce odor by directing airflow through filters, and are expensive to operate. Biomass filters may be a more economical solution. Biomass filters hang outside buildings in front of fans, allowing dust to settle out of the air and thus reducing odor, since dust transports odor and microbes. Another economical way of reducing dust may be to employ the use of dustbreak walls.

V. Soil Nutrient Loading and Ground Water Pollution

Objective:

The committee consulted several sources to determine if soil nutrient loading and ground water pollution are problems associated with intensive livestock operations in North Carolina, and the extent of these problems in Craven County.

Sources:

- Presentation by Dr. Steve Hodges, Dept. of Soil Science, NCSU
- Presentation by Dr. David Crouse, Dept. of Soil Science, NCSU
- Presentation by Dr. Larry Calhoon, Dept. of Biological Science, UNC-Wilmington
- The following publications by the US Department of Agriculture:
 - "NC USDA Hydrologic Unit Area Project"
 - "NC USDA Water Quality Demonstration Project"
 - "Agricultural Systems for Environmental Quality"; USDA Publications

Finding:

The committee found that importing nutrients as feed into North Carolina is a problem associated with intensive livestock operations. Excess nitrogen and phosphorus application to land results in high concentrations of these nutrients in the groundwater, and eutrophication of surface waters which results in fish kills. High nitrogen in groundwaters may yield human health effects. Excess zinc and copper in soil may cause plant toxicity.

Most of the grain fed to North Carolina livestock is imported from the midwest. Trends since 1985 show an increase in demand for feedstuffs as the industry has grown. North Carolina production has not kept pace with demand. Solutions to nutrient build-up may include diet manipulation, exporting manure products, and harvesting and exporting plant products that use nutrients applied to land at agronomic rates.

Nutrient loading is a significant problem in the Neuse and Cape Fear River basins, but elimination of hog farms alone would not solve the problem since people, storm run-off, and sewage treatment plants all contribute as well. However, hog farms contribute more to nutrient loading than other livestock operations.

The USDA has funded water quality projects in Duplin, Sampson, and Wayne counties. The programs seek voluntary participation of hog farms in implementing best management practices (BMPs) to reduce releases of nitrates to ground and surface waters. Goals of the USDA Water Quality projects are to achieve nationwide implementation of recommended BMPs, develop innovative BMPs, and thus improve water quality.

VI. Atmospheric Nitrogen Emissions and Depositions from Livestock Waste

Objective:

The committee sought research information on atmospheric emission and deposition of nitrogen from livestock operations in the Neuse River Basin, and the role that livestock nitrogen emissions play in air and water pollution.

Sources:

- Presentation and fact sheet by Dr. Joe Rudek, Environmental Defense Fund of North Carolina
- Presentation by Mr. Robert Wooten, NC Division of Air Quality, DEHNR
- Presentation by Mr. Jim Southerland, NC Division of Air Quality, DEHNR
- Presentation by Dr. Bill Showers, Assoc. Professor, Marine Earth & Atmospheric Sciences, NCSU

Finding:

Volatilization is the movement of nitrogen from soil and water to the atmosphere in the form of ammonia and nitrogen oxides. Atmospheric nitrogen also comes from point sources such as industry, and mobile sources such as automobiles. Atmospheric deposition is the return of nitrogen to land and water after traveling some distance. Two-thirds of the ammonia emissions deposit within 60 miles of the source, and can travel up to 300 miles.

The USDA estimates that 80-90% of the nitrogen in hog lagoons is volatilized as ammonia. An estimated 63% of the atmospheric deposition from agricultural activities in eastern NC is from hog operations. Dr. Joe Rudek of the Environmental Defense Fund estimated that the nitrogen load to the Neuse River estuary from agricultural activities is equal to the nitrogen load from point sources. An inventory of nitrogen emissions from North Carolina, (achieved through modeling), shows that 20% of nitrogen emissions comes from swine operations.

