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Charlotte-Mecklenburg Stream and Lake Buffer Requirements

Stream and lake buffers are naturally vegetated areas adjacent to a water body that serve the following functions:

- protect water quality by filtering pollutants contained in the storm water runoff;
- allow water to soak into the ground and recharge groundwater supplies;
- provide storage for floodwaters;
- allow channels to meander naturally;
- provide suitable habitats for wildlife;
- provide shade to reduce water temperatures; and
- provide soil stability through root mass.

Local and State regulations require that storm drain pipes end at the edge of the buffer and that energy dissipaters be installed at the outlets for these pipes in order to diffuse storm water flow thus allowing pollutants to be filtered out by the buffer (see Figure 1).

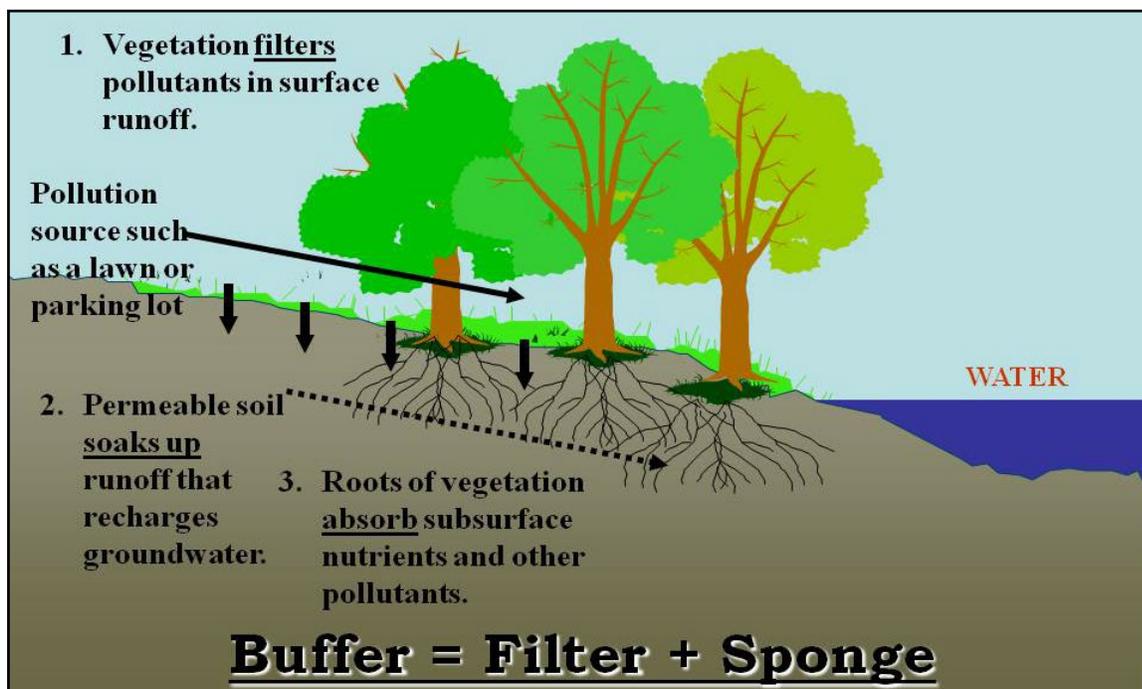


Figure 1: How a Water Quality Buffer Works to Filter Pollutants

Four (4) different types of stream and lake buffers exist in Charlotte-Mecklenburg as required by various ordinances adopted by the City of Charlotte, Mecklenburg County and the six (6) Towns between 1993 and 2008. The ordinance requirements differ significantly based on the buffer type and the jurisdiction where the buffer is located. One thing that all stream buffers in Charlotte-Mecklenburg have in common is that their widths are measured horizontally on a line perpendicular to the stream, landward from the top of the bank on each side of the stream. The widths of the lake buffers contained in the water supply watershed rules are measured in the same manner but the measurement originates from the full pond elevation of each reservoir and not the top of the bank. Another similarity of all Charlotte-Mecklenburg stream and lake buffers is that new structures are not allowed in the buffer, including outbuildings, septic systems, home

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expansions, swimming pools, etc., except gazebos and storage buildings are allowed in the upland zone of S.W.I.M. buffers provided they are for non-commercial use and do not exceed 150 square feet. In addition, existing trees are to remain in place for most buffer types with a few exceptions in S.W.I.M. and post-construction buffers.

