SECTION 7

Summary of Mitigation to Address Secondary and Cumulative Impacts

The Town of Holly Springs is taking progressive steps to protect its environmental heritage. The Town is experiencing significant growth and has developed many programs to balance the competing goals of this growth and environmental protection. Table 7-1 (at the end of this section) summarizes the possible SCI to natural resources and the mitigation programs in place to address them.

7.1 Topography and Floodplains

Impacts to topography will be minimized through the Town's erosion and sediment control program included in the UDO. The erosion and sediment control strategy is discussed at a pre-construction conference, and the Town strives to avoid steep slopes where more grading is needed for development.

The current Town floodplain ordinance does not permit residential structures, including fill, within the FEMA regulated floodplain. Commercial structures must be constructed outside the floodway, and base floor elevations must be 2 feet above the floodplain. Non-residential development rarely occurs within the floodplain; since 2006, only three projects involved encroachment of development within the FEMA floodplain. The Town has a policy in place which applies these residential and commercial rules to the 100-year future floodplain and 500-year floodplain in areas where it is known. In addition to the FEMA floodplains, the Town has established locally designated 100-year floodplains starting at 20 acres of drainage that are identified during the development process. No residential development is allowed within these Town regulated floodplains; non-residential development rarely occurs there as well. Floodplains of smaller streams not under FEMA's jurisdiction, that are not locally designated, are protected by the stream buffer ordinance. No structures can be placed within the stream buffer.

In areas outside the Town's current jurisdiction but within the Planning Area, floodplains are also protected. A Wake County ordinance prohibits development, including fill, in the floodplain. The County regulates streams outside FEMA's jurisdiction by not allowing development in flood hazard soils and through its buffer requirements. Thus, impacts to floodplains will be limited.

The floodplain maps within the Planning Area and County are being updated; these updated maps are likely to include rises in floodplain elevations in some areas, such that more areas will be designated as floodplains and protected from development.

Impacts to wetlands will be minimized by stream buffers, floodplain protection, and other development controls. While some wetland loss still occurs with permitting, overall SCI to wetlands in the Planning Area will be minimized by limiting or prohibiting construction and fill according to the Town's floodplain and stream buffer regulations. By preserving

floodplains, their water storage capacity, habitat, filtration, and infiltration functions will also be preserved.

7.2 Soils

Soil loss will be minimized during development through the implementation of the Town's erosion and sediment control program. Contractor education will also limit impacts on soils (Clear Water Contractor education program). Development of lands will result in higher levels of imperviousness, but good land use planning practices can accommodate future populations while limiting impacts to imperviousness.

7.3 Land Use

The Town is mitigating for land use changes by focusing development in appropriate areas (such as those areas designated for higher density development on in its Vision Holly Springs Comprehensive Plan). The Town encourages development in accordance with the Comprehensive Plan and Small Area Plans by making rezoning difficult when it is not done in accordance with the Plan (Design Based Planning, 2009). Stream buffers, required open space in subdivisions along with clustered development, landscape buffers between different land uses, park lands, and greenways will limit the impacts to open space. While some open spaces such as agricultural land and forests will still be lost to development, the impacts will be minimized by these efforts. Open spaces may become more fragmented, except along stream channels where riparian buffers and floodplains will serve as habitat corridors.

Programs are specified to protect agricultural land. As the Parks, Recreation, and Open Space Master Plan component of the Vision Holly Springs Comprehensive Plan is implemented, the goal of preservation of historical landscapes that reflect the Town's rural heritage, including working farms, should assist in the preservation of agricultural land. The Wake Soil and Water Conservation District works cooperatively with landowners to encourage farmland preservation and protection. This voluntary program was established in 1998 and includes efforts to secure farmers with proper estate planning and protect farms through the purchase of development rights. The latter program has received limited funding, but has been successful in its limited applications. In addition, the County does provide tax relief to qualifying farm owners to help offset tax burdens as property values rise in the County. Typically, as an area develops, property values rise and agricultural use of the land becomes economically unfeasible. The tax relief program was designed to address this issue.