The 1996 NC General Assembly provided funding for studies on atmospheric deposition, odor control technology, isotopic tracer studies, alternative waste management, and groundwater impact. Reports are expected in summer 1998 and later. Dr. Bill Showers from NC State University explained that isotopic tracer studies allow scientists to determine where excess nitrogen in the environment has originated, and will provide data for more accurate modeling of emissions and depositions in North Carolina. Although isotopic studies can indicate the source of nutrients (e.g., nitrogen from domestic animal species, wildlife species, humans, fertilizers, etc.), the method will not

quantitatively indicate the amounts from these sources. Moreover, the isotopic tracer method will not indicate the geographical source without additional ground water gradient monitoring.

Dissenting report:

Concerning isotopic tracer studies:

The Neuse River Foundation believes that there are limitations to this method. The basic premise states that specific nitrogen (N) will have ratios in a specific range. With mixed sources there may be movement by the ratios in and/or out of specific ranges. These conditions make it difficult to identify a specific N source. In cases where mixed sources are not involved the ranges for isotopic ratios may overlap, prohibiting identification.

VII. Risks to Human Health

Objective:

The committee gathered information on the potential human health risks posed by intensive livestock operations. Three categories of human health effects were investigated: nitrate contamination of drinking water, impacts of swine odor, and pathogenic risks.

Sources:

- Presentation by Dr. Ken Rudo, State Toxicologist, NC Division of Epidemiology
- Publication:
 - Schiffman, Susan S., Elizabeth A. Sattely Miller, Mark S. Suggs and Brevick G. Graham. 1995. "The Effect of Environmental Odors Emanating From Commercial Swine Operations on the Mood of Nearby Residents". *Brain Research Bulletin*. Vol. 37, No. 4, pp. 369-375
- Publication:
 - Thu, Kendall, K. Donham, R. Ziegenhorn, S. Reynolds, P.S. Thorne, P. Subramanian, P. Whitten, J. Stookesberry. 1997. "A Control Study of the Physical and Mental Health of Residents Living Near a Large-Scale Swine Operation." *Journal of Agricultural Safety and Health*. Vol 3(1): 13-26.
- Presentation by Dr. Mark D. Sobsey, Professor, University of North Carolina-Chapel Hill

Finding:

1. *Nitrate Contamination of Drinking Water*

Dr. Ken Rudo, the State Toxicologist with the NC Division of Epidemiology, presented information on nitrate contamination of drinking water. Since 1995, the NC Division of Epidemiology has been gathering data on the incidence of nitrates from ILOs contaminating drinking water wells in North Carolina. Of the 1,100 wells sampled adjacent to intensive livestock operations, approximately 35% have shown some degree of contamination (>2 ppm). Approximately 10% have shown nitrate contamination above the state health standard of 10 ppm. The majority of the contamination incidents have been found in Sampson, Duplin and Robeson counties. In only six or seven cases, however, can the nitrate detections be unambiguously attributed to ILOs. In one case in Robeson County, strong evidence indicates that the nitrates originate from the spray field. It was also discovered that nitrates can travel with groundwater over 1,000 ft. from the edge of the spray field toward a well. Nitrates pose a human health risk, particularly to young babies in the form of Blue Baby Syndrome.

A number of water well samples in Craven County have had nitrate detections, some higher than the state drinking water standard of 10 ppm. No information is available regarding agricultural sources with respect to nitrate contamination. The mechanism for periodic testing of wells for nitrates is not in place in Craven County.

2. Health Affects of Swine Odors

Studies on the effect of odor on residents have been published. A Duke University study conducted by Dr. Susan S. Schiffman and colleagues found that persons living near large scale hog farms and exposed to odors experienced greater mood symptoms than people not exposed to odors. They reported significantly greater tension, anger, fatigue, and confusion, and significantly less vigor than persons who do not live near hog farms.

An Iowa University study conducted by Dr. Kendall Thu and colleagues found that residents living within two miles of a hog facility experienced respiratory symptoms such as coughing and wheezing as well as nausea/dizziness more often than the subjects who did not live near the hog facility. However, he found no significant increases in psychological symptoms such as depression and anxiety.

3. Pathogenic Risks from Lagoon Effluent

Human and animal waste contains a variety of disease-causing microbes that may include viruses, bacteria, worms, or protozoa. The disease-causing microbes pose problems when they are present in the environment in excessive amounts. These problems may include loss of oxygen in the water and/or disease. The two most important protozoa, (significant due to their common presence in environmental waters), are *Giardia Lamblia* and *Cryptosporidium*. These two protozoa can be a source of contamination to raw water supply.

