



## **PURPOSE**

In Guilford County, Stormwater Management/Watershed Protection regulations have been adopted to protect designated drinking water supply reservoirs and surface waters from activities that could degrade water quality.

## **APPLICABILITY**

Guilford County Stormwater Management/Watershed Protection regulations apply to any development or re-development that results in an increase in built-upon area (buildings, pavement, gravel, etc.) in the unincorporated areas of the County. The County's review authority also includes the incorporated areas of Stokesdale, Whitsett, Sedalia, Pleasant Garden, and Oak Ridge for watershed protection.

Overlay districts have been established in under Article VII of the Guilford County Development Ordinance. These districts are divided into two (2) overlay zones: the National Pollutant Discharge Elimination System (NPDES) Phase II and the Water Supply Watershed. The Water Supply Watershed area is further divided into the Watershed Critical Area (WCA) and the General Watershed Area (GWA). The attached map (pg. 9) shows the approximate boundaries of the County's nine (9) designated Water Supply Watersheds and their Watershed Critical Areas. More detailed maps are available at the Planning and Development Department and should be reviewed prior to starting any development plans.

## **NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PHASE II**

**District Boundaries:** The NPDES district covers all the territory encompassed in Guilford County, North Carolina except for those areas within incorporated municipalities and their extraterritorial jurisdiction, and property owned by the Piedmont Triad International Airport.

### **Maximum Development Density and Minimum Lot Size:**

- 1) All developments located in the NPDES non-water supply district shall be limited to the maximum density and minimum lot size based upon the development's current zoning.
- 2) All developments located in the NPDES water supply district shall follow the density and development requirements of the GWA and WCA performance tables.

## **GENERAL WATERSHED AREA**

The General Watershed Area (GWA) consists of all areas draining into an existing or proposed drinking water supply reservoir, excluding the Watershed Critical Area. Sections 7-2.2 and 7-2.3 of the Development Ordinance contain the specific regulations pertaining to this overlay district.

Development within the GWA and the required Watershed Development Plan shall meet the performance standards of Table 7-2-2 (See pg. 6).

Review of the GWA development requirements and careful site planning can usually lessen the impact that the watershed protection ordinance will have on the improvement of a given piece of property.

Built-upon area is limited depending upon the classification of the watershed where the property is located. Built-upon area shall not exceed fifty percent (50%) in WS-III watersheds and the Lower Randleman Lake and shall not exceed seventy percent (70%) in WS-IV watersheds.

## WATERSHED CRITICAL AREA

The Watershed Critical Area (WCA) consists of those areas immediately surrounding and draining into the existing or proposed water supply reservoirs. The WCA consists of four (4) divisions or tiers:

- Tier 1 - Reservoir pool to 200 feet from the normal pool.
- Tier 2 - From Tier 1 to 750 feet from the normal pool.
- Tier 3 - From Tier 2 to 3,000 feet from the normal pool.
- Tier 4 - From Tier 3 to the WCA boundary.

The WCA and Tier boundaries are shown on the Guilford County Designated Water Supply Watershed Maps that are available in the Planning and Development Department.

Development restrictions vary depending upon the tier in which the property is located. The following is a brief summary of some of the WCA requirements found in Section 7-2.3:

- A. Environmentally fragile areas shall be protected:
  - Wetlands as designated by the Corps of Engineers shall remain undisturbed.
  - Slopes that are fifteen (15%) percent or steeper, adjacent and parallel to drainageways shall remain undisturbed.
- B. Drainage shall be by means of undisturbed open channels.
- C. Density and built-upon area limits: See attached Table 7-3-1 (pg. 7).
- D. Land Disturbance - Land Development within the WCA shall be done with minimal land clearing and disturbance. Section 7-2.3(D) of the Guilford County Development Ordinance outlines the land disturbance regulations.
- E. Prohibited uses: See attached list (pgs. 4-5).
- F. Development using the low-density option may use a Water Quality Conservation Easement strip or any of the runoff control methods meeting Guilford County guidelines. Development using the high-density option must control runoff by use of a wet detention pond, sand filters, wetland or bio-filtration. The definition of high and low-density options varies depending upon the classification of the watershed and whether the property is in the GWA or WCA. See Table 2-1-1 (pg. 5).