7.4 Wetlands

Impacts to wetlands will be minimized by stream buffers, floodplain development limitations, and other development controls as well as State and Federal regulations. As described in Section 4, the majority of wetlands are located in riparian areas. While some wetland loss still occurs with permitting, overall SCI to wetlands in the Planning Area will be minimized by limiting or prohibiting construction and fill within the stream buffer. While the Town does not have a wetlands permitting program, it requires all USACE and NCDWR permits be obtained before the Town allows grading to begin. This minimizes

impacts to wetlands within the Planning Area. By protecting wetlands, the habitat functions and associated species and genetic diversity functions are also protected.

As outlined in Section 5, increased pollutant loading that occurs with development can result in a decrease of a wetland's ability to filter pollutants. A wetland's ability to attenuate flow may also be compromised by increased stormwater runoff or stream channel entrenchment. The Town's NPDES Phase II stormwater program requires stormwater BMPs that meet pollutant reduction goals established in regulations and limit stormwater impacts to wetlands and streams.

7.5 Prime or Unique Agriculture

As development pressures increase in the area, agriculture will be lost, and remaining prime farmlands may be developed. The Town and Wake County have programs in place to help minimize these impacts. The Town's zoning does allow farming as an approved use within certain land categories. The Town's Land Use Plan also directs highest density development to areas along major roads which may minimize pressures on agricultural land to develop into other land use types.

The Wake Soil and Water Conservation District works cooperatively with landowners to encourage farmland preservation and protection as discussed in Appendix B. This voluntary program was established in 1998 and includes efforts to secure farmers with proper estate planning and protect farms through the purchase of development rights. The latter program has received limited funding, but has been successful in its limited applications. In addition, the County does provide tax relief to qualifying farm owners to help offset tax burdens as property values rise in the County. Finally, the County established a Voluntary Agricultural District Program to promote farming and the value of agriculture on the community.

7.6 Public Lands and Scenic, Recreational, and State Natural Areas

With the continued implementation of the Town's Parks, Recreation, and Open Space Master Plan, its Vision Holly Springs Comprehensive Plan, and UDO; scenic areas, open space, and parks will be a high priority for the Town and will provide mitigation for losses of open space as the Town grows. These planned greenways, open spaces, and additions to the park system will provide recreational opportunities and wildlife habitat. Lands adjacent to Bass Lake are also being preserved, protecting large areas of scenic and recreational areas. Gamelands owned by Duke Energy are likely to remain primarily open space.

7.7 Areas of Archaeological or Historical Value

Historical areas may be impacted directly by future projects, but secondary impacts should be limited. It is likely that few SCI will occur to cultural and historical resources, due to the permitting and review process established by the Town as well as the Towns Village District Area (Town of Holly Springs, 2009a). A 2013 update of this plan is included in Appendix D.

Increased traffic vibration and reduced air quality (through acid rain) could impact historic structures. The Town is developing alternative modes of transportation and increasing the

interconnections of sidewalks, trails, and bike lanes to promote alternatives to vehicle use which will help reduce the source of these impacts. The Town's tree protection regulations also helps address air quality issues.

7.8 Air Quality

To address the impacts of growth on air quality, the Town is planning for and developing alternative modes of transportation. Increasing the interconnections of sidewalks, trails, and bike lanes will potentially reduce the need for vehicle use. The Town has a connectivity requirement in Sections 7.01, 7.06, and 7.09 of the UDO. In addition, the Town is very progressive at planning for and requiring sidewalk and greenway links as evidenced by its Sidewalk CIP (Figure 2-5). As growth occurs, these efforts to reduce vehicular use will curtail air pollution increases. The Town has regulations also in place to protect trees during construction, which also helps to protect air quality in Section 7.01 of the UDO, as trees are natural air filters. A perimeter landscapeyard is required for all new development as well as additional landscape areas depending upon the type of development. Section 7.11 of the UDO requires the submittal of a timbering plan.

In addition, Wake County convened a sustainability task force which has identified several strategies and performance measures for air quality goals (Wake County, 2011). Several regional planning efforts aim to reduce vehicle miles traveled and appropriately size roads according to air quality modeling analyses (TJCOG, 2013 and 2014).

A regional light rail system is planned for the Triangle area (Wake County, 2012). Documents prepared for this project indicate that parking areas to serve the light rail system will not impact levels of carbon monoxide. The document also indicates that the light rail system will result in lower levels of vehicle pollutant emissions (United States Department of Transportation, 2002).