Whereas humans and animals often share the same bacterial pathogens, they do not share many of the same viral pathogens. However, a Hepatitis E virus similar to the human hepatitis virus was recently found to infect swine. Scientists do not know at this time if the virus can cross from hogs to humans.

Scientists studying waterborne pathogens found increased concentrations of pathogenic indicator species in waters adjacent to and running through livestock operations due to runoff from animal housing areas and spray fields.

Research has shown that the movement of airborne pathogens may pose a risk to human health. Dr. Mark Sobsey, professor in the Department of Environmental Sciences and Engineering, UNC-Chapel Hill, questions whether the required 75-ft. buffer between spray fields and residential property is adequate, since potential human exposure from the spray may be difficult to control. Studies on spraying processes have shown that there is some drift away from the spray area. If no physical barrier exists between the spray zone and a residential area, people can be at risk of pathogen infection. He recommends a barrier, such as tall vegetation, to break the dispersal of airborne microbes in addition to a sufficient setback distance.

Wild animals may pose a problem as vectors for pathogens. Vector control programs, especially for rodents, are recommended in farming situations.

VIII. Regulatory/Legal Environment of ILOs

Objective:

Before making any policy recommendations to the County, the committee wanted to examine the regulations, laws, and enforcement mechanisms currently in place for governing intensive livestock operations in North Carolina.

Sources:

- Presentation by Mr. Milton Heath, J.D., Institute of Government, UNC-Chapel Hill
- Presentation by Mr. Scott Jones, Division of Soil and Water Conservation

Finding:

No federal laws govern livestock operations, so oversight is left to the states and local governments. North Carolina had very little legislation addressing ILOs before 1995, although farms were protected from nuisance liability by "Right to Farm Law" and were exempt from county zoning.

In 1995 the North Carolina General Assembly enacted measures requiring setbacks from property boundaries and surface waters, and certification measures for waste applicators. In 1996 a general permit system for intensive livestock operations was enacted. Funding was increased for Division of Water Quality and Division of Soil and Water Conservation enforcement, and for an agricultural cost share program.

The 1997 General Assembly's House Bill 515 includes: a two year moratorium on new and expanded swine farms; a provision to allow counties to zone swine farms; additional setback requirements; requirements for the Environmental Management Commission to develop odor standards; a violation point system; and funding for more research.

Technical inspection and enforcement responsibility of state regulations rests with the Division of Soil and Water Conservation and the Division of Water Quality. Each certified intensive livestock operation receives two inspections yearly; a compliance inspection from the DWQ and an operations inspection from the DSWC. Inspections have been completed this year for all of the certified hog farms in Craven County, with one receiving an enforcement violation which has since been corrected.

Some local governments in NC have adopted more stringent controls on the livestock industry. Counties that have opted for stricter rules have relied on their health boards to pass and enforce nuisance laws. Most have entered into litigation over these rules. Four counties, including Craven County, adopted moratoriums on new and expanded swine operations.

Civil nuisance suits by neighbors against intensive livestock operations have not shown much benefit for the plaintiffs. However, state regulatory agencies have successfully sued owners of intensive livestock operations for damages resulting from permit violations.

IX. Emerging Waste Treatment Technologies

Objective:

The committee sought to examine the new technologies that are emerging as possible solutions to the waste handling problems that plague ILOs. They visited the NCSU Animal and Poultry Waste Management Center to view some of the new technologies and listen to NCSU faculty present on their investigations of these technologies.

Sources:

- Presentation by Dr. Phil Westerman, Professor, Biological & Agricultural Engineering, NCSU

- Presentation by Dr. John Classen, Asst. Professor, Biological & Agricultural Engineering, NCSU
- Presentation by Dr. Mike Williams, Director, Animal & Poultry Waste Management Research Center, NCSU

Finding:

A number of waste treatment technologies have emerged as potential solutions to problems inherent to intensive livestock operation waste treatment. Current studies examine their effectiveness and will also examine economic feasibility. Several waste treatment technologies were reviewed by the committee.