Again, review and understanding the WCA development requirements and careful site planning can avoid costly errors and redesign of projects.

## GENERAL REQUIREMENTS

**PLAN REQUIRED:** A Stormwater Management / Watershed Development Plan must be submitted for approval on all new site development or re-development. Generally the plan shows how a site or subdivision will conceptually meet the development requirements.

The plan requirements are listed in Appendix 2 of the Guilford County Development Ordinance. The Plan must show all of the information required for a preliminary Subdivision Plan or a Site Plan respectively, plus the additional information listed for a Watershed Development Plan. See the attached sample Watershed Development Plan (pg. 10).

When a permanent runoff control structure is required, the Stormwater Management / Watershed Development Plan becomes the cover sheet or the plan view sheet for the runoff control structure construction plans.

ENGINEER REQUIRED: When a permanent runoff control structure is required for a development to meet watershed protection requirements, a North Carolina registered professional engineer is required to certify that the structure has been completed in conformance with approved plans and specifications.

STREAM BUFFER REQUIRED: A stream buffer with a minimum width as specified in Table 7-1-3 (pg. 5) measured landward from the normal pool elevation of impoundments and from the bank of each side of streams or rivers, shall be maintained along intermittent and perennial waters. See the attached Table 2-1-1 (pg. 5) for a definition of low and high-density options.

STREAM CHANNELIZATION: Perennial streams shall not be channelized without prior approval by the Planning Board.

### **RUNOFF CONTROL METHODS**

The use of natural infiltration areas and/or permanent water quality ponds play a large part in controlling the pollutants found in storm water runoff. Guilford County allows the use of several different methods for the control of storm water runoff for watershed protection. The different methods and their design requirements are published in the Stormwater Management / Watershed Protection Manual, available in the Planning and Development Department. The following are the preferred and accepted forms of runoff control:

A. Natural Infiltration -- The setting aside of land area capable of infiltrating the first one-half (½) inch of storm water runoff. Of all the water quality practices in present use, natural infiltration is the preferred method, and should be the first alternative considered. These areas are protected by platting and recording Water Quality Conservation Easements (WQCE).

B. Permanent Wet Detention Ponds -- These are probably the best structural method available for controlling storm water runoff and treating the pollutants contained therein. The ponds contain a permanent pool and a temporary water quality pool, which is used to detain the required runoff and then slowly release it over a period of from two (2) to five (5) days. This type of treatment is estimated to be seventy (70%) to ninety (90%) percent effective in removing pollutants, based upon the total pollutant mass. Permanent wet detention ponds can be used whenever runoff control is required.

C. Other Methods -- The following may possibly be used to control storm water runoff for developments using the high-density option depending upon existing site conditions:

- Sand Filters
- Bio-filtration Areas
- Existing ponds and lakes (upgraded to current standards).
- Constructed Wetlands.
- Regional Lakes (where available).
- Other technologies approved by the TRC and Environmental Review Board (ERB).

## APPEALS AND MODIFICATIONS

In some cases, strict compliance with the watershed protection provisions may cause an unusual and unnecessary hardship and an appeal of a decision or a modification of the Ordinance may be granted.

Appeals of decisions of the Enforcement Officer on a watershed development plan and requests for minor modifications to requirements are made through the Watershed Protection Engineer with the Environmental Review Board having the final authority. Appeals of the Environmental Review Board's decision can be made to the Governing Body. Minor modifications should demonstrate equal or better performance to the required regulation.

Requests for major modifications to regulations are made to the Governing Board through the TRC and Environmental Review Board with the NC Environmental Management Commission being the final authority. All requests for appeals and/or modifications shall be made in writing on forms available in the Planning and Development Department.

## FOR ASSISTANCE

The Watershed Protection Engineer for Guilford County is available in the Planning and Development Department to answer specific questions regarding the stormwater management / watershed protection ordinances and development within the various districts. Copies of the Guilford County Development Ordinance, the Stormwater Management / Watershed Protection Manual, Guilford County Designated Water Supply Watershed Maps, and application forms for appeals or modifications are available in the Planning and Development Department.

This Bulletin is intended for public information purposes only. It is not to be construed or used as an official Development Ordinance interpretation in any legal proceeding.