North Carolina had its lowest ozone levels on record in 2013 since air monitoring began in the early 1970s. The declining ozone levels went hand-in-hand with lower emissions from the state's power plants. A recent report by the NCDAQ shows that the state's coal-fired power plants have cut their nitrogen oxides emissions, a primary industrial contributor to ozone pollution, by more than 80 percent since the General Assembly enacted the Clean Smokestacks Act in 2002 (NCDENR, 2013a).

State legislation to decrease nitrogen oxide emissions from power plants has significantly reduced ozone pollution, as discussed above and in Section 6. Additionally, the Town's actions and regional efforts will keep SCI to air quality in check.

7.9 Noise Levels

Efforts taken to improve air quality by promoting alternative forms of transportation and protect trees will also limit SCI to noise levels in the Planning Area. As quieter, alternative forms of transportation are implemented and efforts to increase the interconnections of sidewalks and greenways promote more pedestrian activities, vehicular traffic noise levels will potentially be reduced. In addition, landscape buffers and tree protection around different development types help reduce noise.

7.10 Water Resources

7.10.1 Surface Water

The Town has created regulations that minimize impacts to water resources resulting from development through existing stream buffer regulations, the Town's NPDES Phase II stormwater program, erosion and sediment control, and open space preservation. The greatest water quality and quantity protection will be achieved by stream buffers and stormwater control measures installed during development. Stream buffers required in the UDO will function to limit changes in stream channel morphology, erosion, and other habitat degradation. Stormwater controls will limit sediment loading and hydrology changes. Under the NPDES Phase II stormwater program, runoff volume is controlled for the 1-year, 24-hour storm to maintain the natural hydrograph and protect the channel morphology. The Town also requires diffuse flow through riparian buffers. Without these regulations, SCI to water resources would be more pronounced.

It should also be noted that as redevelopment occurs, the Town has the opportunity to require stormwater controls and riparian buffer restoration to the maximum extent practicable. While the stormwater controls and riparian buffers may not be as extensive as those required for new development, due to site constraints, they provide an opportunity to improve water quality and aquatic habitat. These practices may help improve water quality for 303(d) listed streams. Middle Creek is the only waterbody in the Planning Area that is currently on the 303(d) list (NCDENR, 2012). The Town will also actively participate in the development of any TMDLs where activities in Town may be impacting water quality.

In addition to the Town ordinances and policies described in Section 6, the Town will also look for opportunities to improve water quality. For example, the Town has worked with State agencies to identify areas for stream and buffer restoration and other strategies and pursue funding through the EEP, Section 319 program, and other funding sources. Waters within the Neuse River basin portion of the Planning Area are classified as NSW in response to excessive growth of macroscopic and/or microscopic vegetation in the Neuse River Estuary. Current strategies to limit nutrient loading, to meet the requirements of the Neuse River NSW rules, will help protect water quality. As agricultural land uses decrease in the Planning Area, impacts from this land use type may decrease in the watershed.

Wake County also implements stormwater protection programs, water supply watershed protection programs, riparian buffers, and open space preservation programs in areas currently outside the Town's jurisdiction. These programs are described in Appendix F.

The Wake County Watershed Management Plan recommended that the County develop an instream monitoring program. Implementing an instream monitoring program at the regional level is more efficient than implementing a monitoring program at the Town level. Wake County is performing targeted instream monitoring.

7.10.2 Groundwater

As growth occurs, impacts to groundwater resources will be mitigated by stormwater programs. The amount of impervious surfaces generated in developments is limited, reducing the potential impacts to groundwater recharge rates. Stormwater programs will also address potential impacts to groundwater quality through improper disposal of wastes.

Positive impacts will occur as fewer residents rely on groundwater as a public water supply source. Also, a significant number of septic tank/ground absorption systems serving residences may be eliminated; reducing the public health risk of groundwater contamination from leaking or failing septic tanks.