Each new buffer ordinance that was adopted added to the previous buffer requirements, which were allowed to remain in the local ordinances. This was done to ensure that there are no gaps in the buffer coverage due to grandfathering. For example, the S.W.I.M. buffers were left intact when the post-construction buffers were adopted so that developments grandfathered under post-construction would in most cases still be required to comply with the S.W.I.M. buffers. In all situations where two (2) buffer types apply to the same stream segment, the buffer that is more protective of water quality will always apply. Provided below is a summary of the four (4) different buffer types in Charlotte-Mecklenburg.

1. Water Supply Watershed Buffers – The water supply watershed buffer requirements went into effect in the City of Charlotte, Mecklenburg County and the Towns of Davidson, Cornelius and Huntersville between 1993 and 2001 through the adoption of water supply watershed rules as part of the respective jurisdictions’ zoning ordinances. These buffer requirements apply to the shoreline of the Catawba River lakes and the perennial streams that drain to them, as well as the ponds they intersect, as delineated by a solid blue line on the 1:24,000 scale (7.5 minute) quadrangle topographic maps prepared by the United States Geologic Survey (USGS). The purpose of these buffers is to protect the public water supplies in Lake Norman, Mountain Island Lake, and Lake Wylie and to comply with the N.C. Water Supply Watershed Classification and Protection Act (NCGS 143-214.5). These buffers do not have zones and are to be left predominantly undisturbed. They vary in width from 30, 40, 50 and 100 feet or the entire 100-year floodplain depending on the density of the development and its location in the watershed. Table 1 below provides an overview of the water supply watershed buffer requirements.

Table 1: Water Supply Watershed Buffer Requirements

Zone	Zoning Jurisdiction	Built Upon Area	Lake/Stream Buffer Width
Lake Norman Watershed			
Critical Area (CA)	Davidson	≤ 24% - Low Density	40 Feet
		≤ 50% - High Density	100 Feet
Critical Area (CA)	Cornelius	≤ 24% - Low Density	50 Feet
		≤ 50% - High Density	100 Feet
Critical Area (CA)	Huntersville	≤ 24% - Low Density	50 Feet
		≤ 50% - High Density	100 Feet
Mountain Island Lake Watershed			
Protected Area (PA)	Cornelius	≤ 24% - Low Density	50 Feet
		≤ 70% - High Density	100 Feet
Protected Area 1 (PA1)	Huntersville	≤ 24% - Low Density	50 Feet
		≤ 70% - High Density	100 Feet
Protected Area 1 (PA1)	Charlotte/Mecklenburg	≤ 24% - Low Density	50 Feet
		≤ 50% - High Density	100 Feet
Protected Area 2 (PA2)	Huntersville	≤ 24% - Low Density	30 Feet
		≤ 70% - High Density	100 Feet
Critical Area 1	Huntersville	≤ 6% - Low Density	100 Feet or 100 yr. Floodplain

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Zone	Zoning Jurisdiction	Built Upon Area	Lake/Stream Buffer Width
(CA1)			(whichever is greater)
Critical Area 1 (CA1)	Charlotte/Mecklenburg	≤ 6% - Low Density	100 Feet or 100 yr. Floodplain (whichever is greater)
Critical Area 2 (CA2)	Huntersville	≤ 12% - Low Density	100 Feet or 100 yr. Floodplain (whichever is greater)
Critical Area 3 (CA3)	Huntersville	≤ 12% - Low Density	100 Feet or 100 yr. Floodplain (whichever is greater)
Critical Area 4 (CA4)	Huntersville	≤ 24% - Low Density	100 Feet
Critical Area 4 (CA4)	Charlotte/Mecklenburg	≤ 24% - Low Density	100 Feet or 100 yr. Floodplain (whichever is greater)
Upper Lake Wylie Watershed			
Protected Area (PA)	Charlotte/Mecklenburg	≤ 24% - Low Density ≤ 70% - High Density	40 Feet 100 Feet
Critical Area (CA)	Charlotte/Mecklenburg	≤ 24% - Low Density ≤ 50% - High Density	100 Feet 100 Feet
Lower Lake Wylie Watershed			
Protected Area (PA)	Charlotte/Mecklenburg	≤ 24% - Low Density ≤ 70% - High Density	40 Feet 100 Feet
Critical Area (CA)	Charlotte/Mecklenburg	≤ 20% - Low Density ≤ 50% - High Density	50 Feet 100 Feet ⁽¹⁾

⁽¹⁾ Buffer width is increased 50% for new high density development along the lake shore where lots have an average slope greater than or equal to 50%.