## WCA Prohibited Uses

- 1) Agricultural Uses
  - Animal Feeder/Breeder
- 2) Agricultural Services
  - Chemical Treatment and Fertilizer Application for Crops, Weed Control for Crop Operations, including Aerial Crop Dusting
- 3) Mining Uses
  - Mining and Quarrying
- 4) Business, Professional and Personal Services Automobile Rental or leasing
  - Automobile Repair Services, Major
  - Automobile Repair Services, Minor
  - Automobile Towing and Storage Services
  - Boat Repairs
  - Car Wash
  - Commercial Chemical and Biological Research
    - Furniture Stripping or Refinishing (including secondary or accessory operations)
  - Equipment Repair, Heavy
  - Agricultural Equipment Repair
  - Boiler Cleaning and Repair
  - Cesspool Cleaning
  - Engine Repair, except automotive
  - Farm Machinery Repair
  - Industrial Truck Repair
  - Machinery Cleaning
  - Motorcycle Repair Service
  - Rebabbiting
  - Repair of Service Station Equipment
  - Sewer Cleaning and Rodding
  - Tanking and Boiler Cleaning Service
  - Tank Truck Cleaning Service
  - Tractor Repair
  - Welding Repair Shops
  - Heavy Construction Equipment Rental and Leasing
    - Lawn Care, Lawn Fertilizing Services, Lawn Spraying
    - Services, Ornamental Shrub and Tree Services with Spraying
  - Laundry or Dry-cleaning Plant
  - Laundromats, Coin-operated
  - Pest or Termite Control Services
  - Septic Tank Services
  - Animal Slaughter or Rendering
  - Arms and Weapons
  - Asbestos, Abrasive, and Related Products Asphalt Plant
  - Batteries
  - Chemicals, Paints & Allied Products Concrete, Cut Stone & Clay Products Cement, Hydraulic
  - Contractors, Heavy Construction Contractors, Special Trade
  - Dairy Products
  - Fats and Oils, Animal
  - Fats and Oils, Plant
  - Fish, Canned, Cured or Frozen
  - Leather and Leather Products (tanning)
  - Magnetic and Optical Recording Media
- Truck Driving Schools
- Truck & Utility Trailer Rental & Leasing, Light
- Truck Tractor & Semi Rental & Leasing, Heavy Truck Washing
- 5) Retail Trade
  - Fuel Oil Sales
  - Convenience Stores with fuel pumps
  - Motor Vehicle Sales (new and used) Motorcycle Sales
  - Recreation Vehicle Sales
  - Service Stations, gasoline
  - Truck Stops
- 6) Wholesale Trade
  - Agricultural Chemicals, Pesticides, Fertilizers Chemical and Allied Products
  - Motor Vehicles
  - Nursery Stock, Plants Potted
  - Paints & Varnishes
  - Petroleum & Petroleum Products
  - Scrap and Waste Materials
- 7) Transportation, Warehousing, and Utilities
  - Air Transportation Facilities
  - Bus Terminal and Service Facilities
  - Hazardous & Radioactive Waste (transportation, storage, disposal)
  - Inert Debris Landfills, Major Landfills of any character, minor or major in Lower Randleman Lake Watershed -WCA
  - Petroleum Contaminated Soil Remediation Disposal Sites
  - Pipelines, except Natural Gas
  - Railroad Terminal or Yard
  - Recycling Processing Centers
  - Refuse & Raw Material Hauling
  - Sanitary Sewer & Water Treatment Plant Sludge Application Sites
  - Sewage Treatment Plants
  - Solid Waste Disposal (non-hazardous)
  - Trucking or Freight Terminals
- 8) Manufacturing and Industrial Uses
  - Meat and Poultry, Packing and Processing (no rendering)
  - Metal Coating and Engraving
  - Paper Products (no coating or laminating) Paper Products (coating or laminating) Petroleum and Related Products
  - Primary Metal Products and Foundries
  - Pulp and Paper Mills
  - Rubber and Plastics, Misc.
  - Rubber and Plastics, Raw
  - Salvage Yards, Auto Parts
  - Salvage Yard, Scrap Processing
  - Solvent Recovery
  - Surface Active Agents
  - Textile Products, (no Dying and Fishing) Textile Products (with Dying and Finishing)