7.11 Forest Resources

The majority of the forested lands within the Planning Area are currently coniferous cultivated pines, which will likely be converted. While this conversion of forested lands provides a one-time source of timber products, this land use conversion is not suitable for sustainable silviculture activities. The main efforts to protect forest resources include stream buffers and open space requirements in residential developments, as well as implementation of the Vision Holly Springs Comprehensive Plan. In addition, the Town has a tree protection ordinance and provides credits for preserving existing vegetation so less new vegetation is required.

7.12 Shellfish or Fish and their Habitats

Fishery impacts are and will be limited in the Planning Area by the Town's current mitigation measures, sediment and erosion control requirements, and stormwater regulations. Impacts to freshwater mussel species from growth in the Planning Area will also be limited due to regulations currently in place. As discussed in Section 7.10, water quality and quantity impacts will be limited by stream buffers, floodplain protection, BMPs implemented as part of the Phase II stormwater program, and open space preservation. The Town's NPDES Phase II program controls for runoff quantity and quality will also help protect downstream aquatic species. Protecting the habitats of aquatic communities will, in turn, protect the aquatic species themselves. The Town also has created fisheries habitat in Bass Lake and is working with NCWRC on a stocking program. Overall, stream buffers and stormwater controls will continue to limit SCI to aquatic habitats, fisheries, and freshwater mussel communities.

The construction of sewer lines, water lines, and roads may impact water quality and the aquatic habitat of these rare mussels, particularly where they cross streams. There are sediment impacts from construction although the use of proper erosion and sediment controls help minimize this impact. In addition, where culverts are used for road crossings and not sufficiently buried, a natural substrate will no longer exist to provide aquatic habitat. In general, these impacts are direct impacts, but there is also a cumulative direct impact from previous crossings and other future crossings. The Town does not have the data to review this impact for its entire Planning Area, but will review it as a cumulative direct impact in future EAs and EISs. For future infrastructure projects that may impact rare species, the Town will work with USFWS to determine whether surveys are needed to evaluate potential impacts.

7.13 Wildlife and Natural Vegetation

The mitigation measures to protect wildlife resources include protecting habitat with riparian buffers, protecting open spaces and limiting habitat degradation through erosion and sediment control and stormwater runoff control. The currently established stream

buffers will help to protect stream channel stability, limit sediment loading, and maintain appropriate water temperature. The Town does not allow residential development in the floodplain and commercial development is rare. The wide floodplain corridors in the Middle Creek watershed will help protect downstream mussel species.

State-designated protected areas afford additional protection of wildlife habitats and vegetative communities. Many SNHAs also provide habitat to State-listed plant species. The Town will work with the NCNHP and NCWRC to identify SNHAs and other important habitat areas and make efforts during the development process to negotiate their protection. Impacts to the bald eagle populations near Jordan Lake and Harris Lake are not likely given Jordan Lake is within USACE managed land and Harris Lake is within significant Duke Energy landholdings. These areas should not be impacted by surrounding development. The Northern long-eared bat is proposed for federal listing; this species is not known to occur within the Planning Area and impacts are not likely. Michaux's sumac, listed as federally endangered, is only found near the Shearon Harris Longleaf Pine Forest SNHA and in areas that are planned for low density residential development, it is unlikely that this species would be impacted by SCI. The Town continues to monitor an approximately 40-acre are of potential habitat for the State threatened eastern tiger salamander. The Town intends on protecting this area in a voluntary dedicated tiger salamander preserve through coordination directly with the property owners. The Town owns a 74-acre and 50-acre undeveloped park property known as Sunset Oaks and Woodcreek Park site, respectively. In 2011 the town was granted a 46-acre tract of land, known as the Jordan property, which is adjacent to a 48-acre tract owned by the Town of Cary.

Any sewer lines that must transverse the area must avoid breeding pools and minimize land disturbance. Logs from any utility construction in the vicinity of the conservation area are left on the ground to enhance the habitat for the eastern tiger salamander. Finally, monitoring may be required for any project in or adjacent to the conservation easement. Therefore, SCI to this species is unlikely due to measures already in place.

7.14 Introduction of Toxic Substances

The Town has programs to prevent toxic releases and treat them when they do occur. The Town has a stormwater education program that provides the public with valuable knowledge of the impacts of toxins reaching the stormwater system. This education program encourages the public to limit the use of common toxins such as lawn pesticides and herbicides. The Town's NPDES Phase II Stormwater Program also promotes the use of BMPs and LID, which also reduces some of the toxic substance impacts.