2. Surface Water Improvement & Management (S.W.I.M.) Buffers – The S.W.I.M. buffer requirements went into effect in all the jurisdictions in Charlotte-Mecklenburg between 1999 and 2000 through the adoption of the S.W.I.M. buffer rules as part of the respective jurisdictions’ zoning ordinances. These buffer requirements apply to the streams and the ponds that they intersect in Charlotte-Mecklenburg and not to the shoreline of the Catawba River lakes. S.W.I.M. buffers apply to intermittent and perennial streams that drain ≥100 acres in the City of Charlotte, Mecklenburg County and the Town of Pineville. S.W.I.M. buffers apply to streams draining ≥50 acres in the Towns of Cornelius, Davidson, Huntersville, Matthews, and Mint Hill. The purpose of these buffers is to filter pollutants, store floodwaters, provide habitat, and contribute to the “green infrastructure” within Charlotte-Mecklenburg. S.W.I.M. buffers in all jurisdictions except the Town of Cornelius are divided into three (3) zones with varying restrictions, including the stream side zone (located immediately adjacent to the water body with no disturbance allowed), managed use zone (located adjacent to the stream side zone with minimal disturbance allowed), and upland zone (located adjacent to the managed use zone with clearing and lawns allowed). S.W.I.M. buffers in the Town of Cornelius do not have zones and are to be left undisturbed. All S.W.I.M. buffers vary in width depending on the size of the upstream drainage area. The width of the zones within these buffers also varies. Table 2 below provides an overview of the S.W.I.M. buffer widths. Table 3 summarizes the different functions, vegetative targets and uses allowed in the S.W.I.M. buffer zones.

Table 2: S.W.I.M. Buffer Widths

Jurisdiction	Total Buffer Widths
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	≥ 640 acres	≥ 300 acres	≥ 100 acres	≥ 50 acres
Mecklenburg County(1) unincorporated	total = 100 ft + 50% of area of floodfringe beyond 100 ft stream side=30ft. managed use=45ft. upland=25ft +50% of area of floodfringe beyond 100 ft	total = 50 ft stream side=20ft managed use =20ft. upland=10ft	total = 35 ft stream side=20ft managed use =none upland=15ft	No Buffer Requirements
Charlotte(1)	same as Mecklenburg County	same as Mecklenburg County	same as Mecklenburg County	same as Mecklenburg County
Pineville(1)	same as Mecklenburg County	same as Mecklenburg County	same as Mecklenburg County	same as Mecklenburg County
Cornelius(2)	total = entire floodplain but no less than 100 feet	total = 50 feet no zones	total = 35 ft no zones	
Huntersville(1)	total = floodway + 100% of floodfringe but no less than 100 ft stream side=30ft managed use=45 ft upland=remainder	total = 50 feet stream side=20ft managed use =20ft. upland=10ft	total = 35 ft stream side=20ft managed=none upland=15ft	
Matthews(1)	same as Huntersville	same as Huntersville	same as Huntersville	
Mint Hill(1)	same as Huntersville	same as Huntersville	same as Huntersville	
Davidson(1)	Total buffer width = a minimum of 100 feet for all streams within Davidson’s jurisdiction. For all FEMA regulated streams the width is 100 feet + 50% of the area of the floodfringe beyond 100 feet – stream side zone = 30 feet, managed use = 45 feet and upland = 25 feet + 50% of area of floodfringe			

Table 3: Function, Vegetative Targets and Uses Allowed in Different S.W.I.M. Buffer Zones