**Table 2-1-1  
DENSITY AND INTENSITY LIMITS  
FOR LOW DENSITY AND HIGH DENSITY OPTIONS**

WATERSHED CLASSIFICATION	OVERLAY ZONE	LOW DENSITY OPTION		HIGH DENSITY OPTION
		DU/AC	% BUILT-UPON AREA	% BUILT-UPON AREA
WS-IV	WCA	2	24	24-50
WS-IV	GWA	2 <sup>a</sup>	24 <sup>a</sup>	24-70
WS-III	WCA	1	12	12-30
WS-III	GWA	2	24	24-50 <sup>b</sup>
Lower Randleman Lake	WCA	0.5	6	30
Lower Randleman Lake	GWA	1	12	50

NOTES:

<sup>a</sup> – Three (3) Du/ac or thirty-six (36%) percent built-upon area is allowed for projects without curb and gutter street and driveway system.

<sup>b</sup> – Refer to Section 7-2.3(B)1) for additional allocation options.

<sup>c</sup> – This table is shown for reference to the State regulations and for use in determining the required width of stream buffers. Allowable density and intensity limits shall be the more restrictive of those shown on this table and those found in Article VII.

**Table 7-1-3**

**Stream Buffer Width Requirements**

WATERSHED	LOW DENSITY DEVELOPMENT		HIGH DENSITY DEVELOPMENT	
	Perennial Streams, Lakes & Ponds	Intermittent Streams	Perennial Streams, Lakes & Ponds	Intermittent Streams
<b><u>Water Supply Districts</u></b>				
<b><u>WS – III</u></b> <sup>a</sup>				
Reidsville (Troublesome Creek) <sup>a</sup>				
Greensboro (Reedy Fork) <sup>a</sup>	30 ft.	30 ft.	100 ft.	30 ft.
Polecat Creek <sup>a</sup>				
Sandy Creek <sup>a</sup>				

<i>WS – IV<sup>a</sup></i> Lake Mackintosh (Big Alamance Creek) <sup>a</sup> Dan River <sup>a</sup>				
Jamestown (Deep River) <sup>b</sup> High Point (East and West Fork, Deep River) <sup>b</sup> Lower Randleman Lake (Deep River) <sup>b</sup>	50 ft.	50 ft.	100 ft	50 ft.
NPDES, non-water supply districts <sup>a</sup>	30 ft.	30 ft.	30 ft	30 ft.

<sup>a</sup> The stream buffer for the NPDES (non water supply district) and water supply districts other than Jamestown, High Point, and Lower Randleman Lake shall have the first twenty feet (20') from the top of bank, landward, designated as a Water Quality Conservation Easement (WQCE) and the remainder of the stream buffer shall be a vegetated area. Refer to Article 2, for Water Quality Conservation Easement requirements.

<sup>b</sup> Under the Low Density Option the stream buffer shall be comprised of Zone 1, which shall be an undisturbed area of vegetation extending a distance of thirty (30) feet landward from the water line or top of stream bank along both sides of the stream, and Zone 2, which begins at the outer edge of Zone 1 and extends a minimum of twenty (20) feet and shall be a vegetated area. Under the High Density Option, the first fifty (50) feet of stream buffers shall conform to the requirements of Zones 1 and 2, the remainder shall be vegetated. Refer to the “Water Quality Protection Manual” as amended, for additional stream buffer requirements.

NOTE: All stream buffers shall be identified on a recorded plat as “Drainage and Stream Buffer Easement” or dedicated as public open space.

**Table 7-2-1  
NPDES Performance Standards**

DISTRICT	LOW DENSITY OPTION <sup>a</sup>	HIGH DENSITY OPTION <sup>b</sup>
NPDES, non-water supply areas	2 DU/1 AC or less ; 0 – 24% BUA	greater than 2 DU/1 AC; greater than 24% BUA

<sup>a</sup> Development under the Low Density Option shall require completion of the low impact design checklist.

Development under the High Density Option shall require Engineering Statement by a registered professional engineer, with seal (Table 7-1-1) certifying the control of the run-off from a one (1) inch rain and control of the difference in volume from pre and post development for a 1 year – 24 hour storm.