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TABLE 7-1
Areas of Potential Impacts to be Addressed by Permitting and Mitigation Programs

Environmental Resource	Potential for SCI	Types of SCI	Mitigation Programs
Topography and Floodplains	LI	Potential for minimal impacts from commercial development; resulting in reduced water storage capacity, habitat, surface water filtration, and infiltration Isolation of floodplain from stream by channel entrenchment; loss of nutrient exchange capabilities	Vision Holly Springs Comprehensive Plan Open Space Preservation in the UDO to preserve additional corridors along required riparian buffers Floodplain Protection—No residential development or fill in floodplain; both 100-year and 500-year floodplains restricted; local floodplain designation in addition to FEMA designation; commercial development rarely occurs in the floodplain Erosion and Sediment Control Stormwater Programs Infrastructure Design Requirements – deters installation of sewer lines in riparian buffers
Soils	LI	Soil erosion and compaction	Vision Holly Springs Comprehensive Plan Open Space Preservation Parks, Recreation, Greenways, and Open Space Planning Land Use Planning – deters sprawl and encourages strategic development Riparian Buffers and Floodplain Protection Erosion and Sediment Control Stormwater Programs
Land Use	PI	Conversion of agricultural and forested land uses to mainly residential land uses	Vision Holly Springs Comprehensive Plan Open Space Preservation Parks, Recreation, Greenways, and Open Space Planning Land Use Planning to encourage development around Town Village District, selected corridors, and mixed use developments UDO Riparian Buffers and Floodplain Protection – restricts development in riparian buffer zones and prohibits nearly all floodplain encroachment

TABLE 7-1
Areas of Potential Impacts to be Addressed by Permitting and Mitigation Programs

Environmental Resource	Potential for SCI	Types of SCI	Mitigation Programs
Wetlands	LI	Loss through development; subsequent loss of habitat and habitat fragmentation, reduced flow attenuation and genetic diversity Loss of wetland function through pollutant loading	Wetland Protection through CWA Section 404 and Section 401 Vision Holly Springs Comprehensive Plan Open Space Preservation Parks, Recreation, and Greenways, and Open Space Planning Land Use Plans and UDO to set aside natural open space and encourage strategic development Riparian Buffers and Floodplain Protection Erosion and Sediment Control Stormwater Programs to reduce pollutant loads and limit stormwater impacts to wetlands
Prime or Unique Agricultural Land	PI	Potential conversion to other uses	Vision Holly Springs Comprehensive Plan Open Space Preservation Parks, Recreation, Greenways, and Open Space Planning Land Use Planning to control uses allowed Wake County Voluntary Agricultural Districts Wake County Tax Incentive Program
Public Lands and Scenic, Recreational, and State Natural Areas	LI	Potential conversion of adjacent land uses	Vision Holly Springs Comprehensive Plan Open Space Preservation Parks, Recreation, Greenways, and Open Space Planning UDO—dedication or fee-in-lieu
Areas of Archaeological of Historical Value	LI	Potential conversion of adjacent land uses Structural damage due to acid rain and vibrations	Vision Holly Springs Comprehensive Plan Parks, Recreation, Greenways, and Open Space Planning Land Use Planning to control uses allowed

TABLE 7-1
Areas of Potential Impacts to be Addressed by Permitting and Mitigation Programs

Environmental Resource	Potential for SCI	Types of SCI	Mitigation Programs
Air Quality	PI	Reduction in air quality due to increased vehicular traffic Negative impacts to human health (such as asthma); acid rain; reduced visibility	Wake County Air Quality and Sustainability Task Force Transportation elements of bicycle planning and greenways planning Comprehensive Transportation Plan Vision Holly Springs Comprehensive Plan Parks, Recreation, Greenways, and Open Space Planning Land Use Planning UDO connectivity requirement and open space preservation Riparian Buffers Protection Tree Protection Ordinance
Noise Level	PI	Increase in overall noise level in Planning Area Negative impacts to human health	Comprehensive Transportation Plan Vision Holly Springs Comprehensive Plan Parks, Recreation, Greenways, and Open Space Planning Land Use Planning UDO connectivity requirement and open space preservation Riparian Buffers Protection – development buffers Tree Protection Ordinance