<i>Characteristics</i>	<i>Stream Side Zone</i>	<i>Managed Use Zone</i>	<i>Upland Zone</i>
Function	Protect the integrity of the ecosystems	Provide distance between upland development and the stream side zone	Prevent encroachment and filter runoff
Vegetative Targets (1)	<u>Undisturbed (no cutting or clearing allowed)</u> - If existing tree density is inadequate, reforestation is encouraged	<u>Limited clearing</u> - Existing tree density must be retained to a minimum of 8 healthy trees of a minimum 6 inch caliper per 1000 square feet - If existing tree density is inadequate, re-forestation is encouraged	<u>Grass</u> or other herbaceous ground cover allowed - Forest is encouraged
Uses (2)	<u>Very restricted</u> - Permitted uses limited to: flood control structures and bank stabilization as well as installation of utilities and road crossings with stabilization of disturbed areas as specified in “III E”	<u>Restricted</u> - Permitted uses limited to: all uses allowed in the Stream Side Zone, as well as storm water best management practices (BMPs), bike paths, and greenway trails (not to exceed 10 feet in width)	<u>Restricted</u> - Permitted uses limited to: all uses allowed in the Stream Side and Managed Use Zones, as well as grading for lawns, gardens, and gazebos and storage buildings (non-commercial and not to exceed 150 square feet)

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3. **Post-Construction Buffers** – The post-construction buffer requirements went into effect on June 30, 2007 in Mecklenburg County and the six (6) Towns, and July 1, 2008 in the City of Charlotte, through the adoption of post-construction ordinances contained in either the respective jurisdictions’ existing zoning ordinances or their City Code. These buffer requirements apply to intermittent and perennial streams and the ponds that they intersect in Charlotte-Mecklenburg and not to the shoreline of the Catawba River lakes. Buffer requirements vary based on established post-construction districts. The purpose of these buffers is to establish storm water management requirements and controls to prevent water quality degradation to the extent practicable and to comply with Phase I and Phase II Storm Water Permit requirements (NCGS 143-214.7). In general terms, post-construction buffers are an expansion of the S.W.I.M. buffer requirements, but in several jurisdictions and watersheds these buffers go significantly beyond the requirements established by S.W.I.M. Table 4 provides an overview of the post-construction buffer requirements.

Table 4: Post-Construction Buffer Requirements

Jurisdiction	Watershed District	Buffer Width					Buffer Delineation		
		Existing SWIM + 30-ft. no-build zone on <50 acres	50-ft on <50 acres & 100-ft on ≥50 acres for all intermittent & perennial streams	200-ft on perennial & intermittent streams inside the 100-yr floodplain & 100 ft on all other perennial & intermittent streams	100-ft on intermittent & 200-ft. on perennial streams	200-ft on intermittent & perennial streams in FEMA floodplain & 100-ft. on all others	GIS (using POLARIS)	On-Site Delineation (using DWQ methods)	USGS & USDA Maps
City of Charlotte	Central Catawba	X						X	
	Western Catawba	X						X	
	Yadkin-Southeast Catawba		X+ floodplain (undisturbed)					X	
	Six Mile Creek				X (undisturbed)			X	
Cornelius	N/A	X				X			
Davidson	Catawba	X						X	
	Yadkin		X (3 zones)					X	
Huntersville	N/A	X				X			
Matthews	Catawba	X						X	
	Yadkin		X+ floodplain (undisturbed)					X	
Mint Hill	Catawba	X				X			
	Yadkin	X				X			
	Goose Creek			X (undisturbed)					X
Pineville	N/A	X				X			
Mecklenburg Co.	N/A	X				X			

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4. Goose Creek and Six Mile Creek Buffers – The Goose Creek buffer requirements went into effect on February 1, 2009 for intermittent and perennial streams and the ponds that they intersect in the Goose Creek Watershed in the Town of Mint Hill. They are currently administered by Mecklenburg County under delegated authority from the N.C. Environmental Management Commission. The Six Mile Creek buffer requirements went into effect with the adoption of the City of Charlotte’s post-construction ordinance on July 1, 2008 and apply to intermittent and perennial streams and the ponds that they intersect located in the Six Mile Creek watershed. The Six Mile Creek buffers are administered by Charlotte Storm Water Services. The Goose and Six Mile Creek buffers are incorporated into the Town of Mint Hill and City of Charlotte post-construction ordinances, respectively. These buffers are distinguished by the fact that both exist for the protection of the Carolina heelsplitter, which is a federally-endangered species of freshwater mussel. Table 4 above provides an overview of the Goose and Six Mile buffer requirements. Disturbances are not allowed in these buffers unless specifically listed in the “Table of Uses” contained in Table 5 below.