Three pretreatment systems were reviewed by the committee; 1) solid separation; 2) aerobic treatment of waste; and, 3) thermophilic anaerobic fermentation. A disadvantage to using pretreatment systems is that each system generates an additional waste stream which requires more resources of farmers. The first system, solid-liquid separation, has the advantage of reducing odor and nutrient content in liquid manure, and yielding a nutrient-rich product. The second system, aerobic waste treatment, also reduces odor as well as decreases ammonia, but requires high energy costs. The third system reviewed, anaerobic fermentation, kills pathogens in waste and may produce biogas for electricity use. However, this system does not reduce ammonia or odor significantly.

The committee also reviewed studies conducted at North Carolina State University to test specific waste treatment products. One study of a manure additive called Digest 54 Plus found that the product does not affect odor but does reduce ammonia. Another study found that a bacterial manure additive designed to reduce sludge in lagoons is effective. A polymer used to enhance solid separation was also found to be a promising way to reduce nutrients in liquids even further. The studies reviewed by the committee represent a sample of the waste treatment products under investigation at North Carolina State University.

The reviewed technologies offer great potential, but implementation is three to five years away. Costs of new technologies may call for a cooperative approach to waste treatment among farmers.

X. Policy Options

Objective:

The committee sought ideas on policy options to consider when making their policy recommendations. These comments are summarized in this section.

The county also sought advice on zoning options from a specialist at the Institute of Government.

Sources:

- Presentation by Dr. Kelly Zering, Associate Professor/Extension Specialist, Agriculture & Resource Economics
- Presentation by Milton Heath, J.D., Institute of Government, UNC-Chapel Hill
- Presentation by Dr. Phil Westerman, Professor, Biological & Agricultural Engineering, NCSU
- Presentation by Dr. John Classen, Asst. Professor, Biological & Agricultural Engineering, NCSU
- Presentation by Dr. Mike Williams, Director, Animal & Poultry Waste Management Research Center, NCSU
- Presentation by Dr. Bob Bottcher, Professor, Biological and Agricultural Engineering, NCSU
- Presentation by Mr. David Owens, Institute of Government, UNC-Chapel Hill

Finding:

Some NCSU faculty warn against implementing legislation on developing rules and regulations that require the use of specific technologies, as these can stifle creativity and create inefficiencies in the livestock industry. Either voluntary or regulated performance standards may provide a better method for achieving the desired balance, although no standards yet exist for odor from swine operations. Voluntary performance standards are most effective when there are repercussions from peer groups for non-compliance. Multiple measurements of odor and ammonia, rather than single point measurements, are necessary for creating a standard. The results of further testing revealing the sources of atmospheric nitrogen emissions and deposition are necessary before performance standards can be made. Legislation should then focus on the appropriate area.

Three zoning options under the new powers granted to counties in House Bill 515 were identified by Mr. David W. Owens of the Institute of Government. These include: 1) subdividing the county into areas suitable and unsuitable for large swine operations; 2) designating intensive livestock operations as a "conditional use" and adopting an ordinance requiring case by case review of proposed swine farms; 3) using zoning to establish standards for swine farms. Because Craven County does not have county-wide zoning, zoning districts would have to be developed and adopted for this purpose.

Policy options available to the county are to:

- 1) do nothing, rely on State laws and regulations;

- 2) use the new zoning powers granted to counties under House Bill 515;
- 3) adopt Board of Health rules;
- 4) create a county commissioner "police power" ordinance;
- 5) push for state legislation clarifying health board powers and zoning authority; or,
- 6) implement a combination of those options.

XI. Recommendations

The recommendations outlined below are intended to address the problems discovered during the Committee's findings process. Each recommendation is listed a specific problem it is intended to address.

For purposes of this report, the terms "intensive livestock operations" and "expansion" of an existing intensive livestock operation are used as defined in the Livestock Moratorium Ordinance adopted by the Craven Board of Commissioners on February 25, 1997.

Problem: General

Recommendation #1

Charge the Craven County Soil and Water Conservation District (SWCD) with the task of performing monthly inspections of livestock operations and ongoing consultations/education with livestock operators. The intent of the monthly inspections and consultations is to improve the management of intensive livestock operations in an effort to reduce odors, and nutrient emissions.