**Table 7-2-2  
GWA Performance Standards**

<b>WATERSHED</b>	<b>LOW DENSITY OPTION <sup>a</sup></b>	<b>HIGH DENSITY OPTION <sup>b</sup></b>
<b>WS – III</b> Reidsville (Troublesome Creek) Greensboro (Reedy Fork) Polecat Creek Sandy Creek	2 DU/1 AC or less ; 0 – 24% BUA	greater than 2 DU/1 AC; 24.01% - 50% BUA <sup>c</sup>
<b>WS – IV</b> High Point (East and West Fork Deep River) Lake Mackintosh (Big Alamance Creek)  Dan River Jamestown (Deep River)	2 DU/1 AC or less ; 0 – 24% BUA	greater than 2 DU/1 AC; 24.01% - 70% BUA
Lower Randleman Lake (Deep River)	1 DU/ 1 AC or less ; 0 – 12% BUA	greater than 1 DU/1 AC; 12.01% - 50% BUA

<sup>a</sup> Development under the Low Density Option shall require completion of the Low Impact Design Checklist and acknowledgement detailed in the Guilford County Water Quality Protection Manual.

<sup>b</sup> Development under the High Density Option shall require Engineering Statement by a registered professional engineer, with seal (Table 7-1-1) certifying the control of the run-off from a one (1) inch rain and control of the difference in volumes from pre and post development for a 1year – 24 hour storm.

<sup>c</sup> Development cannot exceed fifty (50%) percent built-upon unless it is non-residential development and has received an additional allocation option in compliance with Section 7-2.2 (F)2).