Table 5: Table of Uses for Goose and Six Mile Creeks

Description of Uses	Exempt	Potentially allowable requiring approval (X) / or Potentially allowable requiring both approval and mitigation (X*)	Prohibited
<ul style="list-style-type: none"> <li style="text-align: right; margin-right: 20px;">Ai • report facilities that impact equal to or less than 150 linear feet or one-third of an acre of stream buffer <li style="text-align: right; margin-right: 20px;">Ai • report facilities that impact greater than 150 linear feet or one-third of an acre of stream buffer 		X X*	
Archaeological activities	X		
Bridges		X	
Dam maintenance activities	X		
Drainage ditches, roadside ditches and storm water outfalls through stream buffers: <ul style="list-style-type: none"> • Existing drainage ditches, roadside ditches, and storm water outfalls provided that they are managed to minimize the sediment, nutrients including ammonia and other pollution that convey to waterbodies • New drainage ditches, roadside ditches and storm water outfalls provided that a storm water management facility is installed to minimize the sediment, nutrients including ammonia and other pollution and attenuate flow before the conveyance discharges through the stream buffer • New drainage ditches, roadside ditches and storm water outfalls that do not minimize the sediment, nutrients including ammonia and other pollution and attenuate flow before discharging through the stream buffer 	X	X	X

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Description of Uses	Exempt	Potentially allowable requiring approval (X) / or Potentially allowable requiring both approval and mitigation (X*)	Prohibited
<ul style="list-style-type: none"> Excavation of the streambed in order to bring it to the same elevation as the invert of a ditch 			X
Drainage of a pond in a natural drainage way provided that a new stream buffer that meets the diffuse flow requirements of Section 306 is established adjacent to the new channel	X		
Driveway crossings of streams and other surface waters subject to this ordinance: <ul style="list-style-type: none"> Driveway crossings on single family residential lots that disturb equal to or less than 25 linear feet in width and are perpendicular³ Driveway crossings on single family residential lots that disturb greater than 25 linear feet in width and are perpendicular³ In a subdivision that cumulatively disturbs equal to or less than 150 linear feet in width and are perpendicular In a subdivision that cumulatively disturbs greater than 150 linear feet in width and are perpendicular 	X	X X X*	
Fences provided that disturbance is minimized and installation does not result in removal of forest vegetation	X		
Forest harvesting – see Section 305(C)11			
Fertilizer application: <ul style="list-style-type: none"> One-time fertilizer application at agronomic rates to establish replanted vegetation Ongoing fertilizer application 	X		X
Greenway/hiking trails		X	
Historic preservation	X		
Landfills as defined by G.S. 130A-290			X
Mining activities: <ul style="list-style-type: none"> Mining activities that are covered by the Mining Act provided that new stream buffers that meet the diffuse flow requirements of Section 306 are established adjacent to the relocated channels Mining activities that are not covered by the Mining Act OR where new stream buffers that meet the diffuse flow requirements of Section 306 are not established adjacent to the relocated channels Wastewater or mining dewatering wells with approved NPDES permit 		X X*	X
Non-electric utility lines with impacts other than perpendicular crossings ³ <ul style="list-style-type: none"> If activity is within 50 feet of the stream If activity is outside of the inner 50 feet nearest the stream 		X* X	