Problem: General

Recommendation #2

Hire a technician through the Craven County Soil and Water Conservation District with funding from the North Carolina Division of Soil and Water Conservation to assist the Conservation District in performing monthly inspections.

Problem: General

Recommendation #3

To reduce problems of nutrient deposition, pathogens and odor generated from intensive livestock operations, the county should establish size limitation on all new and expanding intensive livestock operations. The following limits should be established for each single operation:

Hogs:

A limit of 8 topping floors @1,240 animals/floor, or
6 nurseries @ 2,600 animals/nursery, or
3,600 sows.

Poultry:

A limit of 4 houses

Size limits for other livestock operations including horses, cattle, sheep or goats shall be set relative to those given for swine and poultry above.

Problem: Odor Control

Recommendation #4

With the assistance of experts from universities, state agencies, and other organizations with expertise in this area, develop a set of best management practices (BMPs) to reduce odors emanating from intensive livestock operations. It will be the responsibility of the Craven SWCD to assist livestock operators to implement these BMPs where needed.

Develop a system within Craven County government for logging all complaints of odors emanating from intensive livestock operations. Require that all complaints be investigated by technicians from the Craven SWCD. Where problems are found, the SWCD technicians, with assistance from experts from universities, state agencies, and other organizations with expertise in this area, will assist the operator to carry out recommended BMPs to resolve the problem.

Problem: Groundwater Contamination

Recommendation #5

The county shall pursue grant funding from the North Carolina Clean Water Trust Fund, or other relevant grant source, to carry out a scientific study of groundwater characteristics and incidents of nitrate infiltration into groundwater at existing intensive livestock operations in Craven County. The purpose of such a study will be to determine the need and feasibility of mandatory groundwater monitoring of intensive livestock operations in Craven County, and to assist in the development of distance requirements (setbacks) between new and expanding livestock operations and water supply wells.

Problem: Groundwater Contamination

Recommendation #6

Provide necessary funding required to sample and analyze operating wells located on existing intensive livestock operations for nutrients, pathogens, and/or additional parameters. Wells will be sampled only with permission of the

owners or operators of the livestock operation. This sampling scheme would provide a mechanism to easily and economically spot check existing sites for areas which may be influenced by groundwater contamination. Positive analysis of groundwater contaminants would indicate the need to perform more intensive groundwater monitoring at that site.

Problem: Nutrient deposition

Recommendation #7

For new and expanding intensive livestock operations in Craven County, establish a minimum of a 25-foot forested buffer within the 75-foot buffer zoned required under H.B. 515 between the outer perimeter of a land area onto which waste is applied from a lagoon that is a component of an intensive livestock operation and any perennial stream or river other than an irrigation ditch or a canal.

Problem: Nutrient deposition

Recommendation #8

For new and expanding intensive livestock operations in Craven County, require water control structures in main drainage channels. All ditches will have a minimum of 5 to 10 feet of vegetation for ditch bank stabilization.

Problem: Pathogen Control

Recommendation #9

For new and expanding intensive livestock operations in Craven County, establish a minimum setback distance of 100 feet with a 75-foot forested buffer, or 300 feet without a forested buffer, between the outer perimeter of a land area onto which waste is applied from a lagoon that is a component of an intensive livestock operation and any boundary of property on which an occupied residence is located. This setback requirement may be relaxed if written permission is given by the owner of the property and recorded with the Register of Deeds.

Problem: Pathogen Control

Recommendation #10

For new and expanding intensive livestock operations in Craven County, establish a minimum setback distance of 1,000 feet between a swine house, lagoon, or outer perimeter of a land area onto which waste is applied from a lagoon that is a component of an intensive livestock operation and a well supplying water to a public water system as defined in G.S. 130A-313.

Dissenting Report from the Neuse River Foundation on Recommendation #10

For new and expanding intensive livestock operations in Craven County, establish a minimum setback distance of 1,500 feet between a swine house, lagoon, or outer perimeter of a land area onto which waste is applied from a lagoon that is a component of an intensive livestock operation and any well supplying water to the public.