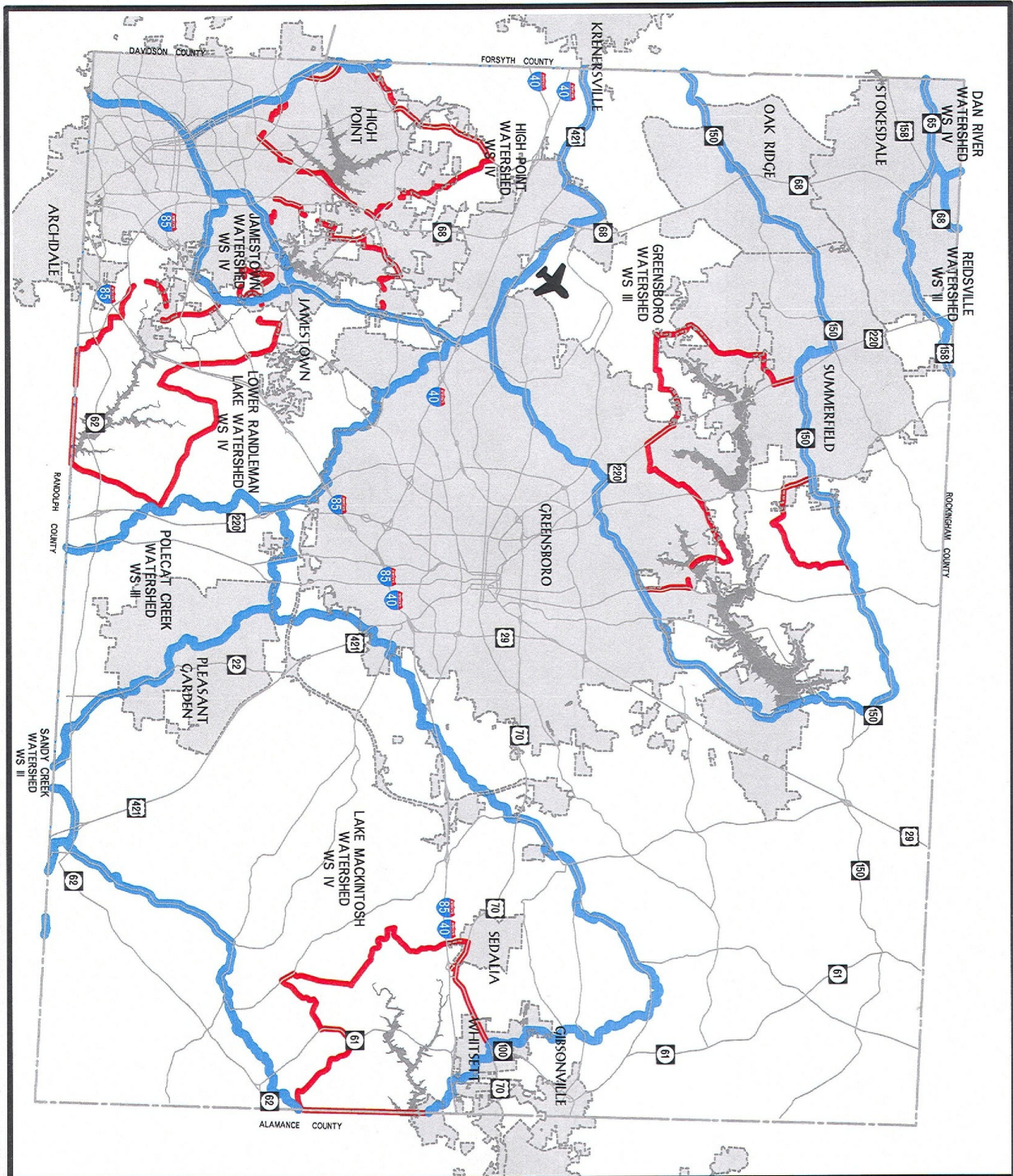
**NOTES:**

1. DU = Dwelling Unit(s); AC=Acre; Percentage (%) refers to built-upon area of the zone lot, parcel, or tract.
2. Single family detached residential developments will be evaluated on the basis of dwelling units per acre
3. All other residential and all non-residential developments will be evaluated on the basis of built-upon area percentage

**Table 7-3-1  
WCA Density and Built-Upon Area Coverage Limits  
(expressed as dwelling units/gross acre or % maximum)**