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Description of Uses	Exempt	Potentially allowable requiring approval (X) / or Potentially allowable requiring both approval and mitigation (X*)	Prohibited
<ul style="list-style-type: none"> • Wastewater collection system utility lines and lift station lines may impact the stream zone if both gravity and force main collections systems are made of ductile iron and 50% of the collection system is cleaned annually • Lift Stations require Supervisory Control and Data Acquisition System (SCADA), telemetry, audio and visual alarms, signage with emergency contact, daily visitation (365 days/year), and documentation must be maintained for 3 years of all of the above and available upon request (note: this requirement also applies to collection system perpendicular crossings, detailed below.) 		X* X*	
<p>Non-electric utility line perpendicular crossing of streams and other surface waters subject to this ordinance that are not collection systems³:</p> <ul style="list-style-type: none"> • Perpendicular crossings that disturb equal to or less than 40 linear feet of stream buffer with a maintenance corridor equal to or less than 10 feet in width • Perpendicular crossings that disturb equal to or less than 40 linear feet of stream buffer with a maintenance corridor greater than 10 feet in width • Perpendicular crossings that disturb greater than 40 linear feet but equal to or less than 150 linear feet of stream buffer with a maintenance corridor equal to or less than 10 feet in width • Perpendicular crossings that disturb greater than 40 linear feet but equal to or less than 150 linear feet of stream buffer with a maintenance corridor greater than 10 feet in width • Perpendicular crossings that disturb greater than 150 linear feet of stream buffer <p>Non-electric perpendicular utility line crossings that are collection systems as defined in Rule 15A NCAC 02T .0300 (note: must follow constraints listed under wastewater collection system utility lines and lift stations, above):</p> <ul style="list-style-type: none"> • That use any of the following installation methods to minimize the sediment, nutrient and other pollution through the stream buffer: underground directional boring methods, bore-and-jack techniques or another appropriate microtunneling method • That does not minimize the sediment, nutrient and other pollution through the stream buffer by the most appropriate exempt method 	X	X X X* X* X	X
On-site sanitary sewage systems - new ones that use ground absorption			X
Overhead electric utility lines ^{1,2,3} :			

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Description of Uses	Exempt	Potentially allowable requiring approval (X) / or Potentially allowable requiring both approval and mitigation (X*)	Prohibited
<ul style="list-style-type: none"> • Stream crossings that disturb equal to or less than 150 linear feet of stream buffer • Stream crossings that disturb greater than 150 linear feet of stream buffer 	X	X*	
Periodic maintenance of modified natural streams such as canals and a grassed travelway on one side of the surface water when alternative forms of maintenance access are not practical		X	
Playground equipment: <ul style="list-style-type: none"> • Playground equipment on single family lots provided that installation and use does not result in removal of vegetation • Playground equipment installed on lands other than single-family lots or that requires removal of vegetation 	X	X	
Ponds in natural drainage ways, excluding dry ponds: <ul style="list-style-type: none"> • New ponds provided that a stream buffer that meets the diffuse flow requirements of Section 306 is established adjacent to the pond • New ponds where a stream buffer that meets the diffuse flow requirements of Section 306 is NOT established adjacent to the pond 		X	X
Protection of existing structures, facilities and stream banks when this requires additional disturbance of the stream buffer or the stream channel		X	
Railroad impacts other than crossings of streams and other surface waters subject to this ordinance			X
Railroad crossings of streams and other surface waters subject to this ordinance: <ul style="list-style-type: none"> • Railroad crossings that impact equal to or less than 40 linear feet of stream buffer • Railroad crossings that impact greater than 40 linear feet but equal to or less than 150 linear feet of stream buffer • Railroad crossings that impact greater than 150 linear feet of stream buffer 	X	X	X
Removal of previous fill or debris provided that diffuse flow is maintained and any vegetation removed is restored	X		
Road impacts other than crossings of streams and other surface waters subject to this ordinance		X*	
Road crossings of streams and other surface waters subject to this ordinance: <ul style="list-style-type: none"> • Road crossings that impact equal to or less than 40 linear feet of stream buffer and is perpendicular • Road crossings that impact greater than 40 linear feet 	X	X	