TABLE 7-1
Areas of Potential Impacts to be Addressed by Permitting and Mitigation Programs

Environmental Resource	Potential for SCI	Types of SCI	Mitigation Programs
Surface Water Resources	PI	Water quality degradation; increase in stormwater runoff	Coordinate and work with agencies to identify restoration projects and funding to improve water quality in 303(d) listed streams
		Alteration of natural hydrograph (magnitude, timing, frequency, duration, rate of change); lower and more frequent low-flow conditions; alteration of channel morphology	Vision Holly Springs Comprehensive Plan
			Parks, Recreation, Greenways, and Open Space Planning
			UDO, Land Use Plans, and open space preservation
			Riparian Buffers and Floodplain Protection – no residential development or fill in the floodplain
			Erosion and Sediment Control
			Stormwater Programs
			Water Conservation and Water Reuse Programs
			Fisheries and Wildlife Programs
			Infrastructure Design Requirements: sewers at stream crossings encased and installed using directional boring
Groundwater Resources	LI	Reduction in use for drinking water; potential to become contaminated	Vision Holly Springs Comprehensive Plan
			UDO, Land Use Plans, and open space preservation
		Groundwater inflow (which provides base flow in streams and supports life during droughts) potentially reduced	Riparian Buffers and Floodplain Protection – allowing for natural infiltration
			Stormwater Programs – sponsoring education programs
			Failing septic systems taken offline as infrastructure is developed
			Water Conservation and Water Reuse Programs
Forest Resources	PI	Potential conversion to other uses	Vision Holly Springs Comprehensive Plan
		Reduction in air quality; increase in near-surface air temperature; habitat fragmentation and reduction	Open Space Preservation
			UDO and Land Use Planning to encourage development around Town Village District, selected corridors, and mixed use developments
			Parks, Recreation, Greenways, and Open Space Planning
			Riparian Buffers and Floodplain Protection

TABLE 7-1
Areas of Potential Impacts to be Addressed by Permitting and Mitigation Programs

Environmental Resource	Potential for SCI	Types of SCI	Mitigation Programs
Shellfish or Fish and their Habitat	PI	Possible aquatic habitat degradation and hydrology alteration Disruption of food chain; reduction in aquatic insect number and diversity through loss of riffle habitat; reduction in potential for long-term population sustainability	Wetland Protection through CWA Section 404 and Section 401 Endangered Species Act Vision Holly Springs Comprehensive Plan Open Space Preservation Parks, Recreation, Greenways, and Open Space Planning UDO and Land Use Planning – encourage clustered development and natural space conservation Riparian Buffers and Floodplain Protection Erosion and Sediment Control Stormwater Programs Fisheries and Wildlife Programs – Bass Lake restoration Infrastructure Design Requirements: sewers at stream crossings encased and installed using directional boring
Wildlife and Natural Vegetation	PI	Reduction in available habitat Habitat fragmentation; reduction in genetic diversity; reduction of intolerance species; increased dispersal distance to suitable habitat; reduction in potential for long-term population sustainability	Endangered Species Act Vision Holly Springs Comprehensive Plan Open Space Preservation Parks, Recreation, Greenways, and Open Space Planning - important habitat areas prioritized for protection UDO and Land Use Planning to encourage clustered development and natural space conservation Riparian Buffers and Floodplain Protection Erosion and Sediment Control Stormwater Programs Tree Protection Ordinance Fisheries and Wildlife Programs including protection of eastern tiger salamander habitat

TABLE 7-1
Areas of Potential Impacts to be Addressed by Permitting and Mitigation Programs

Environmental Resource	Potential for SCI	Types of SCI	Mitigation Programs
Introduction of Toxic Substances	LI	Increase in likelihood of contamination Negative impacts to human health	Land Use Planning to control uses and likely exposure Stormwater education programs Infrastructure Design Requirements – Sewer Use Ordinance to limit potential for sewer blockages and overflows

Notes:
PI = Areas of Potential Impact (major relevance in SEPA documents and permitting applications)
LI = Areas of Limited Impact (minor relevance in SEPA documents and permitting applications)