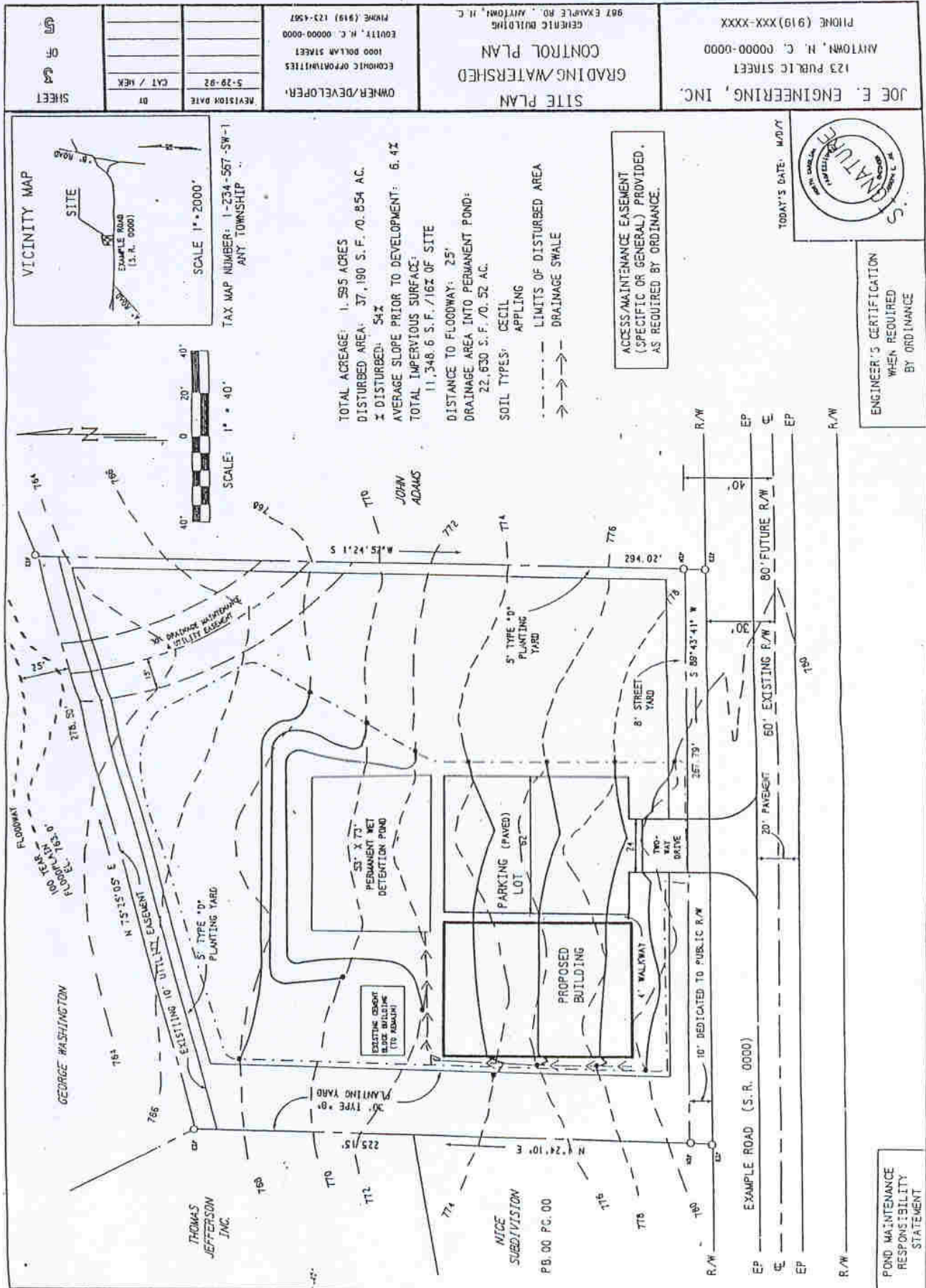
**LOW DENSITY OPTION**

<b>WATERSHED</b>	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>
Greensboro (Reedy Fork)	N/A	1 DU/5 AC or less; 0 - 2.5%	1 DU/3 AC or less; 0 - 4.0%	1 DU/1 AC or less; 0 - 12.0%
High Point (East & West Fork Deep River)	N/A	1 DU/5 AC or less; 0 - 2.5%	1 DU/3 AC or less; 0 - 4.0%	1 DU/1 AC or less; 0 - 12.0%
Lake Mackintosh (Big Alamance Creek)	N/A	1 DU/5 AC or less; 0 - 2.5%	1 DU/3 AC or less; 0 - 4.0%	1 DU/1 AC or less; 0 - 12.0%
Jamestown (Deep River)	N/A	1 DU/5 AC or less; 0 - 2.5%	1 DU/3 AC or less; 0 - 4.0%	1 DU/1 AC or less; 0 - 12.0%
Lower Randleman Lake (Deep River)	N/A	1 DU/5 AC or less; 0 - 2.5%	1 DU/3 AC or less; 0 - 4.0%	1 DU/1 AC or less; 0 - 12.0%
<b>WATERSHED</b>	<b>High Density Option (requires public sewer)</b>			
	<b>Tier 1</b>	<b>Tier 2</b>	<b>Tier 3</b>	<b>Tier 4</b>
Greensboro (Reedy Fork)	N/A	1 DU/5 AC or less; 0 - 2.5%	2 DU/1 AC or less; 4.01 - 24%	2 DU/1 AC or less; 12.01 - 30%
High Point (East & West Fork Deep River)	N/A	1 DU/5 AC or less; 0 - 2.5%	2 DU/1 AC or less; 4.01 - 34%	2 DU/1 AC or less; 12.01 - 40%
Lake Mackintosh (Big Alamance Creek)	N/A	1 DU/5 AC or less; 0 - 2.5%	2 DU/1 AC or less; 4.01 - 34%	2 DU/1 AC or less; 12.01 - 40%
Jamestown (Deep River)	N/A	1 DU/5 AC or less; 0 - 2.5%	2 DU/1 AC or less; 4.01 - 34%	2 DU/1 AC or less; 12.01 - 40%
Lower Randleman Lake (Deep River)	N/A	1 DU/5 AC or less; 0 - 2.5%	2 DU/1 AC or less; 4.01 - 30%	2 DU/1 AC or less; 12.01 - 40%
<b>NOTES:</b>				
1) DU= Dwelling Unit(s); AC = Acre; Percentage (%) refers to built-upon area of the zone lot, parcel, or tract.				
2) There is no WCA area in Guilford County's jurisdiction for the following watersheds: Reidsville, Polecat Creek, Sandy Creek, and Dan River. Therefore they are not listed in the table above.				
3) Single family detached residential developments will be evaluated on the basis of dwelling units per acre				
4) All other residential and all non-residential developments will be evaluated on the basis of built-upon area percentage				



# Designated Water Supply Watershed Map

# SAMPLE WATERSHED DEVELOPMENT PLAN



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