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Description of Uses	Exempt	Potentially allowable requiring approval (X) / or Potentially allowable requiring both approval and mitigation (X*)	Prohibited
but equal to or less than 150 linear feet and is perpendicular • Road crossings that impact greater than 150 linear feet of stream buffer		X*	
Scientific studies and stream gauging	X		
Storm water management ponds excluding dry ponds: • New storm water management ponds provided that a stream buffer that meets the diffuse flow requirements of Section 306 is established adjacent to the pond • New storm water management ponds where a stream buffer that meets the diffuse flow requirements of Section 306 is NOT established adjacent to the pond		X	X
Stream restoration	X		
Stream bank stabilization		X	
Temporary roads: • Temporary roads that disturb less than or equal to 2,500 square feet provided that vegetation is restored within six months of initial disturbance • Temporary roads that disturb greater than 2,500 square feet provided that vegetation is restored within six months of initial disturbance • Temporary roads used for bridge construction or replacement provided that restoration activities, such as soil stabilization and revegetation, are conducted immediately after construction	X	X X	
Temporary sediment and erosion control devices: • To control impacts associated with uses approved by the N.C. Division of Water Quality or that have received a variance provided that sediment and erosion control for upland areas is addressed to the maximum extent practical outside the buffer • In-stream temporary erosion and sediment control measures for work within a stream channel	X	X	
Underground electric utility lines: • Impacts other than perpendicular crossings ^{3,4}	X		
Underground electric utility line perpendicular crossings of streams and other surface waters subject to this ordinance: • Perpendicular crossings that disturb less than or equal to 40 linear feet of stream buffer ^{3,4} • Perpendicular crossings that disturb greater than 40 linear feet of stream buffer ^{3,4}	X	X	
Vegetation management: • Emergency fire control measures provided that topography is restored • Planting vegetation to enhance the stream buffer • Pruning forest vegetation provided that the health and	X X X		

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Description of Uses	Exempt	Potentially allowable requiring approval (X) / or Potentially allowable requiring both approval and mitigation (X*)	Prohibited
function of the forest vegetation is not compromised <ul style="list-style-type: none"> • Removal of individual trees which are in danger of causing damage to dwellings, other structures or human life • Removal of poison ivy • Removal of understory nuisance vegetation as defined in: Smith, Cherri L. 1998. Exotic Plant Guidelines. Department of Environment and Natural Resources. Division of Parks and Recreation. Raleigh, NC. Guideline #30 	X X X		
Water dependent structures as defined in 15A NCAC 02B .0202		X	
Water wells	X		
Wetland restoration	X		

Footnotes for Above Table

1. Provided that all of the following BMPs for overhead utility lines are used. If all of these BMPs are not used, then the overhead utility lines will require a no practical alternatives evaluation by the Storm Water Administrator pursuant to Section 305(C)(1) above.
 - A minimum zone of 10 feet wide immediately adjacent to the water body will be managed such that only vegetation that poses a hazard or has the potential to grow tall enough to interfere with the line is removed.
 - Woody vegetation will be cleared by hand. No land grubbing or grading is allowed.
 - Vegetative root systems will be left intact to maintain the integrity of the soil. Stumps will remain where trees are cut.
 - Rip rap will not be used unless it is necessary to stabilize a tower.
 - No fertilizer will be used other than a one-time application to re-establish vegetation.
 - Construction activities will minimize the removal of woody vegetation, the extent of the disturbed area, and the time in which areas remain in a disturbed state.
 - Active measures will be taken after construction and during routine maintenance to ensure diffuse flow of storm water through the stream buffer.
 - In wetlands, mats will be utilized to minimize soil disturbance.
2. Provided that poles or towers will not be installed within 10 feet of a waterbody unless the Storm Water Administrator completes a no practical alternatives evaluation pursuant to Section 305(C)(1) above.
3. Perpendicular crossings are those that intersect the surface water at an angle between 75 degrees and 105 degrees.
4. Provided that all of the following BMPs for underground utility lines are used. If all of these BMPs are not used, then the underground utility line will require a no practical alternatives evaluation by the Storm Water Administrator pursuant to Section 305(C)(1) above.
 - Woody vegetation will be cleared by hand. No land grubbing or grading is allowed.

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- Vegetative root systems will be left intact to maintain the integrity of the soil. Stumps will remain, except in the trench, where trees are cut.
- Underground cables will be installed by vibratory plow or trenching.
- The trench will be backfilled with the excavated soil material immediately following cable installation.
- No fertilizer will be used other than a one-time application to re-establish vegetation.
- Construction activities will minimize the removal of woody vegetation, the extent of the disturbed area, and the time in which areas remain in a disturbed state.
- Active measures will be taken after construction and during routine maintenance to ensure diffuse flow of storm water through the stream buffer.
- In wetlands, mats will be utilized to minimize soil disturbance.