Problem: Nutrient Deposition

Recommendation #11

Charge the Craven SWCD to encourage adoption of no-till practices on crops onto which waste is applied from a lagoon that is a component of an intensive livestock operation.

Problem: Nutrient Deposition

Recommendation #12

The County should promote and support the study of, and eventual adoption of diet manipulation practices to reduce the production of nitrogen and phosphorous in animal waste.

Problem: Atmospheric Deposition and Odor Control

Recommendation #13

Require the adoption of aerobic waste management systems when economically and technologically available for new intensive livestock operations and replacement lagoons.

Problem: Dead Animal Disposal

Recommendation #14

Improper disposal of dead animals may pose risks to public health and the environment. All dead animals generated in the production of livestock in an intensive livestock operation should be disposed of by rendering of carcasses into by-products.

Problem: Lagoon Closure

Recommendation #15

Lagoon closure is a serious problem. The costs to operators to remove and dispose of sludge that has accumulated in livestock lagoons over the life of the lagoon, and the costs to government to do the same in cases where operators are financially incapable of doing so is expected to be extreme. Moreover the problems associated with finding suitable disposal sites and reuse applications

will be challenging. This issue requires further study. In the meantime, the Craven County Board of Commissioners should open discussions with state legislators to address this issue in the North Carolina General Assembly.



Page 2 of 2 Monday, November 10, 1997

To: Guy Stefanick

From: William H. Ritchie, Jr. Ritchie, Inc. Fax: 919 633-9208 Voice: 919 633-2336

Monday, November 10, 1997

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■ Environment

ambles

Fish cleanup idea falters



The Associated Press

President Clinton on his 'Meet the Press' rday in Washington.

By T. Scott Batchelor
Sun Journal Staff

The Neuse River Basin Regional Council had what looked like a good idea on paper, but state officials have given it a cool reception.

The council passed a resolution for delivery to Gov. Jim Hunt and Wayne McDevitt, the state's top environmental official, asking that dead fish be cleaned up from the river after fish kills occur.

Massive kills contribute to the nutrient overloading of the river — a factor some scientists have linked to outbreaks of the toxic microorganism *pleistocystis piscicida*, said Bill Ritchie, River Bend mayor and

chairman of the Neuse council.

"It's just like dumping fertilizer and leaving it in there," Ritchie said.

Even though menhaden — small, oily fish not generally used for human consumption — comprise the bulk of fish kills, in large numbers they become a problem despite their diminutive size, he said.

The Neuse council's resolution requests that the state "address its responsibility for the cleanup of its navigable waterways by contracting with fishermen to pick up these fish kills for disposal in a safe and environmentally sound manner."

The state Department of Transportation is in charge of the collection and disposal of animals

killed on state roads, but "no counterpart exists for the state's public waterways," the resolution says.

State Department of Environment and Natural Resources spokesman Don Reuter applauded the council's efforts in solving the problem of water pollution, but said the "biomass" of a fish kill is "just not any amount that will severely degrade water quality."

Additionally, he said, the undertaking proposed by the Neuse council would demand "intensive resources," meaning increases in staffing and money.

DENR scientist Janmie Overton said: "As far as the fish, the amount of nutrients associated with the

dying fish ... would be minuscule compared to the other nutrient sources entering the water," such as agricultural and urban runoff.

"There's enough natural processes out there to handle (the dead fish)," he concluded.

However, at least one state biologist agrees that the council might have a point — but just barely.

"The process of decay does use oxygen, and I guess if you had a whole load of fish there in a small spot — two or three million menhaden — it's possible they can have a localized effect," said Jeff Gearhart, a marine biologist with the

See FISH/A2

A2 — Sun Journal, New Bern, N.C. — Monday, November 10, 1997

CONTINUED FROM A1

Fish

Division of Marine Fisheries.

Ritchie dismissed the remarks made by Reuter and Overton.

"That's hogwash," he said of the state officials' take on the subject.

"It's just a case of 'We're going to do what we've always done,'" he complained.

But the mayor's sails weren't completely deflated.

"That's OK. That's fine," Ritchie said. "The plan is out there."

After all, he said, "I didn't expect anybody to jump up and down."

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